WCCM-PANACM
VANCOUVER 2024

16TH WORLD CONGRESS ON COMPUTATIONAL MECHANICS

4TH PAN AMERICAN CONGRESS ON COMPUTATIONAL MECHANICS

JULY 21-26, 2024

Vancouver, British Columbia, Canada

CACSE ACCSG

IACM
INTERNATIONAL ASSOCIATION FOR COMPUTATIONAL MECHANICS

PROGRAM AT A GLANCE

Sunday, July 21		Monday, July 22	Tuesday, July 23	Wednesday, July 24	Thursday, July 25	Friday, July 26
Short Course Registration 8:00 - 9:30		Registration 7:30 -5:30	Registration 7:30 -5:30	Registration 7:30 -5:30	Registration 7:30 -5:30	Registration 7:30 -1:00
	7:45 - 8:30	Opening Ceremony				
	8:30 - 9:15	Plenary Session 1 *Karen Willcox*	Plenary Session 2 *Laura de Lorenzis*	Plenary Session 3 *Thomas J.R. Hughes*	Plenary Session 4 *Daigoro Isobe*	Plenary Session 5 *Zhuo Zhuang*
Short Courses 9:00 - 12:00	9:15 - 9:45	Break	Break	Break	Break	Break
	9:45 - 11:45	Technical Session 1	Technical Session 4	Technical Session 7	Technical Session 10	Technical Session 13
Lunch for short course participants	11:45 - 1:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
Short Courses 1:00 - 4:00	1:00 - 1:45	Semi-Plenary Session 1 *Chiara Bisagni* *Junji Kato* *Barry Sanders*	Semi-Plenary Session 2 *Yuri Bazilevs* *Beverly McKeon* *Kengo Nakajima*	Semi-Plenary Session 3 *Erasmo Carrera* *Alvaro Coutinho* *Alison Marsden*	Semi-Plenary Session 4 *Stefanie Elgeti* *Ugo Piomelli* *Kenji Takizawa*	Semi-Plenary Session 5 *Fangsen Cui* *Kenneth Duru* *Nicolas Moes*
	1:45 - 2:00	Break	Break	Break	Break	Break
	2:00 - 4:00	Technical Session 2	Technical Session 5	Technical Session 8	Technical Session 11	Technical Session 14
	4:00 - 4:30	Break	Break	Break	Break	
Congress Registration 2:00 - 8:00	4:30 - 6:30	Technical Session 3	Technical Session 6	Poster Session (Technical Session 9)	Technical Session 12	
Welcome Reception 6:00 - 8:00		IACM Female Research Chapter Event 6:30 - 8:30	Graduate Student Meet and Greet 6:30 - 8:00		Banquet Reception: 6:30 Dinner: 7:15	

Sunday, July 21: Welcome Reception – 6:00-8:00pm, *Ballroom C/D*
Monday, July 22: Opening Ceremony – 7:45-8:30am, *Ballroom A/B*
Monday, July 22: IACM Female Research Chapter Event, 6:30-8:30pm, *Room 306 and Foyer*
Tuesday, July 23: Industry Needs in Applied and Computational Mechanics Panel – 4:30-5:30pm, *Room 110*
Tuesday, July 23: Graduate Student Meet and Greet - 6:30-8:00pm, *Ballroom D* – Sponsored by USACM Student Chapter
Wednesday, July 24: Poster Session – 4:00-5:30pm, *Ballroom D*
Thursday, July 25: Banquet Reception – 6:30-7:15pm, *Ballroom C/D Foyer*
Thursday, July 25: Banquet – 7:15-8:30pm, *Ballroom C/D*

WCCM-PANACM
VANCOUVER 2024

Welcome!

On behalf of the Canadian Association for Computational Science and Engineering, we would like to welcome you to the 16th World Congress on Computational Mechanics and 4th Pan-American Congress on Computational Mechanics (WCCM-PANACM 2024). The WCCM-PANACM is jointly organized by the International Association for Computational Mechanics (IACM) and the Canadian Association for Computational Science and Engineering (CACSE). This is the first in-person world congress since 2018 and we are very excited to host this scientific event in Canada for the first time.

We wish you a great congress and hope you would enjoy the technical and social program our team put together and will find time to explore the beautiful province of British Columbia and the city of Vancouver.

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University of Calgary

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The University of British Columbia

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Polytechnique Montréal

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Artem Korobenko, University of Calgary

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Short Courses

W24-01: Modeling, Discretization, Optimization, and Simulation of Phase-Field Fracture Problems, Thomas Wick, Room 113

W24-03: Fundamental Principles of Multiphysics Modeling, Christopher Nahed, Room 107

W24-05: Scientific Machine Learning: Application to Computational Mechanics, Rajeev Jaiman, Romit Maulik, Gianmarco Megaldo, Room 116

W24-07: Automated Model Discovery, Ellen Kuhl, Skyler St. Pierre, Mathias Peirlinck, Kevin Linka, Room 115

W24-08: Coupling Simulation Codes using preCICE, Gerasimos Chourdakis, Ishaan Desai, Room 105

W24-09: Geometric Mechanics Formulations and Structure Preserving Discretizations: An Introductory Course, Christopher Eldred, Marc Gerritsma, Artur Palha, Room 114

W24-11: Training and Deploying Physics-Based and Machine Learning Interatomic Potentials for Advanced Materials Applications, Ilia Nikiforov and Amit Gupta, Room 106

W24-12: Machine Learning for Solid Mechanics, WaiChing Sun, JS Chen, Nikolaos Vlassis, Qizhi He, Room 117

Sponsors

We are thankful for the strong support of our Sponsors.

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Exhibitors

Please visit our Exhibitors in Ballroom D Foyer

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Special Events

Sunday, July 21

Welcome Reception – 6:00-8:00pm, Ballroom C/D

Monday, July 22

Opening/Awards Ceremony – 7:45-8:30am, Ballroom A/B
IACM Female Research Chapter Event, 6:30-8:30pm, Room 306 and Foyer

Tuesday, July 23

Industry Needs in Applied and Computational Mechanics Panel – 4:30-5:30pm, Room 110
Student Meet and Greet - 6:30-8:00pm, Ballroom D

Wednesday, July 24

Poster Session – 4:00-5:30pm, Ballroom D

Thursday, July 25

Banquet Reception – 6:30-7:15pm, Ballroom C/D Foyer
Banquet – 7:15-8:30pm, Ballroom C/D

Conference Information

Registration Location/Hours
Registration hours are as follows:
Sunday: 2:00-8:00pm
Monday-Thursday: 7:30-5:30pm
Friday: 7:30-1:00pm

Registration Fees
Your registration fee includes access to all technical sessions, receptions, breaks and poster session. If you purchased a discounted ticket, you do not have access to the congress banquet. Those who are registered as accompanying persons may attend the opening reception and banquet only.

Speaker Preparation Room
There is a speaker prep room in 107. The room has a projector and screen similar to the ones in the breakout rooms. You may use the room to test your laptop with the projector and/or practice your talk.

Refreshment Breaks
Morning refreshments will be in Ballroom D and Foyer. Afternoon breaks will be available on Levels 1, 2, and 3.

Lunch
Lunches are not provided by the congress. Lunch options are detailed in the congress app and at the registration desk.

Nursing Room and Prayer Room
Check for details in the congress app.

WiFi Information/Congress App
Information is available at Registration Desk.

Lost and Found
A lost and found for the congress is located at the registration desk.

Security
Please wear your badge when you are inside the convention centre and keep all of your belongings with you.

Emergency Contact
Call 911 in the case of an emergency.
For non-emergency issues related to the conference, call or text 512-743-3273

Plenary Speakers

Karen Willcox, University of Texas

Monday, July 22, 8:30am, Ballroom A/B

Mathematical and Computational Foundations for Predictive Digital Twins at Scale

Digital twins represent the next frontier in the impact of computational science on grand challenges across science, technology and society. A digital twin is a computational model or set of coupled models that evolves over time to persistently represent the structure, behavior, and context of a unique physical system, process, or biological entity. This talk will highlight progress and opportunities in achieving robust, reliable digital twins at scale, including the important role of graphical models, reduced-order modeling, scientific machine learning, and uncertainty quantification.

Laura de Lorenzis, ETH Zurich

Tuesday, July 23, 8:30am, Ballroom A/B

Material Modeling in the Era of AI: From Sparse Regression to the Language of Material Laws

The lecture provides an overview of recent research conducted by the speaker's group and collaborators on the automated discovery of material models. This research advocates for a paradigm shift, moving away from the traditional approach of calibrating unknown parameters within a preselected material model towards a new objective of model discovery. This entails the simultaneous selection, generation, or encoding of the most suitable model to interpret given experimental data, along with the calibration of its unknown parameters. To achieve this goal, a variety of tools are employed, ranging from sparse regression to Bayesian learning, and from formal grammars to symbolic regression. Each of these tools possesses distinct features but shares the common aim of ensuring the fulfillment of physics constraints and interpretability of the discovered model(s). Initially developed to discover a specific model within a predetermined category (i.e. hyperelasticity, viscoelasticity or plasticity, the approach was more recently extended to the general case of a material belonging to an unknown class of constitutive behavior. Additional relevant aspects such as the type of data, specimen design, and experimental validation are also discussed.

Thomas J.R. Hughes, University of Texas at Austin

Wednesday, July 24, 8:30am, Ballroom A/B

Phase Fields and Computational Mechanics

To many of us, a perhaps overly simplified description of a Computational Mechanics method is one composed of a variational method and function spaces. It is even simplified further if we assume a Galerkin variational method, which only entails one function space. That is a paradigm that has had enormous practical benefits, being the basis of much large-scale computing done in engineering and science. Usually, this can be phrased in terms of the weak form of the problem, the starting point of discretization. It is the discretization of the function spaces that we deal with in practice, reducing an infinite dimensional problem to a finite dimensional one that can be solved on a computer. The Finite Element Method is obviously the predominant discretization method, and the first one to combine geometric and topologic versatility. In a sense, no matter, how complicated an engineering design, it can be discretized using the Finite Element Method. However, it is well known that the exact geometry, perhaps defined by a Computer Aided Design (CAD) file, is almost never represented exactly by the Finite Element Method, the only exceptions being very simple cases. This is but one deficiency of the contemporary Finite Element Method in practice. One can add that building meshes is labor intensive, and a significant bottleneck in the design-through-analysis process. Other deficiencies are the introduction of geometry errors in computational models that arise due to feature removal, geometry clean-up and CAD "healing," utilized to facilitate efficient mesh generation. Still other shortcomings of contemporary technology are the inability to "close the loop" with design optimization, and the lack

of robustness of higher-order finite elements to achieve their full promise in industrial applications. What has been done to address these issues?

Isogeometric Analysis in its basic form represents a partial solution. It is based on the geometrical representations used in CAD, predominantly smooth splines, and is capable of more precise geometric descriptions, and more robust performance of higher-order CO-continuous finite elements, but the problem of developing boundary-fitted meshes remains laborious. Shortly after the introduction of Isogeometric Analysis, Ernst Rank and Alexander Düster proposed the Finite Cell Method, a cut-element or immersed method. In contrast with classical immersed methods, they showed how to obtain the same accuracy as the boundary-fitted method, and specifically higher-order accuracy with higher-order elements. There initial work was for standard higher-order elements but they soon after applied it to Isogeometric Analysis. It has been subsequently shown that Isogeometric Analysis has analytical advantages over standard finite elements in the immersed setting. This has facilitated the original dream of Isogeometric Analysis: To create exact geometries, expedite mesh generation and simplify local refinement. It seems the key concept is the introduction of a phase field that defines the geometry. In the case of an engineering design, the CAD file suffices to define the phase field. It is binary in this instance, taking on the value 1.0 where there is material and 0.0 elsewhere. The phase field concept can be brought to life as a continuous function, which enables the integration of other types of analysis, such as topology optimization within CAD, additive manufacturing, and phase field fracture.

Phase fields are everywhere in contemporary Computational Mechanics and are advocated as a standard device going forward. Immersed and phase field analysis will be illustrated through examples and applications, including Computational Medicine. I also hope to address the open question of whether we can immerse a geometry in an artificial neural net, say a Variationally Mimetic Operator Network (VarMiON), and obtain better, worse or equivalent results to standard Finite Element or Isogeometric Analysis Methods.

Daigoro Isobe, University of Tsukuba

Thursday, July 25, 8:30am, Ballroom A/B

The Beam Elements and Their Engineering Application

In this lecture, unique techniques applied to linear Timoshenko and Bernoulli-Euler beam elements, and their applications in various engineering fields are presented.

First, a brief outline of the Adaptively Shifted Integration (ASI)-Gauss code incorporated with linear Timoshenko beam elements and their applications are introduced. This code provides higher computational efficiency than the conventional code by the shifting numerical integration points of beam elements to appropriate positions according to the elasto-plastic properties. It can be applied to those problems with strong nonlinearities including phenomena such as member fracture and elemental contact. Several examples such as aircraft impact analysis of the WTC tower, seismic pounding analysis of the Nuevo Leon buildings, collapse analysis of a building subjected under tsunami wave and debris collision, and motion behavior analyses of indoor non-structural components such as ceilings and furniture are presented.

Next, the parallel solution scheme of inverse dynamics using Bernoulli-Euler beam elements and its application to a torque cancelling system (TCS) is introduced. The TCS calculates reaction moments generated by motors in robots by considering the dynamics of the numerically modelled system. The developed scheme can handle different types of configurations and can also consider elasticity of constituted links or passive joints by only changing the input numerical model. Once the reaction moment is known, it can be cancelled by applying an anti-torque to a torque generating device. Some applications of the system are presented in this lecture.

Zhuo Zhuang, Tsinghua University

Friday, July 26, 8:30am, Ballroom A/B

Defect Bone Reconstruction by Digital Triplet with Data-driving CT Image, Mechanics Modeling Constitutive and 3D Printing Prosthesis

Human periarticular bone defect is a difficult disease in orthopedics. There is challenge issue to recognize anisotropy, heterogeneity of bone tissue structure and graphics by low resolution clinic-CT image. In collaboration with clinical medicine, the data driving and mechanics modeling technique for bone defect reconstruction is proposed. Data driven micro-CT and clinical-CT images are used to obtain the characteristics of cancellous bone structure and graphics. The experimental technology and numerical method are developed for predicting the mechanics parameters of animal specimen on the multi-axial stress state. The constitutive model of heterogeneous anisotropy of bone tissue is established and the parameters are deduced by numerical simulation and specimen experiment. For designing the robust cancellous prosthesis bone, a kind of spinodal lattice is designed with random, indeterminate, aperiodic, asymmetry, irregular, large space for mechanical and biological function. The digital triplets with physical environment scanning CT image, virtual environment equivalent modulus and additive manufacturing lattice design are created to guide the clinical treatment of personalized bone defects. This work has been demonstrated in some clinical applications to the benefit of patients.

Semi-Plenary Speakers

Chiara Bisagni, Politecnico di Milan

Monday, July 22, 1pm, Ballroom A

Buckling Phenomena from Computational Aspects to the Design of Aerospace Composite Structure

Buckling phenomena are difficult to be computationally analyzed due to the high geometric nonlinearity, especially in the case of composite panels and shells. New design methodologies will be presented for the development of thin innovative aerospace composite structures, that work in the post-buckling field and that reach multi-stable configurations.

A paradigm shift in design concepts, considering buckling no more as a phenomenon to be avoided, but as a favorable behavior to be actively exploited will be presented, together with the new challenges related to the design and analysis of these structures. The developed design methodologies consist of an integrated mathematical formulation based on finite element analyses, that has also the potential to contribute to an increased role of modelling and simulation for aerospace composite structures from the preliminary design to the certification.

This design methodology represents the main goal of an ERC Advanced Grant funded by the European Commission, called NABUCCO with the duration of 5 years. NABUCCO covers all the aspects aforementioned and will include a series of experimental validations spanning from simple structural components to representative scaled wing models.

Junji Kato, Nagoya University

Monday, July 22, 1pm, Ballroom B

Topology Optimization of Microstructures Using FFT-based Homogenization Method

With the growing interest in additive manufacturing utilizing topology optimization, it has recently become possible to fabricate optimized porous and lattice structures at the micro-scale (or meso-scale) level. For topology optimization at such small scales, a homogenization method based on the finite element method is generally used. However, in the optimal design of 3D microstructures considering material nonlinearity, the computational cost and memory usage increase dramatically, requiring treatments such as considerably coarsening the element mesh of the microstructures. As a result, a truly optimal topology of microstructure cannot be obtained.

Therefore, we propose a new multiscale topology optimization method using a homogenization method based on Fourier Fast Transform (FFT). Here, we address the problem of finding the optimal topology of a microstructure consisting of two different elastoplastic materials in order to maximize the energy absorption of the entire macrostructure.

It is shown that the proposed method can significantly reduce the computational cost and memory usage, with results that are almost identical to those of conventional homogenization methods based on finite element methods.

Barry Sanders, University of Calgary

Monday, July 22, 1pm, Ballroom C

Quantum Data Science

Quantum information theory transforms the very foundations of information theory and computing by replacing pre-quantum, or 'classical', informational foundation of binary strings into superpositions thereof, utilising quantum theory's wave-particle duality. In a sense, bits capture the particle-like behaviour with the bit being zero or one like a particle being there or not there (half a particle is forbidden). Superposition bits, such as allowing a 0 and a 1 to co-exist asa superposition of waves representing each, relies on the wave-like property. From this wave-and-particle representation of information is introduced, even the logical rules such as for Boolean operations, manifested as concatenations of one-bit operations such as NOT and two-bit operations such as NAND, gives way to quantum logic, which respects and preserves wave-and-particle-like properties. From this new paradigm of information processing, disruptive changes occur to the notion of whether problems such as number factorisation are even hard in the sense of whether the subexponential cost for solving with respect to the size of computational input, and a provable advantage exists for a kind of unstructured search problem. Building on these notions, I provide a perspective on quantum computing for data science, including a dive into state-of-the-art for both hardware and algorithms.

Yuri Bazilevs, Brown University

Tuesday, July 23, 1pm, Ballroom A

Isogeometric Shells with Emphasis on Modeling of Architected Structures

While IGA has significantly impacted much of computational mechanics, one area that has benefited the most from IGA research is computational methods for shell structures. Because geometrically complex, smooth surfaces are naturally represented in CAD systems, much of that technology could be directly employed in the discretization of existing shell theories, with increased accuracy and robustness in general-purpose nonlinear applications relative to traditional FEA representations. In addition, the increased smoothness of CAD surface representation (by means of B-Splines and their rational and unstructured variants) enabled the formulation, and use in general-purpose nonlinear applications, of thin shell theories previously unattainable in traditional FEW. Many more developments followed, making shells some of the most mature of IGA technologies today and a prime candidate for implementation in commercial FEA codes. This presentation will focus on key recent developments in IGA for thin shell structures and show a novel application of IGA to the modeling of architected materials and structures. In recent years, architected materials and structures have gained significant popularity due to their ability to reach enhanced performance for use in multifunctional and multidisciplinary applications.

Among numerous options investigated, architected structures based on Triply Periodic Minimal Surfaces (TPMS) have gained increasing attention because they exhibit exceptional properties in multiple disciplines simultaneously. However, because of the complexities involved in the geometry representation and mechanical response of these structures, physics-based modeling for this problem class engenders a set of challenges. In this paper we address some of these challenges by developing a first-of-its-kind IGA-based geometry modeling and simulation framework for architected materials and structures. We focus on sheet TPMS-based structures, for which we first develop on IGA-suitable geometry modeling pipeline and then evaluate their mechanical performance in crushing simulations.

Beverley McKeon, Stanford University

Tuesday, July 23, 1pm, Ballroom B

What Makes Turbulence Tick?

Significant recent progress has been made in flow modeling using both equation-driven and data-driven techniques. We focus here on the intersection of these two approaches, using data to complete the details of known flow dynamics. We utilize the classical approaches and tools of the modern day – theoretical analysis and data-driven methods, respectively –to illuminate features responsible for the sustenance of turbulence associated with nonlinear interactions in the Navier-Stokes equations. Focusing on a spatio-temporal representation of turbulence near walls – an omnipresent phenomenon in large-scale transport and transportation – we identify and quantify key scale interactions. Methods to obtain data-driven representations of both linear and nonlinear dynamics will be discussed, along with some implications for the modeling of wall turbulence. The work has benefited from funding by the US ONR, ARO and AFOSR over a period of years, which is gratefully acknowledged.

Kengo Nakajima, The University of Tokyo

Tuesday, July 23, 1pm, Ballroom C

Integration of Simulation/Data/Learning and Beyond

Recently, supercomputing has been changing dramatically. Integration/convergence of Simulation/Data/Learning (S+D+L) is important towards Society 5.0 proposed by Japanese Government, which enables integration of cyber space & physical space. In 2015, we started the BDEC project (Big Data & Extreme Computing) for development of supercomputers and software for integration of (S+D+L). In May 2021, we started operation of the Wisteria/BDEC-01. It is the first BDEC system, which consists of computing nodes for computational science and engineering with A64FX (Odyssey), and those for Data Analytics/AI with NVIDIA A100 GPU's (Aquarius). We also develop a software platform "h3-Open-BDEC" for integration of (S+D+L) on the Wisteria/BDEC-01, which is designed for extracting the maximum performance of the supercomputers with minimum energy consumption focusing on Innovative method for numerical analysis by adaptive precision, accuracy verification and automatic tuning, Hierarchical Data Driven Approach based on machine learning, and Software for heterogeneous systems. Integration of (S+D+L) by h3-Open-BDEC enables significant reduction of computations and power consumption, compared to those by conventional simulations. In this talk, achievements in this project and future perspectives towards the next stage will be described.

Erasmo Carrera, Politecnico di Torino

Wednesday, July 24, 1pm, Ballroom A

The Node Dependent Kinematic form of Finite Element Method

Current Finite Elements implementation, including those in commercial software, are characterized by a fixed/limited number of degrees of freedom per nodes. Normally these are 'six' for structural elements and 'three' for 3D ones. These constraints could lead to severe limitations to solve 'localized' stresses/fields, laminated composite and/or metallic structures, electromechanical problems and structures subjected to multifield loadings.

In recent years, the speaker and co-workers have developed a version of finite elements in which the number of degrees of freedom in the node can vary within the element, from node to node: this is the NDK, Node Dependent Kinematic version of FE. In other words, each node can refer to a different structural theory and the FEM matrices are weighted not only with respect to classical shape functions but also with respect to structural theory. This was done for one-dimensional, two-dimensional plane and curved and three-dimensional elements. The key tool for the generation of the NDK formulation is the Carrera Unified Formulation, proposed by the speaker more than 25 years ago, which allows the writing of stiffness matrices in terms of a few fundamental 'nuclei' that are essentially independent of the type of structural theory and shape functions used in the node.

This lecture illustrates the NDK FEM method and propose applications to various linear and non-linear, static and dynamic problems, metallic and laminated composite materials, mechanical and electrical loadings. In particular, the possibility of applying NDK to global-local problems without the need to use transition elements and/or penalty procedures will be highlighted. The advantage in terms of both accuracy and computational cost reduction of the NDK-FEM method over traditional FEM will be clearly shown. As approximating functions for the structural part, reference will be made to polynomial (Taylor-based) expansions, use of Lagrange and Legendre polynomials or a combination of these.

Alvaro Coutinho, Universidade Federal do Rio de Janeiro

Wednesday, July 24, 1pm, Ballroom B

Advances in Data-driven Methods for Coupled Fluid Flow and Transport

In recent years, there has been significant interest in using data-driven methods to solve problems in science and engineering, especially in the context of large coupled fluid flow and transport. Numerical simulations for these problems can be costly, making data-driven methods valuable for understanding and improving efficiency in quantifying and predicting states. This talk will review recent advancements in data-driven methods, such as dynamic mode decomposition, physics-informed neural networks, manifold learning, and neural operators, as applied to relevant problems involving coupled incompressible fluid flow with transport. These problems are of interest in sustainable resource exploration, geophysics, and carious industrial applications. The talk will show how data-driven information can improve the efficiency of numerical simulation software for short-time prediction and adaptive time-stepping strategies, exploring parametric manifolds for unseen scenarios, and reconstructing high-dimensional simulations with lower-dimensional structures in feasible time.

Alison Marsden, Stanford University

Wednesday, July 24, 1pm, Ballroom C

Multi-physics Modeling for Treatment Planning in Cardiovascular Disease

Physics-based computational models of the cardiovascular system are increasingly used to simulate hemodynamics, tissue mechanics, and physiology in evolving healthy and diseased states. While predictive models using computational fluid dynamics (CFD) originated primarily for use in surgical planning, their application now extends well beyond this purpose. An increasingly wide range of modeling applications are aimed at uncovering fundamental mechanisms of disease progression and development, performing model-guided design, and generating testable hypotheses to drive targeted experiments. Increasingly, models are incorporating multiple physical processes spanning a wide range of time and length scales in the heart and vasculature. We will discuss recent advances in modeling methodology, including pivotal developments in image processing, multi-physics simulations, modeling under uncertainty, and vascular growth and remodeling. We argue that traditional CFD alone is insufficient to tackle increasingly complex clinical and biological problems across scales and systems. Rather, CFD should be coupled with appropriate multiscale biological, physical, and physiological models needed to produce comprehensive, impactful models of mechanobiological systems and complex clinical scenarios.

Stefanie Elgeti, Vienna University of Technology

Thursday, July 25, 1pm, Ballroom A

Splines vs. Neural Networks: How Novel Machine Learning Approaches Influence Design Optimization

Product innovation is a multi-step process: a creative phase where ideas are born, an evaluation phase where the ideas are evaluated, and an implementation phase where these ideas become tangible. While computer-based assistance systems are already available for the latter two phases, creativity is often still considered an exclusively human attribute. However, recent advances in artificial intelligence (AI) have challenged this notion, as creative AI agents are increasingly integrated into our daily lives and have demonstrated their potential to create original content (e.g., ChatGPT, DALL-E, MuseNet, DeepDream). In light of these advances, a new field of research has emerged in the area of AI-enabled design processes, leading to a more-than-human design process in which a computer agent collaborates with a design team to efficiently and creatively explore the entire design space in search of novel design solutions.

To this end, we will demonstrate new technologies, such as how Variational Autoencoders (VAE) can be used to learn low-dimensional, yet feature-rich shape representations. This approach promises significant improvements in both performance and variety of shapes that can be learned. The resulting geometric representation is then incorporated into a shape optimization framework. In addition, we explore the potential of reinforcement learning (RL) as an optimization strategy. RL is based on the trial-and-error interaction of an agent with its environment. As such, RL can be characterized as experience-driven, autonomous learning. While not necessarily superior to classical optimization algorithms (such as gradient-based approaches) for a single optimization problem, based on the existing literature, we expect RL techniques to thrive when recurrent optimization tasks arise.

Ugo Piomelli, Queen's University

Thursday, July 25, 1pm, Ballroom B

The Good, the Bad, and the Beautiful. Leonardo's Studies of Turbulence

Aspects of fluid dynamics appear often in Leonardo da Vinci's notebooks: sketches of water flow, plans for flying machines, studies of bird flight. He seemed fascinated by the eddying movement of water, and designed ingenious experiments to try and understand the causes of these complex motions. He lacked the advanced mathematical tools required to study this subject properly, however, and his attempts to use geometrical reasoning for the analysis of fluid flows are unsuccessful. This limitation is reflected in many of the machines he designed, which we now know cannot work. His observational powers, however, allowed him to make some exceptionally perceptive remarks that foreshadow techniques used today, both in the experimental and the theoretical analysis of flow problems, observations illustrated by striking drawings and sketches. In this talk, some of Leonardo's reflections on turbulence will be discussed, vis a vis the present understanding of this captivating but baffling subject, perhaps the last unsolved problem in classical physics.

Kenji Takizawa, Waseda University

Thursday, July 25, 1pm, Ballroom C

Space-Time Isogeometric Analysis (ST-IGA): From the Inception in 2010 to Tire with Complex Tread Pattern and Road Contact in 2024

The inception of the Space-Time Isogeometric Analysis (ST-IGA) in 2010 was major milestone in the Space-Time Computational Flow Analysis (STCFA). It enabled first-of-its-kind solutions in many classes of problems ranging from flapping-wing aerodynamics of an actual locust to tsunami-shelter vertical-axis wind turbines, ventricle-valve-aorta flow analysis to car and tire aerodynamics with near-actual geometries, road contact, and tire deformation. We will provide an overview of how the ST-IGA evolved in the solutions it can deliver in connection with the STCFA and reached where it is in 2024. We focus on tire aerodynamics with complex treat pattern and rod contact as one of the latest examples of what the ST-IGA can do now.

Fangsen Cui, IHPC, A*Star

Friday, July 26, 1pm, Ballroom A

Modeling, Simulation, and ML in Acoustics and Biomechanics

In this talk, the design, modeling, and simulation on acoustics (vibration and noise, ultrasonic waves non-destructive testing, and structural health monitoring) and biomedical devices (vascular stents) is discussed. It is demonstrated that modeling and simulation plays a pivotal role for successful completion of projects. First an overview is given to the topics. The latter segment of the talk delves into a specialized exploration of ultrasonic waves. Specifically, it delves into the Rayleigh waves and the zero-group-velocity (ZGV) mode waves, and how to combine it with the sensor technology for effective defect detection. The application of machine learning (ML) with ultrasonic waves is also discussed. Finally, the development of a novel stent-graft, incorporating both computational structural analysis and fluid dynamics analysis, is presented.

Kenneth Duru, Australian National University

Friday, July 26, 1pm, Ballroom B

Dual-pairing Summation-by-parts Framework for Accurate and Efficient Numerical Simulation of Waves and Nonlinear Hyperbolic Conservation Laws

The success of modern finite difference (FD) methods for numerical simulation of complex problems in computational mechanics is attributable to the development of summation-by-parts (SBP) finite difference. Traditionally, the design of SBP operators have been exclusively based on central FD stencils on co-located grids, as this has generally been accepted as necessary to ensure a skew-symmetric linear operator which is critical to prove linear stability. Recently, the dual-pairing (DP) SBP framework has shown that this is not necessarily true. The DP SBP operators are a dual-pair of backward and forward FD stencils which together preserve the SBP property. Because of the additional degrees of freedom, the DP SBP framework supports the design of SBP FD with improved properties, such as upwinding and dispersion relations preserving (DRP) properties, necessary for reliable simulation of nonlinear problems, including shocks, and wave propagation problems with high-frequency components. The result of this improvement is the absence of computationally fatal spurious wave modes in numerically computed solutions, and an efficiency increase that is exponential with the dimension of the problem. We will define and give explicit examples of DP SBP operators with a complete methodology to construct them. We will present numerical simulations of complex wave problems in 3D elastic solids and nonlinear atmospheric fluid flow, and demonstrate the efficiency of the DP SBP framework over traditional methods.

Nicholas Moës, Ecole Centrale de Nantes

Friday, July 26, 1pm, Ballroom C

Front Tracking with a Twist: The eXtreme Mesh Deformation Approach (X-MESH)

The arbitrary Eulerian Lagrangian (ALE) formulation is a common approach to tracking fronts in finite element simulations. It is, however, tricky to track fronts over long distances, as the mesh density generally becomes too low on one side of the front (increasingly large elements). Moreover, traditional ALE front tracking cannot cope with changes in front topology. To remedy the above problems (at least the first one), remeshing is required from time to time to maintain correct mesh approximation capability on both sides of the front. This remeshing requires projection of the field and updating of the database in the simulation, which is detrimental to the speed of the code and the accuracy of the solution.

We introduce a new approach in which the set of nodes located on the front evolves over time. This allows the front to migrate through the mesh without breaking the approximation capability of the mesh. Topological changes are also easily taken into account. For example, a small front can form, propagate and merge with other fronts as it propagates. The small front may be represented initially by three or four nodes, then by hundreds of nodes as it lengthens.

For the new approach to work properly, we have to accept that some elements become very small and possibly of zero measure. This means that the elements can deform in extreme ways, hence the acronym X-MESH. Surprisingly, as we shall show, this situation does not prevent simulations from being carried out.

In short, X-MESH simply uses node movements to propagate fronts over long distances, even in the event of topological changes. The mesh topology remains unchanged during simulation. The size and sparsity of the finite element matrices are therefore fixed throughout the simulation, and no field projection is required. As the simulation progresses, nodes arrive and depart from the front.

X-MESH's capability will be demonstrated for several important applications in mechanics and physics, such as front tracking in the Stefan phase change model or the simulation of immiscible two-phase flows.

The work is funded by a European Research Council (ERC) Synergy Grant whose co-pI is J.F. Remacle.

Technical Program Information

Session Times

TS1	Technical Session 1	Monday, July 22, 9:45 – 11:45am
TS2	Technical Session 2	Monday, July 22, 2:00 – 4:00pm
TS3	Technical Session 3	Monday, July 22, 4:30 – 6:30pm
TS4	Technical Session 4	Tuesday, July 23, 9:45 – 11:45am
TS5	Technical Session 5	Tuesday, July 23, 2:00 – 4:00pm
TS6	Technical Session 6	Tuesday, July 23, 4:30 – 6:30pm
TS7	Technical Session 7	Wednesday, July 24, 9:45 – 11:45am
TS8	Technical Session 8	Wednesday, July 24, 2:00 – 4:00pm
TS9	Poster Session	Wednesday, July 24, 4:00 – 5:30pm
TS10	Technical Session 10	Thursday, July 25, 9:45 – 11:45am
TS11	Technical Session 11	Thursday, July 25, 2:00 – 4:00pm
TS12	Technical Session 12	Thursday, July 25, 4:30 – 6:30pm
TS13	Technical Session 13	Friday, July 26, 9:45 – 11:45am
TS14	Technical Session 14	Friday, July 26, 2:00 – 4:00pm

Number	Title	Session(s)
0101	Honoring the Legacy of Prof. Patrick Selvadurai	TS 1-2
0102	Minisymposium in honor of Prof. Yannis Kallinderis's 60th birthday: Progress of Unstructured grid based CFD, hybrid mesh generation and adaptation, and parallel supercomputing	TS 3-4
0103	Professor JN Reddy's contributions to computational mechanics – A Minisymposium on the occasion of Prof. Reddy's 80th birthday	TS 1-4
0104	Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics	TS 1-5
0201	Advanced materials: Computational analysis of properties and performance	TS 10-12
0202	Computational damage and fracture mechanics	TS 7-8, 10-12
0203	Advances in damage & fracture modeling of Multiphysics materials	TS 1-4
0204	Recent advances in computational fracture mechanics and failure analysis	TS 5-7
0205	Catastrophic failure mechanics and numerical modelling	TS 10-11
0206	Accelerating failure mechanics and numerical modelling	TS 13-14
0209	Phase-field models of fracture	TS 5-6
0211	Fracture, damage and failure mechanics of cementitious materials	TS 7-8, 10
0212	Computational mechanics in high-strain rate and impact engineering	TS 13
0213	Current trends in phase-field modeling and computations	TS 10-12
0214	Multi-scale, multi-rate damage and failure: models, experiments, and simulations	TS 10-13
0301	Isogeometric methods	TS 7-8
0302	Advances and applications in meshfree, particle, and Peridynamic methods	TS 1-5
0303	Virtual elements for partial differential equations on polytopal meshes	TS 1-3
0304	Immersed-boundary variational methods: Theory, data structures, and applications	TS 10-11, 13-14
0305	Recent advances in discretization techniques for coupled problems in incompressible fluid dynamics	TS 1-3
0306	Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics and kinetic models	TS 4-6
0307	Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, localization, and failure	TS 10-11
0308	Mesh-free particle methods for multi-physics problems	TS 11-13
0309	Advances and applications of polytopal methods	TS 13
0310	Current trends and advances in enriched finite element methods and coupled simulations	TS 7-8
0311	Recent advances in high-order methods for computational fluid dynamics	TS 5-8

0312	Structure-preserving discretization of Multiphysics systems	TS 10
0401	Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials	TS 1-7
0403	Machine learning methods for multiscale and Multiphysics materials modeling	TS 7-8
0404	Novel mathematical and numerical models for Multiphysics and multiscale systems	TS 5-6
0405	Recent advances in numerical methods for mixed-dimensional PDEs	TS 1
0406	Multiscale modeling of dynamics in complex media and metamaterials	TS 12
0407	Multiscale computational and data-driven approach of advanced materials and structures	TS 10-12
0408	Synergistic computational mechanics + machine learning for the digital twinning of intelligent vehicles	TS 13
0410	Battery modeling and computation: From material to device	TS 10-12
0412	Computational particle-based solvers for Multiphysics & multiscale simulations	TS 1
0413	Multiscale methods for advanced manufactured materials	TS 4-5
0414	Multiscale Theory and Modeling of Advanced Nanocomposites	TS 3
0415	Multi-physics and multi-scale simulations with the coupling library preCICE	TS 7-8
0416	Space-time modeling of coupled problems	TS 6
0417	Microstructures of chemically complex materials and their impacts on material properties from multiscale simulations	TS 1-3
0418	Modeling and simulation of the electro-chemo-thermo-mechanical interactions in energy transition and energy storage systems	TS 2
0420	Advances in multi-scale, multi-material, and multi-component Topology Optimization	TS 10-13
0422	Methods for identification, machine learning, and uncertainty quantification of reduced order models of couples systems	TS 10-11
0501	Multiphysics biomechanics of bio- and bio-inspired soft materials: Theory, simulation and experiments	TS 13-14
0502	Advances in computational biomechanics and mechanobiology	TS 1-5
0503	Biomechanics of hard tissues: From experiments and simulations to clinical applications	TS 6-8
0504	Multiphysics and data-driven modeling for cardiovascular biomedicine	TS 1-5
0505	Imaging-based methods in computational medicine	TS 10-13
0506	Computational models and methods for predicting cancer progression and treatment response	TS 10-12
0507	Continuum biomechanics of active systems	TS 10-11
0508	Imaging and computational methods for biomechanics	TS 6-8
0509	Computational modeling of cardiac fibrosis: A multiscale, Multiphysics challenge	TS 4
0510	Computational mechanobiology of musculoskeletal tissues	TS 7-8
0513	Mechanobiology of cells, vesicles and biomembranes	TS 4-5
0601	Design and mechanics of multifunctional composites and structures	TS 11
0602	Computational design of mechanical metamaterials	TS 3
0603	Computational mechanics of soft matter and machines	TS 1
0604	Modeling, optimization and computational analysis and metamaterials	TS 13
0605	Architected materials and structures	TS 3-6
0606	Advanced materials and smart structures: Modeling, simulation and testing	TS 7-8
0607	Modeling and inverse design of architected materials	TS 7-8
0701	Computational methods in environmental fluid mechanics	TS 10-13
0702	Advanced numerical techniques for fluid flow in porous media	TS 10-12
0703	Multiphase flow and non-Newtonian fluid – Modelling and applications	TS 11-12
0704	Advanced multi-physics CFD simulations in science and engineering	TS 1-5
0705	Advanced techniques for transport phenomena in heterogenous porous media	TS 14
0706	Advanced model order reduction techniques for computational fluid dynamics	TS 5-6
0707	Transport phenomena in micro/nanofluids	TS 13-14
0708	Fluid dynamics and SciML: Navigating challenges and seizing opportunities	TS 7-8
0709	Simulations of particle-laden fluid flows	TS 5-8
0710	Advance modeling and simulation in complex porous media	TS 6
0711	Lattice Boltmann modelling and study of complex flows	TS 1-2
0801	Modeling friction and wear	TS 13-14

0802	Model-based simulations of structural responses under extreme conditions	TS 1-2
0803	Advance and application of meshfree methods	TS 7
0804	Advanced multiscale and adaptive numerical methods for non-linear solids	TS 7-8
0805	Recent advances in numerical methods for interface problems	TS 11
0807	Computational and analytical advances in nonlocal modeling	TS 6-7
0808	Boundary element methods: New theories and applications	TS 13-14
0809	Finite element techniques for wave simulations	TS 7-8, 10
0810	Numerical modeling of granular and multiphase flows	TS 4-6
0811	Buckling analysis and design of thin-walled structures based on novel and intelligent computational methods	TS 5
0812	The phase field method for fracture: Theory, numerics, and applications	TS 1-2
0815	Advancements in model reduction, data assimilation, and uncertainty quantification for complex physical systems	TS 4-5
0816	Model order reduction for parametrized continuum mechanics	TS 1-8
0817	Advances in numerical methods for solution of PDEs	TS 1-3
0818	Numerical methods, mathematical modeling and analysis in material science	TS 4-5
0819	High order methods for time-dependent problems	TS 12
0821	Theory and application of provably-robust and efficient high-order methods for high-fidelity computational fluid dynamics	TS 1-2
0823	Mathematics and algorithms for predictive digital twins (DT)	TS 1-3
0824	Modern structure-preserving methods for PDEs	TS 7-8
0825	Efficient numerical methods for CFD and FSI simulations	TS 7-8
0826	Quantum scientific computing	TS 10-12
0827	Inverse and optimization problems for advanced materials	TS 3-4
0828	Multi-scale and machine learning-based modeling methods for optimization and design of composites	TS 1-3
0830	Recent developments in peridynamics modeling	TS 10
0831	Modeling and learning of structured dynamical systems	TS 6
0834	Physics-informed machine learning for numerical modelling in engineering and science	TS 7
0835	Recent advances in meshfree and particle methods	TS 10-12
0836	Multiscale modeling, analysis and numerical methods of material defect and inhomogeneities	TS 10-12
0838	Phase-field modeling: Analytics, benchmarks, and discussions	TS 4-5
0839	Numerical approaches and discretization techniques for the geometrically nonlinear analysis of slender structures	TS 7-8
0840	Efficient iterative methods for solving coupled and strongly nonlinear problems	TS 4-5
0901	Verification techniques in computational physics and applied mathematics	TS 13-14
0902	Uncertainty quantification and scientific machine learning for predictive modeling of complex systems	TS 5-6
0903	Physics-based data-driven modeling and uncertainty quantification in computational materials science and engineering	TS 10-12
0904	Uncertainty quantification and reliability analysis in engineering	TS 10-12
0905	Probabilistic learning and constrained generative models for uncertainty quantification	TS 1-2
0906	Quantifying epistemic uncertainties for computational predictions	TS 13-14
0907	UQ-TTA student paper competition in uncertainty quantification	TS 4
0908	Certification of simulations and model adaptation in computational science and engineering	TS 10-12
0909	Innovations in machine-learning uncertainty quantification for computational mechanics	TS 7-8
0910	Uncertainty characterization and error control to enable predictive simulations	TS 4
0912	Bayesian learning of dynamical systems under certainties	TS 6-7
0913	Data-enhanced multi-model uncertainty quantification and experimental design of complex computational systems	TS 8, 10
0915	Uncertainty Quantification in Structural Dynamics	TS 11
1003	Recent advances in partitioning method and interface mechanics	TS 10
1004	Numerical modelling of composite materials and structures	TS 8, 10-12
1005	Advanced numerical methods for the modeling and optimization of coupled dynamical systems	TS 10-11

1006	Smart structures – Modelling and simulation	TS 5-6
1007	Advanced computational mechanics based on data-driven techniques for structure, structural dynamics and aeroelasticity	TS 3
1008	Modeling, simulation, and AI for ultrasonic NDT and SHM	TS 4
1009	Advanced discretization schemes and solution strategies for computational structural dynamics	TS 1-4
1010	Recent advances in indirect structural health monitoring	TS 1-2
1011	Analytical models for nonlinear dynamics and evolved dynamics in natural, social and engineering sciences	TS 13
1012	Advanced simulation techniques for the structural design of carbon reinforced concrete	TS 1-2
1101	Modeling and simulation for additive manufacturing	TS 1-7
1102	Emerging frontiers and methods in digital manufacturing: Modeling, simulation, and beyond	TS 1-3
1104	Modeling and simulation of advanced manufacturing processes for metals	TS 4-6
1106	Computational mechanics for additive manufacturing	TS 11-12
1107	Computational co-design of part geometry and material properties for metal additive manufacturing	TS 8
1108	Multi-physics multi-scale numerical simulation and machine learning based modelling for additive manufacturing	TS 13
1201	Nanomechanics and nanoscale thermal transport for new materials	TS 5-6
1202	Modeling mechanics of materials with voids	TS 7
1301	Mathematical modeling and simulation for social, environmental, and disaster prevention issues	TS 5-6
1303	Industrial applications of IGA	TS 3-4
1304	Modeling and simulation of dynamics, stability and control of aerospace structures	TS 1-2
1305	Extended digital twins including uncertainty and complexity of human/society and human knowledge	TS 4
1306	Computational modeling of extreme-loading events	TS 5-7
1308	Novel numerical approaches for integrated disaster simulation for digital twin from living spcaes to urban scales	TS 10
1310	Towards predictive digital twins: Innovative algorithms for physics-, data-assisted and hybrid modeling	TS 7-8
1311	Computational methods for wind energy	TS 11-12
1401	Emerging topology and shape optimization techniques in computational design of materials and structures	TS 10-14
1402	Complex fluid flows in engineering: Modeling, simulation, and optimization	TS 1-2
1403	New trends in topology optimization	TS 1-7
1405	Advances in material model calibration for computational solid mechanics	TS 4-7
1406	Topology optimization for additively manufactured metamaterials and structures	TS 13
1407	Large-scale structural and fluidic topology optimization	TS 10
1408	Design beyond optimization: Why, what if, and how much?	TS 8, 10-12
1409	Applications of shape optimization in complex engineering problems	TS 1-2
1501	PSE (Problem Solving Environment)	TS 11-12
1502	Performance-portable algorithms for unstructured mesh applications	TS 13
1601	Contact and interface mechanics: Modeling and computation	TS 1-4
1602	Recent advances on interfaces dynamics modeling and simulation	TS 6-8
1603	Next-generation numerical methods for coupled multiphysics problems	TS 12-13
1604	Computational fluid dynamics (CFD) and fluid-structure interaction (CFSI): Methods and Applications	TS 3-6
1605	Fluid-structure interaction in interface and moving boundary problems	TS 1-2
1606	Phase-field interface modeling for multiphase and Multiphysics simulations	TS 14
1607	Coupled computational mechanics: Solutions for FSI simulation	TS 10-11
1608	Fluid-structure interaction: Methods and applications	TS 7-8
1609	Multi-scale modeling and upscaling for flow induced vibrations, from local reference simulations to certified industrial tools	TS 12-13
1610	Advances in computational mechanics for flow-induced vibrations	TS 10-11
1701	Advanced computational modelling of wood, wood-based products, bio-composites, and timber structures	TS 1-2
1702	Modeling and simulation of coupled processes in geological media	TS 10-12

1704	Geomechanics of the cryosphere	TS 1-2
1705	Computational geomechanics	TS 4-7
1802	Scientific deep learning	TS 1-2
1803	Enabling technologies for digital twins: Model reduction and scientific machine learning	TS 7-8
1806	Casual discovery and graphical causal models	TS 12
1807	Deep and machine learning methodology in the context of application to computational mechanics	TS 1-4
1808	Predictive digital twins	TS 10-11
1809	Data science and machine learning applications for composite materials and biomedical engineering	TS 1-2
1810	Data-driven approaches for solid mechanics	TS 10-14
1811	Advanced machine learning methods for multiscale modeling	TS 7-8
1812	Constitutive modeling of complex materials with machine learning and artificial intelligence	TS 10-13
1813	Scientific machine learning for geophysical application	TS 4-6
1814	Machine learning and data driven based engineering computation	TS 13
1815	Machine learning algorithms for accelerating material characterization, discovery, design, and manufacturing processes	TS 13-14
1816	Data-driven device and circuits models	TS 13-14
1817	Data-driven methods for modeling complex systems	TS 5-8
1819	Machine learning for design tasks and inverse problems	TS 4-6
1820	Advancing computational mechanics with symbolic regression	TS 4-6
1821	Data-driven modeling and design of materials	TS 1-4
1822	SciML in the real world	TS 10-11
1823	Advances in neural operators for scientific modeling	TS 1-3
1824	Machine learning and multiscale modeling for complex materials and structures	TS 10-12
1825	Physical models and reduced order models augmentation with data for physics-informed machine learning in real-world applications	TS 5-8
1826	Trustworthy multi-fidelity and data-driven models for computational application	TS 13-14
1828	Machine learning for large scale models in physics	TS 7-8
1829	Improving the efficiency and accuracy of computational methods through machine learning	TS 4
2001	Computational mechanics in Canada and China: Current states of shared scientific interests and opportunities for the future cooperation	TS 5-7

Technical Program

follows on next page.

*Indicates presenting author
Keynote lecturers are scheduled for 40 minutes

Monday July 22 - Technical Session 1

0101: Honoring the Legacy of Prof. Patrick Selvadurai Chair(s): Euclides Mesquita		
115 Level 1	9:45 - 10:25	W242211 Time-dependent response of unsaturated poroelastic soils under surface loading Author(s): K Prapinpanich, Teerapong Senjuntichai, Nimal Rajapakse*
	10:25 - 10:45	W241818 How does off-fault plasticity control fault zone seismogenesis? Author(s): Md Shumon Mia*, Ahmed Elbanna, Mohamed Abdelmeguid
	10:45 - 11:05	W241541 An inverse-free Krylov algorithm for computing the first eigenpairs of nonlinear symmetric eigenvalue problems Author(s): Ney Dumont*, Renan Sales, Wellington Carvalho
	11:05 - 11:25	W241750 An IBEM-FEM model of the conversion between surface and body waves resulting from the interaction of pavements with the soil Author(s): Leonardo Antoniazzi Marques, David Carneiro, Persio Leister de Almeida Barros, Josue Labaki*
0103: Professor JN Reddy's contributions to computational mechanics - A minisymposium on the occasion of Prof. Reddy's 80th birthday Chair(s): NR Aluru		
110 Level 1	9:45 - 10:25	W240904 Thermo-chemo-mechanical model and variational multiscale method for material and geometric evolution in frontal polymerization Author(s): Arif Masud*, Ignasius Wijaya
	10:25 - 10:45	W241000 Crystal plasticity phase field model with crack tip enhancement by concurrent atomistic-continuum model Author(s): Somnath Ghosh*, Kishore Nair
	10:45 - 11:05	W240285 Topology Optimization for fiber orientation in fractured concrete Author(s): Andre Luis Ferreira da Silva, Luís A. G. Bitencourt Jr., Emilio Carlos Nelli Silva*
	11:05 - 11:25	W241483 A smooth yield plasticity theory for modeling fatigue in metals: theory, computations and experimental verification Author(s): Prakash Thamburaja*, Arun Srinivasa
	11:25 - 11:45	W242607 A general higher-order shell theory using orthonormal moving frame for transversely isotropic hyperelastic materials Author(s): Archana Arbind*
0104: Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics Chair(s): Abani Patra and Serge Prudhomme		
109 Level 1	9:45 - 10:05	W240888 A nonlinear optimal control framework for the DPG method Author(s): Leszek Demkowicz*, Jiaqi Li
	10:05 - 10:25	W242618 Variational formulation of elastodynamics for a spacetime discontinuous Galerkin method Author(s): Robert Haber*, Pavan Ravi, Reza Abedi
	10:25 - 10:45	W240370 Proximal Galerkin: A structure-preserving finite element method for pointwise bound constraints Author(s): Brendan Keith*, Thomas Surowiec
	10:45 - 11:05	W241562 A primal hybrid finite element method to solve general compressible, quasi-incompressible and incompressible elasticity using stable H(div)-L2 spaces Author(s): Philippe Devloo*, Giovane Avancini, Nathan Shauer, Hugo Oliveira

0203: Advances in damage & fracture modeling of multiphysics materials Chair(s): Poh Leong Hien		
114 Level 1	9:45 - 10:25	W241449 Modeling short crack propagation in 3D polycrystalline microstructures under cyclic loading using adaptive crack insertion Author(s): Damin Xia, Caglar Oskay*
	10:25 - 10:45	W241561 Effect of tangential fracture properties on mixed-mode cohesive zone modeling Author(s): Siwoo Jeon*, Kyoungsoo Park
	10:45 - 11:05	W240765 A fully coupled thermo-mechanical localizing gradient damage model with a modified Mazars strain Author(s): HanWei Huang*, Hao Yu, HengAn Wu
	11:05 - 11:25	W242357 Failure analysis in flexoelectric contact mechanics Author(s): Arezoo Hajesfandiari*, Ali Hadjesfandiari
0302: Advances and applications in meshfree, particle, and peridynamic methods Chair(s): J. S. Chen and Sheng-Wei Chi		
201 Level 2	9:45 - 10:25	W242581 Modeling phase-transformation induced strain localization using a Neural Network enhanced reproducing Kernel Particle Method Author(s): Xuejun Li, Sheng-Wei Chi*
	10:25 - 10:45	W240557 Meshfree fragmentation and analysis of mass distributions from explosive events Author(s): William Elmer*, Colton Ross
	10:45 - 11:05	W241218 Mixed partition of unity methods and stochastic Gillespie algorithms for Transport-Reaction equations Author(s): Markus Kirkilionis*
	11:05 - 11:25	W242502 Large deformation meshfree analysis using higher-order gradient crystal plasticity Author(s): Yuichi Tadano*
	11:25 - 11:45	W241272 A coupled Lagrangian/semi-Lagrangian quasi-conforming embedded RKPM with smooth contact algorithm for modelling penetration problems Author(s): Ryan Schlinkman*, Jonghyuk Baek, Jiun-Shyan Chen
0303: Virtual elements for partial differential equations on polytopal meshes Chair(s): Peter Wriggers		
202 Level 2	9:45 - 10:05	W242677 A Hu-Washizu stabilization-free virtual element method for three- dimensional linear elasticity with star-convex polyhedrons Author(s): Timothee Bouchez*, Anthony Gravouil, Nawfal Blal, Anthony Giacoma Giacoma, Emmanuel Delor, Jean-Daniel Beley
	10:05 - 10:25	W240467 Reduced basis stabilization and post-processing for the virtual element method Author(s): Fabio Credali*, Silvia Bertoluzza, Daniele Prada
	10:25 - 10:45	W242452 On triangular self-stabilized virtual elements for Kirchhoff-Love shells Author(s): Tiago Park Wu*, Paulo de Mattos Pimenta, Peter Wriggers
0305: Recent advances in discretization techniques for coupled problems in incompressible fluid dynamics Chair(s): TBA		
203 Level 2	9:45 - 10:05	W240129 Convergence of numerical methods for the coupled Cahn-Hilliard and Navier-Stokes equations Author(s): Beatrice Riviere*, Chen Liu, Rami Masri
	10:05 - 10:25	W240116 Continuous data assimilation and long-time accuracy in a FEM for the cahn-hilliard equation Author(s): Amanda Diegel*, Leo Rebholz
	10:25 - 10:45	W240230 A decoupled, stable, and linear FEM for a phase-field model of two-phase incompressible surface flow Author(s): Yerbol Palzhanov, Annalisa Quaini*, Maxim Olshanskii

203 Level 2	10:45 - 11:05	W240550 A second-order unconditionally stable bound-preserving scheme for the quasi-incompressible Cahn-Hillaird-Darcy equations Author(s): Yali Gao, Daozhi Han*, Xiaoming Wang
	11:05 - 11:25	W242207 A pressure-robust hybridized discontinuous Galerkin method for the Cahn-Hilliard-Navier-Stokes system Author(s): Keegan Kirk*, Beatrice Riviere
0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Julien Yvonnet		
306 Level 3	9:45 - 10:05	W240364 Pre-trained transformer model as a surrogate in multiscale computational homogenization framework for elastoplastic composites Author(s): Zhongbo Yuan, Leong Hien Poh*
	10:05 - 10:25	W241641 A stochastic multiscale modeling method based on the interaction based deep material networks for highly dissipative structures additively manufactured with selective laser sintering Author(s): Mohamed Haddad*, Ludovic Noels, Issam Doghri
	10:25 - 10:45	W242229 Multiscale modeling of crystal plasticity: Abaqus FE2 model and its surrogate FE-RNN model Author(s): Fengbo Han*, Kapil Krishnan, Jide Oyebanji, Zhongwei Guan
	10:45 - 11:05	W240351 Macro clustering for accelerating FE2 multiscale simulations of nonlinear composites considering elastoplasticity, viscoelasticity and damage Author(s): Souhail Chaouch*, Julien Yvonnet
	11:05 - 11:25	W240211 Solver-free reduced order homogenization for nonlinear periodic heterogeneous media Author(s): Andrew Beel*, Jacob Fish
0405: Recent advances in numerical methods for mixed-dimensional PDEs Chair(s): Oriol Colomés		
304 Level 3	9:45 - 10:05	W240585 Intrinsic multi-dimensional elastic coupling via enriched continua Author(s): Adam Sky*, Jack S. Hale, Andreas Zilian, Stephane Bordas, Patrizio Neff
	10:05 - 10:25	W242636 Backward difference formulae for the transient Stokes problem: optimal order velocity and pressure estimates Author(s): Alessandro Contri, Balázs Kovács*, André Massing
	10:25 - 10:45	W242388 TDC for finite elastic deformation in submerged mooring lines exposed to dynamic loading Author(s): Shagun Agarwal*, Oriol Colomés
	10:45 - 11:05	W241158 Modelling coupled surface-bulk viscous flows in animal cells with unfitted finite elements Author(s): Eric Neiva*, Hervé Turlier
0412: Computational particle-based solvers for multiphysics & multiscale simulations Chair(s): Daniel Wilke, Johannes Joubert and Patrick Pizette		
303 Level 3	9:45 - 10:05	W241713 Advancing multi-scale physics modeling in strongly magnetized relativistic plasmas: an analytical particle pusher approach Author(s): Guangye Chen*, Nicole Ronning, Chengkun Huang, Fan Guo, Lucian Sahd, Patrick Killian, Federico Fraschetti
	10:05 - 10:25	W242002 The hybrid resolved-unresolved SPH(2)-DEM coupling simulation for the internal soil-erosion in soil-structures Author(s): Kumpei Tsuji*, Shujiro Fujioka, Daniel Shigueo Morikawa, Mitsuteru Asai
	10:25 - 10:45	W241849 An integrated experimental approach for erosion dynamics: transient to steady-state Author(s): Patrick Pizette*, Johannes Christoffel Joubert, Daniel Nicolas Wilke

0417: Microstructures of chemically complex materials and their impacts on material properties from multiscale simulations Chair(s): Yu-Chieh Lo		
305 Level 3	9:45 - 10:25	W240206 Atomistic simulation of chemical ordering in medium entropy alloys driven by neural networks: formation kinetics and impact on mechanical and diffusion properties Author(s): Shigenobu Ogata*
	10:25 - 10:45	W241340 Integrating first-principles calculations and empirical studies for exploring mechanical, electrical, and optical properties of high-entropy materials Author(s): Wen-Dung Hsu*, Kai sheng Huang, Chen-Yun Kuan, Yuan-Chun Chang
	10:45 - 11:05	W240401 Planar fault transformation and unfaulting of interstitial dislocation loops in irradiated chemically complex intermetallic alloys Author(s): Cheng Chen*, Jun Song
	11:05 - 11:25	W240619 Understanding the solidification and heat treatment characteristics in the CoCrNiSix medium-entropy alloy by experimentally verifiable multiscale thermodynamic and kinetic computational techniques Author(s): Te-Cheng Su*, Hao-Chuan Huang, Jian-Shiang Chen, Jia-Jun Chen, Kaifan Lin, Hsin-Chih Lin, Jer-Ren Yang
0502: Advances in computational biomechanics and mechanobiology Chair(s): David M. Pierce and Corey Neu		
121 Level 1	9:45 - 10:05	W241673 Assessment of cartilage stiffness heterogeneity via elastography in post-traumatic osteoarthritis Author(s): Emily Miller*, Timothy Lowe, Hongtian Zhu, Stéphane Avril, Rachel Frank, Jonathan Bravman, Eric McCarty, Corey Neu
	10:05 - 10:25	W240761 Specimen-specific finite element modelling of cartilage mechanics: a new paradigm in linking tissue ultrastructure to its micromechanics Author(s): Keke Zheng*, Jingrui Hu, Junning Chen
	10:25 - 10:45	W242106 Fractional Darcy's law for poroelastic behaviour of soft biological tissues: application to meniscus Author(s): Gunda Sachin*, Sundararajan Natarajan, Olga Barrera
	10:45 - 11:05	W241567 Exploring biotransport in a poroelastic model of human vocal folds Author(s): Rana Zakerzadeh*, Isabella McCollum, Manoela Neves
	11:05 - 11:25	W241768 Optimum design method for artificial ear ossicles based on a high-precision vibration analysis model Author(s): Yang Liu*
0504: Multiphysics and data-driven modeling for cardiovascular biomedicine Chair(s): Debanjan Mukherjee		
122 Level 1	9:45 - 10:25	W241375 Computational analysis of turbulent flow structures in the left ventricle of the heart using patient-specific data Author(s): Johan Hoffman*, Joel Kronborg
	10:25 - 10:45	W242290 Modeling left ventricular electromechanics in patients with hypertrophic obstructive cardiomyopathy Author(s): Hannah Haider*, Lei Shi, Hiroo Takayama, Vijay Vedula
	10:45 - 11:05	W241703 Shape optimization of a geometrically-adaptable heart-valved conduit for pediatric applications Author(s): Chuan Luo*, Kewei Li, Abigail Herschman, Haim Waisman, Vijay Vedula, Jeffrey Kysar, David Kalfa
0603: Computational mechanics of soft matter and machines Chair(s): Zishun Liu, Linchun He and Liying Jiang		
112 Level 1	9:45 - 10:05	W240221 Mechanical-electrochemical behaviors of gel electrolyte Author(s): Linchun He*
	10:05 - 10:25	W240766 Machine learning-driven optimization design of hydrogel-based metamaterials Author(s): Yisong Qiu*, Hongfei Ye, Shuaiqi Zhang, Hongwu Zhang, Yonggang Zheng

	10:25 - 10:45	W240873 Finite element simulation on instabilities of dielectric elastomers considering nonlinear material viscosity Author(s): Heng Feng, Liying Jiang*
	10:45 - 11:05	W241004 Emergent network morphology in soft materials: from biological to robotic swarms Author(s): Joe Sgarrella, William Laplante, Christian Peco*
	11:05 - 11:25	W241407 Hyperelastics.jl: the largest collection of hyperelastic models for soft material modeling and simulation Author(s): Carson Farmer*, Hector Medina
0704: Advanced multi-physics CFD simulations in science and engineering Chair(s): Takahiro Tsukahara		
221 Level 2	9:45 - 10:05	W241108 Numerical study on modeling of ice crystal icing with consideration of ice erosion phenomenon. Author(s): Wakana Tatsuta*, Koji Fukudome, Soichiro Fujimura, Makoto Yamamoto
	10:05 - 10:25	W240085 Numerical study of fractal-tree-generated turbulence Author(s): Yuwei Yin*, Ryo Onishi, Seiya Watanabe, Igor Igorevich Segrovets
	10:25 - 10:45	W240195 Composable design of multiphase fluid dynamics solvers in flash-x Author(s): Akash Dhruv*, Anshu Dubey
	10:45 - 11:05	W240435 Drag reduction effect of streamwise traveling wave with spanwise phase shift in a turbulent channel flow Author(s): Kyohei Oishi*, Yusuke Nabae, Koji Fukagata
0711: Lattice Boltzmann modelling and study of complex flows Chair(s): Linlin Fei and Qinjun Kang		
222 Level 2	9:45 - 10:25	W241550 LBM modelling of non-isothermal drying of porous media Author(s): Linlin Fei, Dominique Derome, Jan Carmeliet*
	10:25 - 10:45	W241134 Improved phase-field-based lattice Boltzmann model for droplet evaporation and its parallel acceleration strategy Author(s): Xiaoyu Wu*, Xian Wang
	10:45 - 11:05	W241994 Electrohydrodynamic effects on viscoelastic droplet deformation in shear flows Author(s): Jiachen Zhao*, Vedad Dzanic, Zhongzheng Wang, Emilie Sauret
	11:05 - 11:25	W241026 Numerical study on the bubbles behaviors on complex geometric surfaces with complex wettability based on 3D phase-field lattice Boltzmann method Author(s): Wenqiang Chen*, Yumei Yong, Hanyang Mo, Jialin Dai, Menghui Li, Chao Yang
	11:25 - 11:45	W241261 An integrated Phase-field Lattice Boltzmann model of immiscible two-phase flow and heat transfer at the two-phase interface with temperature jump Author(s): Jialin Dai*, Yumei Yong, Hanyang Mo, Wenqiang Chen, Menghui Li, Chao Yang
0802: Model-based simulations of structural responses under extreme conditions Chair(s): Lihua Wang		
207 Level 2	9:45 - 10:05	W240124 On the convergence of lumped mass galerkin meshfree methods Author(s): Dongdong Wang*, Saisai Fu, Like Deng, Zhiwei Lin
	10:05 - 10:25	W240505 Energy absorption design and working mechanism for solid/liquid hybrid composite Author(s): Guoxin Cao*
	10:25 - 10:45	W240038 A highly parallel simulation of patient-specific hepatic flows Author(s): Zeng Lin*

	10:45 - 11:05	W240286 Molecular dynamics simulations of ice growth under a static electric field induced by transmission lines Author(s): Ruiqi Shang*, Shaker Meguid
0812: The phase field method for fracture: Theory, numerics, and applications Chair(s): Lu-Wen Zhang		
204 Level 2	9:45 - 10:05	W240958 An acceleration scheme for the phase field fatigue fracture simulation Author(s): Shuo Yang, Yongxing Shen*
	10:05 - 10:25	W241219 A unified strain energy decomposition strategy under the local coordinate system for phase field fracture modeling Author(s): Yang Jiang*, Jianguang Fang
	10:25 - 10:45	W240320 Asymptotic homogenization framework for phase field fracture of heterogeneous materials and application to toughening Author(s): Sen Liu*, Yongxing Shen
	10:45 - 11:05	W241109 A phase field model for fatigue fracture considering crack retardation effect due to single overload Author(s): Wei Huang*, Yu-xuan Ying, Yu-e Ma
0816: Model order reduction for parametrized continuum mechanics Chair(s): Masayuki Yano		
211 Level 2	9:45 - 10:05	W241959 Reduced order modelling in CFD: geometry, turbulence and compressibility enhanced by Scientific Machine Learning Author(s): Gianluigi Rozza*
	10:05 - 10:25	W241671 Reduced-order modeling of unsteady convection-dominated problems by implicit feature tracking Author(s): Victor Zucatti*, Matthew Zahr
	10:25 - 10:45	W240339 Entropy stable reduced order modeling of nonlinear conservation laws using discontinuous Galerkin methods Author(s): Ray Qu*, Jesse Chan
	10:45 - 11:05	W240885 A time-relaxation reduced order model for the turbulent channel flow Author(s): Ping-Hsuan Tsai*, Paul Fischer, Traian Iliescu
	11:05 - 11:25	W240971 Energy conservative quadrature based hyperreduction of Lagrangian hydrodynamics problems Author(s): Chris Vales*, Siu Wun Cheung, Dylan M. Copeland, Youngsoo Choi
0817: Advances in numerical methods for solution of PDEs Chair(s): Alexander Idesman		
205 Level 2	9:45 - 10:25	W240030 Optimal local truncation error method for solution of PDEs on irregular domains and interfaces with optimal accuracy and unfitted cartesian meshes. Comparison with finite elements. Author(s): Alexander Idesman*
	10:25 - 10:45	W241868 Finite element modeling of Brinkman equations in porous media Author(s): Hsueh-Chen Lee*, Hyesuk Lee
	10:45 - 11:05	W242326 Mesh optimization and basis compression for extreme-scale solution of partial differential equations Author(s): Graham Harper*, Denis Ridzal, Tim Wildey
	11:05 - 11:25	W241398 Adaptive refinement with finite time Lyapunov exponents in Lagrangian numerical methods Author(s): Arjun Sharma*, Peter Bosler
	11:25 - 11:45	W240680 High-order explicit PDE solvers using trigonometric interpolations of non-periodic functions (with applications to engineering, geophysics, and medicine) Author(s): Faisal Amlani*

0821: Theory and application of provably-robust and efficient high-order methods for high-fidelity computational fluid dynamics Chair(s): Siva Nadarajah		
206 Level 2	9:45 - 10:05	W241110 High-order finite difference method for incompressible Navier-Stokes equations in complex geometry Author(s): David Niemelä*
	10:05 - 10:25	W240056 A hybridizable discontinuous Galerkin method for coupled Navier-Stokes and Darcy Author(s): Aycil Cesmelioglu, Jeonghun Lee, Sander Rhebergen*
	10:25 - 10:45	W241267 Strongly stable dual-pairing upwind summation-by-parts finite difference schemes for the vector invariant shallow water equations Author(s): Justin Kin Jun Hew*, Kenneth Duru, Stephen Roberts, Christopher Zoppou, Kieran Ricardo
	10:45 - 11:05	W240640 Energy stable relaxation-free Runge-Kutta schemes Author(s): Mohammad Reza Najafian Zadeh Najafabadi*, Brian C. Vermeire
	11:05 - 11:25	W241213 Provably stable discretizations of the KZK equations using summation by parts operators and simultaneous approximation terms Author(s): Zhongyu Xie*, David Del Rey Fernández, Sivabal Sivaloganathan
0823: Mathematics and algorithms for predictive digital twins (DT) Chair(s): Pavel Bochev		
209 Level 2	9:45 - 10:25	W241813 Domain decomposition methods and model order reduction for parametric linear elliptic problems Author(s): Marco Discacciati*, Ben Evans, Paola Gervasio, Matteo Giacomini
	10:25 - 10:45	W240558 Partitioned coupling of multifidelity, multiphysics models using optimization-based coupling Author(s): Elizabeth Hawkins, Pavel Bochev, Paul Kuberry*
	10:45 - 11:05	W240477 Surrogate-based partition methods for interface problems Author(s): Justin Owen*, Pavel Bochev, Paul Kuberry
0828: Multi-scale and machine learning-based modeling methods for optimization and design of composites Chair(s): Dinghe Li		
208 Level 2	9:45 - 10:25	W241619 Accelerating structural optimization using gradient online learning and prediction Author(s): Yi Xing, Liyong Tong*
	10:25 - 10:45	W242640 Multiscale ablation analysis for reusable aerospace vehicle with machine learning potentials Author(s): Jongkyung An*, Seunghwan Kwon, Jiwon Jung, Gun Jin Yun
	10:45 - 11:05	W242092 FibrePlug: a multiscale textile composites modeling tool Author(s): Jide Oyebanji*, Changze Sun, Mohamed Nasr Saleh, Kapil Krishnan, Zhongwei Guan
	11:05 - 11:25	W242643 Enhancing the oxidation resistance by adding impurities to carbon site in ultra high temperature ceramics: An ab initio molecular dynamics study Author(s): Seunghwan Kwon*, Jongkyung An, Rajkamal Anand, Jiwon Jung, Gunjun Yun
	11:25 - 11:45	W241073 Generative model to predict the deformation field of CFRP laminates with geometric deviations in wing assembly Author(s): Yuming Liu*, Yong Zhao, Qingyuan Lin, Wei Pan, Yu Ren, Wencai Yu
0905: Probabilistic learning and constrained generative models for uncertainty quantification Chair(s): TBA		
210 Level 2	9:45 - 10:05	W240483 Constrained probabilistic model calibration given summary statistics Author(s): Habib Najm*, Tiernan Casey, Pieterjan Robbe, Mohammad Khalil
	10:05 - 10:25	W240533 Probabilistic learning in nonlinear computational stochastic dynamics: investigating a partially observed uncertain nozzle model Author(s): Olivier Ezvan*, Evangéline Capiez-Lernout, Christian Soize

210 Level 2	10:25 - 10:45	W241432 A probabilistic graphical model approach to decouple multi-physics systems Author(s): Ricardo Baptista, Teo Price-Broncucia*, Rebecca Morrison
	10:45 - 11:05	W241709 Uncertainty quantification in 3D physics-based simulations with a neural operator surrogate model Author(s): Fanny Lehmann*, Filippo Gatti, Michaël Bertin, Didier Clouteau
	11:05 - 11:25	W241880 Accelerating phase field simulations through time extrapolation using neural operators and generative models Author(s): Cosmin Safta*, Christophe Bonneville, Arun Hegde, Habib Najm, Laurent Capolungo
	11:25 - 11:45	W241372 Data driven modeling of unknown stochastic dynamical system Author(s): Yuan Chen, Dongbin Xiu*
1009: Advanced discretization schemes and solution strategies for computational structural dynamics Chair(s): Bastian Oesterle and Alessandro Reali		
116 Level 1	9:45 - 10:25	W242562 Accelerating isogeometric analysis with JAX: a high-speed GPU-powered numerical PDE solver Author(s): Cosmin Anitescu*, Timon Rabczuk
	10:25 - 10:45	W240740 The geometrically exact beam in a quaternion formulation with an energy-momentum conserving integrator Author(s): Paul Wasmer*, Peter Betsch
	10:45 - 11:05	W240754 Advancing data-integrated time step estimation to improve simulation performance Author(s): Maximilian Schilling*, Tobias Willmann, Manfred Bischoff
	11:05 - 11:25	W242088 Hierarchic Reissner-Mindlin shell formulations for explicit dynamic analyses Author(s): Bastian Oesterle*, Rebecca Thierer, Lisa-Marie Krauß, Manfred Bischoff
1010: Recent advances in indirect structural health monitoring Chair(s): Elena Atroshchenko		
111 Level 1	9:45 - 10:25	W241143 Feasibility of vehicle-bridge interaction neural operator for drive-by bridge damage detection Author(s): Joshua Irawan, Chul-Woo Kim*
	10:25 - 10:45	W241299 Stability enhancement through realtime-optimization of mobile device-based vibration measurement Author(s): Sung-min Eom*, Daeho Nam, Hwan-youp Oh, Hye Young Jo, Kyung-ho Sun, Yun-ho Shin
	10:45 - 11:05	W241876 On the crowdsensing-based operational modal analysis of bridge structures using predicted responses with missing values Author(s): Mohammad Talebi-Kalaleh*, Qipei Mei
	11:05 - 11:25	W242115 Identifying cracked/damaged structures and their locations using physics-informed machine learning with sparse measurements Author(s): Jae Hyuk Lim*, Myeong-Seok Go, Hong-Kyun Noh, Seungchul Lee
1012: Advanced simulation techniques for the structural design of carbon reinforced concrete Chair(s): Sven Klinkel and Michael Kaliske		
113 Level 1	9:45 - 10:05	W240455 The microlayer model – a novel approach to describe materials with rigid particles embedded in a matrix Author(s): Jakob Platen, Johannes Storm, Michael Kaliske*
	10:05 - 10:25	W240607 Modelling of 3D woven textile reinforced cement composites RVEs Author(s): Christian Toderascu*, Thierry J. Massart, Tine Tysmans
	10:25 - 10:45	W240829 A homogenization approach for the analysis of shell structures employing image-based methods Author(s): Leonie Mester*, Simon Klarmann, Sven Klinkel
	10:45 - 11:05	W242151 Possibilities for numerical model validation through computed tomography generated data Author(s): Matthias Pahn, Christoph de Sousa*, Szymon Grzesiak, Josiane Giese, Frank Liebold, Birgit Beckmann, Manfred Curbach

113 Level 1	11:05 - 11:25	W240052 Automated model discovery using inelastic constitutive artificial neural networks (iCANNs) Author(s): Hagen Holthusen*, Lukas Lamm, Tim Brepols, Stefanie Reese, Ellen Kuhl
	11:25 - 11:45	W242202 A POD-based methodology for the design of modular carbon-reinforced concrete structures Author(s): Domen Macek*, Stephan Ritzert, Stefanie Reese, Tim Brepols, Hagen Holthusen
1101: Modeling and simulation for additive manufacturing Chair(s): Albert To		
118 Level 1	9:45 - 10:25	W241812 Data driven and high fidelity modeling approaches to advance understanding and TRL level of 3D printing Author(s): Saad A. Khairallah*, Amit Kumar, Justin Patridge, Gabe Guss, Eric Chin, Youngsoo Choi, Joseph Mckeown, Allen Patrick
	10:25 - 10:45	W241680 Multi-track and multi-layer simulation methodology for powder bed Fusion process by lattice Boltzmann and multi-phase field methods Author(s): Sukeharu Nomoto*, Jun Katagiri, Masahiro Kusano, Tomonori Kitashima, Makoto Watanabe
	10:45 - 11:05	W241490 Physics-guided heat source for transient laser absorptance prediction in metal Additive Manufacturing Author(s): Abdullah Amin*, Robert Lowe, Nishat Sultana, Wing Kam Liu
	11:05 - 11:25	W241228 CIFEM: elucidating the role of local thermal environment on multi-track melt pool morphology variation for Inconel 718 laser powder bed fusion Author(s): Seth Strayer*, Alaaeldin Olleak, Praveen Vulimiri, Shawn Hinnebusch, William Frieden Templeton, Florian Dugast, Sneha Narra, Albert To
1102: Emerging frontiers and methods in digital manufacturing: Modeling, simulation, and beyond Chair(s): David Noble and Patrick Anderson		
117 Level 1	9:45 - 10:25	W242213 A Particle Finite Element Method for the Simulation of 3D concrete printing Author(s): Giacomo Rizzieri, Liberato Ferrara, Massimiliano Cremonesi*
	10:25 - 10:45	W240117 Modeling the Direct Ink Write process using a sharp interface finite-element method Author(s): Alec Kucala*, Rekha Rao, Jessica Kopatz, David Noble, Anne Grillet
	10:45 - 11:05	W240882 Viscoelastic free surface flows: from computational models to experiments and physics-informed neural networks Author(s): Rekha Rao*, Weston Ortiz, Seth Lindberg, Mark Hamersky, Dan Bolintineanu, Shyam Sankaran, Nathaniel Trask
	11:05 - 11:25	W242629 Comparative evaluation of 3D-printed auxetic titanium stents: a three-point bending test and finite element simulation study Author(s): Rahul Vellaparambil, Woo-Suck Han*, Pierluigi Di Giovanni, Stéphane Avril
1304: Modeling and simulation of dynamics, stability and control of aerospace structures Chair(s): Reyolando Brasil and Marcelo Araujo da Silva		
302 Level 3	9:45 - 10:25	W240035 Numerical and experimental analysis of the effect of geometric nonlinearity on aerospace structures supporting non-ideal rotating machines Author(s): Reyolando Brasil*
	10:25 - 10:45	W240589 Analysis on nonlinear wheel-holding contact on nose landing gear dynamics characteristics during new towing-out mode of aircraft Author(s): Xiaoyun Li*, Yijun Chai, Xiongwei Yang, Yueming Li
1402: Complex fluid flows in engineering: Modeling, simulation, and optimization Chair(s): Fabian Key and Stefanie Elgeti		
219 Level 2	9:45 - 10:25	W242358 Multi-fidelity and surrogate modeling approaches for uncertainty quantification in ice sheet simulations Author(s): Nicole Aretz*, Karen Willcox, Max Gunzburger
	10:25 - 10:45	W240380 Modeling a pulsatile shear-thinning 2D channel flow with physics-informed neural networks. Author(s): Junwon Son*, Nayeon Park, Jaewook Nam

219 Level 2	10:45 - 11:05	W241578 Finite element simulation of complex fluids and applications in manufacturing Author(s): Marek Behr*, Blanca Ferrer Fabón, Felipe González
	11:05 - 11:25	W240716 Computational analysis of the finite immersion depth dip coating process Author(s): Dongkeun Yu*, Jisoo Song, Jaewook Nam
1403: New trends in topology optimization Chair(s): Emílio Carlos Nelli Silva		
220 Level 2	9:45 - 10:25	W242096 Designing a true wave-focusing acoustic black hole through topology optimization Author(s): Martin Berggren*, Abbas Mousavi, Linus Hägg, Eddie Wadbro
	10:25 - 10:45	W241996 Topology optimized-mechanical unfeelability reversal Author(s): Garuda Fujii*
	10:45 - 11:05	W242038 Topology optimized-thermal cloaks for transient heat conduction Author(s): Ryosuke Seki*, Yuma Dazai, Garuda Fujii
	11:05 - 11:25	W241777 Density-based topology optimization for ITR-free thermal cloak Author(s): Seitaro Kato*, Kohei Takejima, Yugo Kondo, Garuda Fujii
1409: Applications of shape optimization in complex engineering problems Chair(s): Jorge-Luis Barrera		
218 Level 2	9:45 - 10:25	W240232 Explicit feature size control in parameter-free shape optimization Author(s): Kenneth Swartz*, Jorge-Luis Barrera, Mathias Schmidt, Daniel Tortorelli
	10:25 - 10:45	W241765 Efficient and flexible shape sensitivity calculations for finite element methods via automatic differentiation Author(s): Jamie Bramwell*, Christopher White, Samuel Mish, Brandon Talamini, Alex Chapman
	10:45 - 11:05	W241509 Multi-material Topology Optimization with conformal analysis meshes Author(s): Mathias Schmidt*, Jorge-Luis Barrera, Kenneth Swartz, Ketan Mittal, Daniel Tortorelli
	11:05 - 11:25	W240721 Shape design optimization of bimetal composite structures for dynamic compliance minimization Author(s): Jin-Xing Shi*, Haruki Igawa
1601: Contact and interface mechanics: Modeling and computation Chair(s): Peter Wriggers		
224 Level 2	9:45 - 10:25	W241494 Models and methods for contact mechanics at the roughness scale Author(s): Vladislav Yastrebov*
	10:25 - 10:45	W242300 Interpolation-based immersed boundary finite element and isogeometric methods for multi-material and multi-physics problems Author(s): Jennifer Fromm*, John A. Evans, Jiun-Shyan Chen
	10:45 - 11:05	W240998 An arbitrary order contact formulation using lagrange multipliers from raviart-thomas space Author(s): Lukasz Kaczmarczyk*, Chirs Pearce, Adnrei Shvarts
	11:05 - 11:25	W241754 An energy-consistent discretization of hyper-viscoelastic contact models for soft tissues Author(s): Francesco Bonaldi*, Mikaël Barboteu, Serge Dumont, Christina Mahmoud
	11:25 - 11:45	W242586 On a structure preserving implicit dynamics contact algorithm. Author(s): Michael Puso*, Cosmin Petra

1605: Fluid-structure interaction in interface and moving boundary problems Chair(s): Koji Nishiguchi		
223 Level 2	9:45 - 10:05	W242116 Generalization of ghost cell boundary model for particle-based simulation of wave–structure interactions Author(s): Naoto Mitsume*, Takayuki Tsunemi, Hiroyuki Omura
	10:05 - 10:25	W241138 Development of a mesh-constrained discrete point method for moving boundary flow problems Author(s): Takeharu Matsuda*, Satoshi Ii
	10:25 - 10:45	W241264 B-spline s-version of finite element method for boundary value problems for fluids Author(s): Nozomi Magome*, Naoki Morita, Shigeki Kaneko, Naoto Mitsume
	10:45 - 11:05	W241393 A multiscale immersed boundary framework for acoustic streaming Author(s): Khemraj Gautam Kshetri*, Amneet Pal Singh Bhalla, Nitesh Nama
1701: Advanced computational modelling of wood, wood-based products, bio-composites, and timber structures Chair(s): Josef Füssl		
119 Level 1	9:45 - 10:05	W240110 Constitutive modelling of wood-based materials Author(s): Zhiyong Chen*
	10:05 - 10:25	W241583 A multi-physics framework to investigate the complex fire-structure interaction in mass-timber compartments Author(s): Guillermo Roa Muñoz, Marcelo Henríquez Suáres, Sergio Yanez, Carlos Felipe Guzmán, Erick I. Saavedra Flores, Juan Carlos Pina*
	10:25 - 10:45	W240594 Macroscale modeling of wood fracture utilizing the phase field approach Author(s): Sebastian Pech*, Markus Lukacevic, Josef Füssl
	10:45 - 11:05	W242523 Rolling shear simulations in Cross Laminated Timber structures using a domain decomposition method Author(s): Karin Saavedra*, Jorge Fernández, Felipe Núñez
1704: Geomechanics of the cryosphere Chair(s): Kara Peterson and Deborah Sulsky		
120 Level 1	9:45 - 10:05	W241184 Modeling sea ice in a warming climate Author(s): Kenneth Golden*
	10:05 - 10:25	W242271 Observational guidance for mechanical models of pack ice Author(s): Jennifer Hutchings*, Pedro Elosegui, Angela Bliss
	10:25 - 10:45	W242375 Discrete element simulations of sea ice in triaxial tests under different confinements and boundary conditions Author(s): Scott Durski*, Ali Khosravi, Jennifer Hutchings
	10:45 - 11:05	W240801 Modeling sea ice dynamics with a discrete element method: an overview of the DEMSI project Author(s): Devin O'Connor*, Kara Peterson, Adrian Turner, Svetoslav Nikolov
	11:05 - 11:25	W241617 Predicting sea ice behavior and stress-strain characteristics: a data-driven approach Author(s): Peiman Sharifi, Ali Khosravi*, Jennifer Hutchings, Scott Durski, Banafsheh Rekabdar
	11:25 - 11:45	W240511 Modeling small scale processes in Antarctic sea ice Author(s): Raghav Pathak, Tim Ricken*, Silke Thoms, Seyed Morteza Seyedpour, Bernd Kutschan

1802: Scientific deep learning Chair(s): Kentaro Yaji		
214 Level 2	9:45 - 10:05	W241972 Graph neural networks for interpretable mesh-based surrogate modeling with error tagging Author(s): Shivam Barwey*, Romit Maulik
	10:05 - 10:25	W240548 Divide and conquer - improved training of Neural Ordinary Differential Equations through time-domain splitting Author(s): Dibyajyoti Chakraborty*, SeungWhan Chung, Romit Maulik
	10:25 - 10:45	W242103 Goal-Oriented Adaptivity for solving partial differential equations using artificial neural networks Author(s): Carlos Uriarte*, David Pardo, Jamie M. Taylor, Victor M. Calo, Ignacio Muga
	10:45 - 11:05	W242530 Multi-level neural networks for accurate solutions of initial and boundary-value problems Author(s): Ziad Aldirany*, Régis Cottereau, Marc Laforest, Serge Prudhomme
	11:05 - 11:25	W240258 An energy-based adversarial formulation of physics-informed neural networks for saddle point problems involving dielectric elastomers Author(s): Seungwoo Lee*, Chien Truong-Quoc, Youngmin Ro, Do-Nyun Kim
1807: Deep and machine learning methodology in the context of application to computational mechanics Chair(s): Yoshitaka Wada and Yasushi Nakabayashi		
212 Level 2	9:45 - 10:05	W240179 Investigation of CNN-based multigrid-bidirectional networks Author(s): Yukihiro Iwata*, Yoshihisa Inagaki, Miyoko Irikiin
	10:05 - 10:25	W240180 CNN-based surrogate model and temperature prediction method using superposition principle Author(s): Miyoko Irikiin*, Yukihiro Iwata
	10:25 - 10:45	W240328 Deep convolutional architectures for uncertainty quantification and forecast in inundation problems Author(s): Azzeddine Soulaïmani*, Yash Kumar, Pratyush Bhatt, Mohamed Moosa
	10:45 - 11:05	W240391 Physics-informed neural network in partial differential equations for finite element analysis of flash sintering Author(s): Ran He*, Mingxuan Xia, Peter Polak, Baber Saleem, Michael Yu, Xiaoxia Yu, Jingzhe Pan
	11:05 - 11:25	W240573 Prediction of plural crack propagation using discovered PDE Author(s): Genki Muraoka*, Yoshitaka Wada
1809: Data science and machine learning applications for composite materials and biomedical engineering Chair(s): Shu-Wei Chang, Chia-Ching Chou and Grace Gu		
215 Level 2	9:45 - 10:25	W242079 Machine learning-driven optimization of 3D printing composite structures and processes Author(s): Seunghwa Ryu*
	10:25 - 10:45	W241462 Data-efficient one-step mechanical design of composites using generative AI Author(s): Milad Masrouri, Zhao Qin*
	10:45 - 11:05	W242663 A new elastodynamic homogenization theory of finite-size aperiodic media and its machine learning-based implementation Author(s): Jeong-Ho Lee*, Grace Gu
	11:05 - 11:25	W242665 ViscoNet – a machine learning framework for polymer nanocomposite viscoelastic property prediction and material design Author(s): Catherine Brinson*, Anqi Claire Lin, Richard J. Sheridan
	11:25 - 11:45	W242024 An exploration for viscoelastic and dynamic property of 2D cellular materials Author(s): Li-Wei Liu*, Zhen-En Jian

1821: Data-driven modeling and design of materials Chair(s): Markus Kästner and Karl A. Kalina		
213 Level 2	9:45 - 10:25	W241762 Gradient-free neural topology optimization Author(s): Miguel Bessa*, Gawel Kus
	10:25 - 10:45	W240709 Inverse design of spinodoid structures through Bayesian optimization Author(s): Alexander Raßloff*, Paul Seibert, Karl Kalina, Markus Kästner
	10:45 - 11:05	W240762 Sequential design of plate-lattices Author(s): Paul Philipp Meyer, Thomas Tancogne-Dejean*, Dirk Mohr
	11:05 - 11:25	W241374 Discovery of composite material architectures using perpetual machine learning Author(s): Bassam El Said*
1823: Advances in neural operators for scientific modeling Chair(s): Mauro Perego		
216 Level 2	9:45 - 10:05	W240908 Efficient PDE-constrained optimization under uncertainty using derivative-informed neural operators Author(s): Dingcheng Luo*, Thomas O'Leary-Roseberry, Peng Chen, Omar Ghattas
	10:05 - 10:25	W241828 Uncertainty quantification for multifidelity operator networks Author(s): Amanda Howard*, Panos Stinis
	10:25 - 10:45	W241422 Graph neural operators for quantification of geometric uncertainty Author(s): Adrienne Propp*, Amanda Howard, Mauro Perego, Alexander Heinlein, Daniel Tartakovsky, Panos Stinis
	10:45 - 11:05	W240551 A novel ensemble approach to uncertainty quantification in operator learning Author(s): Ravi Patel*
	11:05 - 11:25	W240427 Coupling variational data assimilation and operator learning for effective state estimation on complex systems Author(s): Stiven Briand God Massala Moussounda*, Ludovic Chamoin, Massimo Pica Ciamarra

Monday July 22 - Technical Session 2

0101: Honoring the Legacy of Prof. Patrick Selvadurai Chair(s): Ney Dumont		
115 Level 1	2:00 - 2:20	W240985 On the transient behavior of rotor-structure-foundation-soil systems Author(s): Euclides Mesquita*, Amauri Ferraz
	2:20 - 2:40	W241732 3D-ACA for the time domain boundary element method: Comparison of FMM and H-matrix based approaches Author(s): Martin Schanz*
	2:40 - 3:00	W242531 Model order reduction techniques for the prediction of vibration in the built environment Author(s): Amar Pashov, Stijn Francois, Geert Degrande*
	3:00 - 3:20	W242252 A mechanistic computational framework for simulating a pandemic and social response in a heterogeneous population Author(s): Marie Miot*, Richard Wan, Antoine Wautier, François Nicot, Craig Jenne, Tyler Williamson, Kerry Black
	3:20 - 3:40	W241980 A Terzaghi based approach to consolidation analysis of unsaturated soils Author(s): Nasser Khalili*, Mahnoush Gharehdaghikhajehghiasi
0103: Professor JN Reddy's contributions to computational mechanics - A minisymposium on the occasion of Prof. Reddy's 80th birthday Chair(s): Prakash Thamburaja		
110 Level 1	2:00 - 2:20	W241189 Data-driven multiscale modeling Author(s): NR Aluru*
	2:20 - 2:40	W242648 Programming thermo-active metamaterials with temperature-sensing adaptive responses Author(s): Xiaojia Shelly Zhang*
	2:40 - 3:00	W240902 Band gap evolution in nonlinear dynamics of metamaterials made structures via gradually-changing mechanical properties Author(s): Riccardo Augello*, Erasmo Carrera
	3:00 - 3:20	W240544 3D printed architected shell-based ferroelectric metamaterials Author(s): Jiahao Shi, Kang Ju, Haoyu Chen, Armin Mirabolghasemi, Saad Akhtar, Agus Sasmito, Hamid Akbarzadeh*
	3:20 - 3:40	W240531 A micro-meso coupled model for coral reef rocks based on CT Scanning Author(s): Dengfeng Sang, Shoulong Zhang, Peijun Xie, Liqun Tang*
	3:40 - 4:00	W241473 Phase field fracture model and topology optimization for additive manufacturing Author(s): Qing Li*, Chi Wu, Cuiyi Li, Jianguang Fang, Grant Steven
0104: Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics Chair(s): Ludovic Chamoin		
109 Level 1	2:00 - 2:20	W240820 Some of Professor Oden's investigations on model validation and Bayesian analysis of complex engineering and scientific models Author(s): Ernesto Prudencio*
	2:20 - 2:40	W241327 Validation of displacement damage models Author(s): Kathryn Maupin*, Jaideep Ray, Larry Musson, Suzey Gao
	2:40 - 3:00	W242262 Error estimates for Dynamical Low Rank approximations of random parabolic equations Author(s): Fabio Nobile*, Eva Vidlickova, Thomas Trigo Trindade
	3:00 - 3:20	W242637 A review of VMS a posteriori error estimation in computational fluid dynamics Author(s): Guillermo Hauke*, Diego Irisarri
	3:20 - 3:40	W241638 Discovering optimal predictive deep learning surrogate models using the Occam-Plausibility Algorithm Author(s): Danial Faghihi*, Pratyush Kumar Singh, Kathryn Maupin

109 Level 1	3:40 - 4:00	W242567 Verification and Validation in computational mechanics Author(s): Serge Prudhomme*
0203: Advances in damage & fracture modeling of multiphysics materials Chair(s): Arezoo Hajesfandiari		
114 Level 1	2:00 - 2:20	W240305 Computation infrastructure for modeling discontinuities within materials: DEIP, BEAVER and MOOSE Author(s): Timothy Truster*, Amirfarzad Behnam
	2:20 - 2:40	W241687 Multi-phase-field modelling for am processes simulation including in-situ thermal fracturing Author(s): Roya Darabi*, Ana Reis, Jose Cesar de Sa
	2:40 - 3:00	W240989 Machine learning-aided digital twins for damage sensing: a multi-physics and multi-scale computational framework using piezoelectric composites Author(s): Saikat Dan*, Preetam Tarafder, Somnath Ghosh
	3:00 - 3:20	W241553 Numerical analysis of crack path instability under thermal loading Author(s): Sayako Hirobe, Kenji Oguni*
0302: Advances and applications in meshfree, particle, and peridynamic methods Chair(s): Zhen Chen and Yonggang Zheng		
201 Level 2	2:00 - 2:40	W240303 Phase-field total Lagrangian material point method for fracture in soft materials Author(s): Yonggang Zheng*, Zijian Zhang, Hongfei Ye, Hongwu Zhang
	2:40 - 3:00	W240809 MESHFREE: minimal effort for best quality. Ensure reliability of industrial simulation applications in fluid and continuum mechanics. Author(s): Joerg Kuhnert*
	3:00 - 3:20	W240229 Approximate Voronoi diagrams for nodally integrated Galerkin meshfree methods Author(s): Zhiyuan Tong*, Mauricio Ponga, Mattia Bacca, Zhiyuan Tong
	3:20 - 3:40	W240298 Immersed-boundary approach based on integrated RBFs and smooth extension for solving PDEs in complex domains Author(s): Nam Mai-Duy, Canh-Dung Tran, Dmitry Strunin, Warna Karunasena, Cam Minh Tri Tien, Prasad Yarlagadda*, YuanTong Gu
	3:40 - 4:00	W240295 Engineering porous composites against impact with particle methods Author(s): Zhen Chen*
0303: Virtual elements for partial differential equations on polytopal meshes Chair(s): Gianmarco Manzini		
202 Level 2	2:00 - 2:20	W240308 Axisymmetric virtual elements Author(s): Louie Yaw*
	2:20 - 2:40	W240508 Adaptive mesh refinement and coarsening procedures for the virtual element method Author(s): Daniel van Huyssteen*, Felipe Lopez Rivarola, Guillermo Etse, Paul Steinmann
	2:40 - 3:00	W242258 Automation of higher order virtual element methods Author(s): Joze Korelc*
	3:00 - 3:20	W240535 On a space-time formulation using virtual elements Author(s): Peter Wriggers*, Philipp Junker
	3:20 - 3:40	W242434 Projector assembly: bridging Poisson and elasticity formulations Author(s): Tiago Moherdaui*, Alfredo Gay Neto, Peter Wriggers

202 Level 2	3:40 - 4:00	W240424 Stabilized virtual element method for the nonlinear convection-diffusion-reaction problem Author(s): Natarajan E*
0305: Recent advances in discretization techniques for coupled problems in incompressible fluid dynamics Chair(s): TBA		
203 Level 2	2:00 - 2:20	W240123 Local conservation laws of continuous Galerkin method for the incompressible Navier–Stokes equations in EMAC form Author(s): Leo Rebholz*, Maxim Olshanskii
	2:20 - 2:40	W240737 A continuous-discontinuous shallow water solver for compound flood modeling Author(s): Eirik Valseth*, Chayanon Wichitrnithed, Clint Dawson
	2:40 - 3:00	W241280 Hybridizable discontinuous Galerkin methods for coupled systems of poroelasticity and free flow equations Author(s): Jeonghun Lee*, Aycil Cesmelioglu, Sander Rhebergen
	3:00 - 3:20	W242550 A discontinuous Galerkin finite element modeling approach for compound flooding events Author(s): Ethan Kubatko*, Chayanon Wichitrnithed, Eirik Valseth, Clint Dawson, Younghun Kang, Suranjan Nepal, Aaron Sines
	3:20 - 3:40	W241930 A hybridizable discontinuous Galerkin approximation of the dual-porosity-Stokes problem Author(s): Aycil Cesmelioglu*, Jeonghun Lee, Sander Rhebergen, Dorisa Tabaku
0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Mayu Maruatsu		
306 Level 3	2:00 - 2:20	W242287 A generalised deep learning model for homogenisation of multiphysics properties of composite materials Author(s): Rajesh Nakka, Attada Phanendra Kumar, Dineshkumar Harursampath, Sathiskumar Anusuya Ponnusami*
	2:20 - 2:40	W242350 Accuracy and convexity of homogenized material stiffness for non-affine fibrous materials Author(s): Jacob Merson*, Md. Rifat Hossain
	2:40 - 3:00	W240436 Surrogate computational homogenization for composites consisting of multiple viscoelastic materials with time-temperature superposition properties Author(s): Yosuke Yamanaka*, Shuji Moriguchi, Kenjiro Terada
	3:00 - 3:20	W240563 RBF-based surrogate model for computational homogenization of elastoplastic composites for finite deformation Author(s): Akari Nakamura*, Yosuke Yamanaka, Shuji Moriguchi, Kenjiro Terada
	3:20 - 3:40	W240956 Evaluation of mechanical properties of three-dimensional polycrystalline microstructures of dual-phase steel using machine learning model based on phase-field method and crystal plasticity finite element method Author(s): Misato Suzuki*, Kazuyuki Shizawa, Mayu Muramatsu
	3:40 - 4:00	W240267 Machine learning-based multiscale approach to anisotropic damage in quasi-brittle heterogeneous structures Author(s): Zakaria Chafia*, Julien Yvonnet, Jérémy Bleyer
0417: Microstructures of chemically complex materials and their impacts on material properties from multiscale simulations Chair(s): Chun-Wei Pao		
305 Level 3	2:00 - 2:20	W241188 Intrinsic deformation asymmetry from symmetry breaking in ordered intermetallic alloys: atomistic origins and continuum modeling Author(s): Jun Song*, Cheng Chen
	2:20 - 2:40	W240213 Curvature-controlled band alignment transition in 1D van der Waals heterostructures Author(s): Wenbin Li*
	2:40 - 3:00	W242491 Computational modeling of nanoparticle-coated surfaces for renewable energy applications Author(s): Chao-Cheng Kaun*

0418: Modeling and simulation of the electro-chemo-thermo-mechanical interactions in energy transition and energy storage systems Chair(s): Ralf Jänicke and Fredrik Larsson		
304 Level 3	2:00 - 2:20	W241734 Computational chemo-mechanics with application to multifunctional and high-temperature materials Author(s): Bjoern Kiefer*, Stefan Prüger, Stephan Roth
	2:20 - 2:40	W242186 Multiscale computational modeling of electro-chemo-mechanical interactions in Structural Battery composites Author(s): Ralf Jänicke*, David Rollin, Vinh Tu, Fredrik Larsson, Kenneth Runesson
	2:40 - 3:00	W240251 Electrochemical responses in focus: a voltammetric exploration of two-phase lithiation in high-capacity anodes Author(s): Umair Hussain*, Narasimhan Swaminathan, Gandham Phanikumar
	3:00 - 3:20	W241699 Modeling and simulation of hydrogen-defect interactions in nanostructured metallic materials across multiple time scales Author(s): Xingsheng Sun*
	3:20 - 3:40	W241314 Quantitative numerical studies of lithium electroplating: viscoplastic infiltration and cracking in a solid electrolyte Author(s): Chen Lin*
	3:40 - 4:00	W241499 Modelling and simulation of a fully electric hybrid propulsion system for passenger ships using AVL Cruise-M software Author(s): Luca Micoli, Roberta Russo*, Tommaso Coppola, Daniele Severi, Giuseppe Corda
0502: Advances in computational biomechanics and mechanobiology Chair(s): Corey Neu and David M. Pierce		
121 Level 1	2:00 - 2:20	W242691 A mixed-dimensional multiphase model for coupling air flow, blood flow and gas exchange in human lungs Author(s): Lea J. Köglmeier, Wolfgang Wall*
	2:20 - 2:40	W241505 Aortic stenosis and myocardial remodeling: insights from finite element analysis in a rat model Author(s): Mohammad Javad Sadeghinia*, Henrik Nicolay Finsberg, Emil Espe, Ida Marie Hauge-Iversen, Lili Zhang, Einar S. Nordén, Ivar Sjaastad, Samuel Wall, Joakim Sundnes
	2:40 - 3:00	W240790 Identification of hyperelasticity in human arteries using a machine learning based virtual fields method Author(s): Shuangshuang Meng, Ali Akbar Karkhaneh Yousefi, Stéphane Avril*
	3:00 - 3:20	W241801 A framework for understanding vascular remodeling: from geometry to transport dynamics. Author(s): Jérôme Kowalski*, Lorenzo Sala, Dirk Drasdo, Irene Vignon-Clementel
	3:20 - 3:40	W241935 A computational prestressing algorithm for biological tissues: application to the aorta and consequences on growth and remodeling Author(s): Ali Akbar Karkhaneh Yousefi*, Stéphane Avril
	3:40 - 4:00	W242547 A mesh morphing approach to address the effect of deformable boundaries in CFD simulation of aortic flow Author(s): Elena Di Martino*, Amir Hassaniazardary, Arianna Forneris, Alice Guest, Randy D Moore
0504: Multiphysics and data-driven modeling for cardiovascular biomedicine Chair(s): Adarsh Krishnamurthy		
122 Level 1	2:00 - 2:20	W241489 AI-enabled rapid image-based hemodynamic modeling and simulation Author(s): Pan Du, Delin An, Yongqi Li*, Chaoli Wang, Jianxun Wang
	2:20 - 2:40	W241498 Data-driven FSI simulation of ventricle and aorta integrating in-vivo and in-silico data Author(s): Martino Andrea Scarpolini*, Simona Celi, Francesco Viola
	2:40 - 3:00	W240840 Data-driven wall shear stress prediction from concentration using a surface transport model Author(s): Mahmoud Elhadidy*, Roushan D'Souza, Amirhossein Arzani
	3:00 - 3:20	W241279 Data-driven prediction of reduced-order cardiovascular model parameters Author(s): Natalia Rubio*, Luca Pegolotti, Martin Pfaller, Eric Darve, Alison Marsden

0704: Advanced multi-physics CFD simulations in science and engineering Chair(s): Makoto Yamamoto		
221 Level 2	2:00 - 2:40	W241140 Sensitizing the RANS approach to a scale-resolving computational framework for complex multi-physics turbulent flows Author(s): Suad Jakirlic*
	2:40 - 3:00	W241155 Urban multi-physics CFD model to access the cooling potential of trees in a typical North America neighborhood Author(s): Clément Nevers*, Aytaç Kubilay, Jan Carmeliet, Dominique Derome
	3:00 - 3:20	W240416 Study on performance and hydraulic losses of centrifugal pumps with impellers having porous structure Author(s): Takeshi Konishi*, Yasuyuki Hirano, Yasuyuki Nishi
	3:20 - 3:40	W241271 Impact of surface roughness on turbulent transition on a high reynolds number infinite swept wing Author(s): Hayahide Yoshida*, Takahiro Ishida, Keisuke Ohira, Ryo Araki, Takahiro Tsukahara
	3:40 - 4:00	W241033 Type Ⅰ to Type Ⅱ transition in swept-forward fin shock interactions Author(s): Guangli Li*, Jing Yang, Kai Cui
0711: Lattice Boltzmann modelling and study of complex flows Chair(s): Jan Carmeliet		
222 Level 2	2:00 - 2:20	W241781 Large scale direct numerical simulations of forced convective boiling Author(s): Linlin Fei*, Alessandro Gabbana, Federico Toschi, Jan Carmeliet
	2:20 - 2:40	W241895 Comparison of fully resolved and unresolved particulate flow simulations using the lattice Boltzmann method Author(s): Tristan Vlogman*, Rob Hagmeijer, Kartik Jain
	2:40 - 3:00	W241974 Influence of plasticity on inertialess viscoelastic instabilities Author(s): Vedad Dzanic*, Christopher S. From, Emilie Sauret
	3:00 - 3:20	W242114 A PyTorch based fully differentiable Lattice-Boltzmann solver for hybrid machine learning simulation workflows Author(s): Josef Winter*, David Wawrzyniak, Steffen Schmidt, Thomas Indinger, Christian Janssen, Uwe Schramm, Nikolaus Adams
	3:20 - 3:40	W241844 Lattice Boltzmann simulation of reactive transport in complex fractures Author(s): Qinjun Kang*, Richard Larson, Hari Viswanathan
	3:40 - 4:00	W242228 Lattice Boltzmann simulation of pollutant dispersion using Eulerian aerosols models: application to natural ventilation inside buildings Author(s): Jerome Jacob*
0802: Model-based simulations of structural responses under extreme conditions Chair(s): Zeng Lin		
207 Level 2	2:00 - 2:40	W241064 Stabilized Lagrange interpolation collocation method: a meshfree method incorporating the advantages of finite element method Author(s): Lihua Wang*, Zheng Zhong
	2:40 - 3:00	W241335 Study of failure evolution in shocked porous solids by comparing material point method and molecular dynamics simulations Author(s): Yu-Chen Su*, Mohammed H. Saffarini, Zhen Chen
	3:00 - 3:20	W240021 Shape morphing of smart piezoelectric composite laminates using thermo-electro-mechanical loading Author(s): Tongyu Wu*, Shaker Meguid
	3:20 - 3:40	W240913 Mathematical modeling and numerical simulation of mechanical-thermal-chemical multi-field process Author(s): Ke Liu*, Yazhi Li, Biao Li

0812: The phase field method for fracture: Theory, numerics, and applications Chair(s): Yongxing Shen and Bin Li		
204 Level 2	2:00 - 2:40	W240190 Exploring multi-physical coupled fracture in polymers through phase-field modeling Author(s): Lu-Wen Zhang*
	2:40 - 3:00	W240528 Stabilized formulation for phase-field fracture in nearly incompressible hyperelasticity Author(s): Bin Li*, Ida Ang, Nikolaos Bouklas
	3:00 - 3:20	W240578 A chemo-mechanical coupled phase field model for stress corrosion cracking Author(s): Weian Yao*, Xiaofei Hu, Lang Min, Zhi Sun
	3:20 - 3:40	W241013 Effect of the ratio of diffuse length scale and Irwin's material characteristic length scale l0/lch on the phase field modeling to brittle or quasi-brittle fracture Author(s): Hongjun Yu*, Yaode Yin
	3:40 - 4:00	W241103 Mixed-mode crack opening computation in the phase field method Author(s): Lin Chen*
0816: Model order reduction for parametrized continuum mechanics Chair(s): Eric Joshua Parish		
211 Level 2	2:00 - 2:20	W241584 A collocation model reduction scheme for PDEs (cMOR) Author(s): Angelo Iollo*, Michele Giuliano Carlino, Tommaso Taddei
	2:20 - 2:40	W241437 Shape-morphing nonlinear solutions for model order reduction Author(s): William Anderson*, Mohammad Farazmand
	2:40 - 3:00	W242190 Nonlinear model order reduction with smooth neural fields Author(s): Vedant Puri*, Aviral Prakash, Jessica Zhang, Levent Burak Kara
	3:00 - 3:20	W241349 A hyper-reduced order model for nonlinear coupled porous media flow Author(s): Saeed Hatefiardakani*, Robert Gracie
	3:20 - 3:40	W242035 Reduced-order modeling with and without linearized adjoints Author(s): Samuel Otto*, Nicolas Boulle, Diana Halikias, Alex Townsend
0817: Advances in numerical methods for solution of PDEs Chair(s): Alexander Idesman		
205 Level 2	2:00 - 2:20	W240961 State space based mixed finite element method for laminated structures Author(s): Jiaqing Jiang*, Weiqiu Chen
	2:20 - 2:40	W240759 A fast parallel solving method for thermal conduction-poisson equations based on Fast Fourier Transform Author(s): Jiang Zichao*, Huang Bohua, Wang Zhuolin, Yao Qinghe
	2:40 - 3:00	W241444 Unveiling a novel fluid-structure interaction model and 3D hexagonal channel network for artificial pancreas optimization Author(s): Yifan Wang*, Suncica Canic
	3:00 - 3:20	W242638 A fractional finite element formulation for bending analysis of viscoelastic problems Author(s): Jafar Rouzegar*, Narjes Sanjarian Dehaghani
	3:20 - 3:40	W242568 Summation-by-parts finite-difference operators for singular coordinate systems Author(s): Jonatan Werpers*

0821: Theory and application of provably-robust and efficient high-order methods for high-fidelity computational fluid dynamics Chair(s): David Del Rey Fernandez		
206 Level 2	2:00 - 2:20	W240997 Enforcing cell entropy inequalities using subcell limiting Author(s): Jesse Chan*, Yimin Lin
	2:20 - 2:40	W241367 Central WENO-ZN scheme with the optimal accuracy order at high-order critical points Author(s): Yiqing Shen*, Biao Zhou, Hao Jin, Yi Cheng, Jianyu Qin
	2:40 - 3:00	W242187 Application of bound-preserving limiters to the nonlinearly stable flux reconstruction high-order method Author(s): Sai Shruthi Srinivasan*, Alexander Cicchino, Siva Nadarajah
0823: Mathematics and algorithms for predictive digital twins (DT) Chair(s): Paul Kuberry		
209 Level 2	2:00 - 2:20	W242191 A machine learning framework for model calibration of mercury target simulation Author(s): Hoang Tran*
	2:20 - 2:40	W241538 Learning physics-based reduced-order models from data using nonlinear manifolds Author(s): Rudy Geelen*, Laura Balzano, Stephen Wright, Karen Willcox
	2:40 - 3:00	W240868 Neural partial differential equation models of complex dynamical systems Author(s): Sanket Jantre*, Anthony DeGennaro, Nathan M. Urban
	3:00 - 3:20	W241416 Hybrid surrogate modeling framework and reinforcement learning for digital twin applications Author(s): Jasmin Lim*, Karthik Duraisamy
	3:20 - 3:40	W240791 Enabling tabulated flamelet progress variable methods to solve the reacting Navier-Stokes equations on multiple architectures Author(s): Brian Bojko*, David Kessler, Kamal Viswanath, Ryan Johnson, Andrew Kercher, Andrew Corrigan
0828: Multi-scale and machine learning-based modeling methods for optimization and design of composites Chair(s): Liyong Tong		
208 Level 2	2:00 - 2:40	W240536 Multifield micromechanics analysis of composites with defects using CUF Author(s): Erasmo Carrera*, Alfonso Pagani, Marco Petrolo, Rebecca Masia, Mattia Trombini
	2:40 - 3:00	W240523 Multi-physics fracture analysis of composite laminates based on extended layerwise method Author(s): Dinghe Li*
	3:00 - 3:20	W242377 Two-scale modeling and inelastic analysis of CFRP fan blade dovetails Author(s): Eiichiro Mori*, Tetsuya Matsuda, Naoki Morita, Masahiro Hojo, Nobuhiro Yoshikawa
	3:20 - 3:40	W241072 A fast prediction method for bearing strength of aircraft composite bolted structures considering initial assembly deviation Author(s): Qingyuan Lin*, Yong Zhao, Yuming Liu, Wei Pan, Wencai Yu, Yu Ren
	3:40 - 4:00	W240188 A damage physics-guided approach to acoustic emission signals identification in composite materials Author(s): Fan Dong*, Yazhi Li, Biao Li, Xiaopeng Li
0905: Probabilistic learning and constrained generative models for uncertainty quantification Chair(s): Cosmin Safta		
210 Level 2	2:00 - 2:20	W241937 Efficient estimation of highway bridge seismic response using probabilistic learning on manifolds (PLoM) Author(s): Jeonghyun Lee*, Kuanshi Zhong, Sanjay Govindjee, Gregory Deierlein
	2:20 - 2:40	W241995 Conditional diffusion models for solving physics-based inverse problems Author(s): Assad Oberai*, Agnimitra Dasgupta, Javier Murgoitio-Esandi, Harisankar Ramaswamy
	2:40 - 3:00	W242624 Probabilistic modeling and sampling of constitutive laws for hybrid composite materials using Probabilistic Learning on Manifolds Author(s): Roger Ghanem, Venkat Aitharaju, Zhengtao Yao*, Philippe Hawi

210 Level 2	3:00 - 3:20	W241758 Probabilistic entropy and distance in homogenization of random multi-component composites Author(s): Marcin Kamiński*
1009: Advanced discretization schemes and solution strategies for computational structural dynamics Chair(s): Bastian Oesterle and Alessandro Reali		
116 Level 1	2:00 - 2:20	W240127 An enhanced fully-adaptive explicit-implicit time-marching formulation for elastodynamics Author(s): Delfim Soares*, Lucas Pinto, Isabelle Sales, Webe Mansur
	2:20 - 2:40	W240128 An explicit time-marching procedure for elastodynamic analyses based on adaptive time-integration parameters and time-step values Author(s): Lucas Ruffo Pinto*, Delfim Soares Jr., Isabelle de Souza Sales, Webe João Mansur
	2:40 - 3:00	W241385 A comparative study of adaptive implicit-explicit and explicit-explicit time-marching procedures for wave propagation analyses Author(s): Isabelle de Souza Sales*, Delfim Soares Jr., Lucas Ruffo Pinto, Webe João Mansur
	3:00 - 3:20	W241841 An optimal implicit single-step single parameter time integration method for structural dynamics Author(s): Jie Zhang*
	3:20 - 3:40	W241551 Development of high-order multi-sub-step implicit time integration methods Author(s): Chanju Lee*, Gunwoo Noh
1010: Recent advances in indirect structural health monitoring Chair(s): Elena Atroshchenko		
111 Level 1	2:00 - 2:20	W242135 Estimation of 3D distributions of mechanical parameters for bridge by the Vehicle–Bridge Interaction System Identification method Author(s): Masaki Sakai, Yuka Goto*, Eugene Madahemuca, Ryota Shin, Kyosuke Yamamoto
	2:20 – 2:40	W242081 Physical-based estimation of inter-section bridge responses under vehicular loading with BP-ANN Xuzhao Lu*, Limin Sun, Ye Xia, Guang Qu and Haibin Sun
	2:40 – 3:00	W242117 Hybrid structure health monitoring technique for enhancing modal parameter identification accuracy Author(s): Mudahemuka Eugene*, Kyosuke Yamamoto
	3:00 – 3:20	W242467 Sensing vehicle design optimization for bridge indirect structural health monitoring based on surrogate model Author(s): Andres Felipe Calderon Hurtado*, Mehrisadat Makki Alamdari, Elena Atroshchenko, Chul-Woo Kim, Kai Chun Chang
1012: Advanced simulation techniques for the structural design of carbon reinforced concrete Chair(s): Sven Klinkel and Michael Kaliske		
113 Level 1	2:00 - 2:20	W242313 Numerical simulations of origami-based folded carbon-reinforced concrete shells Author(s): Homam Spartali, Leonie Mester, Georgia Kikis, Simon Klarmann, Sven Klinkel, Rostislav Chudoba, Carlos Guilherme Gomes Cruz*
	2:20 - 2:40	W242670 Mechanical behaviour of tubular topological interlocking assemblies Author(s): Reymond Akpanya*, Alice C. Niemeyer
	2:40 - 3:00	W242168 Development of a design methodology for slender carbon-reinforced concrete columns in axial compression based on EC3 Author(s): Yvonne Ciupack*, Josiane Giese, Manfred Curbach, Birgit Beckmann
1101: Modeling and simulation for additive manufacturing Chair(s): Andreas Lundback		
118 Level 1	2:00 - 2:20	W242095 A highly efficient computational approach for fast scan-resolved simulations of metal additive manufacturing processes on the scale of real parts Author(s): Sebastian D. Proell, Peter Munch, Martin Kronbichler, Wolfgang Wall, Christoph Meier*
	2:20 - 2:40	W241701 GO-MELT: GPU-optimized multilevel execution of LPBF thermal simulations Author(s): Joseph Leonor*, Mohammad Elahi, Gregory Wagner

118 Level 1	2:40 - 3:00	W240954 Determination of optimal beam shapes in laser powder based fusion of metals Author(s): Stefan Kollmannsberger*, Vijaya Holla, Philipp Kopp, Jonas Gruenewald, Patrick Praegla, Christoph Meier, Katrin Wudy
	3:00 - 3:20	W240662 A high-fidelity thermal-fluid-solid modeling approach to understand defect formation and residual stresses in additive manufacturing builds Author(s): Christie Crandall*, Stephen Lin, Daniel Moser, Carl Herriott, Lauren Beghini, Michael Stender
	3:20 - 3:40	W241257 Differentiable thermomechanical simulation for residual stress optimization in additive manufacturing Author(s): Jin Young Choi*, Shuheng Liao, Tianju Xue, Jian Cao
1102: Emerging frontiers and methods in digital manufacturing: Modeling, simulation, and beyond Chair(s): Rekha R Rao, Alec Kucala and Stefanie Elgeti		
117 Level 1	2:00 - 2:20	W242453 Gas effects on horizontal ribbon growth of silicon Author(s): Nojan Bagheri-Sadeghi*, Brian Helenbrook
	2:20 - 2:40	W242178 A quality by digital design (QbD2) framework for the development of intensified crystallization systems Author(s): Monika Neal*, Tesia Janicki, Zoltan Nagy, Rekha Rao
	2:40 - 3:00	W241237 Towards a multiscale computational framework for simulating flow-mediated crystallization based on phase-field crystal formalisms Author(s): Larry Willis*, Rekha Rao, Leo Liu
	3:00 - 3:20	W241241 Microstructural control and defect analysis for flow-mediated crystallization using physics-informed deep learning Author(s): Larry Willis, Rekha Rao, Leo Liu*
	3:20 - 3:40	W240114 Data driven unsupervised clustering of metal additive manufacturing crystallographic texture data Author(s): Aashique Rezwan*, David Montes de Oca Zapiain, Daniel Moser, Michael Heiden, Theron Rodgers
	3:40 - 4:00	W241468 Predicting residual stress fields using a multiphysical model with adaptive remeshing: model construction and validation Author(s): Andrew Stershic*, Christopher D'Elia, Lauren Beghini, Michael Hill
1304: Modeling and simulation of dynamics, stability and control of aerospace structures Chair(s): Marcelo Araujo da Silva and Reyolando Brasil		
302 Level 3	2:00 - 2:20	W240141 Minimization of vibrations in aeronautical wing spars under flutter situation Author(s): Larissa Santos*, Marcelo Araujo Silva, Reyolando Brasil
	2:20 - 2:40	W241395 Investigating the domain of attraction of SDRE applied to a CubeSat attitude control system during launch orbit phase based on cold gas thrusters Author(s): Luiz Carlos Souza*, Alessandro Gerlinger Romero
	2:40 - 3:00	W241603 Reliability analysis of aircraft wing structures based on Monte Carlo simulation and finite element method Author(s): Geovane Gomes*, Reyolando Brasil
	3:00 - 3:20	W242676 Study of the dynamic behavior of cellular structures for the absorption of mechanical vibrations Author(s): Marcelo Silva*, Lucas Ramos
1402: Complex fluid flows in engineering: Modeling, simulation, and optimization Chair(s): Marek Behr and Fabian Key		
219 Level 2	2:00 - 2:20	W241207 Vortex generation in the feed slot during slot coating Author(s): Sangho Oh*, Jaewook Nam

219 Level 2	2:20 - 2:40	W241778 Numerical simulation of the phase-change evolution during the strand extrusion in fused deposition modeling Author(s): Felipe González*, Stefanie Elgeti, Marek Behr
	2:40 - 3:00	W241345 Curing instability on interface tracking utilizing weakly imposed Dirichlet conditions Author(s): Yundong Yang*, Jaewook Nam
	3:00 - 3:20	W241663 On the design of conformal cooling channel through turbulent flow topology optimization Author(s): Marc-Etienne Lamarche-Gagnon*, Vincent Raymond, Francis Lacombe, Florin Ilinca
	3:20 - 3:40	W241068 Extended DVM algorithm and topology optimization of rarefied gas through a discrete adjoint system Author(s): Kaiwen Guan*, Takayuki Yamada
	3:40 - 4:00	W240512 Multi-target/multi-condition aerodynamic configuration optimization of the high-pressure capturing wing bi-wing configuration Author(s): Yao Xiao*, Siyuan Chang, Kai Cui, Guangli Li, Zhongwei Tian
1403: New trends in topology optimization Chair(s): Renato Picelli		
220 Level 2	2:00 - 2:20	W242037 Data-driven topology design for turbulent channel flow Author(s): Yukako Miyazaki*, Yoshinao Komatsu, Kentaro Yaji
	2:20 - 2:40	W240135 Topology optimization of unsteady compressible fluid flows Author(s): Icaro Amorim Carvalho*, Diego Hayashi Alonso, Luis Fernando Garcia Rodriguez, Emilio Carlos Nelli Silva
	2:40 - 3:00	W240823 Rotor-stator design to transport compressible turbulent flow under the topology optimization method Author(s): Luis Fernando Garcia Rodriguez*, Diego Hayashi Alonso, Emilio Carlos Nelli Silva
	3:00 - 3:20	W241581 Topology optimization for fluidic diode design with dissipation and vorticity functions via sequential approximate integer programming Author(s): Anderson Soares da Costa Azevêdo*, Eduardo Moscatelli, Luís Fernando Nogueira de Sá, Emilio Carlos Nelli Silva, Renato Picelli
1409: Applications of shape optimization in complex engineering problems Chair(s): Mathias Schmidt		
218 Level 2	2:00 - 2:20	W240234 Shape optimization of hydrodynamic experiments Author(s): Daniel White*, Dane Sterbentz, Charles Jekel
	2:20 - 2:40	W240125 Material and shape optimization for the active response of liquid crystal elastomers Author(s): Jorge-Luis Barrera*, Caitlyn Krikorian, Elaine Lee, Kenneth Swartz, Daniel Tortorelli
	2:40 - 3:00	W240620 Acoustic shape optimization using energy stable curvilinear finite differences Author(s): Gustav Eriksson*, Vidar Stiernström
	3:00 - 3:20	W240648 Shape optimization for lithium-ion battery with porous electrodes Author(s): Hanyu Li*, Jorge-Luis Barrera, Thomas Roy
1601: Contact and interface mechanics: Modeling and computation Chair(s): Mike Puso		
224 Level 2	2:00 - 2:20	W241371 Fracture propagation along contact interfaces Author(s): Chris Pearce*, Lukasz Kaczmarczyk, Andrei Shvarts, Ignatios Athanasiadis
	2:20 - 2:40	W241121 Modeling solid-solid contact in a fully Eulerian phase-field framework Author(s): Flavio Lorez*, Mohit Pundir, David Kammer
	2:40 - 3:00	W240771 IGA-based modelling of wet grinding processes with special focus on hydrodynamic properties Author(s): Paul Thunich*, Yan Tong, Michael Müller, Oliver Schömig, Robar Arafat, Christoph Herrmann

224 Level 2	3:00 - 3:20	W242353 Optimal GPU contact in Sierra Solid Mechanics Author(s): Mark Merewether*, Matthew Mosby, Nathan Crane, Kendall Pierson
	3:20 - 3:40	W240983 A new perspective on computational contact homogenisation based on the Method of Multiscale Virtual Power Author(s): António Carneiro*, Rodrigo Carvalho, Eduardo Souza Neto, Francisco Andrade Pires
	3:40 - 4:00	W242292 An immersed boundary approach for fluid-structure interaction simulation using the Material Point Method Author(s): Wen-Chia Yang*, Yu-Ting Lin
1605: Fluid-structure interaction in interface and moving boundary problems Chair(s): Naoto Mitsume		
223 Level 2	2:00 - 2:20	W242150 3D generative AI based on DeepSDF incorporating structural dynamics Author(s): Koji Nishiguchi*, Issei Toida, Naoya Chiba, Yuji Wada, Rio Yokota, Hiroya Hoshiba, Junji Kato
	2:20 - 2:40	W241044 Hierarchical reduced order modeling for distributed memory parallel computers Author(s): Kyohei Shintate*, Naoki Morita, Shigeki Kaneko, Naoto Mitsume
	2:40 - 3:00	W240343 A partitioned coupling algorithm for high-fidelity hydrodynamic induced structural fracture analysis Author(s): Gong Chen*, Shunhua Chen
1701: Advanced computational modelling of wood, wood-based products, bio-composites, and timber structures Chair(s): Zhiyong Chen		
119 Level 1	2:00 - 2:20	W241549 Molecular dynamics study of the hygro-mechanical behaviour of natural and consolidated wood Author(s): Ali Shomali, Jan Carmeliet, Dominique Derome*
	2:20 - 2:40	W241855 Computational modelling of moisture transport and swelling in paper through a multi-phase flow approach Author(s): C. Rojas Vega*, Marc G.D. Geers, Ron Peerlings
	2:40 - 3:00	W242423 Determination of orthotropic elastic modulus of wood by indentation with none-axisymmetric indenter and FEM simulation Author(s): Tomoaki Tsuji*, Kouhei Saito
	3:00 - 3:20	W242613 Development of high-strength wooden pallets utilizing local timber from Ehime Prefecture Author(s): Xia Zhu*, Akira Ochi, Tsubasa Kaneko, Daiki Ito, Hiromichi Toyota
	3:20 - 3:40	W242653 Modelling the mechanical behaviour of sandwich panels made of Arundo Donax core and flax fibre reinforced epoxy composite skins Author(s): Giovanni Donini*, Letizia Crociati, Luisa Molari, Vincent Placet
	3:40 - 4:00	W241735 Advanced multiscale modelling of plant fiber-reinforced biocomposites: bridging the gap in predictive analysis for sustainable construction materials Author(s): Markus Königsberger, Valentin Senk, Markus Lukacevic, Sebastian Pech, Josef Füssl*
1704: Geomechanics of the cryosphere Chair(s): Devin O'Connor		
120 Level 1	2:00 - 2:20	W241759 Sea ice modeling in DOE's Energy Exascale Earth System Model (E3SM) Author(s): Deborah Sulsky*, Devin O'Connor, Yawen Guan, Svetoslav Nikolov, Kara Peterson, Andrew Roberts, Onkar Sahni, Mark Shephard, Cameron Smith, Han Tran
	2:20 - 2:40	W241764 Implementation of the Material Point Method on a spherical Voronoi mesh for the MPAS-SI-MPM sea ice model Author(s): Kara Peterson*, Deborah Sulsky, Adrian Turner, Onkar Sahni, Svetoslav Nikolov, Devin O'Connor
	2:40 - 3:00	W241998 Enabling accelerator/GPU support for ice simulations in MPAS framework within Energy Exascale Earth System Model Author(s): Onkar Sahni*, Yuyang Gong, Jun Song, Angel Castillo-Crooke, Han Tran, Cameron Smith, Mark Shephard, Adrian Turner, Deborah Sulsky

120 Level 1	3:00 - 3:20	W241967 Graphics processing unit accelerated ice flow solver for unstructured meshes using the Shallow Shelf Approximation (FastIceFlo v1.0.1) Author(s): Anjali Sandip*, Ludovic Räss, Mathieu Morlighem
	3:20 - 3:40	W242196 On sea ice dynamics applying mixed least-squares FEM Author(s): Sonja Hellebrand*, Carina Schwarz, Jörg Schröder
1802: Scientific deep learning Chair(s): Kentaro Yaji		
214 Level 2	2:00 - 2:20	W240064 Efficient semantic SLAM: leveraging deep learning for enhanced SLAM in drone forestry surveillance under canopy Author(s): Pierre Leroy*, Emmanuelle Abisset-Chavanne, Marco Montemurro, Regis Pommier
	2:20 - 2:40	W242269 Second-order solvers for training regression problems in scientific machine learning Author(s): George Turkiyyah*, David Keyes, Stefano Zampini
	2:40 - 3:00	W240452 Deep machine learning for computer modelling of polymer degradation Author(s): Mingxuan Xia*, Ran He, Peter Polak, Baber Saleem, Jingzhe Pan
	3:00 - 3:20	W241650 Self-supervised learning for health assessment of lithium-ion batteries in electric vehicles Author(s): Jie-Chung Chen, Nien-Ti Tsou*
1807: Deep and machine learning methodology in the context of application to computational mechanics Chair(s): Yasushi Nakabayashi and Yoshitaka Wada		
212 Level 2	2:00 - 2:20	W240747 Acoustic barrier design with topology optimization based on deep reinforcement learning Author(s): Myung Shin*, Gil Ho Yoon
	2:20 - 2:40	W241062 Graph neural networks for accelerating the discrete element simulation of granular flow Author(s): Peng Zhi*, YuChing Wu
	2:40 - 3:00	W241115 Prediction of three-dimensional defect's information in complex shaped CFRP specimens using GNN based on stress distribution on surface from homogenized finite element analysis and infrared measurements Author(s): Yuta Kojima*, Kenta Hirayama, Yoshihisa Harada, Mayu Muramatsu
	3:00 - 3:20	W241625 Enhancing music generative system through optimization with AI and MIR techniques Author(s): Ko Ko Aung*, Masato Masuda, Ryuji Shioya, Yasushi Nakabayashi
	3:20 - 3:40	W241745 Configurable ML-powered defeaturing for simulation Author(s): Steven Owen*
1809: Data science and machine learning applications for composite materials and biomedical engineering Chair(s): Li-Wei Liu, Seunghwa Ryu and Zhao Qin		
215 Level 2	2:00 - 2:20	W240625 Effective elastic and viscoelastic properties of tubular-architectured materials: analytical and numerical simulations Author(s): Li-Wei Liu, Kuan-Ting Li, Marco Bonopera*
	2:20 - 2:40	W241558 An investigation of the mechanical behavior of re-entrant auxetic structures Author(s): Chia-Ching Chou*, Yu-Cheng Lai
	2:40 - 3:00	W241886 Development of an elastic deformation atlas of Cerebral Major Arteries via statistic approach Author(s): Yan Chen, Yang Bai*, Marie Oshima
	3:00 - 3:20	W241464 Lethality prediction of osteogenesis imperfecta by a structure- and sequence-informed graph neural network Author(s): Yen-Lin Chen*, Wei-Han Hui, Shu-Wei Chang

215 Level 2	3:20 - 3:40	W241294 Investigating the effects of the mechanical ventilation strategies on pulmonary mechanics properties for children with Acute Respiratory Distress Syndrome Author(s): Siang-Rong Lin*, Jeng-Hung Wu, En-Ting Wu, Chia-Ching Chou
	3:40 - 4:00	W240338 Fatigue growth of transverse crack in high manganese steel frogs Author(s): Tung-Yu Wu*, Ho Ieng Ieong, Wei-Lun Hsu, Chia-Ming Chang, Yung-Cheng Lai
1821: Data-driven modeling and design of materials Chair(s): WaiChing Sun and Nick N. Vlassis		
213 Level 2	2:00 - 2:20	W242158 A large language model and denoising diffusion framework for targeted design of microstructures with commands in natural language Author(s): Nikita Kartashov, Nikolaos Napoleon Vlassis*
	2:20 - 2:40	W241798 Data-driven exploration of structure-property linkages and inverse design of materials Author(s): Markus Kästner*, Alexander Raßloff, Paul Seibert, Karl Kalina
	2:40 - 3:00	W241178 A comparison of approaches for the inverse design of spinodoid metamaterials with tailored stiffness Author(s): Max Rosenkranz*, Ivo F. Sbalzarini, Markus Kästner
	3:00 - 3:20	W241252 Generative Inverse Design of metamaterials with functional responses by interpretable learning Author(s): Wei (Wayne) Chen*, Rachel Sun, Doksoo Lee, Carlos Portela, Wei Chen
	3:20 - 3:40	W240461 Unveiling amorphous microstructural features: a manifold learning approach using diffusion maps Author(s): Rahul Meena*, Spencer Fajardo, Michael Shields, Michael Falk, Dimitris Giovanis
1823: Advances in neural operators for scientific modeling Chair(s): Amanda Howard		
216 Level 2	2:00 - 2:40	W241975 Toward foundation material model with Nonlocal Attention Operator Author(s): Yue Yu*, Ning Liu, Tian Gao, Siavash Jafarzadeh, Stewart Silling
	2:40 - 3:00	W242553 Accurate solution of linear operator approximations using green's functions by a multi-level neural network approach Author(s): Ziad Aldirany, Charlélie Bilodeau*, Régis Cottereau, Marc Laforest, Serge Prudhomme
	3:00 - 3:20	W241256 A physics-informed operator learning framework inspired by the finite element method for prediction of dynamics physical phenomena: case study on transient heat conduction Author(s): Yusuke Yamazaki*, Ali Harandi, Stefanie Reese, Mayu Muramatsu, Shahed Rezaei
	3:20 - 3:40	W241172 A unifying framework for operator learning via neural fields Author(s): Jacob Seidman, Hanwen Wang, Shyam Sankaran*, Paris Perdikaris, George Pappas
	3:40 - 4:00	W240354 v - Tangent Kernels Author(s): Akshunna S. Dogra*, Martin Peev

Monday July 22 - Technical Session 3

0102: Minisymposium in honor of Prof. Yannis Kallinderis's 60th birthday: Progress of Unstructured grid based CFD, hybrid mesh generation and adaptation, and parallel supercomputing Chair(s): Christos Kavouklis and Hyung Taek Ahn		
115 Level 1	4:30 - 4:50	W241477 Application of unstructured grid-based CFD simulations in naval and ship hydrodynamics Author(s): Hyung Taek Ahn*
	4:50 - 5:10	W242566 Exploring interface conservation in computational fluid dynamics Author(s): Hong Luo*, Gianni Luo, Xiaodong Liu
	5:10 - 5:30	W240638 Discretization error estimation for flow simulations using general hybrid grids Author(s): Yannis Kallinderis*
	5:30 - 5:50	W241968 Communication-computation overlapping for parallel multigrid methods Author(s): Kengo Nakajima*
0103: Professor JN Reddy's contributions to computational mechanics - A minisymposium on the occasion of Prof. Reddy's 80th birthday Chair(s): Arif Masud		
110 Level 1	4:30 - 4:50	W242522 Interlaminar stress formulation with equilibrium based approach applied to a simple multi-layer Kirchhoff-Love shell element Author(s): Paulo Pimenta*, Gustavo Gomes
	4:50 - 5:10	W240615 Elastoplastic computing Saint-Venant flexure-torsion and warping torsion in three dimensions Author(s): Hong-Ki Hong*, Hsien-He Huang
	5:10 - 5:30	W241817 Multiscale modeling of fracture nucleation and propagation in rate-dependent polymer networks Author(s): Ahmed Elbanna*, Ahmed Ghareeb, Chunhui Zhao
	5:30 - 5:50	W241695 A simulation-driven design method for graded lattice structures with complex boundary constraints Author(s): Zhujiang Wang*, Xinwei Du, Bin Zhai
	5:50 - 6:30	W242684 Role of computational mechanics and recent advances Author(s): J.N. Reddy*
0104: Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics Chair(s): Kathryn Maupin		
109 Level 1	4:30 - 4:50	W240554 Learning and adapting - secrets to successful, modeling, computing and predicting Author(s): Abani Patra*
	4:50 - 5:10	W241997 Multi-fidelity modeling via the data graph Laplacian Author(s): Assad Oberai*, Orazio Pinti
	5:10 - 5:30	W240103 Modeling immersed granular flows Author(s): Vincent Legat*, Nathan Coppin, Michel Henry, Simon Yans, Jonathan Lambrechts
	5:30 - 5:50	W240824 A novel shallow water equation solver based on mixed continuous-discontinuous function spaces Author(s): Eirik Valseth*, Chayanon Wichitrnithed, Clint Dawson
	5:50 - 6:10	W240646 Explicit synchronous partitioned scheme for coupled reduced order models based on composite reduced bases Author(s): Amy De Castro, Pavel Bochev*, Paul Kuberry, Irina Tezaur

0203: Advances in damage & fracture modeling of multiphysics materials Chair(s): Carlos Armando Duarte		
114 Level 1	4:30 - 4:50	W242241 Uncertainty quantification of the lifetime of self-healing thermal barrier coatings Author(s): Sergio Turteltaub*, Anuj Kumthekar, Sathiskumar Ponnusami, Sybrand van der Zwaag
	4:50 - 5:10	W240282 Failure simulation of brittle materials under dynamic loads based on scaled boundary finite element method Author(s): Chengbin Du*, Zhiwei Zhao
	5:10 - 5:30	W240641 Leveraging a neural network-enhanced reproducing kernel particle method for multiphysics degradation modeling of energy storage materials Author(s): Kristen Susuki*, Jeffery Allen, Jiun-Shyan Chen
	5:30 - 5:50	W240763 Multiscale tip solution of hydraulic fracture within heterogeneous domain Author(s): Quan Wang*, Hao Yu, HengAn Wu
0302: Advances and applications in meshfree, particle, and peridynamic methods Chair(s): Tsung-Hui Huang and Michael Hillman		
201 Level 2	4:30 - 5:10	W242285 Explicit meshfree methods for predictive solutions in extreme mechanics Author(s): Michael Hillman*, Joseph Magallanes, Dominic Wilmes
	5:10 - 5:30	W240895 A bond-based peridynamics modeling of polymeric material fracture under finite deformation Author(s): Caglar Tamur*, Shaofan Li
	5:30 - 5:50	W240499 Mesh adaptation for free surface flow simulations using the Particle Finite Element Method Author(s): Thomas Leyssens*, Jonathan Lambrechts, Jean Francois Remacle
	5:50 - 6:10	W240574 Spectral decomposition based natural stabilized nodal integration for highly orthotropic and nearly incompressible materials Author(s): Huy Nguyen, Satoyuki Tanaka*
	6:10 - 6:30	W240421 Advanced material point formulation for geomechanical problems under extreme loading conditions Author(s): Tsung-Hui Huang*, Cameron Rodriguez, Sung-Han Yu
0303: Virtual elements for partial differential equations on polytopal meshes Chair(s): Joseph Bishop		
202 Level 2	4:30 - 4:50	W240609 Configurational forces for efficient crack growth simulations with the virtual element method Author(s): Kevin Schmitz*, Andreas Ricoeur
	4:50 - 5:10	W240736 Artificial Neural Network evaluation of geometric constants in polytopal element methods Author(s): Silvia Bertoluzza, Beatrice Crippa, Micol Pennacchio*
	5:10 - 5:30	W241792 Virtual element approximation of eigenvalue problems Author(s): Daniele Boffi, Francesca Gardini*, Lucia Gastaldi
	5:30 - 5:50	W241023 Robust virtual element methods for stress-assisted diffusion problems Author(s): Andres Eduardo Rubiano Martinez*, Ricardo Ruiz Baier, Rekha Khot
	5:50 - 6:10	W241853 A C 1 conforming arbitrary-order two-dimensional virtual element method for the fourth-order phase-field equation Author(s): Gianmarco Manzini*
0305: Recent advances in discretization techniques for coupled problems in incompressible fluid dynamics Chair(s): TBA		
203 Level 2	4:30 - 4:50	W241168 Monolithic multigrid for the marker-and-cell discretization of the Stokes--Darcy equations Author(s): Chen Greif, Yunhui He*

203 Level 2	4:50 - 5:10	W240623 A high-order flux reconstruction framework for incompressible flows on deforming domains Author(s): Marie-Pier Bolduc*, Brian Vermeire
	5:10 - 5:30	W240174 The Picard-Newton iteration for the Boussinesq equations Author(s): Leo Rebholz, Elizabeth Hawkins*
	5:30 - 5:50	W240369 Numerical methods for immiscible incompressible multiphase flows with thermal convection. Author(s): Loic Cappanera*, An Vu, Caroline Nore
0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Leong Hien Poh		
306 Level 3	4:30 - 4:50	W242126 Modeling damage and healing of disordered porous material with homogenized microstructure using Peridynamics Author(s): Shucheta Shegufta*, Michael Zaiser
	4:50 - 5:10	W240159 Hygromechanical modeling of fiber reinforced polyamide on micro- and macroscale Author(s): Paul Wetzel*, Benjamin Schneider, Jan-Martin Kaiser, Anna Katharina Sambale, Markus Stommel
	5:10 - 5:30	W240418 A simple and efficient framework for adaptive multiscale modelling with Direct FE2 Author(s): Kirk Ming Yeoh*, Karthikayen Raju, Leong Hien Poh, Tong-Earn Tay, Vincent Tan
	5:30 - 5:50	W240974 Multiscale computational homogenization for flow through porous media Author(s): Thomas Paris*, Vincent Bruyere, Patrick Namy, Sylvain Chupin, Denis Rochais
	5:50 - 6:10	W240685 Effect of the inelastic self-heating on thermo-mechanically coupled two-scale behaviors Author(s): Seishiro Matsubara*, So Nagashima, Dai Okumura, Kenjiro Terada
	6:10 - 6:30	W241149 Micromechanical constitutive multiscale modeling of rate-dependent effects in ferroelectrics: a comprehensive approach Author(s): Andreas Warkentin*, Andreas Ricoeur
0414: Multiscale Theory and Modeling of Advanced Nanocomposites Chair(s): Xingquan Wang and Denvid Lau		
303 Level 3	4:30 - 4:50	W242001 Degradation of glass FRP in marine environment Author(s): Denvid Lau*, Xing-Quan Wang
	4:50 - 5:10	W242012 Diamond nanothread as promising 1D nanoadditive: topology-controlled thermomechanical properties for polymeric composites Author(s): Xing-Quan Wang*, Denvid Lau
	5:10 - 5:30	W240682 New straightforward benchmark solutions for bending and free vibration solutions of clamped nanocomposite rectangular thin plate Author(s): Dongqi An*
0417: Microstructures of chemically complex materials and their impacts on material properties from multiscale simulations Chair(s): Chun-Wei Pao		
305 Level 3	4:30 - 4:50	W241265 Dynamics and heterogeneity of particle network in composite electrodes of Li-ion batteries Author(s): Kejie Zhao*
	4:50 - 5:10	W241179 Temperature-dependent elastic properties of boron carbide from first-principles calculations and phonon modeling Author(s): Sara Sheikhi*, Wylie Stroberg, James Hogan
	5:10 - 5:30	W240571 Theoretical investigation for the hydrogen evolution reaction enhancement of the two-dimensional MoS2 via lithium intercalation Author(s): Jui-Cheng Kao*, Yu-Chieh Lo, Chun-Wei Pao
	5:30 - 5:50	W241274 Exploration of chemical space for stable solid-state electrolytes with high ion conductivity Author(s): Chi-Hsuan Lee*, Chun-Wei Pao

0502: Advances in computational biomechanics and mechanobiology Chair(s): Stéphane Avril and Corey Neu		
121 Level 1	4:30 - 5:10	W241086 Multiscale modeling of calcified polymer hydrogels Author(s): Sandra Klinge*, Marc Graham
	5:10 - 5:30	W240862 Multiscale, multimodal computational modeling of mechanotransduction in the distal colon and rectum Author(s): Amirhossein Shokrani, Bin Feng, David Pierce*
	5:30 - 5:50	W242563 An efficient semi-analytical approach for the stochastic analysis of soft biological structures Author(s): Georges Limbert*, Teja Melink, Joze Korelc
	5:50 - 6:10	W240265 Poroelastic model of fluid exchange between brain and subarachnoid space: a finite element implementation with jump conditions Author(s): Beatrice Ghitti, Mohammad Jannesari, Patrick J. Drew, Francesco Costanzo*
0504: Multiphysics and data-driven modeling for cardiovascular biomedicine Chair(s): Ming-Chen Hsu		
122 Level 1	4:30 - 4:50	W241978 A two-way coupling framework for immersed heterogeneous structures in flow with applications in vascular systems Author(s): Chayut Teeraratkul, Debanjan Mukherjee*
	4:50 - 5:10	W240637 Multiphysics computational modeling of intra-aneurysmal thrombosis by flow diverter stents Author(s): Jung Hee Seo*, Zulfikar Alamlah, Rajat Mittal, Justin Caplan, Angad Grewal
	5:10 - 5:30	W241404 An efficient beam-to-shell contact formulation for stent deployment in deformable vessels Author(s): Mani Yadav*, Albert Argilaga, Beatrice Bisighini, Baptiste Pierrat, Stéphane Avril, Miquel Aguirre, Nitesh Nama
	5:30 - 5:50	W241718 A Lagrangian computational methodology for assessing mixing in hemodynamic flows with application in carotid atherosclerosis Author(s): Ricardo Roopnarinesingh*, Neel Jani, Michelle Leppert, Debanjan Mukherjee
0602: Computational design of mechanical metamaterials Chair(s): Bianca Giovanardi and Ajay Harish and Sid Kumar		
111 Level 1	4:30 - 4:50	W240443 Effects of different architectural choices for auxetic metamaterials on impact mitigation Author(s): Til Gärtner*, S.J. van den Boom, J. Weerheijm, L.J. Sluys
	4:50 - 5:10	W241749 Application of the Harmonic Balance Method to predict wave propagation in one-dimensional nonlinear metamaterial excited harmonically Author(s): Rangel Moura Barbosa*, Alberto Luiz Serpa
	5:10 - 5:30	W240778 Vibroacoustic bandgap maximization through topology optimization Author(s): Vanessa Cool*, Ole Sigmund, Niels Aage
	5:30 - 5:50	W240639 Multiscale modelling of shock absorbing hyper-elastic metamaterials Author(s): Juan Cante*, Alejandro Nuñez-Labielle, Javier Oliver
0605: Architected materials and structures Chair(s): David Restrepo		
112 Level 1	4:30 - 5:10	W242599 Challenges and opportunities in designing stimulus-responsive architected materials with high work capacity Author(s): Phani Saketh Dasika, Haohuan Xu, Yunlan Zhang, Pablo Zavattieri*
	5:10 - 5:30	W242477 Design of transient heat manipulators via isogeometric optimisation Author(s): Elena Atroshchenko*, Chintan Jansari, Stephane Bordas
	5:30 - 5:50	W240094 Two-scale data-driven design for heat manipulation Author(s): Daicong Da*

112 Level 1	5:50 - 6:10	W240307 Controlling Poisson's ratio and thermal expansion in a rotating rectangle structure combined with bi-material strips Author(s): Duhwan Kang*, Jeong Min Hur, Do-Nyun Kim
	6:10 - 6:30	W241866 The performance of metallic honeycomb structures subjected to high temperatures Author(s): Yunlan Zhang*, Yuanbo Tang, Li Wan, Enrique Alabort, Roger Reed
0704: Advanced multi-physics CFD simulations in science and engineering Chair(s): Mamoru Tanahashi		
221 Level 2	4:30 - 4:50	W240688 Machine learning-based anomaly detector for external flow Author(s): Riku Goto*, Takeru Ishize, Remo Miura, Koji Fukagata
	4:50 - 5:10	W242070 Prediction of pulsating turbulent pipe flow with extensive drag reduction effects by deep learning with generalization capability Author(s): Sota Kumazawa*, Tomohiro Nimura, Akira Murata, Kaoru Iwamoto
	5:10 - 5:30	W241329 Grid-particle coupling simulation for SLD icing introducing high-resolution scheme and improved thermodynamics computation Author(s): Yuki Abe*, Masataka Kaneshi, Koji Fukudome, Soichiro Fujimura, Makoto Yamamoto
	5:30 - 5:50	W241161 Heat transfer analysis of vortex-ring collisions with a vertical constant-temperature wall based on DNS Author(s): Bohua Huang*, Zichao Jiang, Zhuolin Wang, Xuan Luo, Qinghe Yao, Yi Zhang
0816: Model order reduction for parametrized continuum mechanics Chair(s): Eduardo Gildin		
211 Level 2	4:30 - 4:50	W241774 On-the-fly dynamic mode decomposition Author(s): Seung Won Suh, SeungWhan Chung, Peer-Timo Bremer, Youngsoo Choi*
	4:50 - 5:10	W240853 Train small, model big: scalable robust physics simulator via reduced order modeling and domain decomposition Author(s): SeungWhan Chung*, Youngsoo Choi, Thomas Roy, Pratanu Roy, Tiras Lin, Du Nguyen, Christopher Hahn, Eric Duoss, Sarah Baker
	5:10 - 5:30	W240050 Multilinear subspaces with tensor decompositions for projection-based reduced order modelling Author(s): Hemanth Kolla*, Joseph Hart, Indu Manickam, Mamikon Gulian, Eric Phipps
	5:30 - 5:50	W241794 A port-reduced hyperreduced reduced basis element method for model reduction of component-based nonlinear systems Author(s): Mehran Ebrahimi*, Masayuki Yano
0823: Mathematics and algorithms for predictive digital twins (DT) Chair(s): Paul Kuberry		
209 Level 2	4:30 - 4:50	W241780 A multi-fidelity model for large-scale wave energy extractors Author(s): Michel Bergmann*, Beatrice Battisti
	4:50 - 5:10	W242239 Bayesian inference for patient-specific digital twins in oncology Author(s): Graham Pash*, David Hormuth II, Umberto Villa, Thomas Yankeelov, Karen Willcox
	5:10 - 5:30	W240426 Digital twin development and uncertainty quantification for the GS-EPS biomass plant in South Korea Author(s): Dongjin Lee*, Elle Lavichant, Hyeonghun Kim, Seyeong Lee, Boris Kramer
	5:30 - 5:50	W240403 Randomized algorithms for Bayesian inversion and data acquisition in predictive digital twins Author(s): Vishwas Rao*, Amit Subrahmanya, Srinivas Eswar, Arvind Saibaba
	5:50 - 6:10	W240458 Nonlinear CFD data interpolation in parameterized advection-dominated flows Author(s): Jon Labatut*, Angelo Iollo, Tommaso Taddei
0827: Inverse and optimization problems for advanced materials Chair(s): Xiaoying Zhuang, Zhuojia Fu, Timon Rabczuk and Navid Valizadeh		
218 Level 2	4:30 - 4:50	W240780 Topology optimization with stochastic geometric perturbations for waveguide design Author(s): Philip Elbek*, Niels Aage, Rasmus E. Christiansen, Ole Sigmund

218 Level 2	4:50 - 5:10	W240371 A monolithic finite element method for an energy-minimizing phase-field model of fully Eulerian fluid-structure interactions Author(s): Navid Valizadeh*, Xiaoying Zhuang, Timon Rabczuk
	5:10 - 5:30	W240821 Adjoint-based inversion for frictional parameters in earthquake simulations Author(s): Vidar Stiernström, Martin Almquist*, Eric M. Dunham
	5:30 - 5:50	W241989 Positive part based level set method for optimal design problems Author(s): Tomoyuki Oka*
	5:50 - 6:10	W242602 Advancing integrated silicon photonics: topology optimization of mode converters and splitters Author(s): Fariha Haque*, Alok Sutradhar
	6:10 - 6:30	W242669 Inverse design of seismic metamaterials based on machine learning Author(s): Zhuojia Fu, Wenzhi Xu*
1007: Advanced computational mechanics based on data-driven techniques for structure, structural dynamics and aeroelasticity Chair(s): Haesong Cho		
113 Level 1	4:30 - 4:50	W241323 Advanced time-series neural network-based active noise control approach for the interior environment of mobility Author(s): Haeseong Cho*, Hyejin Kim, Inho Jeong, Joong-Kwan Kim, Chisung Oh
	4:50 - 5:10	W240916 GNN-based representation for design of three-dimensional rotor blade structures Author(s): Byeongju Kang*, Seongwoo Cheon, Haeseong Cho, Youngjung Kee, Taeseong Kim
	5:10 - 5:30	W240271 Estimation of grinding contact stiffness and damping parameters from dynamic output only using Hunt-Crossley force model and Unscented Kalman filter Author(s): Viet-Hung Vu*, Quoc-Cuong Nguyen, Marc Thomas
	5:30 - 5:50	W241254 Application of the two-level hyper-reduction approach for the multi-body contact-impact simulation Author(s): Minho Hwang*, Seung-Hoon Kang, Sangmin Lee, Yongse Kim, Haeseong Cho, SangJoon Shin
1009: Advanced discretization schemes and solution strategies for computational structural dynamics Chair(s): Bastian Oesterle and Alessandro Reali		
116 Level 1	4:30 - 5:10	W241331 Embedded reduced models in three-dimensional bodies Author(s): David Portillo*, Guanfeng Zhang, Wenjie Xie, Ignacio Romero
	5:10 - 5:30	W242172 Matrix-free higher-order finite element solvers in tissue mechanics Author(s): Richard Schussnig*, Martin Kronbichler
	5:30 - 5:50	W241648 A multi-director continuum beam finite element for wire rope strands Author(s): Yu-Yeong Kim*, Hyo-Jin Kim, Gunwoo Noh
	5:50 - 6:10	W241144 Spline-based parameterisation techniques for plane graphs Author(s): Jochen Hinz*, Annalisa Buffa
1101: Modeling and simulation for additive manufacturing Chair(s): Stefan Kollmannsberger		
118 Level 1	4:30 - 4:50	W240634 A modified inherent strain modeling framework for predicting recoater interference in laser powder bed fusion Author(s): Wen Dong, Shawn Hinnebusch, Albert To*
	4:50 - 5:10	W240501 Residual stress prediction in LPBF using a finite volume method based coupling framework Author(s): Xuan Yang*, Biao Li, Yazhi Li
	5:10 - 5:30	W241439 Prediction of residual stresses in metal LPBF parts through a holistic multiscale simulation approach Author(s): Yohann Vautrin*, Jean-Philippe Marcotte, Kalonji Kabaa Kabanemi, Marjan Molavi-Zarandi, Florin Ilinca

118 Level 1	5:30 - 5:50	W242296 Distortion compensation for metal additive manufacturing: verification, validation, and development of a thermal mechanical workflow Author(s): Carl Herriott*, Michael Stender, Kyle Johnson, Jonathan Pegues, Christie Crandall, Sannmit Shinde
1102: Emerging frontiers and methods in digital manufacturing: Modeling, simulation, and beyond Chair(s): Marek Behr and Elie Hachem		
117 Level 1	4:30 - 4:50	W241676 Beyond lubrication flow for thin-film manufacturing Author(s): Robert Secor*, Rekha Rao, Weston Ortiz
	4:50 - 5:10	W240007 Design of in-mold decoration mold for complex thin-walled parts Author(s): Jilong Dong*, Dongyan Shi, Jiuqiang Wang
	5:10 - 5:30	W242430 Variational multiscale method for void evolution and transport in process modeling of polymer materials Author(s): Shoaib Goraya*, Arif Masud
	5:30 - 5:50	W242432 A Cosserat finite element model for deformational behaviour of uncured fibrous composites during processing Author(s): Hubert Courteau-Godmaire*, Reza Vaziri
	5:50 - 6:10	W241760 A simulation framework for thermoplastic composite continuous resistance welding of structural aerospace joints Author(s): Stephen Atkinson*, Reza Vaziri, Anoush Poursartip
	6:10 - 6:30	W240392 Application of Densification-Based Finite Element Method in creating digital twin for sintering analysis of ceramic matrix composites: an industrial case study Author(s): Baber Saleem*, Ran He, Peter Polak, James Lander, Ian Edmonds, Xiaoxia Yu, Jingzhe Pan
1303: Industrial applications of IGA Chair(s): Hugo Casquero		
302 Level 3	4:30 - 5:10	W240935 OpenQuad: A semi-automatic and scalable untrimming pipeline for trimmed NURBS Author(s): Xiaodong Wei*, Zheng Wei
	5:10 - 5:30	W242260 Isogeometric crashworthiness analysis: advances and challenges Author(s): Attila Nagy*, Liping Li, Lam Nguyen, Marco Pigazzini, David Benson, Gunther Blankenhorn, Stefan Hartmann, Lukas Leidinger
	5:30 - 5:50	W241858 HybridOctree_Hex: Hybrid octree-based adaptive all-hexahedral mesh generation with Jacobian control Author(s): Jessica Zhang*, Hua Tong
	5:50 - 6:10	W242580 Generalized parametric modeling and isogeometric analysis of stented medical devices Author(s): Emily Johnson*, George Pan
	6:10 - 6:30	W240773 Geometrically watertight unstructured splines applied to CAD, FEA, IGA, CAM, and CAI for a design-through-manufacturing digital thread Author(s): Ryan Jennings*, Benjamin Urick, Daniel Keller
1403: New trends in topology optimization Chair(s): Kozo Furuta		
220 Level 2	4:30 - 4:50	W242051 Multi-material topology optimization using moving wide spline curves with constrained ends Author(s): Hayate Nakayama*, Rixin Wang, Kozo Furuta, Benliang Zhu, Kazuhiro Izui, Shinji Nishiwaki
	4:50 - 5:10	W242036 Topology optimization of thermal management systems with control strategies Author(s): Yonghwa Ji*, Jaewook Lee
	5:10 - 5:30	W240299 Thermomechanical topology optimization of rover chassis under extreme conditions with buckling load constraints Author(s): Murtaza Bookwala*, Alexandre T.R. Guibert, Matteo Pozzi, H. Alicia Kim

220 Level 2	5:30 - 5:50	W241905 Topology optimization of time dependent concentrated solid channels with internal heat generation Author(s): Diego Prado*, Emilio Carlos Nelli Silva, José Luís de Paiva, Marcelo Martins Seckler
1601: Contact and interface mechanics: Modeling and computation Chair(s): Peter Wriggers		
224 Level 2	4:30 - 4:50	W240325 Fluid-structure interaction simulations of nuclear power plant steam generator tubes involving contact Author(s): Kevin Zwijsen*
	4:50 - 5:10	W240792 A mortar-based isogeometric model for partially lubricated contacts Author(s): Yan Tong*, Michael Müller, Georg-Peter Ostermeyer
	5:10 - 5:30	W242559 Power dissipation modelling in rolling contact Author(s): Andrzej Myśliński*, Andrzej Chudzikiewicz
	5:30 - 5:50	W241951 Numerical and physical aspects on adhesive and frictional interaction for rough contact simulation Author(s): Tiago Silva Sabino*, António Couto Carneiro, Rodrigo Pinto Carvalho, Francisco Andrade Pires
	5:50 - 6:10	W241486 Rate-dependent adhesion and suction effects in contact modeling of poroelastic materials using finite element method Author(s): Agnila Ghosh Surovi*, Shank Kulkarni, Wonhyeok Lee, Melih Eriten, Timothy Truster
	6:10 - 6:30	W242476 Micro-contact mechanics with soft particle in tribology Author(s): Jeng-Haur Horng*, Jin-Long Lin, Yang-Yuan Chen
1604: Computational fluid dynamics (CFD) and fluid-structure interaction (CFSI): Methods and Applications Chair(s): Georgios Moutsanidis		
223 Level 2	4:30 - 4:50	W242401 A curvilinear surface ALE formulation for Navier-Stokes flow on deforming surfaces Author(s): Roger Sauer*
	4:50 - 5:10	W242579 Turbulence modeling of high-speed flows using finite element based stabilized formulation and Spalart-Allmaras model Author(s): Rahul Verma*, David Codoni, Craig Johansen, Artem Korobenko
	5:10 - 5:30	W241052 Weakly enforced Dirichlet boundary condition in hemodynamic simulations Author(s): Xuanming Huang*, Ju Liu
	5:30 - 5:50	W240275 Energetics of flexible channel flow Author(s): Danyang Wang*, Xiaoyu Luo, Zishun Liu, Peter Stewart
	5:50 - 6:10	W240538 A (weighted) shifted boundary method for moving boundary problems Author(s): Danjie Xu*, Guglielmo Scovazzi, Oriol Colomés, Nabil Atallah, Kangan Li
1807: Deep and machine learning methodology in the context of application to computational mechanics Chair(s): Yasushi Nakabayashi and Yoshitaka Wada		
212 Level 2	4:30 - 4:50	W241531 Prediction of unsteady heat transfer of temperature field on a circuit board using sub-voxels input data structure Author(s): Takumi Tsukiji*, Yoshitaka Wada, Yukihiro Iwata, Miyoko Irikiin, Yoshihisa Inagaki
	4:50 - 5:10	W241892 Prediction of microstructures of dendrite crystals and process parameters for thermoplastic resin based on mechanical properties using the conditional diffusion model Author(s): Arisa Ikeda*, Ryo Higuchi, Tomohiro Yokozeki, Katsuhiro Endo, Yuta Kojima, Misato Suzuki, Mayu Muramatsu
	5:10 - 5:30	W241899 Development and evaluation of Mg-Ca deep learning interatomic potentials with aid of ab-initio calculations Author(s): Lijun Liu*, Yoji Shibutani
	5:30 - 5:50	W241991 Convolutional variational physics-informed neural networks to solve a finite element formulation Author(s): Mohammed Abda*, Elsa Piollet, Christopher Blake, Frederick Gosselin

212 Level 2	5:50 - 6:10	W242157 Discovery of equations in heterogeneous material mechanics through machine learning approaches Author(s): Yuki Arai*
1821: Data-driven modeling and design of materials Chair(s): Nick N. Vlassis and Markus Kästner		
213 Level 2	4:30 - 4:50	W240036 Realistic RVEs by microstructure reconstruction: harnessing descriptor differentiability Author(s): Paul Seibert*, Alexander Raßloff, Karl Kalina, Markus Kästner
	4:50 - 5:10	W241469 A physics- and data-driven framework for high throughput development of high entropy alloys Author(s): Shardul Kamat*, Victoria Tucker, Michael Titus, Gregory Wagner
	5:10 - 5:30	W241757 A unified sampling and learning framework for textile-based metamaterials Author(s): Xiaoxiao (Catherine) Ding*, Chris Rycroft
	5:30 - 5:50	W241755 Combining PENN, equation discovery, and novel plasticity frameworks Author(s): Knut Andreas Meyer*
	5:50 - 6:10	W240526 Viscoelastic constitutive artificial neural networks (vCANNs) - a framework for data-driven anisotropic nonlinear finite viscoelasticity Author(s): Kian P. Abdolazizi*, Kevin Linka, Christian Cyron
1823: Advances in neural operators for scientific modeling Chair(s): Mauro Perego		
216 Level 2	4:30 - 4:50	W242661 Solution of Riemann problems with real chemistry for compressible flows using neural operators Author(s): Ahmad Peyvan*
	4:50 - 5:10	W242573 Water wave evolution and equation discovery through neural networks and machine learning Author(s): Jeffrey Harris*
	5:10 - 5:30	W241208 Deep neural operators for data-driven modeling of multiphysics coastal hydrodynamics Author(s): Sourav Dutta, Peter Rivera-Casillas*, Shukai Cai, Mark Loveland, Jonghyun Harry Lee, Matthew Farthing, Clint Dawson
	5:30 - 5:50	W242315 DeepONets for forward and inverse problems in astrophysical fluid dynamics Author(s): Shunyuan Mao*, Ruobing Dong, Lu Lu, Kwang Moo Yi, Sifan Wang, Paris Perdikaris

Tuesday July 23 - Technical Session 4

0102: Minisymposium in honor of Prof. Yannis Kallinderis's 60th birthday: Progress of Unstructured grid based CFD, hybrid mesh generation and adaptation, and parallel supercomputing Chair(s): Hyung Taek Ahn and Christos Kavouklis		
115 Level 1	9:45 - 10:05	W242441 Parallelization of the finite element-based mesh warping algorithm using hybrid parallel programming Author(s): Abir Haque, Suzanne Shontz*
	10:05 - 10:25	W241872 A numerical analysis of PPTC2 propeller open-water characteristics using discontinuous Galerkin method Author(s): Sung-Ho Jeong*, Dong-Quen Kim, Hyung Taek Ahn
	10:25 - 10:45	W241921 Numerical simulations of breaking waves Author(s): Seokpyo Yoon*, Ju Seong Bang, Hyung Taek Ahn
	10:45 - 11:05	W241739 A compact sixth order finite difference scheme for the 3D Poisson equation Author(s): Chris Kavouklis*
0103: Professor JN Reddy's contributions to computational mechanics - A minisymposium on the occasion of Prof. Reddy's 80th birthday Chair(s): Archana Arbind		
110 Level 1	9:45 - 10:05	W241797 Taylor-series expansion for meshfree methods in computational solid mechanics Author(s): Yuri Bazilevs*
	10:05 - 10:25	W240955 Complete variable kinematic cuf-based multilayered shell elements Author(s): Erasmo Carrera, Daniele Scano*
	10:25 - 10:45	W240055 Modeling ribbons/strips as a Cosserat rod Author(s): Roushan Kumar*, Ajeet Kumar
	10:45 - 11:05	W240447 A unified theory for shear deformable composite plates Author(s): Chen Liang*, C.W. Lim
0104: Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics Chair(s): Abani Patra and Serge Prudhomme		
109 Level 1	9:45 - 10:05	W241515 From TICOM to the Oden Institute: The visionary leadership of J. Tinsley Oden Author(s): Karen Willcox*
	10:05 - 10:25	W240479 Quantum computing for finite element problems Author(s): Osama Muhammad Raisuddin, Suvranu De*
	10:25 - 10:45	W241560 Modeling cellular phenomena and their impact on the organ-scale physiology Author(s): Marek Behr*
	10:45 - 11:05	W241857 Understanding neurodevelopmental disorders using isogeometric analysis, THB-splines and adaptive domain expansion Author(s): Jessica Zhang*, Kuanren Qian
0203: Advances in damage & fracture modeling of multiphysics materials Chair(s): Timothy Truster		
114 Level 1	9:45 - 10:25	W242409 Hydraulic fracture recession in a porous medium: the Sunset Solution Author(s): Anthony Peirce*, Emmanuel Detournay

114 Level 1	10:25 - 10:45	W241595 A novel dual lattice discrete particle model for multiphysics simulation of coupled mechanical and transport behavior in concrete members subjected to long-term loading Author(s): Dongge Jia*, Yingbo Zhu, John C. Brigham, Alessandro Fascetti
	10:45 - 11:05	W240965 Numerical investigation of the influence of high temperature gas environment on oxidation and mechanical degradation of thermal barrier coatings Author(s): Weidong Wang*, Yazhi Li, Biao Li
	11:05 - 11:25	W242086 Representative volume element model for predicting the Coble creep deformation and void nucleation/growth in three-dimensional polycrystalline structure Author(s): Kota Sagara*, Kazuki Shibanuma
0302: Advances and applications in meshfree, particle, and peridynamic methods Chair(s): Martin Berzins and Duan Zhang		
201 Level 2	9:45 - 10:05	W242236 Application of material point methods to objects with complex geometries Author(s): Duan Zhang*, Kyle Perez, Paul Barclay, Jiajia Waters
	10:05 - 10:25	W240990 A generalized peridynamic material correspondence formulation using non-spherical influence functions Author(s): Hailong Chen*, Xuan Hu
	10:25 - 10:45	W241063 Diffusive-discrete crack transition scheme realized by extended B-spline-based implicit material point method Author(s): Riichi Sugai*, Jike Han, Shuji Moriguchi, Kenjiro Terada
	10:45 - 11:05	W241545 Development of mixed material point method for analysis of free-surface and seepage flow Author(s): Bodhinanda Chandra*, Ryota Hashimoto, Ken Kamrin, Kenichi Soga
	11:05 - 11:25	W242013 Development of a cell-based material point method and contact technique Author(s): Jae-Uk Song*, Hyun-Gyu Kim
	11:25 - 11:45	W240184 Computational error estimation for the Material Point Method using error transport Author(s): Martin Berzins*
0306: Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics and kinetic models Chair(s): Christopher Eldred		
203 Level 2	9:45 - 10:05	W240874 Geometric formulation of three-temperature radiation hydrodynamics Author(s): Brian Tran*, Benjamin Southworth, Joshua Burby, Melvin Leok
	10:05 - 10:25	W241821 Fluid Cohomology Author(s): Hang Yin*, Mohammad Sina Nabizadeh, Baichuan Wu, Stephanie Wang, Albert Chern
	10:25 - 10:45	W241511 Viscous flow of evolving film with arbitrary shape and topology Author(s): Cuncheng Zhu*, Albert Chern, David Saintillan
	10:45 - 11:05	W240942 On the Hamiltonian structure for a model of a closed vortex sheet and a vortex patch in an ideal fluid with a density jump Author(s): Banavara Shashikanth*
0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Sang Yeop Chung		
306 Level 3	9:45 - 10:05	W242435 Advanced computational modelling of the plasticity of complex metallic microstructures - microscale validation and macroscale exploitation Author(s): Ron Peerlings*, Job Wijnen, Tijmen Vermeij, Vahid Rezazadeh, Johan P.M. Hoefnagels, Marc G.D. Geers
	10:05 - 10:25	W242101 Predicting elastic and inelastic fracture of periodic beam-based architected materials using a mixed-order quasicontinuum method Author(s): Kevin Kraschewski*, Dennis Kochmann

306 Level 3	10:25 - 10:45	W240811 Improved relocalization using regularization in computational homogenization of composite structure Author(s): Ali Ketata*, Julien Yvonnet, Nicolas Feld, Augustin Parret-Freaud, Fabrice Detrez
	10:45 - 11:05	W241901 Multiscale modeling of microstructured beams based on micromorphic theory Author(s): Mohammad Shojaee*, Oliver Weeger
	11:05 - 11:25	W241932 Computational optimization of higher-order homogenization framework for large-scale RVE models Author(s): Athira Anil Kumar*, Aewis K.W. Hii, Bassam El Said, Stephen Hallett
	11:25 - 11:45	W241990 Nonlocal modeling of macroscopic non-uniform deformation induced by microscopic heterogeneity Author(s): Makoto Uchida*, Yoshihisa Kaneko
0413: Multiscale methods for advanced manufactured materials Chair(s): Edwin Chiu		
304 Level 3	9:45 - 10:05	W242433 Prediction of the effective response of carbon-black/ultra-high-molecular-weight-polyethylene nanocomposites by multiscale numerical models Author(s): Igor Tsukrov*
	10:05 - 10:25	W240137 A multiscale model for disordered biopolymer gels Author(s): Hashem Moosavian*, Tian Tang
	10:25 - 10:45	W242468 Dynamic behavior of ribbed viscoelastic CNT-PDMS thin-films for multifunctional applications Author(s): Matthew Phillips*, Jong Ryu, Mohammed Zikry
	10:45 - 11:05	W240240 Data-physics driven three-scale approach for ultra-fast resin transfer molding (UF-RTM) Author(s): Junhe Cui*, Andrea La Spina, Jacob Fish
0502: Advances in computational biomechanics and mechanobiology Chair(s): David M. Pierce and Corey Neu		
121 Level 1	9:45 - 10:05	W242351 Automated model discovery for protein misfolding in Alzheimer's disease Author(s): Charles Stockman*, Alain Goriely, Ellen Kuhl
	10:05 - 10:25	W242337 A computational study of the influence of cardiac mechanics in Desmoplakin Cardiomyopathy Author(s): Javiera Jilberto*, Renee Miller, Adam Helms, David Nordsletten
	10:25 - 10:45	W242276 A multiscale finite element model of cardiac growth and baroreflex regulation Author(s): Hossein Sharifi, Mohammad Mehri, Kenneth Campbell, Lik Chuan Lee, Jonathan Wenk*
	10:45 - 11:05	W242120 Continuum-based particle modeling for elastic analysis of multicellular tissue morphogenesis Author(s): Yuka Yokoyama*, Yoshitaka Kameo, Taiji Adachi
	11:05 - 11:25	W242133 A numerical approach to model the role of mechanical strain in tumor growth Author(s): Mariana Carvalho*, Marco Parente, João Ferreira
0504: Multiphysics and data-driven modeling for cardiovascular biomedicine Chair(s): Debanjan Mukherjee		
122 Level 1	9:45 - 10:05	W242537 Simulation of the heart using NNFE Author(s): Shruti Motiwale*, Michael Sacks
	10:05 - 10:25	W242554 A Neural-Network Finite Element approach for simulating trileaflet heart valves with full multi-body contact Author(s): Kenneth Meyer*, Christian Goodbrake, Shruti Motiwale, Michael Sacks
	10:25 - 10:45	W240631 Evaluation of physics-informed neural networks performance for aortic blood flow simulation under different severity of stenosis Author(s): Arman Aghaee*, Owais Khan

122 Level 1	10:45 - 11:05	W241773 The potential of utilizing opensource software for estimating hemodynamic parameters of the aorta Author(s): Ryo Takeda*, Katsuhiko Sasaki, Shinya Honda, Hiroichi Yokoyama, Nobuyuki Oshima, Akiyoshi Kuroda, Hideyoshi Takashima, Chenyu Li, Hiroaki Date, Hiroyuki Kamiya
0509: Computational modeling of cardiac fibrosis: A multiscale, multiphysics challenge Chair(s): Patrick Boyle		
111 Level 1	9:45 - 10:05	W242585 A high-fidelity 3D micromechanical model of ventricular myocardium Author(s): Michael Sacks*
	10:05 - 10:25	W242338 Evaluation of cardiac fibrosis and intervention using computational biomechanics Author(s): John Sayut*, Javiera Jilberto, Mia Bonini, Will Zhang, David Nordsletten
	10:25 - 10:45	W242219 A physiologically valid, multi-physics model of the left atrium to assess the influence of fibrosis on atrial function Author(s): Christoph Augustin*
	10:45 - 11:05	W242210 Multi-fidelity, multi-physics models of fibrosis-induced left atrial thrombosis Author(s): Manuel Guerrero-Hurtado, Yvonne Stöcker, Alejandro Gonzalo, Clarissa Bargellini, Bahetihazi Maidu, Eduardo Duran, Pablo Martinez-Legazpi, Javier Bermejo, Andrew M. Kahn, Elliot McVeigh, Manuel García-Villalba, Nazem Akoum, Christoph Augustin, Patrick Boyle, Juan C. del Álamo, Oscar Flores*
	11:05 - 11:25	W240672 Network dynamics of cardiac inflammation-fibrosis coupling Author(s): Jeff Saucerman*
	11:25 - 11:45	W241636 Mechanical modeling of cardiac fibrosis with explicit spatial representation of myocyte loss and collagen alignment Author(s): Åshild Telle*, Mary M. Maleckar, Joakim Sundnes, Samuel Wall, Patrick Boyle
0513: Mechanobiology of cells, vesicles and biomembranes Chair(s): Roger Sauer		
119 Level 1	9:45 - 10:25	W241400 Interactive active surfaces: a model for cell aggregates Author(s): Guillaume Salbreux*
	10:25 - 10:45	W241163 Computer simulations of lipid nanoparticles for drug delivery Author(s): Peter Tieleman*
0605: Architected materials and structures Chair(s): David Restrepo		
112 Level 1	9:45 - 10:25	W241426 Design and mechanics of 3D woven architected materials Author(s): Carlos Portela*, James Surjadi, Molly Carton, Bastien Aymon
	10:25 - 10:45	W240742 Generalized data-driven material model of 3D-printed biaxial weaves using transfer learning Author(s): Marc Wirth*, Kristina Shea
	10:45 - 11:05	W242233 Fibro-porous architected hybrid materials for multifunctional applications Author(s): William Johnston, Janith Godakawela, Bhisham Sharma*, Carlos Gatti, Suresh Keshavanarayana
	11:05 - 11:25	W240466 Understanding the mechanics of random fiber networks via network topology Author(s): Peerasait Prachaseree*, Emma Lejeune

0704: Advanced multi-physics CFD simulations in science and engineering Chair(s): Koji Fukagata		
221 Level 2	9:45 - 10:05	W241199 Predicting extrusion flow shapes using deep learning Author(s): Dan Stoecklein*, Yulin Zhou, Philip Pounds
	10:05 - 10:25	W241087 An AI assisted wall heat flux model for flame-wall interaction in turbulence Author(s): Takuki Kaminaga, Yamato Shiotsuki*, Ye Wang, Mamoru Tanahashi
	10:25 - 10:45	W241963 CFD modelling of artificial plume dynamics for reef conservation: unveiling benchmarks for large-scale impact Author(s): Saima Bukhat Khan*, Joel Alroe, Emilie Sauret
	10:45 - 11:05	W242496 Response of streamwise vortices to blowing and suction control in turbulent channel flow Author(s): Shohta Hosouchi*, Tomohiro Nimura, Akira Murata, Kaoru Iwamoto
	11:05 - 11:25	W241305 Effects of rotating cylindrical roughness and its rotating direction on crossflow-vortex transition of swept-flat-plate boundary layer Author(s): Yuto Watanabe*, Kosuke Nakagawa, Ryo Araki, Takahiro Ishida, Takahiro Tsukahara
0810: Numerical modeling of granular and multiphase flows Chair(s): Mikio Sakai		
205 Level 2	9:45 - 10:25	W240923 A DEM-based surrogate model for powder mixing Author(s): Hideya Nakamura*, Naoki Kishida, Shuji Ohsaki, Satoru Watano
	10:25 - 10:45	W240063 A data-driven multiscale surrogate model for CFD–DEM simulations Author(s): Shuo Li*, Mikio Sakai
	10:45 - 11:05	W241275 Improvement of predictive accuracy for reduced order model in application of Eulerian-Lagrangian simulations using posterior error estimation Author(s): Kai-en Yang*, Shuo Li, Guangtao Duan, Mikio Sakai
	11:05 - 11:25	W241726 High speed computing for mixing of bi-disperse particles in a rotating drum Author(s): Naoki Kishida*, Hideya Nakamura, Shuji Ohsaki, Satoru Watano
	11:25 - 11:45	W242391 Developments in the use of the Bonded Particle Model to study ore fracture Author(s): Temitope Oladele, Dion Weatherley, Lawrence Bbosa*
0815: Advancements in model reduction, data assimilation, and uncertainty quantification for complex physical systems Chair(s): Ionut Farcas		
209 Level 2	9:45 - 10:05	W241948 Feature-driven sampling strategy in adaptive model order reduction for shock-dominated problems Author(s): Cheng Huang*, Ali Mohaghegh
	10:05 - 10:25	W241526 A method to construct low rank tensor network polynomial reduced order models Author(s): Nicholas Alger*, Blake Christierson, Omar Ghattas
	10:25 - 10:45	W242612 Nonlinear reduced models for parametric PDEs Author(s): Diane Guignard*
	10:45 - 11:05	W242149 Geometric deep least-squares Petrov-Galerkin: a graph autoencoder-based reduced-order model Author(s): Liam Magargal*, Parisa Khodabakhshi, Steven Rodriguez, Justin Jaworski, John Michopoulos
0816: Model order reduction for parametrized continuum mechanics Chair(s): Angelo Iollo		
211 Level 2	9:45 - 10:05	W240837 A reduced-basis method for uncertainty quantification in RANS simulations of hypersonic turbulent flows Author(s): Eric Parish*, Elizabeth Krath, Patrick Blonigan

211 Level 2	10:05 - 10:25	W241850 A ROM-accelerated ensemble transform filter for data assimilation of nonlinear dynamical systems Author(s): Geoff Donoghue, Masayuki Yano*
	10:25 - 10:45	W241112 A multi-query model reduction framework for nonlinear dynamics simulations with multiple non-parametrised loading configurations Author(s): Alexandre Daby-Seesaram, Amélie Fau, Pierre-Etienne Charbonnel, David Néron*
	10:45 - 11:05	W241826 On metaheuristic structural optimization with parametric model order reduction Author(s): Varakini Sanmugadas*, Rakesh Kapania
	11:05 - 11:25	W240875 Emulating ocean models to quantify uncertain responses to climate change Author(s): Hannah Lu*, Siddhartha Bishnu, Simone Silvestri, Raffaele Ferrari, Youssef Marzouk
0818: Numerical methods, mathematical modeling and analysis in material science Chair(s): Huan Lei		
208 Level 2	9:45 - 10:05	W240484 Infer explicit numerical schemes from implicit data with applications to defect dynamics Author(s): Xingjie Li*, Fei Lu, Molei Tao, Xiaofeng Felix Ye
	10:05 - 10:25	W240215 Reduced order modeling of a friction stir welding problem Author(s): Xiulei Cao, Kirk Fraser, Zilong Song*, Chris Drummond, Huaxiong Huang
	10:25 - 10:45	W240906 Momentum space method for electronics of mechanically relaxed incommensurate 2D materials Author(s): Daniel Massatt*, Mitchell Luskin, Stephen Carr
	10:45 - 11:05	W240598 Effect of the capillary force on the repose angle of granular materials Author(s): Wang Ziye*, Tan Yong
	11:05 - 11:25	W242570 Optimizing the identification of transversal compression behavior of a high-strength synthetic fiber using advanced machine learning algorithms Author(s): Quyet-Tien Le, Cuong Ha-Minh*, Quoc-Hoan Pham, Tuan-Long Chu
0838: Phase-field modeling: Analytics, benchmarks, and discussions Chair(s): Andreas Prahs and Daniel Schneider		
204 Level 2	9:45 - 10:05	W241376 Benchmark study on chemo-elastic multiphase-field approaches Author(s): Thea Kannenberg, Yang Bai, Kartik Sunil Umate, Daniel Schneider*, Bob Svendsen, Britta Nestler
	10:05 - 10:25	W241175 Finite element based micromagnetic simulations of heterogeneous structures Author(s): Maximilian Reichel*, Jörg Schröder
	10:25 - 10:45	W242097 Phase-field modeling of elastic microphase separation Author(s): Hamza Oudich*, Pietro Carrara, Laura De Lorenzis
	10:45 - 11:05	W242143 Phase-field simulation of morphological change and stabilization of foam structure Author(s): Takuya Uehara*
	11:05 - 11:25	W241679 3D multi-phase-field lattice Boltzmann simulations for semi-solid deformation in thin film Author(s): Namito Yamanaka*, Shinji Sakane, Tomohiro Takaki
0840: Efficient iterative methods for solving coupled and strongly nonlinear problems Chair(s): Gabriel Wittum		
206 Level 2	9:45 - 10:05	W240543 Parallel Newton-Krylov and quasi-Newton solvers for nonlinear cardiac models Author(s): Luca F. Pavarino*, Nicolás Barnafi, Ngoc Mai Monica Huynh, Simone Scacchi
	10:05 - 10:25	W241947 Improving algebraic multigrid performance for high-order finite elements with multipoint constraints Author(s): Máté Kelemen*, Roland Wüchner, Suneth Warnakulasuriya

206 Level 2	10:25 - 10:45	W241434 Multigrid-in-time methods for nonlinear optimization of dynamical systems Author(s): Denis Ridzal*, Eric Cyr, Radoslav Vuchkov
	10:45 - 11:05	W240185 Geometric multigrid methods for a matrix-free stabilized solver for the incompressible Navier-Stokes equations Author(s): Laura Prieto Saavedra*, Peter Munch, Bruno Blais
	11:05 - 11:25	W242416 Immersed domain approach for fluid-structure-contact interaction problems Author(s): Maria Giuseppina Chiara Nestola, Patrick Zulian, Hardik Kothari, Rolf Krause*
0907: UQ-TTA student paper competition in uncertainty quantification Chair(s): Johann Guilleminot and Serge Prudhomme		
207 Level 2	9:45 - 10:05	W241614 Divide and conquer - improved training of Neural Ordinary Differential Equations through time-domain splitting Author(s): Dibyajyoti Chakraborty*, SeungWhan Chung, Romit Maulik
	10:05 - 10:25	W241632 Capturing model-form uncertainties in various molecular dynamics ensembles with stochastic reduced-order modeling Author(s): Senou Kounouho*, Chongze Hu, Remi Dingreville, Johann Guilleminot
	10:25 - 10:45	W241480 Efficient PDE-constrained optimization under uncertainty using derivative-informed neural operators Author(s): Dingcheng Luo*, Thomas O'Leary-Roseberry, Peng Chen, Omar Ghattas
	10:45 - 11:05	W242620 Goal-oriented calibration of models and associated modeling errors Author(s): Antonin Paquette-Rufiange*, Serge Prudhomme, Marc LeForest
	11:05 - 11:25	W240553 Real-time high-fidelity algorithms for extreme-scale bayesian inverse problems involving shift-invariant systems Author(s): Sreeram Venkat*, Stefan Henneking, Milinda Fernando, Omar Ghattas
	11:25 - 11:45	W242254 Stochastic subspace via probabilistic principal component analysis for model-form uncertainty Author(s): Akash Yadav*, Ruda Zhang
0910: Uncertainty characterization and error control to enable predictive simulations Chair(s): Anca Belme and Tim Wildey		
210 Level 2	9:45 - 10:05	W241290 An adaptive finite-elements - neural network method for parametric PDEs Author(s): Alexandre Caboussat, Maude Girardin*, Marco Picasso
	10:05 - 10:25	W242628 Solving stochastic inverse problems for CFD using data-consistent inversion and an adaptive stochastic collocation method Author(s): Hector Amino, Anca Belme*, Jean-Camille Chassaing, Tim Wildey
	10:25 - 10:45	W242482 Parameter identification of piezoelectric energy harvester based on isogeometric analysis via Bayesian updating Author(s): Jian Huang*, Mehrisadat Makki Alamdari, Elena Atroshchenko
	10:45 - 11:05	W241953 Upper and lower bounds confidence band computing for accuracy and error estimation using Sefea (Strain-Enriched Finite Element Analysis) Formulation Author(s): Theodore Lin*, Yu Hou
1008: Modeling, simulation, and AI for ultrasonic NDT and SHM Chair(s): Fangsen Cui		
113 Level 1	9:45 - 10:05	W240312 Analysis of cross-sectional load according to asymmetric formation of 3-D RC Rahmen structure Author(s): Seonghun Kim*, Hyo-Gyoung Kwak
	10:05 - 10:25	W240722 A surrogate for rapid evaluation of guided waves in plates with multiple defects Author(s): Paul Sieber*, Konstantinos Agathos, Rohan Soman, Wiesław Ostachowicz, Eleni Chatzi
	10:25 - 10:45	W241077 Non-destructive stress wave amplitude testing for interface bonding strength of 3D printable concrete Author(s): Cheng Qi*, YuChing Wu, Peng Zhi

113 Level 1	10:45 - 11:05	W241808 A performance analysis procedure based on corrected displacements to evaluate the seismic response of steel 2D frames Author(s): Jose Mendoza*, Berardi Sensale, Alfredo Canelas
1009: Advanced discretization schemes and solution strategies for computational structural dynamics Chair(s): Bastian Oesterle and Alessandro Reali		
116 Level 1	9:45 - 10:05	W242632 Matrix analysis of molecular structures: formulation and strategies for solving the computational dynamics problem Author(s): Fermín Navarrina*, Andrés Fernández San Miguel, Laura Edreira Marzoa, Luis Ramírez, Iván Couceiro Aguiar, Andrés Soage, José París, Xesús Nogueira, Antonio Peón, Bruno Rodiño, Ignasi Colominas, Manuel Casteleiro
	10:05 - 10:25	W242246 A high-order flux reconstruction approach for hyperbolic elasticity Author(s): Abhishek Barat*, Brian Vermeire, Mojtaba Kheiri, Ashok Kaushal
	10:25 - 10:45	W241864 The method of fundamental solutions using adaptive source point selection for two-dimensional elastic wave analysis Author(s): Akira Furukawa*
	10:45 - 11:05	W240599 Limitations of displacement based finite element method with regard to solution of plane dynamical problems Author(s): Danish Ansari*, Saravanan Umakanthan, Parag Ravindran
1101: Modeling and simulation for additive manufacturing Chair(s): Christoph Meier		
118 Level 1	9:45 - 10:05	W240695 Artificial Neural Network for the qualification of Direct Energy Deposition processes Author(s): Michele Chiumenti*, Timothy Herzog, Carlos Augusto Moreira, Andrey Molotnikov, Manuel Alejandro Caicedo, Runeal Ramma, Miguel Cervera
	10:05 - 10:25	W241425 Advancing online predictions in laser powder bed fusion: a scientific deep learning approach integrating in-situ monitoring data with melt pool simulations Author(s): Lin Cheng*, Yunhao Zhang
	10:25 - 10:45	W241456 Online update of digital twin and its application to metal additive manufacturing Author(s): Yifan Tang*, Mostafa Rahmani Dehaghani, Pouyan Sajadi, Gary Wang
	10:45 - 11:05	W242195 Data-driven surrogate modelling of residual stresses in Laser Powder-Bed Fusion Author(s): Lucas Lestandi*, JC Wong, GuoYing Dong, Mark Jhon
1104: Modeling and simulation of advanced manufacturing processes for metals Chair(s): Jason Mayeur		
117 Level 1	9:45 - 10:05	W240867 Quantitative benchmark for laser powder bed fusion melt pool scale models Author(s): Hélène Papillon-Laroche*, Amishga Alphonius, Magdalena Schreter-Fleischhacker, Yohann Vautrin, Florin Ilinca, Jean-Philippe Harvey, Bruno Blais
	10:05 - 10:25	W241429 Application of a transient heat source model to part-scale simulations of AM Author(s): John Coleman*, Kellis Kincaid, Gerry Knapp, Benjamin Stump, Matt Rolchigo, Alex Plotkowski
	10:25 - 10:45	W240866 Description, verification, and validation of a thermo-fluid solver for laser powder bed fusion melt pool scale predictions Author(s): Amishga Alphonius*, Hélène Papillon-Laroche, Yohann Vautrin, Florin Ilinca, Bruno Blais
	10:45 - 11:05	W241447 Real-time estimation of thermomechanical state during additive manufacturing by assimilating infrared imaging data into simulations Author(s): Stephen DeWitt*, Bruno Turcksin, James Haley
	11:05 - 11:25	W241403 Adaptation of a cellular automata-based grain structure evolution model to additive manufacturing conditions Author(s): Matt Rolchigo*, Jaime Stump, John Coleman, Gerry Knapp, Alex Plotkowski

1303: Industrial applications of IGA Chair(s): Emily Johnson		
302 Level 3	9:45 - 10:05	W242201 Isogeometric analysis and the Digital Twin Author(s): Clint Nicely*, Stuart Taylor
	10:05 - 10:25	W242010 A comparative study of C0, C1, and G1 spline constructions around extraordinary points Author(s): Md Sadman Faruque*, Zuowei Wen, Xiaodong Wei, Hugo Casquero
	10:25 - 10:45	W242652 Point cloud-based immersogeometric flow analysis Author(s): Ming-Chen Hsu*, Monu Jaiswal, Ashton Corpuz
	10:45 - 11:05	W242293 Vanquishing membrane locking in quadratic NURBS-based discretizations of nonlinear Kirchhoff-Love shells: CAS elements Author(s): Kyle Mathews*, Hugo Casquero
	11:05 - 11:25	W240710 Isogeometric reissner-mindlin shell theory application to buckling behavior in stiffened thin-walled structures Author(s): Haoyu Wu*, Xiaoxiao Du, Wei Wang
1305: Extended digital twins including uncertainty and complexity of human/society and human knowledge Chair(s): Tohru Hirano and Seiichi Koshizuka		
303 Level 3	9:45 - 10:05	W240089 Integrating human uncertainty and creativity into the extended digital twin: knowledge is all you need Author(s): Tohru Hirano*
	10:05 - 10:25	W240931 Computational emotion mechanics and inquiry process Author(s): Hideyoshi Yanagisawa*
	10:25 - 10:45	W240706 The role of humans in computational mechanics – Verification and Validation for quality management – Author(s): Seiichi Koshizuka*
	10:45 - 11:05	W242072 Digitalization of manufacturing systems by using Digital Triplet Author(s): Yasushi Umeda*
	11:05 - 11:25	W242685 Simplified maintenance actions for industrial decision support systems Author(s): Alexander A. Laurence*, Keiro Muro
1403: New trends in topology optimization Chair(s): Shinji Nishiwaki		
220 Level 2	9:45 - 10:25	W241988 Topology optimization for additive manufacturing utilizing image processing techniques Author(s): Kozo Furuta*, Takeru Fukutani, Yuya Kozuka, Kazuhiro Izui, Shinji Nishiwaki
	10:25 - 10:45	W241957 Topology optimization for fracture resistance using neural reparameterization Author(s): Gawel Kus*, Miguel Bessa
	10:45 - 11:05	W241634 A framework for level-set based topology optimization with constrained shape updates Author(s): Adrian Humphry, Nigel Morris*, Adrian Butscher, Mehran Ebrahimi, Alex Tessier
	11:05 - 11:25	W240972 A stabilized framework for nonlinear topology optimization based on time-series moving morphable components method Author(s): Xueyan Hu*, Zonghao Li, Weiqiu Chen
	11:25 - 11:45	W241999 3D structural foundation design for onshore wind turbines via topology optimization Author(s): Kamilla Emily Santos Silva*, Gabriel Vicentin Pereira Lapa, Josue Labaki, Alfredo Gay Neto, Emilio Carlos Nelli Silva, Renato Picelli
1405: Advances in material model calibration for computational solid mechanics Chair(s): Coleman Alleman		
219 Level 2	9:45 - 10:25	W241217 Extreme sparsification of physics-augmented neural networks for interpretable model discovery in solid mechanics Author(s): Jan Fuhg*, Reese Jones, Nikolaos Bouklas

219 Level 2	10:25 - 10:45	W240272 Calibration of hybrid constitutive models from full-field data Author(s): Daniel Seidl*, Brian Granzow, Reese Jones, Ravi Patel
	10:45 - 11:05	W240409 Physics-Informed Neural Networks for material parameter identification in quasi-real problems Author(s): Christian Diaz-Cuadro*, Mauricio C. Vanzulli Pena
	11:05 - 11:25	W241380 Calibrating constitutive models with full-field data via physics informed neural networks Author(s): Craig Hamel*
1601: Contact and interface mechanics: Modeling and computation Chair(s): Mike Puso		
224 Level 2	9:45 - 10:05	W240810 Implementing and experimentally validating penalty contact in cosserat rod models to effectively model contact scenarios in the field soft material robotics Author(s): Rebecca Berthold*, Matthias Wangenheim
	10:05 - 10:25	W241786 How does friction affect sliding contact mechanics? Author(s): Nicola Menga*, Christian Mueller, Giuseppe Carbone, Martin Mueser
	10:25 - 10:45	W241662 Hyper-dimensional gap finite elements for the enforcement of interfacial constraints Author(s): Brian Giffin*
	10:45 - 11:05	W241167 An interior-point multigrid based approach for large-scale contact mechanics Author(s): Tucker Hartland*, Socratis Petrides, Jingyi Wang, Michael Puso, Jerome Solberg, Tzanio Kolev, Cosmin Petra
1604: Computational fluid dynamics (CFD) and fluid-structure interaction (CFSI): Methods and Applications Chair(s): Georgios Moutsanidis		
223 Level 2	9:45 - 10:05	W241611 Resolvent modes as the foundation for LES wall models Author(s): Zvi Hantsis, Miles Chan, Beverley McKeon, Ugo Piomelli*
	10:05 - 10:25	W241408 A very high-order framework for fluid structure interaction simulations Author(s): Laura Edreira Marzoa*, Luis Ramírez, Xesús Antón Nogueira Garea, Ignasi Colominas
	10:25 - 10:45	W242444 Aerodynamics analysis of dragonfly flapping wings based on Force Element Theory Author(s): Jie-Chao Lei*, Min-Hong He, Chien-Cheng Chang, Chin-Chou Chu
	10:45 - 11:05	W240617 Hydroelastic vibrations of prestressed elastic tanks computed with isogeometric analyses and projection based reduced order model Author(s): Christophe Hoareau*, Jean-François Deü, Tommaso Landi, Roberto Citarella, Roger Ohayon
1705: Computational geomechanics Chair(s): Jidong Zhao and Jinhyun Choo and Sascha Henke		
120 Level 1	9:45 - 10:25	W240218 Modelling thawing-triggered landslides using a multi-physics SPH framework Author(s): Yanjian Lian, Ha H. Bui*, Giang D. Nguyen
	10:25 - 10:45	W240260 Thermo-hydro-mechanical coupled material point method for simulating the freeze-thaw behavior of porous media Author(s): Jidu Yu*, Jidong Zhao, Shiwei Zhao, Weijian Liang
	10:45 - 11:05	W240372 Numerical modeling of deep earthquakes considering phase transformation and thermal effects Author(s): Craig Foster*, Sheng-Wei Chi, S Sindhusuta, Ashay Panse, Javad Mofidi Rouchi, Yanbin Wang, Timothy Officer
	11:05 - 11:25	W240994 Physics-preserving enriched Galerkin method for thermo-hydro-mechanical processes in geomechanics Author(s): Son-Young Yi*, Sanghyun Lee
	11:25 - 11:45	W241609 A mixed finite element approach for thermo-poro-elasto-plastic simulation of stimulated volume evolution in subsurface applications Author(s): Mohammad Komijani*

1807: Deep and machine learning methodology in the context of application to computational mechanics Chair(s): Yoshitaka Wada and Yasushi Nakabayashi		
212 Level 2	9:45 - 10:05	W242011 Prediction of pressure field of incompressible flow usning CNN Author(s): Masato Masuda*, Yoshiaki Tamura
	10:05 - 10:25	W242215 A dynamic weighted loss function for enhancing the performance of neural networks Author(s): Chetra Mang*, Axel TahmasebiMoradi, David Danan, Mouadh Yagoubi
	10:25 - 10:45	W242325 On defining a feature and label space for ML guided defeaturing Author(s): Sam Parry*, Steven Owen
	10:45 - 11:05	W242519 A study on locking effects within the solution of structural mechanics problems using physics informed neural networks Author(s): Lukas Striefler*, Bastian Oesterle
	11:05 - 11:25	W242597 Polygonal mesh generation with optimal connectivity using deep reinforcement learning Author(s): Arjun Narayanan, Yulong Pan, Per-Olof Persson*
	11:25 - 11:45	W241133 A CNN-based approach for optimizing Lagrange-Galerkin search algorithms in fluid dynamics Author(s): Xuan Luo*, Zichao Jiang, Bohua Huang, Zhuolin Wang, Yi Zhang, Qinghe Yao
1813: Scientific machine learning for geophysical applications Chair(s): Gianmarco Mengaldo, Rajeev Jaiman and Giovanni Stabile		
215 Level 2	9:45 - 10:05	W241089 Hybrid bi-level filtering methods for inverse problem and data assimilation in geophysical applications Author(s): Juntao Yang*, Jeff Adie, Simon See, Gianmarco Mengaldo
	10:05 - 10:25	W241420 Application of variational data assimilation to high-speed outflow boundary-value problems of the ideal magnetohydrodynamics equations Author(s): Jose Arnal*, Clinton Groth
	10:25 - 10:45	W241435 A data-driven reduced order model for the efficient simulation of mesoscale atmospheric flow Author(s): Michele Girfoglio*, Annalisa Quaini, Gianluigi Rozza
	10:45 - 11:05	W241440 RC-CAN: Range-Dependent Conditional Convolutional Autoencoder for real-time far-field underwater noise prediction Author(s): Indu Kant Deo*, Akash Venkateshwaran, Rajeev Jaiman
	11:05 - 11:25	W241487 Synthetic inflow turbulence generation based on conditional neural field encoded latent diffusion model Author(s): Meet Hemant Parikh*, Xin-Yang Liu, Pan Du, Xiantao Fan, Jianxun Wang
1819: Machine learning for design tasks and inverse problems Chair(s): Kazuo Yonekura		
214 Level 2	9:45 - 10:05	W241598 Physics guided training of GAN model to improve accuracy in a desigh synthesis Author(s): Kazuo Yonekura*
	10:05 - 10:25	W240026 Structural optimization through generative adversarial networks Author(s): Lucas Pereira, Larissa Driemeier*
	10:25 - 10:45	W241589 Generative image model for structural design considering both mechanical performance and stylishness Author(s): Hayata Morita*, Kohei Shintani, Chenyang Yuan, Frank Permenter, Matt Klenk
	10:45 - 11:05	W242333 Optimizing fibrillar adhesion design using supervised machine learning Author(s): Mohammad Shojaeifard*, Mattia Bacca, Matteo Ferraresso

1820: Advancing computational mechanics with symbolic regression Chair(s): John Emery and Jacob Hochhalter		
216 Level 2	9:45 - 10:05	W240545 Bayesian symbolic regression: addressing challenges in estimating fractional Bayes factors and application to fatigue crack growth modeling Author(s): Geoffrey Bomarito*, Patrick Leser, Paul Leser, Heather Hickman
	10:05 - 10:25	W241659 A physics-informed machine learning approach to modeling the constitutive response of a single crystal with voids Author(s): Karl Garbrecht*, Andrea Rovinelli, Jacob Hochhalter, Paul Christodoulou, Ricardo Lebensohn, Laurent Capolungo
	10:25 - 10:45	W240549 Performance increases of hypercomplex automatic differentiation (HYPAD) in physics informed symbolic regression Author(s): Samuel Roberts*, Mauricio Aristizabal, Harry Millwater
	10:45 - 11:05	W241003 Symbolic regression and extended Physics-Informed Neural Networks for gray-box motion equation learning Author(s): Elham Kiyani*, Khemraj Shukla, Mikko Karttunen, George Karniadakis
	11:05 - 11:25	W240302 Symbolic regression via neural networks Author(s): Jeff Moehlis*, Nibodh Boddupalli, Tim Matchen
1821: Data-driven modeling and design of materials Chair(s): Karl A. Kalina and WaiChing Sun		
213 Level 2	9:45 - 10:25	W240142 Data-driven-multiscale modeling of anisotropic damage from RVE fracture simulations Author(s): Julien Yvonnet*, Qi-Chang He, Pengfei Li
	10:25 - 10:45	W240779 Multiscale modelling of strongly heterogeneous materials using geometry informed clustering Author(s): Jagan Selvaraj*, Bassam El Said
	10:45 - 11:05	W242253 Efficient computational homogenization of materials with random microstructure morphology through enhanced machine learning techniques Author(s): Sergey Kozinov*, Niklas Miska, Daniel Balzani
	11:05 - 11:25	W241337 Micromechanical properties prediction of multiphase FRP composites using CNN approach Author(s): Dhiraj Biswas, Sathiskumar Anusuya Ponnusami, Ganapathi A. Sengodan*
1829: Improving the efficiency and accuracy of computational methods through machine learning Chair(s): Mostafa S. Shadloo, Mehrdad Mesgarpour and Ahmad Shakibaeinia		
217 Level 2	9:45 - 10:05	W242431 Deep learning-based super-resolution framework for hydrodynamic downscaling Author(s): Nelson Stache*, Julie Carreau, Ahmad Shakibaeinia
	10:05 - 10:25	W241731 Accelerated and stable Kriging surrogate model technique for training large-scale data Author(s): Jieon Kim*, Gunwoo Noh
	10:25 - 10:45	W241920 Fuzzy statistics-aided inference in experimental design Author(s): Renata Dwornicka, Aneta Gądek-Moszczak, Robert Ulewicz, Norbert Radek, Jacek Pietraszek*
	10:45 - 11:05	W242533 RBF interpolation method with an adaptive shape parameter and a posteriori error estimation using supervised learning Author(s): Maria Han Veiga*
	11:05 - 11:25	W241041 A two-dimensional shock wave pattern recognition algorithm based on cluster analysis Author(s): Siyuan Chang*, Kai Cui
	11:25 - 11:45	W241354 Exploring transient flow in pore-scale porous media: a deep learning perspective on the metal foam heat exchanger's analysis Author(s): Mehrdad Mesgarpour, Leyla Amiri*, Sébastien Poncet, Mehmet Yildiz, Somchai Wongwises, Mostafa Safdari Shadloo

Tuesday July 23 - Technical Session 5

0104: Mini-symposium in memory of Professor J. Tinsley Oden honoring his lifetime achievements in computational mechanics Chair(s): Leszek Demkowicz		
109 Level 1	2:00 - 2:20	W242427 Formulations of griffith phase-field fracture with strength: on model validation and variational theories Author(s): John Dolbow*
	2:20 - 2:40	W240341 Some recent advances in structural damage tracking and monitoring Author(s): Ludovic Chamoin*, Sahar Farahbakhsh*, Matthieu Diaz, Martin Poncelet, Pierre-Etienne Charbonnel
	2:40 - 3:00	W241006 Data-driven Bayesian model-based prediction of fatigue crack nucleation in Ni-based superalloys Author(s): Somnath Ghosh*, George Weber
	3:00 - 3:20	W241623 Thermodynamics-based data-driven computing for inelastic materials modeling Author(s): Jiun-Shyan Chen*, Jonghyuk Baek
	3:20 - 3:40	W241601 The hunter, the rancher, the Renaissance man: A tribute to my beloved friend Tinsley Oden Author(s): John Foster*
0204: Recent advances in computational fracture mechanics and failure analysis Chair(s): Hiroshi Okada		
114 Level 1	2:00 - 2:20	W240209 A novel peridynamics elastic-plastic fatigue damage model for predicting crack behavior incorporating elasto-plastic deformation field Author(s): Dongjun Bang, Ayhan Ince*
	2:20 - 2:40	W240322 Multiscale modeling of hydrogen transport in steels and its resulting embrittlement effect Author(s): Xiaosheng Gao*, Guanyue Rao, Chuanshi Huang
	2:40 - 3:00	W240630 Damage in continuum-kinematics-inspired peridynamics Author(s): Marie Laurien*, Ali Javili, Paul Steinmann
	3:00 - 3:20	W241022 Linear elastic fracture mechanics analysis using S-version Isogeometric Analysis - conditions for guarantee the accuracy of evaluates stress intensity factor Author(s): Yusuke Sunaoka, Yuhi Tsuchiyama, Takashi Kurosawa, Yuto Otoguro, Hiroshi Okada*
	3:20 - 3:40	W241046 Finite strain elastic-plastic crack analysis by using S-version Isogeometric Analysis Author(s): Yuhi Tsuchiyama*, Yusuke Sunaoka, Takashi Kurosawa, Yuto Otoguro, Hiroshi Okada
0209: Phase-field models of fracture Chair(s): Keita Yoshioka		
115 Level 1	2:00 - 2:40	W240644 Variational phase-field fracture with controlled nucleation Author(s): Christopher Larsen*
	2:40 - 3:00	W241572 Revisiting the issue of energy conservation in phase-field models for fracture Author(s): Juan Michael Sargado*, Joachim Mathiesen
	3:00 - 3:20	W240093 Hyperbolic modeling of gradient damage and one-dimensional finite volume simulations Author(s): Nicolas Favrie*, Adrien Renaud, Djimedo Kondo
	3:20 - 3:40	W240005 DG0/CR discretization of phase-field for fracture Author(s): Frederic Marazzato*, Blaise Bourdin

115 Level 1	3:40 - 4:00	W241796 Working towards a modular, fully-coupled phase field fracture model integrating elasticity, plasticity, and damage Author(s): Chiraag Nataraj*, Andrew Stershic
0302: Advances and applications in meshfree, particle, and peridynamic methods Chair(s): Zhen Chen and Karel Matous		
201 Level 2	2:00 - 2:20	W240846 An adaptive spacetime wavelet method for predictive computational science with multiple spatial and temporal scales Author(s): Karel Matous*, Cody Cochran, Jack Yost
	2:20 - 2:40	W242538 A displacement-based material point method for weakly compressible free-surface flows Author(s): Georgios Moutsanidis*, Ram Mohan Telikicherla
	2:40 - 3:00	W241554 Smoothed Particle Hydrodynamics simulation of landslides with discontinuities Author(s): Daniel Shigueo Morikawa*, Mitsuteru Asai
	3:00 - 3:20	W240199 Application of solid shell material point method in extreme deformation of thin structures Author(s): Jiasheng Li*, Xiong Zhang
	3:20 - 3:40	W241344 Application of the Material Point Method in metal cutting simulations utilizing the Johnson-Cook material law Author(s): Marvin Koßler*, Sascha Maassen, Rainer Niekamp, Jörg Schröder
0306: Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics and kinetic models Chair(s): Anthony Gruber		
203 Level 2	2:00 - 2:20	W240559 Energy preservation of high-order mimetic differences for systems of conservation laws Author(s): Miguel Dumett*, Johnny Corbino, Jose Castillo
	2:20 - 2:40	W240316 Structure preserving discretization for the linear wave equation Author(s): Artur Palha*
	2:40 - 3:00	W241248 Thermodynamic consistency and structure-preservation in a discontinuous Galerkin method for the moist compressible Euler equations Author(s): Kieran Ricardo*, David Lee, Kenneth Duru
	3:00 - 3:20	W240863 Structure-preserving, high-order, oscillation-limiting, bounds-preserving (SPHOOL-BP) transport operators for arbitrary k-forms using discrete exterior calculus Author(s): Christopher Eldred*
	3:20 - 3:40	W241186 A self-consistent, Hamiltonian model of the ponderomotive force and its structure preserving discretization Author(s): William Barham*, Philip Morrison, Yaman Güçlü, Eric Sonnendrücker
0311: Recent advances in high-order methods for computational fluid dynamics Chair(s): Ngoc Cuong Nguyen		
202 Level 2	2:00 - 2:20	W240216 Metric-based curved mesh adaptation using high-order edge operations Author(s): Krzysztof Fidkowski, Alexander Coppeans*, Joaquim Martins
	2:20 - 3:00	W242407 Can high-order convergence be obtained for practical problems in engineering? Author(s): Brian Helenbrook*
	3:00 - 3:20	W241460 A p-adaptive implicit shock tracking method for high-speed viscous flows Author(s): Huijing Dong, Masayuki Yano, Matthew Zahr*
	3:20 - 3:40	W240431 Multirate time-integration based on dynamic ODE partitioning through adaptively refined meshes for convection-dominated flows Author(s): Daniel Doehring*, Michael Schlottke-Lakemper, Gregor Gassner, Manuel Torrilhon

0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Ron Peerlings		
306 Level 3	2:00 - 2:20	W240978 A generalized homogenization approach to describe the orientation dynamics of fiber suspensions Author(s): Tobias Karl*, Thomas Böhlke
	2:20 - 2:40	W241692 Competition of crazing and shear yielding under cyclic mode I loading using a molecular dynamics informed continuum micromechanical crazing model Author(s): Tobias Laschuetza*, Joerg Rottler, Thomas Seelig
	2:40 - 3:00	W242417 On modelling the frequency dependence of unfilled and filled elastomer blends Author(s): Daniel Juhre*
	3:00 - 3:20	W240480 Prediction of micro-scale mechanical responses of cement paste using scale-linking material parameters calibrated from macro-scale behaviors Author(s): Yong-Woo Kim, Se-Yun Kim, Tong Han*
	3:20 - 3:40	W240947 Characterizing and modeling the wide strain rate range behavior of air-filled open-cell polymeric foam Author(s): Xinghao Wang*, Zhanli Liu
	3:40 - 4:00	W241893 Characterization of local mechanical properties of metallic microstructure using instrumented indentation test Author(s): Ikumu Watanabe*, Toshiro Amaishi, Ta-Te Chen
0404: Novel mathematical and numerical models for multiphysics and multiscale systems Chair(s): Nicolás Barnafi		
305 Level 3	2:00 - 2:20	W240485 Finite Element Interpolated Neural Networks for solving forward and inverse problems Author(s): Alberto F. Martin*, Santiago Badia, Wei Li
	2:20 - 2:40	W242169 Preconditioning the incompressible Stokes problem with variable viscosity Author(s): Chiara Giraudo*, Miroslav Kuchta, Stefano Serra-Capizzano
	2:40 - 3:00	W241211 An efficient, hereditary integral approach to modeling thermal and age-induced permanent set in polymers Author(s): Stephen Castonguay*, Joshua Fernandes, Michael Puso, Sylvie Aubry
	3:20 - 3:40	W242678 Cahn-Hilliard-type diffusion coupled with elasticity Author(s): Shiva Reddy Kondakindi*, A. Rajagopal, T.N. Murthy, R.N. Singh
0413: Multiscale methods for advanced manufactured materials Chair(s): Edwin Chiu		
304 Level 3	2:00 - 2:20	W242324 Exploring the application of mixed solvents in liquid-phase exfoliation of graphitic carbon nitrides with molecular dynamics Author(s): Ehsan Shahini*, Narendra Chaulagain, Karthik Shankar, Tian Tang
	2:20 - 2:40	W240844 Microstructural defects and length-scale problem investigation of AM alloys Author(s): Edwin Chiu*, John Emery, Kyle Johnson, Kyle Karlson, Thomas Ivanoff, John Mitchell
	2:40 - 3:00	W240666 Modeling additively manufactured metallic microstructures for dynamic response Author(s): John Mitchell*, Stewart Silling, Edwin Chiu, Stephen Bond, Timothy Ruggles
	3:00 - 3:20	W242171 A multiscale laminate-based model for semi-crystalline polymers Author(s): José L. P. Vila-Chã*, Bernardo P. Ferreira, Francisco Andrade Pires

0502: Advances in computational biomechanics and mechanobiology Chair(s): Stéphane Avril and David M. Pierce		
121 Level 1	2:00 - 2:40	W240629 A model for strain rate dependent reversible cytoskeletal failure in cells exposed to super-physiological deformation rates Author(s): Samuel Boland, Patrick Alford*
	2:40 - 3:00	W242330 A mechanical analysis of cell migration using a structural optimization approach Author(s): Soham Ghosh, Eric Havenhill*
	3:00 - 3:20	W240903 IPSC-derived endothelial multi-cell networks synergistically modify their basal contractility machinery and extracellular matrix in 3D Author(s): Toni West*, Jiwan Han, Gabriel Peery, Robin Tuscher, Janet Zoldan, Michael Sacks
	3:20 - 3:40	W242074 Exploring the helix-coil transition in DNA: a geometric thermodynamic approach Author(s): Asif Raza*, Debasish Roy
0504: Multiphysics and data-driven modeling for cardiovascular biomedicine Chair(s): Adarsh Krishnamurthy		
122 Level 1	2:00 - 2:20	W241766 Data-driven methods for the diagnosis of coronary microvascular disease from angiography data Author(s): Haizhou Yang*, Jiyang Zhang, Ismael Assi, Brahmajee Nallamothu, Krishna Garikipati, C. Alberto Figueroa
	2:20 - 2:40	W241543 Neural network based surrogate modeling of cardiac function encoding geometric variability Author(s): Elena Martinez*, Matteo Salvador, Fanwei Kong, Beatrice Moscoloni, Mathias Peirlinck, Alison Marsden
	2:40 - 3:00	W242242 Modeling the hemodynamic impact of aortic root enlargements in aortic valve replacement Author(s): Mia Bonini*, Surya Sanjay, Alexander Makkinejad, Maxamilian Balmus, Nicholas Burris, Bo Yang, David Nordsletten
	3:00 - 3:20	W242649 Effects of bicuspid aortic valve morphology on hemodynamics in the ascending aorta Author(s): Ashton Corpuz*, Mehdi Saraeian, Clayton Burkhalter, Adarsh Krishnamurthy, Ming-Chen Hsu
0513: Mechanobiology of cells, vesicles and biomembranes Chair(s): Roger Sauer		
119 Level 1	2:00 - 2:20	W241894 Analyzing the long term biomechanical response of orthokeratology by considering the anisotropic viscoelastic behavior of the cornea Author(s): Yifeng Li*, Zhuoran Yang, Ziming Yan, Huibin Shi, Zhanli Liu
	2:20 - 2:40	W241929 Mesoscopic simulations of protein-induced morphological changes in endoplasmic reticulum Author(s): Emad Ghazizadeh*, Wylie Stroberg
	2:40 - 3:00	W242068 Modeling of cell cortical tension by a co-dynamics model of actin, myosin and crosslinker in actomyosin cortex Author(s): Kohsuke Tsukui*, Hiromi Miyoshi, Naoya Sakamoto, Satoshi Ii
	3:00 - 3:20	W242216 A modified Helfrich model for lipid bilayers Author(s): Eshwar Jagadeesh Savitha*, Roger Sauer
	3:20 - 3:40	W242332 Optimization based synthesis with directed cell migration Author(s): Soham Ghosh*, Eric Havenhill
0605: Architected materials and structures Chair(s): Pablo Zavattieri		
112 Level 1	2:00 - 2:40	W240136 A novel computational approach for predicting micro-buckling sensitivities in architected materials Author(s): David Restrepo*, David Risk, Mauricio Aristizabal, Harry Millwater
	2:40 - 3:00	W242263 Computational modeling of membrane tensegrity structures Author(s): Sanjay Dharmavaram*, Ranajay Ghosh, Muhammad Shahjahan Hossain

112 Level 1	3:00 - 3:20	W242082 Study on the mechanical asymmetry of a non-reciprocal gel using computational homogenization Author(s): Takuma Fuse*, Seishiro Matsubara, So Nagashima, Dai Okumura
	3:20 - 3:40	W242144 Exploring in-plane elastic properties and energy absorption of the bio-inspired glass sponge structures Author(s): Hassan Beigi Rizi*, Harold Auradou, Lamine Hattali
0704: Advanced multi-physics CFD simulations in science and engineering Chair(s): Kaoru Iwamoto		
221 Level 2	2:00 - 2:40	W240694 Flow simulation based on the immersed-interface approach of multiphase, combustion flame and wall boundary Author(s): Nobuyuki Oshima*, Nobuto Nakamichi, Younghwa Cho
	2:40 - 3:00	W242266 Direct numerical simulations of turbulent pulsating flows through curved pipes Author(s): Gokul Anugrah*, Jonathan Wenk, Christoph Brehm
	3:00 - 3:20	W241193 Multiscale simulation of slot die coating using Darcy-Brinkman-Biot approach Author(s): Samuel Fagbemi*, Tequila Harris
	3:20 - 3:40	W240170 Optimizing temperature uniformity in an industrial size electric furnace: a computational fluid dynamics approach Author(s): Sajad Mirzaei*, Farzad Bazdidi-Tehrani, Jean-Benoit Morin, Mohammad Jahazi
0706: Advanced model order reduction techniques for computational fluid dynamics Chair(s): Gianluigi Rozza		
218 Level 2	2:00 - 2:40	W240757 Enhancing cardiovascular CFD simulations with reduced order models Author(s): Pasquale Claudio Africa*, Pierfrancesco Siena, Michele Girfoglio, Gianluigi Rozza
	2:40 - 3:00	W241301 Reduced order modelling of exact periodic flows using a space-time discretisation Author(s): Jacob Lotz*, Ido Akkerman
	3:00 - 3:20	W241524 Adaptive nonlinear reduced-order models for three-dimensional transonic flows Author(s): Alireza Razavi*, Masayuki Yano
	3:20 - 3:40	W241039 Reduced order aerodynamic modeling research for high-pressure capturing wing configurations based on proper orthogonal decomposition and surrogate method Author(s): Kai Cui*, Siyuan Chang, Zhongwei Tian, Guangli Li, Yao Xiao
0709: Simulations of particle-laden fluid flows Chair(s): Eugenio Oñate and Peter Wriggers		
222 Level 2	2:00 - 2:20	W242635 A multiscale method to solve particle-laden turbulent fluid flows Author(s): Sergio Idelsohn*, Juan Gimenez, Eugenio Oñate
	2:20 - 2:40	W240515 A high-order Euler-Lagrange approach for particle-laden flow in moving domains Author(s): Anna Schwarz*, Patrick Kopper, Andrea Beck
	2:40 - 3:00	W240613 Landslide run-out simulations with depth-averaged models and integration with 3D impact analysis using the Material Point Method Author(s): Marco Fois*, Carlo de Falco, Andi Makarim Katili, Antonia Larese, Luca Formaggia
	3:00 - 3:20	W241222 Simulation of particle-laden flow on an inclined plane with varying topography Author(s): Evan Davis*, Lingyun Ding, Andrea Bertozzi
	3:20 - 3:40	W241292 Reduced order models of particle-laden free surface flow Author(s): Andrea Bertozzi*

0810: Numerical modeling of granular and multiphase flows Chair(s): Hideya Nakamura		
205 Level 2	2:00 - 2:20	W240161 Coupled calibration for cohesive and free-flowing granular materials using DEM Author(s): Marcel van Benten*, Dingena Schott, Johan Padding
	2:20 - 2:40	W240524 Effect of particle-size-scaling on particle interactions in DEM-simulations of sand in the context of air pluviation Author(s): Natascha Heim*, Sascha Henke
	2:40 - 3:00	W240686 Speeding up calculation time by specifying search range in squeeze compacting analysis using discrete elements with particle size distribution Author(s): Fumitaka Kondo*, Yasuhiro Maeda
	3:00 - 3:20	W241236 An effective algorithm based on six-equation diffusion interface model for simulating condensed phase detonation Author(s): Biao Zhou*, Yiqing Shen, Baolin Tian
	3:20 - 3:40	W241240 A simplified robust diffusion interface model for elastic solid-fluid interaction Author(s): Yi Cheng*, Yiqing Shen, Baolin Tian, Li Li
	3:40 - 4:00	W242256 DEM-LBM coupling: a micro-scale approach for understanding unsaturated soil behavior Author(s): Nabil Younes, Richard Wan*, Antoine Wautier, Olivier Millet, François Nicot
0811: Buckling analysis and design of thin-walled structures based on novel and intelligent computational methods Chair(s): TBA		
207 Level 2	2:00 - 2:20	W241689 Digital twin for structural load-carrying capacity monitoring and prediction Author(s): Kuo Tian*
	2:20 - 2:40	W241783 Computational model for local buckling of compressively loaded omega-stringer-stiffened panels Author(s): Cherine El Yaakoubi-Mesbah*, Christian Mittelstedt
	2:40 - 3:00	W240301 Large deformations of gradient elastic shells Author(s): Mohammadjavad Javadi Sigaroudi*, Marcelo Epstein
	3:00 - 3:20	W240925 Buckling of shell structures by using the novel approach Author(s): Takeki Yamamoto*, Takahiro Yamada
	3:20 - 3:40	W240510 A reduced-order method with mixed nonlinear kinematics for geometrically nonlinear and buckling analysis of thin-walled structures Author(s): Ke Liang*, Zheng Li
0815: Advancements in model reduction, data assimilation, and uncertainty quantification for complex physical systems Chair(s): Cheng Huang		
209 Level 2	2:00 - 2:20	W241846 Reduced-order modeling of stochastic chemical kinetics under the linear noise approximation Author(s): Justin Eilertsen, Wylie Stroberg*
	2:20 - 2:40	W240659 Model enrichments in reduced ablation models for hypersonic flight simulation Author(s): Rileigh Bandy*, Rebecca Morrison, Teresa Portone
	2:40 - 3:00	W241669 Inverse uncertainty quantification of input fields based on image data with application to a turbulent supercritical carbon dioxide mixing layer experiment Author(s): Keishi Kumashiro*, Dhruv Purushotham, Joseph Oefelein, Adam Steinberg, Masayuki Yano
0816: Model order reduction for parametrized continuum mechanics Chair(s): Thomas Beckers		
211 Level 2	2:00 - 2:20	W240413 Physics guided data-driven model reduction applied to C02 sequestration Author(s): Eduardo Gildin*, Jungang Chen, Daniel Badawi Badawi, Dimitrios Voulanas

211 Level 2	2:20 - 2:40	W240865 Dynamic mode decomposition of nonequilibrium Green's function for quantum many-body systems Author(s): Jia Yin*, Yang-hao Chan, Diana Qiu, Felipe Jornada, Steven G. Louie, Chao Yang
	2:40 - 3:00	W240805 Input-output reduced order modeling for public health intervention evaluation Author(s): Alex Viguerie*, Evin Jacobson, Chiara Piazzola
	3:00 - 3:20	W241397 A physically based reduced order metamodel for parametric computational studies of local post weld heat treatment Author(s): Leonardo Cimatti Lucarelli*, Nawfal Blal, Anthony Gravouil, Auriane Platzer, David Iampietro, Josselin Delmas, Thomas Potin
	3:20 - 3:40	W241871 Model-based design approach finding optimal liquid cooling flow path for electric vehicle battery Author(s): Daisuke Aketo*, Kenji Ono
0818: Numerical methods, mathematical modeling and analysis in material science Chair(s): Xingjie Li		
208 Level 2	2:00 - 2:20	W240481 Consensus-based construction of high-dimensional free energy surface Author(s): Huan Lei*, Liyao Lyu
	2:20 - 2:40	W241282 DeePN^2: a machine-learning based non-Newtonian hydrodynamic model with molecular fidelity Author(s): Lidong Fang*, Pei Ge, Lei Zhang, Weinan E, Huan Lei
	2:40 - 3:00	W241576 Large-scale materials modelling using DFT-FE Author(s): Sambit Das*, Vikram Gavini, Phani Motamarri
	3:00 - 3:20	W241119 Application of machine-learned interatomic potentials in atomic-scale simulations and beyond Author(s): Yangshuai Wang*, Christoph Ortner
0838: Phase-field modeling: Analytics, benchmarks, and discussions Chair(s): Daniel Schneider and Andreas Prahs		
204 Level 2	2:00 - 2:20	W241412 Phase-field method as approximation of the sharp interface theory with the order parameter as internal state variable Author(s): Andreas Prahs*, Daniel Schneider, Britta Nestler
	2:20 - 2:40	W240393 Phase-field modeling and effective simulation of non-isothermal reactive transport Author(s): Carina Bringedal*, Alexander Jaust
	2:40 - 3:00	W240664 Data assimilation using in situ observation data for high-fidelity phase-field simulation of solid-state sintering Author(s): Akimitsu Ishii*, Akinori Yamanaka, Mizumo Yoshinaga, Shunsuke Sato, Ikeuchi Midori, Satoshi Hata, Hikaru Saito, Akiyasu Yamamoto
	3:00 - 3:20	W240460 On a coupling technique between Calphad databases and a grand-potential-based phase-field model: theory and applications Author(s): Kaveh Dargahi Noubary*, Michael Selzer, Britta Nestler
	3:20 - 3:40	W240145 Numerical modelling of steam generator rolled plug using phase field approach Author(s): Luka Sarlija*, Tomislav Lesicar
0840: Efficient iterative methods for solving coupled and strongly nonlinear problems Chair(s): Rolf Krause		
206 Level 2	2:00 - 2:20	W240242 Generalised finite volume methods - taylored test spaces for interface problems Author(s): Susanne Höllbacher, Gabriel Wittum*
	2:20 - 2:40	W240121 Domain decomposition for large neural networks describing battery mechanical response Author(s): Timm Gödde*, Bojana Rosic
	2:40 - 3:00	W241906 Subdomain eigenmode-deflation preconditioning for parallel finite element analysis Author(s): Naoki Morita*, Takumi Murai, Naoto Mitsume

206 Level 2	3:00 - 3:20	W240139 The “chicken-egg” algorithm, a multiphysics methodology to Jacobian triangularization Author(s): Christopher Nahed*
	3:20 - 3:40	W242483 On solving contact problems using substructuring domain decomposition method Author(s): Hardik Kothari*, Patrick Zulian, Rolf Krause
0902: Uncertainty quantification and scientific machine learning for predictive modeling of complex systems Chair(s): Danial Faghihi, Kathryn Maupin, Alireza Tabarraei, Prashant K. Jha and Peng Chen		
210 Level 2	2:00 - 2:40	W241907 Reduced order modeling of incompressible flows Author(s): Aviral Prakash*, Jessica Zhang
	2:40 - 3:00	W240814 Trustworthy and scalable data-driven closure models Author(s): Teresa Portone*, Mohammad Khalil, Kyle Neal
	3:00 - 3:20	W241520 Model selection and dimension reduction of chemical kinetics models for turbulent combustion Author(s): Kunkun Tang*, Tulio Ricciardi, Jonathan Freund
	3:20 - 3:40	W240126 Chance constrained optimal design frameworks in the face of high-dimensional uncertainty Author(s): Pratyush Kumar Singh*, Danial Faghihi
1006: Smart structures – Modelling and simulation Chair(s): TBA		
113 Level 1	2:00 - 2:20	W240415 Non-Linear, Rate-Independent Model of Ferroelectricity Author(s): Mawafag F. Alhasadi, Leila Shahsavari*, Qiao Sun, Salvatore Federico
	2:20 - 2:40	W241651 Self-diagnosis of adaptive structures based on the redundancy concept Author(s): Tamara Prokosch*, Jonas Stiefelmaier, Christina Tarín, Manfred Bischoff
	2:40 - 3:00	W242380 Element-type analysis for planar rotating square auxetics—a finite element study Author(s): Fereshteh Hassani*, Zia Javanbakht, Sardar Malek
	3:00 - 3:20	W240582 Study of wind-induced vibrations on a trellis pylon controlled through an active mass damper system Author(s): Francesco Ripamonti*, Stefano Cii, Alberto Bussini
	3:20 - 3:40	W240347 Numerical analysis of functionally graded magneto-electro-elastic plates and shells Author(s): Shun-Qi Zhang*
1101: Modeling and simulation for additive manufacturing Chair(s): Yuichiro Koizumi		
118 Level 1	2:00 - 2:40	W240457 Efficient sensitivity analysis on a simple laser powder bed fusion built using HYPAD-FEM Author(s): Juan-Sebastian Rincon-Tabares, Mauricio Aristizabal*, Arturo Montoya, Harry Millwater, David Restrepo
	2:40 - 3:00	W240632 Prediction of process outcomes with uncertainty in laser powder bed fusion additive manufacturing Author(s): Daniel Moser*, Nicole Aragon, Michael Heiden, Aashique Rezwan, Theron Rodgers, David Saiz, Michael Stender
	3:00 - 3:20	W240700 Reduced-order phase-field modeling for controlled microstructure in additive manufacturing Author(s): Zhengtao Gan*
	3:20 - 3:40	W242030 Data assimilation-integrated multi-phase-field simulation of solidification in SUS316L stainless steel in additive manufacturing Author(s): Shoichiro Nakamura*, Masahiro Kawasaki, Masahito Segawa, Akinori Yamanaka

118 Level 1	3:40 - 4:00	W241242 Influence of deposit freeform shape on the grain microstructure and residual stress evolution during Wire-Arc Directed Energy Deposition (WA-DED) of IN718 Author(s): Santanu Paul*, Scott Julien, Elizabeth Chang-Davidson, Ahmad Nourian Avval, Samuel Boese, Jon Gager, Sean Langan, Rumman Ahsan, Sinan Müftü
1104: Modeling and simulation of advanced manufacturing processes for metals Chair(s): Jason Mayeur		
117 Level 1	2:00 - 2:20	W240474 Effect of interpass temperature on residual stress evolution in a nickel-aluminum bronze wire-arc additive manufacturing build Author(s): Matthew Dantin*, Charles Fisher
	2:20 - 2:40	W242303 Towards the examination of process-property relationships of wire arc DED via thermo-mechanical FE simulations Author(s): Matthew Priddy*, J. Logan Betts, Matthew Register
	2:40 - 3:00	W242029 Optimization of iron powder compaction processes using discrete element and multi-particle finite element methods coupled with artificial neural networks and genetic algorithm Author(s): Ji Hoon Kim*, Hossein Ghorbani-Menghari, Majid Mohammadhosseinzadeh
	3:00 - 3:20	W242343 Distortion modeling of PM HIP parts produced with AM HIP capsules Author(s): Jason Mayeur*, Soumya Nag, Fred List, Peeyush Nandwana
	3:20 - 3:40	W241402 Model form selection in the indentation plastometry inverse problem Author(s): Emmanuel Michalakis, Matthew Priddy, Aaron Tallman*
1201: Nanomechanics and nanoscale thermal transport for new materials Chair(s): Haifei Zhan and Yuantong Gu		
111 Level 1	2:00 - 2:20	W240912 A peridynamics model for the fracture in graphene sheets Author(s): Xiaoqiao He*, Xuefeng Liu
	2:20 - 2:40	W241263 The effect of temperature and water content on the mechanical properties of Na-MMT under uniaxial compression: molecular dynamics simulations Author(s): Bonan Li, Chengkai Li, Yilin Gui*, Haifei Zhan, YuanTong Gu, Miao Yu
	2:40 - 3:00	W241096 Investigation of residual stress mechanisms on iron substrates during the formation of DLC films by molecular dynamics study Author(s): Noritsugu Kametani*, Morimasa Nakamura, Kisaragi Yashiro, Tomohiro Takaki
	3:00 - 3:20	W240079 Atomistic simulations of diffusion process in materials subject to extreme conditions Author(s): Aylin Ahadi, Namsson Eom*
	3:20 - 3:40	W240310 Assessing the impact on the glass transition temperature of bituminous binder from ultra-thin diamond nanothread Author(s): Yingying Pang*, Haifei Zhan
1301: Mathematical modeling and simulation for social, environmental, and disaster prevention issues Chair(s): Eisuke Kita and Hideki Fujii		
303 Level 3	2:00 - 2:40	W242112 A micro- and macroscopic hybrid traffic simulation model for highway merging section Author(s): Hideki Fujii*, Yo Imai
	2:40 - 3:00	W241117 Development of a Computational Fluid Dynamics model for predicting CO2 conversion efficiency in coke ovens Author(s): Sangjae Seo*
	3:00 - 3:20	W241225 Modelling and simulation of the dynamic resilience of complex systems during large disasters using the i2SIM framework Author(s): Andrea Marti, José R. Martí*, Carlos E. Ventura
	3:20 - 3:40	W240241 Evaluation of effectiveness of traffic jam absorption driving using computer simulation Author(s): Shuya Yamada, Eisuke Kita*

1306: Computational modeling of extreme-loading events Chair(s): Stephen Beissel and Michael Puso		
302 Level 3	2:00 - 2:40	W242619 Modeling of high deformation Lagrangian blast mechanics using isogeomtric analysis and an immersed domain method Author(s): Michael Scott, Derek Thomas*, Greg Vernon, Stephen Beissel, Charles Gerlach
	2:40 - 3:00	W241597 Performance of arbitrary-order finite elements in nonlinear lumped-mass explicit dynamic analysis Author(s): Kent Danielson*, Robert Browning
	3:00 - 3:20	W241806 Application of GPU processing to the Elastic-Plastic Impact Code (EPIC) Author(s): Charles Gerlach*
	3:20 - 3:40	W242311 Multiscale modeling of the ballistic performance of unconfined and confined polymers Author(s): Andrew Bowman*, DeBorah Luckett
1403: New trends in topology optimization Chair(s): Daniel Milbrath De Leon		
220 Level 2	2:00 - 2:20	W241934 Topology optimization method applied to fluid flow considering resonance frequency constraint Author(s): Alberto Duran*, Luis Fernando Nogueira de Sá, Emilio Carlos Nelli Silva
	2:20 - 2:40	W241226 Topology optimization of an airfoil under mass and natural frequency constraints using gaussian function parameterization Author(s): Daniel Oluwalana*, Kai James
	2:40 - 3:00	W241956 Optimizing rotating machinery: a study on natural frequency constraints applied to topology optimization of fluid-structure interaction problems Author(s): Lucas Oliveira Siqueira, Anderson Soares da Costa Azevêdo, Emilio Carlos Nelli Silva, Renato Picelli*
	3:00 - 3:20	W241045 Topology optimization for particle flow using Eulerian-Eulerian model with a finite difference scheme Author(s): Chih-Hsiang Chen*, Kentaro Yaji
	3:20 - 3:40	W240893 Topology optimization design of flow machine rotors for rotating resonance subjected to low density flows Author(s): Diego Hayashi Alonso, Renato Picelli, Julio Meneghini*, Emilio Carlos Nelli Silva
1405: Advances in material model calibration for computational solid mechanics Chair(s): Craig Hamel		
219 Level 2	2:00 - 2:40	W241700 Graphs and mixed adjoint/direct approaches for design sensitivity analysis with transients and history dependent material response Author(s): Daniel Tortorelli*, Brandon Talamini
	2:40 - 3:00	W240160 Optimization of the specimen geometry for one-shot discovery of material models Author(s): Saeid Ghouli*, Moritz Flaschel, Siddhant Kumar, Laura De Lorenzis
	3:00 - 3:20	W240292 A framework for context-specific constitutive model calibration Author(s): Coleman Alleman*, Celso Carranza
	3:20 - 3:40	W241668 Comparison of full-field objective formulations for material model calibration Author(s): Matthew Kury*, Kyle Karlson
1604: Computational fluid dynamics (CFD) and fluid-structure interaction (CFSI): Methods and Applications Chair(s): Georgios Moutsanidis		
223 Level 2	2:00 - 2:20	W240387 X-MESH for multiphase flows Author(s): Jean Francois Remacle*, Nicolas Moes, Antoine Quiriny, Jonathan Lambrechts
	2:20 - 2:40	W240745 Homogenized lattice boltzmann methods for efficient fluid-structure interaction simulations Author(s): Adrian Kummerländer*, Mathias J. Krause

223 Level 2	2:40 - 3:00	W242654 An integrated Fluid Structure Interaction (FSI) - Image Analysis (IA) to reveal energy absorption capability of the human meniscus Author(s): Akhila Gottipati, Sachin Gunda, Sundararajan Natarajan, Daniel Bell, Olga Barrera*
	3:00 - 3:20	W242527 Simulation of fluid-structure interactions using multi-velocity description combining Discontinuous Galerkin finite element method and material point Author(s): Jiajia Waters*, Duan Zhang
1705: Computational geomechanics Chair(s): Ha Bui, Josep Maria Carbonell and Jérôme Duriez		
120 Level 1	2:00 - 2:40	W240033 GeoTaichi: a Taichi-powered high-performance numerical package for modeling multiscale and multifield problems in geotechnics Author(s): Ning Guo*, Yihao Shi, Zhongxuan Yang
	2:40 - 3:00	W241113 Hierarchical multiscale modeling of fluid-soil interactions for large-deformation problems Author(s): Zhang Cheng, Shiwei Zhao*, Jidong Zhao
	3:00 - 3:20	W240509 Computational mechanics of granular materials with a Level Set shape description Author(s): Jérôme Duriez*, Cédric Galusinski
1813: Scientific machine learning for geophysical applications Chair(s): Gianmarco Mengaldo and Rajeev Jaiman and Giovanni Stabile		
215 Level 2	2:00 - 2:20	W242156 Towards trustworthy machine learning for weather modeling Author(s): Zhou Fang, Vishal Srivastava, Gianmarco Mengaldo*
	2:20 - 2:40	W242102 Explainable artificial intelligence for weather extremes Author(s): Chenyu Dong*, Jiawen Wei, Juntao Yang, Jeff Adie, Simon See, Gianmarco Mengaldo
	2:40 - 3:00	W241510 Toward the realisation of an active fault digital twin to monitor slow earthquakes Author(s): Adriano Gualandi*, Davide Faranda, Gianmarco Mengaldo
	3:00 - 3:20	W241941 Towards the inversion of geophysical data generated with parametric PDEs through deep learning Author(s): Julen Alvarez-Aramberri*, Ángel Javier Omella, Vincent Darrigrand
1817: Data-driven methods for modeling complex systems Chair(s): Andrei A. Klishin		
212 Level 2	2:00 - 2:40	W242061 Cluster-based control in high-dimensional flow systems through convolutional autoencoder Author(s): Aditya Nair*, Nitish Arya, Khalid Rafiq, Jayesh Dhadphale, Sujith Ri
	2:40 - 3:00	W241433 Physics-informed diffusion models: introducing physics into data-driven probabilistic models Author(s): Jan-Hendrik Bastek*, Steve WaiChing Sun, Dennis Kochmann
	3:00 - 3:20	W241877 Non-linear dimensionality reduction methods in non-Newtonian fluid mechanics Author(s): Fabio Amaral*, Cassio Oishi, Steven Brunton
	3:20 - 3:40	W240389 Data-driven modeling of complex mechanical components for integration in system-level simulations Author(s): Simon Vanpaemel*, Nathan Kutz, Steven Brunton
1819: Machine learning for design tasks and inverse problems Chair(s): Kazuo Yonekura		
214 Level 2	2:00 - 2:20	W241897 Randomized neural networks for computing inverse parametric PDE problems Author(s): Suchuan Dong*
	2:20 - 2:40	W242032 Understanding agent actions utilizing actor-critic algorithm in deep reinforcement learning Author(s): Rintaro Kai*, Kazuo Yonekura

214 Level 2	2:40 - 3:00	W241585 Multitask representation learning for structural design Author(s): Kohei Shintani*, Yohei Morikuni
	3:00 - 3:20	W240927 Knowledge extraction from time series sensor data using neural network Author(s): Farhad Javid*, Patrick Nadeau, Akmal Bakar, Mehran Ebrahimi, Adrian Humphry, Jesus Rodriguez, Jenmy Zhang, Adrian Butscher, Alex Tessier
1820: Advancing computational mechanics with symbolic regression Chair(s): Karl Garbrecht and Patrick Leser		
216 Level 2	2:00 - 2:20	W240815 Discovering interpretable physical models using Symbolic Regression and Discrete Exterior Calculus Author(s): Simone Manti*, Mohammad Shojaeifard, Mattia Bacca, Alessandro Lucantonio
	2:20 - 2:40	W240667 Improving accuracy, interpretability, and generalizability of stress intensity factor solutions using symbolic regression Author(s): Jonas Merrell*, John Emery, Robert Kirby, Jacob Hochhalter
	2:40 - 3:00	W240661 Developing data-driven dislocation mobility laws for BCC metals Author(s): Nicole Aragon*, David Montes de Oca Zapiain, Eric Rothchild, Hojun Lim
	3:00 - 3:20	W240852 Characterizing the complex deformation of tin using genetic programming to perform symbolic regression Author(s): David Montes de Oca Zapiain*, Nicole Aragon, Matthew Lane, Jay Carroll, Zachary Casias, Corbett Battaile, Saryu Fensin, Hojun Lim
	3:20 - 3:40	W241518 An alternative anisotropic plasticity modeling approach using a surrogate isotropic model and strongly typed-genetic programming-based symbolic regression Author(s): Brian Phung*, David Randall, Karl Garbrecht, Jacob Hochhalter
1825: Physical models and reduced order models augmentation with data for physics-informed machine learning in real-world applications Chair(s): Elias Cueto		
213 Level 2	2:00 - 2:20	W240715 Unveiling bistable stochastic dynamics through physics-infused learning in scarce and noisy data regimes Author(s): Beatriz Moya*, Eleni Chatzi, Francisco Chinesta
	2:20 - 2:40	W240889 Permafrost augmented simulation and forecast using spectral neural networks Author(s): Chady Ghnatios*, Thibault Xavier, Laurent Orgogozo, Francisco Chinesta
	2:40 - 3:00	W242119 Real-time defect detection in structural components: an integrated Machine Learning-enhanced Model Order Reduction and search algorithm approach Author(s): Minyoung Yun*, Mikhael Tannous, Chady Ghnatios, Elvind Fonn, Trond Kvamsdal, Francisco Chinesta
	3:00 - 3:20	W240440 Efficient digital twin of complex material behavior through machine learning-enhanced nonlinear homogenization Author(s): Mikhael Tannous*, Chady Ghnatios, Olivier Castelnau, Pedro Ponte Castañeda, Katell Derrien, Francisco Chinesta
	3:20 - 3:40	W240597 Non-intrusive hyper-reduction for dynamic nonlinear structural finite elements applications Author(s): Davide Fleres*, Daniel De Gregoriis, Onur Atak, Frank Naets

2001: Computational mechanics in Canada and China: Current states of shared scientific interests and opportunities for the future cooperation Chair(s): Jici Wen and Rui Li		
116 Level 1	2:00 - 2:40	W240683 Computational physical mechanics: From advanced materials to Hydrovoltaic Systems Author(s): Wanlin Guo*
	2:40 - 3:00	W241607 Data driven polymer constitutive model based on prior knowledge of mechanics Author(s): Shan Tang*, Xu Guo, Zefeng Yu, Yicheng Lu
	3:00 - 3:20	W240419 Development and analysis of the theory of composite expansion ring under electromagnetic loading Author(s): Zongxing Liu*, Jun Liu
	3:20 - 3:40	W240566 Computational modeling of transport phenomena in fluids at small scales Author(s): Xikai Jiang*
	3:40 - 4:00	W240344 Study on dynamic mechanism of high-speed impact between a liquid wedge and a liquid surface Author(s): Hangfan Xiong*, Wangxia Wu, Honghui Teng

Tuesday July 23 - Technical Session 6

0204: Recent advances in computational fracture mechanics and failure analysis Chair(s): Ayhan Ince		
114 Level 1	4:30 - 4:50	W241092 Adaptive implicit-explicit method for robust and efficient failure analysis Author(s): Xin Lu*, Ryo Higuchi, Tomohiro Yokozeki
	4:50 - 5:10	W241192 A state-of-the-art review on the recent advances of an effective finite element tool for fracture analysis Author(s): Murat Saribay*
	5:10 - 5:30	W241255 An improved hybrid computational mechanics framework for composite damage modelling and simulation Author(s): Heng Liu, Gang Qi*, Il Yong Kim, Diane Wowk
	5:30 - 5:50	W241771 Numerical simulation method for fatigue crack propagation in cladded C(T) test specimen Author(s): Yanlong Li*, Toshio Nagashima
	5:50 - 6:10	W241943 A phase-field fracture model for brittle materials subjected to thermal shocks Author(s): Bo Zeng*, John Dolbow
	6:10 - 6:30	W241971 Evaluation of crack propagation criterion using local approach under extremely low cycle fatigue Author(s): Yoshitaka Wada*
0209: Phase-field models of fracture Chair(s): Blaise Bourdin		
115 Level 1	4:30 - 4:50	W242118 Computational modeling of rate dependent fracture response in soft elastomeric materials Author(s): Paras Kumar*, Miguel Angel Moreno-Mateos, Paul Steinmann
	4:50 - 5:10	W240500 Rate dependency of interfacial and bulk fracture models Author(s): Reza Abedi*, Giang Huynh, Alireza Amirkhizi, Colin Furey, Farhad Pourkamali-Anaraki, Christopher Hansen
	5:10 - 5:30	W240768 Rate-dependent phase-field cohesive theory: A unified model for dynamic crack branching via Eshelby energy-flux integral Author(s): WenLong Xu*, Hao Yu, HengAn Wu
	5:30 - 5:50	W241715 A phase-field approach for the nucleation and propagation of dynamic cracks Author(s): Yangyuanchen Liu*, Oscar Lopez-Pamies, John Dolbow
	5:50 - 6:10	W240060 Electro- and magneto-mechanical coupling modulates fracture in soft multifunctional materials Author(s): Miguel Angel Moreno-Mateos*, Paul Steinmann
0306: Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics and kinetic models Chair(s): Artur Palha		
203 Level 2	4:30 - 4:50	W240287 Distributional complexes and their cohomology: Hessian, divdiv, and elasticity Author(s): Ting Lin*, Kaibo Hu, Qian Zhang, Snorre Christiansen
	4:50 - 5:10	W242208 Mimetic spectral element discretization of continuum mechanics Author(s): Marc Gerritsma*, Revanth Sharma
	5:10 - 5:30	W241206 Coadjoint orbits fluid implicit particles Author(s): Mohammad Sina Nabizadeh*, Ritoban Roy-Chowdhury, Hang Yin, Ravi Ramamoorthi, Albert Chern
	5:30 - 5:50	W240864 Learning metriplectic systems from full and partial state information Author(s): Anthony Gruber*

0311: Recent advances in high-order methods for computational fluid dynamics Chair(s): Brian Helenbrook		
202 Level 2	4:30 - 4:50	W241370 Data-driven shock-capturing indicator for discontinuous Galerkin methods with decision tree classifiers Author(s): Dongseok Kim*, Jayeon Joo, Chongam Kim
	4:50 - 5:10	W241221 An improved flux vector splitting method for characteristic-wise WENO schemes of the Euler equations Author(s): Jianyu Qin*, Yiqing Shen
	5:10 - 5:30	W240315 Adaptive subcell shock-capturing for discontinuous Galerkin methods on supersonic and hypersonic flows Author(s): Taegeon Kim*, Juhyun Kim, Hojun You, Chongam Kim
	5:30 - 5:50	W240977 Discontinuous Galerkin methods for hypersonic flows Author(s): Ngoc-Cuong Nguyen*, R. Loek Van Heyningen, Dominique Hoskin, Jordi Vila-Perez, Wesley Harris, Jaime Peraire
0401: Multiscale computational homogenization for bridging scales in the mechanics and physics of complex materials Chair(s): Tobias Laschütza		
306 Level 3	4:30 - 4:50	W240987 Image-based mesoscopic simulations of alloys Author(s): Bingbing Chen, Chenfeng Li*
	4:50 - 5:10	W241573 Influence of aggregate types on mechanical, thermal, and durability properties of lightweight aggregate concrete Author(s): Sang-Yeop Chung*, Seo-Eun Oh
	5:10 - 5:30	W240602 Generalized Hill-Mandel-condition for dissipative polycrystalline ferroic materials Author(s): Stephan Lange*, Andreas Ricoeur
	5:30 - 5:50	W242608 Stress-strain state of HTSC tapes in SPARC central solenoid Author(s): Sergey Kuznetsov*, Nicoli Ames, Jeremy Adams, Chris Lammi, Alexey Radovinsky, Erica Salazar, Brian LaBombard
	5:50 - 6:10	W240946 A study of continuum-scale stress calculation on finite element method induced by molecular-scale structural transition Author(s): Yuto Terashima*, Paul Brumby, Varvara Kouznetsova, Mayu Muramatsu
0404: Novel mathematical and numerical models for multiphysics and multiscale systems Chair(s): Nicolás Barnafi		
305 Level 3	4:30 - 4:50	W241165 High-order DG methods for the cell-by-cell electroneutral Nernst-Planck framework Author(s): Ada Johanne Ellingsrud*, Miroslav Kuchta
	4:50 - 5:10	W241912 Towards anatomical poromechanical models of the respiratory system for personalized mechanical ventilation in respiratory failure Author(s): Agustin Perez*, Joaquín Araos, Gary Nieman, Nibaldo Avilés-Rojas, Jaime Retamal, Daniel Hurtado
	5:10 - 5:30	W240502 A novel atrial-specific ionic model for stem cells-derived CMs Author(s): Sofia Botti*, Chiara Bartolucci, Michelangelo Paci, Rolf Krause, Luca F. Pavarino, Stefano Severi
	5:30 - 5:50	W242060 An investigation of the fluid structure interaction in articular cartilage across disparate scales Author(s): Emily Butler*, David Head, Mark Walkley, Michael Bryant, Greg de Boer
0416: Space-time modeling of coupled problems Chair(s): Thomas Wick and Philipp Junker		
304 Level 3	4:30 - 4:50	W241346 Space-time finite element geometric multigrid solver for fully dynamic poroelasticity Author(s): Markus Bause*, Mathias Anelmann
	4:50 - 5:10	W241608 Goal oriented error estimation for space-time adaptivity in phase-field fracture Author(s): Viktor Kosin*, Amélie Fau, François Hild, Thomas Wick
	5:10 - 5:30	W241684 Space-time Galerkin finite element discretization and error control for coupled problems Author(s): Thomas Wick*, Philipp Junker, Jan Philipp Thiele, Julian Roth

304 Level 3	5:30 - 5:50	W242059 Space-time modeling of materials with dissipative microstructure evolution via stationary principles Author(s): Philipp Junker*, Thomas Wick
0503: Biomechanics of hard tissues: From experiments and simulations to clinical applications Chair(s): Zohar Yosibash		
122 Level 1	4:30 - 5:10	W240753 The critical impact of anthropometric parameters on fracture gap micro-mechanics - a virtual trial Author(s): Michael Roland*, Stefan Diebels, Bertil Bouillon, Thorsten Tjardes
	5:10 - 5:30	W241324 Influence of soft tissue thickness on the sideways fall models Author(s): Dheeraj Jha*, Alexander Baker, Vee San Cheong, Preeti Gupta, Ecosse. L. Lamoureux, Stephen J. Ferguson, Benedikt Helgason
	5:30 - 5:50	W242447 Computational and experimental characterization of functionally gradient bone tissue scaffolds for complex loading conditions Author(s): Ali Entezari*, Chi Wu, Javad Tavakoli, Joanne Tipper, Qing Li
0508: Imaging and computational methods for biomechanics Chair(s): Xiao-Chuan Cai		
121 Level 1	4:30 - 5:10	W242658 Numerical modeling of the rodent heart and its response to pressure overload Author(s): Vitaly Kheyfets*, Ilham Essafri, Mengqian Zhang, Ella Lyon, Kurt Stenmark, Kenzo Ichimura, Edda Spiekerkoetter
	5:10 - 5:30	W240239 The hemodynamic impact of intracranial arterial stenosis and the clinical implications Author(s): Xinyi Leng*
	5:30 - 5:50	W241903 Characterization of pig vertebrae under axial compression: integrating radiomic techniques and finite element analysis for accurate diagnosis of skeletal system disorders Author(s): Cristian A. Hernández-Salazar, Diego F. Villegas-Bermúdez, Octavio Andrés González-Estrada*
	5:50 - 6:10	W241851 A personalized multiscale model of biventricular cardiac mechanics Author(s): Aaron Brown*, Lei Shi, Matteo Salvador, Fanwei Kong, Vijay Vedula, Alison Marsden
0605: Architected materials and structures Chair(s): Pablo Zavattieri		
112 Level 1	4:30 - 4:50	W241181 Development of an on-lattice kinetic Monte Carlo model for thin film growth via glancing angle deposition technique Author(s): MohammadAli Maleki Bigdeli*, Ahmad Ahmad, Abebaw Jemere, Kenneth Harris, Anter El-Azab, Wylie Stroberg
	4:50 - 5:10	W241805 Modeling of soft multistable structures Author(s): Juan Osorio*, Andres Arrieta
	5:10 - 5:30	W242374 Prestressed nanoarchitected materials Author(s): Amitha Rani Mulastham, Lucas Meza*, John Paul Fallon, Matt Leahy, Caelen Wisont, Robert Verdoes
	5:30 - 5:50	W241926 Predicting the domain of linear elasticity of architected materials - focus on symmetries Author(s): Christelle Combescure*, Marc François, Nicolas Auffray
0706: Advanced model order reduction techniques for computational fluid dynamics Chair(s): Gianluigi Rozza		
218 Level 2	4:30 - 4:50	W240225 Physics informed neural networks in the context of computational fluid dynamics solvers Author(s): Rahul Halder, Gabriele Codega, Giovanni Stabile*, Gianluigi Rozza
	4:50 - 5:10	W240982 Exploring high-dimensional turbulent dynamical systems with AutoEncoders Author(s): Rémi Bousquet*, Didier Lucor, Caroline Nore
	5:10 - 5:30	W242023 Particle-based reduced order modeling of Lagrangian free surface flow using deep learning Author(s): Gen Matono*, Mayuko Nishio

218 Level 2	5:30 - 5:50	W240570 Meta-models predicting gas dynamic performance of a hydrogen re-circulation ejector in a fuel cell system Author(s): Ilyoup Sohn*, Hoyoon Kim, Jihong Jung
0709: Simulations of particle-laden fluid flows Chair(s): Eugenio Oñate and Peter Wriggers		
222 Level 2	4:30 - 4:50	W242075 A world of pure imagination? Understanding the dynamics of vertical stirred mills within chocolate processing Author(s): Daniel Rhymer*, Andy Ingram, Kit Windows-Yule
	4:50 - 5:10	W240845 Equilibrium theory of bidensity particle-laden suspensions in thin-film flow down a spiral separator Author(s): Lingyun Ding, Sarah Burnett*, Andrea Bertozzi
	5:10 - 5:30	W240473 Modelling rock cutting transport by a coupled bonded particle model and CFD Author(s): Simon Larsson*, Albin Wessling
	5:30 - 5:50	W240518 Combining space-filling curves with hybrid parallelization for efficient in-memory load balancing Author(s): Patrick Kopper*, Anna Schwarz, Stephen M. Copplestone, Andrea Beck
	5:50 - 6:10	W240751 The weirdness of soft deformable particles suspended in flows Author(s): Jana Wedel*, Paul Steinmann, Matjaž Hriberšek, Jure Ravnik
0710: Advance modeling and simulation in complex porous media Chair(s): Mostafa S. Shadloo and Leyla Amiri and Ahmad Shakibaeinia		
221 Level 2	4:30 - 4:50	W240503 Pore-scale reactive transport and flow behavior involving dissolution and precipitation in heterogeneous porous media Author(s): Hongkyu Yoon*
	4:50 - 5:10	W242655 An integrated Computational Fluid Dynamics (CFD) - Image Analysis (CFD-IA) to study the fluid flow regimes inside the human meniscal tissue Author(s): Daniel Bell*, Jack Waghorne, Olga Barrera
	5:10 - 5:30	W242667 Application of radial basis functions in an immersed boundary method for parallel CFD simulation Author(s): Olivier Guévremont*, Lucka Barbeau, Vaiana Moreau, Federico Galli, Nick Virgilio, Bruno Blais
	5:30 - 5:50	W241246 A theory of hydrogel mechanics that couples swelling and external flow Author(s): Zelai Xu*, James Feng, Pengtao Yue
	5:50 - 6:10	W241391 Effect of tube-to-particle diameter ratio on the friction factor for airflow inside a packed bed of particles: pore-scale numerical modeling Author(s): Hamidreza Ermagan*, Mostafa Safdari Shadloo, Agus Sasmito, Leyla Amiri
0807: Computational and analytical advances in nonlocal modeling Chair(s): James Scott		
204 Level 2	4:30 - 4:50	W241979 Asymptotically compatible scheme for nonlocal saddle point problems Author(s): Xiaochuan Tian, Zhaolong Han*
	4:50 - 5:10	W242473 Efficient approximation of nonlocal Allen-Cahn equations with the double-obstacle potential Author(s): Olena Burkovska*, Ilyas Mustapha
	5:10 - 5:30	W242489 Fully anisotropic material models in ordinary state-based peridynamics Author(s): Mirco Zaccariotto*, Francesco Scabbia, Ugo Galvanetto
	5:30 - 5:50	W240755 Novel quadratures in continuum-kinematics-inspired peridynamics Author(s): Emely Schaller*, Ali Javili, Paul Steinmann
	5:50 - 6:10	W242460 Cutting-edge node-wise classification for automated region identification in local and nonlocal coupling models Author(s): Noujoud Nader*, Patrick Diehl, Serge Prudhomme, Marta D'Elia, Christian Glusa

204 Level 2	6:10 - 6:30	W242282 The peridigm meshfree peridynamics code: mathematics, numerics, and computation Author(s): David Littlewood, Michael Parks, John Foster, John Mitchell, Patrick Diehl*
0810: Numerical modeling of granular and multiphase flows Chair(s): Shuo Li		
205 Level 2	4:30 - 4:50	W240831 Development of a polyhedral DEM method for simulating the relocation of nuclear fuel during a LOCA. Author(s): Thibault Bessiere*, Serguei Potapov, Philippe Lafon, Antoine Ambard, Farhang Radjai
	4:50 - 5:30	W241258 Development and industrial application of the advanced discrete element method Author(s): Mikio Sakai*
0816: Model order reduction for parametrized continuum mechanics Chair(s): Gianluigi Rozza		
211 Level 2	4:30 - 4:50	W241273 Autoencoder-based gappy data reconstruction algorithm Author(s): Youngkyu Kim*, Youngsoo Choi, Byounghyun Yoo
	4:50 - 5:10	W240331 Derivative-informed DeepONets for high-dimensional parametric PDEs Author(s): Yuan Qiu, Nolan Bridges, Peng Chen*
	5:10 - 5:30	W240382 Implicit neural representations meets interpretable parameterized reduced-order modeling Author(s): Weichao Li, Shaowu Pan*
	5:30 - 5:50	W241633 WLaSDI: Weak-form Latent Space Dynamics Identification Author(s): April Tran*, Xiaolong He, Daniel Messenger, Youngsoo Choi, David Bortz
0831: Modeling and learning of structured dynamical systems Chair(s): Steffen W. R. Werner		
209 Level 2	4:30 - 4:50	W240590 Structure-preserving inference of mechanical systems Author(s): Yevgeniya Filanova*, Igor Pontes Duff, Pawan Goyal, Peter Benner
	4:50 - 5:10	W241946 Modeling time-varying port-Hamiltonian systems Author(s): Karim Cherifi*, Hannes Gernandt, Dorothea Hinsen, Volker Mehrmann, Riccardo Morandin
	5:10 - 5:30	W240187 Positive real balanced truncation model reduction of mechanical systems Author(s): Ines Dorschky, Timo Reis, Matthias Voigt*
	5:30 - 5:50	W241230 Adaptive choice of near-optimal interpolation points for structure-preserving model reduction Author(s): Steffen W. R. Werner*, Quirin Aumann
	5:50 - 6:10	W242309 Estimation of deployment dynamics of a tape-spring boom using rational least-squares fitting Author(s): Deven Mhadgut*, Austin Phoenix, Serkan Gugercin, Jonathan Black
0902: Uncertainty quantification and scientific machine learning for predictive modeling of complex systems Chair(s): Danial Faghihi , Alireza Tabarraei and Kathryn Maupin		
210 Level 2	4:30 - 4:50	W240748 Model parameter identification in simulations of the West African Monsoon with the use of surrogate models Author(s): Matthias Fischer*, Carsten Proppe, Peter Knippertz, Alexander Lemburg
	4:50 - 5:10	W242352 Physics-constrained learning for PDE systems with uncertainty quantified Port-Hamiltonian models Author(s): Kaiyuan Tan*, Peilun Li, Thomas Beckers
	5:10 - 5:30	W241157 Real-time aerodynamic load estimation for hypersonics via strain-based inverse maps Author(s): Julie Pham*, Omar Ghattas, Karen Willcox

210 Level 2	5:30 - 5:50	W241387 DNN modeling of unknown PDE systems Author(s): Zhongshu Xu*, Dongbin Xiu
0912: Bayesian learning of dynamical systems under uncertainties Chair(s): Dominique Poirel and Abhijit Sarkar		
217 Level 2	4:30 - 4:50	W242385 Nonlinear sparse Bayesian learning of semi-empirical models in aeroelasticity and infectious disease modelling Author(s): David Clarabut*, Brandon Robinson, Rimple Sandhu, Mohammad Khalil, Chris Pettit, Dominique Poirel, Abhijit Sarkar
	4:50 – 5:10	W242603 An efficient Bayesian computational method using scalable solvers for stochastic PDEs Author(s): Abhijit Sarkar, Sudhi Sharma*, Pierre Jolivet, Victorita Dolean Maini
	5:10 – 5:30	W242690 Scalable mixture model approximations for nonlinear sparse Bayesian learning Author(s): Brandon Robinson, Mohammad Khalil, Rimple Sandhu, Chris Pettit, Dominique Poirel, Abhijit Sarkar*
1006: Smart structures – Modelling and simulation Chair(s): TBA		
113 Level 1	4:30 - 4:50	W241707 Optimized force manipulation in adaptive truss structures using insights from structural mechanics Author(s): Lisa-Marie Krauß*, Mathias Maierhofer, Achim Menges, Manfred Bischoff
	4:50 - 5:10	W241047 Dynamic displacement recognition of frame structures based on computer vision Author(s): Muyang He*, Jiayi He, Xiaodan Sun
	5:10 - 5:30	W242062 A study on the structural systems with tapered hardening-type hysteresis devices Author(s): Aguri Noda*, Toshio Maegawa, Soma Mitsui, Masamichi Sasatani
	5:30 - 5:50	W241185 Finite Element Modelling of Materially Uniform Dielectric Elastomers Author(s): Mawafag F. Alhasadi*, Ahmed Bayram, Qiao Sun, Salvatore Federico
1101: Modeling and simulation for additive manufacturing Chair(s): Gregory Wagner		
118 Level 1	4:30 - 5:10	W241098 Phase-field simulation of solute segregation in a rapidly solidified Hastelloy-X Ni-based superalloy during laser powder-bed fusion Author(s): Masayuki Okugawa*, Kenji Saito, Haruki Yoshima, Katsuhiko Sawaizumi, Yuichiro Koizumi, Takayoshi Nakano
	5:10 - 5:30	W240324 DECA: Discrete Event inspired Cellular Automata for grain structure prediction in additive manufacturing Author(s): Benjamin Stump*, Alex Plotkowski, James Nutaro
	5:30 - 5:50	W242664 Multiphysics modeling of process–structure–property relationships in metal 3D printing Author(s): Aleksandr Zinoviev*, Olga Zinovieva
	5:50 - 6:10	W242341 A machine learning approach to fast statistical microstructure predictions in laser powder bed fusion with arbitrary process parameters Author(s): Mason Jones*, Jean-Pierre Delplanque, Theron Rodgers, Daniel Moser, Brian Weston
1104: Modeling and simulation of advanced manufacturing processes for metals Chair(s): Matthew Priddy		
117 Level 1	4:30 - 4:50	W240024 Meshfree computational models of metal manufacturing processes: the good, the bad, and the real world Author(s): Mohamadreza Afrasiabi*, Zhilang Zhang, Christof Lüthi, Markus Bambach
	4:50 - 5:10	W241010 DEM simulation to predict the powder bed quality for additive manufacturing processes. Author(s): Olivier Gaboriault*, Roger Pelletier, Louis-Philippe Lefebvre, David Melancon, Bruno Blais
	5:10 - 5:30	W240914 Atomistic simulation of cold spray process for AlCoCrFeNi high-entropy alloy Author(s): Nashit Jalal*, André McDonald, Wylie Stroberg

117 Level 1	5:30 - 5:50	W241180 Research of the simulation accuracy of the ring radial rolling process Author(s): Andrzej Gontarz*, Piotr Surdacki
1301: Mathematical modeling and simulation for social, environmental, and disaster prevention issues Chair(s): Hideki Fujii and Eisuke Kita		
303 Level 3	4:30 - 4:50	W240402 Structure and numerical solution of a thermal problem with imposed internal conditions Author(s): Sergio Zlotnik*, Mariano Tomás Fernández, Pedro Diez
	4:50 - 5:10	W240702 A study on retrofit priority of pipes in sewer network based on disaster resilience Author(s): Tetsuro Goda*, Masaaki Nakano
	5:10 - 5:30	W240986 A numerical investigation of the evolution of tensile strength of oil well cement during curing process Author(s): Zahra Rahmanihamzehkolaei*, Ian Frigaard, Sardar Malek
	5:30 - 5:50	W242050 Computational approach for hydrogen combustion modelling of grain drying machine Author(s): Sams Jarin*, Zhongzheng Wang, Md Imran Hossen Khan, Nawshad Haque, Emilie Sauret
1306: Computational modeling of extreme-loading events Chair(s): Kent Danielson		
302 Level 3	4:30 - 4:50	W241470 Validating 3-axis mechanical shock environments with nonlinear dynamic models Author(s): Tyler Alvis*, Mikhail Mesh
	4:50 - 5:10	W241802 Simulating dynamic material experiments using a lagrangian code in two- and three- dimensions Author(s): Kendra Van Buren*, Saryu Fensin, Anna Llobet
	5:10 - 5:30	W241747 Computational modeling of explosively driven flyer plate experiments in ALEGRA Author(s): Anna Flessner*, Adam Bouma, Mikhail Mesh
	5:30 - 5:50	W241436 Computational modeling of category 5 hurricane loading events on a complex structure Author(s): Andrew Mills*, Joshua Brinkerhoff, Abbas Milani
	5:50 - 6:10	W241809 Simulating thermally induced stresses and the responses to subsequent impulsive loading Author(s): Stephen Beissel*
1403: New trends in topology optimization Chair(s): X. Shelly Zhang		
220 Level 2	4:30 - 5:10	W241682 Reinforcement learning-based topology optimization for adaptive metamaterial using wavelet action space Author(s): Gil Ho Yoon*, Jaemin Jeon, Yoon Young Kim
	5:10 - 5:30	W242039 Data-driven topology optimization for non-relaxed stress minimization problems Author(s): Misato Kato*, Taisei Kii, Kentaro Yaji, Kikuo Fujita
	5:30 - 5:50	W242047 A structural topology optimization method using Physics-Informed Neural Networks based-on KL expansion Author(s): Koutarou Suetake*, Kazuhiro Izui, Kozo Furuta, Shinji Nishiwaki
	5:50 - 6:10	W240894 A reparamerization of topology optimization using PINN and CNN for stress and frequency optimization Author(s): Shengyu Yan*, Jasmin Jelovica
1405: Advances in material model calibration for computational solid mechanics Chair(s): John Emery		
219 Level 2	4:30 - 4:50	W240394 Bayesian optimal experimental design for constitutive model calibration using full-field DIC data Author(s): Denielle Ricciardi*, Daniel Seidl, Brian Lester, Amanda Jones, Elizabeth Jones

219 Level 2	4:50 - 5:10	W240076 Multiscale modeling of active brazing Author(s): Michael Chandross*, Ian Winter, Eric Rothchild, Jaideep Ray, Edward Arata, Ping Lu, Jeffrey Horner, Scott Roberts, David Kemmenoe, Anthony McMaster, Anne Grillet
	5:10 - 5:30	W240569 A calibration strategy for progressive integration of new creep experiments for salt rocks Author(s): Herminio Tasinafo Honorio*, Lambertus J. Sluys, Hadi Hajibeygi
	5:30 - 5:50	W242177 Automated calibration of concrete material model with quasi-static experiments using inverse approach Author(s): Daniel Rios-Estremera*, Jean Santiago-Padilla, Jesse Sherburn, Andreas Frank
	5:50 - 6:10	W240884 Calibration of a rate-dependent concrete material model using high-velocity impact experiments and surrogate-based optimization Author(s): Jean Santiago-Padilla*, William Lawrimore, Jesse Sherburn, Andreas Frank
1602: Recent advances on interfaces dynamics modeling and simulation Chair(s): Huaxiong Huang and Shixin Xu		
224 Level 2	4:30 - 4:50	W240252 How mathematical AI is transforming biosciences Author(s): Guowei Wei*
	4:50 - 5:10	W240423 Droplet coalescence on a sloped cylindrical wire Author(s): Souradip Chattopadhyay, Leyun Feng, Kyoo-Chul Park, Hangjie Ji*
	5:10 - 5:30	W240290 A finite-difference approach for membrane viscosity in capsule dynamics simulations Author(s): Ping Li, Ali Rezghi, Junfeng Zhang*
	5:30 - 5:50	W240910 Droplet dynamics: a phase-field model of mobile charges, polarization, and its leaky dielectric approximation Author(s): Yuzhe Qin*, Huaxiong Huang, Zilong Song, Shixin Xu
	5:50 - 6:10	W240192 Neural networks with local converging inputs (NNLCI) for solving conservation laws and Maxwell's equations in varying domains with greatly reduced complexity and training costs Author(s): Harris Cobb, Haoxiang Huang, Hwi Lee, Yingjie Liu*, Vigor Yang
	6:10 - 6:30	W240196 Neural networks with local converging inputs (NNLCI) for solving PDEs in varying and multi domains with complicated interface conditions Author(s): Zhen Chao, Harris Cobb, Hwi Lee*, Yingjie Liu, Dexuan Xie
1604: Computational fluid dynamics (CFD) and fluid-structure interaction (CFSI): Methods and Applications Chair(s): Georgios Moutsanidis		
223 Level 2	4:30 - 4:50	W241964 Towards robust immersed interface fluid-structure interaction algorithms for complex geometries Author(s): Ebrahim Kolahdouz*, Qi Sun, Michael Facci, David Wells, Boyce Griffith
	4:50 - 5:10	W242347 Accurate and robust mapping algorithms for general multi-physics coupling Author(s): David Brown*, James Thunes, Daniel Williams
	5:10 - 5:30	W240581 A sequential fluid structure interaction analysis of gas slam closure of flapper safety valves Author(s): Allan Zhong, Hadi Arabnejad, Terapat Apichartthabrut, Shengjun Yin*, Shobeir Pirayeh Gar, Junmei Zhang
	5:30 - 5:50	W242354 Accelerating fluid-structure interaction simulations with multi-time-step coupling of implicit-explicit scalar auxiliary variable time integration schemes Author(s): Sun-Beom Kwon*, Arun Prakash

1705: Computational geomechanics Chair(s): Ning Guo, Shiwei Zhao and Ke Gao		
120 Level 1	4:30 - 4:50	W240306 Mapped MPM for soil-structure interactions: capturing sharp gradients with uniform background grids Author(s): Jinhyun Choo*, Yidong Zhao
	4:50 - 5:10	W240173 Signed distance field enhanced virtual element method for large deformation frictional contacts in flexible multi-body systems Author(s): Chuanqi Liu*
	5:10 - 5:30	W240713 Semi-implicit material point method for unsaturated soil with constitutive model depending suction Author(s): Soma Hidano*, Shuji Moriguchi, Kenjiro Terada
	5:30 - 5:50	W241775 Seepage flow simulation using multiple diameter model Author(s): Yasuaki Ono*, Yuichiro Kimura, Kyohei Ueda, Ryosuke Uzuoka
	5:50 - 6:10	W242080 Hyperelastic constitutive models for geomaterials in small strain and finite strain: a review from the aspect of stability Author(s): Yuki Yamakawa*, Akiyoshi Ueda
	6:10 - 6:30	W241297 Practicality investigation of three-dimensional limit equilibrium methods for wide-area landslide prediction Author(s): Daichi Sugo*, Saneiki Fujita, Nilo Dolojan, Kenta Tozato, Reika Nomura, Shuji Moriguchi, Kenjiro Terada
1813: Scientific machine learning for geophysical applications Chair(s): Gianmarco Mengaldo and Rajeev Jaiman and Giovanni Stabile		
215 Level 2	4:30 - 4:50	W241664 Stormer – A state-of-the-art transformer for medium-range weather forecasting Author(s): Troy Arcomano*, Tung Nguyen, Alex Wikner, Matthew Poska, Romit Maulik, Rao Kotamarthi, Aditya Grover
	4:50 - 5:10	W242098 Classification of infrasonic signals of Tatun volcano group with unsupervised machine learning Author(s): Wei-Tze Chang*, Yin-Cherng Lin, Ya-Chuan Lai, Min-Hung Shih, Jye-Hwang Lo, Cheng-Horng Lin Lin, Jen-Yu Han, Chuin-Shan Chen
	5:10 - 5:30	W242509 Fast modeling of postfire debris flows for hazard risk analysis Author(s): Abani Patra*, Palak Patel
1817: Data-driven methods for modeling complex systems Chair(s): Prerna Patil		
212 Level 2	4:30 - 4:50	W241529 Statistical mechanics of dynamical system identification Author(s): Andrei Klishin*, Joseph Bakarji, Nathan Kutz, Krithika Manohar
	4:50 - 5:10	W241373 Data-driven discovery of quantities of interest and their governing equations in complex systems Author(s): Joseph Bakarji*, Nathan Kutz, Steven Brunton
	5:10 - 5:30	W240384 Deep generative modeling for data-driven identification of noisy, non-stationary dynamical systems Author(s): Doris Voina*, Steven Brunton, Nathan Kutz
	5:30 - 5:50	W241862 Data-driven integration of neural, physiological, and behavioral observables through shared latent dynamics Author(s): Ryan Raut*, Zachary Rosenthal, Xiaodan Wang, Adam Bauer, Steven Brunton, Bingni Brunton, J. Nathan Kutz
	5:50 - 6:10	W241712 Recent advances in weak-form equation learning with applications to multiscale phenomena Author(s): Daniel Messenger*
	6:10 - 6:30	W242392 Model identification: a hybrid SINDy-nonlinear Kalman filtering approach Author(s): Luca Rosafalco, Paolo Conti, Andrea Manzoni, Attilio Frangi, Alberto Corigliano, Stefano Mariani*

1819: Machine learning for design tasks and inverse problems Chair(s): Kentaro Yaji		
214 Level 2	4:30 - 4:50	W242041 Data-driven morphogenesis with persistent homology for solving topology optimization problems Author(s): Taisei Kii*, Kentaro Yaji, Hiroshi Teramoto, Kikuo Fujita
	4:50 - 5:10	W241320 Solving distributionally robust shape design problems by learning shape derivatives Author(s): Long Chen*, Nicolas R. Gauger
	5:10 - 5:30	W240880 Material-model calibration for ductile metals using radiographs of high-explosive driven experiments Author(s): Kyle Hickmann*, Skylar Callis, James Carroll, Bryan Kaiser
1820: Advancing computational mechanics with symbolic regression Chair(s): Geoffrey Bomarito		
216 Level 2	4:30 - 4:50	W242493 Equation discovery through genetic programming reflecting the importance of generated terms Author(s): Kenji Ono*, Kanae Shiragami
	4:50 - 5:10	W242535 An open-source benchmark for trustworthy high-dimensional symbolic regression for energetic materials Author(s): Nhon Phan*, Steve WaiChing Sun, John Clayton
	5:10 - 5:30	W240132 Discovery of asymptotic expansions of mechanical problems using symbolic regression Author(s): Rasul Abdusalamov*, Julius Kaplunov, Mikhail Itskov
1825: Physical models and reduced order models augmentation with data for physics-informed machine learning in real-world applications Chair(s): Chady Ghnatios		
213 Level 2	4:30 - 4:50	W241310 Thermodynamics informed Graph Neural Networks for domain dependent problems Author(s): Alicia Tierz*, Icíar Alfaro, David González, Francisco Chinesta, Elías Cueto
	4:50 - 5:10	W241312 Graph neural networks for geometric design of structures in plastic regime Author(s): Mikel Martinez*, Elías Cueto, Francisco Chinesta
	5:10 - 5:30	W241319 On the role of thermodynamics as inductive bias for learned simulators Author(s): Alicia Tierz, Mikel Martinez, Pedro Martins, Francisco Chinesta, Elías Cueto*
	5:30 - 5:50	W241334 Thermodynamics-informed neural networks for super-resolution of fluid-dynamics problems Author(s): Carlos Bermejo-Barbanoj*, Beatriz Moya, Alberto Badías, Francisco Chinesta, Elías Cueto
	5:50 - 6:10	W241579 Thermodynamics-informed graph neural networks for digital human twins Author(s): Lucas Tesán, David González*, Francisco Chinesta, Elías Cueto
2001: Computational mechanics in Canada and China: Current states of shared scientific interests and opportunities for the future cooperation Chair(s): Xikai Jiang		
116 Level 1	4:30 - 5:10	W241502 Optimization method of fiber reinforced plastic (FRP) composite structures Author(s): Zhi Sun*, Xu Guo
	5:10 - 5:30	W241383 Topology optimization design under stiffness, strength, and temperature constraints over a wide range of temperatures Author(s): Qingxuan Meng*, Bin Xu
	5:30 - 5:50	W240144 A domain-independent interaction energy integral in non-homogeneous materials containing complex interfaces under transient thermal loading Author(s): Yanyan Zhang*, Fengnan Guo, Yaoming Fu, Jun Luo, Zengtao Chen

Wednesday July 24 - Technical Session 7

0202: Computational damage and fracture mechanics Chair(s): Michael Brünig		
109 Level 1	9:45 - 10:05	W241835 A systematic metamodeling framework for optimizing energy absorption structures subjected to localized damage Author(s): Edinilson Costa*, Larissa Driemeier
	10:05 - 10:25	W241746 A 1D hybrid beam-shell tube model for progressive cracks in pipelines Author(s): Amalio Coron*, Claude Stolz, Frederic Daude, Philippe Lafon, Serguei Potapov, Thomas Douillet-Grellier
	10:25 - 10:45	W241720 Impact fracture analysis method and its applications to edge chipping of glass Author(s): Sayako Hirobe*, Yousuke Sato, Yoichi Takato, Kenji Oguni
	10:45 - 11:05	W240612 A hierarchical quadrature element method for fracture parameters calculation and crack propagation simulation Author(s): Bo Liu*, Pai Xu, Siqi Jia, Wei Xiang
0204: Recent advances in computational fracture mechanics and failure analysis Chair(s): Xiaosheng Gao		
114 Level 1	9:45 - 10:05	W240178 Application of XFEM using continuum shell elements to damage propagation analyses of CFRP laminate Author(s): Toshio Nagashima*
	10:05 - 10:25	W241061 Lagrange multiplier/cohesive zone (LM/CZ) methods for multiple crack simulations Author(s): Yifang Qin, Shunhua Chen*, Mitsuteru Asai
	10:25 - 10:45	W242124 S-version FEM-based strategy for simulating high-speed crack propagation behaviour in 3D structures Author(s): Tianyu He*, Naoki Morita, Naoto Mitsume, Kazuki Shibanuma
	10:45 - 11:05	W242518 A fast method for computing arbitrary-order Stress Intensity Factor derivatives of 3D Finite Element simulations using Hypercomplex Automatic Differentiation Author(s): Mauricio Aristizabal, Harry Millwater*
	11:05 - 11:25	W242569 On elastic anisotropy of 3D printed acrylonitrile butadiene styrene Author(s): Joseph Marae Djouda*, Ashraf Kasmi, François Hild
	11:25 - 11:45	W242693 How to use statistical Fractography and computational fracture mechanics to understand and model simply and efficiently in-service failures Author(s): Wassim Taleb*, Laurent Ponson
0211: Fracture, damage and failure mechanics of cementitious materials Chair(s): Rena C Yu and Mei Chandler		
115 Level 1	9:45 - 10:25	W240804 Predicting the mechanical properties of concrete materials by multiscale modeling Author(s): Mei Chandler*, Mark Adley, William Lawrimore, Andrew Bowman, Micael Edwards, Robert Moser, Zackery McClelland
	10:25 - 10:45	W241622 Advanced numerical modeling of concrete in meso-scale Author(s): Gianluca Mazzucco*, Beaudin Beaudin, Beatrice Pomaro, Jiangkun Zhang, Valentina Salomoni, Carmelo Majorana
	10:45 - 11:05	W241795 Mesoscale modelling of neutron-irradiated concrete Author(s): Beatrice Pomaro*, Jiangkun Zhang, Gianluca Mazzucco, Beaudin Freinrich Dongmo, Valentina Salomoni, Carmelo Majorana

0301: Isogeometric methods Chair(s): Thomas JR Hughes and Yuri Bazilevs		
203 Level 2	9:45 - 10:25	W242662 A shifted boundary approach to Isogeometric Analysis on trimmed surfaces Author(s): Guglielmo Scovazzi*, Nicolò Antinelli, Rubén Zorrilla, Riccardo Rossi, Ricky Aristio, Roland Wüchner
	10:25 - 10:45	W242449 An overview of advanced isogeometric simulations involving complex geometries Author(s): Alessandro Reali*
	10:45 - 11:05	W241141 Assessing performance in shell analysis: a comparative study of isogeometric and spectral element methods Author(s): Nima Azizi*, Wolfgang Dornisch
	11:05 - 11:25	W242510 Fast space-time isogeometric solvers for thermo-mechanical problems Author(s): Thomas Elguedj*, Joaquin Cornejo-Fuentes, Giancarlo Sangalli, Mattia Tani, Arnaud Duval, David Dureisseix
0310: Current trends and advances in enriched finite element methods and coupled simulations Chair(s): Alejandro M. Aragón and David Noble		
201 Level 2	9:45 - 10:05	W240975 High-order formulations, a posteriori error estimators, and adaptive procedures for the G/XFEM Author(s): Murilo H. C. Bento*, Sergio P. B. Proença, Armando Duarte
	10:05 - 10:25	W240654 Non-intrusive multiscale structural modeling with standard and generalized finite element methods Author(s): Haoyang Li, Javier Avecillas-Leon, Nathan Shauer, Armando Duarte*
	10:25 - 10:45	W241190 Temporal analysis of the generalized finite element method for multi-scale heat transfer problems Author(s): TJ Miller*, Jack McNamara, Patrick O'Hara
	10:45 - 11:05	W241441 Modeling the enhanced geothermal systems using the extended–FEM and an equivalent continuum model Author(s): Amir R. Khoei*, S.M.S. Mortazavi, O. Rezaie Beydokhti, P. Pirmoradi
0311: Recent advances in high-order methods for computational fluid dynamics Chair(s): Per-Olof Persson		
202 Level 2	9:45 - 10:05	W240951 Generalisation of the spectral difference scheme for the diffused-interface five equation model Author(s): Niccolò Tonicello*, Guido Lodato, Matthias Ihme
	10:05 - 10:25	W241454 Implicit shock tracking for high-speed flows with attached shocks Author(s): Matthew Zahr, Alexander Perez*
	10:25 - 10:45	W240352 Spectral difference solutions of two three-dimensional kinematic dynamo problems Author(s): Russell Hankey, Maxwell Stephan, Chunlei Liang*
	10:45 - 11:05	W242521 High-order, structure-preserving schemes for magnetohydrodynamics on GPU architectures Author(s): Joseph Dean*, Garth Wells
0403: Machine learning methods for multiscale and multiphysics material modeling Chair(s): Oliver Weeger		
305 Level 3	9:45 - 10:05	W241602 Parameterized hyperelastic material modeling and multiscale topology optimization with physics-augmented neural network Author(s): Oliver Weeger*, Felix Püsch, Dominik K. Klein, Fabian J. Roth, Kurt Maute
	10:05 - 10:25	W240940 Application of physics-informed operator learning for engineering problems and nonlinear constitutive material behavior Author(s): Shahed Rezaei*, Ahmad Moeineddin, Ali Harandi, Markus Apel, Michael Kaliske, Stefanie Reese
	10:25 - 10:45	W240277 Machine-learning-based asymptotic homogenization and localization considering boundary layer effects Author(s): Xiwei Pan*, Zhengcheng Zhou, Chuang Ma, Shaoshuai Li, Yichao Zhu

305 Level 3	10:45 - 11:05	W240057 A new paradigm for multiphysics and non-linear mechanics modeling: integrated finite element neural networks (I-FENN) Author(s): Mostafa Mobasher*, Panos Pantidis, Diab Abueidda
0415: Multi-physics and multi-scale simulations with the coupling library preCICE Chair(s): Carme Homs Pons and Gerasimos Chourdakis		
304 Level 3	9:45 - 10:25	W241501 A quick introduction to the coupling library preCICE and the minisymposium Author(s): Gerasimos Chourdakis*
	10:25 - 10:45	W241361 Micro manager: a tool for multiscale coupling with preCICE Author(s): Ishaan Desai*, Benjamin Uekermann
	10:45 - 11:05	W242131 Gismo & WaterLily adapters for the preCICE coupling library Author(s): Jingya Li, Hugo M. Verhelst, Marin Lauber*
	11:05 - 11:25	W242589 Overview of multiphysics coupling efforts at LLNL for advanced energy applications Author(s): Jerome Solberg*
0503: Biomechanics of hard tissues: From experiments and simulations to clinical applications Chair(s): Michael Roland		
122 Level 1	9:45 - 10:05	W240041 Prediction of patient-specific knee joint dynamics in tibial fractures Author(s): Elin Theilen*, Anna Rörich, Joachim Georgii, Kaywan Izadpanah
	10:05 - 10:25	W240342 Autonomous finite elements combined with deep learning in orthopedic and endocrinology clinical practice Author(s): Zohar Yosibash*, Nir Trabelsi, Amir Sternheim
	10:25 - 10:45	W240497 Enhancing fracture healing: investigating the role of external factors, including partial weight bearing and rehabilitation, in establishing ideal boundary conditions Author(s): Annchristin Andres*, Michael Roland, Kerstin Wickert, Benedikt Braun, Tina Histing, Stefan Diebels
	10:45 - 11:05	W242221 A Cartesian-mesh stochastic finite element solver to predict bone strength variation Author(s): Saleh Pouresmaeeli*, Pinaki Bhattacharya
	11:05 - 11:25	W240439 Computational studies on the possibility of Mg implants for hard-tissue applications Author(s): Gargi Shankar Nayak*, Michael Roland, Björn Wiese, Norbert Hort, Stefan Diebels
0508: Imaging and computational methods for biomechanics Chair(s): Luca Pavarino		
121 Level 1	9:45 - 10:05	W241368 Monolithic two-level Schwarz preconditioners for micro-macro heterogeneous blood flow Author(s): Martin Lanser*, Axel Klawonn, Natalie Kubicki
	10:05 - 10:25	W241106 Efficiency and accuracy in large-scale cardiac simulations with compressed communication and algebraic adaptivity in BDDC preconditioners Author(s): Fatemeh Chegini*, Martin Weiser
	10:25 - 10:45	W240420 Inexact Newton with learning-based preconditioner for highly nonlinear hyperelasticity problems on three-dimensional unstructured meshes Author(s): Li Luo*
	10:45 - 11:05	W240065 Preconditioned solvers for composite DG discretizations of cardiac cell-by-cell models Author(s): Ngoc Mai Monica Huynh*

0510: Computational mechanobiology of musculoskeletal tissues Chair(s): Richard Weinkamer and Olivia Bruce		
119 Level 1	9:45 - 10:25	W241231 Mechanobiology of bone adaptation in barefoot running Author(s): Julie Kim, Thor Besier, Piaras Kelly, Justin Fernandez*
	10:25 - 10:45	W242043 Modeling targeted bone remodeling and voxel-based computer simulation Author(s): Taiji Adachi*, Tsuyoshi Muto, Youngkwan Kim, Yoshitaka Kameo
	10:45 - 11:05	W241085 The "osteostat": an osteocyte-based theory of bone mechanobiology Author(s): Yves Pauchard*, Pascal Buenzli
	11:05 - 11:25	W240769 Random walk and continuum models for the propagation of bone adaptation signals through the osteocyte network Author(s): Adel Mehrpooya*, Vivien Challis, Pascal Buenzli
	11:25 - 11:45	W242179 Re-orientation over re-alignment: ultrastructural responses of cartilage collagen fibrils to mechanical loading Author(s): Jingrui Hu, Xiaoyuan Gu, Keke Zheng, Benjamin E. Sherlock, Jessica Mansfield, C. Peter Winlove, Junning Chen*
0606: Advanced materials and smart structures: Modeling, simulation and testing Chair(s): Mieczyslaw Kuczma and Peter Wriggers		
112 Level 1	9:45 - 10:25	W240530 Modeling of damage in fiber-reinforced high-performance concrete at low cycle fatigue using a phase-field regularization Author(s): Jörg Schröder*, Mangesh Pise, Dominik Brands
	10:25 - 10:45	W240739 A continuum and computational framework for nonlinear viscoelasticity: beyond the Holzapfel-Simo approach Author(s): Ju Liu*, Jiashen Guan, Chongran Zhao, Jiawei Luo
	10:45 - 11:05	W241075 Design of acoustic metasurfaces for louvers of engine room using topology optimization considering viscosity and temperature boundary layers Author(s): Hiromitsu Emoto*, Takayuki Yamada
	11:05 - 11:25	W240522 Correlation between surface-to-volume ratio of the particle shape and elastic properties of the particulate composites Author(s): Romana Piat*, Pascal Alexander Happ
	11:25 - 11:45	W240622 Numerical evaluation of effective elastic properties of composites with rotationally symmetric particles by a surrogate model Author(s): Pascal Alexander Happ*, Romana Piat
0607: Modeling and inverse design of architected materials Chair(s): Charles Dorn		
110 Level 1	9:45 - 10:25	W241365 Modelling symmetry breaking and geometric frustration in bistable kirigami for on-target anisotropic morphing Author(s): Damiano Pasini*, Chuan Qiao, Filippo Agnelli, Deepak Pokkalla, Nicholas D'Ambrosio
	10:25 - 10:45	W240202 Mechanics of 3D intertwined lattices Author(s): Konstantinos Karapiperis*, Dennis Kochmann
	10:45 - 11:05	W240448 Mechanics of quasi-periodic two-dimensional truss metamaterials Author(s): Matheus Inguaggiato Nora Rosa*, Konstantinos Karapiperis, Kaoutar Radi, Dennis Kochmann
0708: Fluid dynamics and SciML: Navigating challenges and seizing opportunities Chair(s): Andrea Beck		
221 Level 2	9:45 - 10:05	W240901 Utilizing supervised machine learning to enable dynamic adaptive subgrid modeling for multiscale hybridized formulations Author(s): Tim Wildey*
	10:05 - 10:25	W242142 Mesh motion with scientific machine learning Author(s): Ottar Hellan*

221 Level 2	10:25 - 10:45	W241129 Tackling temporal domain complexity to effectively train PINNs for unsteady flows past moving bodies Author(s): Rahul Sundar*, Didier Lucor, Sunetra Sarkar
	10:45 - 11:05	W241626 Active control of fluid-structure interaction systems using deep reinforcement learning Author(s): Mosayeb Shams, Ahmed H. Elsheikh*
0709: Simulations of particle-laden fluid flows Chair(s): Sergio Idelsohn and Peter Wriggers		
222 Level 2	9:45 - 10:05	W240817 Analysis of density-based cell-sorting microfluidic devices using a stabilized finite element method Author(s): Guillermo Casas*, Aniol Sala, Eugenio Oñate
	10:05 - 10:25	W240830 A finite element based unresolved CFD-DEM method for highly dense particle flows Author(s): Joaquín González-Usúa*, Guillermo Casas, Ignasi De-Pouplana, Eugenio Oñate
	10:25 - 10:45	W242174 Large-scale fluid simulations of suspension of deformable capsules in toroidal tube Author(s): Satoshi Ii*, Kazuyasu Sugiyama, Shigeho Noda, Takeharu Matsuda, Xiaobo Gong
	10:45 - 11:05	W242247 Applications of a multi-resolution and multiphase mesh-free particle method to granular gravity-driven flows Author(s): Herman Siaben Musumari, Mojtaba Jandaghian, Ahmad Shakibaeinia*
	11:05 - 11:25	W240818 An analytical model for the analysis of density-based cell-sorting microfluific devices in combination with traditional numerical approaches Author(s): Aniol Sala*, Guillermo Casas, Eugenio Oñate
	11:25 - 11:45	W240532 Numerical analysis of soil erosion with material point method and non-conforming rigid line modeling Author(s): Anthony Flores*, Luis Zambrano, Bill Davids
0803: Advance and application of meshfree methods Chair(s): Tsung-Hui (Alex) Huang		
205 Level 2	9:45 - 10:25	W240253 Integrating deep energy methods in thermoelasticity and piezoelectricity Author(s): Kuan-Chung Lin*, Kuo-Chou Wang, Cheng-Hung Hu
	10:25 - 10:45	W240296 Constrained interpolation from scattered data with radial basis functions Author(s): Jason Torchinsky*, Arjun Sharma, Peter Bosler
	10:45 - 11:05	W240943 A VC/non-VC coupled material point method for structural fragmentation problems with phase field method Author(s): Harshal Tangade*, Cameron Rodriguez, Tsung-Hui Huang
	11:05 - 11:25	W241164 Urban flood mapping using SPH method and precipitation data based on LiDAR data Author(s): Mehrad Artkeli Farahani*, François Morency, Sacha Leprêtre
	11:25 - 11:45	W241322 Application of boundary integral quadrature method to a circular torsion bar with an edge crack Author(s): Jia-Wei Lee*, Yu-Sheng Hiesh, Jeng-Tzong Chen
0804: Advanced multiscale and adaptive numerical methods for non-linear solids Chair(s): Isabell Ramiere and Frédéric Lebon		
113 Level 1	9:45 - 10:05	W240835 Automatic multilevel mesh refinement formalism for linear and nonlinear solid mechanics Author(s): Daria Koliesnikova*, Isabelle Ramiere, Frédéric Lebon
	10:05 - 10:25	W240656 Adaptive mesh algorithm for frictional contact problems based on a posteriori error analysis Author(s): Ilaria Fontana*, Daniele Antonio Di Pietro
	10:25 - 10:45	W240727 Parallel node-to-surface strategy for 3D contact mechanics problems with adaptive mesh refinement Author(s): Alexandre Epalle, Isabelle Ramiere, Guillaume Latu, Frédéric Lebon*
	10:45 - 11:05	W240449 Hybrid high-order methods for time-dependent, coupled elasto-acoustic wave propagation Author(s): Romain Mottier*, Alexandre Ern, Laurent Guillot

113 Level 1	11:05 - 11:25	W240385 On modeling micro-scale strain gradient elastic adhesively bonded joints Author(s): Michele Serpilli*, Raffaella Rizzoni, Frédéric Lebon, Maria Letizia Raffa, Reinaldo Rodrìguez-Ramos
	11:25 - 11:45	W240796 Accurate multiscale solutions to quasi-stationary thermal problems involving a heterogeneous heat source Author(s): Isabelle Ramiere*, Louis Belgrand, Frédéric Lebon
0807: Computational and analytical advances in nonlocal modeling Chair(s): Nojoud Nader		
204 Level 2	9:45 - 10:05	W240353 Nonlocal boundary value problems with local boundary conditions Author(s): James Scott*, Qiang Du
	10:05 - 10:25	W241102 Comparing two nonlocal biharmonic operators Author(s): Nicole Buczkowski*, Mikil Foss, Michael Parks, Petronela Radu, Jeremy Trageser
	10:25 - 10:45	W241356 Accurate absorbing boundary conditions for two-dimensional peridynamics Author(s): Gang Pang*, Xavier Antoine
	10:45 - 11:05	W242542 Efficient nonlocal-to-local coupling Author(s): Shuai Jiang*, Christian Glusa
0809: Finite element techniques for wave simulations Chair(s): Nilima Nigam		
206 Level 2	9:45 - 10:05	W242321 A pseudo-differential sweeping method for the Helmholtz equation using high order spectral elements Author(s): Sebastian Acosta, Jesse Chan, Raven Johnson*, Benjamin Palacios
	10:05 - 10:25	W242009 Symplectic Hamiltonian Hybridizable Discontinuous Galerkin Methods for linearized shallows-water equations Author(s): Manuel Sanchez*, Cristhian Nunez
	10:25 - 10:45	W242270 Time-stepping for nonlinear biological tissues: is first order enough? Author(s): Javier Almonacid*, Nilima Nigam
	10:45 - 11:05	W241223 Modelling of seismic waves using a decoupled discrete-time grid-wave propagation model Author(s): Andrea Marti*, Carlos E. Ventura, José R. Martí
	11:05 - 11:25	W241837 Full waveform modeling in seismic exploration based on a digital geological model using spectral element method on GPU Author(s): Anatoly Vershinin*, Ampilov Yury, Vladimir Levin, Konstantin Petrovsky, Ivan Priezhev, Yan Stein
	11:25 - 11:45	W242429 Approximation of acoustic black holes with a stress-velocity formulation and corrected with artificial neural networks Author(s): Ramon Codina*, Arnau Fabra, Oriol Guasch, Joan Baiges
0816: Model order reduction for parametrized continuum mechanics Chair(s): Matthew Zahr		
211 Level 2	9:45 - 10:05	W242329 Physics-constrained Gaussian process variational autoencoder Author(s): Thomas Beckers*
	10:05 - 10:25	W241564 Weak-form Gaussian Process-based Latent Space Dynamics Identification Author(s): Margaret Trautner*, Xiaolong He, April Tran, Youngsoo Choi, David Bortz
	10:25 - 10:45	W240489 Thermodynamics-informed latent space dynamics identification (tLaSDI) for reduced-order modeling of dynamical systems Author(s): Jun Sur Park*, Siu Wun Cheung, Youngsoo Choi, Yeonjong Shin
	10:45 - 11:05	W240618 Physics-aware deep autoencoders for model order reduction Author(s): Stephen Baek, Shahab Azarfar, H.S. Udaykumar, Zoe Gray*

0824: Modern structure-preserving methods for PDEs Chair(s): Brendan Keith		
208 Level 2	9:45 - 10:05	W240408 High-order bounds-satisfying approximation of partial differential equations via finite element variational inequalities Author(s): Robert Kirby*, Daniel Shapero
	10:05 - 10:25	W240475 De Rham compatible neural network FEM Author(s): Marcello Longo, Joost Opschoor, Nico Disch, Christoph Schwab, Jakob Zech*
	10:25 - 10:45	W241525 A structure-preserving matrix-free finite element method Author(s): Svetlana Tokareva*, Steven Walton, Nathaniel Morgan
	10:45 - 11:05	W240388 Scalable optimal control for inequality-constrained discretizations of conservation laws Author(s): Pavel Bochev, Denis Ridzal, Falko Ruppenthal*, Dmitri Kuzmin
0825: Efficient numerical methods for CFD and FSI simulations Chair(s): Pasquale Claudio Africa and Michele Girfoglio		
218 Level 2	9:45 - 10:05	W240349 Open-source high-order resolved CFD-DEM for non-spherical particle-laden flow Author(s): Lucka Barbeau, Bruno Blais*
	10:05 - 10:25	W240346 The Internodes method for the solution of PDEs in multidomain settings featuring non-conforming interfaces Author(s): Paola Gervasio*
	10:25 - 10:45	W241563 On the iterative solution of saddle point problems using a symmetric positive definite preconditioner Author(s): Philippe Devloo*, Giovane Avancini, Marina Meneghel
	10:45 - 11:05	W242475 Comparing preconditioning strategies for the implicit formulation of the Immersed Boundary method Author(s): Cole Gruninger*, Boyce Griffith
0834: Physics-informed machine learning for numerical modelling in engineering and science Chair(s): YuanTong Gu and Charith Rathnayaka and Jinshuai Bai		
209 Level 2	9:45 - 10:05	W240567 Computational mechanics enhanced by physics and deep learning Author(s): Jinshuai Bai*, Xi-Qiao Feng, YuanTong Gu
	10:05 - 10:25	W242049 Adaptive weight tuning of physics-informed neural networks with hard boundary condition imposition for fast and accurate inverse analysis Author(s): Shota Deguchi*, Mitsuteru Asai
	10:25 - 10:45	W242382 Novel topology optimization framework using physics-informed neural network Author(s): Hyogu Jeong*, Jinshuai Bai, Yubo Chen, YuanTong Gu
	10:45 - 11:05	W242516 Physics-informed machine-learning solution of nonlinear partial differential equations using the Kolmogorov-Arnold representation Author(s): Mikhail Poluektov*
0839: Numerical approaches and discretization techniques for the geometrically nonlinear analysis of slender structures Chair(s): Antonio Madeo and Giovanni Zucco		
207 Level 2	9:45 - 10:25	W241534 Theoretical developments on a kinematically-exact rod model for thin-walled members with cross-sectional deformation and finite strains Author(s): Marcos Pires Kassab, Eduardo de Morais Barreto Campello*, Adnan Ibrahimbegovic
	10:25 - 10:45	W241548 A kinematically-exact reduced-order rod model for elastoplastic failure in thin-walled members Author(s): Marcos Pires Kassab*, Eduardo de Morais Barreto Campello, Adnan Ibrahimbegovic

207 Level 2	10:45 - 11:05	W240957 Hinge and smoothed-hinge models for cloth simulation Author(s): Qixin Liang*, K.Y. Sze
	11:05 - 11:25	W242472 Characterizing cyclic inelastic behavior of angle members: a modified hysteretic model Author(s): Yiwen Li*, Songye Zhu
0909: Innovations in machine learning-enhanced uncertainty quantification for computational mechanics Chair(s): Geoffrey Bomarito and Denielle Ricciardi		
210 Level 2	9:45 - 10:05	W240546 Methods for generating interpretable yield surface models with UQ based on data with multiple sources of uncertainty Author(s): Donovan Birky*, Karl Garbrecht, John Emery, Craig Hamel, Geoffrey Bomarito, Patrick Leser, Jacob Hochhalter
	10:05 - 10:25	W240808 Probabilistic calibration of expensive models using efficiently trained surrogates Author(s): Patrick Leser*, Joshua Fody
	10:25 - 10:45	W241571 Likelihood-free inference of dynamical systems with model uncertainty Author(s): Nick Galioto*, Alex Gorodetsky
	10:45 - 11:05	W242028 Implementing uncertainty quantification calibration when predicting fall parameters of impact-induced skull fractures in infants Author(s): Jacob Hirst*, Brian Phung, Bjorn Johnsson, Brittany Coats, Ashley Spear
	11:05 - 11:25	W242319 Expansion of Deep Material Network for woven composite thermal conductivity homogenization Author(s): Dongil Shin*, Peter Creveling, Scott Roberts, Remi Dingreville
0912: Bayesian learning of dynamical systems under uncertainties Chair(s): Mohammad Khalil and Kathryn Maupin		
217 Level 2	9:45 - 10:05	W242034 Sparse Bayesian learning for the optimal selection of nested models with both time-varying and time-invariant parameters Author(s): Brandon Robinson*, Philippe Bisaillon, Rimple Sandhu, Mohammad Khalil, Chris Pettit, Dominique Poirel, Abhijit Sarkar
	10:05 - 10:25	W241328 Bayesian optimal design of pulsed power experiments Author(s): Kathryn Maupin*, Chris Jennings
	10:25 - 10:45	W242389 Sparse Bayesian neural networks for nonlinear time series prediction: tackling overfitting and uncertainty quantification Author(s): Nastaran Dabiran*, Brandon Robinson, Rimple Sandhu, Mohammad Khalil, Dominique Poirel, Abhijit Sarkar
	10:45 - 11:05	W242387 Comparing parameter estimation outcomes between physics informed neural networks and Bayesian methods Author(s): Michael Pantano*, Brandon Robinson, Jodi D. Edwards, Tetyana Kendzerska, Abhijit Sarkar, Nastaran Dabiran
1101: Modeling and simulation for additive manufacturing Chair(s): Michael Stender		
118 Level 1	9:45 - 10:05	W241021 Modelling for 4D printing of Phase Transforming Cellular mechanical metamaterial Author(s): Sosuke Kanegae, Hayato Nagayama, Saki Morimoto, Masayuki Okugawa, Yuichiro Koizumi*
	10:05 - 10:25	W240470 Numerical investigation on the strength of bi-material joint fabricated by wire arc additive manufacturing Author(s): Muhammad Irfan*, Yun-Fei Fu, Shalini Singh, Osezua Ibhadode, Ahmed Qureshi
	10:25 - 10:45	W241049 Prediction of deposition efficiency in Cold Spray Additive Manufacturing using multiphysics and multiscale computational modelling, data-driven model and experimental validations Author(s): Zhi-Qian Zhang*, Te Ba, Debbie Hwee Leng Seng, Jisheng Pan, Zheng Zhang

118 Level 1	10:45 - 11:05	W242298 Efficient and accurate thermomechanical modeling of fused filament fabrication process Author(s): Satyajit Mojumder*, Wing Kam Liu
	11:05 - 11:25	W240896 How do structure and material affect mechanical strength of additively manufactured bone scaffolds? Author(s): Venus Savaliya*, Zhongpu (Leo) Zhang, Chunhui (Richard) Yang, Kejun Dong, Qing Li
1202: Modeling mechanics of materials with voids Chair(s): Matt Lewis and Gary Gladysz		
111 Level 1	9:45 - 10:05	W241661 Modeling the effect of backbone instabilities and guest occupancies on interfacial and structural processes and dynamics of sII gas hydrate systems using molecular dynamics Author(s): Samuel Mathews*, Phillip Servio, Alejandro Rey
	10:05 - 10:25	W240157 Void and helium bubble interactions with dislocations in an fcc stainless steel alloy: anomalous hardening and void cross-slip locking Author(s): Ryan B. Sills, Xiaowang Zhou*, Michael E. Foster
	10:25 - 10:45	W242123 Enhanced mechanical behavior of nickel-coated graphene graphene reinforced CoCrFeMnNi nanolayered composites Author(s): Junhao Guan, Xia Zhou, Guohui Qu, George Bao*
	10:45 - 11:05	W241944 Mechanics of network glasses: generation, deformation, elementary events and their prediction Author(s): Franz Bamer*, Somar Shekh Alshabab, Zhao Wu, Baghiashri Bachhav, Bernd Markert, Michael Falk
	11:05 - 11:25	W241446 Investigating evolution of voids in Al2219 using 3D characterization and crystal plasticity simulations Author(s): Hojun Lim*, Philip Noell, Matthew Vaughan, Andrew Polonsky, John Emery, Kyle Johnson
	11:25 - 11:45	W240832 A stable hyperelastic model for foamed rubber over a large range of porosity Author(s): Matt Lewis*
1306: Computational modeling of extreme-loading events Chair(s): Michael Puso and Stephen Beissel		
302 Level 3	9:45 - 10:25	W241453 Exploring momentum enhancement in Eulerian and Lagrangian computations of hypervelocity impact including the dart-dimorphos impact Author(s): James Walker*, Sidney Chocron, Stephen Beissel, Christopher Sorini, Donald Grosch, Daniel Durda, Simone Marhci
	10:25 - 10:45	W242614 An assessment of the applicability of modern RKPM methods towards simulation of concrete under extreme events Author(s): Dominic Wilmes*, Michael Hillman, Joseph Magallanes
	10:45 - 11:05	W240886 A comparison of the combined-particle element method and the general particle algorithm in EPIC for application to concrete penetration Author(s): Jesse Sherburn*, Jean Santiago-Padilla, Andreas Frank
	11:05 - 11:25	W241738 Impact simulations of conventional strength concrete using explicit polyhedral aggregate morphologies Author(s): William Lawrimore*, Andrew Bowman
	11:25 - 11:45	W242689 Numerical model of a steel end-plate moment connection using a novel cyclic loading protocol Author(s): Jorge Pi Luco, Sergio Yanez*, Miguel Medalla Riquelme, Juan Carlos Pina, Carlos Felipe Guzmán
1310: Towards predictive digital twins: Innovative algorithms for physics-, data-assisted and hybrid modeling Chair(s): Vasileios Tsiolakis, Matteo Giacomini and Giovanni Stabile		
303 Level 3	9:45 - 10:05	W242446 Patient-specific atherosclerotic analysis supporting medical decision making Author(s): Pedro Diez*, Stephan Gahima, Marco Stefanati, Jose Felix Rodriguez-Matas, Alberto Garcia-Gonzalez
	10:05 - 10:25	W241364 Compressive stocking optimization for lymphedema treatment at lower-limb Author(s): Aratz Garcia Llona*, Miquel Aguirre, Francesc Verdugo, Stéphane Avril
	10:25 - 10:45	W242281 A new approach to combine physics-based and data-driven models using a localised trustworthiness metric Author(s): Lars Bogaerts*, Augustin Persoons, Matthias Faes, David Moens

303 Level 3	10:45 - 11:05	W240015 Reducing uncertainty in digital twin models: using data consistent inversion to build population-informed priors for Bayesian inference Author(s): Rebekah White*, John Jakeman, Tim Wildey, Troy Butler
	11:05 - 11:25	W240547 Bayesian learning of reduced-order operators with Gaussian processes Author(s): Shane McQuarrie*, Mengwu Guo, Anirban Chaudhuri
1403: New trends in topology optimization Chair(s): Emílio Carlos Nelli Silva		
220 Level 2	9:45 - 10:25	W240106 PEM fuel cell topology optimization with a pseudo 3D model Author(s): Luís F. N. Sá*, Fereshteh Razmara, Julio Meneghini, Emilio Carlos Nelli Silva
	10:25 - 10:45	W242222 Exploration of microstructures with negative thermal expansion coefficients using topological derivatives Author(s): Masaki Noda*, Takayuki Yamada
	10:45 - 11:05	W242165 Topology optimization in magnetic field using high-frequency homogenization method Author(s): Sunghoon Lim*, Kazuhiro Izui, Seungjae Min, Shinji Nishiwaki
	11:05 - 11:25	W240606 Shape and topology optimization of composite compliant mechanisms activated by piezoceramics Author(s): André Piva Romeu, Juliano Fagundes Gonçalves, Ignacio Iturrioz, Daniel M. De Leon*
	11:25 - 11:45	W241388 Computational design of 2D and 3D nanostructures Author(s): Daniela Damasceno*, Renato Sanches, Rene Rodriguez, Alexsandro Kirch, Julio Meneghini, Caetano Miranda, Emilio Carlos Nelli Silva
1405: Advances in material model calibration for computational solid mechanics Chair(s): Tom Seidl		
219 Level 2	9:45 - 10:05	W241458 An equation error approach for direct inversion from full-field wave data Author(s): Olalekan Babaniyi*, Mobina Ghorbaninejad
	10:05 - 10:25	W241500 An in silico approach for safety pharmacology studies on vascular tissue Author(s): Sara Costa Faya*, Callan Wesley, Marina Vidrascu, Miguel A. Fernández, Pieter-Jan Guns, Damiano Lombardi
	10:25 - 10:45	W240133 Unveiling full-field modulus and stress using digital image correlation Author(s): Joseph Kirchhoff*, Dingcheng Luo, Thomas O'Leary Roseberry, Zixiang Tong, Jin Yang, Omar Ghattas
	10:45 - 11:05	W241212 Learning the optimal parameters governing confluent tissues to shape their emergent properties Author(s): Alessandro Pasqui*, Hervé Turlier
	11:05 - 11:25	W241596 An approach integrating signed distance functions with the adjoint method to estimate tissue material properties using clinical imaging data Author(s): Elaheh Mehdizadeh, Amin Pourasghar, Timothy Wong, Arvind Hoskoppal, John Brigham*
	11:25 - 11:45	W242415 Identifying material parameters of principal stretch-based hyperelastic models with the virtual fields method Author(s): Mingliang Jiang*, Zhujiang Wang
1602: Recent advances on interfaces dynamics modeling and simulation Chair(s): Hangjie Ji and Shixin Xu		
224 Level 2	9:45 - 10:05	W240100 A simple model for simulating vesicle expanding and shrinkage Author(s): Shuwang Li*, Steve Wise, Xiaoxia Tang
	10:05 - 10:25	W240238 Data-driven modeling of Alzheimer's disease Author(s): Wenrui Hao*

224 Level 2	10:25 - 10:45	W240462 General numerical framework to derive structure preserving reduced order models for thermodynamically consistent reversible-irreversible PDEs Author(s): Zengyan Zhang, Jia Zhao*
	10:45 - 11:05	W242485 Rotation-induced traumatic brain injury: a fluid mechanical study Author(s): Jiaqi Zhang*, Qifu Wang, David Bates, James Feng, Pengtao Yue, Qianhong Wu
	11:05 - 11:25	W242212 Contact representations in reduced interface models Author(s): Ali Raoofian*, Xu Dai, Jozsef Kovecses
1608: Fluid-structure interaction: Methods and applications Chair(s): Marcela Cruchaga and Sergio Ricci		
223 Level 2	9:45 - 10:25	W240834 A finite-element based method for the interaction of fluids with evolving bedforms Author(s): Jorge Molina*, Pablo Ortiz
	10:25 - 10:45	W240626 Applications of the particle finite element method for 3D fluid-structure interactions and multiphysics simulations Author(s): Martin Lacroix*, Simon Février, Eduardo Fernandez, Luc Papeleux, Romain Boman, Jean-Philippe Ponthot
	10:45 - 11:05	W242549 On the number of subproblem iterations per coupling step and monitoring convergence in partitioned fluid-structure interaction simulations Author(s): Norbert Hosters*, Thomas Spenke, Nicolas Delaissé, Joris Degroote
	11:05 - 11:25	W240964 Numerical modelling of fragment and blast loaded concrete structures using massively-parallel coupled CFD-CSD techniques Author(s): Orlando Soto*, Joseph Baum, Rainald Lohner
1705: Computational geomechanics Chair(s): WaiChing Sun and Craig Foster and Chuanqi Liu		
120 Level 1	9:45 - 10:05	W241949 Modelling of soil-root interactions in geomechanics with the G-PFEM Author(s): Josep Maria Carbonell*, Lluis Monforte, Laurin Hauser, Marcos Arroyo
	10:05 - 10:25	W240719 Investigation of geotribological behaviour in the soil-pile interface considering clay based on numerical and laboratory investigations Author(s): Sascha Henke*, Philipp Wiesenthal
	10:25 - 10:45	W240359 Stabilized unfitted finite element method for hydro-mechanical coupling with weak discontinuity Author(s): Yimin Zhang, Yuxin Tong, Fanke Wu, Yongliang Wang, Zhijun Liu*
	10:45 - 11:05	W240488 Seismic damage analysis of underground frame structures with Peridynamics Author(s): Wei Sun*
	11:05 - 11:25	W242289 Hydromechanical constitutive tensor and instability analysis of partially saturated geomaterials via a discrete element approach Author(s): Mojtaba Farahnak*, Richard Wan, François Nicot, Mehdi Pouragha
1803: Enabling technologies for digital twins: Model reduction and scientific machine learning Chair(s): Alvaro Coutinho, Gianluigi Rozza and Alessandro Reali		
214 Level 2	9:45 - 10:25	W242400 Surrogate models for stroke optimization in parameterized flows Author(s): Matteo Giacomini, Antonio Huerta*
	10:25 - 10:45	W240356 Engineering Software 2.0 for digital twin: unification of training, calibrating, and learning through kernel interpretation of neural networks Author(s): Sourav Saha*, Wing Kam Liu
	10:45 - 11:05	W241748 Accelerating physics simulations with libROM Author(s): Siu Wun Cheung*

214 Level 2	11:05 - 11:25	W240552 Real-time high-fidelity algorithms for extreme-scale bayesian inverse problems involving shift-invariant systems Author(s): Sreeram Venkat*, Stefan Henneking, Milinda Fernando, Omar Ghattas
	11:25 - 11:45	W242479 Projection-based model order reduction of environmental flows using FEM-based variational multiscale method Author(s): Sujal Dave*, Artem Korobenko
1811: Advanced machine learning methods for multiscale modeling Chair(s): Chuin-Shan (David) Chen		
215 Level 2	9:45 - 10:05	W240390 Deep material networks for unified computational multi-scale modeling of the highly non-linear behavior of short fiber-reinforced polymers Author(s): Fabian Welschinger*, Argha Protim Dey, Matti Schneider, Thomas Böhlke
	10:05 - 10:25	W241647 Graph-enhanced deep material network for multiscale materials with multiple microstructures Author(s): Tung-Huan Su*, Jimmy Gaspard Jean, Szu-Jui Huang, Chuin-Shan Chen
	10:25 - 10:45	W242255 Mechanistic machine learning-based multiscale material modeling of metal materials Author(s): Dandan Lyu*, Yuxi Xie, Haoyan Wei, Wei Hu, C.T. Wu
	10:45 - 11:05	W241093 Advancing multiscale modeling in polycrystalline materials: a novel Deep Material Network approach Author(s): Ting-Ju Wei*, Chuin-Shan Chen
1817: Data-driven methods for modeling complex systems Chair(s): Joseph Bakarji		
212 Level 2	9:45 - 10:25	W240366 Hierarchical shrinkage Gaussian processes: applications to computer code emulation and dynamical system recovery Author(s): Simon Mak*
	10:25 - 10:45	W241814 Constrained optimization of sensing in nuclear reactors under uncertainty Author(s): Niharika Karnik*, Mohammad Abdo, Krithika Manohar
	10:45 - 11:05	W240627 Data-driven functional networks for complex response analysis Author(s): Charlotte Geier*, Norbert Hoffmann
	11:05 - 11:25	W242071 Time delay embeddings to disentangle unstable periodic orbits in chaotic attractors Author(s): Prerna Patil*, Eurika Kaiser, Nathan Kutz, Steven Brunton
	11:25 - 11:45	W242314 A python toolbox for Bayesian learning of Port-Hamiltonian Systems Author(s): Peilun Li*, Kaiyuan Tan, Thomas Beckers
1825: Physical models and reduced order models augmentation with data for physics-informed machine learning in real-world applications Chair(s): Beatriz Moya		
213 Level 2	9:45 - 10:05	W240264 Physics-informed neural networks for blood flow inverse problems Author(s): Jeremias Garay*, Jocelyn Dunstan, Sergio Uribe, Francisco Sahli Costabal
	10:05 - 10:25	W240437 A new loss function for efficient learning of parametric physics informed neural networks Author(s): Hiroki Kamada*, Shinya Yamamoto, Hideyuki Sakurai, Mayuko Nishio, Yu Otake
	10:25 - 10:45	W240650 Adaptive online learning with physics-informed neural networks for enhanced thermal prediction in metal additive manufacturing Author(s): Pouyan Sajadi*, Mostafa Rahmani Dehaghani, Yifan Tang, Gary Wang
	10:45 - 11:05	W241015 A novel integration of 1D blood flow equations with Physics-Informed Graph Neural Networks for arterial pulse wave propagation prediction with in vivo validation Author(s): Ahmet Sen*, Elnaz Ghajar-Rahimi, Miquel Aguirre, Laurent Navarro, Craig Goergen, Stéphane Avril

213 Level 2	11:05 - 11:25	W242033 Physics-informed machine learning for solving the time-dependent 2D compressible Navier-Stokes equations in the evolution of the protoplanetary disks Author(s): Shunyuan Mao, Weiqi Wang*, Ruobing Dong, Kwang Moo Yi, Lu Lu, Sifan Wang, Paris Perdikaris
1828: Machine learning for large scale models in physics Chair(s): Charbel Farhat		
216 Level 2	9:45 - 10:05	W240812 CROM: continuous reduced-order modeling of PDEs using implicit neural representations Author(s): Peter Yichen Chen*, Maurizio Chiaramonte, Eitan Grinspun, Kevin Carlberg
	10:05 - 10:25	W240317 A nonlinear reduced basis approximation of discrete contact problems in crowd motion Author(s): Giulia Sambataro*, Virginie Ehrlacher
	10:25 - 10:45	W240744 Elasticity based mesh deformation technique and application to reduced order modelling Author(s): Abbas Kabalan*, Fabien Casenave, Felipe Bordeu, Virginie Ehrlacher, Alexandre Ern
	10:45 - 11:05	W242027 Exploring Riemann solvers, machine learning surrogates, and shock tracking in hyperbolic PDE systems Author(s): Akshay Thakur*, Matthew Zahr
	11:05 - 11:25	W240968 Deep reinforcement learning-based flow optimization for improved wind resilience of solar panel arrays Author(s): Theodore Michel*, Philippe Meliga, Elie Hachem
2001: Computational mechanics in Canada and China: Current states of shared scientific interests and opportunities for the future cooperation Chair(s): Shan Tang and Zhi Sun		
116 Level 1	9:45 - 10:25	W242067 Recent progress in reactive diffusion modelling for flexible bioelectronic systems Author(s): Rui Li*
	10:25 - 10:45	W240345 Investigation of cavitation bubble dynamics near a solid wall with pre-set bubble by three-phase sharp-interface method Author(s): Tianyang Qiao*, Wangxia Wu, Honghui Teng
	10:45 - 11:05	W240181 Data-driven multiscale finite element simulation and its applications in lithium ions batteries Author(s): Jici Wen*, Qingrong Zou, Yujie Wei

Wednesday July 24 - Technical Session 8

0202: Computational damage and fracture mechanics Chair(s): Larissa Driemeier		
109 Level 1	2:00 - 2:20	W240034 Numerical analysis of damage and failure behavior of anisotropic aluminum sheets undergoing biaxial loading Author(s): Michael Brünig*, Sanjeev Koirala, Steffen Gerke
	2:20 - 2:40	W242265 Lip-field regularization of second-order anisotropic damage mechanics models Author(s): Bruno Masseron, Giuseppe Rastiello*, Rodrigue Desmorat, Nicolas Moes
	2:40 - 3:00	W242386 A CDM-like constitutive law combined with Tresca yield function to predict shear-lip fracture along with strain localization Author(s): Yuichi Shintaku*, Reiya Tao, Kenjiro Terada
	3:00 - 3:20	W242173 Crack propagation simulation using damage model and finite cover method Author(s): Hirofumi Sugiyama*, Shigenobu Okazawa
	3:20 - 3:40	W240741 On the modeling of damage in rubber-toughened amorphous polymers accounting for cavitation and shear yielding Author(s): A. Francisca Carvalho Alves*, Bernardo P. Ferreira, Francisco Andrade Pires
	3:40 - 4:00	W242139 Anisotropic gradient-enhanced eikonal damage formulation with evolving non-local interactions for modeling quasi-brittle failure Author(s): Breno Ribeiro Nogueira*, Giuseppe Rastiello, Cédric Giry, Fabrice Gatuingt, Carlo Callari
0211: Fracture, damage and failure mechanics of cementitious materials Chair(s): Beatrice Pomaro and Rena C Yu		
115 Level 1	2:00 - 2:20	W240651 Modelación de rótulas plásticas en elementos estructurales de concreto reforzado - Reforzado-modeling of plastic hinges in reinforced concrete structural elements Author(s): Marlyn Arantza Muñoz Moscoso*, Jairo Andres Paredes Lopéz, Daniel Bedoya-Ruíz
	2:20 - 2:40	W240782 Numerical modeling of anisotropic damage behavior in concrete using gradient enhancement of tensile and compressive internal variables Author(s): Athira Vadakkekkara*, Ursula Kowalsky
	2:40 - 3:00	W241656 Calibration of damage parameters of super high-rise frame-core structural subsystem under torsional ground motion Author(s): Zhuang Guo, Yingchang Ma, Zheng He*
	3:00 - 3:20	W241239 Quantification of contributions on plastic shrinkage crack with evaluation of bleeding and evaporation Author(s): Hyun-Kyoung Kim*, Hyo-Gyoung Kwak
0301: Isogeometric methods Chair(s): Alessandro Reali and Yuri Bazilevs		
203 Level 2	2:00 - 2:20	W241986 A comparative study of assumed-strain locking treatments for NURBS-based discretizations Author(s): Hugo Casquero*
	2:20 - 2:40	W240521 Mixed isogeometric methods for Hodge–Laplace problems induced by second-order Hilbert complexes Author(s): Jeremias Arf*, Bernd Simeon
	2:40 - 3:00	W241725 Isogeometric shape sensitivity analysis considering tangential divergence of non-smooth boundary in boundary approach Author(s): Keun-Hyeong Ko*, Hyun-Seok Kim, Seonho Cho
0310: Current trends and advances in enriched finite element methods and coupled simulations Chair(s): C. Armando Duarte		
201 Level 2	2:00 - 2:20	W242525 Accelerating fracture mechanics simulations through model order reduction with enriched reduction spaces Author(s): Konstantinos Agathos*

201 Level 2	2:20 - 2:40	W240839 A discontinuity-enriched finite element method for modeling fracture growth in brittle materials Author(s): Alejandro Aragón*, Jujian Zhang, Yuheg Yang
	2:40 - 3:00	W242405 A low diffusion verified Conforming Transient h-r Unstructured Adaptive Mesh Refinement (cThruAMR) method for coupled interface problems Author(s): David Noble*
	3:00 - 3:20	W241512 Multiscale modeling of localized damage in Ceramic Matrix Composite structures with the Generalized Finite Element Method Author(s): Bryce Mazurowski, Patrick O'Hara*, Armando Duarte
0311: Recent advances in high-order methods for computational fluid dynamics Chair(s): Per-Olof Persson		
202 Level 2	2:00 - 2:40	W242594 Half-closed Discontinuous Galerkin discretisations Author(s): Yulong Pan*, Per-Olof Persson
	2:40 - 3:00	W240857 Efficient high-order entropy-stable discretizations of the Euler and Navier-Stokes equations on simplicial elements Author(s): Zelalem Arega Worku*, Jason Hicken, David Zingg
	3:00 - 3:20	W242249 Nonlinearly stable high-order methods for wall-bounded flows Author(s): Julien Brillon*, Siva Nadarajah
	3:20 - 3:40	W242085 A finite element framework with global divergence-free constraints for non-stationary non-linear Navier-Stokes equations Author(s): Jan Jaśkowiec*, Sławomir Milewski
0403: Machine learning methods for multiscale and multiphysics material modeling Chair(s): Oliver Weeger		
305 Level 3	2:00 - 2:20	W241067 Microstructure-based finite element modeling of the strain-rate-dependent mechanical behavior of additively manufactured alumina ceramics: towards coupling multiscale modeling and data-driven approaches Author(s): Zahra Zaiemyekeh*, Saman Sayahlatifi, Dan L Romanyk, James Hogan
	2:20 - 2:40	W241070 Microstructure-informed data-driven modeling of mechanical behavior of cold-sprayed additively manufactured metal-ceramic composites Author(s): Saman Sayahlatifi*, Zahra Zaiemyekeh, André McDonald, James Hogan
	2:40 - 3:00	W241260 Statistical-Physics-Informed Neural Networks (Stat-PINNs): coarse-graining dissipative evolution from particle dynamics Author(s): Shenglin Huang*, Zequn He, Nicolas Dirr, Johannes Zimmer, Celia Reina, Huajian Gao
0415: Multi-physics and multi-scale simulations with the coupling library preCICE Chair(s): Gerasimos Chourdakis and Ishaan Desai		
304 Level 3	2:00 - 2:20	W240749 Speed up the multi-scale simulations with preCICE and MicroManager: results presented for a porous-media flow Author(s): Jun Chen*, Ishaan Desai, Mathis Kelm, Miriam Schulte, Benjamin Uekermann
	2:20 - 2:40	W241655 Flexible macro-micro coupling for spatial simulation of the liver Author(s): Steffen Gerhäusser*, Lena Lambers, Luis Mandl, Ishaan Desai, Benjamin Uekermann, Matthias König, Tim Ricken
	2:40 - 3:00	W241399 A coupled two-muscle-one-tendon model of the agonist-antagonist myoneural interface Author(s): Carme Homs Pons*, Miriam Schulte
	3:00 - 3:20	W242268 Assessment of flow-induced stresses in spiral weld pipes with bends Author(s): Shahab Ahmadizade*, Suyash Verma, Arman Hemmati

0503: Biomechanics of hard tissues: From experiments and simulations to clinical applications Chair(s): TBA		
122 Level 1	2:00 - 2:20	W240652 Development and validation of an open-source QCT-based finite element analysis and phase field modeling for fracture prediction in goat tibia Author(s): Debangshu Paul*, Zachariah Arwood, Pierre-Yves Mulon, Dayakar Penumadu, Timothy Truster
	2:20 - 2:40	W241057 Biomechanic simulations of fracture non-unions can determine the need to address osteosynthesis stability during revision surgery – a clinical study and finite element analysis Author(s): Benedikt Braun*, Tina Histing, Kerstin Wickert, Annchristin Andres, Stefan Diebels, Michael Roland
	2:40 - 3:00	W240732 Evolution of biomechanical simulations: virtual reconstruction of generated fractures Author(s): Kerstin Wickert*, Michael Roland, Annchristin Andres, Stefan Diebels
	3:00 - 3:20	W240577 Effects of the ligaments on vertebrae and material properties of discs during the S2AI surgery for scoliosis: a finite element study Author(s): Ying-Hsuan Huang*, Chaung-Sian Yang, Chi-Kuang Feng, Jing-Jing Fang, Chung-De Chen
0508: Imaging and computational methods for biomechanics Chair(s): Rongliang Chen		
121 Level 1	2:00 - 2:20	W240878 Computational approach to non-invasively assess velocity in arteries from CT perfusion imaging Author(s): Anahita Abbasnejad Seresti*, Muhammad Owais Khan
	2:20 - 2:40	W241308 Influence evaluation of flow diverter stent parent vessel coverage on cerebral aneurysm through the CFD-DEM coupling simulation Author(s): Yoshio Ohkura*, Dai Watanabe, Ryo Taniguchi, Soichiro Yamani, Hiroyuki Takao
	2:40 - 3:00	W240495 Controlling enzyme orientation for optimal electron transfer on bioelectrode surfaces through electric field modulation: insights from molecular dynamics investigation. Author(s): Taeyoung Yoon*, Sungsoo Na
	3:00 - 3:20	W242583 Patient-specific in vivo estimation of basilar arterial local wall deformation and stiffness using a novel imaging-IGA computational approach Author(s): Jaemin Kim*, Michael Sacks, Kaiyu Zhang, Gador Canton, Niranjan Balu, Kenneth Meyer, Reza Saber, Chun Yuan, David Paydafar
	3:20 - 3:40	W240422 A free software application for one-click stress computation of abdominal aortic aneurism Author(s): Mostafa Jamshidian*, Adam Wittek, Karol Miller
0510: Computational mechanobiology of musculoskeletal tissues Chair(s): Pascal Buenzli and Yves Pauchard		
119 Level 1	2:00 - 2:20	W240350 How osteons form: a quantitative hypothesis-testing analysis of cortical pore filling and wall asymmetry Author(s): Solene Hegarty-Cremer*, Xenia Borggard, Christina Andreasen, Bram van der Eerden, Matthew Simpson, Thomas Andersen, Pascal Buenzli
	2:20 - 2:40	W240698 Integrating osteoblast mechanics and behaviours in a discrete cell-based mathematical model for bone tissue formation Author(s): Shahak Kuba*, Matthew Simpson, Pascal Buenzli
	2:40 - 3:00	W240444 COMMBINI: a novel in silico approach to study mechano-biological regulation of inflammation in bone fracture healing Author(s): Edoardo Borgiani*, Gabriele Nasello, Liesbet Geris
	3:00 - 3:20	W242185 Modeling bone mineralization as a reaction-diffusion system Author(s): Giacomo Rossato*, Mahdi Ayoubi, Peter Fratzl, Angelo Valleriani, Richard Weinkamer
	3:20 - 3:40	W242683 In silico modeling of intramembranous and endochondral ossification using fuzzy logic Author(s): Pieter Ansoms*, Jos Vander Sloten, Liesbet Geris

0606: Advanced materials and smart structures: Modeling, simulation and testing Chair(s): Michael Kaliske and Jörg Schröder		
112 Level 1	2:00 - 2:20	W242558 Self-healing concrete composites: modeling and experiments Author(s): Mieczyslaw Kuczma*, Alireza Tabrizikahou, Marcin Wysokowski, Isaac Agbamu, Magdalena Lasecka-Plura, Jan Bialasik, Peter Wriggers
	2:20 - 2:40	W240802 Effect of long-term sea water exposure on dielectric materials Author(s): Eugenia Stanisauskis Weiss*, Eric Warner, Valentina Rossell-Olmos
	2:40 - 3:00	W241825 Stabilization of large deformation analysis for a nonreciprocal gel under cylindrical indentation Author(s): Shoma Nonogaki*, Seishiro Matsubara, So Nagashima, Dai Okumura
	3:00 - 3:20	W240707 Metastructures with shunted piezoelectric patches Author(s): Jung-San Chen*, Yu-Siang Huang, You-Kuan Su
	3:20 - 3:40	W242626 Multi-objective optimization of piezoelectric energy harvesters for power generation and sensing in structural health monitoring Author(s): Shuai Yao*, Elena Atroshchenko, Mehrisadat Makki Alamdari, Andres Felipe Calderon Hurtado
	3:40 - 4:00	W241875 Image-based feedback control of temporary pedestrian bridges using neutral equilibrium mechanisms Author(s): Ming-Hsiang Shih*, Martin Ghienne, Wen-Pei Sung, Shih-Heng Tung, Shih-Yu Chu, Victor Corvest, Tristan L'Horset
0607: Modeling and inverse design of architected materials Chair(s): Kostas Karapiperis and Matheus Rosa		
110 Level 1	2:00 - 2:20	W240284 Ray tracing for inverse design of graded metamaterial waveguides Author(s): Charles Dorn*, Dennis Kochmann
	2:20 - 2:40	W242272 Identifying wave polarization and bandgaps in periodic architected materials Author(s): Maria Carrillo-Munoz*, Bhisham Sharma
	2:40 - 3:00	W240836 Efficient design and simulation of nonlinear metastructures using maximally-localized Wannier functions Author(s): Sima Zahedi Fard*, Parisa Omidvar, Paolo Tiso, Marc Serra Garcia
	3:00 - 3:20	W240047 Inverse design toward exact static and dynamic behaviors Author(s): Kshiteej Deshmukh, Yunya Liu, Fei Chen, Bolei Deng, Pai Wang*
	3:20 - 3:40	W240191 Towards zero-power speech recognition: implementing machine-learning models in mechanical structures Author(s): Saeed Zohoori*, Finn Bohte, Théophile Louvet, Sima Zahedi Fard, Marc Serra Garcia
	3:40 - 4:00	W242111 Optimizing structures through generative artificial intelligence: case study on a cantilever beam made of different materials Author(s): Lorenzo Miele, Luca Lomazzi, Rafael Junges, Marco Giglio, Francesco Cadini*
0708: Fluid dynamics and SciML: Navigating challenges and seizing opportunities Chair(s): Didier Lucor		
221 Level 2	2:00 - 2:20	W240973 Toward discretization-consistent closure schemes for Large Eddy Simulation using reinforcement learning Author(s): Andrea Beck*, Marius Kurz
	2:20 - 2:40	W240665 Physics-informed data-driven RANS framework for wall-bounded flows: A priori and a posteriori validation Author(s): Jiayi Cai*, Pierre-Emmanuel Angeli, Guillaume Damblin, Didier Lucor
	2:40 - 3:00	W241485 Conditional neural field-based latent diffusion model for stochastic generation of spatiotemporal turbulence Author(s): Pan Du, Meet Hemant Parikh, Xiantao Fan, Xin-Yang Liu, Jianxun Wang*
	3:00 - 3:20	W242436 Application of autoencoder-based Deep Operator Network (DeepONet) to production-scale chemically reacting Computational Fluid Dynamics simulations Author(s): Bryan Susi*, Somdatta Goswami, Ameya Jagtap, Hessam Babaee, George Karniadakis

221 Level 1	3:20 - 3:40	W241427 Spatial neural ODEs for modeling blood flow in stenosed arteries with deformable walls Author(s): Hunor Csala*, Arvind Mohan, Daniel Livescu, Amirhossein Arzani
0709: Simulations of particle-laden fluid flows Chair(s): Sergio Idelsohn and Peter Wriggers		
222 Level 2	2:00 - 2:20	W240166 Particle response to shear-induced lift in two-way coupled turbulent channel flow Author(s): Yucang Ruan, Zuoli Xiao*
	2:20 - 2:40	W241940 A hybrid lattice Boltzmann approach for particle-laden flows with the presence of fouling layers Author(s): Hugo Tavares*, Luca Moriconi, Juliana Loureiro
	2:40 - 3:00	W240104 Empirically modeling ionospheric electron density variations using F107 , E107 and MgII indices based on scatter radar observations over Lagos, Nigeria. Author(s): Christopher Adeogun*
0809: Finite element techniques for wave simulations Chair(s): Robert Haber		
206 Level 2	2:00 - 2:20	W241741 A new numerical method for scalar eigenvalue problems in heterogeneous, dispersive, sign-changing materials Author(s): Martin Halla, Thorsten Hohage, Florian Oberender*
	2:20 - 2:40	W240379 Analysis of waveguide problems with impedance boundary conditions Author(s): Leszek Demkowicz*, Norbert Heuer, Jay Gopalakrishnan
	2:40 - 3:00	W241612 Computation of leaky modes of microstructured optical fibers Author(s): Jay Gopalakrishnan*
	3:00 - 3:20	W241503 Flexible infinite elements for Digital Twin development of unbounded vibro-acoustic models Author(s): Davide Bizzarri*, Onur Atak, Hadrien Beriot, Sjoerd van Ophem
	3:20 - 3:40	W240061 Developing and analyzing a novel unconditionally stable explicit finite element method for the electromagnetic rotation cloak model Author(s): Yunqing Huang, Jichun Li*, Bin He
	3:40 - 4:00	W241804 Fast multiple scattering analyses in reduced spatial dimensions Author(s): Tahsin Khajah*, Sebastian Acosta
0816: Model order reduction for parametrized continuum mechanics Chair(s): Youngsoo Choi		
211 Level 2	2:00 - 2:20	W240883 Calibration of stochastic agent based models with Gaussian process surrogates and Stein variational inference Author(s): Connor Robertson*, Jaideep Ray, Cosmin Safta
	2:20 - 2:40	W240915 Physics-based manifold representation using diffusion model for computational multiscale structural problems Author(s): Hyejin Kim*, Seongwoo Cheon, Haeseong Cho
	2:40 - 3:00	W240948 Efficient derivative-free optimization of structures operating in coupled fluid-solid environments Author(s): Aditya Narkhede*, Noah Eilers, Kevin Wang, Xingsheng Sun
	3:00 - 3:20	W242410 On an efficient parametric PGD solver for damped elastodynamics optimization Author(s): Clément Vella*, Pierre Gosselet, Serge Prudhomme

0824: Modern structure-preserving methods for PDEs Chair(s): Denis Ridzal		
208 Level 2	2:00 - 2:20	W240222 Neural Galerkin schemes that can preserve Hamiltonians and other quantities Author(s): Paul Schwerdtner*, Philipp Schulze, Jules Berman, Benjamin Peherstorfer
	2:20 - 2:40	W240062 An adaptive moments-based interface reconstruction using intersection of the cell with one half-plane, two half-planes and a circle Author(s): Mikhail Shashkov*
	2:40 - 3:00	W240869 Energy and entropy stable high-order cut discontinuous Galerkin methods Author(s): Christina Taylor*, Jesse Chan, Lucas Wilcox, Akil Narayan
	3:00 - 3:20	W240476 Topological methods for model order reduction for scalar transport equations Author(s): Pavel Bochev, Candace Diaz*, Denis Ridzal
0825: Efficient numerical methods for CFD and FSI simulations Chair(s): Girfoglio Michele and Pasquale Claudio Africa		
218 Level 2	2:00 - 2:20	W240086 A depth averaged material point method for fast flow-like landslides and mudflows Author(s): Luca Formaggia*, Marco Fois, Carlo de Falco, Simona Perotto
	2:20 - 2:40	W240513 Lagrange multiplier approaches for the finite element approximation of interface problems Author(s): Lucia Gastaldi*, Daniele Boffi, Luca Heltai
	2:40 - 3:00	W240919 Numerical analysis of evolve filter relax reduced order models (ERF-ROMs) Author(s): Jorge Reyes*, Maria Strazzullo, Traian Iliescu, Claudio Canuto
0839: Numerical approaches and discretization techniques for the geometrically nonlinear analysis of slender structures Chair(s): Antonio Madeo and Giovanni Zucco		
207 Level 2	2:00 - 2:20	W242132 A mixed nonlinear isogeometric plate formulation employing dual basis functions Author(s): Lisa Stammen*, Wolfgang Dornisch
	2:20 - 2:40	W240953 A consistently linearized stochastic finite element formulation for geometric nonlinear composite shallow shells Author(s): Lukas Panther*, Werner Wagner, Steffen Freitag
	2:40 - 3:00	W242536 A feasible numerical model for an analysis of a pipe-lay on a rough seafloor Author(s): Pavel Trapper*
	3:00 - 3:20	W242226 A mixed hexahedral solid-shell element with self-equilibrated stresses for the nonlinear static analysis of shell structures Author(s): Antonio Madeo*, Francesco Salvatore Liguori, Giovanni Zucco, Giovanni Garcea
0909: Innovations in machine learning-enhanced uncertainty quantification for computational mechanics Chair(s): Patrick Leser and Jacob Hochhalter		
210 Level 2	2:00 - 2:20	W240405 Quantification of fabrication-related uncertainties in TPMS lattices with image processing and surrogate modeling Author(s): Waris Khan*, Ece Naz Erulker, Gullu Kiziltas, Pinar Acar
	2:20 - 2:40	W241100 Multiscale modeling and simulation platform for predicting cold dwell fatigue in Ti alloys Author(s): Tawqeer Tak*, Kishore Appunhi Nair, Shravan Kotha, Adam Pilchak, Somnath Ghosh
	2:40 - 3:00	W242184 Uncertainty reduction with multi-model Monte Carlo for crystal plasticity simulations of additively manufactured metals Author(s): Joshua Pribe*, Patrick Leser, Saikumar Yeratapally, George Weber, Edward Glaessgen
	3:00 - 3:20	W241637 Multi-fidelity modeling for uncertainty quantification of a ratcheting mechanism Author(s): David Najera*, Robert Kuether
	3:20 - 3:40	W240789 Enabling probabilistic microweather predictions through deep generative modeling and operator learning Author(s): James Warner*, Geoffrey Bomarito, Patrick Leser, Paul Leser

0913: Data-enhanced multi-model uncertainty quantification and experimental design of complex computational systems Chair(s): Gianluca Geraci and Alex Gorodetsky		
217 Level 2	2:00 - 2:20	W242411 Group estimators for multifidelity sampling Author(s): Michael Eldred*, Alex Gorodetsky, John Jakeman, Gianluca Geraci
	2:20 - 2:40	W241569 Adaptive covariance estimation for multi-fidelity optimization Author(s): Thomas Coons*, Aniket Jivani, Xuan Huan
	2:40 - 3:00	W241521 A multi-fidelity strategy for optimization under uncertainty with robust constraints Author(s): Thomas Dixon*, Alex Gorodetsky
	3:00 - 3:20	W241247 Sample efficient estimation of rare-event probabilities with Gaussian processes and normalizing flows Author(s): Ashwin Renganathan*, Annie Booth
1004: Numerical modelling of composite materials and structures Chair(s): Georgios Stavroulakis and Jean-Marc Cadou and Georgios Drosopoulos		
118 Level 1	2:00 - 2:40	W240787 Numerical study of forced vibrations of flax-epoxy composite structures with a perturbation method. Author(s): Jean-Marc Cadou*, Laetitia Duigou, Khaoula Chikhaoui, Vincent Couillard, Yann Guevel, Mathias Ziapkoff
	2:40 - 3:00	W240616 Modeling of woven ceramic matrix composites using an embedded fibers approach Author(s): Anthony Vassalié*, Guillaume Couégnat, Sébastien Denneulin
	3:00 - 3:20	W240861 A layered solid finite element formulation with interlaminar enhanced displacements for the modeling of laminated composite structures Author(s): Miklos Zoller*, Brian Giffin
	3:20 - 3:40	W240309 Prediction of the failure behavior of pseudo-ductile composites using a micro-mechanical finite element model Author(s): Sayyed Behzad Abdellahi*, Fatemeh Azhari, Phu Nguyen
	3:40 - 4:00	W240493 Static bending response of sandwich composite plates by using C0 element based on higher-order refined zigzag theory Author(s): Pei-Yu Wang*, Chung-De Chen
1107: Computational co-design of part geometry and material properties for metal additive manufacturing Chair(s): Morad Behandish and Adrian Lew		
117 Level 1	2:00 - 2:20	W241931 Material-integrated design optimization through probabilistic property discovery Author(s): Amir Mirzendehdel*, Anurag Bhattacharyya, Adrian Lew, Morad Behandish
	2:20 - 2:40	W240689 Integrating material selection with topology optimization of multi-alloy structures via neural networks Author(s): Saketh Sridhara*, Krishnan Suresh
	2:40 - 3:00	W241465 Generative ai design of multi-material rotors for high-performance propulsion applications Author(s): Zachary Cordero, Cyril Picard*
	3:00 - 3:20	W241693 Design for material properties of additively manufactured metals using topology optimization Author(s): Vibhas Mishra, Can Ayas*, Matthijs Langelaar
	3:20 - 3:40	W241714 Topology optimization of thermal-elastic structures: co-design of geometry and functionally graded material Author(s): Stefan Knapik*, Shiguang Deng, Liwei Wang, Wing Kam Liu, Wei Chen
	3:40 - 4:00	W241985 Optimal path planning for LPBF as an Equality Generalized Traveling Salesperson Problem Author(s): Adrian Lew*, Gradey Wang, Eric Darve

1310: Towards predictive digital twins: Innovative algorithms for physics-, data-assisted and hybrid modeling Chair(s): Vasileios Tsiolakis, Matteo Giacomini and Giovanni Stabile		
303 Level 3	2:00 - 2:40	W242318 Hybrid finite-element / neural-operator modeling of ice-sheet dynamics Author(s): Mauro Perego*, QiZhi He, John Jakeman
	2:40 - 3:00	W240681 Development of an extended chemical reactor neural network for modeling reactors with time-varying temperature Author(s): Katleya Medrano, Tatsurou Yashiki*, Mutsuki Koga, Naoki Hosoda, Yohei Yamaguchi, Atsuya Shimokawa, Ryuichi Suzuki, Ryoichi Aikawa, Kunugi Kondo
	3:00 - 3:20	W241822 Fast prediction of cluster interaction tensors through data-driven surrogate modeling Author(s): Bernardo P. Ferreira*, Max S. Kukkola, Miguel Bessa
	3:20 - 3:40	W242209 A digital twin framework for civil engineering structures Author(s): Matteo Torzoni, Marco Tezzele*, Stefano Mariani, Andrea Manzoni, Karen Willcox
1602: Recent advances on interfaces dynamics modeling and simulation Chair(s): Shixin Xu		
224 Level 2	2:00 - 2:20	W241384 Improved accuracy for regularized line delta sources Author(s): Jane Shaw MacDonald*, Nilima Nigam, John M Stockie
	2:20 - 2:40	W240378 A second-order hybrid IIM-PFEM method for two-dimensional moving contact line problems Author(s): Zhen Zhang*
	2:40 - 3:00	W241358 Numerical analysis of wrinkle transformation due to water surface tension Author(s): Rikuto Ohta*, So Nagashima, Seishiro Matsubara, Dai Okumura
	3:00 - 3:20	W242692 Energetic variational neural network discretizations of gradient flows Author(s): Zhiliang Xu*, Yiwei Wang, Chun Liu
1608: Fluid-structure interaction: Methods and applications Chair(s): Marcela Cruchaga and Norbert Hosters		
223 Level 2	2:00 - 2:20	W241195 The importance of experimental validation in FSI problems: recent aero-servo-elastic tests at large POLIMI's wind tunnel Author(s): Sergio Ricci*
	2:20 - 2:40	W240494 Assumption bulging frequency of the real scale tank by micro-tremor measurement and the eigenvalue analysis Author(s): Shu Hirai*, Taisuke Ono, Hirokazu Hirano, Naotsugu Sato
	2:40 - 3:00	W242161 An Updated Lagrangian particle Hydrodynamics (ULPH) - Non-ordinary State-based Peridynamics coupling approach for modeling fluid-structure interaction problems Author(s): Xin Lai*, Zhen Wang, Shaofan Li, Junsong Xiong, Lisheng Liu, Xiang Liu, Jun Sun
	3:00 - 3:20	W242328 Numerical simulation of fluid-structure interaction with many rigid bodies Author(s): Mario Storti, Julián Medina, Esteban Zamora, Facundo Inzeo, Laura Battaglia, Marcela Cruchaga*
	3:20 - 3:40	W241533 Research on convergence and optimal parameters of inertial relaxed LBM for fluid and solid simulations Author(s): Guangcai Gong*, Ziche Gong
1803: Enabling technologies for digital twins: Model reduction and scientific machine learning Chair(s): Alvaro Coutinho, Gianluigi Rozza and Alessandro Reali		
214 Level 2	2:00 - 2:20	W241942 Conceptual design for predictive digital twins: concepts, tools, and techniques to ensure fitness for purpose Author(s): Michael Kapteyn*, Karen Willcox
	2:20 - 2:40	W240788 Uncertainty estimation of Fourier Neural Operators as surrogates for CO2 storage simulation Author(s): Fernando Rochinha*, Alvaro Coutinho, Rômulo Silva, Rodolfo Freitas, Gabriel Barros, Ezequiel Santos

214 Level 2	2:40 - 3:00	W241697 Computational mechanics and scientific machine learning for digital twins in critical infrastructure protection Author(s): Alexander Popp*, Tarik Sahin, Jacopo Bonari, Max von Danwitz
	3:00 - 3:20	W242396 A modularized workflow for surrogate modeling of turbidity currents Author(s): Gabriel F. Barros*, Roberto M. Velho, Adriano M. A. Côrtes, Jose J. Camata, Fernando Rochinha, Alvaro L. G. A. Coutinho
	3:20 - 3:40	W241629 Incremental tensor decompositions for building efficient digital twins Author(s): Doruk Aksoy*, Alex Gorodetsky
1811: Advanced machine learning methods for multiscale modeling Chair(s): Chuin-Shan (David) Chen		
215 Level 2	2:00 - 2:20	W241118 A compact quantum machine learning framework predicting properties of complex materials Author(s): Hsu-Kai Cheng, Po-Yu Yang, Chun-Wei Pao*
	2:20 - 2:40	W241646 Advancing stability in deep learning: exploring the superiority of SqrResNet in function interpolation, computer graphics, and PDE problem-solving Author(s): C-S David Chen*, Amir Noorizadegan, Kenji Kawaguchi, Der-Liang Young
	2:40 - 3:00	W240313 Nonparametric material model-based FEA with GPU for faster and accurate numerical analysis Author(s): Hyunseung Chung*, Hyo-Gyoung Kwak
	3:00 - 3:20	W242017 Biomechanics analysis based on high-resolution live micro-CT images in the rat temporomandibular joint Author(s): Chia Chun Chen*, Nien-Ti Tsou, Ding-Han Wang
1817: Data-driven methods for modeling complex systems Chair(s): Doris Voina		
212 Level 2	2:00 - 2:20	W241079 Artificial intelligence in dam engineering Author(s): Leandro Flach*
	3:00 - 3:20	W242322 Data-driven models in viscoelastic fluid flows Author(s): Cassio Oishi*, Steven Brunton, J. Nathan Kutz
	3:20 - 3:40	W240456 Wall-models of turbulent flows via scientific multi-agent reinforcement learning Author(s): Jane Bae*, Di Zhou, Petros Koumoutsakos
1825: Physical models and reduced order models augmentation with data for physics-informed machine learning in real-world applications Chair(s): David Gonzalez		
213 Level 2	2:00 - 2:20	W242420 Single- and double-generator brackets for thermodynamics-informed neural networks Author(s): Pau Urdeitx*, Francisco Chinesta, Elías Cueto
	2:20 - 2:40	W241865 Enhancing predictive modeling in reactor building dose distribution: A neural network-aided approach Author(s): Jihong Liu*, Koji Koyamada, Hiroaki Natsukawa, Shuhei Kamioka
	2:40 - 3:00	W242026 Real-time forward and inverse simulations of time-history dynamic structural responses using PINNs and AR visualization Author(s): Toko Okuda*, Mayuko Nishio
	3:00 - 3:20	W240677 Operator learning via neural networks with kernel-weighted corrective residuals Author(s): Carlos Mora, Amin Yousefpour, Shirin Hosseinmardi, Ramin Bostanabad*
	3:20 - 3:40	W240967 Real-time optimisation of composites forming process Author(s): Siyuan Chen*, Adam Thompson, Tim Dodwell, Stephen Hallett, Jonathan Belnoue

1828: Machine learning for large scale models in physics Chair(s): Fabien Casenave		
216 Level 2	2:00 - 2:20	W240605 A Reduced Order Model conditioned on monitoring features for estimation and uncertainty quantification in engineered systems. Author(s): Konstantinos Vlachas*, Thomas Simpson, Anthony Garland, Eleni Chatzi
	2:20 - 2:40	W242424 A consistent non-linear and geometrical reduced order modeling approach with uncertainty quantification applied to the convection dominated incompressible Navier-Stokes equations Author(s): Nissrine Akkari*, Fabien Casenave
	2:40 - 3:00	W242543 The physics-informed kernel operator Author(s): Weiheng Zhong, Hadi Meidani*
	3:00 - 3:20	W242577 Graph Neural Network for large-scale graph prediction of shell buckling Author(s): Bruno Alves Ribeiro*, Guillaume Broggi, João Ribeiro, Pedro Reis, Miguel Bessa

Thursday July 25 - Technical Session 10

0201: Advanced materials: Computational analysis of properties and performance Chair(s): Ankit Srivastava		
111 Level 1	9:45 - 10:25	W240212 Prediction of wrinkle patterns in thin film-compliant substrate systems: direct numerical simulations Author(s): Yu-Lin Shen*
	10:25 - 10:45	W241253 Convergence analysis and error estimation for mixed finite element method modeling flexoelectricity Author(s): Feng Deng*
	10:45 - 11:05	W241566 Constitutive modeling of the Mullins effect in filled rubber-like materials Author(s): Shawn Chester*, Keven Alkhoury
0202: Computational damage and fracture mechanics Chair(s): Larissa Driemeier		
109 Level 1	9:45 - 10:05	W240254 Fatigue crack propagation behavior analysis of 15MnTi steel based on cyclic cohesion model Author(s): Jingyi Guo*, Jian He, Xiaodan Sun
	10:05 - 10:25	W242159 Numerical modeling of hydrogen embrittlement-induced ductile fracture with Gurson-cohesive model (GCM) Author(s): Jihyuk Park*, Huh Nam-Su, Kyoungsoo Park
	10:25 - 10:45	W242294 On the solution of unstable fracture problems with non-linear cohesive laws Author(s): Miguel Vieira de Carvalho*, Igor Andrade Rodrigues Lopes, Francisco Andrade Pires
	10:45 - 11:05	W240841 Numerical crack path prediction in anisotropic inhomogeneous materials Author(s): Konstantin Zarjov*, Andreas Ricoeur
	11:05 - 11:25	W240833 Spatial and temporal constraints of the cohesive modeling: a unified criterion for fluid-driven fracture Author(s): Hao Yu*
0205: Catastrophic failure mechanics and numerical modelling Chair(s): Qing Zhang and Xin Gu		
114 Level 1	9:45 - 10:25	W241767 A stepwise physics-informed neural network for solving large deformation problems of hypoelastic materials Author(s): Lei Wang*, Zikun Luo
	10:25 - 10:45	W241882 Simulation of fault ruptures subjected to far-field loading and consistent state of stress Author(s): Lalith Maddegedara*, Elia Nicolin, Lionel Quaranta, Kohei Fujita, Tsuyoshi Ichimura, Mueno Hori
	10:45 - 11:05	W240767 Numerical analysis of crashworthiness concepts for hydrogen-powered aircraft in the early design phase Author(s): Malte Woidt*, Sebastian Heimbs, Martin Siemann
	11:05 - 11:25	W242087 On irradiation-induced multi-scale deformation behaviors of accident tolerance multi-level composite fuels Author(s): Jing Zhang*, Shurong Ding
0211: Fracture, damage and failure mechanics of cementitious materials Chair(s): Rena C Yu		
115 Level 1	9:45 - 10:05	W240066 Synergistic effects of environmental deterioration on fatigue and flexure properties of glass fiber reinforced polymeric (GFRP) composites : a multiscale and multiphysics model. Author(s): Zhiye Li*, Michael Lepech
	10:05 - 10:25	W241476 3D multi-physics simulation of high temperature induced thermo-hygral fracture of concrete Author(s): Elia Nicolin*, Maddegedara Lalith, Kohei Fujita, Tsuyoshi Ichimura
	10:25 - 10:45	W240614 Numerical modelling of the dynamic failure in fiber-reinforced concrete Author(s): Rena C. Yu*, Elisa Poveda, Gonzalo Ruiz

0213: Current trends in phase-field modeling and computations Chair(s): Laura De Lorenzis, Emilio Martinez-Paneda and Thomas WICK		
116 Level 1	9:45 - 10:05	W240540 Phase-field modelling of ductile fatigue fracture Author(s): Martha Kalina*, Markus Kästner
	10:05 - 10:25	W240842 Phase-field modeling of brittle fracture under cyclic loading: a new gradient-based energy split criterion Author(s): Umberto Perego*, Ayrton R. Ferreira, Alessandro Marengo
	10:25 - 10:45	W240048 Simulation of rolling contact fatigue utilizing a phase field model Author(s): Sikang Yan*, Jochen Hebel, Matthias Krug, Ralf Müller
	10:45 - 11:05	W242083 Phase-field modeling of fatigue based on micromechanics approach Author(s): Mina Sarem*, Nuhamin E. Deresse, Jacinto Ulloa, Els Verstrynge, Stijn Francois
	11:05 - 11:25	W240255 Phase-field modelling of fatigue fracture considering inhomogeneous material properties Author(s): Tom Schneider*, Daniel Müller, Martha Kalina, Thomas Tobie, Karsten Stahl, Markus Kästner
	11:25 - 11:45	W242688 Phase field modelling of fatigue crack growth: opportunities, acceleration schemes and coupled problems Author(s): Emilio Martinez-Paneda*
0214: Multi-scale, multi-rate damage and fracture: Models, experiments, and simulations Chair(s): JeeYeon Plohr		
110 Level 1	9:45 - 10:05	W240471 A combined crystal plasticity, high energy diffraction microscopy, and micro-tomography study of fatigue in a nickel titanium alloy Author(s): John Moore*, Parisa Shabani Nezhad, Jacob Rusch, Opemipo Adetan, Peter Kenesei, Jun-Sang Park, Dinc Erdeniz
	10:05 - 10:45	W241691 Deduction-induction integrated multiscale simulation: dislocation pattern formation in fatigue Author(s): Yoshitaka Umeno*, Emi Kawai
	10:45 - 11:05	W241987 A methodology to quantify entropy generated during fatigue of CF/PEKK composite laminates: constitutive model Author(s): Ricardo Marques*, Afzal Suleman, Mehmet Yildiz
	11:05 - 11:25	W240636 Explosive fragmentation of additively manufactured stainless steel Author(s): Amanda Wu*, Michael Callahan, Dingyi Sun, Marissa Linne, Geoffrey Campbell, Brett Friedman, Stephen Burke, Kelsey Mickelson, Adam Lodes, Hye-Sook Park
	11:25 - 11:45	W241090 Research on high-temperature oxidation damage of PS-PVD sprayed Yb2Si2O7 environmental barrier coatings Author(s): Rong Ma*, Jingjing Yang, Xueling Fan
0304: Immersed-boundary variational methods: Theory, data structures, and applications Chair(s): Guglielmo Scovazzi		
201 Level 2	9:45 - 10:25	W240645 On the stability of a fictitious domain approach for fluid structure interaction problems Author(s): Daniele Boffi*, Fabio Credali, Lucia Gastaldi
	10:25 - 10:45	W241681 Level-set assisted enriched immersed boundary method for Stefan problem with applications to additive manufacturing Author(s): Jinhui Yan*
	10:45 - 11:05	W242651 Implicit geometric representation for the construction of octree-meshes for finite element analysis Author(s): Samundra Karki*, Mehdi Shadkhah, Adarsh Krishnamurthy, Baskar Ganapathysubramanian
	11:05 - 11:25	W242650 Shifted Boundary Method for flow simulations over complex objects Author(s): Cheng-Hau Yang*, Guglielmo Scovazzi, Adarsh Krishnamurthy, Baskar Ganapathysubramanian
	11:25 - 11:45	W241540 Compressible Euler flow computations and aerodynamics using the shifted boundary method Author(s): Xianyi Zeng*, Guglielmo Scovazzi

0307: Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, localization, and failure Chair(s): James Foulk III and Alejandro Mota		
203 Level 2	9:45 - 10:05	W240233 A quasi-meshfree method for nonlinear solid mechanics on geometrically complex domains using boundary-aware reproducing basis functions and a projected-gradient quadrature scheme Author(s): Joseph Bishop*
	10:05 - 10:25	W242408 Energetic mesh smoothing Author(s): Julian Rimoli*, Alejandro Mota, James Foulk
	10:25 - 10:45	W240105 Arbitrary order virtual element methods for high-order phase-field modeling of dynamic fracture Author(s): Yu Leng*, Lampros Svolos, Ismael Boureima, Gianmarco Manzini, JeeYeon Plohr, Hashem Mourad
	10:45 - 11:05	W240040 An automated computational framework relying on a non-iterative meshing algorithm for modeling materials with complex microstructures Author(s): Soheil Soghrati*, Salil Pai, Pengfei Zhang, Balavignesh Vemparala, Kartik Kashyap
	11:05 - 11:25	W242251 A computationally efficient method for considering a large number of nonlinear multi-point constraints within the finite element method Author(s): Jens Wackerfuβ*, Jonas Boungard
0312: Structure-preserving discretization of multiphysics systems Chair(s): Peter Betsch and Andrea Brugnoli		
202 Level 2	9:45 - 10:05	W241330 The energy-stepping Monte Carlo method: a Markov chain Monte Carlo algorithm based on a symplectic, energy-conserving time integrator Author(s): Ignacio Romero*, Michael Ortiz
	10:05 - 10:25	W240669 Structure-preserving discretization of incompressible MHD systems and ideal magnetic relaxation Author(s): Kaibo Hu*
	10:25 - 10:45	W241055 Structure-preserving integration for nonlinear viscoelastodynamics Author(s): Jiashen Guan*, Ju Liu
	10:45 - 11:05	W242056 GENERIC-based mixed finite elements for coupled thermomechanical problems Author(s): Peter Betsch*, Marlon Franke, Moritz Hille, Felix Zähringer
	11:05 - 11:25	W240037 Hybrid stress and heat-flux formulation of thermodynamics for long-term simulations in thermo-viscoplasticity Author(s): Adnan Ibrahimbegovic*, Samir Suljevic
0407: Multiscale computational and data-driven approach of advanced materials and structures Chair(s): Seunghwa Yang and Hyunseong Shin		
304 Level 3	9:45 - 10:05	W240091 A multiscale bridging approach to predict fracture toughness and crack propagation characteristics of polymer nanocomposites Author(s): Jae Hun Kim*, Haolin Wang, Jihun Lee, Hyunseong Shin
	10:05 - 10:25	W240074 Multiscale approach to evaluate fracture toughness of polymer nanocomposites by considering cohesive failure mode Author(s): Jihun Lee*, Haolin Wang, Jae Hun Kim, Hyunseong Shin
	10:25 - 10:45	W240428 Computational interpretation of shape memory epoxy: processing and its operation Author(s): Yeongbin Kim*, Hongdeok Kim, Joonmyung Choi
	10:45 - 11:05	W241621 Multiscale study on the thermal conductivity of Vitrimer-BNNT nanocomposite. Author(s): Nahyun Ki*, Seunghwa Yang

304 Level 3	11:05 - 11:25	W241724 Molecular dynamics study on electroelastic properties of hexagonal boron nitride nanostructure: combined effect of vacancy structure and temperature Author(s): Jaewon Lee*, Seunghwa Yang
0410: Battery modeling and computation: From material to device Chair(s): Jun Xu		
305 Level 3	9:45 – 10:25	W241852 Multi-physics simulations for Li battery Author(s): Wei Lu*
	10:25 – 10:45	W240138 Battery degradation diagnostics: challenges, methodologies, and testing campaigns Author(s): Chao Hu*
	10:45 – 11:05	W241078 Mechanistic study of the degradation mechanism of Lithium-ion batteries Author(s): Sourav Das, Pranav Shrotriya*
	11:05 – 11:25	W242627 Enhancing ionic conductivity in ASSBs through optimized solid electrolyte distribution: a computational analysis of the dry mechanical mixing process Author(s): Janghyuk Moon*
	11:25 – 11:45	W240414 Reactive diffusion of lithium in silicon – new insight from atomistic simulations Author(s): Bin Li*, Jun Xu
0420: Advances in multi-scale, multi-material, and multi-component Topology Optimization Chair(s): Federico Ferrari and James K Guest		
306 Level 3	9:45 - 10:25	W240438 Advancing structural safety through integrated yield and buckling indicator optimization Author(s): Christoffer Fyllgraf Christensen*, Fengwen Wang, Jonas Engqvist, Ole Sigmund, Mathias Wallin
	10:25 - 10:45	W240795 Structural multi-material design at different length-scales using topology optimization Author(s): Fábio Conde*, Rui Silva, Cláudia Almeida, Pedro Coelho, José Guedes
	10:45 - 11:05	W241105 Concurrent multiscale topology optimization using commercial codes with Direct FE2 Author(s): Vincent Tan*, Pei Li, Ang Zhao
	11:05 - 11:25	W241348 Multiscale design of coated structures with spatially rotating lattice infill Author(s): Eddie Wadbro*, Bin Niu
0422: Methods for identification, machine learning, and uncertainty quantification of reduced order models of coupled systems Chair(s): Christophe Hoareau		
303 Level 3	9:45 - 10:05	W241945 Advancing understanding of high-dimensional Quasi Geostrophic systems. Author(s): Ahmad Droobi*, Mustafa Mohamad
303 Level 3	10:05 - 10:25	W241635 Overview of the latest features and capabilities of the Dakota software Author(s): John Stephens*
	10:25 - 10:45	W240714 Markov chain Monte Carlo capabilities in Dakota Author(s): Ernesto Prudencio*, Adam Stephens
0505: Imaging-based methods in computational medicine Chair(s): Jessica Zhang		
121 Level 1	9:45 - 10:25	W241452 New formulations for Digital Twinning in biofluids Author(s): C. Alberto Figueroa*, Jesse Capecelatro, Abhilash Malipeddi, Haizhou Yang, Krishna Garikipati

121 Level 1	10:25 - 10:45	W242181 An automated workflow for construction of virtual twins for haemodynamic analysis of stenosed native aortic valves Author(s): Cristina Teleanu*, Benjamin Matheson, Haoran Dou, George Hyde-Linaker, Rebecca Bryan, Clémentine Shao, Nishant Ravikumar, Alejandro F. Frangi, Zeike Taylor
	10:45 - 11:05	W242193 A Finite Element Informed Neural Network (FINN) for elastography Author(s): Sahil Kamath*, Zhiqi Mao, Ganesh Sankaranarayanan, Dong Qian
	11:05 - 11:25	W242345 Inferring mechanical properties of tissue with quantified uncertainty using conditional generative models Author(s): Javier Murgoitio-Esandi*, Agnimitra Dasgupta, Harisankar Ramaswamy, Ken Foo, Brendan Kennedy, Runze Li, Qifa Zhou, Assad Oberai
	11:25 - 11:45	W241411 Physics-based image registration using neural ordinary differential equations Author(s): Amirhossein Amiri Hezaveh*, Adrian Buganza Tepole
0506: Computational models and methods for predicting cancer progression and treatment response Chair(s): Ryan Woodall		
122 Level 1	9:45 - 10:25	W240084 Personalized predictions of glioblastoma infiltration: mathematical models, physics-informed neural networks and multimodal scans Author(s): Ray Zirui Zhang*, Ivan Ezhov, Michal Balcerak, Andy Zhu, Benedikt Wiestler, Bjoern Menze, John Lowengrub
	10:25 - 10:45	W241481 Mechanically-coupled, biology-informed modeling for predicting triple-negative breast cancer response to neoadjuvant therapy Author(s): Casey Stowers*, Chengyue Wu, Guillermo Lorenzo, Zhan Xu, Jingfei Ma, Gaiane Rauch, Thomas Yankeelov
	10:45 - 11:05	W241658 Patient-specific breast tumour model for predicting response to neoadjuvant chemotherapy Author(s): Rose Collet*, Stephane Urcun, Camilo Suarez Afanador, Thomas Lavigne, Stephane Bordas, David Buckley, Zeike Taylor
	11:05 - 11:25	W240268 Patient-specific, organ-scale prediction of prostate cancer growth and clinical progression during active surveillance Author(s): Guillermo Lorenzo, Chengyue Wu, Joshua P. Yung, John F. Ward, Hector Gomez, Alessandro Reali, Thomas Yankeelov, Aradhana M. Venkatesan, Thomas J.R. Hughes*
0507: Continuum biomechanics of active systems Chair(s): Tim Ricken		
119 Level 1	9:45 - 10:05	W240770 A triphasic model for thrombus growth and formation using realistic geometries Author(s): Ishan Gupta*, Martin Schanz, Tim Ricken
	10:05 - 10:25	W240756 Towards a patient-specific decision support tool for staging of ischemia-reperfusion injury during liver transplantation using an in-silico continuum-biomechanical framework Author(s): Luis Mandl*, Steffen Gerhäusser, Lena Lambers, Uta Dahmen, Matthias König, Hans-Michael Tautenhahn, Tim Ricken
	10:25 - 10:45	W240941 Effect of region-dependent material properties of human brain tissue during surgical procedures Author(s): Emma Griffiths, Nina Reiter, Jan Hinrichsen, Jayaratnam Jayamohan, Silvia Budday*
	10:45 - 11:05	W240952 Microstructure-informed, region-specific viscoelastic modeling of human brain tissue Author(s): Nina Reiter*, Lars Bräuer, Friedrich Paulsen, Silvia Budday
	11:05 - 11:25	W240793 An integrated approach of embedding vasculature for analysing in-vivo testing of the human brain Author(s): Yashasvi Verma*, Emma Griffiths, Jakob Schattenfroh, Camilla Belponer, Alfonso Caiazzo, Ingolf Sack, Silvia Budday, Luca Heltai, Paul Steinmann
0701: Computational methods in environmental fluid mechanics Chair(s): Eirik Valseth		
222 Level 2	9:45 - 10:05	W240269 Multiple time scales and variable bottom topography for discontinuous Galerkin layered ocean modeling Author(s): Robert Higdon*

222 Level 2	10:05 - 10:25	W241547 An implicit discontinuous Galerkin method for two-dimensional shallow water equations Author(s): Younghun Kang*, Mark Loveland, Corey Trahan, Clint Dawson
	10:25 - 10:45	W240892 Multiscale modeling framework using element-based Galerkin methods for simulation of the moist atmosphere Author(s): Soonpil Kang*, James Kelly, Anthony Austin, Francis Giraldo
	10:45 - 11:05	W241698 Efficient numerical schemes for depth-integrated landslide runout models Author(s): Federico Gatti*, Carlo de Falco, Simona Perotto, Luca Formaggia
	11:05 - 11:25	W242048 Two-dimensional riverbed variation analysis using discontinuous Galerkin method with sediment transport equation Author(s): Reo Matsumoto*, Seizo Tanaka, Mitsuteru Asai
0702: Advanced numerical techniques for fluid flow in porous media Chair(s): Paulo Lyra and Darlan de Carvalho		
221 Level 2	9:45 - 10:25	W242504 Preconditioners based on multiscale domain decomposition methods for porous media flows Author(s): Fabricio Sousa*, Pablo Carvalho, Rafael Guiraldello, Roberto Ausas, Gustavo Buscaglia, Felipe Pereira
	10:25 - 10:45	W240176 A predictor-corrector second-order time-stepping schemes for solving water flow and solute transport in unsaturated porous media Author(s): Nour-eddine Toutlini*, Hamza Kamil, Azzeddine Soulaïmani, Abdelaziz Beljadid
	10:45 - 11:05	W240228 Physics-informed neural network vs finite element method for modeling coupled water and solute flow in unsaturated soils Author(s): Hamza Kamil*, Azzeddine Soulaïmani, Abdelaziz Beljadid
	11:05 - 11:25	W240335 Stability of nanoscale gas bubble trapped by a surface defect: a molecular dynamics study Author(s): Ali Ghamartale*, P. Amy Tsai, Tian Tang
0809: Finite element techniques for wave simulations Chair(s): Leszek Demkowicz		
206 Level 2	9:45 - 10:05	W242616 ParaSDG: a parallel–adaptive spacetime solver for hyperbolic systems Author(s): Robert Haber*, Pavan Ravi, Christian Howard, Jeff Erickson, Reza Abedi, Volodymyr Kindratenko
	10:05 - 10:25	W242615 Parallel–adaptive meshing in a Spacetime Discontinuous Galerkin solver for wave problems Author(s): Pavan Ravi*, Christian Howard, Jeff Erickson, Robert Haber
	10:25 - 10:45	W241339 A high-order family of 4-D conforming elements Author(s): Nilima Nigam*
	10:45 - 11:05	W240334 A new finite element method for simulating wave propagation on graphene sheets Author(s): Jichun Li, Li Zhu*, Todd Arbogast
0826: Quantum scientific computing Chair(s): Kenjiro Terada		
209 Level 2	9:45 - 10:05	W242000 Quantum algorithm for time-evolving partial differential equation via Hamiltonian simulation Author(s): Yuki Sato*, Ruho Kondo, Tamiya Onodera, Naoki Yamamoto
	10:05 - 10:25	W241259 Quantum solver of stochastic differential equations Author(s): Jinhwan Sul*, Yan Wang
	10:25 - 10:45	W240777 Hybrid quantum algorithm for the Lattice-Boltzmann method Author(s): David Wawrzyniak*, Josef Winter, Steffen Schmidt, Thomas Indinger, Uwe Schramm, Christian Janssen, Nikolaus Adams
	10:45 - 11:05	W240980 An improved box algorithm for solving linear systems of equations on quantum-annealing machines Author(s): Sanjay Suresh*, Krishnan Suresh

209 Level 2	11:05 - 11:25	W241028 Application of FMQA for hyper-parameter optimization and metamodel-based optimization in DEM granular flow simulations Author(s): Junsen Xiao*, Reika Nomura, Mayu Muramatsu, Shuji Moriguchi, Kenjiro Terada
0830: Recent developments in peridynamics modeling Chair(s): Nojoud Nader		
204 Level 2	9:45 - 10:05	W240486 Superposition-based concurrent multiscale approaches for porodynamics Author(s): Wei Sun*
	10:05 - 10:25	W240937 Thermally-induced fracture in the oxide scale of T91 ferritic/martensitic steel after exposure to oxygen-saturated liquid lead-bismuth eutectic Author(s): Yunpeng Liu, Chenwen Tian, Zhikun Zhou, Ziguang Chen*
	10:25 - 10:45	W240996 Modeling material fracture using a novel peridynamic correspondence formulation based on non-spherical influence functions Author(s): Xuan Hu*, Hailong Chen, Shaofan Li
	10:45 - 11:05	W241036 Performance investigation of differential operators in the peridynamics formulation for heat conduction analysis Author(s): Sunwoo Kim*, Suyeong Jin, Jung-Wuk Hong
	11:05 - 11:25	W241289 A finite deformation micropolar peridynamic theory and its application to metamaterials Author(s): Sajal -*, Pranesh Roy
0835: Recent advances in meshfree and particle methods Chair(s): Seiichi Koshizuka		
205 Level 2	9:45 - 10:05	W242110 Coordinate transformation based on SPH(2) for efficient free surface flow simulation Author(s): Shujiro Fujioka*, Kumpei Tsuji, Naoto Mitsume, Mitsuteru Asai
	10:05 - 10:25	W242063 Improved Density-based Particle Shifting Technique for stable and accurate free surface flow simulations based on SPH(2) Author(s): Yoshiya Shirakami*, Shujiro Fujioka, Kumpei Tsuji, Daniel Shigueo Morikawa, Mitsuteru Asai
	10:25 - 10:45	W240712 Research on SPH model for predicting deposition efficiency of cold spray Author(s): Zhen Dai*, Fei Xu, Jiayi Wang, Wei Feng
	10:45 - 11:05	W241159 A moving least squares immersed boundary method for SPH with thin-walled or slender structures Author(s): Zhuolin Wang*, Yi Zhang, Zichao Jiang, Bohua Huang, Xuan Luo, Qinghe Yao
	11:05 - 11:25	W241642 New spar type floating wind power plant behavior simulation for reduction of motion by SPH method Author(s): Seiya Hagihara*, Rikuto Ideta, Yuhi Uchino, Satoyuki Tanaka, Shinya Taketomi, Yuichi Tadano
Multiscale modeling, analysis and numerical methods of material defect and inhomogeneities Chair(s): TBA		
207 Level 2	9:45 - 10:05	W240676 Ripplocations in graphite layered composites Author(s): Xiaowen Lei*, Mengying Li, Toshiyuki Fujii
	10:05 - 10:25	W240909 A numerical study for shear-induced amorphization in alloy Author(s): Yuntong Huang*, Shuyang Dai, Yang Xiang, Chuqi Chen
	10:25 - 10:45	W242066 Investigation of diffusion behavior and activation energies of self-interstitial atoms in alpha-iron using machine learning interatomic potential Author(s): Kazuki Sekine*, Hirano Atsuo, Akiyuki Takahashi, Tomohisa Kumagai, Kazuma Suzuki, Akiyoshi Nomoto
	10:45 - 11:05	W241304 On efficient solvers in density functional theory and their applications Author(s): Guanghui Hu*
	11:05 - 11:25	W241104 A nonlocal elasiticity model for simulating the structure and stress of crystalline defects Author(s): Shuyang Dai*, Xiaoyin Wang

0903: Physics-based data-driven modeling and uncertainty quantification in computational materials science and engineering Chair(s): Johann Guilleminot		
210 Level 2	9:45 - 10:05	W240149 A modular nonlinear stochastic finite element formulation for uncertainty estimation and parameter sensitivity analysis Author(s): Yanis Ammouche, Antoine Jerusalem*
	10:05 - 10:25	W240168 Deep learning for model correction Author(s): Caroline Tatsuoka*, Dongbin Xiu
	10:25 - 10:45	W240750 Hybrid physics-NN model for dynamic analysis of multi-component systems Author(s): P Varsha*, Debraj Ghosh
	10:45 - 11:05	W240979 Capturing model-form uncertainties in various molecular dynamics ensembles with stochastic reduced-order modeling Author(s): Senou Kounouho*, Chongze Hu, Remi Dingreville, Johann Guilleminot
	11:05 - 11:25	W240944 Correlation-based likelihood-free calibration for realistic inversion of model uncertainty parameters Author(s): Shaojun Feng, Hao Liu*, Peng Hao
0904: Uncertainty quantification and reliability analysis in engineering Chair(s): Po Ting Lin and Ping Yi		
211 Level 2	9:45 - 10:25	W240245 Probability density integral equation for uncertainty propagation and time-variant moment functions of structural responses Author(s): Dixiong Yang*, Junwen Wang, Guohai Chen
	10:25 - 10:45	W242426 Dimension-reduction representation for stochastic ground motions and engineering applications Author(s): Zixin Liu*, Zhangjun Liu
	10:45 - 11:05	W241936 Intrepid MCMC: A novel sampling algorithm for better exploration and identification of disjoint failure regions in Subset Simulation Author(s): Promit Chakroborty*, Michael Shields
	11:05 - 11:25	W241448 Polymorphic uncertainty quantification, sensitivity analysis and Bayesian modeling in multiscale and multiphysical FEM models Author(s): Navina Waschinsky*, Tim Ricken
	11:25 - 11:45	W240517 A new paradigm for engineering simulations under uncertainties: time-separated stochastic mechanics Author(s): Hendrik Geisler*, Philipp Junker
0908: Certification of simulations and model adaptation in computational science and engineering Chair(s): Ludovic CHAMOIN		
208 Level 2	9:45 - 10:05	W241146 Bounds for goal oriented error estimation Author(s): Bernhard Endtmayer*, Ulrich Langer, Thomas Wick
	10:05 - 10:25	W241832 Goal-oriented adaptive multilevel quasi-Monte Carlo for random elliptic PDEs Author(s): Yang Liu*, Joakim Beck, Erik von Schwerin, Raul Tempone
	10:25 - 10:45	W240482 Strict upper and lower bounds on quantities of interest for transient dynamics Author(s): Qisheng Zheng*, Li Wang, Jike Liu
	10:45 - 11:05	W241201 Adaptive importance sampling for optimization with the conditional value-at-risk Author(s): Brendan Keith*, Boyan Lazarov, Anton Malandii, Stanislav Uryasev
0913: Data-enhanced multi-model uncertainty quantification and experimental design of complex computational systems Chair(s): Mike Eldred and John Jakeman		
217 Level 2	9:45 - 10:05	W241574 Linear and non-linear dimension reduction strategies for multi-fidelity sampling uncertainty quantification: complexity versus precision Author(s): Gianluca Geraci*, Andrea Zanoni, Xiaoshu Zeng, Matteo Salvador, Alison Marsden, Daniele Schiavazzi

217 Level 2	10:05 - 10:25	W241716 Multifidelity linear regression via a combined loss function for data-constrained applications Author(s): Vignesh Sella*, Anirban Chaudhuri, Karen Willcox
	10:25 - 10:45	W241840 A multi-fidelity approach to prediction of flutter boundary under uncertainty Author(s): George Lu*, Masayuki Yano, Amin Fereidooni, Anant Grewal
1003: Recent advances in partitioning method and interface mechanics Chair(s): SangJoon Shin		
117 Level 1	9:45 - 10:05	W241233 Substructuring scheme for efficient multivariable dynamic reanalysis of digital twins Author(s): Geomji Choi*, Seongmin Chang
	10:05 - 10:25	W241973 A nonoverlapping domain decomposition method for extreme learning machines solving elliptic partial differential equations Author(s): Chang-Ock Lee*, Youngkyu Lee, Byungeun Ryoo
	10:25 - 10:45	W241618 Iterative solution algorithm for highly heterogeneous structure based on the displacement-only partitioned formulation Author(s): Seung-Hoon Kang*, SangJoon Shin, Kwang-Chun Park, José A. González
	10:45 - 11:05	W240147 Numerical model of metal-ceramic composite with interphase properties Author(s): Eligiusz Postek*, Tomasz Sadowski, Masoud Tahani, Jajnabalkya Guhathakurta
	11:05 - 11:25	W242606 Fracture simulation of femtosecond laser-induced damage in multi-layer dielectric coatings Author(s): Fariha Haque, Tareq Zobaer, Alok Sutradhar*
1004: Numerical modelling of composite materials and structures Chair(s): Georgios Drosopoulos, Xiaodong Xu and Georgios Stavroulakis		
118 Level 1	9:45 - 10:05	W241066 Fiber hybridization effects on resistance to repeated low-velocity impact of Mg-based fiber metal laminates Author(s): Xia Zhou*, Wogayehu Worku Tegegne, Guohui Qu
	10:05 - 10:25	W241095 Multi-scale modeling for tensile behavior of plain woven SiC/SiC composites considering temperature and oxidation Author(s): Qipeng Xu*, Xueling Fan
	10:25 - 10:45	W241281 Simultaneous energy harvesting and sensing using piezoelectric energy harvester based on Metamaterial-Inspired Structures Author(s): Patricio Peralta-Braz*, Mehrisadat Makki Alamdari, Elena Atroshchenko, Mahbub Hassan
	10:45 - 11:05	W241546 Effects of material property uncertainty on fracture modeling of unidirectional double cantilever beam specimens Author(s): Md Hassan, Xiaodong Xu*, Juhyeong Lee
	11:05 - 11:25	W242147 Optimal design of graphene-reinforced composites using shunted piezoelectric systems for optimal vibration attenuation Author(s): Maria-Styliani Daraki, Georgios Drosopoulos*, Georgia A. Foutsitzi, Georgios Stavroulakis
1005: Advanced numerical methods for the modeling and optimization of coupled dynamical systems Chair(s): Antoine Legay		
113 Level 1	9:45 - 10:05	W240020 Modeling of an oblique incident P-wave within a water saturated soil with the wave based method Author(s): Mirjam Lainer*, Gerhard Müller
	10:05 - 10:25	W240794 Calculation of the forced response of a particle-damped structure based on mechanical impedance obtained from measurements Author(s): Jonas Becker*, Gleb Kleyman
	10:25 - 10:45	W241556 Mathematical and experimental modeling of a Stockbridge damper used to suppress Aeolian vibration of transmission line conductors Author(s): Zakhele Zondi*, Modify A.E Kaunda
	10:45 - 11:05	W242078 Transient response of magneto-rheological fluids in high shear rate regime Author(s): Sanket Chougale, Andreas Zilian*

1308: Novel numerical approaches for integrated disaster simulation for digital twin from living spaces to urban scales Chair(s): Daigoro Isobe		
302 Level 3	9:45 - 10:05	W242164 Development of an unresolved CFD-beam coupling model for large scale tsunami-houses interaction problem Author(s): Hiroyuki Omura*, Satoshi Ohinata, Mitsuteru Asai, Daigoro Isobe
	10:05 - 10:25	W242508 Seismic response analysis of a nuclear power plant using a 3D high-fidelity FE model with a tension crack model for concrete material Author(s): Tomoshi Miyamura*, Kuniaki Koike, Shinobu Yoshimura, Takuzo Yamashita
	10:25 - 10:45	W241885 Surrogate modeling for efficient seismic disaster simulation using detailed finite element analysis Author(s): Takuzo Yamashita*, Jun Fujiwara
	10:45 - 11:05	W240697 Implementing integrated earthquake simulator for seismic performance assessment of Indian cities Author(s): Mahendra Kumar Pal*, Nishi Singh, Maddegedara Lalith
	11:25 - 11:45	W241983 An attempt to construct a response database for three-dimensional frame models Author(s): Yasunori Mizushima*, Masaki Gohara, Takuma Kawakami, Motoki Uchiyama, Motonobu Maekawa, Shuei Ikeda, Motoki Akazawa, Sota Murashima, Yasuyuki Nagano
1401: Emerging topology and shape optimization techniques in computational design of materials and structures Chair(s): Ahmad Najafi and Jonathan Gorman		
220 Level 2	9:45 - 10:25	W241244 Differentiable inverse design of active morphing material systems with multi-stimuli responsiveness Author(s): Liwei Wang, Alexander L. Evenchik, Jared Mi Yang, Ryan Truby, Wei Chen*
	10:25 - 10:45	W240140 Multiscale structural optimization with strain gradient effects using second-order homogenization Author(s): Nolan Black*, Ahmad Najafi
	10:45 - 11:05	W240541 Optimized lattice design for tailored force-displacement characteristics Author(s): Saketh Sridhara, Akshay Kumar*, Krishnan Suresh
	11:05 - 11:25	W240075 Neural network-based topology optimization of acoustic metamaterials Author(s): Daniel Yago*, David Roca, Gastón Sal-Anglada, Juan Cante, Javier Oliver
1407: Large-scale structural and fluidic topology optimization Chair(s): Kentaro Yaji and Qingyuan LIN		
218 Level 2	9:45 - 10:05	W241863 Darcy flow-based topology optimization for designing two-fluid heat exchanger of a rocket engine Author(s): Kentaro Yaji*, So Fukui, Ryota Fukunishi, Toshihiko Ebi, Akira Ogawara
	10:05 - 10:25	W241577 Large-scale unsteady flow topology optimization with hierarchical Cartesian mesh method and its parallel performance evaluation Author(s): Ryohei Katsumata*, Koji Nishiguchi, Hiroya Hoshiba, Junji Kato
	10:25 - 10:45	W242093 Micro-scale topology optimization for thermal-fluid problems using FTT-based homogenization method Author(s): Keisuke Takaara*, Hiroya Hoshiba, Koji Nishiguchi, Junji Kato
	10:45 - 11:05	W240624 CFD-MRI: Characterization of reactive flows by solving inverse problems Author(s): Shota Ito*, Alexander Zimmermann, Mathias J. Krause
	11:05 - 11:25	W242458 Harnessing advanced CFD and ML compiler tools for topology optimization of large-scale fluid thermal processes Author(s): Hesam Salehipour*, Massimiliano Meneghin, Mohammadmehdi Ataei, Pradeep Kumar Jayaraman, Nigel Morris, Adrian Butscher
1408: Design beyond optimization: Why, what if, and how much? Chair(s): Andrei A. Klishin		
219 Level 2	9:45 - 10:25	W240214 Minimal surfaces: what are they good for? Author(s): Randall Kamien*

219 Level 2	10:25 - 10:45	W241405 Theory of design space filtering via integral transforms Author(s): Hazhir Aliahmadi, Ruben Perez, Greg van Anders*
	10:45 - 11:05	W241443 Hyperoptimization insight for topology optimization Author(s): Hazhir Aliahmadi*, Ruben Perez, Greg van Anders
	11:05 - 11:25	W241442 Hypoptlib: critical design insight into large-scale design problems in topology optimization and beyond Author(s): Aidan Sheedy*, Hazhir Aliahmadi, Greg van Anders
	11:25 - 11:45	W241528 Air-taxi trajectory and design optimization using surrogate models Author(s): Nicholas Orndorff*, John Hwang
1607: Coupled computational mechanics: Solutions for FSI simulation Chair(s): Scott Miller and Jesse Thomas		
223 Level 2	9:45 - 10:05	W241523 Tracking interface contact and penetration in embedded boundary fluid-structure interaction simulations Author(s): Erick Rivas*, Kevin Wang, Emily Guzas, Edwin Lopez Ramos
	10:05 - 10:25	W241588 Modified Immersed Finite Element Method (mIFEM) for explicit Eulerian to explicit Lagrangian coupling Author(s): Scott Miller*, Anthony Agelastos, Mark Christon, David Hensinger, Chad Hovey, Matthew Mosby, Jennifer Rees, Jesse Thomas, Benjamin Treweek, Michael Wong
	10:25 - 10:45	W241630 Interface mechanics for explicit Eulerian to explicit Lagrangian coupling using the modified Immersed Finite Element Method Author(s): Jesse Thomas*, Scott Miller, Chad Hovey, Matthew Mosby, Jennifer Rees, Michael Wong, Anthony Agelastos, Mark Christon, David Hensinger, Benjamin Treweek
	10:45 - 11:05	W241421 Improving performance of volume overlap calculations for coupled multi-physics simulations Author(s): Matthew Mosby*, Jesse Thomas, Scott Miller
	11:05 - 11:25	W240819 Coupling of an enriched beam model with a compressible flow model for fluid-structure interaction in pipelines Author(s): Mahshid Sharifi*, Frederic Daude, Claude Stolz
1610: Advances in computational mechanics for flow-induced vibrations Chair(s): Rajeev Jaiman		
224 Level 2	9:45 - 10:25	W240411 From wave-powered propulsion to flight with membrane wings: insights powered by high-fidelity immersed boundary methods based FSI simulations Author(s): Rajat Mittal*, Jung Hee Seo, Harshal Raut, Ji Zhou, Sushrut Kumar
	10:25 - 10:45	W241202 Physics-informed neural network-based modeling of the elastic reconfiguration of a plate under fluid flow Author(s): Lucas Berthet*, Bruno Blais, Frederick Gosselin
	10:45 - 11:05	W241285 A graph neural network based reduced-order model for flapping dynamics Author(s): Aarshana Parekh*, Rajeev Jaiman
	11:05 - 11:25	W241176 Evaluating flow-added damping via linear stability analysis Author(s): Clement Audefroy*, Frederick Gosselin, Sebastien Houde, Mathieu Olivier
1702: Modeling and simulation of coupled processes in geological media Chair(s): Robert Gracie		
120 Level 1	9:45 - 10:25	W241845 The thermo-mechanical interactions of fault friction Author(s): Bruce Gee*, Mengsu Hu, Michael Manga

120 Level 1	10:25 - 10:45	W241091 Augmented Lagrangian method for frictional contact on faults and fractures in poroelastic media Author(s): Matteo Frigo*, Nicola Castelletto, Matteo Cusini, Randolph Settgast, Hamdi Tchelepi
	10:45 - 11:05	W240999 On in-plane flow through fracture phenomena using stabilized finite element methods Author(s): Nils Betancourt*, Robert Gracie
1808: Predictive digital twins Chair(s): Trond Kvamsdal and Kjell Magne Mathisen		
214 Level 2	9:45 - 10:25	W240960 A nonparametric probabilistic framework for digital twinning Author(s): Charbel Farhat*, Marie-Jo Azzi
	10:25 - 10:45	W240849 Proof-of-concept digital twin of an indoor footbridge using a parametrized stochastic reduced-order model Author(s): Jenmy Zhang*, Akmal Bakar, Farhad Javid, Patrick Nadeau, Adrian Humphry, Mehran Ebrahimi, Adrian Butscher, Alex Tessier, Jesus Rodriguez, Marie-Jo Azzi, Charbel Farhat
	10:45 - 11:05	W240847 Walking parameter inference from strain data for a footbridge Author(s): Adrian Humphry*, Akmal Bakar, Jenmy Zhang, Farhad Javid, Patrick Nadeau, Mehran Ebrahimi, Adrian Butscher, Alex Tessier, Jesus Rodriguez, Marie-Jo Azzi, Charbel Farhat
	11:05 - 11:25	W241197 Computer modelling of flash sintering Author(s): Michael Yu*, Ran He, Jingzhe Pan, Cathryn Hickey, Graeme ODowd
1810: Data-driven approaches for solid mechanics Chair(s): Yue Yu and Shabnam Semnani		
212 Level 2	9:45 - 10:25	W241174 N-adaptive ritz method: a neural network enhanced computational mechanics framework Author(s): Jiun-Shyan Chen*, Jonghyuk Baek, Yanran Wang
	10:25 - 10:45	W240738 A neural network enhanced differentiable meshfree method for computational mechanics Author(s): Honghui Du, QiZhi He*
	10:45 - 11:05	W242363 A framework of Convolutional Hierarchical Deep Neural Network for nonlinear finite element and meshfree analysis Author(s): Yingjian Liu, Jiachen Guo, Chanwook Park, Wing Kam Liu, Dong Qian*
	11:05 - 11:25	W242604 The quest to find the analytical solution of Cook's membrane with neural networks Author(s): Huijian Cai*, Steve WaiChing Sun
1812: Constitutive modeling of complex materials with machine learning and artificial intelligence Chair(s): Francisco Sahli Costabal and Steve WaiChing Sun		
213 Level 2	9:45 - 10:05	W240090 Automated cardiovascular constitutive model discovery and universal finite element analysis implementation Author(s): Mathias Peirlinck*, Denisa Martonova, Juan Hurtado, Sigrid Leyendecker, Kevin Linka, Ellen Kuhl
	10:05 - 10:25	W240131 Modeling of softening phenomena in elastomers by deep symbolic regression Author(s): Mikhail Itskov*, Rasul Abdusalamov
	10:25 - 10:45	W240660 Mapping stiffness landscape of heterogeneous and anisotropic fibrous tissue Author(s): Mir Jalil Razavi*
	10:45 - 11:05	W240156 A two-step constitutive modeling framework based on data-driven identificaton and physics-augmented neural networks Author(s): Lennart Linden*, Karl Kalina, Jörg Brummund, Markus Kästner
	11:05 - 11:25	W242225 Modeling the effects of fractional viscoelasticity in cardiovascular soft tissues Author(s): Will Zhang*, Majid Jadidi, Sayed A Razian, John Sayut, Gerhard Holzapfel, Alexey Kamenskiy, David Nordsletten

1822: SciML in the real world Chair(s): Jan Fuhg and Reese Jones		
215 Level 2	9:45 - 10:25	W242520 Automated model discovery for soft matter systems Author(s): Kevin Linka, Ellen Kuhl*
	10:25 - 10:45	W240900 Physics-constrained data-driven variational method for discrepancy modeling Author(s): Arif Masud*, Shoaib Goraya
	10:45 - 11:05	W240797 Leveraging uncertainty quantification in deep generative models for manufacturing process discovery Author(s): Tuba Dolar*, Daniel Quispe, Jian Cao, Wei Chen
	11:05 - 11:25	W240826 Learning neural constitutive laws from motion observations for generalizable PDE dynamics Author(s): Pingchuan Ma, Peter Yichen Chen*, Bolei Deng, Wojciech Matusik
1824: Machine learning and multiscale modeling for complex materials and structures Chair(s): Ying Li		
216 Level 2	9:45 - 10:25	W240059 Development of variational Bayesian learning neural network for solutions of inverse problems: from forensic analysis of traffic accidents to thermal distortion control in 3D printing Author(s): Shaofan Li*
	10:25 - 10:45	W240397 Accelerating materials design via computation and machine learning combined approaches Author(s): Yanming Wang*
	10:45 - 11:05	W242565 Rethinking generative inverse design: a general and light-weight machine learning framework for on-demand nonlinear materials design Author(s): Haoxuan Mu*, Wei Zhang, Wei Gao, Wei (Wayne) Chen
	11:05 - 11:25	W240658 Establishing process-microstructure-property linkages via deep learning in additively manufactured ceramics Author(s): Mohammad Rezasefat*, James Hogan
	11:25 - 11:45	W241379 Prediction of structure-property linkages in highly particle-filled polymer composites under various strain rates and temperatures using the machine learning Author(s): Zheng Yang*, Rui Liu, Pengwan Chen

Thursday July 25 - Technical Session 11

0201: Advanced materials: Computational analysis of properties and performance Chair(s): Yu-Lin Shen		
111 Level 1	2:00 - 2:20	W240671 Instability-induced deformation of layered crystals Author(s): Miloš Dujović, Mayank Chouksey, Miladin Radovic, Ankit Srivastava*
	2:20 - 2:40	W240022 Penetration resistance of graphene coated ceramic materials under projectile impacts Author(s): Mohammad Reza Talebi Bidhendi*, Kamran Behdinan
	2:40 - 3:00	W240446 Numerical studies of compression failure in triply periodic minimal surface-based ceramic foams Author(s): Thi Ngoc Diep Tran*, Romana Piat
	3:00 - 3:20	W240918 Statistical investigation of the failure modes of strut bending and compression during compression loading of polydisperse ceramic foams Author(s): Vinit Vijay Deshpande*, Romana Piat
	3:20 - 3:40	W241869 Numerical simulation of the swelling and deswelling process of gel Author(s): Isamu Riku*, Koji Mimura
	3:40 - 4:00	W240872 A graded metamaterial-based cushion for broadband noise mitigation of impact-driven offshore monopiles Author(s): Ana Carolina Azevedo Vasconcelos*, Dingena Schott, Jovana Jovanova
0202: Computational damage and fracture mechanics Chair(s): Michael Brünig		
109 Level 1	2:00 - 2:20	W240783 Semi-analytical failure prediction of adhesive joints by Finite Fracture Mechanics Author(s): Thomas Methfessel, Cherine El Yaakoubi-Mesbah, Wilfried Becker*
	2:20 - 2:40	W240673 Predicting ductile fracture during torsion testing using dislocation density tensor Author(s): Kazutake Komori*
	2:40 - 3:00	W241303 Analysis of the damage by thermal loading in a heterogeneous integration package Author(s): Siham El Otmani, Dong-Kil Shin*
	3:00 - 3:20	W242223 Material characterisation parameters effects on turbine disk rupture speed predictions Author(s): Tonya Rose*, Zeineb Meskine
	3:20 - 3:40	W240463 Developing a fracture probability curve based on observable microstructure in additively manufactured ceramics Author(s): Elizabeth Smith*
0205: Catastrophic failure mechanics and numerical modelling Chair(s): Lei Wang, Lalith Maddegedara and Xin Gu		
114 Level 1	2:00 - 2:20	W240043 Computational modeling of cutting disc-rock interaction in mixed ground conditions Author(s): Sahir Butt*, Günther Meschke
	2:20 - 2:40	W240429 Ordinary state-based peridynamic hygro-mechanical coupled model for moisture diffusion and curling analysis in soil desiccation Author(s): Xin Gu*, Panyong Liu, Yang Lu, Xiaozhou Xia, Lei Wang, Erdogan Madenci, Qing Zhang
	2:40 - 3:00	W240949 Modeling on the multi-field coupling delayed hydride cracking behavior of irradiated zirconium alloys Author(s): Guochen Ding*, Zhongjia Xia, Jing Zhang, Shurong Ding
	3:00 - 3:20	W241381 Study on irradiation thermo-mechanical behavior of surrogate FCM pellets Author(s): Li Zekun*, Zhang Jing, Ding Shurong

114 Level 1	3:20 - 3:40	W241035 Generalized strength reduction method for determining the factor of safety of concrete structures Author(s): Xiangdong Qian*, Renjie Shen
	3:40 - 4:00	W241074 Study on the influence of valley width deformation on the safety of high arch dam considering unsaturated seepage Author(s): Yin Zhao*, Changhong Xin, Xuan Wu
0213: Current trends in phase-field modeling and computations Chair(s): Laura De Lorenzis, Emilio Martinez-Paneda and Thomas Wick		
116 Level 1	2:00 - 2:20	W241170 Chemo-hydro-mechanical variational phase-field fracture model Author(s): Mostafa Mollaali*, Renchao Lu, Vanessa Montoya, Keita Yoshioka, Olaf Kolditz
	2:20 - 2:40	W240468 A phase-field description of thermo-hydro-mechanical propagating fractures Author(s): Sanghyun Lee*, Thomas Wick, Mary Wheeler
	2:40 - 3:00	W240633 Phase-field model for viscous dominated hydraulic fracturing Author(s): Tao You, Keita Yoshioka*
	3:00 - 3:20	W241321 Neural networks meet phase-field: a hybrid fracture model Author(s): Franz Dammass*, Karl Kalina, Markus Kästner
	3:20 - 3:40	W240799 On the energy decomposition in variational phase-field models for brittle fracture under multi-axial stress states Author(s): Francesco Vicentini*, Camilla Zolesi, Pietro Carrara, Corrado Maurini, Laura De Lorenzis
	3:40 - 4:00	W242379 Statistical mechanics-based gradient-enhanced damage for elastomeric materials Author(s): Jason Mulderrig, Mohammad Mousavi, Brandon Talamini, Nikolaos Bouklas*
0214: Multi-scale, multi-rate damage and fracture: Models, experiments, and simulations Chair(s): Toru Aida		
110 Level 1	2:00 - 2:20	W240752 Characterization and modelling of the effects of weaving defects on the mechanical behaviour of L-angle thermoset composite specimens. Author(s): Christian Fagiano*, Anton Koenig, Claire Fougerouse, Florence Saffar, Frédéric Laurin
	2:20 - 2:40	W241341 Failure analysis of composite laminate bolted joints: comparison of experimental test results and numerical analysis Author(s): Myriam Kaminski*, Frédéric Laurin, Christian Fagiano, Mélanie Herman, Jean-Luc Leon-Dufour, Santiago Garcia-Rodriguez
	2:40 - 3:00	W242644 The role of surface defects in dynamic ductile failure: an experiment and numerical study Author(s): Thao Nguyen*, Saryu Jindal Fensin, Darby Luscher
	3:00 - 3:20	W242675 A novel ductile fracture prediction of additive manufactured Ti6Al4V alloy Author(s): Hui Liu*, Xuan Yang, Biao Li, Yazhi Li
0304: Immersed-boundary variational methods: Theory, data structures, and applications Chair(s): Ming-Chen Hsu		
201 Level 2	2:00 - 2:20	W240776 Recent developments in finite cell analysis of microstructured materials Author(s): Alexander Düster*, Mahan Gorji, Seyed Farhad Hosseini, Lars Radtke, Roman Sartorti
	2:20 - 2:40	W240596 On remeshing and data transfer in the finite cell method Author(s): Roman Sartorti*, Alexander Düster
	2:40 - 3:00	W240731 The virtual element method on approximate domains: a new strategy for higher order discretization of PDEs with curved boundary Author(s): Silvia Bertoluzza*, Monica Montardini, Micol Pennacchio, Daniele Prada
	3:00 - 3:20	W241923 A Generalized Weighted Shifted Boundary method for problems with evolving domains Author(s): Oriol Colomés*, Jan Modderman, Guglielmo Scovazzi

201 Level 2	3:20 - 3:40	W241350 Stabilization strategies for the 3D Cartesian grid discontinuous Galerkin method (cgDG) Author(s): Héctor Navarro-García, Ruben Sevilla, José Manuel Navarro-Jiménez*, Enrique Nadal, Juan José Ródenas
	3:40 - 4:00	W240155 Parameter-robust unfitted finite element methods for a Maxwell interface problem Author(s): Tim Haubold*, Christoph Lehrenfeld
0307: Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, localization, and failure Chair(s): David Noble and Julian Rimoli		
203 Level 2	2:00 - 2:20	W242302 Adjoint sensitivity analysis and design optimization for Lagrangian shock hydrodynamics Author(s): Brandon Talamini*, Robert Rieben, Daniel Tortorelli, William Schill
	2:20 - 2:40	W242404 Multi-level optimization-based solvers for quasi-static problems with instabilities Author(s): Michael Tupek*, Brandon Talamini
	2:40 - 3:00	W240010 A fundamentally new coupled approach to contact mechanics via the Dirichlet-Neumann Schwarz alternating method Author(s): Alejandro Mota*, Daria Koliesnikova, Irina Tezaur, Jonathan Hoy
	3:00 - 3:20	W241517 Advances in a 10-node composite tetrahedral framework for shock and mesh adaptivity Author(s): James Foulk*, Jesse Thomas, Scott Miller, David Noble, William Scherzinger, Michael Veilleux, Alejandro Mota
	3:20 - 3:40	W240891 Progress and challenges in the development of the composite wedge localization element Author(s): Michael Buche*, Michael Veilleux, Ellen Wagman, John Emery, Alejandro Mota, James Foulk
	3:40 - 4:00	W241807 Applications of mesh adaptivity and transfers for modeling fracture and failure Author(s): Michael Veilleux*, James Foulk, Mark Merewether, Matthew Staten, Riley Wilson, David Noble, Gabriel de Frias
0308: Mesh-free particle methods for multi-physics problems Chair(s): Ahmad Shakibaeinia		
202 Level 2	2:00 - 2:20	W240118 Non-Newtonian model for simulating sand flow with Moving Particle Hydrodynamics (MPH) method Author(s): Masahiro Kondo*, Sui Satomi, Shunichi Suzuki, Kimitaka Watanabe, Kyuya Matsumoto, Takashi Misaka, Jyunichi Matsumoto, Kazuya Shibata
	2:20 - 2:40	W241728 Adaptive coupling of bulk and thin film flow models using meshfree methods Author(s): Pratik Suchde*
	2:40 - 3:00	W241981 Machine-learning-enabled solid boundary conditions in mesh-free particle methods Author(s): Nariman Mehranfar*, Ahmad Shakibaeinia
	3:00 - 3:20	W240699 Influence of cavity partition on the damping performance of additively manufactured particle dampers Author(s): Honghu Guo*, Takezawa Akihiro
	3:20 - 3:40	W240725 Numerical investigation on hydrodynamic characteristics of floating OWC breakwaters based on multi-phase ASR-SPH method Author(s): Yifan Zhang*, Can Huang, Fang He
0407: Multiscale computational and data-driven approach of advanced materials and structures Chair(s): Seunghwa Yang and Jaehun Lee		
304 Level 3	2:00 - 2:20	W240398 Mesoscale study of polymer pyrolysis using coarse-grained molecular dynamics simulations Author(s): Vinh Phu Nguyen, Inseok Jeon, Seunghwa Yang*, Seung Tae Choi
	2:20 - 2:40	W241727 A reactive molecular dynamic simulation study on hyperthermal erosion of BNNT based nanocomposite under LEO and sub LEO environment Author(s): Inseok Jeon*, Seunghwa Yang
	2:40 - 3:00	W241160 Coarse-grained molecular dynamics model for multicomponent alloy systems using neural networks Author(s): Faiyaz Bin Naser Chowdhury*, André McDonald, Wylie Stroberg

304 Level 3	3:00 - 3:20	W242571 Multiscale modeling of short hyperelastic composite rods: Application to elastomeric isolators Author(s): Eduardo Montalto*, Dimitrios Konstantinidis
	3:20 - 3:40	W241183 Matrix analysis of molecular structures: from linear analysis to buckling Author(s): Andrés Fernández San Miguel*, Iván Couceiro Aguiar, Luis Ramírez, Fermín Navarrina Martínez
0410: Battery modeling and computation: From material to device Chair(s): Bin Li		
305 Level 3	2:00 - 2:20	W240107 Quantitative analysis of electrochemical-mechanical coupling behaviors in lithium-ion batteries Author(s): Chunhao Yuan, Jun Xu*
	2:20 - 2:40	W240098 Dendrite inhibition strategy using hetero-epitaxial residual stresses in thin film deposition mechanics Author(s): Musanna Galib*, Jian Liu, Mauricio Ponga
	2:40 - 3:00	W242197 Modelling the effect of current collectors on structural battery performance Author(s): Karthikayen Raju*, Sihan Dong, Vincent B C Tan, Tong-Earn Tay
	3:00 - 3:20	W242370 A comparative study of the state of charge estimation for lithium-ion batteries using single particle model and Kalman filter Author(s): Kintak Raymond Yu*, Francis Lacombe, Florin Ilinca
0420: Advances in multi-scale, multi-material, and multi-component Topology Optimization Chair(s): James K Guest and Federico Ferrari		
306 Level 3	2:00 - 2:40	W242456 From voxels to balls: towards connected predictions of machine learning models in topology optimization Author(s): Mohammad Behzadi, Horea Ilies*
	2:40 - 3:00	W241318 On the acceleration of a two-level topology optimization process for generating quasi-continuous high-resolution structures Author(s): Antolin Martínez-Martínez, Marc Bosch-Galera, Rafael Merli-Gisbert, Juan José Róndenas, José Manuel Albelda, Enrique Nadal*
	3:00 - 3:20	W242450 VoroTO: multiscale topology optimization of Voronoi structures using surrogate neural networks Author(s): Rahul Kumar Padhy*, Krishnan Suresh, Aaditya Chandrasekhar
	3:20 - 3:40	W242601 Imposing manufacturing constraints using polygonal primitives parametrization Author(s): Yakov Zelickman*, James Guest
0422: Methods for identification, machine learning, and uncertainty quantification of reduced order models of coupled systems Chair(s): Christophe Hoareau		
303 Level 3	2:00 - 2:20	W240204 GPT-PINN: Generative Pre-Trained Physics-Informed Neural Networks toward non-intrusive Meta-learning of parametric PDEs Author(s): Yanlai Chen*, Shawn Koohy
	2:20 - 2:40	W241187 Nonintrusive computation of invariant manifolds and their reduced dynamics in large nonlinear finite element models Author(s): Shobhit Jain*
	2:40 - 3:00	W241357 Data assimilation through semi-Gaussian Bayesian update Author(s): Yoonsang Lee*
	3:00 - 3:20	W241613 Development of tailored fixtures and conditions for 3-axis mechanical shock testing. Author(s): Mikhail Mesh*, Tyler Alvis
0505: Imaging-based methods in computational medicine Chair(s): Adrian Buganza Tepole		
121 Level 1	2:00 - 2:20	W241753 Analyzing time-lapse microscopy data to quantify and understand the behavior of mechanobiological systems Author(s): Emma Lejeune*
	2:20 - 2:40	W241867 Personalizing non-invasive brain stimulation treatments using image-based anatomical and computational models Author(s): Divya Rajasekharan*, Leanne Williams, Ellen Kuhl

121 Level 1	2:40 - 3:00	W240657 Deriving intervertebral disc FEM models from MRI image segmentation in large cohorts Author(s): Kati Nispel*, Tanja Lerchl, Gabriel Gruber, Hendrik Moeller, Veit Senner, Jan S. Kirschke
	3:00 - 3:20	W242539 Patient-specific long-term simulation of transcatheter edge-to-edge mitral valve repair Author(s): Natalie Simonian*, Sneha Vakamudi, Mark Pirwitz, Michael Sacks
	3:20 - 3:40	W240376 Advancing lung finite element models through digital image correlation techniques Author(s): Arif Badrou*, Crystal A. Mariano, Matthew Shankel, Mona Eskandari
0506: Computational models and methods for predicting cancer progression and treatment response Chair(s): Casey Stowers		
122 Level 1	2:00 - 2:20	W242312 Building trust in cancer-patient digital twins for personalized treatment plans Author(s): Anirban Chaudhuri*, Michael Kapteyn, Karen Willcox
	2:20 - 2:40	W240333 Spatio-temporal optimization of therapuetic cell delivery with digital twins Author(s): Ryan Woodall*, Alexander Brummer, Margarita Gutova, Christine Brown, Jennifer Munson, Russell Rockne
	2:40 - 3:00	W241386 Patient-specific optimization of therapeutic regimens via digital twins to improve triple negative breast cancer response to neoadjuvant therapy Author(s): Chengyue Wu, Ernesto Lima*, Casey Stowers, Zhan Xu, Clinton Yam, Jong Bum Son, Jingfei Ma, Gaiane Rauch, Thomas Yankeelov
	3:00 - 3:20	W242656 Strategic integration of predictive models: a holistic approach to deciphering breast cancer metastasis dynamics Author(s): Heber L Rocha*, Ines Godet, Daniele Gilkes, Paul Macklin
	3:20 - 3:40	W242687 Computational modeling guided predictive adaptive radiotherapy (part) for high grade glioma Author(s): David Hormuth II, Maguy Farhat, Holly Langshaw, Mihir D. Shanker, Wasif Talpur, Sara Thrower, Jodi Goldman, Thomas Yankeelov, Caroline Chung*
0507: Continuum biomechanics of active systems Chair(s): TBA		
119 Level 1	2:00 - 2:20	W241423 Coupled analysis of active biological processes for meniscus tissue regeneration Author(s): Bernd Simeon*, Christina Surulescu, Elise Grosjean, Henry Jaeger
	2:20 - 2:40	W241904 Precision thermal therapy in multi-layer skin tissue: modeling with distinct absorption-extinction under infrared laser irradiation Author(s): Seyed Morteza Seyedpour*, Lena Lambers, Mohammad Azdari, Ghader Rezazadeh, Tim Ricken
	2:40 - 3:00	W242488 Elastic-inelastic shells with growth: an Eulerian formulation Author(s): Miles Rubin, Giuseppe Tomassetti*
	3:00 - 3:20	W242371 Active membrane response of the bat wing Author(s): Nakhiah Goulbourne*
0601: Design and mechanics of mutifunctional composites and structures Chair(s): TBA		
112 Level 1	2:00 - 2:20	W240490 Analysis of composite structural lithium-ion batteries and an application to a door structure of electric vehicles Author(s): Cheol Kim*, Yeongeun Park
	2:20 - 2:40	W240008 Ritter-Križaić iteracion method of truss constructions Author(s): Vladimir Križaić*, Tibor Rodiger, Nikolina Križaić, Jelena Križaić
	2:40 - 3:00	W241856 Topology optimization method of skin-to-skeleton connection area's distribution design for alleviating strain concentration and suppressing wrinkles of flexible sheets Author(s): Zhaodong Wei, Renjing Gao*, Shutian Liu

112 Level 1	3:00 - 3:20	W240678 Topology optimization method of lightweight damping composite structure Author(s): Xiaohong Ding*, Qian Wang, Heng Zhang
0701: Computational methods in environmental fluid mechanics Chair(s): Kazuo Kashiyama		
222 Level 2	2:00 - 2:20	W242534 Estimating surface-level winds for storm surge simulations using a CYGNSS-informed parametric modeling approach Author(s): Aaron Sines*, Ethan Kubatko, Suranjan Nepal, Mohammad Al-Khaldi, Younghun Kang
	2:20 - 2:40	W242514 Storm surge modeling on the fjords of Norway with ADCIRC Author(s): Matthew Scarborough*, Eirik Valseth
	2:40 - 3:00	W242600 Implementation of subgrid approaches accounting for unresolved topography in an arbitrarily-structured C-grid shallow water flow model Author(s): Damrongsak Wirasaet*, Steven Brus, Darren Engwirda, Joannes Westerink, Mark Petersen, Andrew Kennedy
	3:00 - 3:20	W242105 Incorporation and evaluation of parametric wind and rainfall models for compound flooding in a discontinuous Galerkin storm surge framework Author(s): Suranjan Nepal*, Ethan Kubatko, Aaron Sines
0702: Advanced numerical techniques for fluid flow in porous media Chair(s): Darlan de Carvalho and Paulo Lyra		
221 Level 2	2:00 - 2:20	W241605 A higher order finite volume multilevel WENO scheme for multiphase flow in porous media Author(s): Todd Arbogast*, Chieh-Sen Huang, Chenyu Tian
	2:20 - 2:40	W241790 A two-scale phase-field model for two-phase flow in porous media Author(s): Mathis Kelm*, Carina Bringedal, Bernd Flemisch
	2:40 - 3:00	W241960 Numerical simulation of the stokes-brinkman equations on 2D unstructured meshes using a monolithic approach and a multipoint flux approximation method based on harmonic points (MPFA-H) Author(s): Darlan Carvalho*, Pedro Albuquerque, Contreras Fernando, Paulo Lyra
0703: Multiphase flow and non-Newtonian fluid - Modelling and applications Chair(s): TBA		
115 Level 1	2:00 - 2:40	W241001 The breaking of three-dimensional waves Author(s): Frederic Dias*, Ayoub Mansar
	2:40 - 3:00	W240785 Pore-scale study of multiphase flow patterns in layered porous media with fractures Author(s): Bo Li*, Hao Yu, HengAn Wu
	3:00 - 3:20	W241295 Numerical study of the impact of grooves on refrigerant flow boiling in microchannel heat exchangers Author(s): Pragun Badhan*, Kiyonori Yokose, Motohiko Fukuoka
	3:20 - 3:40	W241678 Dynamics of buoyant miscible injection flows in a confined medium Author(s): Soheil Akbari*, Seyed Mohammad Taghavi
	3:40 - 4:00	W241763 Numerical analysis of droplet freezing on cold surfaces using the moving particle simulation method Author(s): Hiroki Tsujimura*, Kenichi Kubota
0805: Recent advances in numerical methods for interface problems Chair(s): Aycil Cesmelioglu, Jeonghun J. Lee and Sander Rhebergen		
204 Level 2	2:00 - 2:20	W240300 A Schur complement method for the Stokes-Biot system and ROM implementation Author(s): Amy De Castro, Hyesuk Lee*, Margaret Wiecek

204 Level 2	2:20 - 2:40	W241369 A mixed finite element approach to solving linear Cosserat equations Author(s): Wietse Marijn Boon, Omar Duran*, Jan Martin Nordbotten
	2:40 - 3:00	W241654 Parameter and domain-robust preconditioners for coupled multiphysics problems Author(s): Miroslav Kuchta*, Timo Koch
	3:00 - 3:20	W241665 A mass conservative finite element method for a nonisothermal Navier-Stokes/Darcy coupled system Author(s): Jessika Camaño, Ricardo Oyarzúa*, Miguel Serón, Manuel Solano
	3:20 - 3:40	W241887 Polygonal staggered discontinuous Galerkin methods for problems in porous media Author(s): Eun-Jae Park*
0826: Quantum scientific computing Chair(s): Marek Behr		
209 Level 2	2:00 - 2:20	W241338 Quantum annealing-based approach for fluid dynamics simulation using Finite Element Method and topology optimization Author(s): Yudai Suzuki, Fabian Key, Marek Behr, Katsuhiro Endo, Shu Tanaka, Yoshiki Matsuda, Mayu Muramatsu*
	2:20 - 2:40	W240407 Quantum annealing-based solution methods for topology optimization Author(s): Wenxiao Pan*
	2:40 - 3:00	W240078 Developing a formulation of structural design optimization problems for quantum annealing Author(s): Fabian Key*, Lukas Freinberger
	3:00 - 3:20	W241530 Quantum annealing for structural design Author(s): Naruethep Sukulthanasorn*, Koya Wagatsuma, Xiao Junsen, Shuji Moriguchi, Kenjiro Terada
	3:20 - 3:40	W242288 Quantum annealing for particle matching in quasi-cyclic discrete-element method simulations Author(s): Oliver Ahrend*, Julia Kowalski
	3:40 - 4:00	W241229 Proposing of novel real number representations in ising machines Author(s): Katsuhiro Endo*, Yoshiki Matsuda, Shu Tanaka, Mayu Muramatsu
0835: Recent advances in meshfree and particle methods Chair(s): Mitsuteru Asai		
205 Level 2	2:00 - 2:20	W240153 Simulating overturning moments and pile resistance capacity in tsunami-exposed reinforced concrete buildings with MPS method Author(s): Rose Noggle*, Tibing Xu, Seiichi Koshizuka, Tsuyoshi Koyama
	2:20 - 2:40	W240158 Application of particle method to mixing process simulation Author(s): Eiji Ishii*, Tadashi Sano, Tomoyuki Hosaka, Seiichi Koshizuka, Takuya Matsunaga, Kosuke Oyama
	2:40 - 3:00	W241151 A new computational framework of FPM based on matrix decoupling Author(s): Yang Yang*, Xu Fei, Li Yaoyu
	3:00 - 3:20	W241268 Fluid film lubrication simulation of pressure-dependent non-Newtonian fluid using the moving particle hydrodynamics method Author(s): Shu Hiramoto*, Kazuya Shibata, Kyuya Matsumoto, Hideyo Negishi, Masahiro Kondo
	3:20 - 3:40	W242053 A comparative study of conventional and advanced particle methods on resultant accuracy and computational cost Author(s): Takuya Matsunaga*, Hiroshi Okuda
0836: Multiscale modeling, analysis and numerical methods of material defect and inhomogeneities Chair(s): TBA		
207 Level 2	2:00 - 2:20	W242040 Enabling local lattice structure analysis in finite temperature molecular dynamics simulations Author(s): Atsuo Hirano*, Akiyuki Takahashi
	2:20 - 2:40	W241132 Multiscale modelling of defect kinetics in irradiated Zr-Sn-Nb alloys Author(s): Changqiu Ji*, Yang Li, Yinan Cui

207 Level 2	2:40 - 3:00	W242046 Dislocation dynamics analysis of basal plane dislocation near the surface in 4H-SiC Author(s): Noboru Takahashi*, Atsuo Hirano, Akiyuki Takahashi
	3:00 - 3:20	W241251 Stable and efficient methods for 2D-3C clamped plate and shallow shell models Author(s): Xiaoqin Shen*
0903: Physics-based data-driven modeling and uncertainty quantification in computational materials science and engineering Chair(s): Lori Graham-Brady		
210 Level 2	2:00 - 2:20	W240784 Data-based estimates of extremes of random functions Author(s): Mircea Grigoriu*
	2:20 - 2:40	W241415 Model validation vis à vis predictive capability Author(s): William Oberkampf*
	2:40 - 3:00	W241666 Multiscale uncertainty quantification and propagation for composite materials system with agglomeration and structural anomalies Author(s): Yigitcan Comlek*, Satyajit Mojumder, Anton van Beek, Prajakta Prabhune, Daniel Apley, Catherine Brinson, Wing Kam Liu, Wei Chen
	3:00 - 3:20	W241842 Advanced sampling algorithms for accelerating multi-fidelity information fusion Author(s): Alex Gorodetsky*, John Jakeman, Thomas Dixon
	3:20 - 3:40	W242280 ML surrogates for model calibration and error quantification in high-dimensional problems Author(s): Yulin Guo, Sankaran Mahadevan*
0904: Uncertainty quantification and reliability analysis in engineering Chair(s): Dixiong Yang and Guohai Chen		
211 Level 2	2:00 - 2:40	W240451 Probabilistic failure envelopes of monopiles in scoured seabed based on a new non-stationary random field model Author(s): Ping Yi*, Xinshuai Guo, Jun Liu
	2:40 - 3:00	W242631 Probabilistic indoor navigation and object manipulation of Autonomous Mobile Robots Author(s): Po Ting Lin*, Shaneza Fatma Rahmadhanty, Yu-Chun Huang, Ikjin Lee, Kuei-Yuan Chan
	3:00 - 3:20	W242356 Direct finite element technique for uncertainty quantification for Stokes flows Author(s): Chien-Kai Wang*, Po Ting Lin
	3:20 - 3:40	W240803 Direct probability integral method for high-dimensional stochastic mechnicas analysis Author(s): Guohai Chen*, Dixiong Yang
	3:40 - 4:00	W240504 Reliability design of monopile foundations in spatially variable soil considering random loads Author(s): Jun Liu*, Xinshuai Guo, Ping Yi
0908: Certification of simulations and model adaptation in computational science and engineering Chair(s): Fredrik Larsson		
208 Level 2	2:00 - 2:20	W240988 An equilibrated flux a posteriori error estimator for adaptive refinement in defeaturing problems Author(s): Denise Grappein*, Annalisa Buffa, Rafael Vazquez
	2:20 - 2:40	W241191 Adaptive analisis for scattering problems in the Cartesian grid discontinuous Galerkin method Author(s): Héctor Navarro-García, Pedro Diez, José Manuel Navarro-Jiménez, Antonio Huerta, Juan José Ródenas*, Enrique Nadal
	2:40 - 3:00	W241736 Adaptive grid refinement for high-order finite volume simulations of unsteady compressible and turbulent flows Author(s): Ariadni Liapi*, Anca Belme, Pierre Brenner, Alexandre Limare, Grégoire Pont, Paola Cinnella
	3:00 - 3:20	W240871 Concerning adaptive refinement for FEM approximations of multiple eigenvectors of Schroedinger-type operators Author(s): Jeffrey Ovall*, Stefano Giani
	3:20 - 3:40	W240383 HP-adaptive sparse grid collocation methods for uncertainty quantification in gas networks Author(s): Hendrik Wilka*, Jens Lang

0915: Uncertainty quantification in structural dynamics Chair(s): Steffen Freitag		
217 Level 2	2:00 - 2:20	W241516 Advances in high-performance structural dynamics simulation software toward characterizing structures in combined environments Author(s): Julia Plews*, Dagny Beale, Gregory Bunting, David Day, Clark Dohrmann, Payton Lindsay, Justin Pepe
	2:20 - 2:40	W241889 Uncertainty quantification of large stochastic nonlinear dynamical systems using a novel non-intrusive ROM Author(s): Chandan Bharti*, Debraj Ghosh
	2:40 - 3:00	W242015 A seismic response prediction surrogate model with engineering explainability using attention-embedded CNN Author(s): Taisei Saida*, Mayuko Nishio
	3:00 - 3:20	W242517 Polymorphic uncertainty quantification in structural dynamics Author(s): Steffen Freitag*, Marc Fina, Maximilian Schweizer, Werner Wagner
1004: Numerical modelling of composite materials and structures Chair(s): Georgios Stavroulakis, Ghadir Haikal and Georgios Drosopoulos		
118 Level 1	2:00 - 2:20	W242089 Two-scale damage propagation/strength analysis of CFRP considering randomness of fiber distribution Author(s): Yukinobu Shimura*, Tetsuya Matsuda
	2:20 - 2:40	W242384 Modeling considerations in the simulation of self-healing fiber reinforced polymer composites Author(s): Vikita Kamala, Jack Turicek, Jason Patrick, Ghadir Haikal*
	2:40 - 3:00	W242515 Computational modeling of UHMWPE fabric impregnated with a new chemical crosslinker and Shear Thickening Fluid Author(s): Mahshid Mahbod*, Stefania F. Musolino, Jeremy E Wulff, Reza Vaziri, Abbas S. Milani
	3:00 - 3:20	W242584 Effect of moisture on process induced deformation in carbon fiber composites Author(s): Martin Battilana*, Anoush Poursartip
1005: Advanced numerical methods for the modeling and optimization of coupled dynamical systems Chair(s): Andreas Zilian		
113 Level 1	2:00 - 2:20	W240113 Weight reduction in dynamically loaded systems through the effect of damping in bolted joints Author(s): Silas Roediger*, Carsten Koenke, Heiko Beinersdorf
	2:20 - 2:40	W241544 Optimal design of vehicle dynamics using gradient-based, mixed-fidelity multidisciplinary optimization Author(s): Hyunmin Cheong*, Mehran Ebrahimi, Hesam Salehipour, Adrian Butscher, Alex Tessier
	2:40 - 3:00	W241504 Structural reinforcement and vibration reduction with elastic and viscoelastic materials using topology optimization Author(s): Antoine Legay*, Sylvain Burri
1106: Computational mechanics for additive manufacturing Chair(s): Jinhui Yan		
117 Level 1	2:00 - 2:20	W240604 High-fidelity modeling of multi-material additive manufacturing Author(s): Wentao Yan*
	2:20 - 2:40	W240653 Residual stresses computation and optimization for directed energy deposition processes Author(s): Usman Tariq, Sung-Heng Wu, Ranjit Joy, Frank Liou*
	2:40 - 3:00	W240591 Large-scale phase-field simulation of cell growth in molten pool of powder bed fusion Author(s): Shinji Sakane*, Lu Wang, Wentao Yan, Tomohiro Takaki
	3:00 - 3:20	W240293 Crystal plasticity finite element creep modeling of powder bed fused 316H steel Author(s): Sagar Bhatt*, Mark Messner

1311: Computational methods for wind energy Chair(s): Alessio Castorrini and Vincenzo Morici		
302 Level 3	2:00 - 2:20	W242469 Predicting far wake interaction in wind farm by high resolution 2D LES simulation with porous disk model Author(s): Ji Qi*, Kenji Ono, Koichiro Shibuya, Takanori Uchida
	2:20 - 2:40	W241532 Finite element-based simulation of large wind turbines wake using the actuator line method Author(s): Vincenzo Morici*, Valerio Francesco Barnabei, Alessio Castorrini, Franco Rispoli, Artem Korobenko
	2:40 - 3:00	W242529 Wind farm stratified flow simulations with actuator line method and variational multiscale framework Author(s): Aabhushan Regmi*, Artem Korobenko
	3:00 - 3:20	W241729 Offshore wind cluster modeling using analytical wake models calibrated using long-term SCADA data and scanning lidar Author(s): Diederik van Binsbergen, Pieter-Jan Daems, Timothy Verstraeten, Amir Nejad, Jan Helsen*
	3:20 - 3:40	W241401 Aeroelastic response of the NREL-15 MW wind turbine rotor using fluid-structure interaction modeling Author(s): Claudio Bernardi*, Stefania Cherubini, Pietro De Palma, Giacomo Della Posta, Stefano Leonardi
1401: Emerging topology and shape optimization techniques in computational design of materials and structures Chair(s): Graeme Kennedy and Nolan Black		
220 Level 2	2:00 - 2:40	W241215 Topology optimization of geometrically nonlinear compliant mechanisms with variable loads and supports Author(s): Lee Alacoque, Kai James*
	2:40 - 3:00	W240674 Exploiting rate-dependent instabilities in soft metamaterials through shape and topology optimization Author(s): Ryan Alberdi*, Craig Hamel, Aabhas Singh, Kevin Long, Adam Cook
	3:00 - 3:20	W241816 PolyPlas: A Python implementation of a topology optimization framework for plasticity with unstructured polygonal finite elements Author(s): Emily Alcazar*, Jonathan Russ, Glaucio Paulino
	3:20 - 3:40	W240223 Inverse design of periodic microstructures with targeted nonlinear mechanical behaviour Author(s): Dilaksan Thillaithevan*, Ryan Murphy, Robert Hewson, Matthew Santer
1408: Design beyond optimization: Why, what if, and how much? Chair(s): Greg van Anders		
219 Level 2	2:00 - 2:40	W241156 Programming patchy particles for materials assembly design Author(s): Chrisy Xiyu Du*, Ella King, Qian-Ze Zhu, Samuel Schoenholz, Michael Brenner
	2:40 - 3:00	W241419 Asymptotic designability and the structure of self-assembly Author(s): Maximilian Huebl*, Carl Goodrich
	3:00 - 3:20	W240417 Gradient-based layout optimization for efficient 3D packing of complex components Author(s): Daniel Krsikapa*, Il Yong Kim
	3:20 - 3:40	W242069 A continuum mathematical model for generative design of planar mechanism Author(s): Yurika Sayo, Takayuki Yamada*
1501: PSE (Problem Solving Environment) Chair(s): Hideo Miyachi		
218 Level 2	2:00 - 2:20	W240207 Relationship between perfectionism tendency and sports injuries Author(s): Satsuki Karino*
	2:20 - 2:40	W240236 Yoga therapeutic approaches for the physical and mental health of older adults: using movement analysis and psychometric data analysis Author(s): Satoko Murakami*, Chieko Kato, Hongjie Zheng

218 Level 2	2:40 - 3:00	W240337 The influence of family environment on personality Author(s): Kazuma Yamane*, Eiichi Yubune, Chieko Kato
	3:00 - 3:20	W240363 A study of related models of resilience in adolescence Author(s): Zixuan Wu*, Chieko Kato
	3:20 - 3:40	W240601 Development of a social skills scale for Chinese students in Japan and Japanese students in China Author(s): Airi Yamaguchi*, Chieko Kato
	3:40 - 4:00	W240934 Anthropophobic Tendency and subjective well-being Author(s): Hinata Nanya*, Chieko Kato
1610: Advances in computational mechanics for flow-induced vibrations Chair(s): Frederick Gosselin		
224 Level 2	2:00 - 2:20	W242625 A hybrid model for flow-induced vibrations of pipes conveying fluid subjected to external cross flow Author(s): Mahdi Riazat, Mojtaba Kheiri*, Brian Vermeire, Weixing Yuan
	2:20 - 2:40	W240992 Sparse sensor data-driven digital twin for prediction and estimation of governing equation of a pipe-conveying fluid using unscented Kalman filter Author(s): Vincent Laperle*, Esmaeil Ghorbani, Frederick Gosselin
	2:40 - 3:00	W241478 A hybrid modal and graph neural network analysis: application to flow-induced vibration of long flexible cantilevers Author(s): Shayan Heydari*, Rajeev Jaiman
	3:00 - 3:20	W242495 Simulating soft coral vortex-induced vibrations by coupling a wake oscillator model to a co-rotational beam finite element formulation Author(s): Alexandre Villié, Mauricio Vanzulli Pena, Jorge Pérez Zerpa, Jérôme Vétel, Stéphane Étienne, Frederick Gosselin*
1702: Modeling and simulation of coupled processes in geological media Chair(s): Bruce Gee		
120 Level 1	2:00 - 2:20	W241012 Modelling the flow of fluids through porous solids exhibiting nonlinear response in the small strain regime Author(s): Shriram Srinivasan*
	2:20 - 2:40	W240870 Three-field model for wave propagation in porous media based on mixture theories Author(s): Bruna Campos*, Robert Gracie
	2:40 - 3:00	W242596 Reduced order geomechanics models Author(s): Robert Gracie*, Saeed Hatefiardakani
	3:00 - 3:20	W240263 Finite element-finite volume coupled asymptotic tip enrichment for hydraulic fracture propagation Author(s): Tao Jin*, Joshua White, Randolph Settgast
	3:20 - 3:40	W240555 Modeling of PDC cutter – rock interactions using HOSS Author(s): Erin Heilman*, Esteban Rougier, Bryan Euser, Luke Frash, Meng Meng, Wenfeng Li
1808: Predictive digital twins Chair(s): Kjell Magne Mathisen and Trond Kvamsdal		
214 Level 2	2:00 - 2:20	W242657 Federated learning for Structural Health Monitoring Author(s): Trond Kvamsdal*, Adil Rasheed, Florian Stadtmann, Knut Morten Okstad, Kjell Magne Mathisen
	2:20 - 2:40	W241925 Optimal sensor placement for structural health monitoring Author(s): Knut Morten Okstad*, Adil Rasheed, Trond Kvamsdal, Daniel Menges
	2:40 - 3:00	W242077 Structural model updating of steel frame for displacement prediction during construction using data-driven approach Author(s): Shinya Yamamoto*, Hideyuki Sakurai, Tomomi Kanemitsu, Manabu Uchiyama

214 Level 2	3:00 - 3:20	W242277 Hybrid analysis and modeling for turbulent flow problems Author(s): Vasileios Tsiolakis*, Adil Rasheed, Trond Kvamsdal
	3:20 - 3:40	W241127 Predicting and controlling sintering-related deformation and distortion with surrogate model and digital twin Author(s): Peter Polak*, Ran He, Mingxuan Xia, Baber Saleem, Xiaoxia Yu, Jingzhe Pan
1810: Data-driven approaches for solid mechanics Chair(s): Jiun-Shyan (JS) Chen and Qizhi He		
212 Level 2	2:00 - 2:20	W241799 Heterogeneous peridynamic neural operators (PNO): towards constitutive law and microstructure discovery Author(s): Siavash Jafarzadeh*, Stewart Silling, Lu Zhang, Colton Ross, Chung-Hao Lee, Yue Yu
	2:20 - 2:40	W242360 LatticeGraphNet: A two-scale graph neural operator for simulating lattices and structures Author(s): Ayush Jain, Ehsan Haghighat*, Sai Nelaturi
	2:40 - 3:00	W240806 Data-adaptive modeling of hyperelastic constitutive laws: application to extremely soft materials Author(s): Simon Wiesheier*, Miguel Angel Moreno-Mateos, Paul Steinmann
	3:00 - 3:20	W242366 Predicting linear and nonlinear stress distribution in composites using integrated convolutional and graph neural networks Author(s): Marwa Yacouti*, Maryam Shakiba
	3:20 - 3:40	W242145 A distributed computing framework for model-free data-driven methods Author(s): Wei Yan*, Maoyuan Jiang, Jie Yang
	3:40 - 4:00	W241009 The development of a constitutive neural network approach for multiscale fracture-to-damage modelling Author(s): Yu-Chun Chou*, Wen-Yi Hsieh, Yu-Zhen Li, Tsung-Yeh Hsieh, Tsung-Hui Huang, Po-Yu Chen
1812: Constitutive modeling of complex materials with machine learning and artificial intelligence Chair(s): Ellen Kuhl		
213 Level 2	2:00 - 2:20	W240246 Accelerating multiscale simulation with machine learning Author(s): Reese Jones*, Craig Hamel, Dan Bolintineanu, Jan Fuhg, Nikolaos Bouklas
	2:20 - 2:40	W240412 The mechanical signature of real and plant-based meat Author(s): Skyler St. Pierre*, Ethan C. Darwin, Divya Adil, Magaly C. Aviles, Archer Date, Reese A. Dunne, Yanav Lall, Maria Parra Vallecillo, Valerie A. Perez Medina, Kevin Linka, Marc E. Levenston, Ellen Kuhl
	2:40 - 3:00	W240859 Concurrent multiscale simulations of nonlinear random materials: a probabilistic learning perspective Author(s): Peiyi Chen, Johann Guilleminot*, Christian Soize
	3:00 - 3:20	W241120 Physics informed neural networks for predicting soft solid deformation Author(s): Vikrant Pratap, Bharat Tripathi*
	3:20 - 3:40	W242136 A machine learning approach to predict in vivo skin growth Author(s): Matt Nagle*, Hannah Conroy Broderick, Adrian Buganza Tepole, Michael Fop, Aisling Ní Annaidh
	3:40 - 4:00	W242306 Application of physics-augmented neural networks to multiscale problems Author(s): Karl Kalina*, Jörg Brummund, Steve WaiChing Sun, Markus Kästner
1822: SciML in the real world Chair(s): Nikolaos Bouklas and Reese Jones		
215 Level 2	2:00 - 2:20	W242005 FP-IRL: Fokker-Planck-based inverse reinforcement learning - a physics-constrained approach to Markov decision processes Author(s): Chengyang Huang*, Siddhartha Srivastava, Xun Huan, Krishna Garikipati
	2:20 - 2:40	W241675 Inference of Fokker-Planck equations for the dynamics of populations Author(s): Krishna Garikipati*, Siddhartha Srivastava, Saem Han, Chengyang Huang, Xun Huan

215 Level 2	2:40 - 3:00	W241002 Improving the accuracy and scalability of large-scale physics-based data-driven reduced modeling via domain decomposition Author(s): Ionut Farcas*, Rayomand Gundevia, Ramakanth Munipalli, Karen Willcox
	3:00 - 3:20	W241058 Graph Calculus Neural Network for representation of physical systems Author(s): Siddhartha Srivastava*, Elizabeth Livingston, Krishna Garikipati
	3:20 - 3:40	W241639 Optimizing gradient back-propagation for hybrid neural differentiable solvers Author(s): Deepak Akhare*, Xiantao Fan, Tengfei Luo, Jianxun Wang
1824: Machine learning and multiscale modeling for complex materials and structures Chair(s): Ying Li		
216 Level 2	2:00 - 2:40	W240046 Designing architected materials using neural networks Author(s): Krishnan Suresh*, Akshay Kumar
	2:40 - 3:00	W242439 Multiphysics-informed machine learning for architected battery design Author(s): Parth Bansal, Yumeng Li*
	3:00 - 3:20	W240877 Efficient graph neural networks for structural analysis of stiffened panels Author(s): Yuecheng Cai*, Jasmin Jelovica
	3:20 - 3:40	W241060 Characterizing steel corrosion in concrete using x-ray computed tomography and machine learning techniques Author(s): Mingyang Zhang*, Weilun Wang
	3:40 - 4:00	W241922 High-throughput screening and prediction of high modulus of resilience polymers using explainable machine learning Author(s): Ying Li*

Thursday July 25 - Technical Session 12

0201: Advanced materials: Computational analysis of properties and performance Chair(s): Isamu Riku		
111 Level 1	4:30 - 4:50	W241909 First-principles study on the structural and electronic properties of advanced two-dimensional materials Author(s): Yujia Tian*, Devesh Kripalani, Ming Xue, Swee Lee Gan, Shaofan Li, Kun Zhou
	4:50 - 5:10	W241099 Fracture study of single crystal silicon using atomistic simulations Author(s): Woo Kyun Kim*, Syed Iqbal
	5:10 - 5:30	W241243 Exploring plastic deformation behavior in nanotwinned metals under high quasi-hydrostatic pressure: a molecular dynamics insight Author(s): Ruoqi Dang*, Abhinav Parakh, Melody M Wang, X. Wendy Gu, Yong-Wei Zhang, Huajian Gao
	5:30 - 5:50	W240905 A grand-potential based multi-phase-field model for simulating the evolution of intermetallic phases in Cr-coated Zry-4 alloys Author(s): Menghui Wang*, Chen Lin
	5:50 - 6:10	W242100 Multiscale modeling strategy for accurately predicting fatigue life of steels Author(s): Kazuki Shibanuma*
	6:10 - 6:30	W241459 Temperature and composition dependent critical resolved shear stress of basal slip in Mg-Y alloy from large-scale molecular dynamics Author(s): Huicong Chen*, Jun Song
0202: Computational damage and fracture mechanics Chair(s): Larissa Driemeier		
109 Level 1	4:30 - 4:50	W240848 Critical planes analysis of the impact of porosities on the fatigue of metal solids Author(s): Françoise Fauvin*, Eric Feulvarch, Gregory Debono
	4:50 - 5:10	W242257 Development of a fatigue damage assessment method based on the small punch test Author(s): Sangyeop Kim*, Yong Hwi Kim, Taeksang Lee, Moon Ki Kim
	5:10 - 5:30	W240396 Fatigue life prediction with elasto-plastic damage and hardening modeling Author(s): Hüray Ilayda Kök*, Philipp Junker
	5:30 - 5:50	W241831 Damage threshold and lifetime prediction for multiaxial cyclic loading Author(s): Kai Langenfeld*, Rodrigue Desmorat, Patrick Kurzeja, Jörn Mosler
0213: Current trends in phase-field modeling and computations Chair(s): Laura De Lorenzis, Emilio Martinez-Paneda and Thomas Wick		
116 Level 1	4:30 - 4:50	W240441 An extended phase-field method for fracture simulations Author(s): Verena Curosu, Christian Krüger, Stefan Löhnert*
	4:50 - 5:10	W241413 The revisited phase-field approach to brittle fracture: application to the diametral compression and wing-crack problems Author(s): Aditya Kumar*, Chang Liu, Yangyuanchen Liu, John Dolbow, Oscar Lopez-Pamies
	5:10 - 5:30	W241737 Energy-consistent splits in phase-field modelling of anisotropic brittle fracture via physically interpretable strain modes Author(s): Michele Marino*, Giuseppe Vairo, Peter Wriggers, Laura De Lorenzis
	5:30 - 5:50	W242146 Identification of parameters included in phase-field fracture model using Bayesian data assimilation and digital image correlation Author(s): Akinori Yamanaka*, Ryuki Funamoto, Kengo Sasaki, Akimitsu Ishii
	5:50 - 6:10	W241694 Modeling dynamic ductile fracture and thermal softening with a variational phase-field framework Author(s): David Torres*, John Dolbow, Andrew Stershic, Tianchen Hu, Tim Shelton

116 Level 1	6:10 - 6:30	W240321 Crack phase-field enhanced finite cover method realizing diffusive-discrete crack transition Author(s): Jike Han*, Yuichi Shintaku, Shuji Moriguchi, Kenjiro Terada
0214: Multi-scale, multi-rate damage and fracture: Models, experiments, and simulations Chair(s): David Walters		
110 Level 1	4:30 - 4:50	W241135 A multiscale creep model considering the concurrent evolution of point defect, dislocation, grain boundary, and void Author(s): Yinan Cui*, Zhun Liang
	4:50 - 5:10	W241293 Creep life prediction of coated turbine blades considering the influence of film cooling hole blockage Author(s): Linchuan Liu*, Chaoji Wang, Shengwei Pan, Xueling Fan
	5:10 - 5:30	W242220 Precision in prediction: a comprehensive study of mass timber SFRS through full-scale collapse testing Author(s): Prashanna Mishra*, Mojtaba Harati, Patricio Uarac, John W. Van de Lindt, Andre R. Barbosa, Steve Pryor, Shiling Pei, Barbara Simpson, Steven Kontra, Arijit Sinha, Tara Hutchinson
0308: Mesh-free particle methods for multi-physics problems Chair(s): Ahmad Shakibaeinia		
202 Level 2	4:30 - 4:50	W240690 A coupled SPH-FDM method for simulations of unsteady flows Author(s): Can Huang*, Haonan Jiang, Fang He, Ahmad Shakibaeinia
	4:50 - 5:10	W242231 A fluid-structure interaction model using moving particle semi-implicit (MPS) method Author(s): Saeed Tavakoli*, Najib Bouaanani, Ahmad Shakibaeinia
	5:10 - 5:30	W242125 An incompressible SPH strategy for multi-physics' interfacial problems Author(s): Mostafa Safdari Shadloo*
	5:30 - 5:50	W242176 Assessment of mining tailings spill impacts with the weakly compressible MPS method Author(s): Herman Siaben Musumari*, Ahmad Shakibaeinia
	5:50 - 6:10	W242180 SPH continuum-based modelling of fluvial ice dynamics Author(s): Gabriel Camporredondo-Diaz*, Ahmad Shakibaeinia
	6:10 - 6:30	W240938 Numerical investigation on fluid-flexible-structure interaction based on SPH method Author(s): Tingting Bao*, Jun Hu, Can Huang, Yong Yu
0406: Multiscale modeling of dynamics in complex media and metamaterials Chair(s): Reza Abedi and Alireza Amirkhzii		
303 Level 3	4:30 - 4:50	W242206 Non-hermitian degeneracies in band structure and modal chirality of in-plane stress waves in layered media Author(s): Alireza Amirkhizi*, Vahidreza Alizadeh
	4:50 - 5:10	W242327 Efficient wave manipulation via optimization and machine learning Author(s): Feruza Amirkulova*, Tristan Shah, Stas Tiomkin
	5:10 - 5:30	W241269 Bounds on Q-factor of quasi-static metamaterials and optimal microstructure designs Author(s): Kshiteej Deshmukh*, Graeme Milton
	5:30 - 5:50	W241592 Parametric analysis and design for impact protection based on finite locally resonant metamaterial arrays Author(s): Weidi Wang*, Willoughby Cheney, Erdem Caliskan, Reza Abedi, Alireza Amirkhizi
	5:50 - 6:10	W242464 Transient nonlinear response of resonant metamaterial arrays under impact loading Author(s): Erdem Caliskan*, Weidi Wang, Willoughby Cheney, Alireza Amirkhizi, Reza Abedi

0407: Multiscale computational and data-driven approach of advanced materials and structures Chair(s): Jaehun Lee and Hyunseong Shin		
304 Level 3	4:30 - 4:50	W240073 Temporal homogenization method for viscoelastic–viscoplastic materials subjected to cyclic loading Author(s): Wonjoo Lee*, Hyunseong Shin
	4:50 - 5:10	W240096 Data-driven multiscale finite element method using deep neural network combined with proper orthogonal decomposition Author(s): Suhan Kim*, Hyunseong Shin
	5:10 - 5:30	W241394 Efficient computational multiscale analysis for the homogenization of nonlinear solids using sampling strategies of microscopic models Author(s): Yujin So*, Suhan Kim, Hyunseong Shin, Jaehun Lee
	5:30 - 5:50	W240898 Graph neural networks for 3D geometry-agnostic predictions of material behavior Author(s): Robert Buarque de Macedo*, Kevin Potter, Kyle Johnson, Craig Hamel
0410: Battery modeling and computation: From material to device Chair(s): Chao Hu		
305 Level 3	4:30 - 4:50	W241291 Mathematical model for thermal runaway propagation within cells Author(s): Yikai Jia*, Jun Xu
	4:50 - 5:10	W241355 experimental characterization and numerical modeling of defective battery cells induced by mechancial abuse Author(s): Qingdan Huang*, Chao Zhang, Yikai Jia
	5:10 - 5:30	W241568 Numerical modelling of large pouch lithium-ion battery Author(s): Francis Lacombe*, Kintak Raymond Yu, Florin Ilinca
	5:30 – 5:50	W242020 A computational fluid dynamics approach for metal hydride hydrogen storage Author(s): Mohammad S. Islam*, Puchanee Larpruenrudee, Nick Bennett, Emilie Sauret, YuanTong Gu
0420: Advances in multi-scale, multi-material, and multi-component Topology Optimization Chair(s): Julian Norato and Federico Ferrari		
306 Level 3	4:30 - 4:50	W240375 Bi-directional fiber orientation design for manufacturing in fiber-reinforced composites Author(s): Chuan Luo*
	4:50 - 5:10	W241333 Topology optimization of multi-material structures via transfer-matrix norm minimization Author(s): Paolo Venini*
	5:10 - 5:30	W241463 Multiscale topology optimization for CFRP structures with additive manufacturing Author(s): Yanan Xu*, Chi Wu, Jianguang Fang, Guangyong Sun, Grant Steven, Qing Li
	5:30 - 5:50	W242162 Proposal of a multi-material topology optimization for microstructures using the alternating active-phase algorithm Author(s): Shun Ogawa*, Kazuo Yonekura, Katsuyuki Suzuki
	5:50 - 6:10	W240023 Performance analysis and optimisation of spatially-varying infill microstructure within CAD geometries using asymptotic analysis and machine learning Author(s): Chuang Ma*, Yichao Zhu
0505: Imaging-based methods in computational medicine Chair(s): Jessica Zhang		
121 Level 1	4:30 - 4:50	W242365 Image-guided subject-specific modeling of glymphatic transport and amyloid deposition. Author(s): Michael Johnson, Michael Abdelmalik, Frimpong Baidoo, Andrew Badachhape, Thomas J.R. Hughes, Shaolie Hossain*

121 Level 1	4:50 - 5:10	W242645 Brain tissue softening after repetitive head impact observed from subject-specific FE models generated with diffusion tensor MRI Author(s): Vickie Shim*, Tayebi Maryam, Eryn Kwon, Justin Fernandez, Samantha Holdsworth
	5:10 - 5:30	W240459 Nonrigid image registration of longitudinal subject data to quantify age-related ventricular enlargement Author(s): Lauren Cunniff*, Johannes Weickenmeier
	5:30 - 5:50	W241286 Automated mesh construction from images for cardiac simulations in patients with congenital heart defects Author(s): Fanwei Kong*, Alison Marsden
	5:50 - 6:10	W240507 Deep learning enhanced polycube method for high-quality hexahedral mesh generation and volumetric spline construction Author(s): Yuxuan Yu*, Yuzhuo Fang, Jessica Zhang
0506: Computational models and methods for predicting cancer progression and treatment response Chair(s): Casey Stowers		
122 Level 1	4:30 - 4:50	W241717 Predicting leukemia evolution and response to treatment with state-transition theory Author(s): Russell Rockne*, David Frankhouser, Lisa Uechi, Sergio Branciamore, Denis O'Meally, Jihyun Izarriy, Yu-Hsuan Fu, Bin Zhang, Ya-Huei Kuo, Guido Marcucci
	4:50 - 5:10	W241466 A computational framework for optimizing personalized low dose metronomic therapy Author(s): Lois Okereke*, Ernesto Lima, Anna Sorace, Thomas Yankeelov
	5:10 - 5:30	W242205 Delta-P1 model implementation for numerical simulation of photothermal cancer therapy in three-dimensional heterogeneous tissues Author(s): Roberto Carlos Gomez Araque*, Carlos Andres Bustamante, Raul Adolfo Valencia, Whady Felipe Florez
	5:30 - 5:50	W240058 Tailored therapy: advancing cancer care with quantitative systems pharmacology and digital twins Author(s): Leili Shahriyari*
0701: Computational methods in environmental fluid mechanics Chair(s): Clint Dawson		
222 Level 2	4:30 - 4:50	W242044 Development of traffic noise evaluation system using finite element method Author(s): Haruki Miyauchi*, Kazuo Kashiyama, Hitoshi Yoshikawa
	4:50 - 5:10	W241927 Multi-dimensional flood modeling of an extreme rainfall event in Norway Author(s): Kristen Valseth*, Lars Valnes, Eirik Valseth, Kent-Andre Mardal
	5:10 - 5:30	W240584 On the need for the inertial effects for evaluating the mitigation performance of the coastal trees in 2D unsteady tsunami flow simulations Author(s): Reika Nomura*, Shuji Ishizawa, Shuji Moriguchi, Kenjiro Terada
	5:30 - 5:50	W240224 A multidimensional modeling framework for assessing compound inundation through a reduced-physics approach in coastal watersheds Author(s): Felix Santiago-Collazo*, Logan Bayer, Matthew Bilskie
	5:50 - 6:10	W241884 Numerical analysis of hot air recirculation phenomenon using micro-weather model, a compressible large eddy simulation Author(s): Takashi Terada*, Ryo Onishi, Xidong Hu
	6:10 - 6:30	W242532 Gas-liquid-solid three-phase flow analysis with multiple objects using finite element method Author(s): Junichi Matsumoto*, Tomohiro Sawada

0702: Advanced numerical techniques for fluid flow in porous media Chair(s): Paulo Lyra and Darlan de Carvalho		
221 Level 2	4:30 - 4:50	W242175 Towards efficient simulation of large reservoir flow models: implementing an adaptive multiscale and multilevel finite volume technique for improved accuracy Author(s): Paulo Lyra*, José Cícero Santos, João Paulo Andrade, Artur Souza, Darlan Carvalho
	4:50 - 5:10	W242470 Multiscale mixed methods with improved accuracy: the role of overlapping and smoothing Author(s): Dilong Zhou*, Luis Felipe Feres Pereira
	5:10 – 5:30	W241406 Robust scalable finite volume method for two phase flow through porous media using a nonlinear complementarity problem approach Author(s): Naren Vohra*, Konstantin Lipnikov, David Moulton
0703: Multiphase flow and non-Newtonian fluid - Modelling and applications Chair(s): TBA		
115 Level 1	4:30 - 4:50	W241811 Viscoplastic flows in grooved superhydrophobic channels: Effects of anisotropic slip dynamics Author(s): Hossein Rahmani*, Ian Frigaard, Seyed Mohammad Taghavi
	4:50 - 5:10	W241815 The impact of advective dispersion on the displacement flow of two Herschel-Bulkley fluids in a confined geometry: extending the D2DGA model for non-Newtonian fluids Author(s): Fatemeh Bararpour*, Ian Frigaard
	5:10 - 5:30	W241966 Numerical simulation of the four-equation two-fluid model for one-dimensional multiphase flow, using the flux-reconstruction (FR) method Author(s): Alessandro Antunes*, Anderson Nascimento, Cleuber Silva, Giselle Silva, Paulo Lyra, Darlan Carvalho
	5:30 - 5:50	W242137 A mechanistic model for ice deposition in freeze dryer condensers using computational fluid dynamics Author(s): Blaž Kamenik*, Matjaž Hriberšek, Matej Zadravec
	5:50 - 6:10	W242348 Increasing the effectivity of oil and gas wells' cementing in Canada through modelling and simulation Author(s): Mariana Carrasco-Teja*, Ian Frigaard
	6:10 - 6:30	W242660 Numerical simulations of chiral liquid crystals in a lid-driven cavity using the Landau-de Gennes theory Author(s): Isreal Morawo*, Shancheng Li, Dana Grecov
0819: High order methods for time-dependent problems Chair(s): Reza Abedi		
206 Level 2	4:30 - 5:10	W240410 High-order methods for hyperbolic systems with local evolution Author(s): Thomas Hagstrom*
	5:10 - 5:30	W240855 Enhancing low-order discontinuous Galerkin methods with neural ordinary differential equations Author(s): Shinhoo Kang*, Emil Constantinescu
	5:30 - 5:50	W240991 High-fidelity simulations of lowfrequency sound in real 3D applications Author(s): Ken Mattsson*, Gustav Eriksson
0826: Quantum scientific computing Chair(s): Mayu Muramatsu		
209 Level 2	4:30 - 4:50	W241363 Variational quantum algorithms for topology optimization Author(s): Jungin E. Kim, Yan Wang*

209 Level 2	4:50 - 5:10	W242349 Development of an infinitesimal deformation analysis method for truss structures based on a Quantum Approximation Optimization Algorithm Author(s): Rio Honda*, Katsuhiro Endo, Mayu Muramatsu
	5:10 - 5:30	W240053 Ground energy and related properties estimation in quantum chemistry with linear dependence on the number of atoms Author(s): Taehee Ko*, Xiantao Li, Chunhao Wang
	5:30 - 5:50	W240381 Quantum computing enhanced distance-minimizing data-driven computational mechanics Author(s): Yongchun Xu*, Zengtao Kuang, Jie Yang, Qun Huang, Wei Huang, Heng Hu
0835: Recent advances in meshfree and particle methods Chair(s): Seiya Hagihara		
205 Level 2	4:30 - 5:10	W241513 Application of the 2D and 3D coupled multi-resolution particle method to water wave problems in coastal engineering Author(s): Kazuya Shibata*, Harufumi Sekine, Kenya Takahashi, Kuninori Nagai, Tatsuya Mizuno, Takeshi Nishihata, Hajime Yanagisawa
	5:10 - 5:30	W240708 Analysis of SPH algorithm for elastic-plastic large deformation Author(s): Jiayi Wang*, Fei Xu, Zhen Dai
	5:30 - 5:50	W241270 Particle suspension flow modeling in moving particle hydrodynamics Author(s): Kyuya Matsumoto*, Shu Hiramoto, Masahiro Kondo, Tomohiro Sawada, Junichi Matsumoto, Kazuya Shibata, Hideaki Nakajima
	5:50 - 6:10	W242154 Development of a scalable high-peformance particle solver with multi-resolution background cells preconditioning in GPU Author(s): Mitsuteru Asai*, Haruki Osaki, Daniel Shigueo Morikawa
0903: Physics-based data-driven modeling and uncertainty quantification in computational materials science and engineering Chair(s): Ramin Bostanabad		
210 Level 2	4:30 - 4:50	W242018 A physics-constrained polynomial chaos framework for data-driven modeling and uncertainty quantification Author(s): Himanshu Sharma*, Lukas Novak, Michael Shields
	4:50 - 5:10	W242372 A deep learning approach to microstructure-resolved multiscale modeling, optimization and uncertainty quantification Author(s): Ashwini Gupta*, Lori Graham-Brady
	5:10 - 5:30	W242478 Goal-oriented calibration of models and associated modeling errors Author(s): Antonin Paquette-Rufiange*, Serge Prudhomme, Marc Laforest
	5:30 - 5:50	W242574 Data-driven uncertainty quantification and prediction for models with high-dimensional dependent parameters Author(s): Xiaoshu Zeng*, Roger Ghanem
	5:50 - 6:10	W242355 A novel, consistency-based metric for probabilistic remaining useful life model selection Author(s): Dongjin Du, Pranav Karve*, Sankaran Mahadevan
0908: Certification of simulations and model adaptation in computational science and engineering Chair(s): Juan José RODENAS		
208 Level 2	4:30 - 4:50	W242052 A posteriori error estimators and model reduction for multiscale problems Author(s): Frederic Legoll*, Ludovic Chamoin, Arthur Lebee, Jean Ruel
	4:50 - 5:10	W242113 Reduced order modeling with error control for applications in computational homogenization of poly-crystals Author(s): Rituesh Bharali, Fredrik Larsson*, Kenneth Runesson, Ralf Jänicke
	5:10 - 5:30	W240163 Adaptivity and uncertainty of multi-fidelity surrogate models for shape optimization Author(s): Jeroen Wackers*, Hayriye Pehlivan Solak, Riccardo Pellegrini, Andrea Serani, Matteo Diez
	5:30 - 5:50	W240340 Adaptive modeling and learning of material laws for effective data assimilation Author(s): Ludovic Chamoin*, Antoine Benady, Sahar Farahbakhsh, Emmanuel Baranger, Martin Poncelet

1004: Numerical modelling of composite materials and structures Chair(s): Georgios Drosopoulos, Mario de Stefano and Georgios Stavroulakis		
118 Level 1	4:30 - 4:50	W242609 Stochastic FE-BE method for homogenization analysis of 2D diffusion problems considering uncertainties of inclusion shape Author(s): Kazuhiro Koro*
	4:50 - 5:10	W241911 Nonlinear interaction in composites using physics informed neural networks Author(s): Georgios Stavroulakis*, Aliki Mouratidou, Georgios Drosopoulos
	5:10 - 5:30	W241390 Numerical analysis of a FRCM-strengthened masonry column subjected to composite debonding Author(s): Nicoletta Vettori, Danilo D'Angela, Ayse Cagla Balaban, Angelo D'Ambrisi, Mario De Stefano*, Gennaro Magliulo
	5:30 - 5:50	W242394 Numerical analysis of post-tensioned walls' mechanical behavior for housing via a simplified model of its constitutive tensor Author(s): Jairo A Paredes*, César Dávalos, Jefer Castro, Daniel Bedoya-Ruiz
	5:50 - 6:10	W242299 Qualification of a PRM connection from assembled I-beam to assembled composite tubular column with fillet welds Author(s): Alejandro Cardona Jiménez*, Jairo Andres Paredes Lopéz, Luis Garza Vasquez
1106: Computational mechanics for additive manufacturing Chair(s): Wentao Yan		
117 Level 1	4:30 - 4:50	W240668 Melt pool temperature prediction using visible light camera and machine learning techniques in metal additive manufacturing Author(s): Mostafa Rahmani Dehaghani*, Pouyan Sajadi, Yifan Tang, Gary Wang
	4:50 - 5:10	W240025 Combining synchrotron x-ray diffraction and mechanistic modeling for studying melt pool dynamics during ceramics LPBF Author(s): Zhilang Zhang*, Makowska Malgorzata Grazyna, Mohamadreza Afrasiabi, Markus Bambach
	5:10 - 5:30	W240362 Modelling of solute trapping and non-equilibrium microstructure during rapid solidification of additive manufacturing Author(s): Chinnapat Panwisawas*
1311: Computational methods for wind energy Chair(s): Alessio Castorrini and Vincenzo Morici		
302 Level 3	4:30 - 4:50	W242278 Wind turbine damage equivalent load assessment using Gaussian Process Regression combining measurement and synthetic data Author(s): Rad Haghi*, Cassidy Stagg, Curran Crawford
	4:50 - 5:10	W242121 Multi-fidelity analysis for site-specific aerodynamic design of wind turbine blades Author(s): Alessio Castorrini*, Alessandro Corsini
	5:10 - 5:30	W240330 Exploring the use of metamaterials to mitigate vortex induced vibrations of wind turbine blades Author(s): Sergio Gonzalez Horcas*, David Roca, Enrique Ortega, Juan Cante
	5:30 - 5:50	W242091 Design of wind turbine diffusers using stabilized methods and the VMS turbulence model Author(s): Hector Sanchez, Guillermo Hauke*
1401: Emerging topology and shape optimization techniques in computational design of materials and structures Chair(s): Kai James and Ahmad Najafi		
220 Level 2	4:30 - 4:50	W240729 Topology optimization of trusses and frames accounting for stability and initial post-buckling response Author(s): Federico Ferrari*, Ole Sigmund
	4:50 - 5:10	W240981 Design of a Structural Battery Composite with a bi-continuous 2-phase matrix using a virtual temperature constrained topology optimization Author(s): Jonathan Gorman*, Reza Pejman, Ahmad Najafi
	5:10 - 5:30	W241915 Thermoelectromechanical topology optimization: non-convexity studies for multiphysics problems Author(s): Guillermo Reales*, Alejandro Aragón, Johannes F. L. Goosen, Fred van Keulen

220 Level 2	5:30 - 5:50	W241958 Level set topology optimization for the design of elastic shell solids Author(s): Filippo Agnelli*
	5:50 - 6:10	W240595 Controlling damage - Optimization based on analytical gradients and application in forming Author(s): Fabian Guhr*, Franz-Joseph Barthold
1408: Design beyond optimization: Why, what if, and how much? Chair(s): Chrisy Xiyu Du		
219 Level 2	4:30 - 4:50	W240274 Pratt truss characteristics for optimal weight Author(s): Arturs Neiburgs*
	4:50 - 5:10	W241873 Application-driven multilevel design of nonlinear materials Author(s): Brianna MacNider*, Haning Xiu, Kai Qian, Ian Frankel, H. Alicia Kim, Nicholas Boechler
	5:10 - 5:30	W242546 Learning to Choose Optimizers Author(s): Martin van der Schelling*, Deepesh Toshniwal, Miguel Bessa
	5:30 - 5:50	W240205 Optimization of ultrasonic cerebrovascular stimulation therapy for Alzheimer's disease Author(s): Tsuyoshi Ueta*
	5:50 - 6:10	W240734 A new adaptive Kriging-based optimization (AKBO) framework combining a truncated constraint function (TCF) method and a near constraint boundary search (NCBS) algorithm Author(s): Ungki Lee*
1501: PSE (Problem Solving Environment) Chair(s): Masami Matsumoto		
218 Level 2	4:30 - 5:10	W241888 Development of a remote learning support framework utilizing video analysis AI Author(s): Masami Matsumoto*
	5:10 - 5:30	W242094 Development of a land use classification model based on semantic segmentation using aerial photographs and its application to Tsunami simulation Author(s): Yuto Habutsu*, Tomohiro Miyake, Hiroshi Okawa, Kazuo Kashiyama
	5:30 - 5:50	W242099 Development of a Mixed Reality visualization system using a location-based method for the underwater objects Author(s): Ryodai Nakaso*, Kazuo Kashiyama, Tsuyoshi Kotoura
	5:50 - 6:10	W242243 Composable HPC infrastructure for continuum mechanics and AI workloads Author(s): Rooh Khurram*
	6:10 - 6:30	W240130 Advantages of 500 Hz monitors in e-sports Author(s): Hideo Miyachi*, Teruki Sawa
1603: Next-generation numerical methods for coupled multiphysics problems Chair(s): Ricardo Ruiz Baier		
223 Level 2	4:30 - 4:50	W240087 Bubble-stabilised polytopal scheme for flows in fractured media with frictional contact Author(s): Jerome Droniou*, Guillaume Enchéry, Isabelle Faille, Ali Haidar, Roland Masson
	4:50 - 5:10	W240642 Local time-stepping decoupled algorithms for flow and transport problems in fractured porous media Author(s): Yanzhao Cao, Thi-Thao-Phuong Hoang*, Phuoc-Toan Huynh
	5:10 - 5:30	W240930 A unified mixed method for the fluid-structure interaction Author(s): Lina Zhao*

223 Level 2	5:30 - 5:50	W242274 Coupled multiphysics simulations for high energy density problems Author(s): Adam Bouma*, Mikhail Mesh
	5:50 - 6:10	W240534 Unveiling optimal control of doubly diffusive flows: new insights from theory and numerical advancements Author(s): Jai Tushar, Arbaz Khan*, Manil T Mohan
	6:10 - 6:30	W241961 Analysis of a mixed FEM with exactly divergence-free magnetic field for the stationary MHD problem Author(s): Ana Alonso-Rodriguez, Jessika Camaño*, Ricardo Oyarzúa
1609: Multi-scale modeling and upscaling for flow induced vibrations, from local reference simulations to certified industrial tools Chair(s): Joris Degroote		
224 Level 2	4:30 - 4:50	W240445 Analytical framework and numerical validation for fluid-structure interaction of flexible coaxial cylinders Author(s): Maria Adela Puscas*, Romain Lagrange
	4:50 - 5:10	W241788 RANS and LES simulations of flow-induced vibrations in rod bundles with mixing grids Author(s): Antoine Michel*, Maria Adela Puscas, André Bergeron
	5:10 - 5:30	W242395 Fluid-structure interaction simulations and multi-scale approaches for nuclear reactor applications. Author(s): Daniele Vivaldi*
	5:30 - 5:50	W241672 Large eddy simulation of fluid/structure interaction of two in-line cylinders in a turbulent flow Author(s): Pierre-Emmanuel Angeli*, Maria Adela Puscas
1702: Modeling and simulation of coupled processes in geological media Chair(s): Robert Gracie		
120 Level 1	4:30 - 4:50	W242134 Hybrid isogeometric - finite element modelling of coupled thermo-hydro-mechanical deformation of fractured media in three dimensions Author(s): Ellya Kanimova*, Adriana Paluszny, Marco Paluszny, Robert Zimmerman
	4:50 - 5:10	W241007 Deep learning assisted monitoring inversion model for geologic Carbon Sequestration Author(s): Jonathan Zingaro*, Robert Gracie, Yuri Leonenko
	5:10 - 5:30	W242346 Transport of microcapsule in fractured media using coupled CFD-DEM methods Author(s): Pania Newell*, Xiaoming Zhang
	5:30 - 5:50	W242378 Numerical analyses of coupled thermal-hydraulic-mechanical-chemical processes within fractured rocks based on explicit fracture models Author(s): Sho Ogata*
	5:50 - 6:10	W241733 Space-time analysis for the container problem Author(s): Manfred Göttlicher*
	6:10 - 6:30	W242130 On the viability of salt caverns for massive storage of hydrogen by using numerical simulation Author(s): Jose Paris*, Andrés Soage, Blanca Fernández, Francisco Figueiras, Ignasi Colominas, Luis Cueto-Felgueroso
1806: Causal discovery and graphical causal models Chair(s): Jonas Actor		
214 Level 2	4:30 - 4:50	W241438 A Causality-DeepONet for causal responses of linear dynamical systems Author(s): Wei Cai*, Lizuo Liu, Kamaljyoti Nath
	4:50 - 5:10	W241482 CausalNO: discovering hidden causal mechanisms from mechanical testing data. Author(s): Lu Zhang*, Ning Liu, Tian Gao, Yue Yu

214 Level 2	5:10 - 5:30	W241352 A new parametrization of directed acyclic graphs and causal Markov kernels for scientific feature discovery Author(s): Elise Walker*, Jonas Actor, Carianne Martinez, Nathaniel Trask
	5:30 - 5:50	W242295 Graph attention embeddings as a causal lens in temporal link prediction Author(s): Dan Krofcheck, Matthew Sweitzer, Sarah Simpson*, Asmeret Naugle, Kate Cauthen, Marco Campos
1810: Data-driven approaches for solid mechanics Chair(s): WaiChing Sun and Nikolaos Napoleon Vlassis		
212 Level 2	4:30 - 4:50	W242611 Incremental Neural Controlled Differential Equations for path-dependent material behavior Author(s): Shabnam Semnani*
	4:50 - 5:10	W241910 Data-driven operators for elastic and elastic-plastic solids Author(s): Hari Simha*
	5:10 - 5:30	W241827 Deep learning based accelerated high strain rate simulations for design of materials in extreme environments Author(s): Indrashish Saha*, Lori Graham-Brady
	5:30 - 5:50	W242084 DE-DEM: Discontinuity-Embedded Deep Energy Method for solving fracture problems in solid mechanics Author(s): Zhao Luyang*, Qian Shao
1812: Constitutive modeling of complex materials with machine learning and artificial intelligence Chair(s): Nikolaos Bouklas		
213 Level 2	4:30 - 4:50	W241900 Physics-guided identification of data-driven hyperelastic material parameters from full-field deformation data Author(s): Vahidullah Taç, Manuel Rausch, Francisco Sahli-Costabal, Adrian Buganza Tepole*
	4:50 - 5:10	W240583 On the role of interpretability of data-driven constitutive modeling by Constitutive Artificial Neural Networks Author(s): Kevin Linka*, Ellen Kuhl, Christian Cyron
	5:10 - 5:30	W241136 Automated discovery of hyperelastic models for the human brain cortex through symbolic regression Author(s): Jixin Hou, Xianqiao Wang*
	5:30 - 5:50	W240469 Accounting for elasto-plasticity in constitutive artificial neural networks Author(s): Birte Boes*, Jaan-Willem Simon, Hagen Holthusen
	5:50 - 6:10	W241752 On automated discovery of thermodynamically consistent finite strain plasticity models Author(s): Asghar Arshad Jadoon*, Knut Andreas Meyer, Jan Fuhg
	6:10 - 6:30	W242308 Symmetry-enforcing neural networks for constitutive modeling Author(s): Kevin Garanger*, Julian Rimoli

Friday July 26 - Technical Session 13

0206: Accelerating failure predictions through advances in scientific machine learning and scientific computing Chair(s): Alena Kopanicakova and Somdatta Goswami		
114 Level 1	9:45 - 10:25	W240067 Immersed techniques for simulating flow and transport in fractured porous media Author(s): Patrick Zulian*, Maria Giuseppina Chiara Nestola, Marco Favino, Rolf Krause
	10:25 - 10:45	W242540 An operator learning approach for britle fracture analysis Author(s): Somdatta Goswami*
	10:45 - 11:05	W241200 Conservation properties of embedded finite-element methods for flow in fractured porous media Author(s): Maria Giuseppina Chiara Nestola*, Patrick Zulian, Marco Favino, Rolf Krause
	11:05 - 11:25	W242428 Multiscale mesh-based graph neural networks with adaptive mesh refinement for phase field fracture problems Author(s): Roberto Perera*, Vinamra Agrawal
	11:25 - 11:45	W240042 Development, verification and validation of 3D FEA-based surrogate models for damage tolerance applications Author(s): Adrian Loghin*, Shakhrukh Ismonov
0212: Computational mechanics in high-strain rate and impact engineering Chair(s): Martin Kroon		
111 Level 1	9:45 - 10:05	W241148 Experimental and numerical analysis of buckling of thin polyethylene structure during dynamic impact loading Author(s): Martin Kroon*, Eskil Andreasson, Viktor Petersson
	10:05 - 10:25	W240004 Research on similarity law of nonlinear shock response of ship plate frame structure under underwater explosion Author(s): Jiuqiang Wang*, Dongyan Shi, Xiongliang Yao, Zhikai Wang
	10:25 - 10:45	W241952 Development of drone substitute model for survivability analysis of collision with human head Author(s): Hakim Afarsiou*, Fabien Coussa, Éric Deletombe
0214: Multi-scale, multi-rate damage and fracture: Models, experiments, and simulations Chair(s): JeeYeon Plohr		
110 Level 1	9:45 - 10:25	W242454 Moving window concurrent atomistic continuum approach for modeling shock wave propagation in multiple principal element alloys Author(s): Alexander Davis, Abigail Hunter, Saryu Fensin, Vinamra Agrawal*
	10:25 - 10:45	W240108 Investigation of a novel laser-induced spallation method: analysis of shock and spall behavior through atomistic, finite element, and theoretical modeling Author(s): Mewael Isiet*, Mauricio Ponga
	10:45 - 11:05	W240663 Quasi-brittle fracture model for beryllium Author(s): JeeYeon Plohr*, Abigail Hunter, Thomas Canfield, Michael Prime
	11:05 - 11:25	W241761 Modeling the quasi-brittle fracture of structural materials using a mixed stabilized two-field finite element formulation Author(s): Carlos Felipe Guzmán*, Willy Morocho, Sebastián Cáceres, Ernesto Castillo
	11:25 - 11:45	W242680 pyMesoscale: A friendly python library for generating 3D concrete mesoscale models based on the local background grid method Author(s): Faisal Muhammad*, Saheed Kolawale Adekunle
0304: Immersed-boundary variational methods: Theory, data structures, and applications Chair(s): Baskar Ganapathysubramanian		
201 Level 2	9:45 - 10:25	W242182 Weak and strong stabilisation of cut finite element methods Author(s): Erik Burman, Mats G Larson*, Peter Hansbo

201 Level 2	10:25 - 10:45	W242244 Unfitted high-order hybridisable discontinuous Galerkin method with exact NURBS geometries applied to microfluidics systems Author(s): Matteo Giacomini*, Stefano Piccardo, Antonio Huerta
	10:45 - 11:05	W240730 A new concept for embedding sub-structures via level-sets Author(s): Thomas-Peter Fries*, Jonas Neumeyer, Michael Wolfgang Kaiser
	11:05 - 11:25	W241128 Analysis of divergence-preserving unfitted finite element methods for the mixed Poisson problem Author(s): Christoph Lehrenfeld, Tim van Beeck*, Igor Voulis
	11:25 - 11:45	W241514 A new approach for the enforcement of Neumann boundary conditions with the Shifted Boundary Method Author(s): Jason Haydel Collins*, Guglielmo Scovazzi, Alexei Lozinski
0309: Advances and applications of polytopal methods Chair(s): Carolin Birk and Sven Klinkel		
203 Level 2	9:45 - 10:05	W240377 A scaled boundary finite element framework towards fully automated engineering analysis Author(s): Chongmin Song*
	10:05 - 10:25	W240514 Stabilization of mixed displacement-pressure finite elements at finite strains using polyhedral formulations and Voronoi meshing Author(s): Bjorn Sauren, Emilia Oheim, Sven Klinkel*
	10:25 - 10:45	W240649 Dynamic crack propagation due to thermal loads modeled using scaled boundary polygon elements Author(s): Muhammad Danish Iqbal, Carolin Birk*, Hauke Gravenkamp
	10:45 - 11:05	W241924 Adaptive phase field modeling of hydrogen assisted cracking using scaled boundary finite element method Author(s): Suvin VS*, Ean Tat Ooi, Sundararajan Natarajan
	11:05 - 11:25	W242639 An implicit-explicit time integration for dam-foundation interaction based on octree mesh using scaled boundary finite element method Author(s): Junqi Zhang*, Pengcheng Liu, Mi Zhao, Xiuli Du
0408: Synergistic computational mechanics + machine learning for the digital twinning of intelligent vehicles Chair(s): Gianmarco Mengaldo, Rajeev Jaiman and Wrik Mallik		
304 Level 3	9:45 - 10:05	W240406 SINDy-RL: Interpretable and efficient reinforcement learning Author(s): Nicholas Zolman*, Urban Fasel, Nathan Kutz, Steven Brunton
	10:05 - 10:25	W241594 A graph neural network technique for shape optimization: application to multi-objective fluid-acoustics optimization Author(s): Farnoosh Hadizadeh*, Rajeev K. Jaiman
	10:25 - 10:45	W241722 A finite element-inspired hypergraph neural network: application to fluid flow and fluid-structure interaction simulations Author(s): Rui Gao*, Indu Kant Deo, Rajeev Jaiman
	10:45 - 11:05	W242140 Detecting and quantifying structural nonlinearities: a synergistic approach using post-hoc interpretability and neural networks on response signal time series Author(s): Bayan Abusalameh*, Jiawen Wei, Gianmarco Mengaldo
	11:05 - 11:25	W242192 Translating biology to engineering through multiphysics computational mechanics Author(s): Adamya Singh Dhaker, Yuchen Sun*, Francesco Regazzoni, Luca Dede', Cecilia Laschi, Gianmarco Mengaldo
0501: Multiphysics biomechanics of bio- and bio-inspired soft materials: Theory, simulation and experiments Chair(s): Shoujing Zheng		
122 Level 1	9:45 - 10:05	W240879 Advanced fluid-structure interaction simulation of a humanoid bioreactor system for optimized tissue engineering Author(s): Yuyang Wei*, Pierre Mouthuy, Sarah Waters, Antoine Jerusalem
	10:05 - 10:25	W240679 Mechanics model and injury mechanism of blast-induced Traumatic Brain Injury Author(s): Zhibo Du*, Zhanli Liu, Zhuo Zhuang

122 Level 1	10:25 - 10:45	W241829 Gradient-enhanced modeling of poro-visco-hyperelasticity-induced time-dependent fracture of blood clots Author(s): Dongxu Liu*, Nhung Nguyen, Luka Pocivavsek
	10:45 - 11:05	W242671 Fracture prediction of hydrogel using machine learning and inhomogeneous multiscale network Author(s): Shoujing Zheng*, Hao You, K.Y. Lam, Hua Li
	11:05 – 11:25	W241198 Bacterial multiphysical interactions with hard and soft materials interfaces: towards computational design of engineered living materials Author(s): Jingjie Yeo*
	11:25 – 11:45	W241025 Selectin and integrin cooperatively regulate rolling adhesion of leukocyte under shear flow Author(s): Long Li*, Jizeng Wang
0505: Imaging-based methods in computational medicine Chair(s): Jessica Zhang		
121 Level 1	9:45 - 10:25	W242505 Development of a deformation technique for vascular analysis models using vessel centerlines Author(s): Naoya Imai, Chen Wang, Masaharu Kobayashi, Marie Oshima*
	10:25 - 10:45	W241839 Computational modelling and optimization of leptomeningeal anastomoses configuration: a patient-specific approach using 4D Flow MRI and SPECT Author(s): Chi Hang To*, Shigeki Yamada, Marie Oshima
	10:45 - 11:05	W241029 Image-based vascular fluid-structure interaction with anisotropic fiber-reinforced arterial wall models Author(s): Yujie Sun*, Ju Liu, Jiayi Huang, Qingshuang Lu, Xinhai Yue, Xuanming Huang
0604: Modeling, optimization and computational analysis of metamaterials Chair(s): Arun Prakash and David Roca		
112 Level 1	9:45 - 10:05	W240071 Application of symplectic method in forced vibration of acoustic black hole beam, plate and cylindrical shell structures Author(s): Yongbin Ma*, Sen Zhang, Zichen Deng
	10:05 - 10:25	W240072 Coupling multiple resonances for enhancing sound transmission loss of acoustic metamaterials Author(s): David Roca*, Gastón Sal-Anglada, Daniel Yago, Juan Cante, Javier Oliver
	10:25 - 10:45	W241772 Non-Hermitian degeneracy in two-dimensional open elastic systems with higher-order exceptional points Author(s): Kei Matsushima*, Takayuki Yamada
	10:45 - 11:05	W242364 Dynamic characterization of architected metamaterials using real-time hybrid simulation Author(s): Tao Zhang, Luz Maria Agudelo Urrego, Sun-Beom Kwon, Arun Prakash*
	11:05 - 11:25	W242668 Bandgaps in acoustic metamaterials: design and uncertainty quantification including stochastic geometric defects and material properties Author(s): Han Zhang*, Rayehe Karimi Mahabadi, Cynthia Rudin, Johann Guilleminot, Catherine Brinson
0701: Computational methods in environmental fluid mechanics Chair(s): Ethan Kubatko		
222 Level 2	9:45 - 10:05	W240095 Exploring complex environmental flow phenomena with the lattice Boltzmann method Author(s): Qi Zhou*
	10:05 - 10:25	W242148 Incompressible viscous fluid analysis around complex shapes using Isogeometric Analysis Author(s): Yuto Sakai*, Kazuo Kashiyama, Hiroshi Hasebe
	10:25 - 10:45	W242284 A Lagrangian position-based space-time formulation for finite strain free-surface flows Author(s): Darcy Hannah Falcão Rangel Moreira*, Rodolfo André Kuche Sanches
	10:45 - 11:05	W242381 Large-eddy simulation of intrusive gravity currents at river confluences Author(s): Ching-Sen Wu*

222 Level 2	11:05 - 11:25	W242461 Modeling hurricane storm surges using radial basis functions: a meshless approach Author(s): Vilas Sarsani*, Ethan Kubatko
0707: Transport phenomena in micro/nanofluids Chair(s): Xikai Jiang and Zhuang Sun		
221 Level 2	9:45 - 10:05	W241819 Enhanced hydrodynamic diffusion in dense binary active suspensions Author(s): Zhouyang Ge*, Shervin Bagheri, Gwynn Elfring
	10:05 - 10:25	W242443 Variational multiscale moment methods for the Boltzmann equation Author(s): Frimpong Baidoo*, Irene Gamba, Luis Caffarelli, Thomas J.R. Hughes, Michael Abdelmalik
	10:25 - 10:45	W241706 Transport and dispersion of active colloids in periodic domains Author(s): Zhiwei Peng*
	10:45 - 11:05	W240237 Particle dynamics in a low-Reynolds-number fluid between two spherical shells Author(s): Zhuang Sun*
	11:05 - 11:25	W240562 Manipulation of contact angle hysteresis at electrified ionic liquid-solid interfaces Author(s): Pengcheng Nie*, Xu Zheng, Dongshi Guan
0801: Modeling friction and wear Chair(s): Xiaoming Liu		
204 Level 2	9:45 - 10:05	W241069 A general contact model for rough surfaces based on the incremental concept Author(s): Xuan-Ming Liang*, Shiwen Chen, Chengya Li, Gangfeng Wang
	10:05 - 10:25	W241916 An extensive thermal and stress analysis of railway wheel-rail contact during heavy braking with disc brake Author(s): Peter T. Zwierczyk*
	10:25 - 10:45	W242438 Elastoplastic impact of sphere on large plate Author(s): Yuchi Wang, Qing Peng*, Xiaoming Liu, Yue-Guang Wei
	10:45 - 11:05	W241507 Material removal of a convex pattern surface interacting with non-spherical particles: a numerical study Author(s): Yunpeng Yan, Skirmantas Pargalgauskas, Rudy Helmons, Dingena Schott*
0808: Boundary element methods: New theories and applications Chair(s): Toru Takahashi		
207 Level 2	9:45 - 10:05	W240273 A boundary-integral-equations-friendly shape optimisation for perfectly electric conductors Author(s): Toru Takahashi*
	10:05 - 10:25	W240373 The method of boundary integral equations in the boundary value problems of dynamics of fluids and gases Author(s): Yurii Krashanytsia*
	10:25 - 10:45	W240580 Some advances on the fast BEM for acoustic problems Author(s): Yijun Liu*, Ruoyan Li, Zonglin Li, Zhenyu Gao
	10:45 - 11:05	W240743 Time-dependent fundamental solution for numerical modeling of Fourier and non-Fourier bioheat transfer Author(s): Ivan Dominik Horvat*, Jurij Iljaž
0901: Verification techniques in computational physics and applied mathematics Chair(s): Jim Ferguson and Steven Anderson		
208 Level 2	9:45 - 10:05	W240031 Code-verification techniques for integral equations Author(s): Brian Freno*

208 Level 2	10:05 - 10:25	W240464 Wall-modeled large eddy simulation of smooth-body separation: results of a CFD verification workshop Author(s): Johan Larsson*, Ivan Bermejo-Moreno, Christoph Brehm
	10:25 - 10:45	W242305 Deterministic verification of electrostatic, gyrokinetic particle-in-cell codes using the method of manufactured solutions Author(s): Paul Tranquilli*, Lee Ricketson, Ben Sturdevant, Luis Chacón
	10:45 - 11:05	W240825 Utilizing self-similarity for solution verification Author(s): Steven Anderson*
	11:05 - 11:25	W240539 Verification with asymptotic solutions: a novel approach for radiative transfer problems Author(s): William Bennett*, Ryan G. McClarren
0906: Quantifying epistemic uncertainties for computational predictions Chair(s): Aaron Koskelo and Ryan McClaren		
210 Level 2	9:45 - 10:05	W240890 Accumulated epistemic uncertainties and the challenge to quantify them in multiphysics predictions Author(s): Brandon Wilson*
	10:05 - 10:25	W240655 Uncertainty analysis in the presence of model-form errors Author(s): Ralph Smith*
	10:25 - 10:45	W242267 Quantifying uncertainties in modeling choices for time-sensitive applications Author(s): Wendy Caldwell*
	10:45 - 11:05	W242254 Stochastic subspace via probabilistic principal component analysis for model-form uncertainty Author(s): Akash Yadav*, Ruda Zhang
	11:05 - 11:25	W241216 Flow-based quantification of the epistemic uncertainty of simulation predictions Author(s): Bryan Kaiser*, Kyle Hickmann
1011: Analytical models for nonlinear dynamics and evolved dynamics in natural, social and engineering sciences Chair(s): Ricardo Tomás Ferreyra		
113 Level 1	9:45 - 10:05	W242014 Examples of analysis methods for ultrasonic vibration-assisted machining Author(s): Shigeru Aoki*
	10:05 - 10:25	W241742 Determination of high-order frequency response of nonlinear systems using the arc-length method Author(s): Lucas Pini Tanabe, Alberto Luiz Serpa*
	10:25 - 10:45	W242045 Impact craters of the moon without signs of the matter melting and the matter emissions Author(s): Michael Shpekin*, Ricardo Tomas Ferreyra
	10:45 - 11:05	W241965 Evolving dynamics for the analysis of complex craters Author(s): Ricardo Tomas Ferreyra*, Michael Shpekin
	11:05 - 11:25	W241950 Coupled twin conical funnels or conical hoses: an internal process of dynamic flow distribution Author(s): Ricardo Tomas Ferreyra*
1108: Multi-physics multi-scale numerical simulation and machine learning based modelling for additive manufacturing Chair(s): Qingcheng Yang		
117 Level 1	9:45 - 10:05	W241645 A thermodynamically consistent phase-field-micromechanics model of microstructure evolution in sintering-based additive manufacturing Author(s): Qingcheng Yang*, Arkadz Kirshtein
	10:05 - 10:25	W242323 Adaptive mesh refinement strategies for melt pool resolution in part-scale AM simulations Author(s): Kellis Kincaid*, John Coleman, Alex Plotkowski

117 Level 1	10:25 - 10:45	W240703 Numerical simulation methods and data-driven models for metal additive manufacturing Author(s): Yanping Lian*, Ming-jian Li, Wenze Zou, Jiawei Chen, Shi Dai, Zhidong Wang
1401: Emerging topology and shape optimization techniques in computational design of materials and structures Chair(s): Nolan Black and Jonathan Gorman		
220 Level 2	9:45 - 10:05	W240197 Multiscale structural optimization using machine learning surrogate models for second-order homogenization Author(s): Ahmad Najafi*, Nolan Black
	10:05 - 10:25	W241537 Comparing topology-optimized reinforced concrete beams designed with 0-1 and variable thickness methods Author(s): Jackson Jewett*, Josephine Carstensen
	10:25 - 10:45	W241366 Analytical design sensitivity information of composite laminate shells Author(s): Jan Liedmann*, Franz-Joseph Barthold, Nikolai Gerzen
	10:45 - 11:05	W242064 Two-scale shape and topology optimization using level-set and heuristic method with stress and volume constraints Author(s): Jinhoo Kim*, Hyun-Gyu Kim
	11:05 - 11:25	W241467 Polycrystalline material design: a data-driven approach with Bayesian optimisation Author(s): Rui Pedro Cardoso Coelho*, Miguel Vieira de Carvalho, Francisco Andrade Pires
1406: Topology optimization for additively manufactured metamaterials and structures Chair(s): Ryan Murphy		
219 Level 2	9:45 - 10:05	W240506 Multiscale topology optimisation for nonlinear elastic structures Author(s): Ryan Murphy*, Dilaksan Thillaithevan, Robert Hewson, Matthew Santer
	10:05 - 10:25	W241014 Topology optimization for multi-axis additive manufacturing Author(s): Yifan Guo*, Jikai Liu, Yongsheng Ma, Rafiq Ahmad
	10:25 - 10:45	W242016 Study of objective functional in optimal design of phononic crystals focusing on band gap in high frequency range Author(s): Naoki Murai*, Takayuki Yamada
	10:45 - 11:05	W240711 A method of successive iteration of analysis and design for large-scale dynamic topology optimization Author(s): Zhan Kang*, Yixiao Zhu, Xiaopeng Zhang
	11:05 - 11:25	W241854 Topology optimization of vibrating structures and phononic crystals with prescribed frequency bands Author(s): Qiangbo Wu, Quhao Li, Shutian Liu*
1502: Performance-portable algorithms for unstructured mesh applications Chair(s): Anjali Sandip		
218 Level 2	9:45 - 10:05	W240556 MFEM: accelerating efficient solution of PDEs at exascale Author(s): Tzanio Kolev*
	10:05 - 10:25	W241474 Development of GPU accelerated kinetic modeling codes in fusion plasma physics and gas dynamics Author(s): Chonglin Zhang*, Gerrett Diamond, Cameron Smith, Mark Shephard
	10:25 - 10:45	W242481 SOMA: scalable operator abstractions for representing unstructured meshes Author(s): Vijay Mahadevan*, Lulian Grindeanu
	10:45 - 11:05	W242021 HPC considerations for global km-scale earth system models Author(s): Stanley Posey*
	11:25 - 11:45	W242240 Performant low-order matrix-free finite element kernels on GPU architectures Author(s): Randolph Settgast*, Yohann Dudouit, Nicola Castelletto, William Tobin, Ben Corbett, Sergey Klevtsov

1603: Next-generation numerical methods for coupled multiphysics problems Chair(s): Lina Zhao		
223 Level 2	9:45 - 10:05	W240472 Robust and scalable solvers in nonlinear poroelasticity Author(s): Nicolás Barnafi*
	10:05 - 10:25	W241235 Variational model and numerical analysis of fluid in poroelastic medium Author(s): Arkadz Kirshtein*, James Adler, Xiaozhe Hu
	10:25 - 10:45	W242513 Efficient solvers for Biot's equations Author(s): Álvaro Pé de la Riva*, Carmen Rodrigo Cardiel, Francisco J. Gaspar Lorenz
	10:45 - 11:05	W240111 Fully mixed formulations for poroelasticity with stress-dependent permeability Author(s): Arbaz Khan, Bishnu Lamichhane, Ricardo Ruiz Baier*, Segundo Villa Fuentes
1609: Multi-scale modeling and upscaling for flow induced vibrations, from local reference simulations to certified industrial tools Chair(s): Maria-Adela Puscas		
224 Level 2	9:45 - 10:05	W240775 Development of a methodology to quantify the distribution of vibration frequency and damping for submerged elastic structures Author(s): Joris Degroote*, Henri Dolfen
	10:05 - 10:25	W240453 Sensitivity analysis for turbulent flows Author(s): Nathalie Nouaime*, Bruno Després, Maria Adela Puscas, Camilla Fiorini
	10:25 - 10:45	W241779 FSI simulation with imposed displacements using TrioCFD on a scale-relevant mockup of a nuclear fuel assembly Author(s): Raksmy Nop*, Maria Adela Puscas, Guillaume Ricciardi
	10:45 - 11:05	W240516 Time-stepping strategies for non-linear multi-scale fluid-structure dynamics with partitioned coupling Author(s): Vincent Faucher*, Maria Adela Puscas
1810: Data-driven approaches for solid mechanics Chair(s): Yue Yu, Jiun-Shyan (JS) Chen and Shabnam Semnani		
212 Level 2	9:45 - 10:25	W241824 Solving partial differential equations with physics-informed neural networks based on a dual variational principle Author(s): N. Sukumar*, Amit Acharya
	10:25 - 10:45	W240537 Physics-informed machine learning model for brittle damage prediction Author(s): Roozbeh Eghbalpoor, Azadeh Sheidaei*
	10:45 - 11:05	W240151 An accurate physics-informed neural network architecture for determining the heterogeneous micromechanical elastic properties of biological materials Author(s): Wensi Wu*, Lu Lu
	11:05 - 11:25	W242383 A Physics-Informed Neural Network for inverse characterization of constitutive models used in progressive damage analysis of composites Author(s): Sahar Abouali*, Ehsan Haghighat, Reza Vaziri
1812: Constitutive modeling of complex materials with machine learning and artificial intelligence Chair(s): Adrian Buganza Tepole		
213 Level 2	9:45 - 10:05	W240813 Generative hyperelasticity with physics-informed probabilistic diffusion fields Author(s): Francisco Sahli Costabal*, Vahidullah Taç, Manuel Rausch, Ilias Bilionis, Adrian Buganza Tepole
	10:05 - 10:25	W240897 Sparse regression, Lp-regularization, and automated model discovery Author(s): Jeremy McCulloch*, Skyler St Pierre, Kevin Linka, Ellen Kuhl
	10:25 - 10:45	W242361 Novel metrics for assessing the quality and completeness of stress-strain datasets: bridging the gap in constitutive law development Author(s): Ehsan Motevali Haghighi*, Samir Chidiac

213 Level 2	10:45 - 11:05	W242561 A novel diffusion tensor based myocardial material model: form determination using neural networks Author(s): Benjamin Thomas*, Christian Goodbrake, Michael Sacks
1814: Machine learning and data driven based engineering computation Chair(s): Zhanli Liu		
216 Level 2	9:45 - 10:05	W241054 Multi-physics field-driven inverse design and manufacturing framework for mechanical metamaterials accelerated by neural operators Author(s): Ziming Yan*, Xiang Li, Zhanli Liu, Zhuo Zhuang
	10:05 - 10:25	W240696 A surrogate model for rapid solution of acoustic wave equation based on the boundary element method and Fourier neural operators Author(s): Ruoyan Li*, Wenjing Ye, Yijun Liu
	10:25 - 10:45	W240921 A data-driven method for mechanical properties prediction of material built by metal additive manufacturing Author(s): Fei Yu*, Yanping Lian
1815: Machine learning algorithms for accelerating material characterization, discovery, design, and manufacturing processes Chair(s): Elise Walker, Troy Shilt, Jonas Actor and Ankit Shrivastava		
215 Level 2	9:45 - 10:05	W240226 BIRDSHOT: a framework for the accelerated discovery and optimization of alloys Author(s): Raymundo Arroyave*
	10:05 - 10:25	W241431 Discovery of conductive inks and electronic devices co-designed with closed-loop, autonomous, reinforcement ecosystems Author(s): Matthew Kottwitz*, James Fowler
	10:25 - 10:45	W240054 Data-driven framework for the accelerated screening of high-entropy alloys catalysts Author(s): Mohamed Hendy*, Okan Orhan, Ali Malek, Homin Shin, Mauricio Ponga
	10:45 - 11:05	W240365 Learning process-structural-property relations in microstructures through multi-modal based machine learning. Author(s): Ankit Shrivastava*, Matias Kalaswad, Marta D'Elia, David Adams, Habib Najm
	11:05 - 11:25	W241194 Physics-Informed Machine Learning of the thermodynamics and kinetics of point defects in alloys Author(s): Anjana Talapatra*
1816: Data-driven device and circuits models Chair(s): Paul Kuberry and Suma George Cardwell		
217 Level 2	9:45 - 10:05	W241430 Accelerating codesign in emerging computing Author(s): Suma Cardwell*, Mark Plagge, J. Darby Smith, Catherine Schuman, Jean Anne Incorvia, James Brad Aimone, Frances Chance
	10:05 - 10:25	W241471 Hammerstein-Wiener data-driven compact circuit modeling. Part 1: Model formulation and time domain training. Author(s): Joshua Hanson, Biliana Paskaleva*, Pavel Bochev, Ethan Thieme, Paul Kuberry, Ian Wilcox
	10:25 - 10:45	W241565 Hammerstein-Wiener data-driven compact circuit modeling. Part 2: extension to multiple loads and frequency domain training Author(s): Ethan Thieme*, Biliana Paskaleva, Xu Chen, Pavel Bochev, Joshua Hanson, Paul Kuberry, Ian Wilcox
	10:45 - 11:05	W240478 Projection-based reduced-order models for compact circuit models Author(s): Elizabeth Krath*, Edgar Galvan, Heidi Thornquist
	11:05 - 11:25	W241362 Multimodal, data-driven modeling of interdigitated comb sensors for characterization of electronics reliability Author(s): James Fowler*, Matthew Kottwitz, Rosario Gerhardt, Roshaun Titus, Anthony Trofe, Samuel Grosso, Ayorinde Olatunde, Kristopher Davis, Jarod Kaltenbaugh, Fernando Garzon

1826: Trustworthy multi-fidelity and data-driven models for computational applications Chair(s): Gianluca Geraci, Mohammad Motamed and Timothy Wildey		
214 Level 2	9:45 - 10:05	W240675 Symplectic model reduction of Hamiltonian systems using data-driven quadratic manifolds Author(s): Harsh Sharma*, Hongliang Mu, Patrick Buchfink, Rudy Geelen, Silke Glas, Boris Kramer
	10:05 - 10:25	W240684 A neural network approach to numerical approximation of infinity and p-Laplace problems Author(s): Hannah Potgieter*, Ivan Au Yeung, Charles Cheung, Steve Ruuth
	10:25 - 10:45	W240860 Non-linear encoding for multi-fidelity neural network surrogates Author(s): Cristian Villatoro*, Gianluca Geraci, Daniele Schiavazzi
	10:45 - 11:05	W241392 Towards trustworthiness through the lens of geometric interpretation Author(s): Zach Grey*

Friday July 26 - Technical Session 14

0206: Accelerating failure predictions through advances in scientific machine learning and scientific computing Chair(s): Somdatta Goswami and Alena Kopanicakova		
114 Level 1	2:00 - 2:20	W241955 Nonlinear multilevel and domain decomposition methods for phase-field fracture simulations Author(s): Alena Kopanicakova*, Hardik Kothari, Rolf Krause
	2:20 - 2:40	W240013 Adaptive alarm system for predictive maintenance of electric motors Author(s): Zhengyu Zhang*, Dongyan Shi, Renjie Huang, Yongran Yin, Yubo Gao, Yuguang Zhong
	2:40 - 3:00	W240718 Research on fiber fracture damage pattern recognition of CMCs based on deep features of acoustic emission signal Author(s): Xuejiao Chen*, Leijiang Yao, Xiaoyan Tong, Bin Li, Shuaiqi Li
	3:00 - 3:20	W241705 Progressive fracture pattern prediction in fiber-reinforced composites using graph neural network Author(s): Zeping Chen*, Deepak Akhare, Hanfeng Zhang, Marwa Yacouti, Priyambada Nayak, Vikas Varshney, Maryam Shakiba, Jianxun Wang, Tengfei Luo
	3:20 - 3:40	W242511 Early detection of surge phenomena in air conditioning systems through synthetic data generation Author(s): Sangheon Lee*, Beomjoon Lee, Jongjae Cho, Hyungki Shin, Byung Chang Jung, Yun-ho Shin
0304: Immersed-boundary variational methods: Theory, data structures, and applications Chair(s): Alexander Düster		
201 Level 2	2:00 - 2:20	W241519 High-order explicit re-parameterization of implicit geometries for enriched immersed FEA Author(s): Nils Wunsch*, John A. Evans, Kurt Maute
	2:20 - 2:40	W241080 Discontinuous finite cell method for problems in solid mechanics Author(s): Jamshid Parvizian*, Stefan Kollmannsberger, Ernst Rank, J. Egerer, E.J. Quiroz, J.A. Vargas
	2:40 - 3:00	W240611 Assessment of unfitted finite element methods for fluid-structure interaction of floating offshore structures Author(s): Jan Modderman*, Oriol Colomés
	3:00 - 3:20	W241653 Error-controlled multi-level hp finite cells in the realm of elastoplastic analysis Author(s): Jan Niklas Schmäke*, Oliver Wege, Martin Ruess
	3:20 - 3:40	W241652 An improved multi-level hp finite cell method for efficient thermo-viscoplastic analyses Author(s): Oliver Wege*, Jan Niklas Schmäke, Martin Ruess
0705: Advanced techniques for transport phenomena in heterogenous porous media Chair(s): Dr Vedad Dzanic		
222 Level 2	2:00 - 2:20	W240572 Numerical simulation investigation on nonlinear flow characteristics of rough single fractures with different contact areas Author(s): Yanbo Liang*, Yuanfang Cheng, Zhongying Han, Chuanliang Yan
	2:20 - 2:40	W240838 Flow and transfer laws in solid foams: regime transitions and stability Author(s): Yann Jobic*, Frédéric Topin, Marc Médale
	2:40 - 3:00	W242528 Confinement effects on the thermodynamics and fluid flow in porous media Author(s): Jiaoyan Li*
0801: Modeling friction and wear Chair(s): Hengxu Song		
204 Level 2	2:00 - 2:20	W241690 Scratch tests modeling using finite element applied to the design of materials' tribological performance Author(s): Vanessa Seriacopi, Ed Bordinassi, Adalto de Farias, Larissa Driemeier, Izabel Machado*

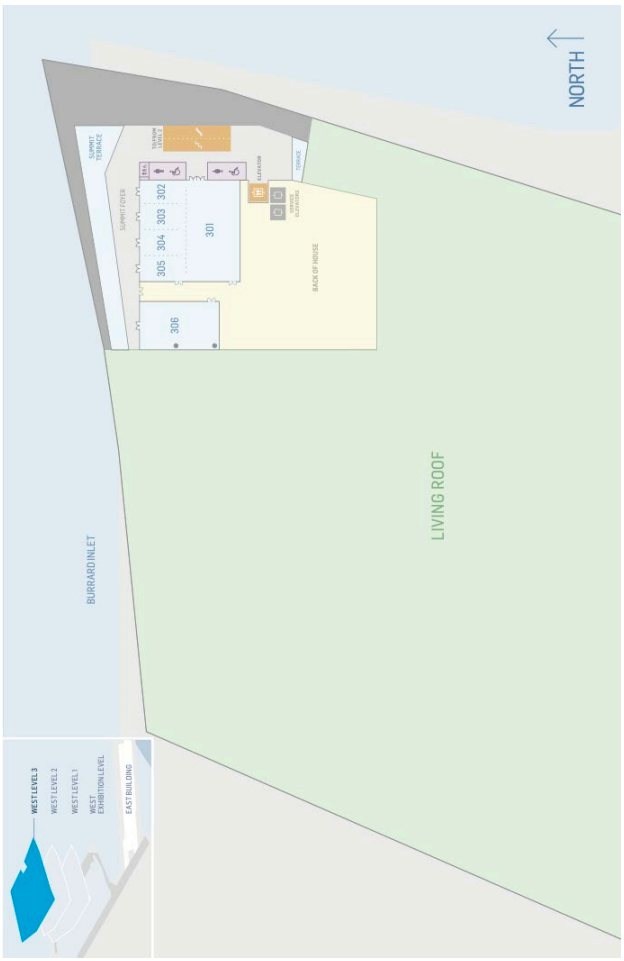
204 Level 2	2:20 – 2:40	W240355 Coupled adhesion and friction of graphene nanoribbons Author(s): Rui Huang*, Ganbin Chen, Kenneth Liechti
	2:40 – 3:00	W240843 Load-area relation of random rough surfaces for large contact fraction Author(s): Chengya Li*, Yue Ding, Xuanming Liang, Gangfeng Wang
0808: Boundary element methods: New theories and applications Chair(s): Yijun Liu		
207 Level 2	2:00 - 2:20	W241317 Universal contact stiffness of axisymmetric indentations considering the effect of membrane tension on the surface Author(s): Weike Yuan*, Yue Ding, Gangfeng Wang
	2:20 - 2:40	W241770 Boundary element method using quantum computer for 2D Laplace and Helmholtz equations Author(s): Takahiro Saitoh*
	2:40 - 3:00	W242076 Bi-material topology optimization for vibro-acoustic problems based on non-negative intensity Author(s): Dan Li*, Haibo Chen
	3:00 - 3:20	W242630 Elastic wave diffraction in multi-domains with a Gunter-Costabel a symmetric regularized boundary element method Author(s): Sara Touhami*, Denis Aubry
0901: Verification techniques in computational physics and applied mathematics Chair(s): Brian Freno		
208 Level 2	2:00 - 2:20	W242457 Towards hierarchical verification by utilizing symmetries Author(s): Jim Ferguson*
	2:20 - 2:40	W242264 Effect of mathematical model simplifications on solution verification exercises Author(s): Filipe Pereira, Aaron Koskelo*
	2:40 - 3:00	W240760 A new approach to constructing solvable problems in free vibration eigenvalue problems of elasticity Author(s): Takahiro Yamada*
	3:00 - 3:20	W241982 An overview of symmetry-preserving numerical methods for verification Author(s): Sebastian Henderson*, Jim Ferguson
0906: Quantifying epistemic uncertainties for computational predictions Chair(s): Brandon Wilson and Bill Oberkampf		
210 Level 2	2:00 - 2:20	W240080 Simultaneous equation of state parameter calibration and estimation of epistemic uncertainties in experimental data Author(s): Abigail Schmid*, Stephen Andrews
	2:20 - 2:40	W240323 Uncertainty propagation for multi-physics simulation in gas turbine design Author(s): Andrew White*, Alexander Karl, Jason Schmucker
	2:40 - 3:00	W240887 An approachable problem for the Bayesian analysis of a variety of uncertainties in hierarchical physical models Author(s): Sean Smith*, Giridhar Gopalan, Devin Francom
	3:00 - 3:20	W241210 Quantifying uncertainty and tuning hyperparameters of the unscented Kalman filter using a physics-aware loss function for joint state and parameter identification of dynamical systems Author(s): Esmaeil Ghorbani*, Quentin Dollon, Frederick Gosselin
1401: Emerging topology and shape optimization techniques in computational design of materials and structures Chair(s): Graeme Kennedy, Jonathan Gorman and Ahmad Najafi		
220 Level 2	2:00 - 2:20	W242686 AI based shape optimization of automotive rubber parts Author(s): Tamás Mankovits*, David Huri

220 Level 2	2:20 - 2:40	W241627 Design of a soft pneumatic actuator using topology optimization and porohyperelasticity Author(s): Sumit Mehta*, Konstantinos Poulios
	2:40 - 3:00	W241696 Achieving precision in compliant mechanism design: topology and shape optimization with stress and curvature constraints Author(s): Gabriel Stankiewicz*, Chaitanya Dev, Paul Steinmann
	3:00 - 3:20	W241204 Application of topology optimization methods to spatial packaging of interconnected systems with thermal stress constraints Author(s): Waheed Bello*, Corey Parrott, Kai James
	3:20 - 3:40	W241145 Topology optimization design of underwater pressure hull for submersible Author(s): Yuanteng Jiang*, Min Zhao
1606: Phase-field interface modeling for multiphase and multiphysics simulations Chair(s): Xiaoyu Mao, Rajeev Jaiman and Thomas Wick		
223 Level 2	2:00 - 2:20	W240311 Modeling and simulation of thermal degradation in a composite material subjected to heat flux Author(s): Mhadji Abdoussalam*, Damien Halm, Azdine Nait-Ali, Benjamin Batiot
	2:20 - 2:40	W241976 A 3D phase-field based Eulerian variational framework for multiphase FSI with contact between solids Author(s): Xiaoyu Mao*, Rajeev Jaiman
	2:40 - 3:00	W242073 Assessment of fully Eulerian phase-field framework for ship hydrodynamics with ice interaction Author(s): Sabiha Bhuiyan*, Xiaoyu Mao, Rajeev Jaiman
	3:00 - 3:20	W241005 Phase-field modeling of contact between deformable solids in fluid flow Author(s): Biswajeet Rath*, Xiaoyu Mao, Rajeev Jaiman
1810: Data-driven approaches for solid mechanics Chair(s): Qizhi He, WaiChing Sun and Nikolaos Napoleon Vlassis		
212 Level 2	2:00 - 2:20	W240858 Derivative-informed neural operators for Bayesian inversion of heterogeneous material properties Author(s): Thomas O'Leary-Roseberry*, Lianghao Cao, Simone Puel, Joseph Kirchhoff, Dingcheng Luo, Ziheng Zhang, Umberto Villa, Omar Ghattas
	2:20 - 2:40	W241450 Neural operator accelerated design of multifunctional metamaterials subject to heterogeneous fields Author(s): Doksoo Lee*, Lu Zhang, Yue Yu, Wei Chen
	2:40 - 3:00	W241836 Prediction of forming processes under uncertainty Author(s): Paul Philipp Meyer*, Dirk Mohr
	3:00 - 3:20	W241111 Early forecasting of tsunami waveform with Bayesian scenario-superposition Author(s): Saneiki Fujita*, Reika Nomura, Shuji Moriguchi, Yu Otake, Randall J. LeVeque, Kenjiro Terada
	3:20 - 3:40	W240774 Study on gas adsorption behavior in shale nanopores based on molecular kinetic theory and machine learning method Author(s): Mengcheng Huang*, Hao Yu, Hengan Wu
1815: Machine learning algorithms for accelerating material characterization, discovery, design, and manufacturing processes Chair(s): Jonas Actor, Ankit Shrivastava and Troy Shilt		
215 Level 2	2:00 - 2:20	W240807 Feature discovery using multimodal autoencoders Author(s): Troy Shilt*, Elise Walker, Carianne Martinez
	2:20 - 2:40	W241309 Revealing microscopic dynamics: in-situ liquid-phase TEM for live observations of soft materials and quantitative analysis via deep learning Author(s): Xiaohui Song*
	2:40 - 3:00	W240227 Learning a reliable compression of in-situ, high-speed camera data for additive manufacturing Author(s): Tian Yu Yen*, Anthony Garland, Daniel Moser, Cody Lough, Ben Brown, Jon Zettwoch

215 Level 2	3:00 - 3:20	W241820 Reduced-order dynamics modeling for additive manufacturing via a pre-trained transformer network Author(s): Zhongsheng Sang, Andrew Potts, Gregory Wagner*
	3:20 - 3:40	W242238 Towards co-solving forward and inverse boundary value problems in solid mechanics using concurrent PINNs Author(s): Mostafa Sharifan*, Keith D. Humfeld, Milad Ramezankhani, Abbas S. Milani
1816: Data-driven device and circuits models Chair(s): Biliana Paskaleva and Paul Kuberry		
217 Level 2	2:00 - 2:20	W240270 Data-driven compact photocurrent models Author(s): Pavel Bochev*, Biliana Paskaleva
	2:20 - 2:40	W242232 Challenges and approaches for reintegrating reduced-order models in circuit simulation Author(s): Heidi Thornquist*, Ting Mei
	2:40 - 3:00	W241719 Data-driven circuit-level responses to device-level variation via Xyce-PyMi Author(s): Paul Kuberry, Thomas Buchheit*, Biliana Paskaleva, Andrea Jin, Ting Mei, Coby Davis
	3:00 - 3:20	W241472 Development and testing of subcircuit surrogate models using Data-Driven Exterior Calculus and Xyce-PyMi Author(s): Mamikon Gulian, Ravi Patel, Edgar Galvan, Andy Huang*
1826: Trustworthy multi-fidelity and data-driven models for computational applications Chair(s): Daniele Schiavazzi and Tian Yu Yen		
214 Level 2	2:00 - 2:20	W241587 Surrogate modeling with deep random Fourier features residual networks and multifidelity information Author(s): Owen Davis*, Gianluca Geraci, Mohammad Motamed
	2:20 - 2:40	W242544 Multi-fidelity Graph U-Net for physics simulations Author(s): Rini Gladstone*, Hadi Meidani
	2:40 - 3:00	W242259 Accelerating manufacturing process discovery in material science through multi-fidelity neural networks Author(s): Mohammad Khalil*, Ankit Shrivastava, Matias Kalaswad, Habib Najm, David Adams

Index of technical program only begins on the next page.

Maps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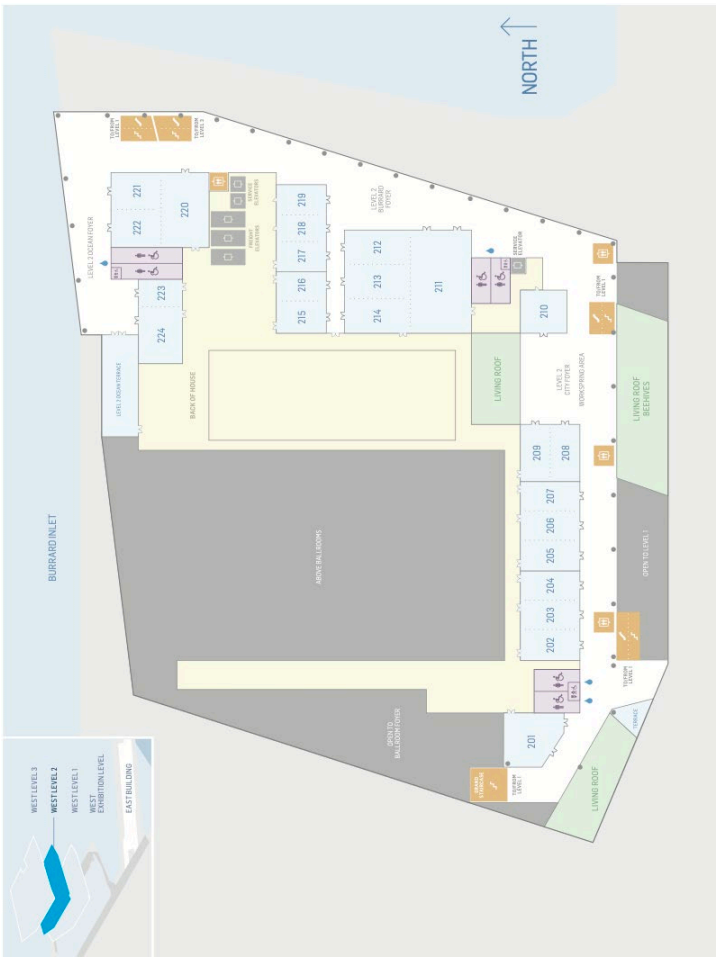
EAST BUILDING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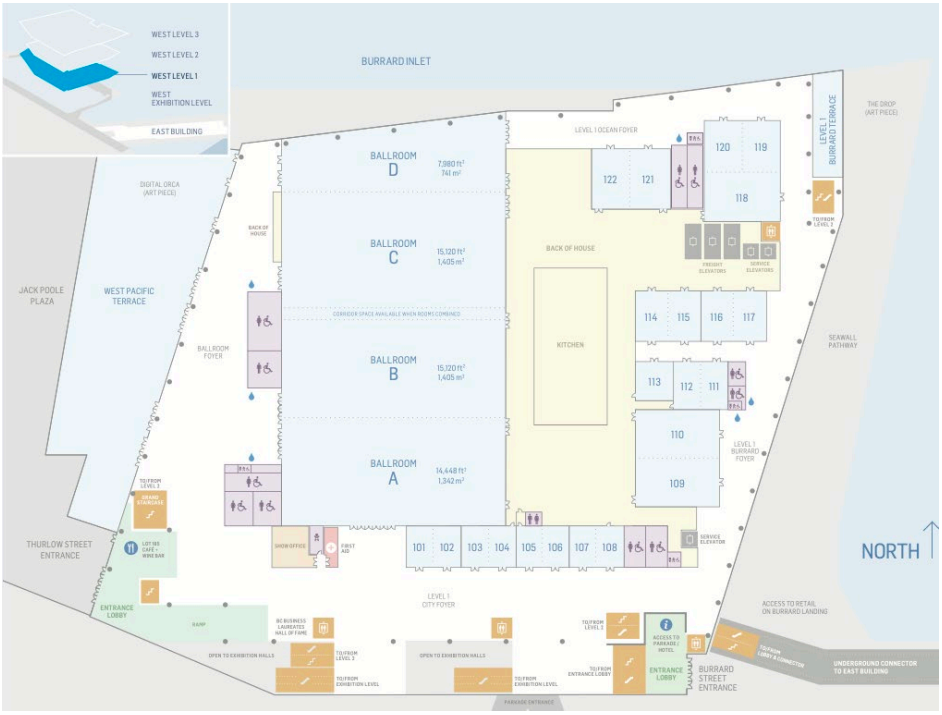
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WEST LEVEL 2
WEST LEVEL 1
WEST EXHIBITION LEVEL
EAST BUILDING
BURRARD INLET
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BALLROOM C
BALLROOM B
BALLROOM A
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