

WCCM-PANACM 2024 Minisymposia

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 60 th 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 80 th 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
0411	Computation for energy storage	TS 4
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 Boltzmann 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 spaces 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
1703	Multiscale, multifield, and continuum-discontinuum analysis in geomechanics	TS 13
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 Chine: Current states of shared scientific interests and oppportunities for the future cooperation	TS 5-7