

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

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 Christerson, 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

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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

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 Bente*, 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): Raleigh 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 CO2 sequestration Author(s): Eduardo Gildin*, Jungang Chen, Daniel Badawi Badawi, Dimitrios Voulanas

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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*

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	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
Level 2	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 Hinsén, 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