WEDNESDAY 4/3

8:00	**Registration and Breakfast – Annapolis Atrium**			
8:45	**Welcome and Opening Remarks: KT Ramesh – Regatta Ballroom**			
9:00	**Plenary Lecture: Dr. Benji Maruyama, "Autonomous Research Systems Applied to Carbon Nanotube Synthesis" – Regatta Ballroom**			
10:00	**Coffee Break – Annapolis Atrium**			
10:30	**Plenary Lecture: Prof. Dennis Dimiduk, "Perspectives on the Materials Data Revolution and the Impacts of Machine Learning, Deep Learning, and Artificial Intelligence on Materials, Processes, and Structures Engineering" – Regatta Ballroom**			
11:30	**Panel Discussion - Regatta Ballroom**			
12:00	**Lunch – Annapolis Atrium**			
	Regatta A **Architected Materials: Design, Fabrication and Characterization (Stavros Gaitanaros, Jamie Guest, Jordan Raney)**	***Regatta B*** **Analytical and numerical methods for upscaling of grain/particle mechanics (Kane Bennett, Duan Zhong Zhang)**	***Regatta C*** **Impact Matters: KT Ramesh's 60th Birthday Symposium (Shailendra Joshi, Jamie Kimberley, Leslie Lamberson, Emily Retzlaff, Justin Wilkerson)**	***Windjammer*** **Ceramic in Extreme Environments: Processing and Properties (Rich Haber)**
1:00-1:20	On the high-temperature crushing of metal foams (B.S. Aakash, S. Bi, M. Shields, **S. Gaitanaros)**	A micromorphic filter for determining stresses from poly-crystalline elasto-plastic DNS (**R. Regueiro**, N. Miller, F. Shahabi, J. Bishop)	Shock Wave Propagation in Particulate Composites (**G. Ravichandran**)	Growth, characterization, and preparation of single crystal boron carbide (**M. Straker**, MVS Chandrashekhar)
1:20-1:40	Design, manufacturing, and testing of metamaterials for seismic vibration control of structures (**N. Bonessio**)		Biomechanics of Primary Blast Injury to the Human Eye (**V. Nguyen**)	Microstructural Investigation of Amorphization Resistant Silicon and Boron-doped Boron Carbides (**C. Marvel**, B. Yang, V. Domnich, J. LaSalvia, R. Haber, M. Harmer)
1:40-2:00	Concurrent Optimization of Structural Topology and Infill Properties with a CBF-Based Level Set Method **(S. Chen**, X. Gu, L. Jiang)	Experimental Studies of Micro-Macro Relations and Length Scales in Granular Materials (**R. Hurley**, C. Zhai, E. Herbold, S. Hall)	Extremely Fine Extreme Materials (**K. Hemker**)	Structure and properties of aluminum dodecaboride and boron carbide-based ceramics, modeling and tests of ballistic characteristics (**T. Prikhna**, P. Barvitiskyi, R. Haber, V. Domnich, B. Karpinos, V. Kulish)
2:00-2:20	Architecting Surface Features for Nonlinear Response (**R. Ghosh**, H. Ali, H. Ebrahimi)	A meta-modeling machine game for automated generation of cohesive zone model (**W. Sun**, K. Wang)	Fracturing in planetary science: contributions by Dr. Ramesh (**O. Barnouin**)	Onset Conditions to Induce Amorphization of Doped Boron Carbides in a Diamond Anvil Cell (**M. Schaefer**, R. Haber, V. Domnich)
2:20-2:40	Transforming cellular structures via active materials (**J. Mueller**, D. Kokkinis, K. Bertoldi, J. Lewis)	Modeling Interfaces in Diamond-SiC (**S. Coleman**, M. Guziewski, J. Synowczynski-Dunn, C. Carlin, P. Goins, R. B. Leavy, J. Clayton)	Breaking asteroids and comets in the sunlight (**M. Delbo**)	Suppression of Amorphization in Boron Carbide: Silicon or Boron doping? (**B. Yang**, C. Marvel, V. Domnich, J. LaSalvia, R. Haber)
2:40-3:00	Large-scale topology optimization for architected materials design (**H. Lee**, J. Guest)	On self-consistent homogenization of porous bonded particle assemblies (**K. Bennett**, D. Luscher)		Influence of Microstructure Variability on Mechanical Variability in Advanced Ceramics (J. Hogan, B. Koch, **C. Lo**, H. Li, T. Sano)

3:00-3:30	**Coffee Break – Annapolis Atrium**			
	Regatta A **Machine Learning Techniques for Accelerated and Intelligent Materials Design and Discovery (Jaafar El-Awady, Mohammad H. Rafiei)**	***Regatta B*** **Analytical and numerical methods for upscaling of grain/particle mechanics (Kane Bennett, Duan Zhong Zhang)**	***Regatta C*** **Slip, Twins, and Voids – IV (Jeffrey T. Lloyd, Shailendra Joshi, Justin Wilkerson)**	***Windjammer*** **From Atoms to Armor: multiaxial dynamic impact mechanics of ballistic fibers and composites (Sanjib Chowdhury, John W. Gillespie Jr, Subramani Sockalingam, Tusit Weerasooriya)**
3:30-3:50	Development and Application of Automated Image Segmentation for Time Resolved Ballistics Data (**D. Elbert**, N. Carey, A. Rachidi, C. Krill, B. Schuster)	Intergranular Mechanics of Metallic Ductile Damage Under Dynamic Loading Conditions **(C. Bronkhorst)**	The role of faceting in twin-twin interactions (**C. Barrett**)	Capturing Subtleties of the Impact Behavior of Dyneema Hard Armors (S. Chocron, J. Walker, **A. Carpenter**)
3:50-4:10	Designing neural network models of mechanical variability due to microstructural features (**R. Jones**, A. Frankel, C. Alleman)	Modelling the Transition from Fracture to Granular Flow using Particle-Based Simulations (**J. Clemmer**, M. Robbins)		Temperature measurements during tensile testing Dyneema® fibres and composites (**S. Del Rosso**, D. Kempesis, P. Curtis, P. Duke, D. Pope)
4:10-4:30	Machine Learning-Based Reduced Order Crystal Plasticity Modeling and Microstructure Representation for ICME Applications **(S. Niezgoda,** M. Yuan, B. Meredig, S. Paradiso, Y. Wang, D. Dimiduk)	Parameter-free prediction of the dynamic mechanical response of polymer glasses with Non-Affine Lattice Dynamics (NALD) (**A. Zaccone**, T. Sirk, R. Elder, V. Palyulin, C. Ness, R. Milkus)	Dislocation drag in metals: dependence on velocity & crystal geometry (**D. Blaschke**)	A preliminary framework for determining the inelastic strike-face mass fraction of soft armor targets (Z. Guo, **W. Chen**)
4:30-4:50		Twinning-Detwinning in Shock Compressed UFG AMX602 Magnesium via Time-Resolved In-Situ Synchrotron X-Ray Diffraction **(C. Williams**)	Visualisation of spall failure in magnesium alloy AZ31B using X-ray phase contrast imaging **(D. Chapman**, L. Farbaniec, D. Eakins)	Impact of AK47 ammunition on Dyneema® HB26 – validating a numerical model against experiments (**M. Hazzard**, T. Låssig, U. Heisserer, W. Riedel, H. van der Werff)
4:50-5:10	A Machine Learning Approach for Estimating the Stress Field and Dislocation-Dislocation Interactions in Two-Dimensional Discrete Dislocation Dynamics (**M. Rafiei**, J. El-Awady)	Using a single velocity field within MPM to model fracture and mutli-body interactions (**C. Long**, G. Moutsanidis)	Adiabatic shear localization and thermal softening in hexagonal close-packed metals under high strain rate loading (**L. Farbaniec**, D. Chapman, M. Zhou, D. Eakins)	A novel progressive failure constitutive model for UHMWPE composites (**D. Kempesis**, L. Iannucci, S. Del Rosso, P. Curtis, P. Duke, D. Pope)
5:10-5:30		Ensemble Phase Average as an Upscaling Method **(D. Zhang**)	Atomic Scale Modeling of Deformation Twinning in Polycyrstalline Mg Microstructures at High Strain Rates **(S. Galitskiy,** A. Dongare, G. Agarwal)	Inter-fibrillar interactions in UHMWPE fibers **(S. Chowdhury,** S. Sockalingam, J.W. Gillespie Jr.)
5:45	**Poster Session / Reception, sponsored by KLA Corporation – Annapolis Atrium**			
7:15	**Dinner on your own**			

THURSDAY 4/4

8:00	**Thank you breakfast for Symposium Organizers – Mainsail Room**			
8:30	**Breakfast – Annapolis Atrium**			
9:00	**Plenary Lecture: Dr. Jonathan D. Almer, "Watching Microstructures Evolve with High-Energy X-rays" – Regatta Ballroom**			
10:00	**Coffee Break – Annapolis Atrium**			
10:30	**Plenary Lecture: Prof. Gilbert Collins, "Extreme matters, pressure to explore new worlds and exotic solids" – Regatta Ballroom**			
11:30	**Panel discussion – Regatta Ballroom**			
12:00	**Lunch – Annapolis Atrium**			
	Regatta A **Uncertainty quantification and stochastic modeling of materials (Lori Graham-Brady, Michael Shields, Jaroslaw Knap)**	***Regatta B*** **Experimental and Computation Characterization of Dynamic Behavior of Advanced Ceramics (Ghatu Subhash)**	***Regatta C*** **Impact Matters: KT Ramesh's 60th Birthday Symposium (Shailendra Joshi, Jamie Kimberley, Leslie Lamberson, Emily Retzlaff, Justin Wilkerson)**	***Windjammer*** **Slip, Twins, and Voids – IV (Jeffrey T. Lloyd, Shailendra Joshi, Justin Wilkerson)**
1:00-1:20	Robust concurrent optimization of material and device (**K. Bhattacharya**)	Reactive molecular dynamics simulations of shock of boron carbide (**M. DeVries**, A. Awasthi, G. Subhash)	Controlling the Incident Wave Profile in Torsional Kolsky Bar (**W. Chen**, B. Claus)	Retained Austenite Stability in Transformation Induced Plasticity Steels (**E. De Moor**)
1:20-1:40	Towards optimal mesh refinement for uncertainty propagation in a phase field model of brittle fracture (**J. Andres Christen**)	Dynamic behavior of granulated boron carbide (**M. Cil**, R. Hurley, L. Graham-Brady)	Dynamic Simple Shear Characterization and Dynamic Viscosity of Polymeric Gels (**G. Subhash**, K. Upadhyay, D. Spearot)	
1:40-2:00	Calibrating Strength Model Parameters Using Taylor Anvil and Stress-Strain Data (**J. Florando**, N. Baron, J. Bernstein, A. Kupresanin, D. Rivera, K. Schmidt)	Eulerian framework for dynamic fragmentation of brittle materials (**V. Agrawal**)	Hydrogen induced fast fracture (**V. Deshpande**)	Laser-Driven Micro-Flyer Plates for spall studies in AZ31B Magnesium Alloy Thin Films (**D. Mallick,** V. Kannan, J. Lloyd, B. Bosworth, M. Foster, K.T. Ramesh)
2:00-2:20	Uncertainty Quantification approaches to small 3D printed microstructure datasets (**S. Ghosh**, D. Allaire, R. Arroyave)	The importance of inclusions in the failure of boron carbide (**A. Tonge**)	Some History and Highlights from Twenty Years of Collaborations with Professor KT Ramesh (**J. McCauley**)	Predicting Dislocation-Interface Reactions from the Atomistic to the Microscale (**L. Xiong**)
2:20-2:40	Surrogate model based multiscale bridging with accelerated Gaussian learning (**T. Wang**, K. Leiter, P. Piechac, J. Knap)	Intrinsic Hardness of Boron Carbide: Influence of polymorphs, stoichiometry and Bonding Structure (**G. Subhash**, A. Cheednay, A. Awasthi)		Thermally activated twin thickening and solute softening in magnesium alloys - a molecular simulation study (**P.Yi**, M.Falk)
2:40 3:00	Uncertainty Quantification and Propagation in Parametrically Homogenized Constitutive Models (**D. Ozturk**, S. Kotha, S. Ghosh)	Modeling the Inelastic Behavior of Tungsten-Carbide in Pressure-Shear Plate Impact Experiments at Very High Pressure (**Z. Lovinger**, C. Kettenbell, M. Mello, G. Ravichandran)		Dynamic Necking and Fragmentation of Ductile Materials – Expanding Ring Test and Modeling (**H. Zhang**, K. Ravi-Chandar)

3:00-3:30	**Coffee Break – Annapolis Atrium**			
	Regatta A **Modeling and Characterization of Fiber-Matrix Interphase (Sanjib Chowdhury, John W. Gillespie Jr, Timothy W. Sirk)**	***Regatta B*** **Experimental and Computation Characterization of Dynamic Behavior of Advanced Ceramics (Ghatu Subhash)**	***Regatta C*** **Impact Matters: KT Ramesh's 60th Birthday Symposium (Shailendra Joshi, Jamie Kimberley, Leslie Lamberson, Emily Retzlaff, Justin Wilkerson)**	***Windjammer*** **Mechanical Processing for Advanced Lightweight Alloys (Laszlo Kecskes, Nicholas Krywopusk, Timothy Weihs)**
3:30-3:50	Molecular Modeling of Silica-Silane-Epoxy Interphase (**S. Chowdhury**, R. Elder, T. Sirk, G. Palmese, J. Gillespie)	Dynamic behavior of directionally porous hierarchical ice-templated ceramics: Effects of porosity, morphology, and strain rate (**D. Ghosh**, M. Banda, S. Akurati, D. Terrones, J. John)	On the Applicability of Grady's Fragment Size Formula for the Brittle or Ductile Materials (**F. Zhou**, X. Zheng)	Mechanical Properties of Hexagonal Close Packed Metals Subject to Severe Plastic Deformation, A Review (**S. Agnew**, J. Bhattacharya)
3:50-4:10	Insights into the interphase formation between glass-fiber and epoxy based polymers (S. Zarrini, M. Huang, **C. Abrams**)	Using ultra-high speed imaging to obtain tensile properties of armour ceramics at high strain rates (**L. Fletcher**, F. Pierron)	Getting stuck and breaking free (**K. Bhattacharya**)	Interplay of dynamic precipitation and recrystallisation in Mg-Al alloys (**S. Prameela**, P. Yi, V. Liu, L. Kecskes, M. Falk, T. Weihs)
4:10-4:30	New Surface Treatment and Sizing Technology for Improved Carbon Fiber Composite Interface Propoerties (**S. Ozcan**)	An algorithm for modelling the micromechanical behaviour of polycrystalline ceramics (**S. Falco**, N. Fogell, S. Kasinos, N. Petrinic, L. Iannucci)	Novel Capability for Microscale In-situ Imaging of Temperature and Deformation Fields under Dynamic Loading (**M. Zhou**, A. Keyhani)	First principles calculations of the energetics of precipitation and the interaction of point defects in magnesium aluminum alloys (**S. Ghosh**, K. Bhattacharya, M. Ortiz)
4:30-4:50	Interfacial failure mechanisms of different single FRPC under transverse tensile loading (J. Chu**, J. Gao**, D. O'Brien, W. Chen)	Hierarchical multiscale modelling of Alumina ceramics using the Johnson-Holmquist II constitutive model (**N. Fogell**, S. Kasinos, S. Falco, L. Iannucci)	The structure of shock waves in porous metals (**A. Molinari**, C, Czarnota, S. Mercier)	Processing Refractory Metals by Severe Plastic Deformation – Challenges and Opportunities (**T. Hartwig**)
4:50-5:10	Modeling of Failure Process of Multiple Fiber Reinforced Composites Using an Interface-Oriented Finite Element Framework (**R. Liu**)	Dynamic Compression Strength of Ceramics: Preliminary Results from a Round Robin Exercise (**J. Swab**, G. Quinn)	On the dynamics driving the rupture of interfaces obeying rate-and-state friction laws (**J.F. Molinari**, F. Barras, E. Bouchbinder, M. Aldam, E. Brener)	The role of extreme cold work on elastic precursor decay (**J. Jonsson**, D. Chapman, D. Eakins)
5:10-5:30	Atomistic scale simulation for the inter-diffusion of Epon828/Epon1001F and Jeffamine/PACM-20 (**J. Yeon**, S. Chowdhury, G. Palmese, J. Gillespie)	A multi-mechanism-based constitutive model for the dynamic failure of quasi-brittle materials (**Q. Zeng**, A. Tonge, K.T. Ramesh)		Atomistic simulation of dislocation-assisted precipitate nucleation in Mg-Al alloys (**P. Yi**, M. Falk)
6:00	**Reception – Annapolis Atrium**			
7:00	**Conference Banquet - Regatta Ballroom**			

FRIDAY 4/5

8:30	**Breakfast – Annapolis Atrium**			
9:00	**Plenary Lecture and Discussion: Prof. William Curtin, "A Screwy Theory on the Edge: Origins of High-Temperature Strength Retention in BCC High Entropy Alloys" - Regatta Ballroom**			
10:00	**Coffee Break– Annapolis Atrium**			
	Regatta A **High rate multiscale mechanics of particulate materials and soils (David Fox, Richard Regueiro)**	***Regatta B*** **Multiscale approaches to modeling hierarchical materials (Christopher Meyer, Xiaofan Zhang, Bazle Haque)**	***Regatta C*** **Slip, Twins, and Voids – IV (Jeffrey T. Lloyd, Shailendra Joshi, Justin Wilkerson)**	***Windjammer*** **Multiscale Models and Experiments for Energetic Materials (Kasra Momeni)**
10:30-10:50	Dynamic Fracture of Granular Particles Impacted at Different Velocities **(W. Chen**, N. Parab, Z. Guo, T. Sun, K. Fezzaa)	Bridging the scales: Continuum-based material constitutive modeling of mechanical and ballistic test data from composites and fabrics (**A. Carpenter**, S. Chocron, C. Anderson)	Hole Closure Experiments for Assessing Flow Strength at High Rates and Large Deformations (J. Lind, M. Nelms, **N.R. Barton**)	Novel meso-scale diagnostics for temperature and deformation field measurements in energetic materials (**L. Farbaniec**, A. Keyhani, D. Chapman, M. Zhou, D. Eakins)
10:50-11:10	Mesoscale Study of Rate Effects in the Comminution of Brittle Powders (**M. Homel**, E. Herbold)	Parametrically Homogenized Continuum Damage Mechanics (PHCDM) Model for Composites (**X. Zhang**, S. Ghosh, D. O'Brien)		Overview of the First SHPB Experiments on Single Crystal Explosives (**C. Meredith**, D. Casem, K. Ramos, C. Lie, B. Morrow, C. Cady)
11:10-11:30	Dynamic Granular Flow of Boron Carbide in Pressure Shear Plate Impact **(X. Sun**, A. Tonge, J. LaSalvia)	A Multiscale, Nonlocal Sub-Laminate Model for Progressive Damage in Composite Materials **(K. Kodagali,** S. Sockalingam**)**	A damage model based on dislocation-mediated nucleation of microcracks under high-rate compression (**N. Daphalapurkar**, D.J. Luscher, M. Nelms)	Temperature evolution in plastic bonded explosives during impacts (**N. Mohan**, D. Luscher, M. Cawkwell, K. Ramos)
11:30-11:50	Developing a Generalized Parallel Computing Framework for Particle-shape-captured DEM-CFD Coupling Simulations of Gas-Particles Interaction in Compressible Supersonic Flows **(B. Yan**, R. Regueiro)	Parametric Homogenization based Continuum Elasto-Plastic Models for Titanium Alloys (S. Kotha, **D. Ozturk**, S. Ghosh)	Elastic models of dislocations based on atomistic Kanzaki forces (**B. Gurrutxaga-Lerma**, J. Verschueren)	Phase-field approach to nonequilibrium phase transformations in HMX energetic crystals (**K. Momeni**)
11:50-12:10	Interaction of Shock Wave with Granular Materials through High-speed Schlieren photography (**H. Lu**, H. Luo)	Orthotropic Face Sandwich and Composite Beam Analysis using Improved Higher Order Theory with Inter-laminar Strain Energy Continuity Assumption **(T. Takele Kasa**)	Damage by void growth in nanotwinned metals (**S. Joshi**)	Energy localization in shock-compressed TATB bicrystals (**M. Nelms**, M. Kroobblawd, R. Austin)
12:10-12:30	Particle-scale Modeling and Simulation Powder Processing -- Die Filling and Compaction (**J. Lechman**, M. Cooper, D. Bufford, C. Barr)	Progress on the stochastic micromechanical modeling of transverse punch shear damage behavior of unidirectional composites (**B. Haque,** M. Ali, J.W. Gillespie Jr.)	Eliminating reversible twinning during shock loading via pre-twinning **(J. Lloyd**, J. Ligda, C. Williams)	A Multiscale Assessment of Microscopic Mechanisms to Model Propellant Behavior Nonlinearities **(M. Picquart**, D. Aubry, G. Puel, G. Poirey)
12:30	**Lunch – Annapolis Atrium**			
1:30	**ADJOURN**			