

WEDNESDAY 4/3

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| 8:00 | Registration and Breakfast – Annapolis Atrium | | | |
| 8:45 | Welcome and Opening Remarks: Lori Graham-Brady – 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 | | | |
| 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 | | A micromorphic filter for determining stresses from poly-crystalline elastoplastic 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) | Fracturing in planetary science: contributions by Dr. Ramesh (O. Barnouin) | Structure and properties of aluminum dodecaboride and boron carbide-based ceramics, modeling and tests of ballistic characteristics (T. Prikhna , P. Barvitskiy, 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) | Breaking asteroids and comets in the sunlight (M. Delbo) | 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) | Extremely Fine Extreme Materials (K. Hemker) | 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 | | | |

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| | 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 | | 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 | Designing neural network models of mechanical variability due to microstructural features (R. Jones, A. Frankel, C. Alleman) | 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 | Machine Learning-Based Reduced Order Crystal Plasticity Modeling and Microstructure Representation for ICME Applications (S. Niezgodá, M. Yuan, B. Meredig, S. Paradiso, Y. Wang, D. Dimiduk) | 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. Lässig, U. Heisserer, W. Riedel, H. van der Werff) |
| 4:50-5:10 | | Using a single velocity field within MPM to model fracture and multi-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 | A Machine Learning Approach for Estimating the Stress Field and Dislocation-Dislocation Interactions in Two-Dimensional Discrete Dislocation Dynamics (M. Rafiei, J. El-Awady) | Ensemble Phase Average as an Upscaling Method (D. Zhang) | Atomic Scale Modeling of Deformation Twinning in Polycrystalline 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

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| 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) | Some History and Highlights from Twenty Years of Collaborations with Professor KT Ramesh (J. McCauley) | |
| 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) | Dynamic Simple Shear Characterization and Dynamic Viscosity of Polymeric Gels (G. Subhash, K. Upadhyay, D. Spearot) | 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) | A novel split Hopkinson bar using electromagnetic loading (Y. Li, H. Nie, T. Suo, Z. Tang, H. Zhao) | 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) | Hydrogen induced fast fracture (V. Deshpande) | 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) |

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| 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 Properties (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 | Progress on the stochastic micromechanical modeling of transverse punch shear damage behavior of unidirectional composites (B. Haque , M. Ali, J.W. Gillespie Jr.) | 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 | | | |
| 6:30 | Conference Banquet with speakers Regatta Ballroom | | | |

FRIDAY 4/5

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| 8:30 | Breakfast – Annapolis Atrium | | | |
| 9:00 | Plenary Lecture and Discussion: Prof. William Curtin, “A Screw 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) | Progress on the stochastic micromechanical modeling of transverse punch shear damage behavior of unidirectional composites (B. Haque , M. Ali) | | 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. Verschuereen) | 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. Krooblawd, 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) | | 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 | | | |