

WEDNESDAY 4/6

8:00	Registration and Breakfast – Annapolis Atrium				
8:45	Welcome and Opening Remarks: Lori Graham-Brady – Regatta Ballroom				
9:00	Plenary Lecture: Marc de Graef - Regatta Ballroom				
10:00	Coffee Break – Annapolis Atrium				
10:30	Plenary Lecture: Michael Uchic- Regatta Ballroom				
11:30	Panel Discussion: moderator, Kevin Hemker - Regatta Ballroom				
12:00	Lunch – Annapolis Atrium				
	Windjammer	Regatta A	Regatta B	Regatta C	Mainsail
	Ceramics: new concepts and new theories (Ghatu Subhash)	Slip, Twins and Voids: Micromechanics of Material Failure (Shailendra Joshi, Amine Benzerga)	Architected Materials: Design, Fabrication and Characterization (Jamie Guest, Lorenzo Valdevit)	Nonequilibrium Molecular Dynamics for Materials (William Mattson)	Assessing the Role of Non-Equilibrium Interfaces in Structural Materials: Toward Correlated Simulation and Experiment (Mitra Taheri, Christopher Weinberger, Garritt Tucker)
1:00-1:20	“An Evolving, Hypothetical Boron Carbide Figure of Merit” (J. McCauley)	“Micromechanics of dynamic void growth and spall failure” (J. Wilkerson)	“Topology Optimization of Cellular Material Architectures with Multiple Base Materials” (J. Carstensen, S. Ha, C. Williams, J. Guest,	“Rheology of glass-forming fluids: high-rate shear thinning, pressure-viscosity response, and the glass transition” (V. Jadhao, M.Robbins)	“Phases and phase transformations at interfaces” (Y. Mishin, T. Frolov, M. Asta)
1:20-1:40	“Which one has More Influence on Failure Strength of Ceramics: Pressure of Strain Rate?” (G. Subhash)	“Direct numerical simulation of spall from 3D particle distributions” (R. Becker, J. Lloyd, L. Farbaniec, D. Tabas)	“Computed Tomography Characterization of Topologically Optimized, Additively Manufactured Designs” (J. Sietins, A. Gaynor)	“Large-scale molecular dynamics studies of shock compression and spall failure of tantalum” (T.C. Germann, E. Hahn, R. Ravelo, S. Fensin, M. Meyers)	“Development and Application of Precession Electron Diffraction Tools for hcp Metallic Materials” (P. Collins, I. Ghamarian, Y. Liu)
1:40-2:00	“Failure Response of Glass and Ceramics During Ballistic Impact” (P. Jannotti, D. Andrews, B. Aydelotte, P. Patel, B. Schuster)	“Amorphization of silicon under extreme deformation via laser-driven shock compression” (M. Meyers, S. Zhao, E. Hahn, B. Kad, B. Remington, E. Bringa)	“Architected Shape Reconfigurable Materials” (B. Haghpanah, L. Salari-Sharif, P. Pourrajab, J. Hopkins, L. Valdevit)	“Molecular Scale Investigation of Anisotropic Shock Mechanics in Crystalline and Amorphous Polyethylene” (T.C. O’Connor, R. Elder, Y. Sliozberg, T. Sirk, T. Chantawansri, M. Robbins, J. Andzelm)	“Diffuse Interface Modeling of Grain Boundary Segregation in Metallic Systems” (F. Abdeljawad, S. Foiles)
2:00-2:20	“Ballistic impact damage and fragmentation in different types of glass and glass ceramic” (E. Strassburger, P. Patel)	“The Role of Second Phase Particles on the Spall Behavior of ECAE 5083 Aluminum and ECAE AZ31B Magnesium” (C. Williams, T. Sano, L. Kecskes, R. Becker, KT Ramesh)	“Topology optimization design of micro-truss material architectures using geometry projection” (S. Watts, D. Tortorelli, C. Spadaccini)	“Nanovoid formation in cross-linked epoxy and poly(dicyclopentadiene) networks during high strain rate deformation” (R. Elder, D. Knorr, J. Lenhart, J. Andzelm, T. Sirk)	“Progress in Developing Time-Temperature-Transformation (TTT) Diagrams for Grain Boundary Complexion Transitions” (M.P. Harmer)
2:20-2:40	“Surface constraint effects on ceramic ballistic performance” (J. McDonald, S. Satapathy)	“A coupled dislocation-flux crystal plasticity theory for modeling shock response of single- and poly-crystals” (D.J. Luscher, J. Mayeur, H. Mourad, A. Hunter, M. Kenamond)	“Topology Optimization for Wear of Bi-Material Composites” (N. Vermaak, F. Feppon, X. Jia, G. Michalidis, M. Sidebottom, B. Krick)	“Fast DFTB method of DFT accuracy for simulations of large polymers and ceramics” (T. Beaudet, F. Aquino, S. Izvekoy, B. Rinderspacher, J. Andzelm)	“Grain Boundary Plane Structure-Property Relationships and Fundamental Zones” (E. Homer, S. Patala, J. Priedeman, D. Olmstead)

2:40-3:00		“Micromechanical modeling of void coalescence: quasi-static vs. dynamic solutions” (A. Benzerga, A. Molinari, N. Jacques, S. Mercier, J.B. Leblond)	“Designing Molecular Structure to Achieve Ductile Fracture Behavior in a Stiff and Strong 2D Polymer to Achieve Fracture Toughness Greater than Graphene” (E. Sandoz-Rosado, T. Beaudet, E. Wetzel)	“Pushing the boundaries of linear scaling approaches” (J. Mullin, W. Mattson)	“Femtosecond laser based milling for high through-put multiscale materials characterization” (J. Ligda)
3:00-3:30	Coffee Break – Annapolis Atrium				
	Windjammer	Regatta A	Regatta B	Regatta C	
	Ceramics: new concepts and new theories (Ghatu Subhash)	Slip, Twins and Voids: Micromechanics of Material Failure (Shailendra Joshi, Amine Benzerga)	Architected Materials: Design, Fabrication and Characterization (Jamie Guest, Lorenzo Valdevit)	Transverse impact of flexible materials (Jack Gillespie, Danny O'Brien)	
3:30-3:50	“Modeling the Stress Fields Caused by Normal and Oblique Impacts of Spheres on Brittle Targets” (B. Aydelotte, P. Jannotti, M. Andrews, B. Schuster)	“On the deformation and failure of Al 6061-T6 evaluated through in situ microscopy” (K. Ravi-Chandar, A. Gross)	“PERIODIC CELLULAR MATERIAL FOR SEISMIC VIBRATION CONTROL” (N. Bonessio, L. Valdevit, G. Lomiento)	“Transverse impact on crimped glass fibers: tests, theory, computations, and interpretation” (S. Chocron, J. Walker, A. Carpenter, R. Bigger)	
3:50-4:10	“Investigation of the Structural and Physical Properties of Boron Carbide Across the Solubility Range” (K. Kuwelkar, V. Domnich, K Behler, R. Haber)		“ Post-bifurcation and stability of a finitely strained hexagonal honeycomb subjected to equi-biaxial in-plane loading” (R. Elliot, C. Combescure)	“Reverse ballistics of single-ply Kevlar fabric with different indenters at different loading rates” (Z. Guo, D. Casem, M. Hudspeth)	
4:10-4:30	“Equivalence and Abundance of Boron-Carbide Polymorphs from Simulated Lattice Parameters, Relative Energy, and Raman Spectra” (C. Kunka, A. Aswathi, G. Subhash)	“Ductile Fracture under Combined Tension and Shear: Mathematical Modeling and Numerical Implementation” (M. Torki, A. Benzerga)	“Tension-induced tunable corrugation in soft composites with patterned heterogeneities: Mechanisms and implications” (A. Elbanna, Q. Chen)	“MODELING TRANSVERSE IMPACT ON MULTI-LAYER UHMWPE SOFT BALLISTIC SUB-LAMINATE: A FINITE ELEMENT STUDY” (B. Haque, M. Ali, J. Gillespie)	
4:30-4:50	“Microstructure-Based Design of Advanced Ceramics for Light-Weight Protection Systems” (J. Hogan, L. Farbaniec, D. Mallick, B. Schuster, T. Sano, J. McCauley, KT Ramesh)	“On Intrinsic Material Stability” (T. Wright)	“Crushing of random foams of varying density and polydispersity” (S. Gaitanaros, S. Kyriakides, A. Kraynik)	“The Effects of Fibre Orientation on the Impact Performance of Dyneema® Composites” (M. Hazzard, H. Hallet, P. Curtis, L. Iannucci, R. Trask)	
4:50-5:10	“Silicon Incorporation into Boron Carbide” (A. Etzold, R. Haber)	Unraveling Texture, Triaxiality and Anisotropy Effects in Polycrystalline Magnesium Alloys” (S. Joshi, B. Selvarajou, A. Benzerga)	“Finite element simulation of a novel bio-inspired topologically interlocking tile armour under ballistic impact” (J. Best, S. Hallet, R. Trask)	“Effect of Projectile Nose Geometry on Fiber/Yarn Breaking Strain and Resulting Critical Impact Velocity” (M. Hudspeth, J. Zheng, W. Chen)	
5:10-5:30		“Multiscale modeling of twinning and nano void growth in Magnesium” (A. Ramabathiran, M. Ortiz)	“Metallic-ceramic composite panels for protection from forcible entry” (S. Szyniszewski, K. Fivaesh, R. Vogel, T. Hipke)	“MODELING THE TRANSVERSE IMPACT OF BALLISTIC FIBERS” (S. Sockalingham, J. Gillespie, M. Keefe, J. Staniszewski, T. Bogetti, D. O'Brien)	
5:45	Poster Session / Reception – Annapolis Atrium				
7:15+	Dinner on your own				

THURSDAY 4/7

7:30	Benchmarking Discussion – Mainsail Room (KT Ramesh, Richard Becker)				
8:30	Breakfast – Annapolis Atrium				
9:00	Plenary Lecture: Nancy Sottos – Regatta Ballroom				
10:00	Coffee Break – Annapolis Atrium				
10:30	Plenary Lecture: Alejandro Strachan - Regatta Ballroom				
11:30	Panel discussion: moderator, Cameron Abrams – Regatta Ballroom				
12:00	Lunch – Annapolis Atrium				
	Windjammer	Regatta A	Regatta B	Regatta C	Mainsail
	Image-based Computational Mechanics (Masoud Safdari, Phillippe Geubelle, Somnath Ghosh)	Slip, Twins and Voids: Micromechanics of Material Failure (Shailendra Joshi, Amine Benzerga)	Challenges in modeling plasticity and damage in bcc and hcp materials (Crystal Pasiliao, Oana Cazacu, Frederic Barlat)	Panel: Key technologies for characterizing and understanding dynamic failure (Brady Aydelotte, Asher Rubenstein)	Assessing the Role of Non-Equilibrium Interfaces in Structural Materials: Toward Correlated Simulation and Experiment (Mitra Taheri, Christopher Weinberger, Garritt Tucker)
1:00-1:20	“Statistically Augmented Boundary Conditions for Statistically Equivalent Representative Volume Elements” (D. Kubair, S. Ghosh)	“Crystal Plasticity simulations of the mechanical behavior of Mg alloys” (J. Segurado, V. Herrera, R. Sanchez, J. Molina, J. Llorca)	“Assessment of Taylor, ALAMEL and Cluster Models for the plastic deformation of bcc and fcc polycrystalline materials” (P. Van Houtte, Q. Xie)	This session will be two keynote talks followed by a panel discussion 1:00-1:30 “Failure modeling: a perspective from one caught between development & application,” Dr. Richard Becker 1:30-2:00 “Experiments and Simulations with Dynamic Failure: Survival Guide,” Dr. Sidney Chocron	“Mechanical behavior of nanotwinned metals” (X. Zhang, D. Buford, Y. Liu, H. Wang)
1:20-1:40	“NIGFEM 3D: From micro-CT Images to Computational Models” (M. Safdari, Q. Dang, P. Geubelle)		“An hierarchical multi-scale model to take texture-induced anisotropy into account during FE simulations of metal forming” (P. Van Houtte, J. Gawad, P. Eyckens, A. Van Bael, G. Samaey, D. Roose)		“Grain Boundary Anatomy: integrating migration, defect absorption, sliding, polycrystal plasticity” (D. Srolovitz, J. Han, V. Vitek)
1:40-2:00	“An Automated Computational Approach for the Image-Based Modeling of Composite Materials” (S. Soghrati, B. Liang, H. Ahmadian)	“Mapping the Stochastic Response of Nanostructures” (R. Elliot, E. Tadmor, S. Pattamatta)	“Capabilities and Limitations to Model the Deformation and Failure Behavior of HCP metals at the Atomic Scales: A Case Study for Mg” (G. Agarwal, A. Dongare)	2:00-2:15 Break 2:15-3:00 Panel Discussion: "Key Technologies For Characterizing and Understanding Dynamic Failure"	“Predicting the coevolution of grain structure and material performance in reactor fuel using multiscale modeling and simulation” (M. Tonks, P. Chakraborty, K. Ahmed, D. Andersson, X. Bai)
2:00-2:20	“Image-based Computational Modeling of a Carbon/Epoxy Composite”(S. Zacek, C. Montgomery, M. Safdari, N. Sottos, P. Geubelle)	“A Couple Extended-Finite Element Method and three-dimensional discrete dislocation dynamics simulations framework for modeling voids in Magnesium microcrystals” (K.Srivastava, J. El-Awady)	“Combined effects of anisotropy and tension-compression asymmetry on the torsional response of AZ31 Mg” (N. Chandola, O. Cazacu, R. Lebensohn, B. Revil-Baudard, F. Barlat)	Panelists: Dr. Richard Becker, Dr. Sidney Chocron, Dr. Elmar Strassburger, and Dr. KT Ramesh, moderated by Dr. Brady Aydelotte.	“Materials design for radiation resistant microstructures based on the grain boundary network” (M. Kumar, T. Lagarange)
2:20-2:40	“Spectral Methods for Understanding Slip-Twinning Interactions in Polycrystalline Magnesium” (Vidyasagar A., Y.	“A New Theory of Deformable Solids with Microstructure based on Finsler Differential Geometry” (J. Clayton)	“Modeling slip resistance and junction formation in HCP metals” (M. Messner, M. Rhee, A. Arsenlis, N. Barton)		“Enhancing Ductility of Metal-Ceramic and Metal-Metal (BCC-HCP) Multilayered Nanocomposites” (S. Pathak,

	Cheng, D. Kochmann)			M. Knezevic, N. Li, I. Beyerlein, N. Mara)
2:40 3:00		“Shock Response of Nanocrystalline Cu-Ta Systems at the Atomic Scales” (J. Chen, M. Tschopp, A. Dongare)	“A reduced-order crystal plasticity model for predicting the dynamic response of hcp metals” (J. Lloyd, R. Becker)	“In situ Synchrotron Studies of Interfaces under Extreme Environments” (S.K. Gill)
3:00	Coffee Break – Annapolis Atrium			
	Windjammer	Regatta A	Regatta B	Regatta C
	Multiscale modeling and uncertainty quantification for materials in extreme environments (Mike Kirby, Lori Graham-Brady)	Slip, Twins and Voids: Micromechanics of Material Failure (Shailendra Joshi, Amine Benzerga)	Challenges in modeling plasticity and damage in bcc and hcp materials (Crystal Pasiliao, Oana Cazacu, Frederic Barlat)	Polymers and Fibers (Weiguo Hu)
3:30- 3:50	“Modeling Coupled Crystal Elasto-viscoplasticity and Ductile Damage Evolution within the Distribution-Enhanced Homogenization Framework” (C. Alleman, S. Ghosh, C. Bronkhorst, D.J. Luscher)	“Adiabatic shear localization in materials with strong strain hardening—A case study on magnesium alloys with strong twinning tendency” (Q. Wei, J. Shen, K. Kondoh, X. Yu, L. Kecskes, Y. Li)	“Unraveling the temperature dependence of the yield strength in single-crystal tungsten using atomistically-informed crystal plasticity calculations” (D. Cereceda, M. Diehl, F. Roters, D. Raabe, J. Manuel Perlado, J. Marian)	“Engineering Next-Generation Transparent Armors using Polymeric Glasses” (A. Lesser)
3:50- 4:10	“Multiscale Modelling with MPM and the Uintah Software for Electro-Chemistry Applications” (M. Berzins)	“Slip transmission in fcc/fcc bilayers using phase field dislocation dynamics (PFDD)” (A. Hunter, Y. Zheng, I. Beyerlein, M. Koslowski)	“New findings on the room-temperature deformation and failure of polycrystalline Mo at room temperature” (G. Kleiser, O. Cazacu, C. Pasiliao)	“Failure Mechanism of UHMWPE Fibers: An Investigation of the Temperature and Strain Rate Effects” (D. Jenkett)
4:10- 4:30	“Accelerating Molecular Dynamics Simulations to Investigate Shock Response at the Mesoscales” (A. Dongare, G. Agarwal, R. Valisetty, R. Namburu, A. Rajendran)	“On the conversion of plastic work to heat in hot-rolled Mg alloy AZ31B” (O. Kingstedt, J. Lloyd, G. Ravichandran)	“High-rate deformation of Molybdenum” (G. Kleiser)	“Interfibrillar Interactions Probed Through Nanoindentation and Nanoscratching of UHMWPE Fibers” (P. McDaniel, K. Strawhecker, J. Deitzel, J. Gillespie)
4:30- 4:50	“Inverse Design of Metal Nanoparticles Morphology” (Y. He, C. Forestiere, R. Wang, M. Kirby, L. Dal Negro)	“The Twinning Genome: Towards A Systematic Framework for Predicting Twinning in Materials” (D. Sun, M. Ponga, K. Bhattacharya, M. Ortiz)	“Plastic deformation and damage features in Titanium: experimental tests, constitutive modeling and validation” (B. Revil-Baudard, O. Cazacu)	“Mechanism of PBO Fiber Environmental Degradation by NMR Spectroscopy” (W. Chen, N. Kanbargi, A. Lesser)
4:50- 5:10	“Modeling dynamic fragmentation of heterogeneous structural materials” (D. Cereceda, N. Daphalapurkar, L. Graham-Brady)	“On the Effect of Strain Rate on Twinning Modes Selection in Magnesium Single Crystal” (K. Hazeli, O. Kingstedt, V. Kannan, G. Ravichandran, KT Ramesh)	“On the Combined Effect of Pressure and Third Invariant on Yielding of Porous Solids With von Mises Matrix” (O. Cazacu)	“Novel Processing Apparatus for Control of Multi-Scale Morphology to Strengthen UHMWPE Fibers” (C. Henry, G. Palmese, N. Alvarez)
5:10- 5:30		“The Dynamics of Twinning in Magnesium at High Strain Rates” (V. Kannan, K. Hazeli, KT Ramesh)	“Importance of consideration of the specificities of the plastic deformation on the mechanical response of porous solids” (O. Cazacu, B. Revil-Baudard, J.L. Alves)	“Probing the Influence of Molecular Dynamics of Matrix Elastomers on Ballistic Impact Back-face Deformation in UHMWPE Composites” (A. Hsieh, T. Chantawansri, W. Hu, J. Cain, D. Veysset, K. Nelson)
6:00	Reception – Mainsail and Spinnaker Rooms			
7:00	Conference Banquet with remarks from Jay Gould (presentations of poster awards after dinner) – Annapolis Atrium			

FRIDAY 4/8

8:30	Breakfast – Annapolis Atrium			
9:00	Plenary Lecture: Betsy Rice - Regatta Ballroom			
10:00	Coffee Break– Annapolis Atrium			
	Windjammer	Regatta A	Regatta B	Regatta C
	Multiscale modeling and uncertainty quantification for materials in extreme environments (Adri van Duin)	Biological Materials under High-rate Loading (W.G. Proud, K. Brown)	Challenges in modeling plasticity and damage in bcc and hcp materials (Crystal Pasiliao, Oana Cazacu, Frederic Barlat)	Polymers and Fibers (Weiguo Hu)
10:30-10:50	“A unified multi-scale model to capture the influence of efficiently binned microcrack coalescence in failure of brittle materials” (F. Huq, L. Graham-Brady)	“Understanding the Material Properties of Skin Using Comparative Strain Rate Studies” (K. Brown, B. Butler, D. Sorry, W. Proud, A. Williams)	“Determining Elusive Phase Transitions in Molybdenum” (L. Chhabildas, G. Kleiser, W. Reinhart, W. Anderson)	“Modeling shock-driven reaction in low density non-energetic polymeric materials” (A. Brundage, C.S. Alexander, W. Reinhart, D. Peterson)
10:50-11:10	“Uncertainty quantification in molecular dynamics simulation of fluid systems: statistical errors and finite-system-size effects” (C. Kim)	“Computational Modeling and Validation of Brain Deformation in Human Volunteers with Relevance to Traumatic Brain Injury” (S. Ganpule, N. Daphalapurkar, KT, Ramesh)	“Atomistically based discrete dislocation dynamics simulations of c-axis compression in Magnesium” (K. Srivastava, J. El-Awady)	“Modeling the nanoindentation of fibers with fibrillated microstructures and traction-separation interfibril behavior” (J. Staniszewski, S. Chowdhury, S. Sockalingham, R. Ganesh, T. Bogetti, J. Gillespie)
11:10-11:30	“A computational framework for scale-bridging in multi-scale simulations” (J. Knap, K. Leiter, B. Barnes, R. Becker, O. Borodin)	“Implementation of Viscoelasticity into the CTH Marker Method” (Z. Hertel, R. Kraft, S. Schumacher,	“Deformation Mechanisms and Thermo-Mechanical Behavior of Fine-Grained Magnesium Alloy AMX602” (C. Meredith, J. Lloyd)	“Molecular Dynamic Simulation of Carbon Nanotube Composite Fracture” (B. Jensen, K. Wise, G. Odegard)
11:30-11:50	“Toward Meso-mechanical Modeling of Plain Weave Architecture for Ballistic Perforation of Composites” (C. Meyer, B. Haque, C. Key, J. Gillespie, D. O’Brien)	“Constitutive Models for White Matter to Capture the Brain’s Shearing Response” (F. Madouh, KT Ramesh)	“Response of Magnesium Foils Subjected to Dynamic Tension” (J. Kimberley, A. Matejunas, N. Pfeifer, N. Krywopusk, L. Kecskes)	“Molecular Dynamics Characterization of Mechanical and Structural Properties of Semicrystalline Polyethylene under Tensile Deformation” (I.C. Yeh, K. Masser, J. Lenhart, G. Rutledge, J. Andzelm)
11:50-12:10	“Developing a consistent transition from microcrack growth to granular flow” (A. Tonge)	“Rate-dependent fracture modes in human femoral cortical bone” (L. Shannahan, L. Lamberson, T. Weerasooriya, A. Gunnarsson, B. Sanborn)	“Understanding the formation and expansion of partial dislocations from grain boundaries in deformed face centered cubic crystals” (W. Joost, A. Hunter, I. Beyerlein)	
12:10-12:30	“Applications of the ReaxFF force field for identifying reactive properties for complex battery materials and interfaces” (A. van Duin, M. Islam, A. Ostadhossein, W. Zhang)	“Primary Blast Loadings Enhance Osteogenesis of Mesenchymal Stem Cells in vivo and in vitro” (S. Rankin)		
12:30	Lunch – Annapolis Atrium			
1:30	ADJOURN			