

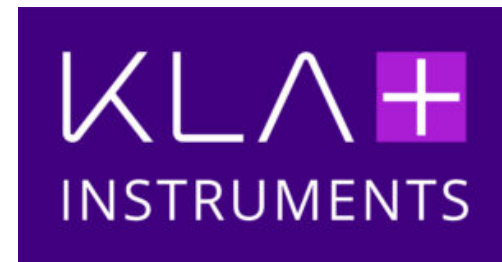
2024 Mach Conference Agenda

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WEDNESDAY 4/3

8:00	Registration and Breakfast – Annapolis Atrium			
8:45	Welcome and Opening Remarks: Ryan Hurley– Regatta Ballroom			
9:00	Plenary Lecture: Dr. Benji Maruyama, “Accelerated Science Through Autonomous Experimentation” – Regatta Ballroom			
10:00	Coffee Break – Annapolis Atrium			
10:30	Plenary Lecture: Keith Brown, "Extreme Mechanics Using a Self-Driving Lab" – Regatta Ballroom			
11:30	Panel Discussion – Regatta Ballroom. Moderated by Ian McCue and Justin Wilkerson			
12:00	Lunch – Annapolis Atrium			
	Regatta A (MS1) Systematic Discovery and Characterization of Materials Across Compositions and Structures (Ilia Nikiforov, Chris Bartel, Rodrigo Freitas, Ellad Tadmor)	Regatta B (MS2) High-throughput Materials Discovery for Extreme Conditions (Lori Graham-Brady, Raymundo Arroyave, Chris Haines, Debjoy Mallick, Ian McCue, Michael Shields, Ankit Srivastava, Justin Wilkerson)	Regatta C (MS12) Mechanics and Manufacturing of Architected and (Multi-)Functional Materials (Jochen Mueller, Jamie Guest, Stavros Gaitanaros)	Surgeon Meeting Room (MS5) Advances in Experimental Techniques for Extreme Environments (Arezoo Zare, Dimitrios G. Giovanis, Jacob M. Diamond, Belinda P. Johnson)
1:00-1:20	The NIST-JARVIS Infrastructure for Data-driven Materials Design (Kamal Choudhary)	Deformation mechanisms and stress triaxiality in spall failure in niobium: a molecular dynamics study (Alejandro Strachan , William Zummo, Chunyu Li)	Multiscale Characterization of Rotating-Square Auxetics under Impact Conditions (Behrad Koohbor , George Youssef, Subramani Sockalingam, Michael Sutton)	The Ejecta Enigma: Suspect Codes or Deficient Physics? (Sidney Chocron , James D. Walker, Don Grosch)
1:20-1:40	Systematic discovery and characterisation of two-dimensional materials by first-principles calculations (Tara Boland)	High-throughput design, synthesis, and characterization of refractory high entropy alloys (RHEAs) (Eli Norris , Cafer Acemi, Brent Vela, William Trehern, Raymundo Arroyave, Ibrahim Karaman)	Programming mechanical voxel interface properties in extrusion 3D printing (Daniel Ames , Sarah Propst, Aadarsh Shah, Jochen Mueller)	
1:40-2:00	ColabFit: An Integrated Platform for Training and Deploying Machine Learning Interatomic Potentials at Scale (Stefano Martiniani)	Bayesian convolutional neural networks for stress field prediction and uncertainty quantification in solid mechanics (George Pasparakis , Michael Shields, Lori Graham-Brady)	Application of Material Point Methods to Objects with Complex Geometries (Duan Zhang , Kyle Perez, Paul Barclay, Jiajia Waters)	Single-Shot Imaging of Void-Shockwave Interactions in Extreme Conditions (Daniel Hodge , Arianna Gleason, Richard Sandberg, Andrew Leong, Silnia Pandolfi, David Montgomery)
2:00-2:20	Crystal Genome: symmetry-based material property testing of interatomic potentials (Ilia Nikiforov , Ellad Tadmor)	High-Throughput Rapid Experimental Alloy Development (HT-READ) via Additive Manufacturing and Automated Measurement (Kenneth Vecchio , Haoren Wang)	Tailorable Piezoelectric and Flexoelectric Output of Polymer-Metal Particle Composites (Ju Hwan Shin, Min Zhou)	Shock-induced ultrafast dislocations observed by in-situ X-ray radiography using an X-ray Free Electron Laser (Kento Katagiri , Leora Dresselhaus-Marais)
2:20-2:40	SEAMM: A user-friendly environment for molecular and materials simulation and machine learning (Paul Saxe)	Automatic Differentiation in Dynamic Topology Optimization (Kevin Korner , William Schill, Jonathan Belof, Julian Anrej, Brandon Talamini)	Bistable rotational mechanisms for morphing wings in unmanned aerial vehicles and beyond (Kaveh Barri, Jochen Mueller)	
2:40-3:00		Batch Active Learning Approach in Material Genomics: A Focus on Energetic Materials (Ozge Ozbayram , Maruthi Annamaraju, Daniel Olsen, Min Zhou, Lori Graham-Brady, Surya Kalidindi)	Additive manufacturing of continuous gradients to prevent nodal failure and improve energy absorption in lattice structures (Sarah Propst , Jochen Mueller)	Development of the tamped RMI method and application to Au, Pt, and Mo dynamic yield strength measurements (Travis Voorhees , Athena Padgiotis, Vincent Garcia, Stacy Guo, Benjamin Zussmann, Tracy Vogler)
3:00-3:30	Coffee Break – Annapolis Atrium			
	Regatta A (MS1)	Regatta B (MS2)	Regatta C (MS12)	Surgeon Meeting Room (MS5)

	Systematic Discovery and Characterization of Materials Across Compositions and Structures (Ilia Nikiforov, Chris Bartel, Rodrigo Freitas, Ellad Tadmor)	High-throughput Materials Discovery for Extreme Conditions (Lori Graham-Brady, Raymundo Arroyave, Chris Haines, Debjoy Mallick, Ian McCue, Michael Shields, Ankit Srivastava, Justin Wilkerson)	Mechanics and Manufacturing of Architected and (Multi-)Functional Materials (Jochen Mueller, Jamie Guest, Stavros Gaitanaros)	Advances in Experimental Techniques for Extreme Environments (Arezoo Zare, Dimitrios G. Giovanis, Jacob M. Diamond, Belinda P. Johnson)
3:30-3:50	Assessing the Role of Crystal Structure in Models of Magnetic Material Properties (Nam Le , Elizabeth Pogue, Michael Pekala, Anna Langham, Georgia Leigh, Mitra Taheri)	Recent Progress in the BIRDSHOT Center (Raymundo Arroyave)	Advancing Endovascular Interventions: Magnetic-Activated Metastructures with Negative Poisson's Ratio for Optimized Vascular Device Conformance (Shikui Chen, Ran Zhuang , Siqian Sun, Apostolos Tassiopoulos, Chander Sadasivan, Xianfeng Gu)	Laser ablation depths in aluminum from ultrafast x-ray diffraction (Sophie Parsons , Michael Armstrong, Harry Radousky, Farhat Beg)
3:50-4:10	Automating materials synthesis with robotics, DFT, and machine learning (Nathan Szymanski)	Similarity Metrics for Real-Time Analysis of High Energy X-Ray Diffraction Data (Timothy Long , Michael Wall, Todd Hufnagel)	Shock Dynamics of Architected Materials (Stavros Gaitanaros , Shengzhi Luan, James Guest)	Geometric scaling laws: From microparticle to macroscale projectile impact testing of materials (Ramathanan Thevamaran Nicholas Jaegersberg, Jizhe Cai)
4:10-4:30	Towards autonomous electrical characterization of oxide materials and devices for extreme operating environments (David Febba , Kingsley Egbo, Jake Huang, Ryan O'Hayre, Andriy Zakutayev)	Combinatorial synthesis and high throughput, high temperature mechanical characterization of refractory alloys (Sal Nimer , Alex Lark, Li Ma, Victor Leon, Jared Wormley, Christian Sanjurjo-Rodriguez)	Design of material architecture in structural batteries through topology optimization (Yakov Zelickman , Jamie Guest)	
4:30-4:50	MAXIMA: A new instrument for high-throughput microstructural characterization of materials (Michael Wall , Timothy Long, Todd Hufnagel, Robert Drake)	AI-assisted statistical analysis of fragmentation response of heterogeneous material fields to dynamic loading (Reza Abedi , Colin Furey, Farhad Pourkamali-Anaraki, Giang Huynh, Erdem Caliskan, Alireza Amirkhizi, Christopher Hanson)	Decomposing Energy Dissipation Contribution in High-Throughput Impact of Architected Materials (Carlos Portela , Thomas Butruille, Joshua Crone)	Automated high throughput laser driven flyer impact experiments for spall strength evaluation (Piyush Wanchoo , Heyun Wang, Anuruddha Bhattacharjee, Axel Krieger, K.T. Ramesh)
4:50-5:10		Chemical and Microstructural Origins of the Mechanical Properties of CoCrFeNiVAl FCC Complex Concentrated Alloys (Wenle Xu, Daniel Salas , James Paramore, Brady Butler, Raymundo Arroyave, Ibrahim Karaman)		Seeing inside shocked plastic-bonded explosives (Dana Dlott)
5:10-5:30		High throughput screening of semicoherent metallic interface energy for data set augmentation and physics-based machine learning alloy design (Ben Szajewski , Daniel Magagnosc, Efrain Hernandez, Heather Murdoch, Krista Limmer, Matthew Guziewski)		
5:45	Poster Session / Reception – Annapolis Atrium			
7:15	Dinner on your own			

THURSDAY 4/4

8:30	Breakfast – Annapolis Atrium			
9:00	Plenary Lecture: Kamal Choudhary, Ph.D., “JARVIS-Leaderboard: Large Scale Benchmark of Materials Design Methods” – Regatta Ballroom			
10:00	Coffee Break – Annapolis Atrium			
10:30	Plenary Lecture: Christopher Stiles, Ph.D., “Advancing Closed-Loop AI-Driven Materials Discovery” – Regatta Ballroom			
11:30	Panel discussion – Regatta Ballroom. Moderated by Morgana Trexler			
12:00	Lunch – Annapolis Atrium			
	Regatta A (MS10) AI-Guided Discovery and Design of New Extreme Materials (Morgan Trexler, Leslie Hamilton, Chris Stiles, Elizabeth Reilly, Ashwini Gupta)	Regatta B (MS6) Damage and Failure at High Strain Rates (Cristophe Czarnota, José A. Rodríguez-Martínez)	Regatta C (MS3) Advances in automated, high-throughput, and small-scale characterization of high strain-rate phenomena (Debjoy Mallick, Suraj Ravindran, Ankit Srivastava, Justin Wilkerson)	Surgeon Meeting Room (MS8) Electronic Material and Devices under Extreme Environment (Hamed Attariani)
1:00-1:20	Prediction Intervals Determination and Autonomous Experimentation as key components in Machine Learning approaches for Material Discovery and Optimization (Francesca Tavazza , Gilad Kusne, Austin McDannald, Brian DeCost, Howie Joress)	In-Situ Imaging of Spall Fracture (Jacob Diamond , Justin Moreno, Lily Zhao, K.T. Ramesh)	Development of Novel Laser-Driven Ballistic Test Methodology (Matt Barsotti, Eddie O'Hare, Alex Lakocy , Sidney Chocron, Daniel Portillo, Michael Heim)	Demonstration of high-temperature operation of $\text{I}^2\text{-Ga}_2\text{O}_3$ MOSFETs with TiW and NiAu metal gates (Nicholas Sepelak , Jeramiah Williams, Daniel Dryden, Ahmad Islam, Weisong Wang, Andrew Green)
1:20-1:40		High-throughput laser-driven micro-flyer spall failure of niobium (Nicolo' Maria della Ventura , Arezoo Zare, Jacob Diamond, Todd Hufnagel, K.T. Ramesh, Daniel Gianola)	Laser-Based High-Throughput Dynamic Mechanical Characterization Materials at the Microscale (Carlos Portela)	Swift Heavy Ion Irradiation in Semiconductors: A Phase-Field Study (Ebrahim Ebrahimi , Hamed Attariani)
1:40-2:00	Ensemble models outperform single model uncertainties and predictions for operator-learning of hypersonic (Victor Leon , Noah Ford, Honest Mrema, Jeffrey Gilbert, Alexander New)	Comprehending the dynamic indentation response of elasto-viscoplastic materials (Ankit Srivastava , Zahra Ghasemi, Tiago dos Santos, Jose Rodríguez-Martínez)	Microscale Fatigue Testing Using a High-Throughput Laser-Driven Shock Generation Method (Jude Deschamps , Yun Kai, Thomas Pexeril, Alexey Lomonosov, Keith Nelson)	Influence of thermal boundary conditions on environmental qualification tests for printed circuit boards (Paul Perin , Gautier Girard Martion Martiny, Sebastien Mercer)
2:00-2:20	Deep learning framework for phase prediction of refractory multi-principal element alloys (Ali Shargh , Christopher Stiles, Jaafar El-Awady)	Finite Element Simulation of Steady Shock Waves in Porous Materials: Exploring the Influence of Void Spatial Arrangement, Size, and Shape (Christophe Czarnota , Eyass Massarwa, Alain Molinari)	Quantifying Dislocation Drag at Ultra-High Strain Rates with Laser-Induced Microprojectile Impact (Qi Tang, Mostafa Hassani)	Phase Change Materials as Random-Access Memory Devices (RAMs) (Majid Dousti, Mehdi Javanbakht, Weisong Wang, Hamed Attariani)
2:20-2:40	An integrated deep learning and numerical optimization framework for multiscale materials modeling and design (Ashwini Gupta , Indrashish Saha, Tamer Zaki, Lori Graham Brady)	Visualizing Damage Evolution of Ceramics with in-situ X-Ray and Visible-Light Imaging under High-Rate Uniaxial Compression (Christopher Meredith , Jeffrey Swab, Nicholas Lorenzo, Andrew Leong, Bryan Zuanetti)	Studying Shock-Compressed Metal Composites Using a High-Throughput Characterization Technique to Establish Nanostructure-Performance Correlation (Siva Kumar Valluri , Edward L. Dreyzin, Dana Dlott)	
2:40-3:00	Global Sensitivity Analysis for Mixed Design Spaces in Materials Design (Tuba Dolar , Yigitcan Comlek, Wei Chen)		Measurement of Mechanical Properties at High Strain Rates by Nanoindentation (Benjamin Hackett , Christopher Walker, P. Sudharshan Phani, Warren Oliver, George Pharr)	
3:00-3:30	Coffee Break – Annapolis Atrium			
	Regatta A (MS10)	Regatta B (MS6)	Regatta C (MS3)	Surgeon Meeting Room (MS7)

	AI-Guided Discovery and Design of New Extreme Materials (Morgan Trexler, Leslie Hamilton, Chris Stiles, Elizabeth Reilly, Ashwini Gupta)	Damage and Failure at High Strain Rates (Cristophe Czarnota, José A. Rodríguez-Martínez)	Advances in automated, high-throughput, and small-scale characterization of high strain-rate phenomena (Debjoy Mallick, Suraj Ravindran, Ankit Srivastava, Justin Wilkerson)	Kinematics of defects and defect networks during high strain rate or dynamic loading (Douglas E. Spearot, Khanh Q. Dang, Debjoy Mallick, Suraj Ravindran)
3:30-3:50	Title TBD (Ichiro Takeuchi)	Statistical analysis of ductile damage under impact loading (Corentin Thouénon , Alizée Dubois, Nicolas Bruzy, Christophe Denoual, Jacques Besson, François Willot)	Deformation mechanisms and activation parameters in refractory multi-principal element alloy micropillars across the temperature spectrum: from cryogenic to high-temperature (Nicolo Della Ventura , Carolina Frey, Johann Michler, Tresa Pollock, Daniel Gianola)	Strength of OFHC copper under high dynamic pressures (Suraj Ravindran , Vatsa Gandhi, Guruswami Ravichandran)
3:50-4:10		Machine learned optimization-based modeling for shattering geomaterials (Eric Bryant , Bozo Vazic, Kane Bennett)	Autonomous Experimentation for Accelerated Scientific Research (Benji Maruyama)	Limiting velocities and supersonic dislocations in Mg (Khanh Dang , Daniel Blaschke, Saryu Fensin, Darby Luscher)
4:10-4:30	Closed-loop materials discovery using generative machine learning (Brandon Wilfong, Alexander New, Gregory Bassen, Wyatt Bunstine, Tyrel McQueen, Christopher Stiles)	Limitations of regularization techniques for local damage models for dynamic fracture (Kedar Kirane , Taufiq Abdullah)	Automated split Hopkinson bar experiments (Suraj Ravindran , Vladimir Kornev, Pranav Kartha, Mouliswar Ramapuram Ramakumaresan)	Length Scales Associated with Dislocation Nucleation during Shock of Single-Crystalline Aluminum (Douglas Spearot , Andre Archer)
4:30-4:50	Automated Database Generation of Multi-Principal Element Alloy Phase-Specific Mechanical Properties Measured with Nano-Indentation (Eddie Gienger , Justin Rokisky, Denise Yin, Elizabeth Pogue, Bianca Piloseno)	Understanding Complex Damage Mechanisms and Jetting Phenomena of Additively Manufactured Ti-5553 Lattices under Extreme Shock Environments (Roselyn Hurlow , Alison Kubota, Robert Reeves, Jenny Nicolino, Minta Akin)	Dynamic radial expansion and fragmentation of porous metal rings (Jose Rodriguez-Martinez , Anil Kumar, Thomas Virazels, Javier Garcia, Federico Sket, Krishnaswamy Ravi-Chandar)	Effect of Interfacial bonding on Energy Dissipation in a Particle-Reinforced Ceramic Matrix Composites under Impact Loading (Tyler Ragan , Min Zhou)
4:50-5:10	Data-driven Design of High Pressure Hydride Superconductors using DFT and Deep Learning (Daniel Wines , Kamal Choudhary)	A weakly non-linear stability analysis for the prediction of multiple necking during dynamic extension of round bar (Skander El Mai , Sébastien Mercier, Alain Molinari)	Size Matters: Impact Energy Absorption Across Five Decades of Length Scale (Jacob Rogers , Kailu Xaio, Paul Mead, Charles Pittman, Justin Wilkerson, Thomas Lacy)	Strain rate history effects in TWIP and TRIP steels (Jeffrey Lloyd , Danie Magagnosc, Christopher Meredith, Krista Limmer, Daniel Field)
5:10-5:30	ML Interatomic Potential development for advanced ceramics in extreme conditions, (Kimia Ghaffari , Sali Bavdekar, Douglas Spearot, Ghatu Subhash)	Pores collapse and spall fracture: a direct observation using fast ultra-high speed x-ray phase contrast imaging (Thomas Virazels , Jose A. Rodríguez-Martínez, Federico Sket, Bralislav Lukic)		Shock to Detonation Transition Behavior of Energetic Materials with Graded Void Distributions (Daniel Olsen , Min Zhou)
6:00	Reception – Annapolis Atrium			
6:30	Conference Banquet with speaker: Emeritus Professor Stuart W. “Bill” Leslie – Regatta Ballroom			

FRIDAY 4/5

8:30	Breakfast – Annapolis Atrium			
9:00	Plenary Lecture and Discussion: Angela Stickle, “Design, Impact Modeling, and Results of NASA’s Double Asteroid Redirection Test (DART) Mission” – Regatta Ballroom. Moderated by Dr. Dawn Graninger			
10:10	Coffee Break– Annapolis Atrium			
	Regatta A (MS4) Response of Brittle Materials Across Length Scales (Christopher Meyer, Kedar Kirane, Bazle Haque, Sakshi Braroo)	Regatta B (MS9) Hypervelocity Impact Phenomena (Justin Moreno, Matt Shaeffer)	Regatta C (MS11) Biological and Biomimetic Soft Materials (Kshitiz Upadhyay, Reuben Kraft, Amy Dagro)	Figure Eight Double Room (MS13) Advances in Experiments and Computational Modeling to Capture Heterogeneity in Shock Response of Geological Materials and Concrete (Mohmad Mohsin Thakur, Brett Kuwik)
10:30-10:50	Microscopic and macroscopic failure of sintered glass beads: mechanisms and relevance for sandstone surrogates (Brett Kuwik , Ryan Hurley)	Exploring the Role of the Background Atmosphere for Hypervelocity Impact Flashes (Humberto Caldelas II , Patrick King, Dawn Graninger, Thomas Rosch, Matthew Shaeffer, Justin Moreno)	Effects of Different Seat Angles to Disc Degeneration in Pilots under High-G Forces (Ann Reyes , Reuben Kraft)	The effect of particle arrangement of granular materials under shock compaction (Dawa Seo , Nitin Daphalapurkar, Darby Luscher)
10:50-11:10	Mesoscale Modeling to Predict Dynamic Impact Response of Plain Weave Composites (Christopher Meyer)	Comparison of the high-velocity impact performance of boron carbide ceramics (Konrad Muly , Justin Moreno, Matthew Shaeffer, K.T. Ramesh)	An investigation of lung tissue damage due to direct impact trauma (Oren Petel , MacKenzie Brannen, James Makhlof, Rohan Banton, John Clayton)	Experimental and numerical investigations of hybrid-fibre engineered cementitious composite panels under contact explosions (Lei Yang)
11:10-11:30	Spallation in Brittle and Ductile Materials under Extreme Conditions: A Multi-Billion Atom Simulation Study (Killian Babilotte)	Guiding mission design through hypervelocity impact experiments on rubble pile asteroids (Min Lê , K.T. Ramesh, Justin Moreno)	The quest to establish finite element brain strain as a cognitive change indicator (Reuben Kraft , Ritika Menghani, Clayton Bardall, Martin Tanaka)	Mesoscale Framework for Modelling Rapid Compaction in Granular Materials (Sohanjit Ghosh , Mohmad Thankur, Ryan Hurley)
11:30-11:50	The mechanical response of shock loaded B4C-TiB2 ceramic composite (Scott Turnage)	Removing Articles Via In-situ On-orbit Localized Impacts (RAVIOLI) (Rachel Hartig)	Modeling Self-Assembling Polymers Dynamics for Ballistic Self-Sealing (Thomas O'Connor , William Ferguson)	
11:50-12:10		Vortical flow and the modulation of jetting processes (William Schill)	Mixed finite elements for thermoelastic modeling of biological matter (Tyson Loudon)	
12:10-12:30		Development of combustion two-stage light gas gun (YunHo Kim , Hyunsoo Kim, Inhae Song)	Simulation of High-Level Impulse Noise Propagation into the Human Head (Gary Tan , Amit Bagchi, K. Teferra, J. H. O'Donnell)	
12:30	Lunch – Annapolis Atrium			
1:30	ADJOURN			