

16th Ablation Workshop

Sept 1–3, 2026

New Mexico State University

Corbett Center Student Union

<https://ablation.engr.uky.edu/>

Hosted and Organized by:



AGENDA

Sponsored by:



Monday

August 31, 2026

Welcome Cocktail Mixer and Registration

17:00 - 20:00 Stan Fulton Center

Tuesday

September 1, 2026

08:00 Registration and Breakfast

08:40 Welcome Remarks - MAE Dept. Head Dr. Frankel

Technical Session #1: Overviews and Applications *Chair: Prof. Torres-Herrador*

09:00 Overview Office Naval Research
Eric Marineau (*Office Naval Research*)

09:20 Overview from SNL
Scott Roberts (*Sandia National Laboratories*)

09:40 Dragonfly TPS Challenges
Michael Wright (*NASA Ames Research Center*)

10:00 Qualification in CO₂ of the TPS and the aerothermal instrumentation for the EXOMARS RFM mission
Gregory Pinaud (*ArianeGroup SAS*)

10:20 KRUPS: Overview of the KREPE-3 flights and beyond
Alexandre Martin (*University of Kentucky*)

10:40 Coffee Break

Technical Session #2: Experimental I *Chair: Dr. Engerer*

11:00 Multiscale Analysis of Ablators Tested on an Oxy-Acetylene Test Bed
Samantha R. Bernstein (*University of Texas - Austin*)

11:20 Atomic oxygen measurements via coherent anti-Stokes Raman Scattering: a new path for study of recombination physics
Sean Kearney (*University of Illinois Urbana-Champaign*)

11:40 Investigations of High-Temperature Oxygen-Carbon Ablation by Molecular Beam-Surface Scattering
Timothy K. Minton (*University of Colorado Boulder*)

12:00 Modeling and simulation of radiometer placement experiments in the NASA Ames mARC II arc jet facility
Andrea Scaboro (*University of Illinois Urbana-Champaign*)

12:20 Lunch

Technical Session #3: Coupling *Chair: Dr. Borner*

13:20 Staggered coupling of a high-order flow solver and a material solver for ablation in high-enthalpy flows

Julien Klauner (*UCLouvain, ULB, VKI*)

13:40 Influence of Surface Recession on Transitional Fluid–Ablation Interactions over a Mach 8 Compression Ramp

Kumaraguru Sethunarayanan (*University of Maryland, College Park*)

14:00 Multivelocity Formulation Discretized Using Combined Discontinuous Galerkin and Material Point Methods for Ablation Simulations

Duan Z. Zhang (*Los Alamos National Laboratory*)

14:20 Comparison of Fluid–Material Coupling Strategies for Hypersonic Ablation

Gabriel Merlaud (*University of Bordeaux*)

14:40 Analyzing the impact of GSI models on Fluid-Radiation Coupled Simulations

Alessandro Meini (*University of California, Irvine*)

15:00 Coffee Break

Technical Session #4: Experimental II *Chair: Prof. del Val*

15:20 ARCTRON: A Rapid Experimental Proving Ground for TPS Experiments and Arcjet Technology Development

Arnaud Borner (*Analytical Mechanics Associates, Inc. at NASA Ames Research Center*)

15:40 Kalman Filtering and RTS Smoothing for Arc-Jet Sample Edge Tracking

Alexandre Quintart (*Flying Squirrel*)

16:00 Development of Thermal Protection Systems Research Capabilities at NMSU

Francisco Torres-Herrador (*New Mexico State University*)

16:20 Mesoscale Test Cases Presentation

Francisco Torres-Herrador (*New Mexico State University*)

Savio J. Poovathingal (*University of Kentucky*)

16:30 Poster Pitch

17:00 Poster Session

19:00 End of Poster session

Wednesday

September 2, 2026

08:00 Breakfast**Technical Session #5: ML / UQ** *Chair: Prof. Poovathingal***08:40 Reduced-Order Modeling of a One-Dimensional Charring Ablator Using Coupled Thermal-Decomposition Dynamics**Brianna Morales (*University of California Merced*)**09:00 Few-shot multistage phase classification in CT scans of carbon-carbon composites**Xiongjun Wu (*DEVCOM ARL*)**09:20 Stochastic reconstruction of ablating material properties for uncertainty propagation in material response simulations**Joseph Schulz (*NASA Ames Research Center*)**09:40 Uncertainty Aware Air Carbon Ablation Model From Molecular Beam Data**Graham John Larson (*University of Minnesota*)**10:00 In-Situ micro-CT Analysis of RTV with Dispersed Phenolic Micro-Balloons**Spencer Dansereau (*University of Colorado Boulder*)**10:20 Physics-Constrained Trajectory-Coupled Scientific Machine Learning for Accelerated End-to-End Hypersonic Entry Design**Rui Fu (*University of Kentucky*)

10:40 Coffee Break

Technical Session #6: Thermochemistry *Chair: Prof. Lachaud***10:50 A Novel Thin-Layer Model for Finite Rate Ablation Closure**Dallin Lee Littlewood (*Sandia National Laboratories*)**11:10 Sublimation of carbon materials**Savio J. Poovathingal (*University of Kentucky*)**11:30 Reactive Coverage Model Fit to Graphite Oxidation Dataset Across Pressure Regimes**Nicholas Anderson (*University of Illinois at Urbana-Champaign*)**11:50 High-throughput molecular dynamic simulation for char-yield prediction and materials screening**Md Razaul Karim (*The University of Texas at El Paso*)**12:10 Thermal Conductivity Characterization of Commercial Carbon Fibers Up to 2700 °C**Yixin Luo (*CAER, University of Kentucky*)12:30 Lunch

Technical Session #7: Thermomechanical *Chair: Mr. Bersbach*

- 13:30 Multiscale aero-thermo-chemo-mechanics modeling of Thermal Protection Systems in Σ MIT**
Raul Radovitzky (*Massachusetts Institute of Technology*)
- 13:50 Simulations of Yarn Micro-Mechanics of Woven Heat Shield Materials (3MDCP)**
Elizabeth Suehr (*NASA NPP*)
- 14:10 Thermo-poro-mechanical modeling of RTV intumescence**
Sreevishnu Oruganti (*Amentum Technology Inc. at NASA Johnson Space Center*)
- 14:30 Thermomechanical modeling of woven materials with particle-based, explicit-fiber simulations**
Andrew P. Santos (*NASA Ames Research Center*)
- 14:50 An Iterative Coupling Methodology for Fully Coupled Pyrolysis, Gas–Surface Interaction, and Thermo-Structural Analysis**
Bibin Joseph (*University of Kentucky*)
- 15:10 Coffee Break**

Technical Session #8: GSI *Chair: Dr. Wu*

- 15:20 Investigations the influence of gas-surface reactions to compute RF Blackout in atmospheric entry**
Alexandra Richet (*CEA*)
- 15:40 Development of a Modular Coupling Framework for Aerothermodynamic and Material Response Simulations**
Raghava S. C. Davuluri (*Purdue University*)
- 16:00 Implicit coupling between free flow and pyrolyzing porous materials: from micro-CT-scale deformation to particle-scale interaction**
Abderrahman M'jikou (*University of Bordeaux*)
- 16:20 A Computational Thermo-Chemo-Poro-Mechanical Model of Pyrolyzing Ablative Thermal Protection Systems**
Christopher T Quinn (*Massachusetts Institute of Technology*)
- 16:40 Ice micrometeoroid ablation modeling on aeroshells**
Erin Heilman (*Earth and Environmental Sciences Division, Los Alamos National Laboratory*)
- 17:00 Discussing Ablation Test-Case #4**
Jean Lachaud (*University of Bordeaux*)

18:00 Gala Dinner: Farm & Ranch Museum

Thursday - ITAR Session

September 3, 2026

08:15 Breakfast

08:45 Visit PSL

09:30 Coffee Break

ITAR Session at PSL *Chair: Prof. Martin*

09:50 **Overview Office Naval Research**
Eric Marineau (*Office Naval Research*)

10:10 **Characterization of the resin structure in PICA**
Savio Poovathingal (*University of Kentucky*)

10:30 **Aerothermal Modeling of 2.5DCC in H1 Arc Heater**
Chuck Bersbach (*Raytheon-RTX*)

10:50 **Aerothermal Evaluation of 2.5DCC in H1 Arc Heater**
Chuck Bersbach (*Raytheon-RTX*)

11:10 **Under Pressure: The Artemis I Heatshield Char Loss Investigation and Artemis II’s Successful Entry**
Joseph C. Ferguson (*NASA Ames Research Center*)

12:00 Lunch

13:00 Visit MAE Hypersonics lab

Thursday - Non-ITAR

September 3, 2026

08:15 Breakfast

08:45 Visit MAE Hypersonics lab

Posters

- **Experimental Characterization of the Orthotropic Gas Permeability in High-Density Carbon-Phenolic Ablators During Pyrolysis**

Thibaud Coelho, Nell Trouillet, Alexandre Duméry, Audrey Duphil, Cécile Gaborieau, Alain Sommier, Olivier Ledain, Antonio Cosculluela, Jean Lachaud (*University of Bordeaux*)

- **An Experimental Method for Measuring Gas Diffusivity and Tortuosity in TPS Materials**

Jack W. Wooten, Michael W. Renfro (*University of Kentucky*)

- **Aerothermal Assessment of Supersonic Flows Past a Roughened Sphere-Cone**

Nikhil Kohar, Mostafa Aghaei-Jouybari (*The University of Kansas*)

- **Aerothermal Characteristics of Supersonic Channel Flows Over Sinusoidal Roughness**

Adrian Cabildo Arias, Mostafa Aghaei-Jouybari (*University of Kansas - Lawrence*)

- **Developing Digitally Knitted Textile Architectures for Thermal Protection Systems**

Jennifer Meakins, Ashley Grace Smith & Cayenne Warren (*University of Kentucky*)

- **The evolution of transport properties in charring carbon-phenolic ablators**

Henry X. Varona, Erik Poloni, Gregory S. Elliott, Francesco Panerai (*University of Illinois Urbana-Champaign*)

- **Shock tube - plasma wind tunnel similarity based on optical emission spectroscopy**

A. Fagnani, S.R. Latimer, B.A. Cruden, O. Chazot (*NASA Ames Research Center*)

- **Modeling volumetric oxidation and oxidation-induced mechanical degradation in porous graphite TPS**

Akhil Ambardekar, Raul Radovitzky (*Massachusetts Institute of Technology*)

- **Probabilistic inference of air-carbon ablation model parameters using conditional flow matching**

Vijay B Mohan Ramu, Caedan Burcham, Savio J. Poovathingal, Assad A. Oberai (*University of Southern California*)

- **A Poro-Thermo-Mechanics Theory for Fracture and Delamination of Carbon Ablators**

Daniel Pickard, Christopher Quinn, Raul Radovitzky (*Massachusetts Institute of Technology*)

- **Machine learning-accelerated embedded chemistry calculations for the simulation of oxidation transitions in silicon carbide TPS**

Théo A. Rulko, Raúl A. Radovitzky (*Massachusetts Institute of Technology*)

- **Spatially resolved emission spectroscopy around graphite samples in nitrogen/methane plasmas**

Nimesh Chaulagain, Stefan Löhle, Savio Poovathingal, Alexandre Martin, Dan Fries (*University of Kentucky*)

- **Dust Effects on the Aerothermal Environment and TPS Material Response during Martian Hypersonic Entry**

Hyeon Woo Nam, Sung Min Jo (*University of Central Florida*)

- **Modeling of a high velocity oxygen fuel (HVOF) torch**

Joseph Chaplin, Gehn Ferguson, Kenneth Kane, Alexandre Martin (*University of Kentucky*)

- **A Computational Framework for Heterogeneous Oxidation and Fracture in Ultra-High Temperature Ceramics**

Aaditya Rau, Raul Radovitzky (*Massachusetts Institute of Technology*)

- **A Scalable Framework for Hypersonic Aero-Thermo-Chemo-Mechanical Simulations of Thermal Protection Systems**

G. Tsilimidos, C. Quinn, T. Collin, D. Pickard, C. Nguyen, J. Peraire, R. Radovitzky (*Massachusetts Institute of Technology*)

- **Stochastic Network Modeling of Progressive Failure in a Fiber-Based Material**

José Lasso, Harley T. Johnson (*University of Illinois Urbana Champaign*)

- **Time-Resolved Micro-CT of Methane Coking in Porous Carbon Ablators**

Henry Boesch, Jeffrey D. Engerer, Lincoln N. Collins, Francesco Panerai (*University of Illinois at Urbana-Champaign*)

- **Multi-species Implementation in Material Response Code**

H Berk Gur, Alexandre Martin (*University of Kentucky*)

- **Modeling laser-based ablation of carbon materials**

Bruno Tacchi, Frederick N. Shireman, Ahmed H. Yassin, Kate B. Rhoads, Wyatt Crawford, Tyler C. Haag, Boris S. Leonov, Richard B. Miles, Michael Q. Hovish, Alexandre Martin, Savio J. Poovathingal (*University of Kentucky*)

- **Influence of Carbon Fibers on the Pyrolysis of Carbon-Phenolic Ablative Heat Shield Materials**

Celeste H. Guiles, Timothy K. Minton (*University of Colorado Boulder*)

- **A coupled framework for mesoscale ablation**

Ahmed H. Yassin, Ahmed H. Yassina, Carlos E. Americoa, Ethan H. Huffa, Robert L. Harpera, Tyler D. Stoffelb, Savio J. Poovathingala (*University of Kentucky*)

- **Self-Consistent Modeling of an RF Plasma Flow Reactor**

Junhao Zhang, Andrea Gonzalez Guerrero, Monica Aguirre Perez, Jesus Ivan Silva Rodriguez, Venkattraman Ayyaswamy, Francisco Torres Herrador (*New Mexico State University*)

- **Oxygen-Carbon Reactions in FiberForm Investigated with Molecular Beam Mass Spectrometry**

Henri N. Doucet, Celeste H. Guiles, Timothy K. Minton. (*University of Colorado-Boulder*)

- **BEAST: Expanding Sustainable Data Infrastructure for High-Enthalpy Facilities**

Alexandre M. Quintart, Magnus A. Haw (*Flying Squirrel*)

- **Artificial Neural Network for Material and Dimensional Characterisation of Thermally Induced Distortion in Extruded Metals**

Saisruthi Kotagiri, Venkata Sirimuvva Chirala (*New Mexico State University*)

- **Tomography And Lattice Boltzmann Exploration**

Hubert Quintana III, Wyatt MacGregor, Andres Ibarra-Gonzalez, Kelsey Sanchez, Rayce Becerra, Luis Diaz, Yanxing Wang, Francisco Torres-Herrador (*New Mexico State University*)

- **Insights into Meteor Physical Properties from Faint Meteor Flares**

Jessica Klusmeyer, Maximilian Vovk, Peter Brown, Denis Vid (*New Mexico State University*)

- **Experimental study of internal thermo-chemical response of ablators by means of a laser-heated facility**

Andres Ibarra Gonzalez, Henry Larsen, Margot Shipton-Cook, Lincoln Collins, Jeffrey Engerer, Francisco Torres-Herrador (*New Mexico State University*)

- **SCAM: (not so) Simple Code for Ablative Materials**

Francesco Panerai (*University of Illinois Urbana-Champaign*)

- **Development of a Mach 2.3 Supersonic Indraft Wind Tunnel and Experimental Investigation of Swirling Jets in Crossflow**

Bryce Richards, Andreas Gross, Fangjun Shu (*New Mexico State University*)

- **Stability Analysis of Hypersonic Thermochemical Nonequilibrium Boundary Layer**

Angel Zuniga Ramirez, Servio Tulio Haramura Bastos, Andreas Gross, Qiong Liu (*New Mexico State University*)

Workshop Organizing Committee

General Chairs

- Prof. Alexandre Martin, *University of Kentucky*
- Prof. Savio J. Poovathingal, *University of Kentucky*

Local Chairs

- Prof. Francisco Torres-Herrador, *New Mexico State University*
- Prof. Jay Frankel, *New Mexico State University*

Logistics and Coordination

- Ms. Victoria Trujillo, *New Mexico State University*
- Ms. Marcella Shelby, *New Mexico State University*
- Mr. Stanley Cheng, *New Mexico State University*
- Mx. Finn Pias, *New Mexico State University*

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