

10th Ablation Workshop

September 17-18, 2018

Silver Maple Ballroom of the Dudley H. Davis Center

590 Main Street, Burlington, VT 05405

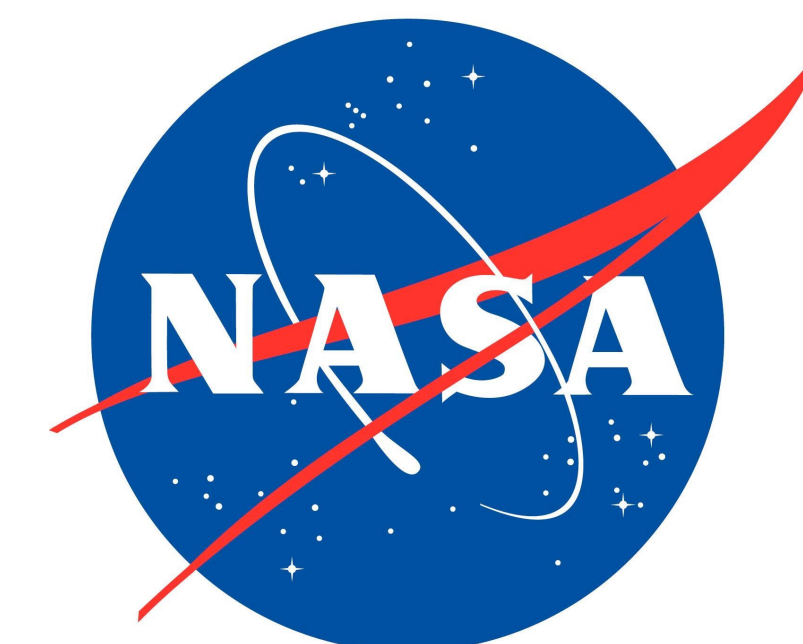
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Meyers et al., 2018

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Agenda

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Agenda

Monday September 17, 2018

Introduction/Overview

Chair: Alexandre Martin, University of Kentucky, USA

7:00 Registration, Breakfast and Coffee

8:00 Overview and welcome

Jason Meyers & Linda Schadler, University of Vermont, USA

8:10 Ablation Workshop: 10 Years of History

Michael Wright, NASA Ames Research Center, USA

8:35 Mars Sample Return: Grand Challenge for EDL

Ethiraj Venkatapathy, NASA Ames Research Center, USA

9:00 TPS Architectures and the Influence of Material and Architecture on Failure Mode Evolution

Mairead Stackpoole, NASA Ames Research Center, USA

9:25 Overview of Sandia National Laboratories ablation activities

Justin Smith, Sandia National Laboratories, USA

9:50 Preliminary post-test ablation analysis of the ExoMars2016 Schiaparelli module during the entry on Mars atmosphere

Gregory Pinaud, Ariane Group SAS, France

10:15 Coffee Break

Experimental Chemical Decomposition

Chair: Justin Smith, Sandia National Laboratories, USA

10:45 Measurements of Pyrolysis Gas Interactions in Dilute Plasmas

Douglas Fletcher, University of Vermont, USA

11:10 Determination Of The Ablation Properties Of A New Class Of Ablatives By Mesa Code

Ozen Atak, University of Texas, USA

11:35 Thermogravimetric Analysis of Phenolic and Silicone Decomposition Products

Jason White, SRI, USA

12:00 Molecular Beam Studies of Carbon and Silicon Carbide Ablation by Atomic Oxygen

Timothy Minton, Montana State University, USA

12:25 Lunch

Micro-scale Modeling

Chair: Yves Dubief, University of Vermont, USA

13:40 Predictive Modeling of Chemical and Structural Failure of Porous Ablative Materials

Thomas Schwartzentruber, University of Minnesota, USA

14:05 Pitting Dynamics in Carbon Oxidation

José Graña-Otero, University of Kentucky, USA

14:30 Apparent Permeability Prediction on Micro-Porous Media with the Lattice Boltzmann Method

Michel Ho, École Polytechnique de Montréal, Canada

14:55 Modeling the Effective Thermal Conductivity of Anisotropic Porous Materials

Federico Semeraro, UIUC at NASA Ames Research Center, USA

15:20 Coffee Break

Poster Session (see page 4)

15:20 Poster session

17:00 Adjourn

17:40 Spirit of Ethan Allen Boarding Begins

18:00 Spirit of Ethan Allen Departs

Agenda

Tuesday September 18, 2018

Mesoscale Modeling -- Phenomena

Chair: Mark Ewing, Northrop Grumman, USA

7:00 Breakfast and Coffee

8:00 KATS-Universal Solver: Application to Flow Tube Oxidation Modeling

Haoyue Weng, University of Kentucky, USA

8:25 Effects of carbon-based ablation products on hypersonic boundary layer stability

Olivia S. Elliott, Air Force Institute of Technology, USA

8:50 Mesoscale Framework for Multi-Physics Simulation of Ablative Thermal Protection Systems

Marina F. F. Sessim, University of Florida, USA

9:15 Overview of the Material Response Code MABLE

Luke Chipperfield, Fluid Gravity Engineering Ltd., UK

9:40 Investigation of Factors Affecting Rocket Nozzle Conjugate Ablation Predictions

Peter G. Cross, Navy NAWCWD, USA

10:05 Coffee Break

Mesoscale Modeling -- Properties

Chair: Peter G. Cross, Navy NAWCWD, USA

10:35 Icarus Material Response Modeling of Meteoritic Melt Interfaces: Application of an

Atomistically-Derived Property Database

Justin B. Haskins, NASA Ames Research Center, USA

11:00 Mesoscale Modeling of TPS materials: Effective Property Calculations and Sensitivity Analysis

Lincoln N. Collins, Sandia National Laboratories, USA

11:25 A Ready-to-Use Multi-Fidelity Gas-Surface Interaction Module for CFD

Georgios Bellas-Chatzigeorgis, von Karman Institute for Fluid Dynamics, Belgium

11:50 Development of an Oxidation Model for Carbon Preform Ablators for use in CFD

Krishnan Swaminathan-Gopalan, NASA Ames Research Center, USA

12:15 Lunch

Experimental Characterization

Chair: Adam Amar, NASA Johnson Space Center, USA

13:55 HEEET ETU Test Series

Scott Splinter, NASA Langley Research Center, USA

14:45 A Comparative Study on Ablation Performance, Thermal Properties, and Microstructures of

2D, 2.5D, and 3D Carbon/Phenolic Ablatives

Joseph Koo, University of Texas, USA

13:30 Comprehensive Material Properties Characterization of the Zuram Ablator at the VKI for

Material Response Code Validation

Francisco Torres Herrador, von Karman Institute for Fluid Dynamics, Belgium

15:10 Nitridation and Surface Catalyzed Recombination on High-Temperature Carbonaceous

Fiber Materials

Jason Meyers, University of Vermont, USA

15:35 Conclusion/Adjourn

Posters

Development of a Low-Mach Number Flow Solver for the UVM ICP Torch

Yves Dubief, University of Vermont, USA

Towards the Prediction of the Mars 2020 Heatshield Material Response

Jeremie Meurisse, NASA Ames, USA

Recent developments to the Porous Microstructure Analysis (PuMA) software.

Joseph Ferguson, STC at NASA Ames, USA

CFD modeling of Subsonic Plasma Flow for Ablation Experiments

K. Sandeep Prata, University of Minnesota, USA

Computing Surface Properties on Thermal Protection System Microstructure

A. Dev Achambath, University of Minnesota, USA

Competing Reaction Pyrolysis model Applied to Carbon/Phenolic Ablators

F. Torres Herrador, von Karman Institute, Belgium

Significance of DSMC Computed Aerothermal Environments in the Rarefied Regime for Atmospheric Entry Material Response

Arnaud Borner, STC at NASA Ames, USA

Conjugate Heat Transfer Model of an Experimental Apparatus Measuring Thermal Conductivity of Fibrous Insulation Materials

Christopher Barrow, University of Kentucky, USA

Material Response Analysis of a Titan Entry Heatshield
Grant Palmer, AMA at NASA Ames, USA

A Chemical Equilibrium Approach to Silicon Carbide Oxidation
Samuel Chen, University of Michigan, USA

Kentucky Re-entry Universal Payload System (KRUPS): Sub-orbital Flights

Nicola Khouri, University of Kentucky, USA

Numerical Reconstruction of Spalled Particle Trajectories in an Arc-Jet Environment

Raghava Davuluri, University of Kentucky, USA

DSMC Simulation of Flow Through Various TPS Microstructures

S. Ramjatan, University of Minnesota, USA

Qualitative Assessment of Supersonic Flow Through Porous Media with KATS-US

Umrhan Duzel, University of Kentucky, USA

Modeling Multi-Phase Transport in a Porous Ablator Using KATS Universal Solver

Ali Omidy, University of Kentucky, USA

Computation of Darcy's Permeability in Porous Media Based on Voxel Images

John M. Thornton, NASA Ames, USA

A thermochemical model for oxidation of ultra high temperature ceramics using high temperature high enthalpy and high temperature flows

Erica Corral, University of Arizona, USA

Scientific Committee

Dr. Mark Ewing

Director, Analysis Engineering
Northrop-Grumman
Brigham City, UT 84302
mark.ewing@orbitalatk.com

Dr. Alexandre Martin

Associate Professor
University of Kentucky
Lexington, KY 40506
Alexandre.Martin@uky.edu

Dr. Justin Smith

Program Manager - Aerosciences
Sandia National Laboratories
Albuquerque, NM 87185
jussmit@sandia.gov

Dr. Ivett Leyva

Program Manager, High-Speed Aero.
Air Force Office of Scientific Research
Arlington, VA 22203
Ivett.Leyva@us.af.mil

Dr. Grégory Pinaud

Research Engineer
Ariane Group SAS
Saint-Médard-en-Jalles, France
gregory.pinaud@ariane.group

Dr. Michael J. Wright

Entry Systems Modeling Proj. Manager
NASA Ames Research Center
Moffett Field, CA 94035
Michael.J.Wright@nasa.gov

Organizing Committee

Dr. Jason Meyers, Chair

Research Assistant Professor
University of Vermont
Burlington, VT
Jason.Meyers@uvm.edu

Dr. Alexandre Martin

Associate Professor
University of Kentucky
Lexington, KY 40506
Alexandre.Martin@uky.edu

Dr. Michael J. Wright

Entry Systems Modeling Proj. Manager
NASA Ames Research Center
Moffett Field, CA 94035
Michael.J.Wright@nasa.gov