Agenda
Monday September 16, 2019

Introduction/Overview

Chair: Alexandre Martin, University of Kentucky, USA

7:15 Registration, Breakfast and Coffee

8:00 Overview and welcome

Thomas Schwartzentruber, University of Minnesota, USA

8:15 Overview of NASA ablation activities

Michael Wright, NASA Ames Research Center, USA

8:25 MSR EEV TPS - Requirements, Options, and Trades - What is in, what is out, and challenges ahead

Ethiraj Venkatapathy, NASA Ames Research Center, USA

8:50 Overview of Sandia National Laboratories ablation activities

Derek Dinzl, Sandia National Laboratories, USA

9:15 Overview of ESA ablation activities

Gregory Pinaud, Ariane Group SAS, France

9:40 Overview of AFOSR ablation activities

Ivett Leyva, Air Force Office of Scientific Research, USA

9:50 Coffee Break

Technical Session #1: Micro-tomography based analysis

Chair: Thomas Schwartzentruber, University of Minnesota, USA

10:20 Microscopic imaging of carbon fiber oxidation in 4D

Francesco Panerai, University of Illinois - Urbana-Champaign, USA

10:40 Ablation of carbon fiber TPS samples in DSMC

Arnaud Borner, NASA Ames Research Center, USA

11:00 Image-based mesoscale ablation modeling

Lincoln Collins, Sandia National Lab, USA

11:20 Computation of fiber orientation in X-ray micro-tomography reconstructions

Frederico Semeraro, NASA Ames Research Center, USA

11:40 Applying multi scale computational materials science method to predict ablation of PICA

Michael Tonks, University of Florida, USA

12:00 Lunch - Graduate Hotel Pinnacle Ballroom (2nd floor of conference hotel)

Technical Session #2: Atomistic chemistry and Finite Rate Modeling

Chair: TBD

13:20 Molecular beam studies of carbon and silicon carbide ablation by O and N atoms

Timothy Minton, Montana State University, USA

13:40 Visualizing oxidative and ablation erosion of HOPG using supersonic beams of O2

Timothy Grabnic, University of Chicago, USA

14:00 Finite rate modeling of reactions between dissociated air and carbon at high temperature

Tom Schwartzentruber, University of Minnesota, USA

14:20 Kinetics model of graphite ablation rates as a function of microstructure

Erica Corral, University of Arizona, USA

14:40 An interface for coupling Icarus to the US3D flow solver

Vladimir Gidzak, GoHypersonic, Inc., Minneapolis, USA

Poster Session (see page 4)

15:30 Poster session - Graduate Hotel Pinnacle Ballroom (2nd floor of conference hotel)

17:00 Adjourn

18:00 Banquet - Campus Club West Wing
Tuesday September 17, 2019

Technical Session #3: Material characterization
Chair: TBD

7:15 Registration, Breakfast and Coffee
8:00 Unraveling the mysteries of transport properties in porous media
   Alexandre Martin, University of Kentucky, USA
8:20 Additive manufacturing of ultra-performance polymers for TPS
   Joseph Koo, University of Texas at Austin, USA
8:40 Multi-scale thermal response modeling of an AVCOAT-like TPS material
   Surabh Sawant, University of Illinois - Urbana-Champaign, USA
9:00 Phenolic polymer pyrolysis via reactive molecular dynamics simulation
   Keith Jones, Sandia National Lab, USA
9:20 A coupled DSMC-SPH solver to study atmospheric entry ablation in the presence of a rarefied gas phase
   Federico Bariselli, von Karman Institute (VKI) for Fluid Dynamics, Belgium
9:40 Coffee Break

Technical Session #4: Experimental measurements
Chair: TBD

10:10 TPS technology maturation and sustainment in support of in-situ science missions: HEET and PICA
   Mairead Stackpoole, NASA Ames Research Center, USA
10:30 Airborne observation and X-ray analysis of the Hayabusa SRC heat shield and plan for Hayabusa 2
   Tetsuya Yamada, Japan Aerospace Exploration Agency (JAXA), Japan
10:50 Analysis of the hypervelocity impact response of graphite and weather capabilities at NASA WSTF-RHTL
   Ben Carmichael, Southern Research - Hypersonics Department, USA
11:10 Ablation chemistry under high-heat / high-flux solar testing
   Bemadette Hemadez-Sanchez, Sandia National Lab, USA
11:30 An ultrasonic method for ablation rate measurement of silica-phenolic TPS material
   Aleksander Zibitsker, Israel Institute of Technology (Technion), Haifa, Israel
11:50 Analysis of the PICA-NuSiL HyMETS Arc-Jet Campaign
   Brody Bessire, NASA Ames Research Center, USA
12:10 Lunch - Graduate Hotel Pinnacle Ballroom (2nd floor of conference hotel)

Technical Session #5: ICP modeling and experiment
Chair: TBD

13:30 Recombination of nitrogen atoms in high-temperature graphite
   Doug Fletcher, University of Vermont, USA
13:50 Investigation of thermochemical processes in inductively coupled plasma torches
   Savio Poovathingal, University of Michigan, USA
14:10 Modeling of silicon carbide oxidation in coupled, reacting boundary layers
   Samuel Chen, University of Michigan, USA
14:30 Surface catalyzed recombination on high-temperature carbonaceous fiber materials
   Jason Meyers, University of Vermont, USA
14:50 Coffee Break
15:20 Material characterization and ablation experiments of the ZURAM carbon-phenolic ablation
   Bernd Helber, von Karman Institute (VKI) for Fluid Dynamics, Belgium
15:40 Validation of carbon ablation models based on Plasmatron experiments
   Thierry Magin, von Karman Institute (VKI) for Fluid Dynamics, Belgium

Technical Session #6: Non-TPS related research
Chair: TBD

16:00 Micro-tomography and modeling based reconstruction of meteoritic material in high temperature air
   Justin Haskins, NASA Ames Research Center, USA
16:20 Development of a melt flow boundary condition in the Icarus material response solver
   Grant Palmer, NASA Ames Research Center, USA
16:40 Ablation test-case series: What about joining forces with the fire and biomass communities?
   Gregory Pinaud, Ariane Group SAS, France
17:00 Conclusion/Adjourn
Numerical simulation of porous flow and ablative test case under supersonic flow conditions, Umran Duzel, University of Kentucky
A multiphysics phase-field tool to model PICA on atmosphere entry conditions, Marina Sessim, University of Florida
Video processing for evaluation of ablative behavior of meteorite samples tested in the IHF and HyMETS arc-jet facilities, Aleksander Zibitsker, Technion, Israel
Strain-dependent analysis of conductivity in fibrous insulation materials, Christopher Barrow, University of Kentucky
A finite-rate model for air-carbon ablation, Sandeep Prata, University of Minnesota
Decomposition of heat shield silicones under atomic oxygen bombardment, David Chen, Montana State University
Heatshield erosion due to dust particle impacts on the Schiaparelli capsule during Martian entry, Grant Palmer, NASA Ames Research Center
Overview of modeling micro-meteoroid and orbital debris impact cavity growth, Olivia Schroeder, University of Minnesota
Implementation and verification of a mesh motion scheme using radial basis functions in the Icarus material response code, Olivia Schroeder, University of Minnesota
Modeling bourbon barrels, Alexandre Martin, University of Kentucky
Numerical reconstruction of spalled particle trajectories in an arc-jet environment, Raghava Davuluri, University of Kentucky
Fully coupled material-environment simulation of a Simoun plasma wedge test on a conformable C/P with PATO, Gregory Pinaud, Ariane Group SAS, France
Computational analysis of thermal protection system with embedded vascular network, Nate Skolnik, University of Illinois - Urbana-Champaign
Modeling carbon fiber oxidation under high temperature by ReaxFF based molecular dynamics simulation, Linyuan Shi, University of Florida
Surface properties on thermal protection system microstructure at flight relevant conditions, Sahadeo Ramjatan, University of Minnesota
Bayesian inference and the effects of varying uncertainty models in charring ablation calibration and uncertainty quantification problems, Przemyslaw Rostkowski, University of Illinois - Urbana-Champaign
A testing and evaluation facilities framework to develop leading edge materials for application in high speed flows, Erica Corral, University of Arizona
Efficient sticking of crystalline nanospheres via phase-transition plasticity, Traian Dumitrica, University of Minnesota
Determination of aerothermal environment and ablation material response using inverse methods, John Thornton, NASA Ames Research Center
Micro-scale artificial weave generation capabilities for TPS material modeling, Sander Visser, NASA Ames Research Center
Progress towards modeling the ablation response of NuSil-coated PICA, Jerome Meurisse, NASA Ames Research Center
Effect of out-gassing on the onset of transition in hypersonic boundary layers, Mona Karimi, NASA Ames Research Center
Determination and comparison of the characteristics of a new class of ablative materials, Ozen Atak, University of Texas at Austin
Microstructure investigation of elastomeric TPS char based on solid rocks motor experiments, Ramin Shilav, Rafael, Ltd., Israel
Model and characterization of ablative composite material based on cork and silicone rubber, Noa Eizckoviz, Technion, Israel
HyCUBE: A reconfigurable cubesat-like platform for hypersonic flight testing, Alex Hayes, University of Minnesota
Arc jet testing and evaluation of Mo-Si-B coated Mo and SiC-ZrB2 ceramics, P.J. Ritt, University of Wisconsin

Organizing Committee

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

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

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

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

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

Dr. Thomas Schwartzentruber, Chair
Professor
University of Minnesota
Minneapolis, MN 55455
schwartz@umn.edu

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

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