



Agenda Day 1 | December 6, 2021

MURI Review Meeting 2021 (Kick-off)

Time	Topic		Speaker
8:00	BRICC elevators open & Zoom Login 8:15 AM		
8:30	Welcome & Project Overview	Welcome and Opening Remarks	Sarah Popkin (Topic Chief), AFOSR
8:40		AFOSR MURI HYFLITS: Project Overview	Brian Argrow (PI), UC Boulder
9:00	Invited Speakers	Stratospheric Science	Mary Bedrick, AFRL/RQ
9:30		Atmospheric AirCore and Sample Return System	Colm Sweeney, NOAA/ESRL/GML
10:00		Toward an Improved Understanding of Stratospheric Aerosol Processes and Budget	Troy Thornberry, NOAA/ESRL/CSL
10:45	BREAK		
11:15	Atmospheric & Boundary Layer Simulations	High-Fidelity Modeling of Stratospheric Turbulence Cascade from Mesoscale Sources to Centimeter-Scale Turbulence	Dave Fritts
11:45		Hypersonic Boundary Layer Receptivity to Stratospheric Turbulence and Particulates	Graham Candler, UMN
12:15	LUNCH BREAK		
1:00	Stratospheric Turbulence/Particulates Measurements	Balloon-Borne Stratospheric Measurement Systems	Dale Lawrence, UC Boulder
1:30		DNS of the Turbulent Fine-Wire Measurement Environment and Calibration System	Joseph Pointer, UC Boulder
2:00		Particulate Instrument Calibration	Joseph Habeck, UMN
2:30	BREAK		
2:45	Atmospheric Optical Propagation	Optical Propagation Through the Atmosphere: Observational Techniques and Measurements	Andreas Muschinski, NorthWest Research Associates


3:15		BOLT-I Deployment, Preliminary Results and BOLT-II Planning	Dale Lawrence, UC Boulder/Aroh Barjatya, ERAU
4:00	Discussion & Wrap-Up		Sarah Popkin (AFOSR)
5.00	MEETING ADJOURN		

 2021 AFOSR/ONR MURI Review Drs. Sarah Popkin & Eric Marineau December 6-9, 2021 Arlington, VA		
Agenda Day 2 December 7, 2021		
FY2020 ONR MURI Review: Particulate and Precipitation Effects on High-speed Flight Vehicles – Schwartzentruber (PI)		
Time	Topic	Speaker
8:00	BRICC elevators open & Zoom Login 8:15 AM	
8:35	Meeting Introduction (Agenda, Rules, Technical intro)	Eric Marineau (Topic Chief), ONR
8:45	ONR MURI Team Overview	Tom Schwartzentruber (PI), UMN
9:00	Experiments of High-Speed Particle Collisions with Surfaces	Chris Hogan, UMN
9:30	Modeling Small Particle Interactions with High-speed Flow	Tom Schwartzentruber, UMN
10:00	BREAK	
10:15	CFD Framework and Modeling for Particle/Droplet Flow Interactions	Graham Candler, UMN
10:45	Particle Impact Modeling with the PISALE Code	Alice Koniges, U of Hawaii
11:15	Wind-tunnel and Small Gas-gun Experiments with Droplets and Particulates	Stuart Laurence, UMD
11:45	LUNCH	
1:00	Advanced Diagnostics and Ballistic-range Experiments	Nick Parziale, Stevens
1:30	Experiments and Modeling of Hypersonic Weather Environments	Steven Beresh, Sandia

2:00	Characterization of High-speed Weather Encounters	David Kessler, NRL
2:30	BREAK	
2:45	Impact Damage Predictions due to High-Velocity Weather Encounters Using Peridynamics	Ibrahim Guven, VCU
3:15	Summary and Next Steps	Tom Schwartzentruber, UMN
3:30	Online discussion	
4:00	Offline discussion	
5:00	BRICC Closes & MEETING ADJOURN	
6:00	<i>Happy hour followed by dinner</i>	

 2021 AFOSR/ONR MURI Review Drs. Sarah Popkin & Eric Marineau December 6-9, 2021 Arlington, VA		
Agenda Day 3 December 8, 2021		
FY2021 AFOSR MURI Kickoff: A Robust Multi-Physics Design Analysis and Optimization Framework for Hypersonic Systems Grounded in Rigorous Model Reduction – Farhat (PI)		
Time	Topic	Speaker
8:00	BRICC elevators open & Zoom Login 8:15 AM	
8:30	Welcome and Opening Remarks	Sarah Popkin (Topic Chief), AFOSR
8:40	AFOSR MURI Team Overview	Charbel Farhat (PI)
8:55	A Robust Multi-Physics Design Analysis and Optimization Framework for Hypersonic Systems Grounded in Rigorous Model Reduction	Charbel Farhat, Stanford
9:20	Multi-fidelity Predictions of Hypersonic Flight Vehicles	Graham Candler, UMN
9:45	BREAK	
10:00	Control-oriented Modeling for Hypersonic Flight Vehicles	Maziar Hemati, UMN

10:25	Adaptive Model Order Reduction to Accelerate Hypersonic Flow Simulations	Matthew Zahr, Univ of Notre Dame
10:50	Recent Advances in Projection-Based Model Order Reduction and Physics-Informed Neural Networks	Charbel Farhat, Stanford
11:15	Multi-fidelity Methods for Gradient-based MDAO of Hypersonic Systems	Juan Alonso, Stanford
11:40	LUNCH (1hr 15 min)	
12:55	Surrogate-based Optimization Methods for MDAO under Uncertainty	Matthias Heinkenschloss, Rice University
1:20	Design of Aerospace Systems for Hypersonics – AFRL High Speed Systems Perspective	Jose Camberos, AFRL/RQ
1:50	Hypersonic Vehicle Design Challenges, Requirements and Capability Gaps	Kevin Bowcutt, Boeing
2:20	BREAK	
2:35	Invited Speaker #3: Lockheed Martin Perspectives on MDAO	Mike Henson/John Rhoads, Lockheed Martin
3:05	Summary and Next Steps	Charbel Farhat, Stanford
3:20	Online discussion	
4:00	Offline discussion	
5.00	BRICC Closes & MEETING ADJOURN	
6:00	<i>Happy hour followed by dinner</i>	

 <p>2021 AFOSR/ONR MURI Review Drs. Sarah Popkin & Eric Marineau December 6-9, 2021 Arlington, VA</p>		
Agenda Day 4 December 9, 2021		
FY2021 ONR MURI Kickoff: Discovering and Modeling Turbulence and Chemistry Interactions in High-speed Reactive Flows – Venkat Raman (PI)		
Time	Topic	Speaker
8:00	BRICC elevators open & Zoom Login 8:15 AM	

8:30	Welcome and overview of topic	Eric Marineau (Topic Chief), ONR
8:45	Overview of MURI team and Proposed Research	Venkat Raman (PI), U of Michigan
9:00	Experimental program	Tonghun Lee, UIUC
9:30	Multiscale Modeling of High-Speed Reacting Flows	Venkat Raman, U of Michigan
10:00	External Flows: Multiscale Modeling Finite Rate Chemical Processes	Marco Panesi, UIUC
10:30	BREAK	
10:45	Progress and key issues in combustion reaction chemistry modeling	Hai Wang, Stanford
11:15	Uncertainty quantification, statistical reduction and machine learning	Roger Ghanem, USC
11:45	Multi-fidelity Approach to Transitional and Turbulent Flows at High-Enthalpy Conditions	Carlo Scalo, Purdue
12:15	LUNCH	
1:15	Invited Talk: Synergistic Turbulence-Flame Interactions with Modeling Implications	Jackie Chen, Sandia National Laboratory
1:45	Invited Talk: CFD Modeling for Scramjet Engine Design and Evaluation: Current Practices and Future Needs	Robert Baurle, NASA
2:15	Invited Talk: Physical Understanding and Computational Modeling of Turbulent Reacting Flows	Venke Sankaran, Air Force Research Laboratory
2:45	Invited Talk: Towards Highly Accurate Simulations of Chemically Reacting Flows with the Discontinuous Galerkin Method	Ryan Johnson, Naval Research Laboratory
3:15	BREAK	
3:30	Online Discussion	
4:15	Offline Discussion	
5:00	MURI ADJOURN	