



**University of Minnesota | Tate Hall
116 Church Street SE | Minneapolis MN 55455**

Agenda Day 1 | Monday, August 5, 2024 | Central Daylight Time (CDT)

Time	Thrust Area	Title	PI/Organization
08:30-08:40	Welcome and Opening Remarks		Amanda Chou, AFOSR Eric Marineau, ONR Jack Edwards, ARO
08:40-08:45	Propulsion	Introduction to High Speed Propulsion	Program Officers
08:45-09:02	Propulsion	ONR - High Fidelity Simulations of Combustion in High-Speed Propulsion Engines (Wrap up) / Discontinuous Galerkin Methods for Modeling Chemically Reacting Hypersonic Phenomena (New Start)	R. Johnson, NRL
09:02-09:20	Propulsion	ONR - Integration of Physics-Based and Data-Driven Turbulent Combustion Models in the JENRE® Multiphysics Framework and Computational Performance Analysis	S. Demir, ANL
09:20-09:38	Propulsion	ONR- Evaluation, Enhancement, and Application of JENRE on Large-Scale Computing Systems	T. Dunn, LLNL
09:38-09:56	Propulsion	ONR - Combustion Behavior Within a Solid-Fuel Ramjet at High Altitudes	D. Kessler, NRL
09:56-10:14	Propulsion	ONR - Improved Flamelet Progress Variable Approach for Compressible High-Speed Flows	B. Bojko, NRL
10:14-10:32	Propulsion	ONR - Data-driven, Learning-based, Adaptive Control of Solid Fuel Ramjet	A. Goel, UMBC
10:32-10:52	BREAK		
10:52-11:10	Propulsion	ONR - Experimental and Numerical Investigation on the Combustion Characteristics of Solid Fuels in Supersonic Combustors	G. Young, Virginia Tech
11:10-11:28	Propulsion	ONR - Transport Physics in Reacting Turbulent Boundary Layers	C. Slabaugh, Purdue U
11:28-11:46	Propulsion	ONR - Temperature and Compositional Measurements in Model Solid Fuel Ramjet Inlet and Exhaust Flows	R. Hanson, Stanford U.
11:46-12:04	Propulsion	ONR - High Fidelity Modeling of Hypersonic Air-Breathing Propulsion	T. Taylor, APL
12:04-12:22	Propulsion	ONR - Optimized Simulations of High-Speed Turbulent Combustion	G. Candler, U of MN
12:22-12:40	Propulsion	ONR - Intrinsic Instability of Compressible Reacting Flows and Its Role in Scramjet Unstart and Transition	A. Poludnenko, UConn
12:40-12:58	Propulsion	ONR - Active Mitigation of Unstart in Scramjet	R. Acharya, UTSI

12:58-14:13	LUNCH		
14:13-14:31	Propulsion	ONR - Mach 4 Inlet Unstart Investigation and Mitigation with Self Energizing Vortex Generating Jets	G. Hobson, NPS
14:31-14:49	Propulsion	ONR - Data-Driven Input-Output Models for Reacting, High-Enthalpy Flows	McKeon, Stanford U
14:49-14:54	NEE	Introduction in Non-Equilibrium Effects (NEE)	Program Officers
14:54-15:21	NEE	AFOSR - Spectroscopic Measurements and Nonequilibrium Modeling for High-Enthalpy Air	J. Austin, Caltech R. Hanson, Caltech
15:21-15:36	BREAK		
15:36-15:46	NEE	AFOSR - Modeling of Recombination in Hypersonic Flows: A Combined Theoretical and Experimental Approach (Wrap-up)	M. Panesi, UIUC (Rep)
15:46-16:04	NEE	AFOSR - High-fidelity modeling of non-equilibrium gas-phase recombination for hypersonic air flows (YIP)	R. MacDonald, U of CO
16:04-16:14	NEE	AFOSR - Formulation of a General Collisional-Radiative Model for NO to Study Non-Equilibrium, Hypersonic Flows (Wrap-up)	D. Levin, UIUC
16:14-16:32	NEE	ONR - Deep Learning Closure of Non-Equilibrium Fluid Mechanics	J. MacArt, Notre Dame
16:32-16:47	BREAK		
16:47-17:05	NEE	AFOSR - Ultra-fast DSMC based on explainable AI for all flow regimes including rarefied hypersonics	R. S. Myong, Gyeongsang National U, Korea
17:05-17:23	NEE	ONR - Experimental Study of Non-Equilibrium Turbulence-Chemistry Interaction in External Hypersonic Flows	A. Veeraragavan, U of Queensland, Australia
17:23-17:45	NEE	AFOSR - Evaluation of Aerothermochemistry Models Through Sensitivity Analysis and Low-Uncertainty Experiments	I. Boyd, U of CO
17:45	MEETING ADJOURN		

Agenda Day 2 Tuesday, August 6, 2024 Central Daylight Time (CDT)			
Time	Thrust Area	Title	PI/Organization
8:30-8:48	NEE	AFOSR - Quantification and Mitigation of Thermochemical Non-Equilibrium in High-Enthalpy Hypersonic Wind Tunnels	D. Baccarella, U of TN
8:48-9:06	NEE	AFOSR - Fundamental Studies of Vibrationally Resolved Air Kinetics in the Vicinity of a Partially Catalytic Surface	D. Andrienko, U of CO
9:06-9:24	NEE	AFOSR - Topology-Aware Learning and Modeling of High-Rate Dynamic Systems	A. Razmarashooli, Iowa State U

9:24-9:32	NEE	AFOSR - Direct Molecular Simulation of Multi-Species Reacting Flows (New Start)	N. Bisek, AFRL
9:32-9:50	NEE	AFOSR - Electron Density Measurements in a Plasma around a Body in High Enthalpy Hypersonic Flow by means of Radar	R. Petervari, Fraunhofer FHR, Germany
9:50-10:08	NEE	AFOSR - Computational approach to collisions with molecules in Earth's atmosphere	N. Mori, Curtin University, Australia
10:08-10:26	NEE	AFOSR - Computationally tractable robust codesign of hypersonic vehicles	C. Manzie, U of Melbourne, Australia
10:26-10:46	BREAK		
10:46-10:51	GSI	Introduction to Gas-Surface Interaction (GSI)	Program Officers
10:51-11:09	GSI	AFOSR - Surface catalytic recombination on carbon-based TPS materials	F. Torres, UIUC
11:09-11:27	GSI	AFOSR - Experimental/Computational Study of Gas-phase and Gas-surface Interactions for High Speed Rarefied Flow	T. Schwartzenruber, UMinn
11:27-11:45	GSI	ONR - Computational and Experimental Study of the Temporal Response of UHTC Materials for Thermal Protection of Hypersonic Vehicles	I. Boyd, U of Colorado
11:45-13:00	LUNCH		
13:00-13:18	GSI	ONR - Characterization of High Enthalpy Flows and Ablation Products Surrounding Hypersonic Platforms	R. Miles, TAMU
13:18-13:36	GSI	AFOSR - Disruptive research approach for GSI-model consolidation through on-ground and in-flight analyses	T. Magin, VKI
13:36-13:41	FSI	Introduction to Gas-Surface Interaction (GSI)	Program Officers
13:41-13:59	FSI	ONR - Fluid-thermal-structure Interaction of a Finned Model at Mach 6	D. Bodony, UIUC
13:59-14:17	FSI	ONR - Electromagnetic Launch For Hypersonic Research and Development	M. Libeau, NSWC_DD
14:17-14:32	BREAK		
14:32-14:49	FSI	ONR - Peridynamic Modeling Development for High Velocity Weather Encounter Damage (Wrap Up) / Prediction of High-Velocity Droplet Damage Using Peridynamic Approaches (New Start)	I. Guven, VA Commonwealth U
14:49-15:07	FSI	ONR - A Numerical Investigation of Particle and Droplet Impingement for Hypersonic Flow Conditions Including Material Response Modeling	C. Brehm, U of MD
15:07-15:25	FSI	AFOSR - The Role of Cavitation in Droplet Breakup: Understanding and Predicting Hypersonic Structural Loading through Multiscale Simulations and Shock-tube Experimentation	S. Grace, Boston U
15:25-15:43	FSI	ONR - Resolving Shock-Driven Droplet Breakup and Evaporation at Hypersonic Conditions	D. Jarrahbashi, TAMU
15:43-16:01	FSI	ONR - Investigating the Formation of Ice Crystal Aggregates and their Impacts on Hypersonic Vehicles	H. Chelmo, U of North Dakota

16:01-16:19	FSI	ONR - Fragmentation and Melting of Ice Particles Subjected to Hypersonic Aerothermodynamic Environments	S. Poovathingal, U of Kentucky
16:19-16:34	BREAK		
16:34-16:52	FSI	ONR - Water Entry of Hypervelocity Projectiles (YIP)	B. Schmidt, Case Western U
16:52-17:10	FSI	ONR - Modeling Support for Water Entry of Hypervelocity Projectiles	E. Walzer, NSWC_CD
17:10-17:20	FSI	AFOSR - Fluid Structural Thermal Interactions (FSTI) in Hypersonic Flow (Wrap-up)	V. Narayanaswamy, NCS
17:20-17:38	FSI	AFOSR - Hypersonic FTSI Unit Case for a Thermally-Buckled Structural Panel	A. Neely, UNSW, Australia
17:38	MEETING ADJOURN		
17:45	RECEPTION GARY BALAS HANGAR IN AKERMAN HALL		

Agenda Day 3 Wednesday, August 7, 2024 Central Daylight Time (CDT)			
Time	Thrust Area	Title	PI/Organization
8:30-8:48	FSI	AFOSR - Experiments on Hypersonic Fluid-Structure Interaction in the Wind Tunnel H2K	S. Willems, DLR
8:48-8:58	FSI	AFOSR - Hypersonic Vehicle Shape Distortion Sensing with Optical Fibre Bragg Gratings (Wrap-up)	G. Wild, UNSW, Australia
8:58-9:16	FSI	AFOSR - Fluid Structural Thermal Interactions (FSTI) in Hypersonic Flow (Wrap-up)	J. McNamara, OSU
9:16-9:34	FSI	AFOSR - Measurement and Modeling of an Oblique Shock Grazing a Compliant Panel	D. Bodony, UIUC
9:34-9:42	FSI	ONR - Droplet Breakup and Evaporation from Unsteady Accelerations in Hypersonic Weather Impacts (New Start)	J. McFarland, TAMU
9:42-9:50	FSI	ONR - Enhanced hypersonic aerodynamics and stability models through hardware in the loop ground tests in TUSQ (New Start)	I. Jahn, U of SQ, Australia
9:50-10:08	FSI	AFOSR - Aerothermoelastic Experiments and Simulation of High-Speed Vehicle Structures	D Ehrhardt, AFRL R. Perez, AFRL
10:08-10:28	BREAK		
10:28-10:33	TF	Program Officers	Introduction to Turbulent Flows (TF)
10:33-10:41	TF	AFOSR - Theoretical developments in hypersonic turbulent boundary layers with application to friction and heat transfer estimation (New Start)	V. Kumar, U of MD
10:41-10:59	TF	AFOSR - Theoretical developments in hypersonic turbulent boundary layers with application to friction and heat transfer estimation	S. Pirozzoli, Sapienza, Rome (Alessandro Ceci)

10:59-11:17	TF	ONR - Turbulence Quantities in Supersonic and Hypersonic Flows	N. Parziale, Stevens
11:17-11:35	TF	ONR - Simulation and Modeling of Hypersonic Turbulent Boundary Layers with Varied Reynolds Numbers and Pressure Gradients	L. Duan, OSU
11:35-11:53	TF	ONR - Subfilter-scale (SFS) analysis of hypersonic turbulence: a path towards a consistent wall-modeled LES strategy	C. Scalo, Purdue U
11:53-12:11		ONR - Development of Improved WMLES Capabilities for Hypersonic Flows for Body-Fitted and IBM-based CFD Solvers	C. Brehm, U of MD
12:11-13:26	LUNCH		
13:26-13:44	TF	ONR - Aerothermal Turbulent Predictions of Relevant, High Reynolds Number Hypersonic Flows using Large Eddy Simulation	R. Powers, NAWC_AD
13:44-14:02	TF	ONR - Development of Hybrid Simulation Models for Heat Transport in Hypersonic Turbulent Flow	P. Durbin, Iowa State U
14:02-14:20	TF	ONR - Aero-Optical Studies of Mixing Flows at Supersonic and Hypersonic Speeds	S. Gordeyev, Notre Dame
14:20-14:30	TF	AFOSR - Hypersonic Base Flow Characterization (Wrap-up)	R. Gosse, U of FL
14:30-14:40	TF	AFOSR - DNS and Constrained Nonlinear Analysis of the BOLT-II Flight Experiment (Wrap-up)	G. Candler, U of MN
14:40-15:00	BREAK		
15:00-15:18	TF	ARO - Aero-Optical Effects of Vortical Instabilities in Hypersonic Boundary Layers	S. Gordeyev, Notre Dame T. Giuliano, Notre Dame K. Handquist, U of Arizona
15:18-15:36	TF	ARO - Role of Compressibility on Crossflow Separation and Vortex Asymmetry on Slender Axisymmetric Bodies at High Angles of Incidence	Rajan Kumar, Unnikrishnan Nair, Florida A&M University
15:36-15:46	TF	AFOSR - Research in Support of Flight Experiment BoLT 2: Simulations and Characterization of the Turbulent Flow Regime (Wrap-up)	P. Martin, U of MD
15:46-15:56	TF	AFOSR - Advanced Ground Testing and Simulation of the Boundary Layer Transition (BOLT) Flight Experiment (Wrap-up)	A. Veeraragavan, U of Queensland, Australia
15:56-16:14	TF	AFOSR - Assessment of the applicability of quantum computation for solving the problem of numerical hypersonic flow	D. Ahn, U of Seoul
16:14-16:34	BREAK		
16:34-16:52	TF	AFOSR - Expanding Hypersonic Flow	L. Di Mare, University of Oxford
16:52-17:10	TF	AFOSR - Entropy-conserving Large Eddy Simulation Models for Hypersonic Flows	J. Bellan, Cal Tech
17:10-17:20	SBLI	AFOSR - Investigation of the effects of ablation-induced distributed roughness on shock-wave/boundary-layer (Wrap-up)	C. Combs, UTSA
17:20	MEETING ADJOURN		

Agenda Day 4 Thursday, August 8, 2024 Central Daylight Time (CDT)			
Time	Thrust Area	Title	PI/Organization
8:30-8:40	TF	AFOSR - Hypersonic Boundary Layer Turbulence (BOLT-II) Flight Test Experiment (Wrap-up)	R. Bowersox, TAMU
8:40-8:58	TF	ONR - High-Speed High-Reynolds-Number Boundary Layer Measurements and Modeling	R. Bowersox, TAMU
8:58-9:03	Transition	Introduction to Hypersonic Boundary Layer Transition	Program Officers
9:03-9:21	Transition	AFOSR - Linear modal and non-modal instability analyses of high-speed laminar separated flow over complex geometries. Part II: The HIFiRE-1, ROTEX-T and Oberkampf vehicles	V. Theofilis, Technion, Israel A. Burtsev, UT Austin
9:21-9:29	Transition	ONR - A probabilistic transition model for hypersonic boundary layers (New Start)	A. Towne, U of Michigan
9:29-9:47	Transition	ONR - Receptivity to Breakdown Mechanisms During Transition on Hypersonic Forebodies	D. Gaitonde, OSU
9:47-10:05	Transition	ONR - Receptivity and Transition over Blunt Configurations under Noisy and Quiet Hypersonic Conditions	P. Paredes Gonzalez, Nat. Inst. Of Aerospace
10:05-10:15	Transition	AFOSR - Novel Concepts for Transition Delay in Hypersonic Boundary Layers and their Optimization (Wrap-up)	P. Paredes Gonzalez, Nat. Inst. Of Aerospace
10:15-10:33	Transition	ONR - Instability and Receptivity of Complex Hypersonic Flows using Input/Output Analysis	J. Nichols, U of MN
10:33-10:53	BREAK		
10:53-11:11	Transition	AFOSR - Stagnation Point Injection in Hypersonic Flow	B. Schmidt, Case Western U
11:11-1:26	Transition	AFOSR - Effect of Particulates and Free Stream Disturbances on Hypervelocity Boundary Layer Transition	B. Schmidt, Case Western U
1:26-11:47	Transition	ONR - Detailed Investigation of Hypersonic Instability, Breakdown, and Natural Transition under Quiet Flow with Simulated Ablation-Gas Injection	J. Jewell, Purdue U
11:47-12:05	Transition	AFOSR - A Numerical Investigation of Transpiration Cooling for Transitional and Turbulent Flows over Slender Bodies	C. Brehm, U of MD
12:05-12:23	Transition	AFOSR - Boundary Layer Transition 1B (BOLT-1B) Flight Experiment	B. Wheaton, JHU/APL
12:23-13:38	LUNCH		
13:38-13:55	Transition	ONR - Assessment of Hypersonic Transition and Turbulent Heating Prediction Methods for Complex Geometries (WrapUp)/ Practical Modeling of Hypersonic Boundary Layer Transition and its Impact to Flight Vehicle Performance (New Start)	D. Araya, N. Bitter, APL
13:55-14:13	Transition	ONR - One-way Navier-Stokes for transition prediction in high-speed boundary layers	T. Colonius, CalTech
14:13-14:23	Transition	AFOSR - Experimental study of the effect of nose bluntness on hypersonic boundary-layer transition	A. Craig, U of AZ

		(Wrap-up)	
14:23-14:41	Transition	ONR - Numerical Investigations of the Nonlinear Transition Stages in Boundary Layers for High Mach Numbers	H. Fasel, U of AZ
14:41-14:51	Transition	AFOSR - Numerical Investigation of Non-linear Transition Stages in Hypersonic Boundary Layers for Wind-Tunnel and Free-Flight Conditions (Wrap-up)	H. Fasel, U of AZ
14:51-15:09	Transition	ONR - Wave Packets in High-Speed Boundary Layers	E. Kerschen, U of AZ (Michelle Levi Bailey)
15:09-15:24	BREAK		
15:24-15:34	Transition	AFOSR - Competing instability mechanisms in hypersonic boundary layers (Wrap-up)	J. Kuehl, U of Delaware
15:34-15:52	Transition	AFOSR - Effects of Thermal Gradients on Boundary Layer Transition Mechanisms	J. Kuehl, U of Delaware, T. Juliano, Notre Dame
15:52-16:00	Transition	AFOSR - Investigating the Influence of Tailored Wall Temperature Profiling on Hypersonic Boundary Layer Transition (New Start)	A. Veeraragavan, U of Queensland, Australia
16:00-16:18	Transition	AFOSR - Hypersonic boundary-layer transition on control surfaces with separation bubbles	S. Schneider, Purdue U
16:18-16:36	Transition	AFOSR - Boundary Layer Transition induced surface heating on hypersonic vehicles	S. Smith, Howard U
16:36-16:54	Transition	AFOSR - Efficient prediction of hypersonic transition on cones	T. Zaki, APL
16:54-17:12	Transition	AFOSR - Transition to turbulence in high-speed flight: Incoming disturbances and particulates	T. Zaki, APL
17:12	MEETING ADJOURN		

Agenda Day 5 Friday, August 9, 2024 Central Daylight Time (CDT)			
Time	Thrust Area	Title	PI/Organization
8:30-8:35	SBLI	Introduction to Shock-Boundary Layer Interactions (SBLI)	Program Officers
8:35-8:53	SBLI	AFOSR - Nonlinear Flow Receptivity in Shock-Wave Boundary-Layer Interaction	G. Rigas(Flavio Savarino), Imperial College, England
8:53-9:11	SBLI	AFOSR - Mach number effects on shock-boundary layer interactions over curved surfaces of supersonic turbine cascades	W. Wolf, Universidade Estadual de Campinas, Brazil
9:11-9:21	SBLI	ONR - Investigation of Transitional SBLI at Mach 5 using Controlled Forcing: Experiments, Simulations and Theory (Wrap-up)	J. Little, U of Arizona
9:21-9:39	SBLI	ONR - Kinetic Treatment of Sources and Mechanisms that Drive Unsteady, Shock-dominated Flow Instability	D. Levin, UIUC
9:39-9:49	SBLI	AFOSR - Study of Shock-Wave/Boundary-Layer Interaction on the STORT Configuration (Wrap-up)	S. Willems, DLR

9:49-9:59	SBLI	AFOSR - Investigation of 3D Shockwave Boundary Layer Interaction and Related Phenomena for the STORT Flight Program (Wrap-up)	J. Little, U of Arizona
9:59-10:17	SBLI	AFOSR - Turbulent Separation and Unsteadiness in Compound Shock/Boundary Layer Interactions	F. Alvi, FSU
10:17-10:37	BREAK		
10:37-10:55	SBLI	ONR - The Origin and Scaling of Low-Frequency Unsteadiness in Shock-Separated Boundary layers using DNS, LES and Input/Output Analyses	P. Martin, U of MD
10:55-11:13	SBLI	ONR - Improved Simulation of Internal and External Hypersonic Flows using High-Order Implicit Shock Tracking (YIP)	M. Zahr, Notre Dame
11:13-11:31	SBLI	ONR - High-Order Implicit Shock Fitting for Three-Dimensional Hypersonic Flows	A. Kercher, NRL
11:31-11:39	SBLI	ARO - Investigation of High-Reynolds-Number, Hypersonic Shock-Wave /Boundary-Layer Interactions through Ballistic-Range and Ground Testing (New Start)	S. Laurence, U of M
11:39-11:57	SBLI	ARO - Joint Computational-Experimental Investigation of Fin-Wake Flow Interactions	F. Alvi, FSU D. Gaitonde, OSU
11:57-13:12	LUNCH		
13:12-13:17	DFI	Introduction to Diagnostics, Facilities and Instrumentation (DFI)	Program Officers
13:17-13:25	DFI	ONR - Development of spontaneous Raman spectroscopy for optical diagnostics in detonation engines (New Start)	P. Varghese, UT Austin
13:25-13:43	DFI	ONR - Arc-Jet Freestream Turbulence Characterization and its Influence on Laminar Heating Augmentation in the Stagnation Region	L. Maddalena, UTA
13:43-14:01	DFI	ONR - Spectrally-Resolved Laser Diagnostics for High-Enthalpy Flow Measurements	R. Hanson, Stanford U.
14:01-14:31	BREAK		
14:31-14:49	DFI	ONR - Development and Assessment of Detonation-Drivers for Hypervelocity Expansion Tube Ground Testing	J. Shepherd, Caltech (Joanna Austin)
14:49-14:59	DFI	AFOSR - Canonical Validation Experiments for Fundamental Hypersonic Aerodynamics (Wrap-up)	C. Limbach(Bowersox), TAMU
14:59-15:17	DFI	AFOSR - Development of Advanced Off-Surface Flow and Thermodynamic Measurements in Hypersonic Environments	J. Sutton, OSU
15:17-15:35	DFI	AFOSR - New Mexico Basic Research Center of Excellence for Hypersonic Sensor Development and Testing	J. Frankel, NMSU
15:35-15:52	DFI	AFOSR - "Async-ELF": 10k USD, 1kg, 100kHz-Equivalent 3D Optical Diagnostics for Hypersonic Testing (Wrap-up) / AFOSR - AsyncELF 2.0: Hypersonic Ground-Test and Transonic Flight-Test with the Asynchronous Embedded Light-Field	Z.P. Tau, National Yang Ming Chiao Tung U, Taiwan
15:52	MEETING ADJOURN		

