34th International Symposium on Rarefied Gas Dynamics

Brisbane, Australia

13-17 July 2026

Program

Monday 13 July				
08:20 - 09:00	Welcome Remarks, Welcome to Country, Building: 49 Advanced Engineering Building, Room: 200			
09:00 - 10:00	Room: 49-200 Plenary 1: **Dr Domenico Giordano**, The Harold Grad Lecture: Reflections on my experience with the kinetic theory Chair: *Em. Prof Hans Hornung*			
Mon 13 Jul 10:10 - 11:10				
	Room: 50-N201 **Aerospace** Chair: *Yonghao Zhang*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Russel Caflisch*	Room: 50-T103 **Moment methods** Chair: *Julian Koellermeier*	Room: 50-T105 **Internal flows and vacuum systems** Chair: *Surya Kiran Peravali*
10:10	Vibrationally state-resolved rotational relaxation time (102) (S) *Yingying Yun, Elena Kustova*	Variance Reduction in the Fokker–Planck Particle Method for Rarefied Gases using Quasi-Random Numbers (127) (S) *Lukas Netterdon, Veronica Montanaro, Hossein Gorji, Manuel Torrilhon*	A Multi-Temperature ES-BGK Model with a Continuous Internal-Energy Variable: Derivation of a Maximum-Entropy 21-Moment System and Two-Temperature Navier-Stokes-Fourier Limits (64) *Takashi Arima, Annamaria Pollino*	Pressure Profile along Microchannel induced by Thermal transpiration flow (34) *Hiroki Yamaguchi, Hiroki Kura, Irina Graur*
10:30	Vibrational Non-Boltzmann Effects in Advection-dominated Boundary Layer Flows (151) (S) *Shrihari Ravichandran, Robyn L. Macdonald*	Discrete Rotational Energy for Polyatomic Molecules in Direct Simulation Monte Carlo (51) *Derek Liechty, Dylan Crouse, Thomas Schwartzentruber*	Symmetrizable Hyperbolic Moment Closures with a Convex Entropy (165) (S) *Benoit Allard, James McDonald*	Modelling rarefied gas mixture flows using various kinetic approaches (94) *Thanasis Basdanis, Christos Tantos, Tim Teichmann*
10:50	Modeling reflected-shock tube experiments using ab initio vibrational specific kinetics for oxygen mixtures (173) *Luis Rodriguez, Robyn Macdonald*	Polyatomic chemistry modeling in DSMC using a harmonically-coupled-anharmonic-oscillator model (26) (S) *Simone Lauterbach, Franziska Tuttas, Stefanos Fasoulas, Marcel Pfeiffer*	Rotation-Based Dimensional Reduction for Nonlinear Moment Closures in Multidimensional Kinetic Systems (89) (S) *Eda Yilmaz, Manuel Torrilhon*	Alternative Internal Structures of Turbomolecular Pumps Using Numerical Analysis of Rarefied Gas (86) *Hiroshi Sugimoto, Shun Otani, Maika Itou*
11:10 - 11:40	Coffee Break, Building 49 Level 3			
Mon 13 Jul 11:40 - 13:00				
	Room: 50-N201 **Aerospace** Chair: *Upendra Bhandarkar*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *William McDoniel*	Room: 50-T103 **Boltzmann and related equations** Chair: *Masanari Hattori*	Room: 50-T105 **Internal flows and vacuum systems** Chair: *Hiroshi Sugimoto*
11:40	Aerothermal Comparisons of CFD and Flight Data for the W-2 Reentry Capsule Using the MMT Model (67) (S) *Sean Cranford, Thomas Gross, Thomas Schwartzentruber*	Predicting hypersonic flow physics with quantum guided molecular dynamics (Invited - 40 min) (252) *Maninder Grover*	Steady Solutions to the Relativistic Boltzmann Equation in a Slab (15) *Jin Woo Jang, Seok-Bae Yun*	DSMC-Based Analysis of Gas Flow Behavior in Particle Exhaust Systems of Fusion Reactors (93) (S) *Foteini Litovoli, Christos Tantos, Holger Strobel*
12:00	Configuration Optimization of ABEP-Equipped VLEO Satellites Based on a Feasible-Region Approach (80) *Chao Yang, Jinyue Geng, Xiaoqi Li, Heji Huang, Quanhua Sun, Yuan Hu*	Predicting hypersonic flow physics with quantum guided molecular dynamics (Invited - 40 min) (252) *Maninder Grover*	A Kinetic Linear Stability Theory Framework for High Speed Flows (169) *Irmak Taylan Karpuzcu, Mor Aharoni, Deborah Levin, Vassilis Theofilis*	Study of coating uniformity and axis switching of metal vapour jet through rectangular nozzles in thin film deposition systems (113) (S) *Anik Mazumder, Nagaraj Alangi, Sanjay Sethi, Upendra Bhandarkar, Kinshuk Dasgupta, Amit Agrawal*
12:20	Surrogate-Based Aerodynamic Shape Optimization of HTV-2-Type Vehicle from Continuous to Rarefied Flow Regimes (114) (S) *Wenpei Long, Xiaozhe Xi, Yue Zhang, Junzhe Cao, Kun Xu*	Photophoretic force exerted on a membrane composed of rings (33) *Felix Sharipov, Benjamin C. Schafer, Joost J. Vlassak*	A Multi-level Implicit Discrete Velocity Method to Solve the Relaxation-type Boltzmann Equation (117) (S) *Kaiwen Guan, Takayuki Yamada*	Towards Efficient Aerosol Injector Design for Generating Protein-Sized Nanoparticle Beams (230) *Suryakiran Peravali, Jingxuan He, Amit Kumar Samanta, Philipp Neumann, Jochen Kupper, Michael Breuer*
12:40	Coarse-grain modelling of a hypersonic expanding flow (81) (S) *Caiyu Xie, Rowan Gollan, Nicholas Gibbons, Carolyn Jacobs*	Molecular Dynamics Study of Poiseuille Flow of Dense Confined Fluids (157) (S) *Ryo Kiyose, Satoshi Taguchi, Tetsuro Tsuji*	Fluid-dynamic limit of the Enskog equation with the guaranteed H-theorem (41) (S) *Aoto Takahashi, Shigeru Takata*	
13:00 - 14:00	Lunch, Building 49 Level 3			
Mon 13 Jul 14:00 - 15:20				
	Room: 50-N201 **Aerospace** Chair: *Alina Alexeenko*	Room: 50-N202 **Experimental methods** Chair: *Tristan Vanyai*	Room: 50-T103 **Boltzmann and related equations** Chair: *Deborah Levin*	Room: 50-T105 **Gas-surface interactions** Chair: *Timothy Minton*
14:00	DSMC coupling with peridynamics for aero-thermal-structural analysis (13) *Shiwei Hu, Xu Wang, Yong Wang, Guan Zhang, Tianbai Xiao, Yonghao Zhang*	Laser Absorption Measurements of Nitric Oxide Formation in Air with High Vibrational State Resolution (49) *Jesse Streicher, Devin Merrell, Dylan Drescher, Ronald Hanson*	Kinetic Theory Analysis of a Lid-Driven Cavity Flow of a Gas: Behavior of the Gas near Sharp Corners (23) *Masanari Hattori*	Gas Surface Interaction Model for Very Low Earth Orbit (VLEO) Systems (6) *Ahilan Appar, Savio Poovathingal*
14:20	Investigation of Shock Standoff Distance in Hypersonic Rarefied Flows with DSMC Method (32) (S) *Wei Fang, Zhi-Hui Wang*	Saturated Absorption Velocimetry in the Freestream of a High Enthalpy Shock Tunnel Flow (144) (S) *Swapneel Roy, Sean O'Byrne*	Development of a Particle Bhatnagar-Gross-Krook Method for Rarefied Monatomic Gas Mixtures (29) (S) *Inchan Kim, Joonbeom Kim, Woonghwi Park, Eunji Jun*	MD-DSMC modelling of gas-surface interaction for VLEO systems. (170) *Sachin Nair, Ahilan Appar, Savio Poovathingal*
14:40	Efficient Adjoint Optimization of Rarefied Gas Flows (38) *Lei Wu*	TDLAS characterisation of magnetic field deformation within a hypersonic MHD flowfield (237) *Alexis Lefevre, David Gildfind, Tristan Vanyai, Timothy McIntyre, Jude Hendricks, Takeaki Muramatsu, Kohei Shimamura*	Lattice Boltzmann schemes for parabolic problems under monotonicity conditions (52) *Denise Aregba, Nathalie Bonamy Parrilla, Stephane Brull*	Machine Learning-Based Gas-Surface Scattering Model for Direct Simulation Monte Carlo Simulations in Very Low Earth Orbit (91) (S) *Miklas Schutte, Stefanos Fasoulas, Marcel Pfeiffer*
15:00	Kinetic modelling of rarefied gas flows with radiation (125) *Qi Li, Jianan Zeng, Lei Wu*	Velocity Distribution of Water Molecules Evaporating From a Liquid Surface: Molecular Beam Experiment and Molecular Dynamics Simulation (185) *Ikuya Kinefuchi, Kohei Sato, Atsuki Fujita*	KitAMR.jl: An Adaptive Mesh Based, Efficient and Scalable DVM Solver (57) (S) *Longqing Ge, Tianbai Xiao, Qingdong Cai*	An Inverse-Design Approach to Characterizing Gas-Surface Interaction in VLEO and Their Effects on Aerodynamic Drag (69) *Sai Sudha Ramesh, Benjamin Y.J. Wong, Wai Lee Chan, Roland Yingjie Tay*
15:20 - 15:50	Coffee Break, Building 49 Level 3			
Mon 13 Jul 15:50 - 17:10				
	Room: 50-N201 **Aerospace** Chair: *Lei Wu*	Room: 50-N202 **Experimental methods** Chair: *Jesse Streicher*	Room: 50-T103 **Boltzmann and related equations** Chair: *Jin Woo Jang*	Room: 50-T105 **Gas-surface interactions** Chair: *Ahilan Appar*
15:50	Magnetohydrodynamic Aerobraking Research at The University of Queensland (Invited - 40 min) (251) *David Gildfind*	Investigating Fibre Optic Intensity Calibrations for Spectrally Resolved Surface Emission Spectroscopy of Non-Equilibrium Flows (209) (S) *Robert Hawken, Samuel Lock, Chris James*	A hybrid kinetic/fluid model based on Kinetic-Diffusion Monte Carlo for neutral particle simulations in plasma edge (40) (S) *Zhirui Tang, Thijs Steel, Niels Horsten, Giovanni Samaey*	Surface Roughness Effects on Gas-Surface Scattering and Recombination in VLEO (22) (S) *Woonghwi Park, Eunji Jun*
16:10	Magnetohydrodynamic Aerobraking Research at The University of Queensland (Invited - 40 min) (251) *David Gildfind*	Poiseuille coefficient for mixtures of rarefied gases: measurements and modelling (227) *Irina Graur Martin, Felix Sharipov, Emil Grigorov, Pierre Perrier, Frederic Topin*	An implicit unified gas-kinetic scheme with adaptive mesh refinement in velocity space (215) (S) *Quan Yuan, Qibing Li*	Molecular Dynamics Investigation of Aerodynamic Heating on Nano-Rough Surfaces in High-Speed Flows (36) *Quan Han, Can Cao*
16:30	Magnetohydrodynamic Flow Control during LEO Reentry with Realistic Magnetic Field and Capsule Geometry (83) (S) *Liam Newlands, Vincent Wheatley, David Gildfind*	Optimisation of X2 Schlieren System for Studying Nonequilibrium Low Density Hypersonic Flows (177) (S) *Sandy Goetjens, Sam Lock, Richard Morgan, Chris James*	Self-thermophoresis of a Thin Circular Disk (156) *Takuma Tomita, Satoshi Taguchi, Tetsuro Tsuji*	Molecular Beam-Surface Scattering Dynamics Relevant to Satellites in Very Low Earth Orbit (VLEO) (130) *Tim Minton, Pedro Jorge, Chenbiao Xu, Celeste Guiles*
16:50	Numerical Study of Magnetohydrodynamic Aerobraking for Large-scale Spacecraft with Magnetic Field Deformation (158) (S) *Sebastiaan van Oeveren*		Evaporation of a metal droplet in rarefied gas (194) *Denize Kalempa, Felix Sharipov*	Effect of Adsorbed Molecules on the Scattering Characteristics of Gas Molecules at Solid Surfaces (110) (S) *Kazuki Takemura, Takashi Tokumasu, Hideki Takeuchi*

Tuesday 14 July				
09:00 - 10:00	Room: 49-200 Plenary 2: **Dr Shahid Rauf**, The Irving Langmuir Lecture: Rarefied Plasmas for Nanofabrication: Modeling, Diagnostics and Applications Chair: *Dr Ingrid Wysong*			
Tue 14 Jul 10:10 - 11:10				
	Room: 50-N201 **Aerospace** Chair: *Eunji Jun*	Room: 50-N202 **AI and Machine Learning in rarefied gas dynamics** Chair: *Tianbai Xiao*	Room: 50-T103 **Moment methods** Chair: *Jacek Polewczak*	Room: 50-T105 **Gas-surface interactions** Chair: *Alessandro Munafo*
10:10	A Quasi-1D Stagnation Line Solver for designing Hypersonic Non-Equilibrium Experiments (180) (S) *Taine Rossini, Toby van den Herik, Christopher James*	Residual closure of Navier-Stokes-Fourier system for rarefied flows (9) (S) *Yijun Wang, Hossein Gorji, Patrick Jenny*	Non-equilibrium simulations of monatomic rarefied gas flows based on Grad's 20-moment equations (58) *Satyvir Singh, Manuel Torrilhon*	A Navier Type Boundary Condition for Boltzmann Equation (65) *Vincent Giovangigli, Kazuo Aoki, Francois Golse, Shingo Kosuge*
10:30	Nonequilibrium Ionization And Chemistry Effects Of H2O Plume Injection In Rarefied Hypersonic Reentry Flow (210) (S) *Erik Zabalegui Lopez, Evgeniia Vorozhbit, Jesus Meza-Galvan, Alina Alexeenko*	Machine-learning-based derivation of moment closures for strongly nonequilibrium flows (47) (S) *Hang Song, Satyvir Singh, Manuel Torrilhon*	Non-Equilibrium Applications of Hyperbolic Higher-Order Moment Models with Solid-Wall Boundary Conditions (164) (S) *Ethan Rice, Stefano Boccelli, James McDonald*	Model of Thermal Slip Under Near-Wall Fluid-Solid Interaction Potentials (133) *Tetsuro Tsuji, Koichiro Takita, Satoshi Taguchi*
10:50	Investigation of through-model surface thermography using a foil calorimeter for hypersonic heat transfer measurements (155) (S) *Chengxin Yu, David Gildfind, David Mee, Timothy McIntyre*	Topology of machine-learned DSMC constitutive relations in rarefied Couette flow and the proof of the elliptic constraint (55) *Gagan Garg, Tapan Mankodi, Rho Shin Myong*	Boundary conditions for fluid models describing neutral particles in the plasma edge of a fusion device (25) (S) *Vince Maes, Wouter Dekeyser, Julian Koellermeier, Martine Baelmans, Giovanni Samaey*	Modeling of Sawtooth-Shaped Walls for Rarefied Gas Flow Control (112) (S) *Jiwon Lee, Dibyesh Satpathy, Kimiya Komurasaki, Nadine Barth, Maho Matsukura, Hiroyuki Koizumi*
11:10 - 11:40	Coffee Break, Building 49 Level 3			
Tue 14 Jul 11:40 - 13:00				
	Room: 50-N201 **Prof. Suzuki memorial** Chair: *Domenico Giordano*	Room: 50-N202 **AI and Machine Learning in rarefied gas dynamics** Chair: *Nadim Maraqten*	Room: 50-T103 **Turbulence and instabilities** Chair: *Vincent Wheatley*	Room: 50-T105 **Gas-surface interactions** Chair: *Savio Poovathingal*
11:40	Development of Research Concepts Based on Hypersonic Wind Tunnel Experiments (207) *Osamu Imamura*	A Physics-Informed Neural Particle Method for the Spatially Homogeneous Landau Equation (10) *Minseok Kim, Yeoneung Kim, Donghyun Lee, Sung-Jun Son*	DNS Analysis of the Free-Flight Measurements GAsFEx-2 at Mach 5 - 7.5 (99) (S) *Lennart Bott, Cosimo Capecchi, Christian Stemmer, Ingo Jahn, Jack Williamson, Morgan Van Hoffen, Marcus Hoerschgen-Eggers, Maximilian Hiepp, Rainer Kirchhartz, Robert Pietsch*	A modeling framework for gas-surface interaction processes in hypersonics and plasma discharges (109) *Alessandro Munafo, Claudio Chicchiero, Abhyudaya Singh, Sankeev Kumar, Kelly Stephani, Marco Panesi*
12:00	R&D Activity on the Inflatable Aeroshell Atmospheric-entry Technology and Future Vision of Mars Exploration (111) *Kazuhiko Yamada*	Physics-informed Neural Networks Based on the Fokker-Planck Model for Rarefied Gas Flows (21) (S) *Joonbeom Kim, Eunji Jun*	Influence of wall-temperature distribution on hypersonic boundary-layer stability (100) (S) *Cosimo Capecchi, Christian Stemmer*	Numerical assessment of parietal accommodation at hypersonic rarefied flow conditions (88) (S) *Beatriz Carda, Viviana Lago, Damien Toussaint*
12:20	DSMC Simulations and Ground Tests for ABIE Intake Development (79) *Takashi Ozawa, Ryunosuke Endo, Masahito Tagawa, Tomotaka Yamamoto, Shunsuke Imamura*	A Unified Physical-Neural Modeling Framework for Rarefied Gas Dynamics via Differentiable Simulation (70) *Tianbai Xiao*	Rarefaction effects on high-speed boundary-layer stability and receptivity (108) *Jihui Ou, Jie Chen*	Design of a Test Model for Studying Gas Surface Interactions in Ablating Flows (149) (S) *Henry Straede, Samuel Lock, Timothy McIntyre, Richard Morgan, Christopher James*
12:40	Aerobraking and Professor Kojiro Suzuki: Contributions and Legacy (11) *Maximilien Berthet*		Modelling Characteristic Disturbances in Impulse Facilities (154) (S) *Noah Wechgelaer, Chris James*	Rarefaction-Controlled Oxidizer Transport and Thermal Response in Ablating Porous Composite TP (202) *Upendra Yadav, Kelly Stephani, Marco Panesi*
13:00 - 14:00	Lunch, Building 49 Level 3			
Tue 14 Jul 14:00 - 15:20				
	Room: 50-N201 **Jets and plumes** Chair: *Martin Grabe*	Room: 50-N202 **AI and Machine Learning in rarefied gas dynamics** Chair: *Rho Shin Myong*	Room: 50-T103 **Turbulence and instabilities** Chair: *Rowan Gollan*	Room: 50-T105 **Gas-surface interactions** Chair: *Ikuya Kinefuchi*
14:00	Ionosphere-Rocket Exhaust Plume Interactions: A Hybrid CFD-DSMC Study (82) (S) *Muhammad Arham, Trevor Lafleur, David Petty, George Bowden*	Machine Learning Collision Models to Accelerate Direct Molecular Simulation of Rarefied Flows in Diatomic Gases (225) (S) *Nicholas Daultry Ball, Justin Sirignano, Jon MacArt*	Vibrational Non-Equilibrium Effects on Rarefied Reactive Richtmyer-Meshkov Instability (30) *Wendy Adolph Casseus, Kuo-Long Pan*	Accelerated Oxide Formation and Functional Degradation of Conductive Materials in Reactive, Rarefied Plasma Environments (98) (S) *Rodrigo Sandoval Rodriguez, Kalle Braumer, Jana Zorn, Jan Luka Dornseifer, Kristof Holste, Peter J. Klar*
14:20	Modelling of plume-plume interactions in space like environment via the hybrid DSMC-Fokker-Planck approach (146) *Leo Basov, Martin Grabe*	From sparse diagnostics to plume fields: what can (not) be inferred with PINN-PONN reconstruction? (152) (S) *Nadim Maraqten, Georg Herdrich, Uwe Soergel*	Experimental Evidence for the Normal Shock Instability in a Two-dimensional Granular Gas (192) (S) *Eduardo Suarez Morales, Farzane Zangene, Matei Radulescu*	Influence of diffusion modelling on catalytic wall heat flux in hydrogen/helium boundary layers (174) (S) *Matthew Uren, Yu Liu, Chris James, Richard Morgan*
14:40	Plume Impingement Software Module for Real-Time Proximity Operations (178) *Kyle Higdon, Wayne Yu*	A Data-Driven Bayesian Calibration of the International Reference Ionosphere Using Spacecraft Potential Measured Aboard the ISS (78) *Rachel Ulrich, Kelly Moran, Ky Potter, Gabriel Wilson, Carlos Maldonado*	Wave-particle turbulent simulation (WPTS), one multi-scale non-equilibrium turbulence modeling approach (216) *Xiaojian Yang, Kun Xu*	Molecular Dynamics Study of Reactive Gas-Surface Interactions Induced by Atomic Oxygen in VLEO (222) *Zhi-Hui Wang, Rui-Ling Tao, Chao-Yue Zhao, Xu-Hong Jin*
15:00		Parametric Velocity Modes from DSMC Shocks (171) *Robert Martin*	Frequency-domain general synthetic iterative scheme for efficient simulation of oscillatory rarefied gas flows (46) (S) *Li Pengshuo, Wu Lei*	
15:20 - 15:50	Coffee Break, Building 49 Level 3			
16:00 - 17:30	Poster session, Building: 49 Advanced Engineering Building, Room: 301			

Wednesday 15 July				
09:00 - 10:00	Room: 49-200 Plenary 3: **Prof Irina Graur Martin**, The Lloyd Thomas Lecture: Gas transport at microscale and low pressure: experiments and simulations Chair: *Prof Alina Alexeenko*			
Wed 15 Jul 10:10 - 11:10				
	Room: 50-N201 **Aerospace** Chair: *Robyn Macdonald*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Derek Liechty*	Room: 50-T103 **Rarefied plasmas** Chair: *Philip Varghese*	Room: 50-T105 **Gas-surface interactions** Chair: *Tetsuro Tsuji*
10:10	Numerical Study of Photophoretic Forces on a Thin Plate with Various Structured Surfaces (214) *Jie Chen, Yi Wang*	Construction of a Unified Gas-Kinetic Wave-Particle Method for ES-BGK Models (7) (S) *Celine Baranger, Alexis Coepeau, Luc Mieussens*	Fast-convergence and asymptotic-preserving simulation of charged particle flows based on the Vlasov-BGK-Poisson system (76) (S) *Yifan Wen, Lei Wu*	Experimental Demonstration of Radiometric Force in a Crookes Radiometer with Isothermal Vanes (87) *Yuma Takami, Hiroshi Sugimoto*
10:30	Phase-based Microwave Shock Velocity Interferometry (234) (S) *Toby van den Herik, Christopher M. James*	Extension of unified gas-kinetic wave-particle method to the gas mixture flow with an elementary chemical reaction (85) (S) *Junzhe Cao, Yufeng Wei, Wenpei Long, Chengwen Zhong, Kun Xu*	Experimental investigation of non-thermal plasma jet chemistry (223) (S) *Roshan John Kurian, Nils Temme, Farzan Zare, Carolyn Jacobs, Vincent Wheatley*	A Molecular Dynamics Study of Evaporation and Condensation of Atomic Clusters at a Metal Surface as well as Cluster Growth in the Vapor Phase (96) *Alexey N. Volkov, Saeed Siahtiri, Lily Stubblefield*
10:50	Zeeman spectroscopy of hypersonic flow in a magnetic field (176) *Timothy McIntyre, David Gildfind, Yu Liu, Nils Temme, Chengxin Yu, Samuel Lock*	Extension and application of a quantum lattice Boltzmann method to free molecular flow around a flat plate (97) (S) *Aaron Nagel, Leo Basov*	An Accurate Energy-Preserving Particle Integration Scheme for the Vlasov-Fokker-Planck System (66) (S) *Armin Riess, Hossein Gorji, Patrick Jenny*	Multiscale Analysis of Oxygen Transport in Catalyst Layer in Polymer Electrolyte Fuel Cell (119) (S) *Hirotaka Sugihara, Ikuya Kinefuchi, Takashi Tokumasu*
11:10 - 11:40	Coffee Break, Building 49 Level 3			
Wed 15 Jul 11:40 - 13:00				
	Room: 50-N201 **Aerospace** Chair: *Ingrid Wysong*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Xueli Luo*	Room: 50-T103 **Rarefied plasmas** Chair: *Patrick Jenny*	Room: 50-T105 **Reactive gas dynamics** Chair: *Robert MacDermott*
11:40	DSMC-CFD Consistency in the Continuum/Transition Overlap Region for a Deployable Mars Capsule (122) (S) *Federica Portis, Domenic D'Ambrosio, Antonio Schettino*	Comprehensive cross section datasets for charged particle collisions with atoms and molecules (Invited - 40 min) (148) *Dmitry Fursa, Liam Scarlett, Haadi Umer, Corey Plowman, Igor Bray, Mark Zammit, Michael Pak, Richard Bergmayr, Dirk Wuenderlich, Ursel Fantz*	Electromagnetic flow control in hypersonic rarefied environment (145) *Zhigang Pu, Kun Xu*	Research on the Mechanism of OH Ultraviolet Non-equilibrium Radiation Spectral Characteristics in hypersonic Rarefied Flow (219) *Shijie Chai, Yuhuai Zhang, Dandan Zeng, Hao Chen, Shuaihui Li*
12:00	Dimension-reduced Simulation of Hypersonic Vibrational Non-Equilibrium Flows Using DSMC Method (179) (S) *Zixin Liu, Zhihui Wang*	Comprehensive cross section datasets for charged particle collisions with atoms and molecules (Invited - 40 min) (148) *Dmitry Fursa, Liam Scarlett, Haadi Umer, Corey Plowman, Igor Bray, Mark Zammit, Michael Pak, Richard Bergmayr, Dirk Wuenderlich, Ursel Fantz*	Monte Carlo modeling of nonstoichiometry in laser produced plasmas of a binary alloy target (163) *Rommil Emperado, Arjay Dulay, Marc Robert Casero, Myles Allen Zosa, Lean Dasallas, Wilson Garcia*	H-theorems for dense reactive mixtures and global existence of solutions (74) *Jacek Polewczak*
12:20	Propellant Transport Modeling of Atmosphere-Breathing Electric Propulsion Using a DSMC-Centered Numerical Framework (120) *Geonwoong Moon, Minwoo Yi, Eunji Jun*	Particle Merge Strategies for PIC/DSMC Plasmas (199) *William McDoniel, Aubrey Zimmer, Christopher Moore, Andrew Fierro*	A novel two-fluid approach for modelling the near-wall collisionless electron sheath under strong thermionic emission (193) *Shahzeb Imran, Vincent Wheatley, Dale Pullin*	Nonequilibrium Hydrogen Kinetics for Gas Giant Atmospheric Entry (16) *Clement Civrais, Sung Min Jo, Marco Panesi*
12:40	Pore-Scale Rarefaction Effects on Aerodynamic Heating of a Gas-Permeable Textile for Deployable Aeroshells (116) (S) *Reo Iida, Kazuhiko Yamada, Akira Oyama*		Kinetic simulations of non-equilibrium ionization and excitation in laser-induced plasma plumes (95) *Alexey N. Volkov, Michael A. Stokes, Tanner Tripoli, Michael Wolkow, Zhibin Lin*	A flow field for studying recombination and vibrational de-excitation rates (136) *Hans Hornung, Robert Watt, Peter Jacobs, Joanna Austin, Rowan Gollan*
13:00 - 14:00	Lunch, Building 49 Level 3			
Wed 15 Jul 14:00 - 15:20				
	Room: 50-N201 **Aerospace** Chair: *Tamara Sopek*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Dmitry Fursa*	Room: 50-T103 **Rarefied plasmas** Chair: *Alexey Volkov*	Room: 50-T105 **Reactive gas dynamics** Chair: *Hans Hornung*
14:00	Experimental Investigation of Test Gas Substitution Effects on Non-Equilibrium Flow Under Uranus Entry Conditions (28) (S) *Daisy-May Joslyn, Samuel Lock, Robert Watt, Nicholas Gibbons, Yu Liu, Richard Morgan, Christopher James*	An Adjoint Method for Optimization of RGD (115) *Russel Caflisch, Yunan Yang*	Experimental investigation of the efficiency and compression ratio of a passive intake for air-breathing electric propulsion (31) (S) *Jana Zorn, Max Reinhardt, Peter J. Klar*	Modeling Reacting Flow for Hybrid Navier-Stokes/DSMC Methods (68) (S) *Mitchell Wall, Iain Boyd*
14:20	Vacuum Ultraviolet to Near-Infrared Measurements of Precursor Radiation in the X2 Expansion Tube (160) (S) *Samuel Lock, Yu Liu, Christopher James, Timothy McIntyre, Richard Morgan*	Modeling of Chemically Reactive Gas Flows for Multi-Scale Problems (62) (S) *Franziska Tuttas, Marcel Pfeiffer*	Numerical characterisation of a supersonic bidirectional vortex inductively coupled plasma torch (128) (S) *Landry Riou, Amaury Bilocq, David Henneaux, Pierre Schrooyen, Koen Hillewaert, Thierry Magin, Trevor Lafleur*	Numerical Simulation of Chemically Reacting Wakes of Hypersonic Spheres Using Kestrel CFD (141) *Blake Martin, Robert MacDermott, Joel Redmond*
14:40	Investigation of Thermochemical Effects on Hypersonic Flow Unsteadiness Over a Double Cone (172) *Shubham Thirani, Dr. Deborah Levin*		Accurate PIC Simulation of Ion Optics using p-Adaptation on Tetrahedral Meshes (138) (S) *Kim-Sophie Ellenberger, Tobias Ott, Stefanos Fasoulas, Marcel Pfeiffer*	Rovibronic Energy Transfer and Reactive Processes in Direct Simulation Monte Carlo (53) *Clement Civrais, Marcel Pfeiffer*
15:00	Experimental Observations of Plasma Wakes Created by Charged Bodies (236) *Carlos Maldonado, Matthew Dunn, Gabriel Wilson, Rachel Ulrich*		Flight Configuration Optimization of VLEO Satellites Considering Electromagnetic Forces under Strong Geomagnetic Activity (211) (S) *Hao Ding, Shuqiu Zhang, Dandan Zeng, Xilong Yu, Shuaihui Li*	
15:20 - 15:50	Coffee Break, Building 49 Level 3			
16:00 - 17:00	Room: 49-200 **Round Table Discussion: Past Achievements, Present Challenges, and Future Directions in Rarefied Gas Dynamics** Martin Grabe, Felix Sharipov, Ingrid Wysong, Rho Shin Myong Chair: *Dr Clement Civrais*			

Friday 17 July				
09:00 - 10:00	Room: 49-200 Plenary 4: **Prof Tom Schwartzentruber**, The Graeme Bird Lecture: Direct molecular simulation of hypersonic flow and gas-surface scattering for VLEO Chair: *Prof Rho Shin Myong*			
Fri 17 Jul 10:10 - 11:10				
	Room: 50-N201 **Aerospace** Chair: *Dale Pullin*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Felix Sharipov*	Room: 50-T103 **Moment methods** Chair: *Clement Civrais*	
10:10	Experimental Heat Transfer Distributions in Swept Shock-Boundary Layer Interactions (SwSBLIs) across Rarefied Regimes (107) (S) *Nnaemeka F. Anyamele, Nathan Donaldson, Alec Berry, Peter T. Ireland, Luke J. Doherty*	Multiscale Hybrid CFD/DSMC Simulation of Rocket-Induced Atmospheric Waves for Ionospheric Disturbance Prediction (18) *Gokula Krishna Tavva, George William Bowden*	Model-Adaptive Simulation of Moment Models for Non-Equilibrium Gas Flows (35) *Julian Koellermeier, Rik Verbiest*	
10:30	Maximising Vibrational Nonequilibrium in Supersonic Nozzle Flows (181) *David John Petty*	Analysis of fast-converging and asymptotic-preserving DSMC boosted by GSIS intermittently (90) (S) *Bin Hu, Liyan Luo, Lei Wu*	A Comparative Assessment of Moment-Based Closures for Flows at Various Levels of Rarefaction (162) (S) *Daniele Biasone, Pierre Bernigaud, Marc Massot*	
10:50	Failure of NS Equation in Jet Turbulence (50) *Songyan Tian, Lei Wu*	Kinetic-Continuum (KC) Internal Energy and Chemistry Model for DSMC (203) *Michael Kroells, Thomas Schwartzentruber*	Derivation of the generalized SO13 higher-order transport equation for non-continuum flows (204) *Upendra Yadav, Amit Agrawal*	
11:10 - 11:40	Coffee Break, Building 49 Level 3			
Fri 17 Jul 11:40 - 13:00				
	Room: 50-N201 **Aerospace** Chair: *Sean O'Byrne*	Room: 50-N202 **Monte Carlo methods and numerical** Chair: *Maninder Grover*	Room: 50-T103 **Boltzmann and related equations** Chair: *Stephane Brull*	
11:40	Gas-Dynamic Characterization of Airlock Venting Operations and Outgassing from Manned Lunar Rovers (105) *Stefano Boccelli, William M. Farrell, Prabal Saxena, Orenthal J. Tucker*	Pressure Profile Simulation in the Neutral Beam Injector System of a Volumetric Neutron Source (61) *Xueli Luo, Christos Tantos, Stefan Hanke, Thomas Giegerich, Thomas Haertl*	Achieving affordable high phase-space resolution for kinetic plasma dynamics via characteristic mapping methods (37) *Rostislav-Paul Wilhelm, Philipp Krah, Fabio Bacchini, Katharina Kormann, Kai Schneider*	
12:00	The Aerodynamic and Acoustic Performance of a Bumblebee-Inspired Vehicle in the Martian Atmosphere (238) *Nathan Widdup, Li Wang, John Young, Fang-Bao Tian*	Implementation of Surface Radiation to SPARTA's Hypersonic Ablation Model (60) *Falk Ramin, Lennart Bott, Christian Stemmer*	Heat transfer problem of a dense gas described by the Enskog equation with a modification of the Enskog factor (42) (S) *Shigeru Takata, Soma Sakata, Masanari Hattori*	
12:20		A Phenomenon Related to a Knudsen Force Exerted on an Object in a Gas with a Different Temperature (224) *Shigeru Yonemura, Clint John Otic*	Weakly Nonlinear Drag Induced by Uniform Surface Heating of a Sphere (189) *Satoshi Taguchi, Kwanghyun Ko, Tetsuro Tsuji*	
12:40			On The De-Excitation Shock In A Hypersonic Prandtl-Meyer Nonequilibrium Oxygen Flow (195) *Amna Khraibut, Sudhir Gai*	
13:00 - 14:00	Lunch, Building 49 Level 3			
14:00 - 14:20	Farewell, Building: 49 Advanced Engineering Building, Room: 200			

Version: 2026-07-02