

RGD32 Program (Hybrid, Real-time; Version 3; 24 May 2022)

KST, CEST, CDT

Time ¹	Mon (July 4th)				Time	Tue (July 5th)				Wed (July 6th)				Thu (July 7th)				Time	Fri (July 8th)			
07:30 – 08:00 00:30 – 01:00 17:30 – 18:00	Registration				07:30 – 08:00 00:30 – 01:00 17:30 – 18:00	Registration				Registration				Registration				07:30 – 08:00 00:30 – 01:00 17:30 – 18:00	Registration			
Halls	A	B	C	D	Halls	A	B	C	D	A	B	C	D	A	B	C	D	Halls	A	B	C	D
08:00 – 10:00 01:00 – 03:00 18:00 – 20:00	T01 Boltzm I (K06)	T03 Numeric I	T05 DSMC I	T16 Shock	08:00 – 10:00 01:00 – 03:00 18:00 – 20:00	S02 Rich Memorial I	T04 PDE II (K10)	T17 Gas- Surf I	T5,24 DSMC & HPC	T02 Kinetic III (K07)	S06 Porous Media	T12 Reacting I	T19,22 Jet Plume Vapor	T14 Hyper Veh I	S13 eProp I (K08)	T05 DSMC VI	S16 Hyper Flow I	08:00 – 10:00 01:00 – 03:00 18:00 – 20:00	S09 BGK I	T15 Space Veh I	T06 MD I (K15)	T18 Vacuum I
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break				10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break				Coffee Break				Coffee Break				10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
10:20 – 12:20 03:20 – 05:20 20:20 – 22:20	T01 Boltzm II	T03 Numeric II	T05 DSMC II	T21 Plasma I	10:20 – 12:20 03:20 – 05:20 20:20 – 22:20	S03 Rich Memorial II	S18 Entropy Closure (K05)	T17 Gas- Surf II	T5 DSMC IV	S12 Emerg- ent	T09,11 Multiph Shale	T07,08 Multisc, Micro, Nano I	S15 Dust Lunar	T14 Hyper Veh II	S14 eProp II (K02)	T05 DSMC VII	S17 Hyper Flow II	10:20 – 12:20 03:20 – 05:20 20:20 – 22:20	S10 BGK II	T15 Space Veh II (K12)	T06 MD II	T1,2,3,18 Vacuum II
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch				12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch & Poster (On-site)				Lunch				Lunch & Poster (On-site)				12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch			
13:20 – 14:40 06:20 – 07:40 23:20 – 00:40	Opening and Welcome Remarks Grad Lecture (Liu) (P1)				13:20 – 15:20 06:20 – 08:20 23:20 – 01:20	T02 Kinetic I	T13 Experi- ment (K03)	S07 Bulk Visco I	T5,12 Reacting & DSMC	Excursion				T01 Boltz III (K11)	T03 Numeric III	S04 Nano I (K01)	T12 Reacting II	13:20 – 16:00 06:20 – 09:00 23:20 – 02:00	S11 BGK III	T15 Space Veh III	T06 MD III (K13)	T10,11 Multiph Granul
14:40 – 15:00 07:40 – 08:00 00:40 – 01:00	Coffee Break				15:20 – 15:40 08:20 – 08:40 01:20 – 01:40	Coffee Break								Coffee Break				16:00 – 18:00 09:00 – 11:00 02:00 – 04:00	Farewell Party			
15:00 – 17:00 08:00 – 10:00 01:00 – 03:00	S01 Reese Memorial	T04 PDE I	T05 DSMC III	T21 Plasma II (K04)	15:40 – 16:40 08:40 – 09:40 01:40 – 02:40	Thomas Lecture (Ubachs) (P3)								GNU-ERC Lecture (Eu) (P4)								
17:00 – 17:10	Break				16:40 – 16:50	Break								Break								
17:10 – 18:10 10:10 – 11:10 03:10 – 04:10	Bird Lecture (Levin) (P2)				16:50 – 18:50 09:50 – 11:50 02:50 – 04:50	T02 Kinetic II	T14,16,23 Hyper Shock	S08 Bulk Visco II (K09)	T5 DSMC V					T01 Boltz IV	T03 Numeric IV (K14)	S05 Nano II	T07,08 Multisc, Micro, Nano II					
19:00 – 21:00 12:00 – 14:00 05:00 – 07:00	Reception				19:00 – 21:00 12:00 – 14:00 05:00 – 07:00	IAC Meeting / NextGen								Banquet								

Hybrid halls (A-Diamond, B-Vivace, C-Allegro, D-Andante)

On-site (In-person) & Virtual Poster

Time	Tue (July 5th)	Wed (July 6th)	Thu (July 7th)
10:20 – 12:20	Virtual Poster Session T1		Virtual Poster Session Th1
12:20 – 13:20	Lunch & Poster (On-site)	Lunch	Lunch & Poster (On-site)
13:20 – 15:30	Virtual Poster Session T2	Excursion	Virtual Poster Session Th2

Keynote Lectures		
K01	Murat Barisik	“Law of the Nano-wall” in Nano-channel Gas Flows
K02	Wonho Choe	Unique Physical Features of Cylindrical Hall Thruster Plasmas for Low Power Operation
K03	Stéphane Colin	Molecular Tagging – an Experimental Technique for Velocimetry and Thermometry in Internal Rarefied Gas Flows
K04	Zoltan Donko	Kinetic Effects in Charged Particle Transport, Gas Breakdown, and Electrical Discharges
K05	Clinton Groth	Development, Numerical Solution, and Application of Maximum-Entropy-Inspired Moment Closures for Non-Equilibrium Gaseous Flows with Shocks
K06	Yan Guo	Geometric Correction in Knudsen Layer Expansion
K07	Seung Yeal Ha	A Kinetic Approach for Collective Dynamics
K08	Kentaro Hara	Physics-based and Data-driven Models of Low-temperature Plasmas for Aerospace Applications
K09	Elena Kustova	New Challenges in Modeling Non-equilibrium Carbon Dioxide Flows
K10	Chang Liu	A Brief Review of the Direct Modeling Method: Multiscale Scheme, Unified Preserving Property, and Applications
K11	Duncan Lockerby	Simulating Low-speed Rarefied Flows around 3D Particulate and Droplets
K12	Jason Rabinovitch	A (very) Quick Overview of NASA Planetary Exploration Missions and the VATMOS-SR Mission Concept
K13	Takashi Tokumasu	Molecular Dynamics Simulations for Nanoscale Mass Transport Phenomena in Polymer Electrolyte Fuel Cells
K14	Lei Wu	Efficient and Accurate Deterministic Solver for the Boltzmann Equation: The Fast Spectral Method and General Iterative Scheme
K15	Yonghao Zhang	Effect of Confinement on Non-equilibrium Flow of Dense Gases

Plenary Lectures		
P01	Tai-Ping Liu (Grad Lecture)	Solving Boltzmann Equation, Green’s Function Approach
P02	Wim Ubachs (Thomas Lecture)	Light Extinction, Rayleigh-Brillouin Scattering and Absorption in the Earth's Atmosphere, and in Dilute and Dense Gases
P03	Deborah Levin (Bird Lecture)	Exploring the Physics of Multiscale Flows at the Molecular Level
P04	Byung-Chan Eu (GNU-ERC Lecture)	Thermodynamically Consistent Generalized Hydrodynamic Theory of Flows Far Removed from Equilibrium
Special Sessions		
S01	Yonghao Zhang	Memorial Session for Jason Reese
S02, S03	Igor Adamovich, Sergey Macheret, Deborah Levin	Memorial Session for Bill Rich I, II
S04, S05	BoHung Kim	Nanoscale Transport Phenomena at Interfaces I, II
S06	Alina Alexeenko, Irina Graur Martin	Rarefied Flows in Porous Media
S07, S08	Elena Kustova, Rakesh Kumar	Bulk Viscosity and Relaxation Processes I, II
S09, S10, S11	Seok-Bae Yun	Boltzmann Equation and BGK Models: Theory and Numerics I, II, III
S12	Doheon Kim, Seok-Bae Yun	Recent Advances on Emergent Behaviors and Collective Dynamics
S13, S14	Eunji Jun	Electric Propulsion I, II
S15	Jae Hyun Park, Kyun Ho Lee	Dust in Lunar Exploration
S16, S17	Gisu Park, Jaegang Kim	Hypersonic Flows I, II
S18	Clinton Groth, James McDonald	Entropy-Based Moment Closure Methods for Kinetic Equations

Topics			
T01	Boltzmann and Related Equations	T15	Space Vehicle Aerodynamics and Propulsion
T02	Kinetic Theory for Gases and Complex Systems	T16	Shock Waves in Rarefied Flows
T03	Numerical Methods for Kinetic Equations	T17	Gas-Surface Interactions (including Condensation) and Slip Flows
T04	PDE-based Computational Methods for Non-equilibrium Flows	T18	Vacuum Technology
T05	DSMC and Related Simulations	T19	Vapor Deposition Processes and Simulation
T06	Molecular Dynamics and Particle Methods	T20	Molecular Beams and Collisions
T07	Mesoscale and Multiscale Modeling	T21	Plasma Flows and Processes
T08	Micro- & Nano-scale Flows and Heat Transfer	T22	Jets, Plumes and Surface Interaction
T09	Shale Gases and Porous Media Flows	T23	Radiation and Astrophysics
T10	Granular Flows and Aerosols	T24	High-performance Computing in RGD
T11	Multiphase Flows and Kinetic Modeling		
T12	Non-equilibrium Reacting Flows		
T13	Experimental Techniques for Non-equilibrium Flows		
T14	Hypersonic Vehicles, Facilities, and Diagnostics		

Time	Mon (July 4th)			
	Room A	Room B	Room C	Room D
07:30 – 08:00 (KST) 00:30 – 01:00 (CEST) 17:30 – 18:00 (CDT)	Registration			
	Session M1A: Boltzmann and Related Equations I (Chair:)	Session M1B: Numerical Methods for Kinetic Equations I (Chair:)	Session M1C: DSMC I (Chair:)	Session M1D: Shock Waves in Rarefied Flows (Chair:)
08:00 – 08:20 01:00 – 01:20 18:00 – 18:20	Geometric Correction in Knudsen Layer Expansion Yan Guo* <i>Brown University, USA</i>	Physics-Informed Neural Networks for the Vlasov Equation Hanquist , Florio, Schiassi, Furfaro* <i>University of Arizona, USA</i>	In-Situ, Conservative Particle Merging With Octree Sorting Huerta* , Martin, Eckhardt <i>Jacobs Engineering Group, USA</i>	Molecular Diffusivity Based Constitutive Relations for Rarefied Conditions Reddy* , Dadzie, Tomy <i>Heriot-Watt University, UK</i>
08:20 – 08:40 01:20 – 01:40 18:20 – 18:40		Verification of a Discontinuous Galerkin Fast Spectral Solver for the Full Boltzmann Equation Adhikari* , Morton, Hu, Alexeenko <i>Purdue University, USA</i>	A Computational Study on Thermally Induced Knudsen Forces for a Non-Contact Controlling Device Otic* , Ohara, Yonemura <i>Tohoku University, Japan</i>	Low Reynolds Number Effect on Hypersonic Flow Over a Hemisphere with Counter-flow Jet Yoon* , Suzuki <i>University of Tokyo, Japan</i>
08:40 – 09:00 01:40 – 02:00 18:40 – 19:00	Simulations of Flow Past a Blunt Body in an Inert Binary Gas Mixture in Rotational Non-Equilibrium Using DSMC and the Generalized Boltzmann Equation Agarwal* , Qian <i>Washington University, USA</i>	Assessment of Kinetic Fokker-Planck Methods for Hypersonic Rarefied Flows Kim , Jun* <i>KAIST, Korea</i>	GSIS-LVDSMC for BGK Equation Luo , Li, Wu* <i>Southern University of Science and Technology, China</i>	On the Conditions of Clusters Penetration beyond the Limits of a Supersonic Jet Dubrovin* , Zarvin, Bondar, Yaskin, Kalyada, Dering <i>Novosibirsk State University, Russia</i>
09:00 – 09:20 02:00 – 02:20 19:00 – 19:20	Comparison of Numerical Solutions of Rarefied Hypersonic Gas Flows Using Boltzmann-based Zero-, First-, and Second-Order Constitutive Models Singh* , Battiato, Myong <i>Nanyang Technological University, Singapore</i>	General Synthetic Iterative Scheme for Unsteady Phonon Boltzmann Equation with Dual Relaxation Times Liu , Su, Wu* <i>Southern University of Science and Technology, China</i>	Hydrodynamics, Normal-stress Differences and Heat Transport in Rarefied Pressure Driven Poiseuille Flow Ravichandir* , Alam <i>Jawaharlal Nehru Centre for Advanced Scientific Research, India</i>	A Computational Investigation of High-Temperature Effect on the Type IV Shock Interaction Peng* , Hu, Z. Han, G. Han, Jiang <i>University of Chinese Academy of Sciences, China</i>
09:20 – 09:40 02:20 – 02:40 19:20 – 19:40	Comparative Study of Model Kinetic Equations and the Boltzmann Equation in the Shock Wave Structure Problem Poleshkin* , Kudryavtsev <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	Linearly Implicit Time Integration of Vibrational Master Equation Using Automatic Differentiation Petty , Byrne* <i>University of New South Wales, Australia</i>	Relativistic DSMC Collisions in EMPIRE McDoniel* , Moore, Cartwright <i>Sandia National Laboratories, USA</i>	Transition of The Regular to Mach Reflection of Shock Waves in Steady Rarefied Flows Shoev* , Timokhin <i>Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>
09:40 – 10:00 02:40 – 03:00 19:40 – 20:00	A Fast Fourier Spectral Method for the Non-cutoff Boltzmann Collision Operator Qi* , Hu <i>City University of Hong Kong, Hong Kong PRC</i>	A GPU Accelerated Unified Gas-Kinetic Wave-Particle Algorithm for Rarefied Flows Yu , Xie*, Tian, Ren, Li <i>National University of Defense Technology, China</i>	Rarefied Atmospheric Gas Effects on The Aerodynamics of Super Low Altitude Satellites Yu , Vignesh Ram, Yoon, Kim* <i>Sejong University, Korea</i>	Application of the Mott-Smith Approximation to the Regular Shock-Wave Reflection Problem Timokhin* , Kudryavtsev, Bondar <i>Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
	Session M2A: Boltzmann and Related Equations II (Chair:)	Session M2B: Numerical Methods for Kinetic Equations II (Chair:)	Session M2C: DSMC II (Chair:)	Session M2D: Plasma Flows and Processes I (Chair:)
10:20 – 10:40 03:20 – 03:40 20:20 – 20:40	Physics-informed Neural Network and Functional Interpolation for Rarefied-Gas Dynamics in the BGK Approximation De Florio , Schiassi, Barichello, Ganapol, Furfaro* <i>University of Arizona, USA</i>	A Conservative Multidimensional Vlasov Algorithm with Curvilinear Moving Phase-Space Grid Taitano* , Liu, Chacon <i>Los Alamos National Laboratory, USA</i>	Trajectory Estimation Model of Space Debris with Gravitational and Drag Perturbations Preethi , Appar, Kukilaya*, Kumar* <i>Indian Institute of Technology Kanpur, India</i>	Real-Time State Estimation for Plasma Chemistry Applications Greve* , Hara <i>Texas A&M University, USA</i>
10:40 – 11:00 03:40 – 04:00 20:40 – 21:00	Source-sink-type Condition for Slightly Rarefied Gas Flow Driven by a Discontinuous Wall Temperature Taguchi* , Tsuji	New Fast Numerical Method for Rarefied Gas Simulation by Spherical Design and Traveling Finite Volume	A Hybrid DSMC-continuum Formulation for Jet Expansion into Rarefied Flows Tumuklu , Bellan*, Hanquist	A Kinetic-continuum Method Combining the Direct Simulation Monte-Carlo with Collision-Radiation Model for Simulation of Laser-Induced

	<i>Kyoto University, Japan</i>	Sugimoto* , Morikawa <i>Kyoto University, Japan</i>	<i>California Institute of Technology, USA</i>	Plasma Plumes Volkov* , Stokes, Lin <i>University of Alabama, USA</i>
11:00 – 11:20 04:00 – 04:20 21:00 – 21:20	Global In Time Existence of Solutions With L^1 -Initial Data for The Revised Enskog Equation Polewczak* <i>California State University, USA</i>	General Synthetic Iterative Scheme for Steady Solutions of Multi-Scale Polyatomic Gas Flows Zeng, Wu* <i>Southern University of Science and Technology, China</i>	Plume Analysis for VISORS Mission Karis* , Kazarin, Chinnappan, Alexeenko <i>Purdue University, USA</i>	Two-Dimensional Axisymmetric Fluid Modeling of Low-Pressure Capacitively Coupled Plasma Using an Extended Temporal Multi-Scale Algorithm Wu* , Gu, Hu <i>National Yang Ming Chiao Tung University, Taiwan ROC</i>
11:20 – 11:40 04:20 – 04:40 21:20 – 21:40	An Attempt on the ES-Model-Based Construction of a Kinetic Equation for a Dense Gas Miyauchi* , Takata, Hattori <i>Kyoto University, Japan</i>	On the Five-Moment Maximum Entropy System of One-Dimensional Boltzmann Equation Li, Fan, Zheng* <i>Peking University, China</i>	On The Convergence of the Symmetrized and Simplified Bernoulli Trial (SSBT) Collision Scheme in Shock Wave Problem Javani, Roohi* , Taheri <i>Xi'an Jiaotong University, China</i>	On the Mechanism of Cluster Luminescence in the External Field of a Supersonic Flow Konstantinov , Zarvin*, Dubrovin, Kalyada, Yaskin, Dering <i>Novosibirsk State University, Russia</i>
11:40 – 12:00 04:40 – 05:00 21:40 – 22:00	Model Two-Particle Kinetic Equation for Pairs of Quasiparticles Saveliev* <i>Fesenkov Astrophysical Institute, Kazakhstan</i>	Data-Driven Nonlinear Compression and Denoising Martin* , Huerta, Wong, Eckhardt <i>U.S. Army Research Office, USA</i>	Re-Entry Trajectory Estimation for Space Debris in Low Earth Orbit Park* , Nam, Kim, Kim <i>Agency For Defense Development, Korea</i>	On the Role of Rotational Relaxation in Oxygen Discharges Huang* , Hu, Sun <i>Chinese Academy of Sciences, China</i>
12:00 – 12:20 05:00 – 05:20 22:00 – 22:20	Thermally Driven Flow of a Dense Gas in a Nanochannel Hattori* <i>Kyoto University, Japan</i>	Kinetic Simulation of Pulsed Evaporation into Low-Pressure Gas: Model Kinetic Equation vs DSMC Titarev* , Morozov <i>Federal Research Center, Russia</i>	Coupled Kinetic-Continuum Modeling of Re-Entry Vehicle Plasma Environment Shevyrin* , Bondar <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	Investigation of Hypersonic Plasma Sheath Effects on RF Degradation Using DSMC Method Agarwal*, Derubertis* <i>Washington University, USA</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch			
13:20 – 14:40 06:20 – 07:40 23:20 – 00:40	Opening and Welcome Remarks			
	Grad Lecture			
	(Solving Boltzmann Equation, Green's Function Approach, Tai-Ping Liu* , <i>Academia Sinica and Stanford University</i>)			
14:40 – 15:00 07:40 – 08:00 00:40 – 01:00	Coffee Break			
	Session M3A: Memorial Session for Jason Reese (Chair:)	Session M3B: PDE-based Computational Methods for Non-equilibrium Flows I (Chair:)	Session M3C: DSMC III (Chair:)	Session M3D: Plasma Flows and Processes II (Chair:)
15:00 – 15:20 08:00 – 08:20 01:00 – 01:20	Flow Past a Square Cylinder in the Slip and Early Transition Regime: A Computational Study by Coupling Kinetic and Extended Thermodynamic Methods Gu* , Yang, Emerson, Zhang <i>STFC Daresbury Laboratory, UK</i>	Numerical Analysis of Slow Uniform Flow past a Circular Disk with Sharp Edge Tomita , Taguchi*, Tsuji <i>Kyoto University, Japan</i>	Investigation of the Effect of Pseudo-Random Number Generating Algorithms on DSMC Simulation Sengupta , Mankodi, Myong* <i>Gyeongsang National University, Korea</i>	Kinetic Effects in Charged Particle Transport, Gas Breakdown, And Electrical Discharges Zoltan Donko* <i>Wigner Research Centre for Physics, Hungary</i>
15:20 – 15:40 08:20 – 08:40 01:20 – 01:40		Reduced-order Modeling of a Collisional-Radiative, Euler Fluid System Through Low-Rank Tensor Decomposition Abrantes* , Taitano, Cambier <i>Air Force Research Laboratory, USA</i>	Similarity Parameters in the Longitudinal Cylindrical Couette Problem: From the Continuous to Free Molecular Abramov, Alexandrov, Butkovskii* <i>Central Aerohydrodynamic Institute, Russia</i>	
15:40 – 16:00 08:40 – 09:00 01:40 – 02:00	Gas Rarefaction Effects in a Two-Dimensional Acoustic Micro-Resonator Manela* , Ben-Ami <i>Technion - Israel Institute of Technology, Israel</i>	Entropy-based Ansatz for Galerkin Approximations of the Boltzmann Equation Abdelmalik* , Gamba, Kessler, Rjasanow <i>Eindhoven University of Technology, Netherlands</i>	Thermophoretic Force on Micron-Sized Particles in Rarefied Gas Conditions Reinartz* , Staso, Shestakov, Kunnen, Toschi, Clercx <i>Eindhoven University of Technology, Netherlands</i>	A New Class of Second-order Uniformly Asymptotic-preserving Imex Schemes for Kinetic and Hyperbolic Balance Laws with Stiff Relaxation Pichard* , Reboul, Massot <i>Ecole polytechnique</i>

16:00 – 16:20 09:00 – 09:20 02:00 – 02:20	Drag on a Sphere over a Range of Knudsen Numbers and Speed Ratios White* , Cao, Agir, Vasiliadis <i>University of Glasgow, UK</i>	On Moment Approximations of Boltzmann Equation: A Generic Moment System and Its FEM-Based Numerical Solution Christhuraj* , Torrilhon <i>RWTH Aachen, Germany</i>	IXV Vehicle, Comparison of Aerothermodynamic DSMC Results and Flight Data in Rarefied Regime Schouler* , Prevèreaud, Mieussens <i>ONERA, France</i>	Energy and Momentum-Preserving Particle Scheme for the Magnetized Poisson-Vlasov- Fokker-Planck Equation Chung* , Fei, Gorji, Jenny <i>Swiss Federal Institute of Technology, Switzerland</i>
16:20 – 16:40 09:20 – 09:40 04:20 – 02:40	Multiscale Modelling and Computation of Hypersonic Gas Flows and Gas-Surface Interactions Zhang* , Deng, Tian, Feng, Fei <i>Beihang University, P.R. China</i>	Thermal Analysis of Mildly Rarefied Gaseous Flows through Isothermally Heated Circular Pipe Jha* , Agrawal <i>Indian Institute of Technology Bombay, India</i>	Different Approaches for Simulation of Convective and Radiative Heat Fluxes in Planetary Entry Problems Istomin* , Kustova, Prutko <i>Saint Petersburg State University, Russia</i>	Moment Models for Neutral Particles in the Plasma Edge Cusicanqui, Koellermeier* , Maes, Samaey <i>University of Groningen, Netherlands</i>
16:40 – 17:00 09:40 – 10:00 02:40 – 03:00		Domain Decomposed Hyper-reduction for Steady, Inviscid Hypersonic Flow Joshi* , Choi <i>Virginia Polytechnic Institute and State University, USA.</i>	Energy Redistribution in DSMC Using Modified Quantum-Kinetic Model Chou* , Pan <i>National Taiwan University, Taiwan</i>	Fluid Simulations of Partially Magnetized Plasmas: Advanced Numerical Methods and Comparison to Kinetic Simulations Reboul* , Massot, Laguna, Anne Bourdon <i>CNRS, France</i>
17:00 – 17:10	Break			
17:10 – 18:10 10:10 – 11:10 03:10 – 04:10	Bird Lecture (Exploring the Physics of Multiscale Flows at the Molecular Level, Deborah Levin* , <i>University of Illinois at Urbana-Champaign</i>)			
19:00 – 21:00 12:00 – 14:00 05:00 – 07:00	Reception			

Time	Tue (July 5th)			
	Room A	Room B	Room C	Room D
07:30 – 08:00 (KST) 00:30 – 01:00 (CEST) 17:30 – 18:00 (CDT)	Registration			
	Session T1A: Memorial Session for Bill Rich I (Chair:)	Session T1B: PDE-based Computational Methods for Non-equilibrium Flows II (Chair:)	Session T1C: Gas-Surface Interactions (including Condensation) and Slip Flows I (Chair:)	Session T1D: DSMC and HPC (Chair:)
08:00 – 08:20 01:00 – 01:20 18:00 – 18:20	Detecting Order in Complexity of Molecular Collisions: Historical Perspective and Future Outlook Adamovich*, Rich Ohio State University, USA	A Brief Review of the Direct Modeling Method: Multiscale Scheme, Unified Preserving Property, and Applications Chang Liu* Hong Kong University of Science and Technology, Hong Kong PRC	Gas Scattering on Porous Surfaces and Its Impact on Rarefied Gas Transport in Shale Chen*, Jun, Li, Datta, Docherty, Gibelli, Borg University of Edinburgh, UK	Impact Quantification of an Harmonic Oscillator Model for a Flow over a Sphere Civrais*, White, Steijl University of Glasgow, UK
08:20 – 08:40 01:20 – 01:40 18:20 – 18:40			Effect of Speed Ratio Increase on Pressure Measurement for Hypersonic Rarefied Gas Flows Ozawa*, Suzuki, Fujita Japan Aerospace Exploration Agency, Japan	On the Unsteady Behavior of a Hypersonic Flow over a Double Cone Using Kinetic Methods Karpuzcu*, Levin, Cerulus, Theofilis University of Illinois, Urbana-Champaign, USA
08:40 – 09:00 01:40 – 02:00 18:40 – 19:00	Development and Application of the Modified Marrone and Treanor Chemical Kinetics Model Chaudhry*, Boyd, Candler University of Colorado Boulder, UK	Application of a 10-Moment Fluid Model to Transition Neutral and Plasma Flows Kuldinow*, Hara Stanford University, USA	Modeling Molecular Outgassing Transport and Deposition for Spacecraft Operating in Vacuum Anderson*, Alred, Hoey Jet Propulsion Laboratory, USA	State of the SPARTA DSMC Code Moore*, Plimpton Sandia National Laboratories, USA
09:00 – 09:20 02:00 – 02:20 19:00 – 19:20	Vibrational Kinetics in 2D High Enthalpy Flows Using GPU's Colonna*, Bonelli, Ninni, Pascazio CNR-ISTP, Italy	Investigation on the Validity of a Rarefied Gas Flow Model Based on the LBM as an Extended Navier-Stokes Equation Solver for Porous Media Tucny*, Vidal, Leclaire, Bertrand Research Center in Industrial Flow Processes (URPEI), Canada	Stochastic Multiscale Simulation Method for Heterogeneous Catalysts: Concurrent Coupling of Kinetic Monte Carlo and Fluctuating Hydrodynamics Kim*, Nonaka, Bell, Garcia University of California, USA	3D-DSMC Method Applied to Coma Generation of Cometary Nuclei: Application to Comet 67P/Churyumov-Gerasimenko Pinzón-Rodríguez*, Gerig, Marschall, Herny, Thomas University of Bern, Switzerland
09:20 – 09:40 02:20 – 02:40 19:20 – 19:40			Three-dimensional Generalized Finite Difference Method for Thermal Evolution and Rarefied Flows in Porous Small Planetary Bodies Zhang*, Hartzell University of Maryland, USA	Measurements of Thermal and Tangential Momentum Accommodation Coefficients on a Solid Sample Surface in High Knudsen Number Flows Yamaguchi*, Osada, Endo Nagoya University, Japan
09:40 – 10:00 02:40 – 03:00 19:40 – 20:00	Theoretical Models of Chemical Reactions in Vibrational-Translational Nonequilibrium Macheret* Purdue University, USA	Modeling of High Speed Gas Flows Using In-house Computational Framework based on Direct Flux Reconstruction Suman, Singh, Ujwal, Ramesh, Kumar* Indian Institute of Technology Kanpur, India	Development of an Effective Finite-Rate Oxidation Model for NusiI-coated Charred Carbon Preform Ablators Swaminathan Gopalan*, Borner Analytical Mechanics Associates Inc. at NASA Ames Research Center, USA	An Open Source USP Code within the Framework of SPARTA for the Simulation of Multiscale Gas Flows Feng, Tian, Zhang* Beihang University, China
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
	Session T2A: Memorial Session for Bill Rich II (Chair)	Session T2B: Entropy-Based Moment Closure Methods for Kinetic Equations (Chair:)	Session T2C: Gas-Surface Interactions (including Condensation) and Slip Flows II (Chair:)	Session T2D: DSMC IV (Chair:)
10:20 – 10:40 03:20 – 03:40 20:20 – 20:40	Validation of Vibrational Kinetics in Molecular Plasmas Guerra*, Silva, C. Dias, Fromentin, Baratte, Guaitella Instituto de Plasmas e Fusao Nuclear, Instituto	Development, Numerical Solution, and Application of Maximum-Entropy-Inspired Moment Closures for Non-Equilibrium Gaseous Flows with Shocks Clinton Groth*	Molecular Dynamics Study of Gas Surface Interactions on B-Cristobalite Surface Naspoori, Kumar*, Kammara, Appar Indian Institute of Technology Kanpur, India	Outflow of a Gaseous Mixture with a Large Species Mass Ratio into Vacuum Bykov*, Fedorov, Zakharov Russian Academy of Sciences, Russia

10:40 – 11:00 03:40 – 04:00 20:40 – 21:00	Superior Tecnico, Portugal	University of Toronto, Canada	Heterogeneous Catalytic Reactions of Dissociated Air on the B-cristobalite Surface Pogosebekian* , Kroupnov <i>Lomonosov Moscow State University, Russia</i>	Evaporation/Condensation and Nozzle Flow Modeling for FEMTA Microthruster Fowee Gasaway* , Pugia, Vorozhbit, Kazarin, Alexeenko <i>Purdue University, USA</i>
	High Temperature Flow Simulations: Reduced Models and Data Validation Kustova* , Kunova, Kravchenko, Melnik <i>Saint Petersburg State University, Russia</i>			
11:00 – 11:20 04:00 – 04:20 21:00 – 21:20		Multi-Dimensional Approximate Maximum-Entropy Twenty-One-Moment Model with a Novel Approximation for Knudsen-Layer Wall Boundary Conditions Giroux* , McDonald <i>University of Ottawa, Canada</i>	Condensation Induced by Rapidly Moving Liquid Film Surrounded by Vapor and Non-condensable Gas Ohashi* , Kobayashi, Fujii, Watanabe <i>Hokkaido Univeristy, Japan</i>	Modeling of Lunar Dust Dispersion Using Two-Way Coupled Lagrangian-Lagrangian Framework Kumar* , Chinnappan, Bajpai, Bhavsar <i>Indian Institute of Technology Kanpur, India</i>
11:20 – 11:40 04:20 – 04:40 21:20 – 21:40	Modeling of Optical Diagnostics to Study Nonequilibrium Characteristics of High-Temperature Flows Levin, Gimelshein, Wysong, Karpuzcu* , Thirani <i>University of Illinois, Urbana-Champaign, USA</i>	Investigation into New Moment-Closure-Based Quantum Hydrodynamics Models Morin* , McDonald <i>University of Ottawa, Canada</i>	Gas Adsorption Modeling for Various Monoatomic Gases Considering Quantum Effects Basdanis* , Misdanitis, Valougeorgis, Sharipov <i>University of Thessaly, Greece</i>	Coupling Carbon Oxidation and Surface Recession in Direct-Simulation Monte Carlo Code, SPARTA Arias* , Gopalan, Borner, Stephani, Plimpton <i>University of Illinois at Urbana-Champaign, USA</i>
11:40 – 12:00 04:40 – 05:00 21:40 – 22:00	Determining Vibrational Distributions by Rotational Raman Miles* , Dogariu, Abbasszadehrad <i>Texas A&M University, USA</i>	On the Application of Maximum-Entropy Inspired Multi-Gaussian Moment Closure for Multi-Dimensional Non-Equilibrium Gas Kinetics Brooks* , Groth, Laurent <i>University of Toronto, Canada</i>	Simulation of Rarefied Gas Flow in a Channel Applying Artificial Neuron Network Aksenova, Khalidov* <i>St.Petersburg Naval Polytechnic University, Russia</i>	Jet Expansion into the Vacuum Chamber: Kinetic-Continuum Computations and Validation Against Experiment Zaitsev* , Yarkov, Zarvin, Dubrovin, Bondar <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>
		First-Order Hyperbolic-Relaxation Turbulence Modelling for Moment-Closures Yan* , McDonald <i>University of Ottawa, Canada</i>	Simulation of Rarefied Gas Flow Near Rough Surface Applying the Solution of Inverse Problem Aksenova* , Khalidov <i>St.Petersburg Naval Polytechnic University, Russia</i>	Kinetic Comparative Study of Rarefied-Transitional Flows Li* , Jiang, Geng, Chen, Wang <i>China Aerodynamics Research and Development Center, China</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch & Poster			
	Session T3A: Kinetic Theory for Gases and Complex Systems I (Chair:)	Session T3B: Experimental Techniques for Non-equilibrium Flows (Chair:)	Session T3C: Bulk Viscosity and Relaxation Processes I (Chair:)	Session T3D: Non-equilibrium Reacting Flows and DSMC (Chair:)
13:20 – 13:40 06:20 – 06:40 23:20 – 23:40	Discontinuous Galerkin Methods for Hyperbolic Moment Models of the Boltzmann-BGK Equation Van Heyningen* , Nguyen, Peraire <i>Massachusetts Institute of Technology, USA</i>	Molecular Tagging – an Experimental Technique for Velocimetry and Thermometry in Internal Rarefied Gas Flows Stephane Colin* <i>University of Toulouse, France</i>	Continuum Models for Bulk Viscosity and Relaxation in Polyatomic Gases Kustova* , Mekhonoshina, Bechina, Lagutin, Alekseev <i>Saint Petersburg State University, Russia</i>	Implementation of Detailed Balance in DSMC Based on an Internal Energy Model Coupling Rotational and Electronic Energy Yang, Sun, Hu* <i>Chinese Academy of Sciences, China</i>
13:40 – 14:00 06:40 – 07:00 23:40 – 00:00	Fast Evaluation of the Boltzmann Collision Operator Using Data Driven Reduced Order Models Alekseenko* , Martin, Wood <i>California State University Northridge, USA</i>		Understanding Role of Bulk Viscosity in Rarefied Polyatomic Gases Based on Rational Extended Thermodynamics Arima* <i>National Institute of Technology Tomakomai College, Japan</i>	Relaxation Processes During Gas-jet Deposition of Diamond Structures from a Cloud of Microwave-activated Gas Yudin* , Plotnikov, Rebrov <i>Kutateladze Institute of Thermophysics of SB RAS, Russia</i>
14:00 – 14:20 07:00 – 07:20 00:00 – 00:20	A Rotational Relaxation Model for Nonlinear Coupled Constitutive Relations Yuan, Jiang* , Zhao, Chen <i>Zhejiang University, China</i>	Development and Validation of a Nitric Oxide Vibrational Temperature Diagnostic Using Ultraviolet Laser Absorption Spectroscopy Krish* , Streicher, Hanson <i>Stanford University, USA</i>		Capturing the COVID-19 Pandemic Characteristic with DSMC Method Guan, Wang* <i>University of Chinese Academy of Sciences, China</i>
14:20 – 14:40 07:20 – 07:40 00:20 – 00:40	Application of the Moment System of Equations in the Second Approximation to Determine the Speed and Surface Temperature of the Aircraft Sakabekov, Yergazina, Auzhani* <i>Satbayev University, Kazakhstan</i>	Experimental Investigation on Electron Beam Fluorescence Application in Rare Gas Flow AiGuo* , YanGuang, Zhihui, Yin, Zhonghua, Jie <i>China Aerodynamics Research and Development Center, China</i>	Vibrational Relaxation and Heat Capacity of CO2 under Non Thermodynamic Equilibrium Fernandez* , Alvarez, Tejeda, Montero <i>Instituto de Estructura de la Materia, Spain</i>	A Comparison of Nonlinear Coupled Constitutive Relations and DSMC for Hypersonic Reverse Jet Flows Huang, Zeng, Jiang* , Chen <i>Zhejiang University, China</i>

14:40 – 15:00 07:40 – 08:00 00:40 – 01:00	Compactness Property for the Linearized Boltzmann Operator in the Polyatomic Case Brull* , Shahine, Thieullen <i>Institut de mathematiques de Bordeaux, France</i>	Shock Tube Measurements of Atomic Nitrogen Collisional Excitation in Partially-ionized Nitrogen-Argon Mixtures Finch* , Granowitz, Streicher, Krish, Strand, Hanson <i>Stanford University, USA</i>		Influence of DSMC Collision Model Parameters on Hypersonic Chemically Reacting Flows Hu , Zhao, Li, Geng, Yang*, Sun <i>Chinese Academy of Sciences, China</i>
15:00 – 15:20 08:00 – 08:20 01:00 – 01:20	Renormalized Expressions for Momentum and Energy Exchange Terms for a Disparate Gas Mixture Gorbachev* <i>Novosibirsk State University, Russia</i>	Rotational Relaxation of CO2 in Supersonic Jets: A Gas Dynamic and Kinetic Study by Raman Spectroscopy Alvarez* , Fernandez, Tejeda, Montero <i>Instituto de Estructura de la Materia, Spain</i>	Studying Rotational Relaxation in Gas Mixtures by Molecular Simulations of Rayleigh-Brillouin Scattering Ma , Yang, Bruno, Zhang* <i>Beihang University, China</i>	Low-variance Deviational Monte Carlo Simulation of Polyatomic Rarefied Gas Flow Using Reduction Method Shiraishi* , Imai, Yoshimoto, Takagi, Kinefuchi <i>University of Tokyo, Japan</i>
15:20 – 15:40 08:20 – 08:40 01:20 – 01:40	Coffee Break			
15:40 – 16:40 08:40 – 09:40 01:40 – 02:40	Thomas Lecture (Light Extinction, Rayleigh-Brillouin Scattering and Absorption in the Earth’s Atmosphere, and in Dilute and Dense Gases, Wim Ubachs* , <i>Vrije University</i>)			
16:40 – 16:50 09:40 – 09:50 02:40 – 02:50	Break			
	Session T4A: Kinetic Theory for Gases and Complex Systems II (Chair:)	Session T4B: Hypersonic Vehicles and Shock Waves (Chair:)	Session T4C: Bulk Viscosity and Relaxation Processes II (Chair:)	Session T4D: DSMC V (Chair:)
16:50 – 17:10 09:50 – 10:10 02:50 – 03:10	Minimum of the Normal Momentum Flux Transferred to the Inner Cylinder in the Rarefied Couette Flow with a Fixed Outer Cylinder Abramov, Alexandrov, Buzykin, Butkovskii* <i>Central Aerohydrodynamic Institute, Russia</i>	CFD/Radiation Analysis of the Chelyabinsk and St Valentine Meteoroids Reynier* , Lino Da Silva <i>Ingénierie et Systèmes Avancés, France</i>	New Challenges in Modeling Non-Equilibrium Carbon Dioxide Flows Elena Kustova* <i>Saint Petersburg State University, Russia</i>	DSMC Study of Taylor Couette Flow with Added Circulation Garg, Bhandarkar* , Puranik <i>Indian Institute of Technology Bombay, India</i>
17:10 – 17:30 10:10 – 10:30 03:10 – 03:30	Unsteady-state Method for Calculating Steady Subsonic and Transonic External Rarefied Gas Flows Abramov, Butkovskii* , Buzykin <i>Central Aerohydrodynamic Institute, Russia</i>	Experimental Investigation on the Role of Boundary Layers Around a Supersonic Cylinder in Rarefied Flows Kovacs* , Passaggia, Mazellier, Lago <i>CNRS, France</i>		Computation of Hypersonic Flow around an Isolated Roughness Element Using Kinetic Theory Klothakis* , Dylewicz, Theofilis, Levin <i>Technical University of Crete, Greece</i>
17:30 – 17:50 10:30 – 10:50 03:30 – 03:50	A Kinetic Model for Rarefied Flows of Molecular Gases with Vibrational Modes Li , Wu* <i>Southern University of Science and Technology, China</i>	Simulation of Radiating Non-Equilibrium Flows around a Capsule Entering Titan’s Atmosphere Beyer* , Pfeier, Nizenkov, Fasoulas <i>University of Stuttgart, Germany</i>	Internal Energy Relaxation Processes and Bulk Viscosities Bruno, Giovangigli* <i>Ecole Polytechnique, France</i>	Surface Chemistry Modelling with the Simulation Tool PICLas Lauterbach* , Pfeier, Fasoulas <i>University of Stuttgart, Germany</i>
17:50 – 18:10 10:50 – 11:10 03:50 – 04:10	Sound Wave Propagation in Rarefied Polyatomic Gases Li , Su, Zhang* <i>University of Edinburgh, UK</i>	On Transitory Shock Interaction with Incipient Flow Separation Kang , Lee* <i>KAIST, Korea</i>		Analysis of Non-Equilibrium Gas Flows with Evaporation from Porous Array Membranes Imai* , Yoshimoto, Takagi, Kinefuchi <i>University of Tokyo, Japan</i>
18:10 – 18:30 11:10 – 11:30 04:10 – 04:30	Anomalous Transport in Flows near Simple Bodies Aristov* , Voronich, Zabelok <i>Russian Academy of Sciences, Russia</i>	Numerical Analysis of Shock Wave Propagation in a Macrotube at Reduced Pressures Lokhande* , Deshpande <i>Veermata Jijabai Technological Institute, India</i>		Implementation of Machine Learning Methods for Non Equilibrium Gas Dynamic Problems Istomin* , Kustova, Lagutin, Shalamov <i>Saint-Petersburg State University, Russia</i>
18:30 – 18:50 11:30 – 11:50 04:30 – 04:50	Kinetic Study of Spatial Spread of COVID-19 Waves Aristov* , Aliev, Stroganov, Yastrebov <i>Russian Academy of Sciences, Russia</i>	Experimental and Numerical Analysis of Rarefaction and Base Geometry Effects on Supersonic Flows Toussaint*, Noubel , Baranger, Braeunig, Lago <i>CEA-CESTA, France</i>	Quantum-classical Calculations of Transport Collision Integrals from Accurate Intermolecular Potentials Hong , Coletti, Bartolomei, Sun*, Pirani <i>Chinese Academy of Sciences, China</i>	Direct Simulation Monte Carlo Modeling of the Flip over Effect in Laser Produced Plasma Expansion Using SPARTA Emperado* , Dasallas, Garcia <i>University of the Philippines Diliman, Philippines</i>
19:00 – 21:00 12:00 – 14:00 05:00 – 07:00	IAC Meeting / NextGen			

Time	Wed (July 6th)			
	Room A	Room B	Room C	Room D
07:30 – 08:00 (KST) 00:30 – 01:00 (CEST) 17:30 – 18:00 (CDT)	Registration			
	Session W1A: Kinetic Theory for Gases and Complex Systems III (Chair:)	Session W1B: Rarefied Flows in Porous Media (Chair:)	Session W1C: Non-equilibrium Reacting Flows I (Chair:)	Session W1D: Jet, Plumes and Vapor Deposition (Chair:)
08:00 – 08:20 01:00 – 01:20 18:00 – 18:20	A Kinetic Approach for Collective Dynamics Seung Yeal Ha* <i>Seoul National University, South Korea</i>	Heat Conduction of Rarefied Gas in Porous Media Su* , Zhang <i>University of Edinburgh, UK</i>	Shock-Tube and Laser Absorption Study of the $N_2 + O \rightarrow NO + N$ Reaction Rate at High Temperatures Streicher* , Krish, Chang, Hanson <i>Stanford University, USA</i>	Rarefied Supersonic Jet of Metal Vapor with a Light Carrier Gas: Cluster Formation Processes Bykov* , Fedorov, Safonov, Starinskiy, Bulgakov <i>Saint Petersburg Polytechnic University, Russia</i>
08:20 – 08:40 01:20 – 01:40 18:20 – 18:40		Rarefied Porous Flow Effects in Lyophilization Wheeler* , Kazarin, Narsimhan, Alexeenko <i>Purdue University, USA</i>	Thermal Conductivity of Molecular Nitrogen from ab initio Direct Molecular Simulations Valentini* , Grover, Bisek, Verhoff <i>University of Dayton Research Institute, USA</i>	Moon Landing: Thrusters Cluster Plume Interactions Modelling Zitouni* , Kast, Peukert <i>OHB, Germany</i>
08:40 – 09:00 01:40 – 02:00 18:40 – 19:00	Study of the Chemical Composition of Pyrolysis Distillate Salokhiddinov* <i>National University of Uzbekistan named after MirzoUlugbek, Uzbekistan</i>	Predicting Rarefied Gas Flow Through Surface Functionalized Channels Kunze* , Besser, Groll, Thöming <i>University of Bremen, Germany</i>	Role of Translational Non-equilibrium Effects on Reactive Dynamics Controlling the Shock to Detonation Transition Using Molecular Dynamics Murugesan* , Radulescu <i>University of Ottawa, Canada</i>	Continuum-based Simulation of the Plume and Dusty Surface Interaction in Lunar Landing Using OpenFOAM Ejtehadi* , Mankodi, Sohn, Myong <i>Chungnam National University, Korea</i>
09:00 – 09:20 02:00 – 02:20 19:00 – 19:20	Transport Coefficients for Dilute Relativistic Degenerate Gases in Arbitrary Dimensions Garcia-Perciante* , Mendez, Chacon-Acosta <i>Universidad Autonoma Metropolitana, Mexico</i>	Prediction of Lyophilized Cake Collapse in the Protein Drug Product based on the Cake Observation Using Micro-CT Kodama* <i>Daiichi Sanyo Co., Ltd., Japan</i>	Quantum Mechanically Guided Simulations of Nonequilibrium Hypersonic Flow Grover* , Valentini, Verhoff, Bisek <i>University of Dayton Research Institute, USA</i>	Calculation of Sputtered Atom Deposition via Non-Maxwellian View Factor Model and Particle VDF Compression Araki* , Martin <i>Air Force Research Laboratory, USA</i>
09:20 – 09:40 02:20 – 02:40 19:20 – 19:40	Locally-implicit Discontinuous Galerkin Schemes for the Kinetic Boltzmann-BGK System That Are Arbitrarily High-Order And Asymptotic-Preserving Rossmannith* , Sar <i>Iowa State University, USA</i>	Macroscopic Model for Unsteady Slip Flow in Porous Media Lasseux* , Valdés-Parada, Bottaro <i>CNRS, University of Bordeaux, France</i>	Bow Shock Stand-off Distance in CO ₂ at Re-entry Velocities: Theoretical Analysis and Numerical Simulation Bondar* , Shoen <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	A Parabolic Supersonic Nozzle for High Center-Line Density for Free Jets Patel* , Thomas, Joshi <i>Institute for Plasma Research, India</i>
09:40 – 10:00 02:40 – 03:00 19:40 – 20:00	Analytical Solution for the Development of Rarefied Shear Flow Mohan* , Sameen, Srinivasan, Girimaji <i>Indian Institute of Technology Madras, India</i>	Temperature Gradient Driven Flows through a Microporous Medium Johansson, Perrier, Topin, Graur* <i>Aix-Marseille University, France</i>	Evaluation of Velocity Gradient Term in Goulard Heat Transfer Theory Jeong , Yang, Yoon, Kim* <i>Sejong University, Korea</i>	Splitting of Laser-induced Plasma Plumes Due to the Snow-plow Effect: Kinetic-continuum Simulations Volkov* , Humphrey <i>University of Alabama, USA</i>
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
	Session W2A: Recent Advances on Emergent Behaviors and Collective Dynamics (Chair:)	Session W2B: Multiphase Flows and Kinetic Modeling (Chair:)	Session W2C: Multiscale, Micro- & Nano-scale Flow and Heat Transfer I (Chair:)	Session W2D: Dust in Lunar Exploration (Chair:)
10:20 – 10:40 03:20 – 03:40 20:20 – 20:40	A Unified Framework for Distributed Optimization Algorithms over Time-varying Directed Graphs Kim* , Choi, Yun <i>Hanyang University, Korea</i>	Particle Impact on the Surface of a High Mach Number Recirculating Double-Cone Flow Liu* , Marayikkottu, Karpuzcu, Levin <i>University of Illinois Urbana Champaign, USA</i>	Thermal Transportation inside Oscillating Cavity over Various Flow Regimes Lim , Xu* <i>Hong Kong University of Science and Technology,</i>	Kinetic Particle Simulations of Plasma Charging and Dust Transport near the Lunar Terminator Han* , Zhao, Lund <i>Missouri University of Science and Technology,</i>

			<i>Hong Kong PRC</i>	<i>USA</i>
10:40 – 11:00 03:40 – 04:00 20:40 – 21:00	Asymptotic Behavior of a System for Coupled Schrodinger Equations Kim* , Park <i>Sungshin Women's University, Korea</i>	Numerical Simulation of Instabilities Emerging in Gravitational Fields Using Kinetic and Continuum Approaches Kashkovsky, Kudryavtsev, Shershnev* <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	Effect of Boundary in Nano-confinement Hossain, Kim* <i>University of Ulsan, Korea</i>	Electrostatic Dust Motion on the Moon and Asteroids: A Review Hartzell* <i>University of Maryland, USA</i>
11:00 – 11:20 04:00 – 04:20 21:00 – 21:20		A Multi-Continuum Model for Gas Flow in Heterogeneous and Hierarchical Porous Media of Shale Reservoirs Wu* , Wang, Wang <i>Colorado School of Mines, USA</i>	Variational Multiscale Moment Methods for the Boltzmann Equations Baidoo* , Abdelmalik, Hughes, Gamba, Caarelli <i>University of Texas at Austin, USA</i>	
11:20 – 11:40 04:20 – 04:40 21:20 – 21:40	Rigorous Derivation of the Euler-alignment Model with Singular Communication Weights from a Kinetic Fokker-Planck-alignment Model Choi, Kim* <i>Korea Institute for Advanced Study, Korea</i>	Numerical Analyzition of Nano-particle Following Features for Rayleigh Scattering Velocity Measurement Test in Low Density Wind Tunnel Zhonghua* , Zhihui, Aiguo, Junlin <i>China Aerodynamics Research and Development Center, China</i>	Simplified Unified Wave-Particle Method and Direct Relaxation Process Liu* , Yang, Fang, Geng, Zhong* <i>Northwestern Polytechnical University, China</i>	Spacecraft Engine Plumes in Near-Vacuum: Earth's Moon and Beyond Hoey* , Soares, Alred, Anderson, Martin, Shallcross, Wong <i>California Institute of Technology, USA</i>
11:40 – 12:00 04:40 – 05:00 21:40 – 22:00		Unified Gas-Kinetic Wave-Particle Method for Gas-Particle Flow in All Regimes Yang, Xu* <i>Hong Kong University of Science and Technology, Hong Kong PRC</i>	Numerical Analysis of Unsteady Rarefied Gas Flows around a Sphere Induced by Impulsive Rotation Tsuji , Taguchi*, Kotera <i>Kyoto University, Japan</i>	
12:00 – 12:20 05:00 – 05:20 22:00 – 22:20		Numerical Simulation of Decent Vehicle Entry in Dust Flow Conditions Polyanskiy* , Zaitsev <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	On the Application of the Regularized Lattice Boltzmann Method for Isothermal Flows with Non-Vanishing Knudsen Numbers Jonnalagadda* , Yadav, Sharma, Agrawal <i>Indian Institute of Science, India</i>	Lunar Dust: Recent Observations and Experimental Studies Zhang* , Gan, Xie <i>Macau University of Science and Technology, Macau</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch			
13:20 – 21:00 06:20 – 14:00 23:20 – 07:00	Excursion			

Time	Thu (July 7th)			
	Room A	Room B	Room C	Room D
07:30 – 08:00 (KST) 00:30 – 01:00 (CEST) 17:30 – 18:00 (CDT)	Registration			
	Session Th1A: Hypersonic Vehicles, Facilities, and Diagnostics I (Chair:)	Session Th1B: Electric Propulsion I (Chair:)	Session Th1C: DSMC VI (Chair:)	Session Th1D: Hypersonic Flows I (Chair:)
08:00 – 08:20 01:00 – 01:20 18:00 – 18:20	Experimental Investigation of Waverider Aerodynamic Forces in Supersonic and Hypersonic Slip Regime Noubel*, Lago, Baranger CNRS, France	Physics-based and Data-driven Models of Low-Temperature Plasmas for Aerospace Applications Hara* Stanford University, USA	Noncontinuum Effects at the Smallest Scales of Turbulence Gallis*, McMullen, Krygier, Torczynski Sandia National Laboratories, USA	Recent Progress of Impulse Facilities at KAIST Park*, Kim, Yang KAIST, Korea
08:20 – 08:40 01:20 – 01:40 18:20 – 18:40	A Canonical Optimization Approach for Waverider Inverse Design Son, Son, Yee* Seoul National University, Korea		Thermal Transpiration Flows Induced by Differences in Accommodation Coefficients Sugimoto*, Sugimoto Kyoto University, Japan	
08:40 – 09:00 01:40 – 02:00 18:40 – 19:00	Doppler-free Saturated Absorption Velocimetry for Low-density Hypersonic Flow Diagnostics Roy*, O’Byrne University of New South Wales, Australia	Ion Transport in the Magnetic Nozzle of Electrodeless Plasma Thrusters for Spacecraft Mazouffre*, Vinci, Inchingolo, Navarro-Cavalle, Fajardo CNRS, ICARE laboratory, France	Direct Simulation Monte Carlo Simulations of 2D Rayleigh-Benard Convection Han, Lo*, Mo National Defense University, Taiwan ROC	Electronic-state-resolved Non-equilibrium Analysis of ICP Discharges Kumar*, Munafo, Panesi University of Illinois at Urbana-Champaign, USA
09:00 – 09:20 02:00 – 02:20 19:00 – 19:20	Numerical Simulation of Aerodynamic Characteristics of a Sharp-edged Vehicle Using NNW-UGKS Dingwu , Jin, Pei*, Meiliang, Haomin China Aerodynamics Research and Development Center, China		PIC Model of Air-breathing Hall thruster Taccogna*, Cichocki, Minelli CNR-ISTP, Italy	
09:20 – 09:40 02:20 – 02:40 19:20 – 19:40	Prediction of Aerodynamic Heating over Hypersonic Flow Using Rapid Aerothermodynamic Analysis Program Yeo, Han, Kim, Seo, Kim* Seoul National University, Korea	The Chemically Reacting Hypersonic Flow over a Reentry Capsule with Hybrid Chemical Reaction Gokul, Malaikannan* SRM Institute of Science and Technology, India		
09:40 – 10:00 02:40 – 03:00 19:40 – 20:00	Numerical Simulation of Operating Characteristics of JF12 Shock Tunnel for Mars Entry Aerodynamic Tests Han*, Hu, Peng, Han, Jiang Chinese Academy of Sciences, China	Part 1: Experimental Studies on Taylor Cone Formation with Annular/Linear Slit Configured Emitter for FEEP Thruster Kwon, Kumar, Kwon, Yoh* Seoul National University, Korea	Recommended Direct Simulation Monte Carlo Collision Model Parameters for Reacting Methane Flows Gosma, Gopalan, Stephani* University of Illinois at Urbana-Champaign, USA	
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
	Session Th2A: Hypersonic Vehicles, Facilities, and Diagnostics II (Chair:)	Session Th2B: Electric Propulsion II (Chair:)	Session Th2C: DSMC VII (Chair:)	Session Th2D: Hypersonic Flows II (Chair:)
10:20 – 10:40 03:20 – 03:40 20:20 – 20:40	Numerical Simulations of Rarefied Gas Flow over an Aero-spiked Hypersonic Blunt Body Using the Second-Order Boltzmann-Curtiss Constitutive Model Chourushi, Singh, Vishnu, R. S. Myong* Gyeongsang National University, Korea	Unique Physical Features of Cylindrical Hall Thruster Plasmas for Low Power Operation Choe*, Kim, Doh, Lim, Lee, Kim KAIST, Korea	Effect of Rarefaction on Axial Vortex Using Direct Simulation Monte Carlo Dhurandhar*, Mohan, Sharma, Sameen Indian Institute of Technology Madras, India	Self-consistent Modeling of ICP Discharges Munafo*, Kumar, Le Maout, Chiodi, Panesi University of Illinois at Urbana-Champaign, USA
10:40 – 11:00 03:40 – 04:00 20:40 – 21:00	Experimental Study of Sphere Drag Measurement in Hypersonic Low-Density Flow Using Accelerometer Lee, Park* KAIST, Korea		Thermally Driven Rarefied Flows Induced by a Partially Heated Diamond in a Channel Zhu, Roohi* Xi’an Jiaotong University, China	

11:00 – 11:20 04:00 – 04:20 21:00 – 21:20	Validity of the Blowing Correction Correlation in Rarefied Flow Regimes Appar , Sivakumar, Bajpai, Kumar*, Naspoori <i>Indian Institute of Technology Kanpur, India</i>	Hybrid Kinetic-Fluid Simulations of Hall Thruster Plasma Dynamics Kawashima* , Komurasaki <i>Shibaura Institute of Technology, Japan</i>	Flow-field and Performance Analysis of Plug Nozzle Under Continuum, Rarefied and Transitional Flow Regimes Jency , Appar, Khan, Kumar* <i>Indian Institute of Technology Kanpur, India</i>	Parameters of CN for Titan Entry Jo, Rostkowski, Panesi* <i>University of Illinois at Urbana-Champaign, USA</i>
11:20 – 11:40 04:20 – 04:40 21:20 – 21:40	A Pump-Probe Laser-Induced Fluorescence Diagnostic for Measuring Velocity Distributions in High-Enthalpy Wind Tunnels Cousens* , O'byme <i>University of New South Wales Canberra, Australia</i>		Hypersonic Turbulence Modeling from Rarefied to Continuum Regimes Tumuklu , Hanquist* <i>University of Arizona, USA</i>	Comparison of Thermochemical Nonequilibrium Models for Hypersonic Flow Analysis in OREX Vehicle Yang , Kim* <i>Sejong University, Korea</i>
11:40 – 12:00 04:40 – 05:00 21:40 – 22:00	Aerodynamic Force Measurement Technique of Free-Flying Model in a Shock Tunnel Choi , Park* <i>KAIST, Korea</i>	R&D Activities of Electric Propulsion at Korea Aerospace Research Institute (KARI) Kim* , Kim, Cho, Doh, Lee, Kim, Choe <i>KAIST, Korea</i>	Monte Carlo Simulation of Thermal Creep Flow Around a Set of Plates with Different Surface Temperatures in a Pipe Matsumoto* , Kurita, Kato <i>Yokohama National University, Japan</i>	
12:00 – 12:20 05:00 – 05:20 22:00 – 22:20	Development of Detonation Driven Shock Tunnels and the Application in Hypersonic Vehicle Tests Hu* , Peng, Han, Han, Jiang <i>Chinese Academy of Sciences, China</i>	Sensitivity Analysis of Mesh-to-Mesh Interpolation in 2D Fluid-Particle Simulation of Hall Thruster Plasma Jung , Sung* <i>Korea Aerospace University, Korea</i>	Multi-Zone Kinetic-continuum Simulation of An Orbit Correction Thruster Back Flow Around a Space Station Kashkovskya* , Bondar <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>	Suitability of Tunable Diode Laser Absorption Spectroscopy Experiments for Low Density Flows Kelly* , Cousens, O'Byrne <i>University of New South Wales, Australia</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch & Poster			
	Session Th3A: Boltzmann and Related Equations III (Chair:)	Session Th3B: Numerical Methods for Kinetic Equations III (Chair:)	Session Th3C: Nanoscale Transport Phenomena at Interfaces I (Chair:)	Session Th3D: Non-equilibrium Reacting Flows II (Chair:)
13:20 – 13:40 06:20 – 06:40 23:20 – 23:40	Simulating Low-speed Rarefied Flows around 3D Particulate and Droplets Duncan Lockerby* <i>University of Warwick, UK</i>	Efficient Compressible Lattice Boltzmann Methods: Numerical Equilibria and Adaptive Mesh in Phase Space Coreixas* , Latt, Shan <i>University of Geneva, Switzerland</i>	"Law of the Nano-wall" in Nano-channel Gas Flows Barisik* <i>Izmir Institute of Technology, Turkey</i>	Theoretical Modeling of Effects of Microstructure on Surface Oxidation under Rarefied Nonequilibrium Conditions Zhang , Wang* <i>University of Chinese Academy of Sciences, China</i>
13:40 – 14:00 06:40 – 07:00 23:40 – 00:00		A symmetry Class Approach to 3D Discrete Collision Models via Computer Algebra Babovsky* , Grabmeier <i>Technische Universität Ilmenau, Germany</i>		Hypersonic Nonequilibrium Prandtl-Meyer Expansion Khraibut* , Gai <i>University of New South Wales, Australia</i>
14:00 – 14:20 07:00 – 07:20 00:00 – 00:20	Measure-valued Solution to the Inelastic Boltzmann Equation with Hard Potentials Qi* , Jang <i>The Chinese University of Hong Kong, Hong Kong, PRC</i>	Solving Kinetic Equations Using Quadrature Based Moment Methods Van Cappellen* , Laboureur <i>von Karman Institute for Fluid Dynamics, Belgium</i>	Nanofluidic Transport under Continuous and Discontinuous Graphitic Confinements Park* <i>POSTECH, Korea</i>	Construction of a Boltzmann Model Equation Synchronously Involving Polyatomic Molecular Internal Energy, Dissociation and Recombination Effects for Multicomponent Gases Wu* , Li, Peng, Jiang <i>China Aerodynamics Research and Development Center, China</i>
14:20 – 14:40 07:20 – 07:40 00:20 – 00:40	Kinetic Theory of Confined Systems Maynar* , Garcia de Soria, Brey <i>Universidad de Sevilla, Spain</i>	Neural Network Assisted Modeling and Simulation of Kinetic Theory and Fluid Mechanics Xiao* Schotthöfer, Frank <i>Karlsruhe Institute of Technology, Germany</i>		Slip Boundary Conditions for Gas Mixture Flows with State-to-state Vibrational-Chemical Kinetics Shakurova* , Kustova <i>Saint Petersburg State University, Russia</i>
14:40 – 15:00 07:40 – 08:00 00:40 – 01:00	Understanding an Instability in Vibrated Granular Monolayers Soria* , Maynar, Brey <i>Universidad de Sevilla, Spain</i>	Nonlinear Approximation of the Boltzmann Equation with an ES-BGK Collision Model Using the Method of Moments van der Woude* Abdelmalik, van Brummelen <i>Eindhoven University of Technology, Netherlands</i>	Exploring the Link Between the Interfacial and Bulk: Functionalized 2D Materials as a Key for Nanoscale Engineering Bakli* <i>Indian Institute of Technology Kharagpur, India</i>	Computational Simulation of Reentry Flows over Hypersonic Vehicles Using Nonlinear Coupled Constitutive Relations Zeng* , Zhao, Jiang, Chen <i>Zhejiang University, China</i>

15:00 – 15:20 08:00 – 08:20 01:00 – 01:20	Moment Equations for a Polytropic Gas Reproducing Adjustable Transport Coefficients Djordjic* , Pavic-Colic, Torrilhon <i>RWTH Aachen, Germany</i>	Simulation of Multi-species Non-equilibrium Gas Flows with the Particle-Based Ellipsoidal Statistical Bhatnagar-Gross-Krook Method Hild* , Pfeiffer <i>University of Stuttgart, Germany</i>	Modeling Molecular Transport Phenomena in Nanochannels, Superlattices and Nanotubes Masuduzzaman, Al Hossain, Karim, Kim* <i>University of Ulsan, Korea</i>	Study on Chemical Reaction Channels of CO ₂ +O ↔ CO + O ₂ Based on ab initio Calculation Furudate* , Hagebaum-Reignier, Jeung <i>Chungnam National University, Korea</i>
15:20 – 15:40 08:20 – 08:40 01:20 – 01:40	Coffee Break			
15:40 – 16:40 08:40 – 09:40 01:40 – 02:40	GNU-ERC Lecture (Thermodynamically Consistent Generalized Hydrodynamic Theory of Flows Far Removed from Equilibrium, Byung-Chan Eu* , <i>McGill University</i>)			
16:40 – 16:50 09:40 – 09:50 02:40 – 02:50	Break			
	Session Th4A: Boltzmann and Related Equations IV (Chair:)	Session Th4B: Numerical Methods for Kinetic Equations IV (Chair:)	Session Th4C: Nanoscale Transport Phenomena at Interfaces II (Chair:)	Session Th4D: Multiscale, Micro- & Nano-scale Flow and Heat Transfer II (Chair:)
16:50 – 17:10 09:50 – 10:10 02:50 – 03:10	A Kinetic Derivation of Cahn-Hilliard Fluid Equations Giovangigli* <i>Ecole Polytechnique, France</i>	Efficient and Accurate Deterministic Solver for the Boltzmann Equation: The Fast Spectral Method and General Iterative Scheme Lei Wu* <i>Southern University of Science and Technology, China</i>	Microfluidic Platform for Rapid and Dynamic Transport Control of Nanoparticles Kim* , Ha, Seo <i>UNIST, Korea</i>	Three-dimensional Unified Gas-Kinetic Wave-Particle Method for Diatomic Gases in Rotational and Vibrational Nonequilibrium Wei, Zhu, Xu* <i>The Hong Kong University of Science and Technology, Hong Kong PRC</i>
17:10 – 17:30 10:10 – 10:30 03:10 – 03:30	Hilbert Expansion Based Fluid Models for Describing Rarefied Gases Interacting with a Plasma Background Medium Maes* , Dekeyser, Koellermeier, Baelmans, Samaey <i>KU Leuven, Belgium</i>			Diffusion-slip Boundary Conditions in Modelling Flows in Micro- and Nano-channels Tomy* , Dadzie* <i>Heriot-Watt University, UK</i>
17:30 – 17:50 10:30 – 10:50 03:30 – 03:50	Dissipation and Dispersion Properties of Discrete Velocity Boltzmann Model on Nine-velocity Lattice Ilyin* <i>Russian Academy of Sciences, Russia</i>		A Comparison of Spectral Current and Temperature Dependent Wavelength of Vibrational Carrier Modes in Carbon Nanotubes and Boron Nitride Nanotubes Anandakrishnan, Sathian* <i>Indian Institute of Technology Madras, India</i>	Approximation of State-Resolved Diffusion Coefficients Using Artificial Neural Networks Bechina, Kustova, Avrutskiy, Chikitkin* <i>Moscow Institute of Physics and Technology, Russia</i>
17:50 – 18:10 10:50 – 11:10 03:50 – 04:10	Balanced States and Closure Relations: Kinetic Models in the Fluid Dynamic Limit Babovsky* <i>Technische Universität Ilmenau, Germany</i>	Exponential BGK Integrator for Multiscale Flow Simulation Garmirian* , Gorji, Pfeiffer <i>University of Stuttgart, Germany</i>	Coherent Phonon Scattering in the Coated Grain Nanocomposites and Their Thermoelectric Performance Kim* <i>Yonsei University, Korea</i>	A data-driven Approach to DSMC-CFD Coupling for Multiscale Gas Flows Tatsios* , Chinnappan, Kamal, Vasileiadis, Gibelli, Docherty, White, Borg, Kermode, Lockerby <i>University of Edinburgh, UK</i>
18:10 – 18:30 11:10 – 11:30 04:10 – 04:30	About Macroscopic Boundary Conditions for Three Dimensional Nonlinear Nonstationary Boltzmann's Moment System of Equations Sakabekov* , Auzhani <i>Satbayev University, Kazakhstan</i>	Advances in the Development of the Fokker-Planck Method for Simulation of Rarefied Gases Basov* , Grabe <i>German Aerospace Center, Germany</i>		Asymptotic Modelling of the Flow of a Thermal Binary Gas Mixture in a Microchannel with Variable Width Croizet* , Gatignol <i>Sorbonne University, France</i>
18:30 – 18:50 11:30 – 11:50 04:30 – 04:50		SMARTA: a Code Based on the View-Factor Method for Collisionless Flows Parodi* , Alsalihi, Magin <i>von Karman Institute for Fluid Dynamics, Belgium</i>	On the Mechanism of the Thermally Induced Tangential Knudsen Force Yonemura* , Otic <i>Chubu University, Japan</i>	Computational Analysis of Pressure-Driven Gas Flows through a Periodical System of Short Channels in Wide Range of Rarefaction Voronich* , Titarev <i>The Russian Academy of Sciences, Russia</i>
19:00 – 21:00 12:00 – 14:00 05:00 – 07:00	Banquet			

Time	Fri (July 8th)			
	Room A	Room B	Room C	Room D
07:30 – 08:00 (KST) 00:30 – 01:00 (CEST) 17:30 – 18:00 (CDT)	Registration			
	Session F1A: Boltzmann Equation and BGK Models: Theory and Numerics I (Chair:)	Session F1B: Space Vehicle Aerodynamics and Propulsion I (Chair:)	Session F1C: Molecular Dynamics and Particle Methods I (Chair:)	Session F1D: Vacuum Technology I (Chair:)
08:00 – 08:20 01:00 – 01:20 18:00 – 18:20	Ellipsoidal BGK Model of the Boltzmann Equation with the Correct Prandtl Number Yun* <i>Sungkyunkwan University, Korea</i>	The VATMOS-SR Mission Concept: DSMC Studies of the Gas Sampling Borner* , Rabinovitch, Gallis, Parai, Petkov, Avice, Sotin <i>AMA Inc. at NASA Ames Research Center, USA</i>	Effect of Confinement on Non-equilibrium Flow of Dense Gases Yonghao Zhang* <i>University of Edinburgh, UK</i>	Estimation of Gas Surface Interaction Coefficients in VKI's Dual Chamber Vacuum Facility Jorge* , Hubin, Magin <i>von Karman Institute for Fluid Dynamics, Belgium</i>
08:20 – 08:40 01:20 – 01:40 18:20 – 18:40		Performance Comparison of Xenon and Krypton Mixture Discharges in 500 W-class Cylindrical Hall Thruster Kim , Park, Doh, Lee, Choe* <i>KAIST, Korea</i>		Modeling Contaminant Outgassing and Free Molecular Transport Processes for the Cryogenic SPHEREx Observatory Alred* , Moore, Susca, Ricchiuti, Rocca, Soares <i>California Institute of Technology, USA</i>
08:40 – 09:00 01:40 – 02:00 18:40 – 19:00	Non-Uniqueness of Stationary Solutions to the Radiative Transfer Equation Jang* , Velázquez <i>Pohang University of Science and Technology, Korea</i>	Reentry Aerothermodynamics of a Deorbiting CubeSat with DragSail Adhikari* , Black, Cofer, Alexeenko <i>Purdue University, USA</i>	Knudsen Minimum Disappearance in Molecular-Confined Flows Corral-Casas* , Li, Borg, Gibelli <i>University of Edinburgh, UK</i>	Evaluation of a Space-borne MLI Performance by Using and Experimental Estimation Kim , Chang, Kim, Huh* <i>Chungnam National University, Korea</i>
09:00 – 09:20 02:00 – 02:20 19:00 – 19:20	Holder Regularity of the Boltzmann Equation Past an Obstacle Kim, Lee* <i>Pohang University of Science and Technology, Korea</i>	Investigation of Gurney Flap on Aerodynamic Characteristics of NACA4412 Airfoil Wang , Li, Jiang*, Mao, Li <i>China Aerodynamics Research and Development Center, China</i>	Comparison of Two Approaches in Molecular Dynamics Simulation of Gas-Surface Interaction Tao , Wang* <i>University of Chinese Academy of Sciences, China</i>	Topological Impact of a Simple Self-Replication Geometric Structure with Great Application Potential in Vacuum Pumping and Photovoltaic Industry Luo* , Day <i>Karlsruhe Institute of Technology, Germany</i>
09:20 – 09:40 02:20 – 02:40 19:20 – 19:40		Plume Simulation of Atmosphere-Breathing-Electric-Propulsion System Moon , Jun* <i>KAIST, Korea</i>	Characterization of Second-order Non-Navier-Fourier Constitutive Laws in Planar and Cylindrical Couette Flow Using Molecular Dynamics Simulations Kammara , Sharma, Myong* <i>Gyeongsang National University, Korea</i>	Rarefied Gas Dynamic Applications in Spacecraft Contamination Control Engineering at NASA JPL Hoey* , Soares, Alred, Anderson, Martin, Shallcross, Wong <i>California Institute of Technology, USA</i>
09:40 – 10:00 02:40 – 03:00 19:40 – 20:00	ES-BGK Model for Diatomic Gases with Translational- Rotational and Translational-Vibrational Energy Exchanges Dauvois, Mathiaud, Mieussens* , Pfeiffer <i>Univ. Bordeaux, France</i>	Similarity Study on The Aeroheating of the Hypersonic Strong Shear-Compression Flow Gao , Wang* <i>University of the Chinese Academy of Sciences, China</i>	Multiscale Modeling of Electrospray Thrusters with Particle-in-Cell and Molecular Dynamics Nuwal* , Azevedo, Klosterman, Levin, Rovey <i>University of Illinois Urbana Champaign, USA</i>	A Direct Simulation Monte Carlo Framework for the Simulation of Mercury Driven Diffusion Pumps for Fusion Reactor Exhaust Pumping Teichmann* , Giegerich, Day <i>Karlsruhe Institute of Technology, Germany</i>
10:00 – 10:20 03:00 – 03:20 20:00 – 20:20	Coffee Break			
	Session F2A: Boltzmann Equation and BGK Models: Theory and Numerics II (Chair:)	Session F2B: Space Vehicle Aerodynamics and Propulsion II (Chair:)	Session F2C: Molecular Dynamics and Particle Methods II (Chair:)	Session F2D: Vacuum Technology II (Chair:)
10:20 – 10:40 03:20 – 03:40 20:20 – 20:40	To be updated Kim* <i>University of Wisconsin Madison, USA</i>	A (very) Quick Overview of NASA Planetary Exploration Missions and the VATMOS-SR Mission Concept Jason Rabinovitch* <i>Stevens Institute of Technology, USA</i>	Multiscale Simulation of Gas Flow in a Micro Thruster Based on the Unified Stochastic Particle BGK method Sun , Hu*, Fei*, Sun Chinese Academy of Sciences, Huazhong <i>University of Science and Technology, China</i>	Accurate Modeling and Simulation of NVBCS Based on the Test Particle Monte Carlo Method Sun* , Li, Wang, Wang, Deng, Zhang <i>Anhui University of Science and Technology, China</i>
10:40 – 11:00 03:40 – 04:00			Bulk Viscosity of Dilute Gases and Their Mixtures Using Equilibrium Molecular Dynamics	Numerical Cooling Power Predictions for a Dilution Refrigerator via Kinetic Modeling

20:40 – 21:00	Small Solutions of the Einstein-Boltzmann System Coupled with a Non-Linear Scalar Field with Bianchi Symmetries Lee* <i>Kyung Hee University, Korea</i>		Approach Sharma, Kumar* , Pareek, Singh <i>Indian Institute of Technology Kanpur, India</i>	Tantos* , Zilz, Day, Adam, Wernsdorfer <i>Karlsruhe Institute of Technology -Campus Nord, Germany</i>
11:00 – 11:20 04:00 – 04:20 21:00 – 21:20		DSMC Calculation and Analysis of Aerodynamic Drag of VLEO Satellite Jiang, Zhang* <i>Beihang University, China</i>	Molecular Dynamics Simulations on Scattering of High-Speed Ar Molecules on Pt(100) Surface Ye, Hu, Sun* <i>University of Chinese Academy of Sciences, China</i>	Simulating the Effect of Background Gas in Stoichiometry of Film Produced by Pulsed Laser Deposition Mata* , Dasallas, Garcia <i>University of the Philippines Diliman, Philippines</i>
11:20 – 11:40 04:20 – 04:40 21:20 – 21:40	Local Velocity Grid Conservative Semi-Lagrangian Schemes for the BGK Model Cho* , Boscarino, Russo <i>Gyeongsang National University, Korea</i>	Axial-Azimuthal Numerical Modeling of Hall Thruster Plasmas to Investigate Electron Anomalous Transport Park, Kim, Doh, Lee, Choe* <i>KAIST, Korea</i>	The Effect of Boundary in Nanoscale Phenomena on the Atomic-level Interface Masuduzzaman, Kim* <i>University of Ulsan, Korea</i>	Recent Advances in the Theory of Kinetic Equations of Collision Dynamics Gapyak* , Gerasimenko <i>Taras Shevchenko National University of Kyiv, Ukraine</i>
11:40 – 12:00 04:40 – 05:00 21:40 – 22:00		Effect of Thermochemical Nonequilibrium on Supersonic Combustion Liu, Yao*, Sun* <i>University of Chinese Academy of Science, China</i>	Desorption Kinetics for Carbon Surfaces with Defects Chaithanya Kondur, Stephani* <i>University of Illinois at Urbana-Champaign, USA</i>	A Meshfree Arbitrary Lagrangian-Eulerian (ALE) Method for the BGK Model of the Boltzmann Equation with Moving Boundaries Tiwari* , Klar, Russo <i>TU Kaiserslautern, Germany</i>
12:00 – 12:20 05:00 – 05:20 22:00 – 22:20	Well-Posedness and Singularity Formation for Vlasov-Riesz System Choi* <i>Yonsei University, Korea</i>	Mixed Flow Charged Aerodynamics for Small Satellite Orbital Predictions Watson* , Glowacki, Parashar, Capon <i>Victoria University of Wellington, New Zealand</i>	Collision Integrals of Interacting Atoms and Ions - Analysis of Used Approximations and Best Practices Buchowiecki* <i>University of Szczecin, Poland</i>	Comparison of Different Time-Stepping Methods Based on the Simulation of an Electron Gun Ott* , Pfeiffer <i>University of Stuttgart, Germany</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch			
	Session F3A: Boltzmann Equation and BGK Models: Theory and Numerics III (Chair:)	Session F3B: Space Vehicle Aerodynamics and Propulsion III (Chair:)	Session F3C: Molecular Dynamics and Particle Methods III (Chair:)	Session F3D: Multiphase Flows and Granular Flows (Chair:)
13:20 – 13:40 06:20 – 06:40 23:20 – 23:40	Conservative Semi-Lagrangian Methods for Kinetic Equations Russo* <i>University of Catania, Italy</i>	Three Dimensional Plasma Discharge in Annular Hall Thruster Channel with Multiple Collision Models in OpenFOAM Anflo, Lee* <i>Seoul National University, Korea</i>	Molecular Dynamics Simulations for Nanoscale Mass Transport Phenomena in Polymer Electrolyte Fuel Cells Takashi Tokumasu* <i>Tohoku University, Japan</i>	Non-monotonic Heat Flux Trends in a Rarefied Granular Gas Hong* , Morris <i>Purdue University, USA</i>
13:40 – 14:00 06:40 – 07:00 23:40 – 00:00		Performance Study of Intake Device for Atmosphere-Breathing Electric Propulsion Jun* <i>KAIST, Korea</i>		Role of Viscosity in Macroscopic Description of Cluster Formation in Granular Flow Suzuki* <i>University of Tokyo, Japan</i>
14:00 – 14:20 07:00 – 07:20 00:00 – 00:20	A Mixed Boltzmann-BGK Model for Gas Mixtures Bisi* <i>University of Parma, Italy</i>	Analysis of DSMC Flow Profiles Generated in Microgap Plasma Thrusters Using Different Electrode Plate Configurations Guevara Jelid* , White, Kontis <i>University of Glasgow, UK</i>	Determination of Shear and Bulk Viscosity of Dilute Gases and Their Mixtures Using Accurate Inter-molecular Potentials Sivakumar, Sharma, Kumar* <i>Indian Institute of Technology Kanpur, India</i>	Surface Polishing Using Particle-laden Gas Flows Garg, Agarwal* <i>Indian Institute of Technology Bombay, India</i>
14:20 – 14:40 07:20 – 07:40 00:20 – 00:40	Derivation Of BGK Models for Complex Gases from Entropy Minimization Brull* <i>Institut de mathématiques de Bordeaux, France</i>	Design of a Low-Reynolds-Number Airfoil for Mars Exploration Airplane Using a Transition Model Jung, Yee, Jeong* <i>Seoul National University, Korea</i>	Air Outflow into Vacuum Periodically Interrupted by Bodies Moving Towards the Jet Yakunchikov* <i>Lomonosov Moscow State University, Russia</i>	Symmetric Simulations of Droplets with a Particle based Vlasov-Enskog-Solver Tietz* , Pfeiffer, Fasoulas <i>University of Stuttgart, Germany</i>
14:40 – 15:00 07:40 – 08:00 00:40 – 01:00	On Multi-Species Kinetic Modeling of Plasma Klingenberg* , Marlies Pirner	Time-stepping Global Stability Analysis of Hypersonic Flows Dylewicz* , Klothakis, Theofilis, Levin <i>University of Liverpool, UK</i>	A Weighted Particle Scheme for Solving the Enskog-Vlasov Equation in Spherical Geometry Busuioc* , Gibelli <i>West University of Timișoara, Vasile Pârvan, Romania</i>	Interaction of Shock Waves in Dilute Rapid Granular Gas Khan, Jaiswal, Patel, Kumar, Kumar* <i>Indian Institute of Technology Kanpur, India</i>

15:00 – 15:20 08:00 – 08:20 01:00 – 01:20	<i>University of Würzburg, Germany</i>	Part 2: Numerical Studies on Taylor Cone Formation and Its Inherent Characteristics for FEEP Thruster Kumar, Kwon, Kwon, Yoh* <i>Seoul National University, Korea</i>	Assessment of Molecular Mean Free Paths and Its Application in Micro/Nanochannel Gas Flows Xie* <i>University of Derby, UK</i>	Uniform Shear Flow in a Granular Gas of Inelastic and Rough Maxwell Particles Santos* , Kremer <i>Universidad de Extremadura, Spain</i>
15:20 – 15:40 08:20 – 08:40 01:20 – 01:40	Relativistic BGK Model for Inert Gas Mixtures Hwang , Lee, Yun* <i>Sungkyunkwan University, Korea</i>	Investigation on the Mode Transition Process in a Three-Dimensional Scramjet Combustor Equipped with a Strut Yan* , Liao, Meng, Huang <i>National University of Defense Technology, China</i>	Stefan-Maxwell Diffusivities of Gas Mixtures, and Onsager's Regression Hypothesis Zyskin* , Monroe* <i>University of Oxford, UK</i>	Kinetic-based Two-phase Flow Model: A Reduced-order Model of Polydisperse Oscillating Droplets with Geometrical Variables Loison* , Pichard, Kokh, Massot <i>Ecole Polytechnique, France</i>
15:40 – 16:00 08:40 – 09:00 01:40 – 02:00	BGK Model for Multi-Component Gases Near a Global Maxwellian Bae , Klingenberg, Pirner, Yun* <i>Sungkyunkwan University, Korea</i>		Performance Evaluation of CLL-Kernel Using Accommodation Coefficients Obtained by the Classical and the Correlation Method Nejad* , Nedea, Frijns <i>Eindhoven University of Technology, Netherlands</i>	
16:00 – 18:00 09:00 – 11:00 02:00 – 04:00	Farewell Party			

Poster Presentations (45; On-site In-Person & Virtual)

¹KST, CEST, CDT

Time ¹	Tue (July 5th)	Wed (July 6th)	Thu (July 7th)
	Virtual Poster Session T1		Virtual Poster Session Th1
10:20 – 10:30 03:20 – 03:30 20:20 – 20:30	The First DSMC Model Created on COMSOL Multiphysics® Denpoh* <i>Tokyo Electron Technology Solutions Ltd, Japan</i>		Design Exploration on the Mixing Augmentation Mechanism Induced by the Cantilevered Ramp Injector in the Shock-induced Combustion Ramjet Engine Du, Huang* , Yan <i>National University of Defense Technology, China</i>
10:30 – 10:40 03:30 – 03:40 20:30 – 20:40	Accurate Modeling and Simulation of a Rotor-stator Row Based on the Test Particle Monte Carlo Method Sun* , Zhang, Han, Zhao, Zhang, Han <i>Northeastern University, China</i>		Effect of High-Altitude Atmosphere on Resonant Rossiter Frequencies of Cavity Flow Uthpala , Lee, Myong, Lee* <i>Gyeongsang National University, Korea</i>
10:40 – 10:50 03:40 – 03:50 20:40 – 20:50	On the Role of Finite Size of Vehicles and Multilane Highways in the Traffic Flow Fundamental Diagram Méndez* , Marques Jr, Velasco <i>Universidad Autónoma Metropolitana- Cuajimalpa, Mexico</i>		Calculation of Newtonian Aerodynamic Coefficients with Mesh Refinements Using Kernel Interpolation Jo , Furudate* <i>Chungnam National University, Korea</i>
10:50 – 11:00 03:50 – 04:00 20:50 – 21:00	Variational Approach to Thermal Creep Flow in Microchannels on the Basis of the Linearized Boltzmann Equation for Hard-Sphere Molecules and General Boundary Conditions Nguyen* , Lorenzani <i>FPT University, HCM, Vietnam</i>		Reflected Shock Data Interpretation with the DSMC Method Wysong* , Streicher, Krish, Hanson, Gimelshein <i>Air Force Research Laboratory, USA</i>
11:00 – 11:10 04:00 – 04:10 21:00 – 21:10	Numerical Simulation for OLED Manufacturing Process in High Vacuum System Park* , Seo, Lee, Seo, Shon <i>Metariver Technology Co., Korea</i>		Numerical Investigation of Pyrolysis Gas Interaction with Hypersonic Reentry Flow-Field Appar , Bajpai, Naspoori, Kumar* <i>Indian Institute of Technology Kanpur, India</i>
11:10 – 11:20 04:10 – 04:20 21:10 – 21:20	3D Density Field of Shock Tube by Background Oriented Schlieren Technique and Physics Informed Neural Networks Hur , Lee* <i>Seoul National University, Korea</i>		A Second Order Velocity Slip and Temperature Jump Boundary Condition for Thermodynamic Non Equilibrium Flows Liu* , Wu <i>Southern University of Science and Technology, China</i>
11:20 – 11:30 04:20 – 04:30 21:20 – 21:30	A Multi-Prediction Implicit Scheme for Gas Flow in All Flow Regimes Yuan* , Wu, Liu, Zhong <i>Southern University of Science and Technology, China</i>		Design and Optimization of Hypervelocity and High-Enthalpy Nozzles Wang* , Jiang <i>Chinese Academy of Sciences, China</i>
11:30 – 11:40 04:30 – 04:40 21:30 – 21:40	Rarefied Cylindrical Couette Flow with Different Boundary Surface Temperatures Abramov, Alexandrov*, Butkovskii <i>Central Aerohydrodynamic Institute, Russia</i>		Surface Defect and Al ₂ O ₃ -Nanoparticle Bombardment on Graphite Surface Jeon , Kwon, Lee, Park* <i>Gyeongsang National University, Korea</i>
11:40 – 11:50 04:40 – 04:50 21:40 – 21:50	Axisymmetric Simulation of Interaction of Rocket Exhaust with Lunar Surfaces Shaik* , Gavasane, Mankodi, Bhandarkar <i>Indian Institute of Technology Bombay, India</i>		Extending Low-rank Radiation Transport Methods and Exploring Partial Frequency Re-distribution Applications Cambier* , Taitano, Abrantes <i>Air Force Research Laboratory, USA</i>
11:50 – 12:00 04:50 – 05:00 21:50 – 22:00	The Knudsen Number Effect of Hypersonic Flow over a Re-Entry Capsule Gokul , Malaikannan* <i>SRM Institute of Science and Technology, India</i>		Runtime based Weighted N-way Partitioning Scheme for Direct Simulation Monte Carlo Codes Mankodi* <i>Indian Institute of Technology Guwahati, India</i>
12:00 – 12:10 05:00 – 05:10 22:00 – 22:10	Numerical Investigation of Thermal Creep like Flow in Micro-Channels with Different Temperature Quadrilaterals Han* , Wang, Zhang, Zhang <i>Northeastern University, China</i>		Analysis of Continuum Breakdown of Jet Interaction with Rarefied Flow Yang , Song, Wang, Sun* <i>Chinese Academy of Sciences, China</i>
12:10 – 12:20 05:10 – 05:20 22:10 – 22:20	Non-equilibrium Shock Wave Structure in Supersonic Granular and Molecular Gas Bajpai , Appar, Khan, Kumar, Kumar*		DSMC Simulations of High-Speed Flow Instabilities Kashkovsky* , Kudryavtsev, Shershnev <i>Khrstianovich Institute of Theoretical and Applied Mechanics SB</i>

	<i>Indian Institute of Technology Kanpur, India</i>		<i>RAS, Russia</i>
12:20 – 13:20 05:20 – 06:20 22:20 – 23:20	Lunch & Poster (On-site)	Lunch	Lunch & Poster (On-site)
	Virtual Poster Session T2		Virtual Poster Session Th2
13:20 – 13:30 06:20 – 06:30 23:20 – 23:30	Numerical Analysis of Flow Field according to Nozzle Shape in LPCVD Furnace Ji, Sohn, Ko* <i>Sungkyunkwan University, Korea</i>		Effect of Velocity Slip and Temperature Jump at the Fluid-Solid Interface in a Coupled Chemically Reacting Flow Appar, Sivakumar, Kumar* <i>Indian Institute of Technology Kanpur, India</i>
13:30 – 13:40 06:30 – 06:40 23:30 – 23:40	G13-Based Moment Gas Kinetic Solver for Steady and Unsteady Rarefied Flows: Discrete and Explicit Form Liu*, Shu <i>National University of Singapore, Singapore</i>		Deep Learning Methods for CH4 and CO2 Detection in Near and Shortwave Infrared Spectral Ranges Jang, Kim* <i>Inha University, Korea</i>
13:40 – 13:50 06:40 – 06:50 23:40 – 23:50	Lagrangian-Lagrangian Simulation of Dusty Gas Flow Past a Cylinder Bajpai, Bhavsar, Appar, Bhateja, Kumar* <i>Indian Institute of Technology Kanpur, India</i>		Supersonic Gas Flow into a Vacuum through a Forward and Backward Facing Step in a Wide Range of Rarefaction Sazhin* <i>Ural Federal University, Russia</i>
13:50 – 14:00 06:50 – 07:00 23:50 – 00:00	On Some Recent Advances in the Kinetic Theory of Collisional Dynamics Gapyak*, Gerasimenko <i>Taras Shevchenko National University of Kyiv, Ukraine</i>		Non-stationary Rarefied Gas Flow in a Channel with Oscillating Barriers in a Wide Range of Knudsen Numbers Kosyanchuk* <i>Lomonosov Moscow State University, Russia</i>
14:00 – 14:10 07:00 – 07:10 00:00 – 00:10	Reynolds Analogy for the Rarefied Gas Flow Past a Flat Plate at Zero Incidence: Similarity Parameters Abramov, Butkovskii* <i>Central Aerohydrodynamic Institute, Russia</i>		Local Nonequilibrium Molecular Distribution Function Reconstruction from the Continuum Models Timokhin*, Rukhnikov, Bondar <i>Lomonosov Moscow State University, Russia</i>
14:10 – 14:20 07:10 – 07:20 00:10 – 00:20	Rarefied Gas Flow Past a Flat Plate Abramov, Butkovskii* , Buzykin <i>Central Aerohydrodynamic Institute, Russia</i>		The Effect of Source Pressure on a Coating Process Using the Aerosol Deposition Method Agir*, Cao, White, Kontis <i>University of Glasgow, UK</i>
14:20 – 14:30 07:20 – 07:30 00:20 – 00:30	Lattice Boltzmann Solver for One-dimensional Computational Hemodynamics: Applications to Modeling of Pressure Losses in Arterial Networks Ilyin*, Kochergin, Stroganov <i>Federal Research Center "Computer Science and Control" of the Russian Academy of Sciences, Russia</i>		Hypersonic Boundary Layer Flow with an Obstacle in the Near Continuum Regime Chen, Stemmer* <i>Technical University of Munich, Germany</i>
14:30 – 14:40 07:30 – 07:40 00:30 – 00:40	A Fick's Law Recovering Relaxation BGK Operator for General Mixtures of Gases Brull, Guillon* , Thieullen <i>Institut de Mathématiques de Bordeaux, France</i>		Accommodative Dependence of the Photophoresis of a Fine Aerosol Particle Chernyak, Sograbi* <i>Ural Federal University, Russia</i>
14:40 – 14:50 07:40 – 07:50 00:40 – 00:50	Homogenous States of Granular Gases of Inelastic Hard Spheres under Nonlinear Drag Megias, Santos* <i>Universidad de Extremadura, Spain</i>		GPU Code Implementation for Numerical Solving of Multidimensional Kinetic Equations Malkov*, Kudryavtsev <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>
14:50 – 15:00 07:50 – 08:00 00:50 – 01:00	Implementation of Test Particle Monte-Carlo Codes in the Development of a Metal Foil Pump Kathage*, Luo, Day <i>Karlsruhe Institute of Technology, Germany</i>		Comparative Analysis of Numerical Schemes for the Vlasov Kinetic Equation Malkov*, Kudryavtsev <i>Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia</i>
15:00 – 15:10 08:00 – 08:10 01:00 – 01:10			Granular Flow past an Elliptical Obstacle Bhavsar, Bajpai, Khan, Kumar* <i>Indian Institute of Technology Kanpur, India</i>