SUNDAY 11

room Apulia – Congress Centre

10.30 RGD 24 Opening Chairman: M. Capitelli
11.00 Harold Grad Lecture Chairman: C. Cercignani

Cédric Villani
Convergence to equilibrium: entropy production and hypocoercivity

Boltzmann and Related Equations
Chairman: K. Aoki

12.00 Mario Pulvirenti (Invited) Su-1
On the Quantum Boltzmann Equation

12.40 R. Gatignol, C. Croizet Su-2
Kinetic Modelling of a Heterogeneous Dispersed Medium

13.00 Lunch

15.00 L.H. Söderholm Su-3
Nonlinear acoustics to second order in knudsen number without unphysical instabilities

15.20 H. Cabannes, Li-Shi Luo Su-4
The discrete Boltzmann equation: the regular plane model with four velocities

15.40 M. Galler, F. Schürrer Su-5
Stability analysis of a multigroup model for the Boltzmann transport equations of carriers and phonons

16.00 R. Monaco, M. Pandolfi Bianchi, A.J. Soares Su-6
A reactive BGK-type model: influence of elastic collisions and chemical interactions

16.20 C. Auer, F. Schürrer Su-7
A semi-continuous Boltzmann equation for particles with general dispersion relations

17.00-19.00 Poster Session

21.00 C. Cercignani Chairman: G.A. Bird
Evening Lecture: “From Nice to Bari: 46 years of RGD Symposia”

room Albatros – Congress Centre

Internal Flows and Vacuum Systems
Chairman: E.P. Muntz

12.00 Ching Shen (Invited) Su-8
Information preservation method - a tool in simulating rarefied gas flows in MEMS

Flows of a binary mixture of rarefied gases between two parallel plates

13.00 Lunch

15.00 K. Yamamoto, H. Takeuchi, T. Hyakutake Su-10
Effect of surface grooves on the rarefied gas flow between two parallel walls

15.20 F. Sharipov Su-11
Gas outflow through an orifice into a background gas

15.40 Y.L. Han, M. Young, E.P. Muntz, G. Shiflett Su-12
Knudsen compressor performance at low pressures

16.00 H. Sugimoto, Y. Sone Su-13
Vacuum pump without a moving part driven by thermal edge flow

16.20 O.A. Aksenova, I.A. Kalidov Su-14
Application of nonlinear dynamics methods to rarefied gas flows in channels
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<td>M. Young, Y.L. Han, E.P. Muntz, G. Shiflett</td>
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<td>Estimates of the flow conditions in low-density hypersonic plasma wind-tunnels</td>
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<td>M.K. Kwon, S.Y. Lee, Y.K. Hwang</td>
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<td>G. Stringano, R. Verzicco</td>
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<td>T. Soga, A. Nakamishi, T. Miyasaka</td>
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**Kinetic and Transport Theory**

**Chairperson:** R. Gatignol

**9:00**  
**Alexander Bobylev (Invited)**  
Self-similar solutions of the Boltzmann equation with elastic and inelastic interactions

**9:40**  
**R. Pettersson**  
On stationary solutions to the linear Boltzmann equation with inelastic granular collisions

**10:00**  
**Y. Sone, T. Doi**  
Instability of the plane couette flow by the ghost effect of infinitesimal curvature

**10:20**  
**A. Manela, I. Frankel**  
On the Rayleigh-Bénard problem in rarefied gases

**11:00**  
**G.J. Hadjiconstantinou**  
A second-order slip model for hard-sphere gases

**11:20**  
**E.V. Kustova, E.A. Nagnibeda, A. Chikhaoui**  
Non-equilibrium effects in reacting gas flows

**11:40**  
**A. Santos**  
Kinetic theory of soft matter. The penetrable-sphere model

**12:00**  
**A.J. Christlieb, J.A. Rossmanith, P. Smereka**  
The limiting behavior of the Broadwell model: flow in a thin channel

**12:20**  
**A.I. Erofeev, O.G. Friedlander, M.N. Kogan**  
Quasi equilibrium Knudsen boundary layers

**12:40**  
**P. Facchi**  
Quantum Zeno effect in a multilevel molecule

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**Rarefied Jets and Plumes**

**Chairman:** J.C. Lengrand

**9:00**  
**Jean-François Crifo (Invited)**  
Unbound neutral atmosphere in the solar system

**9:40**  
**G.A. Lukyanov, V.V. Zakharov, A.V. Rodionov, J.F. Crifo**  
Comparison between Navier-Stokes and Direct Monte-Carlo Simulations of the rarefied gas flow from model cometary nuclei

**10:00**  

**10:20**  
**A.S. Kudryavtsev, A.L. Makas, A.K. Rebrov,**  
**P.A. Skovorodko, M.L. Troshkov**  
Numerical simulation of collision-induced dissociation of large molecular ions in mass-selective detector with atmospheric pressure chemical ionization

**10:40**  
**I.G. Khalil, D.R. Miller**  
The free-jet expansion of supercritical CO₂ from a capillary source

**11:20**  
**M. Taniguchi, H. Mori, R. Nishihira, T. Niimi**  
Experimental analyses of flow field structures around clustered linear aerospace nozzles

**11:40**  
**P.V. Vashchenkov, A.N. Kudryavtsev, G.N. Markelov, M.S. Ivanov**  
DSMC study of backflow for nozzle plumes expanding into vacuum

**12:00**  
**P. Vankan, D.C. Schram, R. Engeln**  
Anomalous inflow into rarefied plasma expansion

**12:20**  
**A.D. Ketsdever, T.C. Lilly, S.F. Gimelshein, A.A. Alexeenko**  
Experimental and numerical study of nozzle plume impingement on spacecraft surfaces

**12:40**  
**M. Woronowicz**  
Solid rocket motor backflow analysis for CONTOUR mishap investigation
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<td>D. D’Ambrosio, D. Giordano, A. Viviani</td>
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<td>Experimental and theoretical studies of inelastic and reactive ion-molecule systems at low collision energies: cross-section energy dependence and theoretical dynamical studies</td>
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<td>Characterization of strong and weak intermolecular Hydrogen bonding by Fourier Transform Microwave Spectroscopy</td>
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**Monte Carlo Methods and Numerical Solutions 2**  
Chairman: A.K. Rebrov

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<td>G.A. Lukyanov</td>
<td>Unsteady outflow of the vapor into vacuum from the flat surface</td>
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<td>Y. Onishi, K. Yamada</td>
<td>Evaporation and condensation flows of a vapor-gas mixture from or onto the condensed phase with an internal structure</td>
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<td>Y. Onishi, T. Ooshida</td>
<td>Flows of a vapor due to phase change processes at the condensed phases with temperature fields as their internal structures</td>
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<td>T. Ishiyama, Y. Tano, S. Fujikawa</td>
<td>Molecular dynamics study on the evaporation part of the kinetic boundary condition at the interface between water and water vapor</td>
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<td>A. Frezzotti, L. Gibelli, S. Lorenzani, C. Fajdiga</td>
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<td>S. Takata</td>
<td>Half-space problem of weak evaporation and condensation of a binary mixture of vapors</td>
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<td>M.I. Zeifman, J. Zhong, D.A. Levin</td>
<td>Applicability of the homogeneous nucleation theory to the condensation in unsteady gas expansion</td>
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**State-to-State Kinetics**  
Chairperson: C. Gorse

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<td>R. Yano, K. Suzuki, H. Kuroda</td>
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<td>Tu-12 Modeling vibrationally favored dissociation with the macroscopic chemistry method</td>
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<td>H. Yamaguchi, S. Takagi, Y. Matsumoto</td>
<td>Tu-13 Vibrational relaxation/excitation collision model of diatomic molecules for rarefied gas flows</td>
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<td>T. Tokumatsu, K. Kamijo, A. Miyamoto</td>
<td>Tu-15 Quantum Molecular Dynamics Simulation of dissociative adsorption of H$_2$/Pt(111)</td>
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<td>L. Bedra, M.J.H. Balat-Pichelin, M. Rutigliano, M. Cacciatore</td>
<td>Tu-16 A combined MD simulation and experimental investigation of the O$_2$ formation on β-quartz at high temperature</td>
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**Molecular Beams 2**  
Chairmen: U. Even, F. Pirani

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<td>A.J. van den Brom, R.L. Toomes, C. Murray</td>
<td>Tu-18 Product scattering of H-abstraction from small organic molecules</td>
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<td>N. Balucani, G. Capozza, E. Segoloni, P. Casavecchia, G.G. Volpi</td>
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<td>Tu-20 Crossed beam studies of C(P$_1$) reactions of interstellar interest</td>
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Monte Carlo Methods and Numerical Solutions 3
Chairman: W. Wagner

15,00 P.D. O’Connor, L.N. Long, J.B. Anderson Tu-22
Monte Carlo simulations of ultrafast detonations in mixtures

15,20 Y.A. Bondar, M.S. Ivanov, G.N. Markelov, S.F. Gimelshein Tu-24
DSMC study of shock-detachment process in hypersonic chemically reacting flow

15,40 S.K. Stefanov, V.M. Roussinov, C. Cercignani Tu-25
Three-dimensional Rayleigh-Bénard convection of a rarefied gas: DSMC and Navier-Stokes calculations

16,00 V.Y. Rudyak, S.L. Krasnolutskii Tu-26
Kinetic theory of nanoparticles diffusion in rarefied gases

16,20 F. Ladeinde, X. Cai, R. Agarwal Tu-27
On the stability of Higher-Order Continuum (HOC) equations for hybrid HOC/DSMC solvers

Granular Gases
Chairmen: A. Frezzotti, J. J. Brey

15,00 J.M. Montanero, A. Santos, V. Garzó Tu-28
DSMC evaluation of the Navier-Stokes shear viscosity of a granular fluid

15,20 V. Garzó Tu-29
Impurities in inelastic Maxwell models

15,40 M. Ernst, E. Trizac, A. Barrat Tu-30
The rich behaviour of the Boltzmann equation for dissipative fluids

16,00 J.J. Brey, M.J. Ruiz-Montero Tu-31
Heat flux and upper boundary condition in an open fluidized granular gas

16,20 J.J. Brey Tu-32
Green-Kubo representation of the transport coefficients of dilute granular gases

Molecular Beams 3
Chairman: F. Huisken

15,00 J. de Andrés, M. Sabidó, J. Sogas, J.M. Lucas, M. Albertí, J.M. Bofill, A. Aguilar Tu-33
Electronic excitation and charge transfer processes in collisions between alkali ions and neutral atoms and molecules: cross-sections in the 0.1-4.0 eV energy range

15,30 R.F.M. Lobo, N.T. Silva, M.S. Costa Tu-34
Selective induced negative fragmentation of C60 by atomic electron transfer collisions

Clusters of biomolecules in supersonic beam: chiral discrimination and energetics

17,00-19,00 Poster Session

21,00 F. Selleri Chairman: M. Capitelli
Evening Lecture: “The Uncertainty Relations and the Causal Interpretation of Quantum Theory”
M. Ellero, M. Tessarotto
Continuous inverse kinetic theory for incompressible fluids
Tu-36
P. Nicolini, M. Tessarotto
Theory of stochastic transitions in area preserving maps
Tu-37
G. Zuppardi
Evaluating anisotropy and thermodynamic non-equilibrium in hypersonic transitional regime
Tu-38
L. Pareschi, S. Trazzi, G. Russo, A.A. Shevyrin, Y.A. Bondar, M.S. Ivanov
Comparison between TRMC and MFS methods for the space homogeneous Boltzmann equation
Tu-40
L. Pareschi, S. Trazzi, G. Russo, A.A. Shevyrin, Y.A. Bondar, M.S. Ivanov
Plane Couette flow computations by TRMC and MFS methods
Tu-41
A.V. Kashkovsky, Y.A. Bondar, G.A. Zhukova, M.S. Ivanov, S.F. Gilmelshein
Object-oriented software design of real gas effects for the Direct Simulation Monte Carlo method
Tu-42
M.N. Macrossan, M.V. Metchnik, P.A. Pinto
Hypermolecular flow over a wedge with a particle flux method
Tu-43
V.P. Menmonova
Simulation of transitional nanoscale channel flows on several parallel clusters with enhanced reliability and surface roughness accounting
Tu-44
H. Akatsuka, M. Asami
DSMC Simulation of transport phenomena of neutral particles in a positive column of a DC arc discharge
Tu-45
T.G. Elizarova, I.A. Shirokov, S. Montero
Shock wave structure for Argon, Helium and Nitrogen
Tu-46
D.A. Fedosov, S.V. Rogasinsky, M.S. Ivanov, A.A. Alexeenko, D.A. Levin
Analysis of numerical errors in the DSMC method
Tu-47
E.V. Titov, D.A. Levin
Application of the DSMC technique to the modeling of a dense, low Reynolds' number MEMS device
Tu-48
D.Y. Dankov, S.K. Stefanov
Influence of boundary conditions and chemical reactions on the Rayleigh-Bénard convection of a rarefied gas mixture
Tu-49
L.A. Gochberg
Radiative heat transfer computations as a free molecular flow modeling tool
Tu-50
Y. Pechatnikov
Probable simulation of gas flows in transition range
Tu-51
S.V. Koulikov
Translational nonequilibrium of a gas by flow in vacuum through the constant cross-section channel
Tu-52
D. Valougeorgis, S. Naris
A fast iterative synthetic method for discrete velocity calculations
Tu-53
A Hybrid Molecular Dynamics-Monte Carlo Simulations for the properties of a dense and dilute hard-sphere gas in a microchannel
Tu-54
K. Nanbu, Y. Hareyama, S. Kanemoto
Diffusion of ion clusters generated by $\alpha$-Rays
Tu-55
M.J. McNenly, I.D. Boyd
Low discrepancy particle simulation of collisionless flows with a local source term
Tu-56
K. Nanbu, T. Otsuka
Motion of nanoparticles in gas flows
Tu-57
H. Matsumoto, J.P.W. Stark, A. Nuno
Monte Carlo simulation of thermal conduct of dissociating Nitrogen gas between flat plates
Tu-58
C.M. Teixeira
Simulation of Plane Poiseuille flow of a rarefied gas with an Extended Lattice Boltzmann method
Tu-59
Ye.A. Bondar, S.F. Gilmelshein, M.S. Ivanov, I.J. Wysong
On the accuracy of DSMC modeling of rarefied flows with real gas effects
Tu-60
N. Tsuibo, Y. Matsumoto
DSMC simulation of non-uniform flow effects behind a conical nozzle
Tu-61
D. Bruno, S. Longo
Dynamics of fluid dynamics fluctuations by particle simulations
Tu-62
L.V. Pletnev
Simulation of evaporation of a monoatomic condensed phase into a Knudsen layer by Monte Carlo and Molecular Methods
Tu-63
Verification of the reaction level rate constant models on the basis of trajectory calculations
Tu-64
E.M. Anokhin, A.Yu. Starikovskii
Non-equilibrium radiation and physical-chemical processes in Martian atmosphere in strong shock waves
Tu-65
N. Belouagadja, T. Saito, R. Brun, K. Takayama
A statistical model for vibration-chemical reaction interaction: extension to gas mixtures
Tu-66
S.A. Losev, M.Yu. Pogosbekian, E.A. Nagnibeda, E.V. Kustova
State-to-state reaction rate coefficients, distributions and gas dynamics behind strong shock waves
Tu-67
A. Aliat, E.V. Kustova, A. Chikhaoui
Vibration-electronic kinetics and radiation in a non-equilibrium CO flow behind a shock wave
Tu-68
V. V. Shumov
Modeling of kinetics of highly excited molecular states in shock-heated jets of CO$_2$
Tu-69
V.I. Khorunzhenko, D.V. Roupassov, A.Yu. Starikovskii
Energy transfer in hypersonic N$_2$O$_2$ plasma flow
Tu-70
H. Akatsuka, K. Kano
Stationary population inversion in an expanding Argon plasma jet by Helium puffing
Tu-71
W.J. Goedheer, Yu.I. Chutov
PIC/MC modeling of dusty plasmas
Tu-72
WEDNESDAY 14

Transport in Plasmas
Chairman: R. Brun

9,00 G. Colonna, M. Capitelli We-11
Plasma expansion in presence of electric and magnetic fields

9,20 P. Nicolini, M. Tessarotto, A. Beklemishev We-12
Relativistic kinetic theory of magnetoplasmas

9,40 D. Bruno, C. Catalfamo, M. Capitelli,
D. Giordano, A. Laricchiuta We-13
Transport properties of equilibrium Ar plasma in a magnetic field

10,00 V.L. Savelev, K. Nanbu We-14
Exact forms of representation of Boltzmann collision integral as a divergence of the flow in velocity space

10,20 A.J. Christlieb, R. Krasny, J. Emhoff,
I. Boyd We-15
Grid-free plasma simulations based on hierarchical treecode field solvers

10,40 J.R. Torczynski, M.A. Gallis, D.J. Rader We-16
DSMC simulations of fourier and couette flow: Chapman-Enskog behavior and departures therefrom

11,20 G.M. Alves, G.M. Kremer We-17
Transport coefficients of a single reactive gas

11,40 I. Armenise, M. Capitelli, E.V. Kustova We-18
State-to-state kinetics and transport properties of a reactive air flow near a re-entering body surface

12,00 M.A. Rydalevskaya We-19
Kinetic foundation of nonextensive gas dynamics

12,20 P. Nicolini, M. Tessarotto We-20
Canonical Lie-transform method in Hamiltonian gyrokinetics: a new approach

12,40 V. Sofonea, G. Gonnella, A. Lamura We-21
Lattice Boltzmann Method for phase-separating liquid-vapor systems

Molecular Beams 4
Chairman: A. G. Ureña

9,40 M. Alagia, F. Biondini, B. G. Brunetti, P. Candori,
S. Falcinelli, M. Moix Texidor, F. Pirani, R. Richter,
S. Stranges, F. Vecchiocattivi We-22
Double photo-ionization of Hydrogen Halide molecules

10,00 P. Piseri, H. Vahedi Tafreshi, F. Di Fonzo,
G. Bongiorno, S. Vinati, A. Podestà, E. Barborini,
P. Milani We-24
Aerodynamic separation for the production of high intensity cluster beams

10,30 S. Shiozaki, I. Kinefuchi, Y. Sakiyama, S. Takagi,
Y. Matsumoto We-25
Development of high energy molecular beam source using small shock tube

11,30 W. Caminati We-26
Molecular Beam Fourier Transform Microwave Spectroscopy of small molecular complexes

12,00 G. Pietraperzia, M. Becucci, M. Pasquini, G. Piani,
A. Zoppi, E. Castellucci We-27
Structural determinations and dynamics on floppy molecular systems

12,30 Ph. Dugourd, M. Abd El Rahim, R. Antoine,
M. Broyer, I. Compagnon, D. Rayane We-28
Molecular beam deflection: electric dipole and structure of clusters and biomolecules
**Microflows**

**Chairmen:** R. Barber, S. Stefanov

**9.00**

S. Stefanov, R.W. Barber, M. Ota,  
D.R. Emerson  
*Comparison between Navier-Stokes and DSMC calculations for low Reynolds number slip flow past a confined microsphere*

**9.20**

Y. Sun, R.W. Barber, D.R. Emerson  
*The impact of accommodation coefficient on concentric couette flow*

**9.40**

K. Aoki, M. Hatano, S. Kosuge, T. Takata  
*Diffusiophoresis of a spherical volatile particle*

**10.00**

C. Cercignani, M. Lampis, S. Lorenzani  
*Flow of a rarefied gas between parallel and almost parallel plates*

**10.20**

D.A. Lockerby, J.M. Reese, D.R. Emerson,  
R.W. Barber  
*Geometry curvature dependence in the solid-wall velocity boundary condition for rarefled flows*

**10.40**

D.A. Lockerby, J.M. Reese, M.A. Gallis  
*A wall-function approach to capturing the Knudsen layer in practical gas microfluidic geometries*

**11.20**

Ying He, M. Ota, S.K. Stefanov  
*Carbon deposition on blade surfaces of laser microactuator for optical MEMS*

**11.40**

C.L. Bailey, R.W. Barber, D.R. Emerson,  
D.A. Lockerby, J.M. Reese  
*A critical review of the drag force on a sphere in the transition flow regime*

**12.00**

W.W. Liou, Y. Fang, G.A. Bird  
*Direct numerical simulation of forced micro couette flow using DSMC*

**12.20**

I.A. Graur, I.G. Meolans, D.E. Zeitoun  
*Gaseous slip flow in microchannels*

**12.40**

S. Naris, D. Valougeorgis  
*Micro-cavity gasflow simulation*

**Rarefied Plasmas**

**Chairman:** K. Nanbu

**9.00**

Savino Longo (Invited)  
*Monte Carlo simulation of charged species kinetics in non equilibrium gases*

**9.40**

H. Takekida, K. Nanbu  
*Particle modeling of plasmas in reactors with multipolar magnetic field*

**10.00**

J.-S. Wu, K.-H. Hsu, K.-C. Tseng  
*Parallel particle modeling of plasma dynamics in a DC-magnetron sputtering chamber*

**10.20**

V. Lago, H. Oussadi  
*Investigation of CO₂ containing arc-jet plasma with optical spectroscopy emission and electrostatics probes*

**10.40**

L. Albarede, V. Vial, A. Lazurenko, A. Bouchoule,  
M. Dudeck  
*Stationary and dynamical behavior of hollow cathode: diode regime and with SPT 100 Hall thruster*

**11.20**

F. Taccogna, S. Longo, M. Capitelli,  
R. Schneider  
*Geometrical scaling of hall thruster particle model*

**11.40**

B. Ezrar, M. Lino da Silva, M. Dudeck  
*Plasma transitional regime jets production using ARES code*

**12.00**

M. Lino da Silva, F. Passarinho,  
M. Dudeck  
*Strong shock-wave interaction with an expanding plasma flow: influence on the CN molecule internal modes*

**12.20**

A.V. Eremin, A.V. Shmakov, V.Yu. Velikodny,  
V.S. Ziborov  
*Nonequilibrium UV radiation of molybdenum atoms in a weak shock wave front*

**12.40**

T. Alexandrova, M. Lino da Silva,  
M. Dudeck  
*Nozzle flow modelling with arc-jet discharge heating in the state-to-state approach*

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**THURSDAY 15**

**Molecularr Beams 5**

**Chairman:** T. Kasai, Ph. Bréchignac

**10.00**

L. Vattuone, A. Gerbi, M. Rocca, U. Valbusa,  
F. Pirani, D. Cappelletti, F. Vecchiocattivi  
*Th-22 Stereodynamics of hydrocarbon adsorption at Ag surfaces*

**10.30**

T. Toccoli, A. Pallaoro, L. Aversa, S. Chiarani,  
N. Coppedè, M. Nardi, F. Siviero, A. Boschetti,  
R. Verucchi, E. Cazzanelli, S. Iannotta  
*Th-23 Growth of organics by Supersonic Beams (SuMBE): a kinetic approach to control thin film properties*

**11.30**

J. Baudon, J.-C. Karam, F. Perales, M. Boustimi,  
J. Grucker, J. Reinhardt, G. Vassilev, C. Mainos,  
J. Robert, H. Haberland  
*Th-24 Coherent metastable rare gas atom beam to study van der Waals interaction with micro- and nano-structured surfaces*

**12.00**

E. Kolodney, A. Bekkerman, B. Tsipinyuk  
*Th-25 Charge transfer in hyperthermal Fullerene-surface collisions*

**12.30**

T.M. Bernhardt  
*Th-26 Low temperature and low pressure gas phase reactions of mass-selected noble metal cluster ions*
**Experimental Procedures in RGD 2**  
Chairman: D.C. Schram

15,00 **Bruno Chanetz (Invited)**  
Experimental aspects of code validation in hypersonics flows  

15,40 **H. Mori, T. Niimi, M. Hirako, Y. Oshima**  
Application of PSP to surface pressure measurement in high Knudsen number flows  

16,00 **E. Depussay, E. Menier, V. Lago**  
Recent developments and applications of Doppler Global Velocimetry in hypersonic wind tunnels  

16,20 **D.E. Cecil, J.C. McDaniel, C.E. Glass**  
Planar laser-induced iodine fluorescence measurements in rarefied hypersonic flow

17,00-19,00 **Poster Session**

21,00 **Social Dinner**

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**Gas Phase Molecular Collision Dynamics**  
Chairperson: I. Wysong, D. Bruno

15,00 **Yoichiro Matsumoto (Invited)**  
Multiscale modeling of molecular collision dynamics  

15,40 **T. Ozawa, D.A. Fedosov, D.A. Levin**  
Modeling of OH product distributions using QCT-MD and BL models in a bow shock  

16,00 **N. Faginas Lago, A. Laganà**  
A comparison of semiclassical IVR and exact quantum collinear atom diatom transition probabilities for mixed reactive and non reactive regimes  

16,20 **E.V. Kustova, E.A. Nagnibeda**  
Deviations from the mass action law in non-equilibrium gas flows

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**Molecular Beams 6**  
Chairman: W. Caminati

15,00 **M. Velegrakis**  
Structural characterization of large molecules and clusters by molecular beam photofragmentation spectroscopy and scattering experiments  

15,30 **Van-Oanh Nguyen-Thi, S. Douin, P. Parneix, Ph. Bréchignac**  
A laser–molecular-beam technique to study fragmentation dynamics in large cations  

16,00 **M. Schmitt, Chr. Plützer, I. Hünig, K. Kleinermanns**  
Laser spectroscopy of biomolecules and their aggregates in molecular beams
**POSTER SESSION THURSDAY 15**

Chairpersons: D.A. Levin, M. Lampis

T. Pot, B. Chanetz  
Fundamental study of hypersonic shock interactions about double cones  
Th-38

J.K. Kakkassery, J. Kurian  
Laser interferometric measurement of shear stress in low density flows  
Th-39

L.M. de Socio, L. Marino  
Rarefied flow through a packed bed of spheres  
Th-40

V. Lago, E. Depussay, P. Lasgoceix, A. Lebehot, J.P. Martin  
The facilities of the Laboratoire d’Arothermique at Centre National de la Recherche Scientifique - Orleans  
Th-41

P.F. Ambrico, G. Dilecce, S. De Benedictis  
ICP plasma jet for target interaction studies of a supersonic O atoms stream  
Th-42

V.M. Azriel, D.B. Kabunov, L.Yu. Rusin  
Dynamics of collision-induced dissociation of two molecules with ionic bond  
Th-43

L.I. Kurkina, V.S. Drozdov, V.S. Rudnev, A.A. Vostrikov  
Molecular-dynamics simulation of structure and properties of neutral and charged water clusters  
Th-44

T. Yano, K. Kobayashi, S. Fujikawa  
Condensation of methanol vapor onto its liquid film on a solid wall behind a reflected shock wave  
Th-45

M.I.H. Balat-Pichelin, V.L. Kovalev, A.F. Kolesnikov, A.A Krupnov  
An analysis and predicting the efficiency of atomic Oxygen recombination and chemical energy accommodation on heated silica surfaces  
Th-46

T. Hyakutake, K. Yamamoto, H. Takeuchi  
Numerical analysis of gas mixtures flow through micro/nano channel  
Th-47

M.Yu. Plotnikov, A.K. Rebrov  
Direct Monte Carlo Simulation of the transverse supersonic rarefied gas flow past a cylinder  
Th-48

A.Ph. Polikarpov, Ph.J. Polikarpov, S.F. Borisov  
A Silicon crystal microbalance for normal momentum transfer study in a gas/surface system  
Th-49

O. V. Sazhin, S.F. Borisov  
Gas-surface scattering influence on thermal transpiration in channels  
Th-50

V. Guerra  
Analytic solutions for the probability of atomic surface recombination as a function of surface parameters  
Th-51

E. Molinari, M. Tomellini  
Vibrational populations of the adlayer in exoergic processes at solid surfaces  
Th-52

A.V. Gusarov  
Discrete velocity numerical approach to strong evaporation of Graphite  
Th-53

J.G. Batishcheva, V.V. Vedenyapin  
On the motion of solid particle in rarefied gas, sorbing on its surface  
Th-54

A.L. Bondareva, V.D. Levchenko, G.I. Zmievskaia  
Stochastic simulation of termoemission from surfaces of dusty grains  
Th-55

A.L. Bondareva, T.V. Levchenko, G.I. Zmievskaia, E.N. Moos  
Stochastic simulation of fluctuation stage of phase transfer on solid surface during thin film formation.  
Th-56

M.V. Anolik  
The scattering of rarefied gas atoms on rough surfaces  
Th-57

S. Chable, F. Rogier  
Numerical modeling of hall thruster  
Th-58

M. Shimada, R.J. Cattolica, G.R. Tynan  
Measurements of radial and axial neutral gas temperature in a semi-conductor plasma reactor  
Th-59

A.J. Christlieb, R. Krasny, J. Emhoff, I. Boyd  
Plasma simulations for arbitrary domains with applications to ion optics  
Th-60

A.A. Vostrikov, L.I. Kurkina, D.Yu. Dubov, A.A. Agarkov, V.A. Galichin  
Formation of charged and excited particles produced by cluster-electron interaction  
Th-61

D. Bruno, M. Capitelli, F. Esposito, S. Longo, P. Minelli  
DSMC-QCT modeling of dissociation kinetics in Nitrogen  
Th-62

D. Pagano, C. Gorse, M. Capitelli, F. Carbutti  
Hydrogen plasmas for negative ion production  
Th-63

P. Diomede, S. Longo, M. Capitelli  
Capacitively coupled radio frequency discharge plasmas in Hydrogen: particle modeling and negative ion kinetics  
Th-64

M. Capitelli, O. De Pascale, V. Shakatov, K. Hassouni, G. Lombardi, A. Gicquel  
Non-equilibrium vibrational kinetics in radiofrequency H$_2$ plasmas: a comparison between theoretical and experimental results  
Th-65

M. Capitelli, A. Laricchiuta, R. Celiberto, A.V. Kosarim, B.M. Smirnov  
Electron-molecule collision cross-sections for air kinetics  
Th-66

G. Seller, M. Capitelli, S. Longo, I. Armenise, D. Bruno  
MHD of aircraft re-entry: limits and perspectives  
Th-67
**FRIDAY 16**

**Gas - Surface Interaction**

Chairman: M. Cacciatore

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
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<tbody>
<tr>
<td>9,00</td>
<td><strong>Sergei F. Borisov (Invited)</strong></td>
<td>Progress in gas-surface interaction study</td>
</tr>
<tr>
<td>9,40</td>
<td><strong>M.J.H. Balat-Pichelin, L. Bedra, J.M. Badie, P. Boubert</strong></td>
<td>Atomic Oxygen recombination and chemical energy accommodation on alumina at high temperature</td>
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<tr>
<td>10,00</td>
<td><strong>H. Takeuchi, K. Yamamoto, T. Hyakutake</strong></td>
<td>Behavior of the reflected molecules of a diatomic gas at a solid surface</td>
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<tr>
<td>10,20</td>
<td><strong>O.A. Aksenova, I.A. Khalidov</strong></td>
<td>Fractal and statistical models of rough surface interacting with rarefied gas flow</td>
</tr>
<tr>
<td>10,40</td>
<td><strong>I. Kinefuchi, H. Yamaguchi, S. Shiozaki, Y. Sakiyama, Y. Matsumoto</strong></td>
<td>Out-of-plane scattering distribution of Nitrogen molecular beam on graphite (0001) surface</td>
</tr>
<tr>
<td>11,20</td>
<td><strong>Y. Sakiyama, Y. Iga, S. Takagi, and Y. Matsumoto</strong></td>
<td>Multiscale analysis for gas-surface interaction of hyperthermal SiH₄ and Si (100) surface</td>
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<tr>
<td>11,40</td>
<td><strong>B.C. D’Souza, A.D. Ketsdever, E.P. Muntz</strong></td>
<td>Investigation of transient forces produced by gases expelled from rapidly heated surfaces</td>
</tr>
<tr>
<td>12,00</td>
<td><strong>O.E. Gerasimova, S.F. Borisov, S.P. Protsenko</strong></td>
<td>The study of momentum and energy transfer in a gas/solids system by Molecular Dynamics method</td>
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<tr>
<td>12,20</td>
<td><strong>J.G. Méolans, S.K. Dadzie</strong></td>
<td>Scattering Kernel in polyatomic gases</td>
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<tr>
<td>12,40</td>
<td><strong>S.K. Dadzie, J.G. Méolans</strong></td>
<td>Anisotropic scattering kernel and temperature jump at the wall</td>
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**Non Equilibrium Plasma Kinetics (Hypersonics and Scramjets)**

Chairmen: D. Giordano, S. Borrelli, G. Colonna

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<tr>
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<tbody>
<tr>
<td>9,00</td>
<td><strong>Sergey O. Macheret (Invited)</strong></td>
<td>Weakly ionized plasmas in hypersonics: fundamental kinetics and flight applications</td>
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<tr>
<td>9,40</td>
<td><strong>M.A. Gallis, K.A. Boyles, G.J. LeBeau</strong></td>
<td>DSMC simulations in support of the Columbia Shuttle Orbiter accident investigation</td>
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<tr>
<td>10,00</td>
<td><strong>G.R. Inger</strong></td>
<td>Viscous effects on cooled Pitot tubes in hypersonic low Reynolds number flows</td>
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<tr>
<td>10,20</td>
<td><strong>E. Chabut, J.C. Lengrand, M.E. Sokolova, T.G. Elizarova</strong></td>
<td>Numerical simulation of a Mars-entry flow</td>
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<tr>
<td>10,40</td>
<td><strong>J.C. McDaniel</strong></td>
<td>Dual-mode scramjet operation at a Mach 5 flight enthalpy in a clean air test facility</td>
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<tr>
<td>11,20</td>
<td><strong>E. Josyula, D. C. Wadsworth, K. Xu</strong></td>
<td>Testing continuum and non-continuum descriptions in high speed flows</td>
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<tr>
<td>11,40</td>
<td><strong>H. F. Liu</strong></td>
<td>Hypersonic rarefied flow simulation using 2D unstructured DSMC with free stream condition</td>
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<tr>
<td>12,00</td>
<td><strong>R.V. Maltsev, A.K. Rebrov</strong></td>
<td>Hypersonic transversal flow of rarefied gas mixture past infinite band</td>
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<td>12,20</td>
<td><strong>I.G. Brykina, B.V. Rogov, G.A. Tirskiy</strong></td>
<td>Continuum approach to hypersonic aerodynamics and heat transfer prediction at low Reynolds numbers</td>
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<tr>
<td>12,40</td>
<td><strong>A. Passaro, L. Biagioni</strong></td>
<td>Comparison of DSMC computations and experimental results for shock-wave/boundary-layer interaction</td>
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