NEGF 26

5th European Conference on Non-Equilibrium Gas Flows

PROGRAM

MARCH 25TH–27TH 2026

Toulouse, Maison de la Formation Jacqueline Auriol (MFJA)
1 Rue Tarfaya, 31400 Toulouse

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contact@shf-hydro.org | www.shf-hydro.org | **https://negf26.sciencesconf.org/**

Tuesday, March 24th 2026

PROGRAM

Meeting place :
Office de tourisme, Donjon du Capitole, Square Charles de Gaulle, 31000 Toulouse

16:30-18:30 - Guided tour of Toulouse
Free guided visit of Toulouse - registration is mandatory

You will discover the Place du Capitole; the Basilica of Saint-Sernin, a masterpiece of Romanesque art and a major stop on the pilgrimage routes to Santiago de Compostela; the Church of the Jacobins, the mother house of the Dominican Order with its remarkable architecture; and finally the banks of the Garonne River, offering splendid views of Toulouse's most iconic landmarks.

Donna Restaurant

19:00-22:00 - Welcome Party
Donna Restaurant, 8 rue Gabriel Péri, 31000 Toulouse

Wednesday, March 25th 2026

PROGRAM

Lecture Hall 001

08:30-09:15 - Onsite registration

09:15-09:30 – Welcoming word

09:30-10:30 - SESSION 1 - AEROTHERMODYNAMICS & SHOCKWAVES
Chair : Domenico BRUNO

09:30-09:45 (15min) - Coupled Flow-Thermal Analysis of a Rocket Nozzle with Charring Ablative Thermal Protection System - Rakesh Kumar, Indian Institute of Technology

09:45-10:00 (15min) - Simulation of the Entry of a Sphere into a Nitrogen Atmosphere with a Vibrational-Specific Model - Marie-Claude Druguet, Aix-Marseille Université

10:00-10:15 (15min) - Dynamics of MHD Flows in Low-Density Argon Plasmas at a Stagnation-Point Disk - Mattéo Comito, ONERA/ICARE

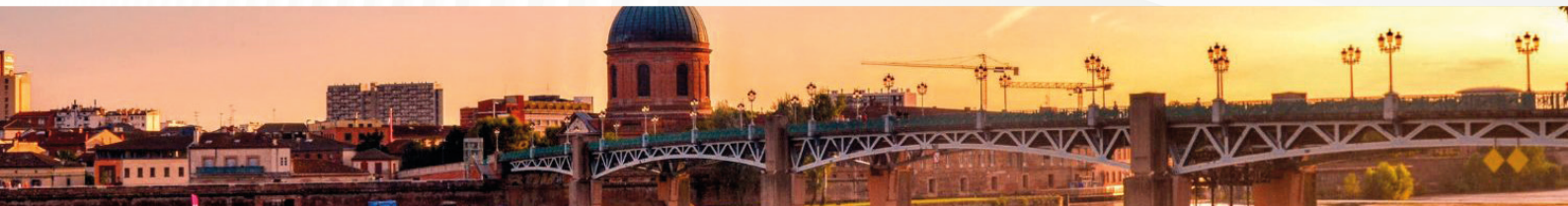
10:15-10:30 (15min) - Extension of UniGasFoam Solver to Multiscale Rarefied Polyatomic Gas Flows - Nikos Vasileiadis, Flow Matters Consultancy BV

Aeronautics Hall

10:30 - 11:00 - Coffee break

Lecture Hall 001

11:00-11:45 (45 min) Plenary Lecture 1: **Flying at Very Low Earth Orbit: An Application of Aerothermochemistry** - Thierry Magin, von Karman Institute for Fluid Dynamics.
Chair : Stéphane Colin



Wednesday, March 25th 2026

PROGRAM

Lecture Hall 001

11:45-13:00 – SESSION 2 - AEROTHERMODYNAMICS & SHOCKWAVES
Chair: Manuel TORRILHON

11:45-12:00 (15min)- A Novel Splitting Scheme and Its Application to Stochastic Particle Simulation of Diatomic Gas Flows - Ziqi Cui, Beihang University

12:00-12:15 (15min) - Hybrid Approach to Modeling Coupled Vibrational–Chemical Relaxation in Carbon Dioxide Mixtures - Denis Kravchenko, St Petersburg State University

12:15-12:30 (15min) - Kinetic Modelling of Chemically Reacting Mixtures: A BGK-Type Approach - Anna Macaluso, University of Parma

12:30-12:45 (15min) - Shock Thickness Analysis in Multi-Temperature Navier–Stokes Equations for Binary Inert Mixtures - Giorgio Martalo, University of Pavia

12:45-13:00 (15min) - Shock Wave Dynamics in Non-Equilibrium Gas Flow Regimes: Insights from Grad-Type Moment Systems - Satyvir Singh, RWTH Aachen University

Aeronautics Hall

13:00-14:15 – Lunch break

Lecture Hall 001

14:15-16:00 - SESSION 3 - MOMENTUM AND MASS TRANSPORT IN RAREFIED GAS FLOWS
Chair : Arjan FRIJNS

14:15-14:30 (15min) - Enhancing DSMC Simulations of Rarefied Gas Using a Fast-Converging and Asymptotic-Preserving Scheme - Lei Wu, Southern University of Science and Technology

14:30-14:45 (15min) - Efficient Adjoint Optimization of Rarefied Gas Flows - Lei Wu, Southern University of Science and Technology

14:45-15:00 (15min) - A Denoising Multiscale Particle Method for Simulating Nonequilibrium Gas Flows - Hao Yang, Beihang University

15:00-15:15 (15min) - Experimental Measurements of Acetone Diffusion Coefficients in Gas Mixtures by Molecular Tagging - Andrea Luccon, University of Toulouse

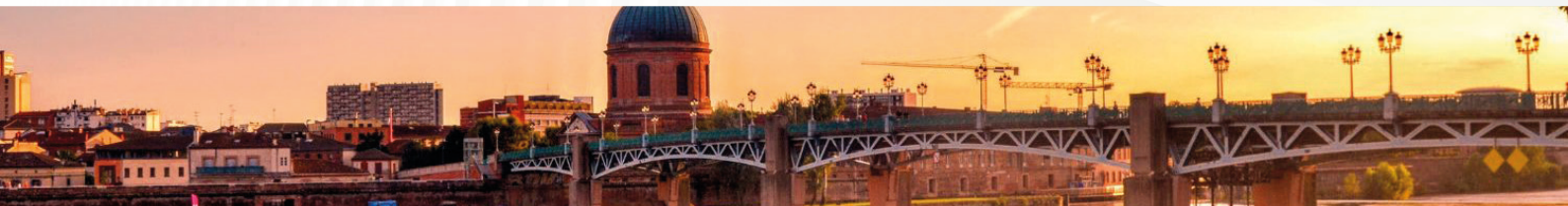
15:15-15:30 (15min) - Measurements of Helium Argon Mixture Using Constant Volume Technique - Irina Graur, Aix-Marseille Université

15:30-15:45 (15min) - On the Generation of Corner Flow Circulation at Highly Rarefied Conditions - Din Ben-Adva, Israel Institute of Technology

15:45-16:00 (15min) - Estimation of N_2 Volume Viscosity by Classical Trajectories Simulation - Domenico Bruno, Italian National Research Council

Aeronautics Hall

16:00-16:30 - Coffee break



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Lecture Hall 001

16:30-18:15 - SESSION 4 - MOMENTUM AND MASS TRANSPORT IN RAREFIED GAS FLOWS

Chair : Lei WU

16:30-16:45 (15min) - From 3D Tensors to 1D: A Reduction Strategy for Moment Closures in Multidimensional Systems - Eda Yilmaz, RWTH Aachen University

16:45-17:00 (15min) - High-Order Schemes for Stochastic Particle Solution of Fokker–Planck Kinetics - Montanaro Veronica, Swiss Federal Institute of Material Sciences

17:00-17:15 (15min) - Domain Decomposition for the Boltzmann Equation - Revanth Kollegala Sharma, Technische Universiteit Eindhoven

17:15-17:30 (15min) - Molecular Dynamics-Informed Collision Kernels for Polyatomic Gases - Bas Gieling, Technische Universiteit Eindhoven

17:30-17:45 (15min) - Non-Equilibrium Thermodynamics of Oriented Granular Gases Ben Nadler, University of Victoria

17:45-18:00 (15min) - Correcting Navier-Stokes-Fourier System for Rarefied Flows with Non-Linear Super-Stencil - Yijun Wang, ETH Zurich

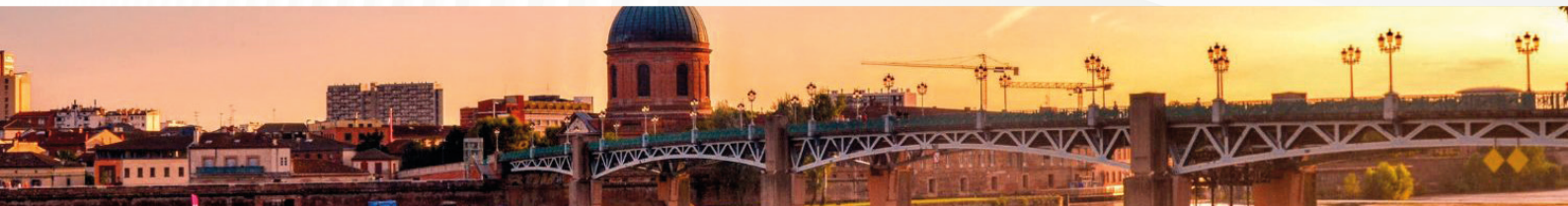
18:00-18:15 (15min) - Model-Adaptive Simulation of Moment Equations for Capturing Nonequilibrium Regions in Rarefied Gas Flows - Rik Verbiest, University of Groningen

J'Go Restaurant

20:00 - 22:30 - Scientific Committee Dinner

Le J'Go, Gascon Restaurant & Bodega

Free evening & scientific committee dinner for CS members



Thursday, March 26th 2026

PROGRAM

Lecture Hall 001

08:45-10:00 - SESSION 5 - GAS-SURFACE AND PLASMA-WALL INTERACTION
Chair : Stylianos VAROUTIS

08:45-09:00 (15min) - Thermal and Gas-Surface Interaction Effects in Rarefied Rayleigh-Bénard Convection - Sanjana Rao, IIT Madras

09:00-09:15 (15min) - Gas–Surface Interaction Models for Very Low Earth Orbit (VLEO) Systems - Ahilan Appar, Universidad Carlos III de Madrid

09:15-09:30 (15min) - Experimentally Determining the Effect of Gas–Surface Interactions on Particle Dynamics in Rarefied Flows - Rick Jansen, indhoven University of Technology

09:30-09:45 (15min) - Thermodynamically Consistent Incorporation of the Langmuir Adsorption Model into Compressible Fluctuating Hydrodynamics - Changho Kim, University of California

09:45-10:00 (15min) - Direct Estimation of Gas-Surface Accommodation Coefficients Using Supervised Machine Learning - Manish Muni Krishna, Eindhoven University of Technology

Aeronautics Hall

10:00 - 10:30 - Coffee break

10:30 - 11:15 (45min) - Plenary Lecture 2 - **Photophoretic Levitation: From Aerosols to Aircraft** - Ben Schafer, Rarefied Technologies Inc., Harvard University John A. Paulson School of Engineering and Applied Sciences - *Chair : Pierre Perrier*

Lecture Hall 001

11:15 - 12:45 - SESSION 6 - SENSORS, ACTUATORS, PUMPS, HEAT EXCHANGERS, AND OTHER DEVICES - *Chair : Martin WÜEST*

11:15-11:30 (15min) - Design and Modelling of Knudsen Micropumps Fabricated via Advanced Laser Manufacturing - Thanasis Basdanis, University of Toulouse

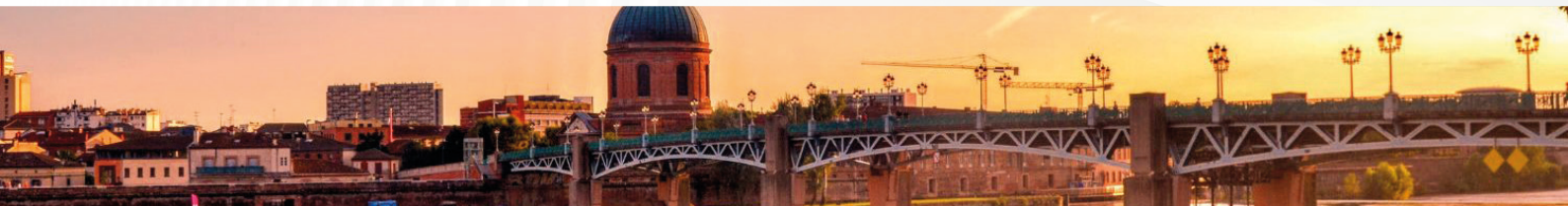
11:30-11:45 (15min) - Realization of Friction Reduction Acting on an Object Utilizing Knudsen Force - Hiroki Yamaguchi, Toyota Technological Institute, Nagoya University

11:45-12:00 (15min) - Microregenerators Designed for Oscillatory Gas Flows inside Cryocoolers - Samuel Bonnet, Université Grenoble Alpes

12:00-12:15 (15min) - Fabrication of a Knudsen Micropump For Operation Above Atmospheric Pressures - Phassawat Leelaburanathanakul, University of Toulouse

12:15-12:30 (15min) - Actuation of Artificial Micro-Muscles Using a Knudsen Micropump Marcos Rojas-Cárdenas, University of Toulouse

12:30-12:45 (15min) - Performance Study on a Knudsen Pump Prototype Fabricated via Two-Photon-Polymerization - Franz Schweizer, University of Toulouse



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Lecture Hall 001	**12:45 - 13:00 - Ceremony and Group Photo**
Aeronautics Hall	**13:00-14:15 – Lunch break**
Lecture Hall 001	**14:15 - 16:00 - SESSION 7 - NON-EQUILIBRIUM PLASMA FLOWS** *Chair : Dimitris VALOUGEORGIS*

14:15-14:30 (15min) - Radiometric Forces on Structures Composed of Coaxial Rings
Benjamin Schafer, Rarefied Technologies Inc., Harvard University John A. Paulson School of Engineering and Applied Sciences

14:30-14:45 (15min) - H-Theorems for Dense Inert and Reactive Mixtures with Application to Global in Time Existence of Solutions - Jacek Polewczak, California State University

14:45-15:00 (15min) - Hyperbolicity of a Hermite-Laguerre Moment Model for the Plasma Edge in Slab Geometry - Julian Koellermeier, Ghent University

15:00-15:15 (15min) - Space Charge Compensation of Hydrogen Ion Beams: A Particle-in-Cell Study - Benzi John, STFC Daresbury Laboratory

15:15-15:30 (15min) - Ionic Wind Induced by a Dielectric Barrier Discharge between a Needle Tip and the Surface of a Liquid - Eric Moreau, University of Poitiers

15:30-15:45 (15min) - Cold Plasma-Induced Liquid Flow: What Is the Role of Electrohydrodynamic Phenomena? - Eric Moreau, University of Poitiers

15:45-16:00 (15min) - The Key Role of Non-Equilibrium Gas Flows on Edge Plasma Behavior and Exhaust Efficiency in Nuclear Fusion Reactors - Stylianos Varoutis, Max Planck Institute for Plasma Physics

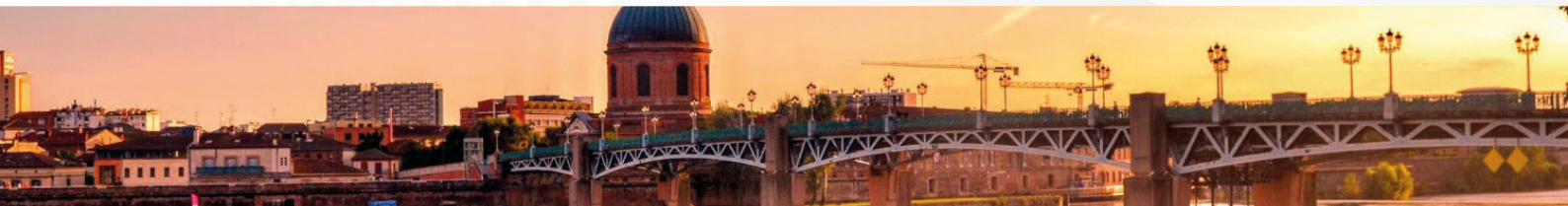
Aeronautics Hall	**16:00-16:30 - Coffee break**
Lecture Hall 001	**16:30 - 18:30 - SESSION 8 - HEAT TRANSFER IN RAREFIED GAS FLOWS** *Chair : Lucien BALDAS*

16:30-16:45 (15min) - Generalized Thermodynamically Admissible 13-Moment Equations
Luke Bell, University of Victoria

16:45-17:00 (15min) - Anomalous Nonequilibrium Effects in Supersonic Rarefied Flows
Vladimir Aristov, Russian Academy of Sciences

17:00-17:15 (15min) - A Semi-Lagrangian Method for the Polyatomic ESBGK Model and Its Comparison to DSMC - Erik Arlemark, ASML

17:15-17:30 (15min) - Particle Reduction Schemes for Binning-Based Merging Approaches in Variable-Weight DSMC - Georgii Oblapenko, RWTH Aachen University



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Lecture Hall 001

17:30-17:45 (15min) - DSMC Evaluation of the Thermophoretic Force on Micron-Sized Particles in Rarefied Gas Conditions with Hermite Boundary Domain Truncation - Ralf Reinartz, Eindhoven University of Technology

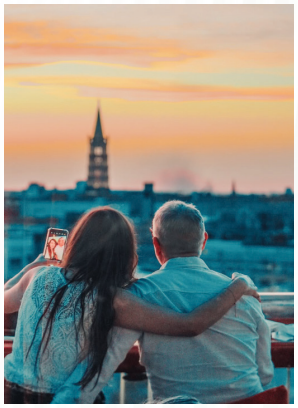
17:45-18:00 (15min) - Raman Thermometry of Confined Gas Microflows - José Maria Fernández, Instituto de Estructura de la Materia

18:00-18:15 (15min) - The Use of the Thermophoretic Force for Aerosol Particle Separation Irina Graur, Aix-Marseille University

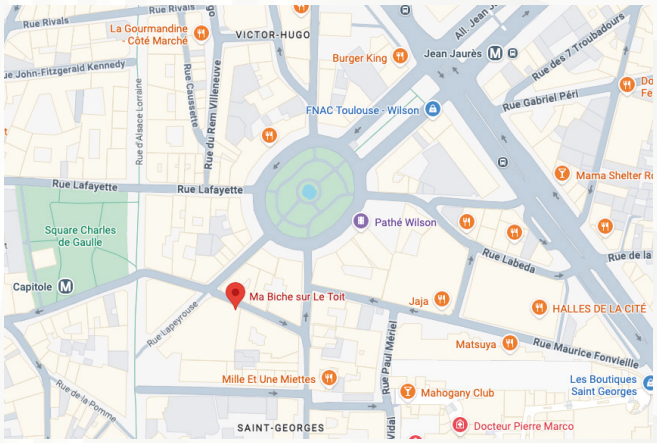
18:15-18:30 (15min) - Gas Transport through a Capillary Bundle Induced by a Temperature Gradient - Junhao Tu, Aix-Marseille University

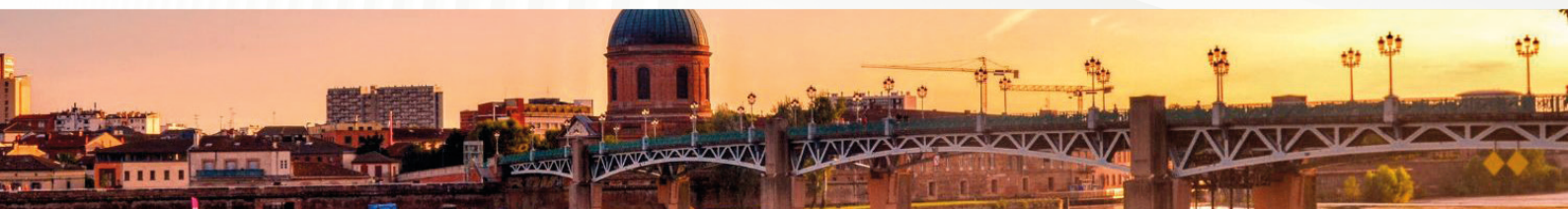
Ma Biche Sur Le Toit

20:00 - 23:30 - Conference Dinner
Ma biche sur le toit Rooftop Restaurant & Bar



How to get there :
Galeries Lafayette
(6th Floor)
4-8 rue du lieutenant colonel Pélissier,
31000 Toulouse





Friday, March 27th 2026

PROGRAM

Lecture Hall 001

08:30 - 9:45 - SESSION 9 - MULTIPHASE MICROFLOWS AND INTERFACIAL PHENOMENA
Chair : Irina GRAUR

08:30-08:45 (15min) - Mass and Heat Transfer at Liquid–Vapor Interfaces: Real Gas and Nonlinearity - Henning Struchtrup, University of Victoria

09:00-09:15 (15min) - Molecular Kinetic Modelling of Surface-Confined Evaporative Flows - Yonghao Zhang, Chinese Academy of Sciences

09:15-09:30 (15min) - Nonlocal Moment Equations for Liquid-Vapor Flows - Aldo Frezzotti, Politecnico di Milano

09:30-09:45 (15min) - A Conforming Interface Approach for Phase Transitions in Rarefied Gas Dynamics Based on the R13 Equations - Manuel Torrilhon, RWTH Aachen University

Aeronautics Hall

09:45 - 10:15 - Coffee break

Lecture Hall 001

10:45-11:00 (45min) - Plenary Lecture 3 - Thermally-Induced Flows in Microfluidic Systems: From Optothermal Fluidic Experiments to Non-Equilibrium Gaseous Modeling
Tetsuro Tsuji, Kyoto University - *Chair : Marcos Rojas-Cárdenas*

11:00 - 11:45 - SESSION 10 - GAS FLOWS IN FLUIDIC MICROSYSTEMS
Chair : Erik ARLEMARK

11:00-11:15 (15min) - Interfacial Resistivities from a Shakhov-Enskog Kinetic Model
Gaetan Brunetto, University of Toulouse

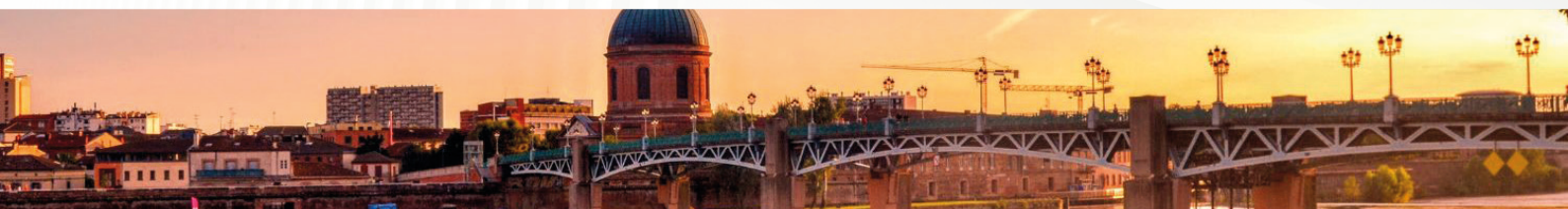
11:15-11:30 (15min) - Evaporation & Condensation Coefficients under Non-Equilibrium Conditions - Arjan Frijns, Eindhoven University of Technology

11:30-11:45 (15min) - Consistent Lattice Boltzmann Modeling of Low-Speed Isothermal Flows in the Slip Flow Regime: A Unified Slip Velocity Boundary Scheme - Goncalo Silva, Universidade de Évora

11:45 - 12:00 (15min) - Closing Word - Lecture Hall 001

Aeronautics Hall

12:00 - 13:00 - Lunch break



Friday, March 27th 2026

PROGRAM

Airbus & Aeroscopia Museum

13:00 - 17:30 (4h30)
Industrial site and museum visit
Visit of Airbus Assemby Lines and of Aeroscopia Museum
Departure by bus from the conference venue

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