



64th IUVESTA Workshop

on Practical Applications and Methods of Gas Dynamics for Vacuum Science and Technology

Organised by

*Dr. Christian Day
Karlsruhe Institute of
Technology, Karlsruhe,
Germany*

*Prof. Felix Sharipov
Physics Department,
Federal University of
Parana, Curitiba, Brazil*

*Dr. Oleg B. Malyshev
ASTeC, STFC Daresbury
Laboratory, Warrington, UK*



May 16-19. 2011

Leinsweiler Hof ~ Leinsweiler, Germany

Workshop Programme

SUNDAY, May 15, 2011

16:00 - 19:00	Registration
19:00 - 21:00	Welcome Reception

MONDAY, May 16, 2011

8:00 - 11:00	Registration
8:00 - 8:30	Introduction and Opening of the 64 th IUVESTA Workshop
8:30 - 10:30	Section 1: Vacuum Metrology
8:30 - 9:10	Keynote Address: Problems of Vacuum Metrology for Industrial Applications that Call for Solutions by Rarefied Gas Dynamics, Karl Jousten, PTB
9:10 - 9:25	Gas flow through the multiopening orifices, Martin Vicar, Czech Metrology Institute
9:25 - 9:40	An Experiment on Real-time Leak Detection Under Low Temperature, Zuxing Chen, Fermi National Accelerator Laboratory
9:40 - 9:55	Gas Flows in Shielded Vacuum Gauges, Marcus Veldkamp, VACOM GmbH
9:55 - 10:15	Practical Needs in Further Research of Leaks, Ladislav Peksa, Charles University in Prague
10:15 - 10:30	General Discussion
10:30 - 11:00	Coffee Break
11:00 - 12:25	Section 2: Vacuum Pumps
11:00 - 11:40	Keynote Address: Solved and Unsolved Gas Dynamics Problems for Turbo-Molecular-Drag Pumps: an Industrial Overview, Silvio Giors, AGILENT Technologies
11:40 - 11:55	A kinetic Approach in Modeling Compact Siegbahn Molecular Drag Stages: Physical and Numerical Aspects, Haysam Telib, Politecnico di Torino
11:55 - 12:10	Discretised Network Modelling Approach to Scroll Pump Performance Prediction, Michael Galtry, Edwards Ltd
12:10 - 12:25	General Discussion
13:00 - 14:15	Lunch Break

1 4 : 1 5 - 1 6 : 3 0	Section 3: Experimental activities
1 4 : 1 5 - 1 4 : 5 5	Keynote Address: Experimental Techniques for the Analysis of Gas Microflows, Stephane Colin, University of Toulouse
1 4 : 5 5 - 1 5 : 1 0	Mass Flow Rate Measurements Through Microchannels With Gold Surfaces in All Flow Regimes, Mustafa Hadj-Nacer, University of Marseille
1 5 : 1 0 - 1 5 : 2 5	Integrated Measuring System For the Thermal Characterization of Gas Flows in MEMS Under Slip-flow Regime, Alice Vittoriosi, Karlsruhe Institute of Technology (KIT)
1 5 : 2 5 - 1 5 : 4 0	Analysis of A Thermal Transpiration Rarefied Gas Flow: A Circular Cross Section Micro-tube Submitted to a Temperature Gradient Along its Axis, Marcos Rojas, University of Marseille
1 5 : 4 0 - 1 5 : 5 5	Direct Brownian Motion: A New Thermo-molecular Transport Mechanism, Jörg Thöming, University of Bremen
1 5 : 5 5 - 1 6 : 1 0	Measurements in the TRANSFLOW Facility, Thomas Giegerich, Karlsruhe Institute of Technology (KIT)
1 6 : 1 0 - 1 6 : 3 0	General Discussion
1 6 : 3 0 - 1 7 : 0 0	Coffee Break
1 7 : 0 0 - 1 8 : 4 5	Section 4: Numerical modeling Chairman: Dimitris Valougeorgis, University of Thessaly
1 7 : 0 0 - 1 7 : 1 5	Introduction to the DS-BGK Method for Gas Flow in Vacuum Systems, Jun Li, King Abdullah University of Science and Technology
1 7 : 1 5 - 1 7 : 3 0	The Regularized 13 Moment Equations for Rarefied and Vacuum Flows, Henning Struchtrup, University of Victoria
1 7 : 3 0 - 1 7 : 4 5	Velocity and Temperature Boundary Layer Modeling Using Averaged Molecule Cluster Transport Equations, Rodion Groll, University of Bremen
1 7 : 4 5 - 1 8 : 0 0	Heat Transfer Through a Gas Confined Between Coaxial Cylinders Under any Vacuum Conditions: A Comparison Between the DSMC and Kinetic Algorithms, Manuel Vargas, Bulgarian Academy of Sciences
1 8 : 0 0 - 1 8 : 2 0	General Discussion
1 8 : 2 0 - 1 8 : 4 5	SUMMARY OF THE DAY
1 9 : 0 0	Dinner

TUESDAY, May 17, 2011

8 : 3 0 - 1 2 : 5 0	Section 5: Benchmark problems Chairman: Felix Sharipov, Federal University of Parana
8 : 3 0 - 9 : 1 0	Keynote Address: Deterministic Modeling of Multi-Dimensional Rarefied Gas Flow, Vladimir Titarev, Dorodnicyn Computing Centre of Russian Academy of Sciences
9 : 1 0 - 9 : 5 0	Keynote Address: Numerical Simulations and Applications of Rarefied Gas Mixtures Flows, Aldo Frezzotti, Politecnico di Milano
9 : 5 0 - 1 0 : 1 5	General Discussion
1 0 : 1 5 - 1 0 : 4 5	Coffee Break
1 0 : 4 5 - 1 1 : 0 0	Benchmark Problem. Direct Simulation Monte Carlo of Gas Flow Through a Slit and Channel, Felix Sharipov, Federal University of Parana
1 1 : 0 0 - 1 1 : 1 5	Benchmark Problem. Direct Simulation Monte Carlo of Gas Flow Through an Orifice and Short Tube, Stylios Varoutis, Karlsruhe Institute of Technology (KIT)
1 1 : 1 5 - 1 1 : 3 0	Rarefied Gas Flows Through Slits and Orifices, Sarantis Pantazis, University of Thessaly
1 1 : 3 0 - 1 1 : 4 5	Benchmark Problem. Numerical Modelling of Gas Flow Through a Slit: Kinetic Approach, Irina Graur, University of Marseille
1 1 : 4 5 - 1 2 : 0 0	Gas Flows Through Short Channels Studied by the Direct Solution of Boltzmann Equation, Vladimir Aristov, Dorodnicyn Computing Centre of Russian Academy of Sciences
1 2 : 0 0 - 1 2 : 1 5	Benchmark Problems Solved With a Parallel Version of G. A. Bird's DSMC, Martin Rose
1 2 : 1 5 - 1 2 : 5 0	General Discussion
1 3 : 0 0 - 1 4 : 1 5	Lunch Break
1 4 : 3 0 - 1 5 : 1 5	Special Talk: Current Techniques and Challenges in the Design of Vacuum Pumps, Magnus Janicki, Oerlikon Leybold Vacuum GmbH
1 5 : 1 5 - 1 5 : 4 5	General Discussion and SUMMARY OF THE DAY
1 6 : 0 0 - 2 3 : 3 0	Workshop Excursion to Speyer and Walking Dinner

WEDNESDAY, May 18, 2011

8 : 3 0 - 1 0 : 0 0	Section 6: Vacuum System Design Chairman: Oleg Malyshev, ASTeC, STFC Daresbury Laboratory
8 : 3 0 - 8 : 4 5	Design of Gas Piping Distribution Systems Consisting of Long Pipes Under Any Vacuum Conditions, Serafeim Misdanitis, University of Thessaly
8 : 4 5 - 9 : 0 0	Network Modelling of Complex Vacuum Systems, Volker Hauer, Karlsruhe Institute of Technology (KIT)
9 : 0 0 - 9 : 1 5	Numerical Modelling of the ITER Model Cryopump, Felix Sharipov, Federal University of Parana
9 : 1 5 - 9 : 3 0	Measures and Simulations With a MC Code of Cryogenic Trap Efficiency for SPIRAL2, Romuald Levallois, GANIL
9 : 3 0 - 1 0 : 0 0	General Discussion
1 0 : 0 0 - 1 0 : 3 0	Coffee Break
1 0 : 3 0 - 1 2 : 0 0	Section 7: Transient Problems Chairman: Martin Wüst, INFICON
1 0 : 3 0 - 1 0 : 4 5	An Analytical Model For The Temporal Evolution of The Spatial Pressure Profile in Finite Conduction Limited Pipes With Distributed Pumping, Volker Ziemann, Uppsala University
1 0 : 4 5 - 1 1 : 0 0	Modelling a Vacuum Accident In an X-Ray Beam Line, Matthew Cox, Diamond Light Source
1 1 : 0 0 - 1 1 : 1 5	Fast Response of Cold-cathode and Ion Pumps For NSLS II Vacuum Protection, Marcelo Ferreira, NSLS-II Project, BNL
1 1 : 1 5 - 1 2 : 0 0	General Discussion
1 2 : 3 0 - 1 4 : 0 0	Lunch Break
1 4 : 0 0 - 1 5 : 4 0	Section 8: ITER Chairman: Roberto Kersevan, ITER International Organization
1 4 : 0 0 - 1 4 : 1 5	Test-Particle Calculations of Pressure Profiles and Pumping Efficiencies: Application to Some Vacuum Devices of ITER, Roberto Kersevan, ITER International Organization
1 4 : 1 5 - 1 4 : 3 0	Application of The Rarefied Gas Dynamics For Design of The ITER Optical Diagnostics, Vladislav Kotov, Jülich Research Institute
1 4 : 3 0 - 1 4 : 4 5	Benchmark of an Efficient BGK Model For Rarefied Gas Flows in Full 3D Geometry, Andrea Scarabosio, Max-Planck Institute for Plasma Physics
1 4 : 4 5 - 1 5 : 0 0	ProVac3D - A Test Particle Monte Carlo Program For Complex Vacuum Systems, Xueli Luo, Karlsruhe Institute of Technology (KIT)
1 5 : 0 0 - 1 5 : 1 5	Cryogenic Viscous Compressor Development and Modelling for the ITER Vacuum System, Larry Baylor, Oak Ridge National Laboratory
1 5 : 1 5 - 1 5 : 4 0	General Discussion and SUMMARY OF THE DAY
1 6 : 0 0 - 1 8 : 0 0	Wine tasting tour
1 9 : 0 0	BBQ

THURSDAY, May 19, 2011

8 : 3 0 - 1 0 : 3 0	Section 9: Accelerator Vacuum Systems
8 : 3 0 - 9 : 1 0	Keynote Address: Geometrical structure effects on the pumping delay time, Yoshio Saito, KEK
9 : 1 0 - 9 : 1 5	Gas Dynamics Modelling For Particle Accelerators, Oleg Malyshev, ASTeC, STFC Daresbury Laboratory
9 : 1 5 - 9 : 3 0	Accelerator Design and Laboratory Studies of the LHC Vacuum System With the VASCO Code, Giuseppe Bregliozzi, European Organization for Nuclear Research (CERN)
9 : 3 0 - 9 : 4 5	Numerical Simulation of a Pressure Distribution in Vacuum Chambers for Design and Optimization of Vacuum Systems For Accelerator Complexes, Alexander Tikhomirov, Joint Institute for Nuclear Research
9 : 4 5 - 1 0 : 0 0	Vacuum at The ESRF, Hugo Marques, ESRF
1 0 : 0 0 - 1 0 : 3 0	General Discussion
1 0 : 3 0 - 1 1 : 0 0	Coffee Break
1 1 : 0 0 - 1 2 : 1 5	Round table
1 2 : 1 5 - 1 2 : 3 0	Lunch and Departure
	Laboratorial visit in KIT Experimental Facilities(Upon request)