



ACCADEMIA NAZIONALE DEI LINCEI e FONDAZIONE «GUIDO DONEGANI»

INTERNATIONAL CONFERENCE

CLASSICAL AND QUANTUM PLASMAS: MATTER UNDER EXTREME CONDITIONS

Rome, 5 - 6 April, 2018

Organizing committee: Vincenzo AQUILANTI (Chair), Giuseppe BERTIN, Sergio CARRÀ, Mario CAPITELLI (Chair),
Francesco PEGORARO (Chair), Vincenzo SCHETTINO, Sandro STRINGARI

This interdisciplinary conference will range from the physics to the chemistry of plasmas in different regimes of particle density, electron energy and of magnetic field. Specific themes of investigation will be selected, covering the statistical mechanics foundations of plasmas as many-body classical and quantum systems with long range interactions and the chemistry of collisional plasmas dominated by the Boltzmann equation.

The second day will focus on the open problems that are common to the dynamics of plasmas from chemical and physical perspectives, such as the roles of collective behaviour and of energy transfer processes. The last aspect will be emphasized as essential for plasma chemistry, being strongly linked to the dynamics of elementary physico-chemical processes. The opportunity will be taken in some of the talks to evoke the six decades-long list of contributions initiated by the schools of Ettore Molinari and of Gian Gualberto Volpi.

PROGRAMME

Thursday, 5 April

- 14.15 Welcome address by Maurizio BRUNORI (President of Class of Sciences, Accademia dei Lincei, and President of the Fondazione Donegani)
- 14.30 Francesco PEGORARO (Linceo, Università di Pisa): Introduction
- 14.45 Vladimir FORTOV (Russian Academy of Sciences, Moscow): *Plasma in extreme states in the universe and in the laboratory: correlations and degeneracy*
- 15.15 Sergei V. BULANOV (ELI Beamlines, Prague, and Russian Academy of Sciences, Moscow): *Dynamics of relativistic laser produced plasmas*
- 15.45 Lev PITAEVSKII (Università di Trento and Russian Academy of Sciences, Moscow): *Magnetic solitons in a binary Bose-Einstein condensate mixtures*
- 16.15 Coffee break
- 16.30 Antonino DI PIAZZA (Max Planck Institute for Nuclear Physics, Heidelberg): *Quantum electrodynamic processes in plasmas*
- 17.00 Marco TAVANI (Linceo, INAF, Rome): *Flaring cosmic plasmas*
- 17.30 Mauro NISOLI (Politecnico di Milano): *Attosecond pulses for the investigation of electron dynamics in complex molecules and solids*

Friday, 6 April

- 9.30 Eduard SON (Russian Academy of Sciences, Moscow): *The fundamentals of externally excited non-equilibrium plasmas and applications in basic research, space, labs and industry*
- 10.00 Khaled HASSOUNI (University of Paris North - Paris 13): *Dusty formation in collisional plasmas*
- 10.30 Vanni ANTONI (IGI-CNR, Padua) and Francesco TACCOGNA (Nanotec-CNR, Bari): *Negative ion sources for fusion: experiments and theory*
- 11.00 Coffee break
- 11.15 Mario CAPITELLI (Università di Bari): *Plasma chemistry*
- 11.30 Piergiorgio CASAVECCHIA (Università di Perugia), Gianpiero COLONNA (Nanotec-CNR, Bari) and Carlo CAVALLOTTI (Politecnico di Milano): *Plasma assisted combustion: elementary processes and theoretical aspects*
- 12.15 Giovanni ISELLA (Politecnico di Milano): *Plasmas for growing materials for electronic and optoelectronic applications*
- 12.30 Giovanni BRUNO (Nanotec-CNR, Bari): *The pivotal role of plasma-chemistry in determining a sustainable future for graphene innovations*
- 14.00 Vincenzo AQUILANTI (Linco, Università di Perugia): *Molecular dynamics*
- 14.15 Stefan WILLITSCH (University of Basel): *Energy distributions of a trapped ion immersed in an ultracold buffer gas*
- 14.45 Antonio LAGANÀ (Università di Perugia), Dario DE FAZIO (ISM-CNR, Rome) and Fabrizio ESPOSITO (Nanotec-CNR, Bari): *Reactivity and relaxation of vibrationally excited molecules with open shell atoms*
- 15.30 Savino LONGO (Università di Bari and Nanotec-CNR, Bari): *Fokker-Planck equation for chemical reactions in plasmas*
- 15.45 Coffee break
- 16.00 Fernando PIRANI (Università di Perugia) and Annarita LARICCHIUTA (Nanotec-CNR, Bari): *Transport cross sections from accurate intermolecular forces*
- 16.30 Round table and conclusion

ROMA - PALAZZO CORSINI - VIA DELLA LUNGARA, 10

Il convegno è organizzato con la collaborazione del
Dipartimento di Chimica, Biologia e Biotecnologie dell'Università di Perugia

*La partecipazione al convegno è libera, fino ad esaurimento dei posti disponibili. Si prega di segnalare la presenza
Segreteria del convegno: piemontese@lincei.it - www.lincei.it*

Fino alle ore 10 è possibile l'accesso da Lungotevere della Farnesina, 10