



From Elementary Processes to Plasma Chemistry

Dedicated to Prof. Mario Capitelli (1941-2025)

Location: Biblioteca della Accademia Nazionale delle Scienze detta dei XL, Via Lazzaro Spallanzani, 1/A, 00161 Rome
Date: 15th September 2026

Organizing Committee

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Aims

The Accademia Nazionale delle Scienze detta dei XL, the National Research Council (CNR), and the University of Bari, are pleased to announce the organization of a symposium in honour of Professor Mario Capitelli, a pioneer of plasma chemistry in Italy and worldwide. Topics, inspired by those covered throughout Prof. Capitelli's career, include low-temperature plasmas, laser induced plasmas, elementary processes in plasmas, aerospace research and epistemology. Colleagues, who shared with him long-lasting and also recent scientific collaborations, will present the latest developments and future perspectives, providing an opportunity for the scientific community to discuss and share their research and experiences.

L'Accademia Nazionale delle Scienze detta dei XL, il Consiglio Nazionale delle Ricerche (CNR) e l'Università di Bari sono lieti di annunciare l'organizzazione di un simposio in onore del Professor Mario Capitelli, pioniere della chimica dei plasmi in Italia e nel mondo. I temi, che si ispirano a quelli trattati dal Prof. Capitelli nell'arco della sua carriera, includono i plasmi di bassa temperatura, i plasmi indotti da laser, i processi elementari nei plasmi, la ricerca aerospaziale e l'epistemologia. Colleghi che hanno condiviso con lui lunghe e anche recenti collaborazioni scientifiche presenteranno gli ultimi sviluppi e le prospettive future, offrendo alla comunità scientifica l'opportunità di discutere e condividere le proprie ricerche ed esperienze.

Streaming

The live stream of the Symposium will be available on the Academy's official Youtube channel <https://www.youtube.com/@accademixl1942/streams>.

Programme

9.30 Welcome addresses

VINCENZO AQUILANTI, *University of Perugia, Perugia, and Accademia Nazionale delle Scienze detta dei XL (President) Rome; Linceo*

FRANCESCO PEGORARO, *University of Pisa, Pisa; Linceo*

Session I

Low Temperature Plasmas

Chair: ALIX GICQUEL, *LSPM CNRS-Université Sorbonne Paris Nord, Paris (France)*

10.00 **CO₂ plasma kinetic modeling: the influential view of Mario Capitelli**

DANIELA PIETANZA, *CNR – ISTP, Bari*

10.15 **Production of N and H atoms in N₂-H₂ flowing afterglows of HF plasmas**

ANDRÉ RICARD, *Laboratoire Plasma et Conversion d'Énergie, Toulouse (France)*

10.30 **The role of chemistry in Fusion Science: the telling examples of the experiments at Consorzio RFX**

VANNI ANTONI, *CNR – ISTP, Padova*

Session II

Laser Induced Plasmas

Chair: ROBERTA FANTONI, *ENEA, Rome*

10.45 **Laser-Induced Plasma: From Ultrapure Nanoparticle Synthesis to Nanoparticle-Enhanced Laser-Induced Breakdown Spectroscopy**

MARCELLA DELL'AGLIO, *CNR – IFN, Bari*

11.00 **Superradiant plasmons for mid infrared emitters**

ANGELA VASANELLI, *Université Paris Cité, Paris (France)*

11.15 **The emerging role of handheld laser-induced breakdown spectroscopy (LIBS) in Geoscience: from mining exploration to geoarcheology**

GIORGIO S. SENESI, *CNR – ISTP, Bari*

11.30 COFFEE BREAK

Session III

Elementary Processes in Plasmas

Chair: FERNANDO PIRANI, *University of Perugia, Perugia*

11.45 **Electron-impact-induced reactivity of molecular cations in cold plasmas (...how is to be inspired by Mario Capitelli)**

IOAN SCHNEIDER, *Université Le Havre Normandie, Le Havre (France)*

12.00 **Vibrational energy transfer in non-equilibrium molecular systems: a quantum-classical framework**

CECILIA COLETTI, *University of Chieti, Chieti*

12.15 **Exact quantum dynamics: non-Arrhenius behavior in extreme hot environments**

DARIO DE FAZIO, *CNR – ISM, Roma*

12.30 **Heavy species molecular dynamics for non-equilibrium plasmas**

FABRIZIO ESPOSITO, *CNR – ISTP, Bari*

12.45-15.00 LUNCH

Session IV

Aerospace Research

Chair: SALVATORE BORRELLI, *CIRA, Capua, Napoli*

- 15.00 **Development of Hall thrusters: the synergy between phenomenological models, experiments and numerical models**
FABRIZIO PAGANUCCI, *University of Pisa, Pisa*
- 15.15 **Experimental and modeling studies of nonequilibrium recombining plasmas**
CHRISTOPHE LAUX, *Centrale Supélec - University Paris-Saclay (France)*
- 15.30 **Reduced-Order Kinetics via Maximum-Entropy Coarse-Graining: From the Boltzmann Equation to Hypersonic Nonequilibrium**
MARCO PANESI, *University California Irvine, Irvine (USA)*

Session V

Epistemology

Chair: PAOLO CAPITELLI, *CNR, Roma*

- 15.45 **Biological diversity before "the Biodiversity "**
CORINNA GUERRA, *University Pegaso & UR EST, University Paris-Saclay (France)*
ALEKSANDRA KISLOVA, *Ca' Foscari University of Venice*
- 16.00 **Art, Collecting, and Science in 17th Century Rome: Case Studies and Research Perspectives**
GIOVANNA CAPITELLI, *University Roma Tre, Roma*

Session VI

Final Remarks

- 16.15 FRANCESCO CAPITELLI, *CNR – IC, Rome*
FRANCESCO PEGORARO, *University of Pisa, Pisa; Linceo*
VINCENZO AQUILANTI, *University of Perugia, Perugia, and Accademia Nazionale delle Scienze detta dei XL (President), Rome; Linceo*
- 17.00 **End of Symposium**

Contributions presented at the Symposium will be collected on the journal *Memorie e Rendiconti di Chimica, Fisica, Matematica e Scienze Naturali* edited by Accademia XL.

Info: segreteria@accademixl.it

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