NIS Colloquium

First chemical steps towards the origin of life

Torino 16-17 Settembre 2010

Museo Regionale di Scienze Naturali
Via Giolitti 36, 10123 Torino

Local organizer: **P. Ugliengo** Scientific committee: **J-F. Lambert, M. Sodupe and P. Ugliengo**

Thursday 16th September 2010 (afternoon)		
14:00-14:30	Opening	
14:30-15:15	**Roberto Gallino** (U. Torino)	Cosmic origin of the chemical elements and formation of the solar system
15:30-16:15	**Juli Peretó** (U. València)	Origin of life: an overview of the possible scenarios
Coffee break	Poster session	
16:45-17:30	**Nadia Balucani** (U. Perugia)	Gas-Phase Prebiotic Chemistry in the Solar System: How and Where
17:45-18:30	**Ernesto Di Mauro** (U. Rome)	Spontaneous generation of RNA under prebiotic conditions

Friday 17th September 2010 (morning)		
9:00-9:45	**Jean-Francois Lambert** (UPMC Paris)	Review on the adsorption and catalysis at mineral surfaces from experiments
10:00-10:45	**Mariona Sodupe** (UAB Barcelona)	Review on the quantum mechanical simulations of building blocks formation and polymerization
Coffee break	Poster session	
11:15-12:00	**Uwe J. Meierhenrich** (U. Nice-Sophia Antipolis)	Caught in the act of formation: amino acids and the asymmetry of life
12:15-13:00	**Luigi Luisi** (U. Rome)	The problem of compartmentalization: the minimal cell

Invited Speakers

Roberto Gallino got a degree in Physics and a PhD in Nuclear Astrophysics at the University of Torino where he was Associate Professor of Stellar Physics working at the Department of General Physics. He has published more than 380 papers on international Journals on stellar nucleosynthesis and evolution, origin of the heavy elements, S-process nucleosynthesis in AGB stars, neutron captures in massive stars in hydrostatic pre-explosive phases and the origin of the s-weak component, analysis of diverse mechanisms of r-processes operating in first generation stars of the galactic halo, astrophysical origin of meteoritic presolar grains and solar system origin.

Juli Peretó is Associate Professor of Biochemistry and Molecular Biology at the University of València. He is a member of the Evolutionary Genetics Group at the Cavanilles Institute for Biodiversity and Evolutionary Biology. His research interests include the origin and early evolution of life, with a focus on the evolution of metabolic pathways. He is also interested in the history of ideas on the natural origin and the artificial synthesis of life. His teaching activities are related to metabolism and chemical and biochemical evolution for undergraduates.

Nadia Balucani received her Ph.D. in Chemistry from the University of Perugia (Italy) in 1993 and did postdoctoral work at UC Berkeley with Prof. R.J. Saykally. She was appointed Research Associate in Chemistry in 1993 and Associate Professor in 2004 at the University of Perugia, Department of Chemistry. Her research interests include reaction dynamics, atmospheric chemistry, combustion chemistry, astrochemistry and prebiotic chemistry.

Prof. **Uwe J. Meierhenrich** studied chemistry at the Philipps University of Marburg. After completing his PhD at the University of Bremen, he identified amino acids in artificial comets at the Max-Planck Institute for Solar System Research in Katlenburg-Lindau and at C.B.M. in Orleans in preparation for the cometary Rosetta mission. In 2005, he was promoted to full Professor at the University of Nice-Sophia Antipolis. His book, “Amino Acids and the Asymmetry of Life”,was published in 2008.

Prof. **Jean-François Lambert** obtained a Ph.D. from the UCL (Louvain-la-Neuve) in 1987. He spent 2 years as a post-doc at the University of Wisconsin (Milwaukee), and another year at the Soil Science lab at the INRA-Versailles. He joined the LRS (Laboratory for Surface Reactivity) at the UPMC in 1990 and worked on the rationalization of supported catalysts synthesis with M. Che. In 2004, after obtaining a full professorship, he founded the research group on “interfaces in biological environments” with C-M. Pradier. His current research interests include biocompatibility, hybrid materials and prebiotic chemistry.

Prof. **Mariona Sodupe** received her PhD in Chemistry from the Autonomous University of Barcelona (UAB) in 1990. Then she continued her studies as postodoctoral researcher at NASA Ames Research Center (California) for two years with Prof. C.W. Bauschlicher. In 1992 she returned to UAB where she is now full professor at the Department of Chemistry. Research areas of interest are metal-ligand systems of biological interest, structure and reactivity of radical cations and surface properties of silica based materials. Recent projects focus on the role of mineral surfaces in pre-biotic chemistry.

Prof. **Ernesto Di Mauro** is expert in the biophysics, biochemistry and molecular genetics of DNA, and in RNA structure and polymerization. His research activity has dealt with regulation of transcription in prokaryotes and yeast, DNA topology, chromatin structure, telomers. He is currently developing a unitary chemical frame aiming to reconstruct the prebiotic process of spontaneous generation of genetic information. Starting from one-carbon simple compounds, all the steps leading to the non-enzymatic synthesis of long RNA molecules have been established. Recent achievements pertain to the abiotic generation of RNA in water from 3’-5’ cyclic nucleotides.

Prof. **Luigi Luisi** got his degree in chemistry from Scuola Normale di Pisa and made all his professional career at the Swiss Federal Institute of Technology in Zürich (ETHZ) where he became ordinarius of Macromolecular Chemistry/Biopolymers. Since 2003 at Roma3 as prof. Biochemistry. Fields of research: self-organization of complex biological systems, surfactant aggregates (micelles, liposomes), origin of life, autopoiesis, synthetic biology of minimal cells and of never born proteins. Interested and active in the philosophy of science, and in programs at the interface between science and humanity/lay spirituality (promoter since 1985 of the international Cortona-week “Science and the other aspects of life” for graduate students.