ETTORE MAJORANA FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

"Water and Water Systems"

Directors: Prof. Roberto Car and Prof. Francesco Mallamace

22nd July– 31th July 2016, Erice (Italy)

Application deadline: 1 July 2016

Application is now open for "**WATER AND WATER SYSTEMS"** – 3rd Course of the Erice School "**NEUTRON SCIENCE AND INSTRUMENTATION**" (Directors: Ian S Anderson, Carla Andreani and Roberto Caciuffo) – organized in collaboration with the School of Neutron Scattering (SoNS) "Francesco Paolo Ricci". The Course will be held at the ETTORE MAJORANA FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE**,** Erice (Sicily, IT) **22nd July (Arrival 12:30 p.m) – 31th July 2016 (departure 12:30 pm.)**
The Course is normally highly oversubscribed, so we encourage applicants to apply early, as late applications will not be accepted. This Course focuses on water and water systems and will include advanced scientific discussions and lectures on the theory, simulations and experiments devoted to understanding condensed water phases and water solutions.

Proceedings of this Course will be published on a Special Issue of Frontiers of Physics (Higher Education Press and Springer).

Course Objectives.
Water plays a key role in chemistry, biology, geology and environmental sciences. However, in spite of decades of intense research, the microscopic mechanisms that are behind its unusual structural and dynamical properties giveing rise to its rich phase diagram are far from being well understood. The study of water and its solutions from a molecular perspective is at the intersection of physics, chemistry, biology and materials science. It requires sophisticated experimental methods and advanced techniques of statistical physics. The course will consist of lectures and specialized seminars by leading experts, which are oriented to graduate students, postdoctoral researchers and junior scientists working at universities and research institutions. It will provide a broad overview of the field, including the most recent ideas in theory and experiments, as well as a critical discussion of the problems that are currently attracting the attention of the researchers. By gathering participants with different specialized backgrounds, the course also aims at cross-fertilization of ideas that could advance the state of the field.

The course has a target audience of 15-20 students.
Students are encouraged to **join the school page on Facebook**

Directors of 3nd Course:
Prof. Roberto Car (Princeton University) rcar@princeton.edu
Prof. Francesco Mallamace (University of Messina), mallamac@unime.it
Liquid water is ubiquitous in the environment, biology and engineered systems. This workshop will bring together experimental and theoretical experts working on both liquid water and water systems. Sessions will also include talks by experts discussing implications of chemical physics of water.

Accommodation of participants is organized by the **Ettore Majorana Foundation** (EMFCSC) either in their premises or in local hotels on the basis of indications provided by the Organizing Committee and by participants in the Travel Form. Special requests should be addressed to the School Scientific Secretary, **school_fpricci@its.me.cnr.it**.

Registration and fees

STUDENTS: To register you will need to fill out the online **registration form**, send a 'personal statement' and a 'statement from your supervisor' to **rcar@princeton.edu** and **mallamac@unime.it**, and copy to **school_fpricci@its.me.cnr.it**. Registered students will receive feedback of the selection starting from mid-March. Once accepted you will need to fill out the **Student**

Registration Form and a **Student travel form** to be returned to **rcar@princeton.edu** and **mallamac@unime.it**, and copy to **school_fpricci@its.me.cnr.it** by the date specified in the form header. Fee payment details are reported in a specific section of the **Student Registration_Form**. **Deadline for lecture and student registration and travel forms is the 1st** of July.

LECTURERS: please fill out the **Lecturer_Registration_Form** and the **Lecturer_Travel_Form** to be returned to **rcar@princeton.edu** and **mallamac@unime.it**, and copy to **school_fpricci@its.me.cnr.it** by the date specified in the form header. Fee payment details are reported in a specific section of the **Lecturer_Registration_Form**. **Deadline for lectures registration and travel forms is the 1st of July.**

The Registration Fee for students and lectures is €1000.
School fees include the cost of lodging during the school, breakfast, lunch, evening meal, teaching and all course materials.

Payment of registration Fee is due by the 10th of July. Payment should be made by bank transfer to:
Account name: Fondazione Ettore Majorana e Centro di Cultura Scientifica
Bank Name: Unicredit Private Banking S.p.A.
BRANCH NAME: 07858 TRAPANI
STREET: Via Garibaldi 9 – 91100 Trapani, Italy
IBAN: IT 47 I 02008 16407 000600000655
BIC SWIFT: UNCRITMM
Fee. (Period 22nd July- 31st July) **Students** are kindly requested to pay the allinclusive fee of 1000 € per participant student plus 100 Euro per day for each accompanying person (if any). The participation fee is unbreakable, independently of the number of days you stay at the Conference, whereas the accompanying persons are charged on a daily basis.

Fee. (Period 22nd July- 31st July) **Lectures** are kindly requested to pay the allinclusive fee of 1000 € per participant lecture, whereas the accompanying persons are free of charge. The participation fee is unbreakable, independently of the number of days you stay at the Conference.

Bring with you to ERICE a copy of your payment. You will receive the receipt from EMCSC secretariat. In case you have difficulties to perform the payment in this way, please inform the Conference Scientific Secretary for instructions.

Programme

The school programme consists of lectures, tutorials and problem classes with occasional evening lectures. In addition, students will be asked to give short presentations to their tutorial groups about their current research projects.

LECTURES AND SCIENTIFIC PROGRAM

Carla Andreani, University of Rome Tor Vergata (I)	*Measurements of quantum kinetic energy tensor in stable and metastable water near the triple point*
Marcia Barbosa, Rio Grande do Sur University (Brazil)	*Polymorphism in lattice models*
Roberto Car, Princeton University (US)	*Electronic structure and molecular dynamics in disordered water phases at low and high pressure*
Sow-Hsin Chen, MIT (US)	*Evidence of Liquit-to-Liquid Phase Transition in Deeply Cooled Confined Water Show By Neutron and X-Ray Scattering Studies*
Antonio Cupane, Palermo(I) and CNRS(F)	*Protein Hydration water*
Pablo Debenedetti, Massachusetts Institute of Technology (US)	*Supercooled water – models and simulations*
Giancarlo Franzese, Universitat de Barcelona(E)	*Water and protein folding*
Paola Gallo, University of Rome Tre (I)	*MD simulation in confined water*
Thomas Loerting, Innsbruck University (A)	*Amorphous Ices*
Francesco Mallamace, University of Messina (I)	*On the hydrophobic and hydrophilic interctions in water-alcohol solutions*
Anders Nilsson, Stockholm University (SE)	*Probing supercooled water with x-ray laser and coherent synchrotron radiation*
Michele Parrinello, Eidgenössische Technische Hochschule (CH)	*Enhancing crucial fluctuations*
Lars Pettersson, Stockholm University (SE)	*Pair-distribution functions of water x-ray spectroscopy applied to water*
Christoph Salzmann, University College London (UK)	*The many facets of experimental Ices research*
Roberto Senesi, University of Rome Tor Vergata (I)	*Atomic quantum dynamics: neutron experiments to benchmark state-of-the-art modeling*
Eugene H. Stanley, Boston University (US)	*Liquid Polymorphism and the liquid-liquid critical point*
Tanaka Hagime,Tokio University (J)	*Roles of local structural ordering in water anomalies and ice nucleation*
Salvatore Torquato, Princeton University (US)	*Fundamental Aspects of the Glass Transition*
Limei Xu, Bejing University (China)	*The low density and high density water liquid phases*
Yip Sidney, MIT (US)	*Self-Organized Criticality at the Mesoscale: Understanding the Glass Transition through Molecular Simulations*

ORGANIZING COMMITTEE

Nicola Cicero, University of Messina
Grazia Cottone , University of Palermo
Carmelo Corsaro, CNR-IPCF Messina
Antonio Cupane , Chair University of Palermo
Vincenzo Ferrantelli, Zooprophylactic Institute of Sicily, Palermo
Domenico Mallamace, University of Messina
Roberto Senesi, University Rome Tor Vergata

Organized by SonS

Web site for on-line registration @ **http://www.sonsfpricci.org/sons-school-2016**
Email: school_fpricci@its.me.cnr.it Phone: +39 06 7259 4117

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