



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
TO PAY A PERMANENT TRIBUTE TO ARCHIMEDES AND GALILEO GALILEI, FOUNDERS OF MODERN SCIENCE
AND TO ENRICO FERMI, THE "ITALIAN NAVIGATOR", FATHER OF THE WEAK FORCES



INTERNATIONAL SCHOOL OF NEUTRON SCIENCE AND INSTRUMENTATION

5th Course: *NEUTRONS FOR CHEMISTRY AND MATERIALS SCIENCE APPLICATIONS*

ERICE-SICILY: 4 – 13 JULY 2018

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government

PROGRAMME AND LECTURERS

Neutron detectors
Moderator development
Diffraction instruments
Sample environments for in situ chemistry applications
PDF modelling using total scattering data
Engineering realities in instrument design
Sample environments
QENS instruments
Neutron Sources: Past, present and future
Shielding technologies
Reflectometry instruments
Reverse Monte Carlo modelling using total scattering data
Vibrational spectroscopy instruments
Spectroscopy instruments
Density functional theory for materials simulation
eV spectrometers
Imaging instruments
MeV irradiation instruments
Open data and open science: How scientific software development can make data FAIR
Instrument modelling using Monte Carlo methods
Neutron moderators

- G. GORINI, University of Milano-Bicocca, IT
- M. HARTL, European Spallation Source (ESS), Lund, SE
- P. HENRY, ISIS Pulsed Neutron & Muon Source, Didcot, UK
- A. HUQ, Oak Ridge National Laboratory, Knoxville, TN, US
- S. KIMBER, Oak Ridge National Laboratory, Knoxville, TN, US
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- S. PARKER, ISIS Pulsed Neutron & Muon Source, Didcot, UK
- T. RAMIREZ, Oak Ridge National Laboratory, Knoxville, TN, US
- K. REFSON, Royal Holloway in London, UK
- G. ROMANELLI, ISIS Pulsed Neutron & Muon Source, Didcot, UK
- M. SCHULZ, Forschungs-Neutronenquelle Heinz Maier-Leibnitz, Garching, DE
- R. SENESI, University of Rome "Tor Vergata", IT
- J. TAYLOR, ESS, SE, European Spallation Source (ESS), Lund, SE
- P. WILLENDRUP, European Spallation Source (ESS), Lund, SE
- L. ZANINI, European Spallation Source (ESS), Lund, SE

PURPOSE OF THE COURSE

The 2018 course focusses on the relationship between the design and operation of instruments, sample environment and software, concentrating on those relevant towards chemistry and materials science applications. It provides a coherent set of introductory lectures on design, construction and implementation of instrumentation, sample environment and software to address the scientific requirements of the user community. Foundation lectures on the application of structural analysis, using average and local structure methodology, and dynamics, using experimental data analysis techniques and theoretical modelling, will introduce participants to the rapidly growing "combined approach" available to the neutron scattering community today and the requirements they impose on all forms of instrumentation. With a target audience of 25-30 students, the school intends to promote collaboration in instrumentation design, including sample environments, and successful implementation of reliable software for current and next generation large-scale neutron facilities. It will provide a broad overview of the field, including the most recent ideas and advances in instrumentation, modelling and experimental capabilities, as well as critical discussions of the development issues involved. Evening lectures will highlight the historical role of neutron scattering techniques. By gathering participants with different backgrounds, the course encourages cross-fertilization of ideas necessary for the continued success of large-scale facilities.

The Course will consist of lectures and specialised seminars directed towards graduate students, postdoctoral researchers and junior scientists working at universities and/or large-scale facilities. Participants will be selected for the school based on their need to develop instrumentation (including sample environment and software) in their present and/or future research activities.

APPLICATIONS

Persons wishing to attend the Course should send a letter to the Course Directors:

Professor Paul F. HENRY, (STFC), ISIS Facility, STFC Rutherford Appleton Lab., Harwell Oxford, Didcot, UK – email: paul.henry@stfc.ac.uk

Professor Timmy RAMIREZ CUESTA, (ORNL), Oak Ridge National Laboratory, Knoxville, TN, US – email: ramirezcueaj@ornl.gov

POETIC TOUCH

According to legend, Erice, son of Venus and Neptune, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago. The founder of modern history — i.e. the recording of events in a methodic and chronological sequence as they really happened without reference to mythical causes — the great Thucydides (~500 B.C.), writing about events connected with the conquest of Troy (1183 B.C.) said: «After the fall of Troy some Trojans on their escape from the Achaei arrived in Sicily by boat and as they settled near the border with the Sicilians all together they were named Elymi: their towns were Segesta and Erice.» This inspired Virgil to describe the arrival of the Trojan royal family in Erice and the burial of Anchise, by his son Enea, on the coast below Erice. Homer (~1000 B.C.), Theocritus (~300 B.C.), Polybius (~200 B.C.), Virgil (~50 B.C.), Horace (~20 B.C.), and others have celebrated this magnificent spot in Sicily in their poems. During seven centuries (XIII-XIX) the town of Erice was under the leadership of a local oligarchy, whose wisdom assured a long period of cultural development and economic prosperity which in turn gave rise to the many churches, monasteries and private palaces which you see today. In Erice you can admire the Castle of Venus, the Cyclopean Walls (~800 B.C.) and the Gothic Cathedral (~1300 A.D.). Erice is at present a mixture of ancient and medieval architecture. Other masterpieces of ancient civilization are to be found in the neighbourhood: at Motya (Phoenician), Segesta (Elymian), and Selinunte (Greek). On the Aegadian Islands — theatre of the decisive naval battle of the first Punic War (264-241 B.C.) — suggestive neolithic and paleolithic vestiges are still visible: the grottoes of Favignana, the carvings and murals of Levanzo.

Splendid beaches are to be found at San Vito Lo Capo, Scopello, and Cornino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

PLEASE NOTE

Participants must arrive in Erice on July 4, no later than 7 p.m.

More information about the other activities of the
«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
can be found on the WWW at the following address:
<http://www.ccsem.infn.it>

P.F. HENRY – T. RAMIREZ CUESTA
DIRECTORS OF THE COURSE

C. ANDREANI – R.M.G. CACIUFFO – R. McGREEVY
DIRECTORS OF THE SCHOOL

A. ZICHICHI
PRESIDENT EMFCSC