«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 NUCLEAR PHYSICS

40th Course: *THE STRONG INTERACTIONS: FROM QUARKS AND GLUONS TO NUCLEI AND STARS*

ERICE-SICILY: 16 – 24 SEPTEMBER 2018

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government • European Physical Society • Extreme Matter Institute EMMI • GSI Helmholtzzentrum für Schwerionenforschung

PROGRAMME AND LECTURERS

Hadron interactions from lattice QCD
• S. AOKI, Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, JP

Ab-initio nuclear many-body problems and QCD forces
• C. BARBIERI, University of Surrey, Guildford, UK

Neutron star mergers and the high-density equation of state
• A. BAUSWEIN, Heidelberg Institute for Theoretical Studies, Heidelberg, DE

Nuclear reactions from lattice QCD simulations
• S. BEANE, University of Washington, Seattle, WA, US

Astrophysical constraints on the high-density EoS including deconfinement
• D. BLASCHKE, University of Wroclaw, Wroclaw, PL

Thermonuclear explosions on neutron-star crusts
• D. GALLOWAY, Monash University, Clayton, VIC, AU

The Nuclear Equation of State and Neutron Stars
• J. LATTIMER, Stony Brook University, Stony Brook, NY, US

R-process nucleosynthesis and its electromagnetic signatures
• G. MARTINEZ-PINEDO, GSI and TU Darmstadt, Darmstadt, DE

Applications of Nuclear Density Functional Theory
• W. NAZAREWICZ, Michigan State University, East Lansing, MI, US

Shell Structure at the Extremes
• A. OBERTELLI, TU Darmstadt, Darmstadt, DE

Fundamental nuclear physics: from quarks and gluons to finite nuclei and neutron stars
• A. THOMAS, CSSM University of Adelaide, Adelaide, AU

Nuclear structure of exotic nuclei
• K. WIMMER, University of Tokyo, Tokyo, JP

Summary talk
• S. REDDY, University of Washington, Seattle, WA, US

PURPOSE OF THE COURSE

The program concentrates on the following topics:
Lattice QCD and few-body nuclei;
Nuclear structure from chiral EFT interactions;
Ab-initio methods for medium-mass nuclei;
Single-particle and collective dynamics;
Nuclear structure far from the line of stability;
Nuclei as a laboratory for beyond the Standard Model physics;
Cold and hot neutron star matter;
Exploding stars and binary mergers of compact objects;
Nuclear synthesis and neutrino production in cosmic events.

APPLICATIONS

Persons wishing to attend the Course should register online at:
http://theorie.ikp.physik.tu-darmstadt.de/erice/
or
http://www.uni-tuebingen.de/erice/

PLEASE NOTE

Participants must arrive in Erice on September 16, not 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

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 Sicanians 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.

M. BUBALLA – A. FAESSLER – J. WAMBACH
DIRECTORS OF THE SCHOOL

A. ZICHICHI
PRESIDENT EMFCSC