



«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 SOLID STATE PHYSICS

## 81st Course: *DYNAMICS OF ELECTRONS IN ATOMIC AND MOLECULAR NANOCCLUSERS*

ERICE-SICILY: 25 – 31 AUGUST 2022

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

### PROGRAMME AND LECTURERS

#### *Photoelectron spectroscopy*

- K. BOWEN, Johns Hopkins University, Baltimore, MD, US

#### *Electron attachment to clusters*

- I. FABRIKANT, University of Nebraska, Lincoln, NE, US

#### *Electron collisions and spectroscopy of clusters*

- J. FEDOR, J. Heyrovsky Institute of Physical Chemistry, Prague, CZ

#### *Radiative cooling of carbon clusters*

- P. FERRARI, Katholieke Universiteit, Leuven, BE

#### *Ferromagnetism in clusters*

- A.I. KIRILYUK, FELIX Radboud University, Nijmegen, NL

#### *Radiative cooling of metal clusters*

- N. KONO, Tokyo Metropolitan University, Tokyo, JP

#### *Many-body excitations in superfluid nanodroplets*

- M.P. LEMESHKO, Inst. of Science and Technology, Klosterneuburg, AT

#### *Cold molecules and clusters*

- H. LEWANDOWSKY, University of Colorado, Boulder, CO, US

#### *Cold collision chemistry*

- E. NAREVICIUS, Weizmann Institute of Science, Rehovot, IL

#### *Synchrotron studies of free clusters*

- R. RICHTER, Elettra-Sincrotrone Trieste, IT

#### *Short-pulse spectroscopy of clusters*

- D. RUPP, Institut für Optik und Atomare Physik, Berlin, DE

#### *Electric and magnetic susceptibilities of clusters*

- R. SCHAEFER, TU Darmstadt, DE

#### *Electrons and ions in helium nanodroplets*

- P. SCHEIER, University of Innsbruck, AT

#### *Free-electron laser spectroscopy*

- Xueming YANG, Dalian Institute of Chemical Physical, PRC

#### *Photophysics of clusters and molecules*

- V. ZHAUNERCHYK, University of Gothenburg, SE

### PURPOSE OF THE COURSE

This proposal grows out of a 2016 meeting at the Centre which was organized by the present co-directors (71st Workshop of the International School of Solid State Physics), entitled *Delocalized Electrons in Atomic and Molecular Nanoclusters*. It was attended by a large number of graduate students and postdocs, which was a central goal of the organizers, and received excellent feedback. Since then, the field has experienced important progress in a number of novel directions. It also has established important topical and experimental overlap with other active research areas. As a result, it was felt that a meeting in 2021 will be productive and well attended. In order both to update the Workshop's subject and to mark its continuity, the upcoming title will be *Dynamics of Electrons in Atomic and Molecular Nanoclusters*. The aim is to remain focused (in particular, the talks will concentrate on free nanoclusters with attention paid to the precise size dependence of their inherent properties), but at the same time to emphasize the synergetic developments.

A wide range of important effects in nanoscience are connected with the dynamics of mobile electrons. Nanocluster phenomena such as shell effects, magnetism, electron solvation, Rydberg states, and others are highly sensitive to delocalized electrons' mobility, screening, response, direct and exchange interactions, correlations, and so on. However, these phenomena are frequently discussed in non-overlapping venues, and the aim of the present workshop is to examine recent and future developments under the general headline. New topics and connections brought into the upcoming Workshop will include, for example, the excitation and emission of "hot" electrons; the important role of radiative cooling; FIR, ultrashort, and free-electron-laser spectroscopy; cold molecules and quantum state-resolved reactions; many-body theory of excitations in nanodroplets and nanoclusters, etc.

The meeting will lead to cross-fertilization of experimental and theoretical ideas and concepts, and to productive international collaborations. The program will include a range of invited talks by recognized experts, as well as "hot topic" presentations, a poster session, and time for personal discussions. Attendance by junior researchers will be especially encouraged and sponsored.

### APPLICATIONS

Persons wishing to attend the School are requested to write to:

Professor Vitaly V. KRESIN  
Department of Physics, University of Southern California  
Los Angeles, CA 90089-0484, US  
email: [kresin@usc.edu](mailto:kresin@usc.edu)

### 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 Anchises, by his son Aeneas, 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.

More information about the «Ettore Majorana» Foundation and Centre for Scientific Culture can be found on the WWW at the following address:  
<http://www.csem.infn.it>

### PLEASE NOTE

Participants must arrive in Erice no later than 12 a.m. on 25th August 2022.