



**MAYORANA**  
Multi-Aspect Young-ORiented Advanced Neutrino Academy

## SECOND CIRCULAR

The Multi-Aspect Young Oriented Advanced Neutrino Academy (MAYORANA) School&Workshop will be held in Modica (Italy) on **July 4 - 14, 2023**.

This circular will also be available on the event web site:  
<https://agenda.infn.it/e/mayorana23>

### Event Host and Venue

The MAYORANA School&Workshop is hosted jointly by the Fondazione Grimaldi, the Istituto Nazionale di Fisica Nucleare - Laboratori Nazionali del Sud and the University of Catania. The scientific sessions will be held downtown, at the historical *Palazzo Grimaldi*, located in Corso Umberto I, 106, Modica, Italy.

### Scope and Scientific Program

The main objective of MAYORANA is to promote a collaborative framework of young and senior researchers in the fields of nuclear, particle and astroparticle neutrino physics to discuss theories and experiments in which interdisciplinary aspects are particularly relevant.

At present, neutrino physics is developing more and more toward a cross-disciplinary approach, but still much needs to be done. The overlap between different communities is an unavoidable, despite demanding, feature to face several challenges of this research field. The sharing of different experimental and theoretical techniques and the exchange of technical experiences and know-how are perhaps the best resources to this ambitious goal. In this context, it is of utmost importance to allow young and senior researchers working at the intersections of these fields to meet regularly to exchange ideas and results.

In this view the proposed School&Workshop format for MAYORANA is designed to integrate the lecture-based content of a School targeting students and young researchers with the advanced talks of a Workshop addressed to experts of the field. Thus, the two event pillars give the young researchers the chance of a synergic exposure to basic as well as advanced information from top-level worldwide experts of the field. Ambitiously, the MAYORANA School&Workshop aims at evolving in the long term into a periodic meeting. The list of the topics to be developed during the School and the Workshop is given below:

- Double beta decay
- Nuclear structure in connection with neutrino physics
- Neutrino nucleus interactions at low and high energy
- Nuclear reactions for weak interactions
- Supernova models and detection of supernovae neutrinos
- Solar models
- Direct and indirect dark matter searches
- Rare beta decay of nuclei for neutrino mass measurement
- Neutrino oscillation and matter effect
- Anomalies in reactor neutrinos
- Ultra-high energy astroparticle neutrinos
- New related detection technologies
- Artificial intelligence for DAQ and data analysis

## Format

The program of the **MAYORANA School**, available at the web site link <https://agenda.infn.it/event/34363/timetable/#20230705>, foresees lecture, poster, discussion and mini-talk sessions. The list of the lectures is given below.

During the lecture sessions high-ranked worldwide experts will present each one a three-four hours program focused on a specific hot topic of the field addressed to students and young researchers with different scientific background. Discussion sessions are specifically conceived to allow students and junior scientists a direct and informal interaction with teachers.

The students and young researchers are invited to prepare a poster describing their present activity and plans for the future. The size of the poster should be compliant with the A0 standard, corresponding to 84,1 cm x 118,9 cm. A permanent exposition of the posters will be arranged in dedicated rooms of the palace. The-participants are also asked to prepare a short presentation to summarize the content of the poster during dedicated mini-talk sessions.

Proceedings of the poster and mini-talk contributions will be published on-line, upon peer review process, in the "*Il Nuovo Cimento C*" journal, which is indexed on Scopus, ADS, INSPEC and INSPIRE.

The best two presentations (poster + minitalk) will be honoured with a dedicated award, delivered during the School social dinner on July 10 2023.

Students who need a didactic credit for their attendance at the School will be examined and, in case of positive result, receive a proper certificate.

The format of the **MAYORANA Workshop** consists of plenary sessions hosting invited and contributed talks, selected among the abstracts submitted by the participants. The preliminary list of invited speakers is available at the Workshop web site link <https://agenda.infn.it/event/34364/page/7213-invited-speakers>.

## Program of the School Lectures

- ✓ **Elena Aprile**  
Columbia University, New York, United States  
*Direct search of Dark Matter: present status and future perspectives*
- ✓ **Laura Baudis**  
University of Zurich, Zurich, Switzerland  
*The neutrinoless double beta decay: theory and experiments*
- ✓ **Giorgio Gratta**  
Stanford University, Palo Alto, United States  
*The search of neutrinoless double beta decay: present and future*
- ✓ **Horst Lenske**  
Justus-Liebig-Universität Gießen, Giessen, Germany  
*Nuclear reactions for weak interactions*
- ✓ **Javier Menéndez**  
Universitat de Barcelona, Barcelona, Spain  
*Challenges in nuclear structure theory in connection with double beta decay*
- ✓ **Marco Pallavicini**  
Università degli Studi di Genova, Genoa, Italy  
*Neutrino properties*
- ✓ **Esteban Roulet**  
Centro Atómico Bariloche, Argentina  
*High Energy Astrophysical Neutrinos*
- ✓ **Alexei Y. Smirnov**  
Max-Planck-Institut für Kernphysik, Heidelberg, Germany  
*Theory of neutrino mass and mixing*
- ✓ **Jouni T. Suhonen**  
University of Jyväskylä, Jyväskylä, Finland  
*Nuclear structure theory in connection with neutrino physics*

## Abstract Submission

The MAYORANA Workshop abstract submission page is available at the event website: <https://agenda.infn.it/event/34364/abstracts/>

The deadline for abstract submission is May 5, 2023.

## Proceedings

Proceedings will be published on-line, after peer review, in the "*Il Nuovo Cimento C*" journal, which is indexed on Scopus, ADS, INSPEC and INSPIRE. They will include contributions from:

- i) posters and mini-talks presented at the School;
- ii) viewpoints from the lecturers of the School;
- iii) talks presented at the Workshop.

## Social Activities and Excursions

A public lecture will be held on July 4 2023 at Teatro Garibaldi (<http://www.fondazioneteatrogaribaldi.it/>) C.so Umberto I, 207 - 97015 Modica. The lecture is given by Prof. Francesco Vissani of the Laboratori Nazionali del Gran Sasso, Istituto Nazionale di Fisica Nucleare and Gran Sasso Science Institute.

An appealing excursion program is being organized for the School attendants. It includes tours of the baroque towns, part of the historical *Val di Noto* UNESCO World Heritage Site, and a seaside excursion on the golden beaches around Modica. Details of the program will be available at the website.

Two social dinners will be organized, one for the attendants of the School and the other for the participants of the Workshop. The School social dinner will take place on July 10 2023 while the Workshop dinner on July 13 2023.

## Registration and Fee

The registration is open at the following link: <https://agenda.infn.it/event/34363/registrations/3546/> (School) and <https://agenda.infn.it/event/34364/registrations/3556/> (Workshop) and will close on May 5 2023. The registration fee for the School is 200 €, for the Workshop is 150 €. The full registration fee for the School&Workshop is 350 €. Students and young researchers with special motivations can ask for a specific support. Reduced fees of 100 € and 75 € are foreseen for accompanying persons of the attendants of the School and Workshop, respectively.

The School fee will cover coffee breaks, lunches, School social dinner, transportations from and to Catania airport, excursions, School package and proceedings. The reduced School fee for the accompanying persons include School social dinner, transportations from and to Catania airport, excursions.

The Workshop fee will cover the coffee breaks, lunches, transportations from and to Catania airport, Workshop social dinner, Workshop package and proceedings. The reduced Workshop fee for the accompanying persons include Workshop social dinner and transportations from and to Catania airport.

Transportations from Catania airport to Modica will be organized on July 4 2023 and July 11 2023 in the afternoon. A return transportation from Modica to Catania airport will be available on July 15 in the morning. More details will be given to participants.

The deadline for the payment of the fee is May 3 2023. We kindly ask registered participants who have not paid the fee yet, to make the payment at their earliest convenience, following the instructions on the dedicated page of the conference website.

## International Advisory Committee

E. Aprile (Columbia Univ., USA),  
C. Brofferio (Milano-Bicocca Univ., Italy),  
J. Cao (IHEP, China),  
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A. Smirnov (Max-Planck-Institute, Germany),  
F. Vissani (LNGS and GSSI, Italy),  
K. Zuber (Dresden Univ., Germany).

## Local Organizing Committee

F. Cappuzzello (School chair) (DFA Catania Univ, INFN LNS),  
R. Caruso (School chair) (DFA Catania Univ, INFN CT),  
C. Agodi (Workshop chair) (INFN LNS),  
M. Cavallaro (Workshop chair) (INFN LNS),  
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G. A. Brischetto (INFN LNS),  
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C. Petta (DFA Catania Univ, INFN CT),  
A. Spatafora (INFN LNS),

C. Tuvè (DFA Catania Univ, INFN CT),  
G. Verde (INFN CT)  
Fondazione Grimaldi (Modica)

All correspondence and requests for further information concerning the MAYORANA School&Workshop should be sent to the e-mail address: [mayorana2023@ct.infn.it](mailto:mayorana2023@ct.infn.it)

We look forward to seeing you in Modica,

The MAYORANA School&Workshop Organizing Committee