



“ETTORE MAJORANA” FOUNDATION and CENTRE FOR SCIENTIFIC CULTURE
INTERNATIONAL SCHOOL OF QUANTUM ELECTRONICS

64th Course: *PROGRESS IN PHOTOACOUSTIC AND PHOTOTHERMAL PHENOMENA:*

FOCUS on BIOMEDICAL, NANOSCALE, NDE, GAS SENSING, AND

THERMOPHYSICAL PHENOMENA AND TECHNOLOGIES

ERICE-SICILY: 16 – 23 OCTOBER 2021

DIRECTOR OF THE CENTRE: A. ZICHICHI

DIRECTOR OF THE SCHOOL: A.N. CHESTER – D. WIERSMA

DIRECTORS OF THE COURSE: R. LI VOTI - A. MANDELIS

We are pleased to inform you that the workshop entitled “*Progress in Photoacoustic and Photothermal Phenomena: Focus on Biomedical, Nanoscale Imaging, NDE, Gas Sensing, and Thermophysical Phenomena and Technologies*” will be held at the Center Ettore Majorana in Erice (Sicily, Italy), in the period October 16-23, 2021. (Additional information about the Center can be found on the website at <http://www.sbai.uniroma1.it/conferenze/photoacoustic-photothermal/index.html> or <http://www.csem.infn.it/>)

The aim of the workshop is to bring together scientists, clinicians, engineers, technology developers and users who are involved or interested in the Photoacoustic (PA) and Photothermal (PT) sciences, in the wonderful atmosphere of the old pre-mediaeval monasteries of the Center Ettore Majorana in Erice, in the middle of the Mediterranean Sea.

This Foundation and Center for Scientific Culture has a long tradition in the organization of Summer Schools, Workshops and International Conferences, covering all branches of Science, in a tradition similar to the Gordon Research Conferences.

The Workshop intends to bring together a group of invited leading PA/PT scientists and expert practitioners developing current “hot” and growing areas of our field, and participants who are active researchers, users, entrepreneurs and technologists wishing to become involved. The invited speakers will present topics in the focus areas of the Sixth Workshop which will cover the following thematic subjects:

Session A: Biomedical and Biological PA & PT (A. Mandelis)

1. Instrumentation design, software and signal generation techniques for biomedical photoacoustic and photothermal imaging.
2. Clinical applications of biomedical photoacoustics and photothermics
3. Microscopy, spectroscopy and endoscopy
4. Animal imaging
5. Dyes, nanoparticles and other contrast agents
6. Thermophotonics, thermography and other photothermal methodologies in biomedicine
7. Photoacoustics and photothermics in biology
8. Biosensors

Session B: Nanoscale Heat Transfer and Imaging (S. Volz and G. Tessier)

9. Ultrafast thermoelastic phenomena
10. Thermal and elastic properties on the nanoscale
11. Picosecond and other ultrafast photoacoustics
12. Phonon Transport - Phononics

Session C: Non Destructive Evaluation & Testing (C. Glorieux and X. Maldague)

13. Infrared Thermography and Thermophotonic Imaging (non-biomedical)
14. Non-destructive testing and industrial applications
15. Depth profiling of materials and inverse problems
16. Environmental sensors, robotics and machine learning, new instrumentation and methodology

Session D: Thermophysical and Diffusion-Wave Properties (R. Li Voti and A. Mandelis)

17. Complex fluids, phase transitions and glass transitions
18. Spectroscopy, analytical chemistry, nonlinear optics and photochemistry
19. Thermophysical and thermodynamic properties using PA & PT
20. Semiconductors, Photovoltaics, MEMS, NEMS

International School of Quantum Electronics: • Physical and Technical Measurements with Lasers - 1971 • Non-linear Optics and Short Pulses - 1972 • Laser Frontiers Short Wavelengths and High Power - 1973 • Cooperative Phenomena in Multi-component Systems - 1974 • Molecular Spectroscopy and Photochemistry with Laser - 1975 • Physics and Technology of Free Electron Lasers - 1980 • Integrated Optics Physics and Applications - 1981 • Analytical Laser Spectroscopy - 1982 • Laser Applications to Biology and Medicine - 1983 • Optical Phase Conjugation - 1984 • Progress in Microemulsions - 1985 • Optical Fiber Sensors - 1986 • Laser Science and Technology - 1987 • Nonlinear Optics and Optical Computing - 1988 • Optoelectronics for Environmental Sciences - 1989 • Laser Systems for Photobiology and Photomedicine - 1990 • Phase Transitions in Liquid Crystals - 1991 • Laser Applications for Mechanical Industry - 1992 • Advances in Integrated Optics - 1993 • Biomedical Optical Instrumentation and Laser-assisted Biotechnology - 1995 • Diffractive Optics and Optical Microsystems - 1996 • Global Automotive Technology Senior Management Briefing - 1997 • Optical Sensors and Microsystems - 1997 • Excimer Laser for Fusion and Industrial Applications - 1997 • Advances in Optoelectronics for Environmental Monitoring - 1998 • Observational Database and Mechanisms of Climate Change - 1998 • Bose-Einstein Condensates and Atom Lasers - 1999 • Laser beam and optics characterization - 2000 • Nanoscale linear and non-linear optics - 2000 • Atoms, solids and plasmas in super-intense laser fields - 2000 • Global Automotive Laser Applications - 2001 • Optical Coatings - 2001 • Free d guided optical beams - 2002 • Quantum Information Processing - 2003 • Spectroscopic techniques for materials, environment and cultural heritage - 2003 • VLSI Photonics - 2003 • Optical Chemical Sensors - 2004 • Molecular Physics and Plasmas in Hypersonics - 2005 • Photonics Metamaterials - 2005 • Matter in Super-Intense Laser Fields - 2006 • Advances on Nanophotonics II - 2007 • Optical Biosensors and Biochips for Clinical Applications - 2008 • Atoms and Plasmas in Super-Intense Laser Fields - 2009

Secretariat of the Centre: Via Guarnotta 26 - 91016 Erice - Italy - Tel. +39 0923 869133 - Telefax +39 0923 869226 - e-mail: hq@emcsc.csem.infn.it

Secretariat of the Course: Prof. R. Li Voti - Universita' di Roma - La Sapienza - Via Scarpa 16, 00161 Roma - Italy

Tel.: +39-06-49916540 - Fax: +39-06-44240183 - e-mail: WorkshopErice@uniroma1.it



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Session E: Gas Sensing and Spectroscopy and novel laser sources (V. Spagnolo, F. Tittel)

21. Photoacoustic and photothermal gas sensing
22. Mid-IR sources for gas sensing
23. Particulate sensing
24. Industrial applications

WORKSHOP FEE

The Workshop fee is **1000 Euro** for each participant.
The fee will cover full board and lodging

1. Registration to the Workshop
2. Accommodation (for the whole period October 16-23, 2021)
3. All meals (for the whole period October 16-23, 2021)
4. Social Dinner
5. Transfer to and from the local Airports (Trapani or Palermo).

For your convenience we remind you that both Palermo and Trapani airports are served by the low-cost airline company Ryanair (see <http://www.ryanair.com/>), by Alitalia (see <http://www.alitalia.com/>) and other companies.

INTERNATIONAL SUMMER SCHOOL:

In addition, students and newcomers to the field will, for the first time, have the opportunity to attend the Summer School “*Basic Photothermal and Photoacoustic Techniques: Theory, Instrumentation and Applications*” which will be organized in parallel with the Workshop, **at no additional fee**. The Summer School is organized in collaboration with the Graduate School of the University of Nova Gorica, Slovenia, and will offer a transfer of **10 ECTS credit points** to participating students.

FURTHER DETAILS and APPLICATION

All information about the Workshop and the Summer School can be found on the website <http://www.sbai.uniroma1.it/conferenze/photoacoustic-photothermal/index.html>

In order to submit an application to attend the Workshop and the Summer School, you are kindly asked to send a short email to the conference Secretariat at

Roberto LI VOTI

Sapienza Università di Roma - Dipartimento SBAI

e-mail: WorkshopErice@uniroma1.it

Application: deadline **JULY 4th, 2021**

In the email you are kindly asked to write the following info:

- 1) Name and affiliation of the participant
- 2) Option: poster presentation, oral presentation, none of them.

Looking forward to seeing you in Erice

Sincerely yours, the organizers

Roberto Li Voti

Sapienza Università di Roma

Andreas Mandelis

University of Toronto

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