

INTERNATIONAL SCHOOL OF ATOMIC AND MOLECULAR SPECTROSCOPY

26th Course: BIO-PHOTONICS: SPECTROSCOPY, IMAGING, SENSING, AND MANIPULATION A NATO ADVANCED STUDY INSTITUTE

ERICE, SICILY, ITALY: July 2-17, 2009

Sponsored by: Boston College, ENEA-Italy, Italian Ministry of University and Scientific-Technological Research, Sicilian Regional Government, Karlsruhe School of Optics and Photonics, NASA, USA National Science Foundation

PROGRAMME AND LECTURERS

Overview of the applications in the field of bio-photonics

- Paras N. Prasad, University of Buffalo, Buffalo, NY, USA

Photonic molecular and supramolecular devices

- Jean-Marie Lehn, Nobel Laureate, Inst. de Science et d'Ing. Supramolécul., Strasbourg, FRANCE

Dynamics of biosystems

- Majed Chergui, EPFL, Lausanne-Dorigny, SWITZERLAND

Photons and photon correlation spectroscopy

- Ralph von Baltz, Universität Karlsruhe, Karlsruhe GERMANY

Towards molecular-scale imaging using far-field optical fluorescence microscopy of biological systems

- Stefan W. Hell, Max Planck Inst. for Biophysical Che., Göttingen, GERMANY

Plasmonics, surface-plasmon sensors, plasmonic "super-resolution", metamaterial super- and hyperlenses

- Martin Wegener, Universität Karlsruhe, Karlsruhe, GERMANY

Lasers for bio-photonics

- Paolo Di Lazzaro, ENEA, Frascati, ITALY

Application of Luminescence to biological molecules

- Alexander Voitovich, Academy of Sciences of Belarus, Minsk, BELARUS

Fluorescence correlation spectroscopy

- Petra Schwille, Biotechnologisches Zentrum der TU Dresden, GERMANY

Energy transfer processes serving as nanoscopic rulers and applications to FRET

- Baldassare Di Bartolo, Boston College, Chestnut Hill, MA, USA

THz-spectroscopy of biological systems

- John W. Bowen, The University of Reading, Reading, UK

Optical coherence tomography

- Johannes de Boer, VU University, Amsterdam, THE NETHERLAND

Unlabelled bio-sensing: From the Surface Plasmon Resonance Sensor (SPR) to the Whispering Gallery

- Steve Arnold, Polytechnic Institute of NYU, Brooklyn, NY, USA

Coherent control of biological molecules

- Jean-Pierre Wolf, Université de Genève, Genève, SWITZERLAND

Subcellular surgery and nanoneurosurgery using femtosecond laser pulses

- Eric Mazur, Harvard University, Cambridge, MA, USA

Fluorescence microscopy bottom up: from single molecules to complex biomolecular interactions

- Philip Tinnefeld, University of München, München, GERMANY

Contrast Agents for Molecular Diagnostics

- Cees Ronda, Philips Research Labs, Aachen, Germany

Photosynthesis and light harvesting

- Villy Sundström, Lund University, Lund, SWEDEN

PURPOSE OF THE COURSE

The aim of this Institute will be to give a broad overview of the emerging field of bio-photonics including the optical analysis, spectroscopy, sensing and imaging of biological systems as well as their manipulation and modification. The proposed meeting will start from the consideration of fundamental principles, and will reach the current frontiers of research in a systematic and didactic fashion.

The Institute will provide the participants with an opportunity to present their research work in the form of short seminars or posters.

The proceedings of the course will be developed as a book and published in the NATO Science Series

POETIC TOUCH

According to legend, Erice, son of Venus, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago. The great historian Thucydides (~500 B.C.) said that the Elymi - founders of Erice - were survivors of the destruction of Troy. Ancient historians agreed that Erice was the oldest city in Europe.

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. 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, such as Motya (Phoenician), Segesta (Elymian) and Selinunte (Greek), are to be found in the neighborhood. On the Aegadian Islands - theatre of 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. At less than one hour drive from Erice, one can admire the splendid beaches of San Vito Lo Capo, Scopello, Comino, and the wild rocky coast around Mount Cofano.

GENERAL INFORMATION

Persons wishing to attend the course should write to the Director of the School:

Professor B. Di Bartolo
Department of Physics, Boston College
Chestnut Hill, MA 02467, USA
dibartob@bc.edu

APPLICATION

Applications can be done by e-mail, by using the address dibartob@bc.edu. Hard copy applications are also welcome. The applications should specify:

- (1) date and place of birth, together with their present nationality,
- (2) degrees and other academic qualifications,
- (3) present position and place of work and current research activities, and send:
- (4) a letter of recommendation from their research group leader or from a senior scientist active in the field,
- (5) a list of graduate courses attended (if the applicant is a graduate student),
- (6) a list of publications (optional).

The total fee, including full board and lodging (arranged by the School) is Euros 1600.

The sponsorships received will allow the support of some deserving students in need of financial assistance. This need must be specified and justified in the application.

Closing Date for Application: May 4, 2009

A letter will be sent to successful applicants by May 6, 2009. The participants who are having difficulties with travel documentation, need to know whether or not their applications have been accepted, may get an earlier special decision upon request.

Admission to the School will be decided by a committee consisting of Professors A. Voitovich, B. Di Bartolo and A. Zichichi.

The participants should arrive in Erice on July 1, no later than 7 p.m.

More detailed information, including the timetable of the lectures, will be sent to successful applicants together with the acceptance letter.

More information about the activities of the Spectroscopy Group at Boston College can be found on the WWW at the following address: <http://www.physics.bc.edu/spectroscopy>

More information about the other activities of the Ettore Majorana Center can be found on the WWW at the following address: <http://www.csem.infn.it>