INTERNATIONAL SCHOOL
Nanoscale Optical Microscopy
3rd edition
Palazzo Loredan, Venice, Italy
11 - 14 June 2019

Directors: A. DIASPRO, P. BIANCHINI G. GIACOMETTI

Organised by:
IVSLA - Istituto Veneto di Scienze Lettere ed Arti
IIT - Istituto Italiano di Tecnologia
SIOF - Società Italiana di Ottica e Fotonica
SIBPA - Società Italiana di Biofisica Pura e Applicata
SISM - Società Italiana di Scienze Microscopiche
SIF - Società Italiana di Fisica
PURPOSE OF THE COURSE

The objective of this Course is to advance the field of nanoscale optical microscopy operating at the scale of nanometres to tens of nanometres, through the exchange of information, ideas, and innovative techniques. Nanoscale optical microscopy focuses on the study of the physical principles governing biological processes occurring on a nanometre scale, typically on an atomic or molecular level. It also encompasses the development of photonics approaches and sample preparation designed specifically for biophysical investigations. The success and relevance of nanoscale optical microscopy reached a peak with the 2014 Nobel prize assigned for the development of super-resolved fluorescence microscopy. Correlation between methods is a crucial step for dealing with investigations, at the molecular scale, of possible applications not only in medicine and biology, but also in material sciences, cultural heritage and environmental sciences. The understanding of methods and techniques has the great potential of allowing, in the near future, for the design and performance of new exciting experiments in Biophysics, Optics and Photonics.

IVSLA and VENICE

The aim of the Istituto Veneto di Scienze, Lettere ed Arti in Venice is to promote and safeguard the sciences, letters and arts and to foster scientific research, also in association with national and international academies, universities and research centres. The School is held in the magnificent Palazzo Franchetti, located in the historical centre of Venice, close to Canal Grande and Accademia.

Palazzo Cavalli Franchetti, designed by the Institute of Sciences, Letters and Arts to host cultural activities, is an imposing neo-Gothic at the foot of the Accademia bridge extended towards Campo Santo Stefano. The garden that surrounds it is one of the largest among those visible from the Grand Canal.

Palazzo Loredan, state-owned, is the historic seat of the Institute of Sciences, Letters and Arts since 1891 and is home to the activities of academic life, the historic library, archives, art collections and offices. The building occupies a considerable part of Santo Stefano square on which it overlooks. In the main entrance there is a collection of marble busts “Pantheon Veneto”.

More information about the «Istituto Veneto di Scienze Lettere e Arti»,
www.istitutoveneto.it
Istituto Veneto di Scienze, Lettere ed Arti, I-30124 Venezia, Campo S. Stefano 2945
Tel. 041 2407711 – Telefax 041 5210598 - ivsla@istitutoveneto.it
Tuesday 11th
from 13.00  Light lunch
15.00-16.00  Registration & Coffee
16.00-19.00

Alberto Diaspro, Paolo Bianchini, Giorgio M. Giacometti, Arianna Traviglia
Opening remarks.

Colin J.R. Sheppard
Image formation in conventional and scanning microscopes

Paul Wiseman
Introduction to image correlation spectroscopy in space, time and reciprocal space

Ammasi Periasamy
FLIM, FRET, FLIRR Microscopy to characterize the endogenous molecules in live cells and tissue

20.00-23.00  Social Dinner:
Ristorante “Gianni”, Dorsoduro 918/A-B, Zattere – 30123 Venice

Wednesday 12th

9.00-11.00

Peter T. C. So
Paths toward non-fluorescence based super-resolution imaging

Aymeric Le Gratiet
Label-free Stokes/Mueller-matrix and scattering scanning microscopy for biological organization imaging

11.00-11.30  Coffee break
11.30-13.00

COMPANY

Marco Castello
PRISM: pixel reassignment image scanning microscopy

Stefano Selci
Hyperspectral imaging: a general view and applications for microscopy in biology

13.00-15.00  Lunch
15.00-17.00

Francesca Cella Zanacchi
Quantitative super-resolution imaging of cells and tissues at the single molecule level

Satoshi Kawata
Plasmonics and Raman spectroscopy for Nano-imaging and Microscopy

17.00-17.30 Coffee break

17.30-19.00 Poster session

Thursday 13th

9.00-11.00

Luca Lanzanò
Investigation of nuclear organization by nanoscale fluorescence microscopy and spectroscopy

Paolo Bianchini
Novel approaches in super-resolution: from expansion microscopy to pump-probe

11.30-13.00

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Ricardo Nunes Bastos ONI
Meet the Nanoimager, the first desktop compatible super-resolution microscope

Lothar Schermelleh
Chromatin organisation in mammalian cells - lessons from 3D super-resolution microscopy

13.00-15.00 Lunch
15.00-17.00

Peter Saggau  
*Scalable Encoded Microscopy for Scalable Optical Imaging of the Brain*

Giuseppe Vicidomini  
*Point-Scanning Microscopy with SPAD Array*

17.00-17.30  **Coffee break**

17.30-19.00

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Nathalie Garin, Leica Microsystems  
*Lifetime imaging in an instant: SP8 FALCON*

Takahiro Deguchi  
*The use of a tunable varifocal lens in confocal microscopy enables fast volumetric imaging of biological dynamics.*

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**Friday 14th**

9.00-11.00

Michael Mancini  
*Single cell analysis of endocrine disrupting chemicals by automated microscopy and image informatics*

Nicholas Anthony  
*Ptychographic imaging and other computational approaches to microscopy*

11.00-11.30  **Coffee Break**

11.30-13.00

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Ryu Nakamura  
*Twigs deep in the Forest*

Joerg Enderlein  
*Image Scanning Microscopy and Metal Induced Energy Transfer: Enhancing Microscopy Resolution in All Directions*

Alberto Diaspro  
*Closing remarks*

13.00  **Farewell drinks and light lunch**
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### Next events

**XII EBSA Biophysics Congress**  
20-24 July 2019, Madrid, Spain.  

**MCM2019 Serbia a Belgrado,**  
https://www.sdm.edu.rs/mcm2019/

**105° SIF National Congress**  
23 - 27 September 2019. Gran Sasso Science Institute, L’Aquila, Italy  
https://www.sif.it/attivita/congresso/105

**6th NIC@IIT school,**  
2-6 December 2019, Istituto Italiano di Tecnologia, Genova, Italy. http://www.nic.iit.it

### Notes