SIBPA

Società Italiana di Biofisica Pura e Applicata
Fondata nel 1973

IstitutoVeneto diScienzeLettere edArti

XXV INTERNATIONAL SCHOOL OF PURE AND APPLIED BIOPHYSICS on

Venice (I), Palazzo Franchetti, 17-22 January, 2021

Quantitative analysis of optical imaging for Medicine and Biophysics: foundations, applications and perspectives.

In case of Covid-19 restrictions, the school will be postponed to June 2021 (notification by 5 november 2020).

The quantitative analysis of the huge amount of data produced by traditional and modern optical microscopy and spectroscopy techniques can dramatically improve our understanding of basic physiological phenomena and foster the application of innovative imaging approaches in medical diagnosis. The school will offer an overview of the foundations and applications of some of the most recent methods for quantitative analysis of data provided by modern optical and multimodal imaging, with a special focus on recent machine learning approaches. Technical details of the quantitative analysis will be discussed in extended lectures, hands-on sessions and free informal discussion with the lecturers. The participation to the school is limited to 35 students.

Coorganized by:

Società Italiana di Biofisica Pura e Applicata

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Università di Milano-Bicocca Milano

Institute Pasteur, Paris

INSTITUT PASTEUR

CNR, ISASI Napoli

National Research Council of Italy

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SCIENTIFIC COORDINATORS:
Giuseppe Chirico-UNIMIB (Italy);
Maddalena Collini –UNIMIB (Italy);
Pietro Ferraro –CNR- ISASI (Italy);
Cristophe Zimmer – Institute Pasteur (F)

DIRECTOR of the school:
Prof. Giorgio Giacometti - IVSLA and Uni. Padua (Italy)

SPEAKERS:

Margaux Bouzin, Milano (I)
Silvia Caponi, Perugia (I)
Gastone Castellani, Bologna (I)
Isabella Castiglioni, Milano (I)
Maddalena Collini, Milano (I)
Alberto Diaspro, Genova (I)
Enrico Gratton, Irvine (USA)
Nicola Gritti, Barcellona (E)
Jelle Hendrix, Hasselt (B)
Florian Jug, Dresden (D)

Francesco Pavone, Firenze (I)
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Demetri Psaltis, Lousanne (CH)
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Laura Sironi, Milano (I)
Yoav Shechtman, Haifa (IL)
Stefan Stanciu, Bucharest (RO)
Ioannis Tsamardinos, Crete (GR)
Devrim Ünay, Ivrim (TR)

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Additional info at: www.sibpa.it/index.php/scuola-internazionale-di-biofisica-sibpa-ivsla.
Please notice that the registration fee is due only after confirmation of the acceptance and in any case after the 5th November 2020. Further details will be emailed to the applicants in due time.

International School of Biophysics

Quantitative analysis of optical microscopy and spectroscopy in biophysics: foundations, applications and perspectives.

University of Milano-Bicocca (I)   Institute Pasteur, Paris (F)   ISASI, CNR, Naples (I)

Preliminary program

18 Jan 2021		BIO-IMAGING: CELL TO TISSUE LEVEL
Morning session	9.00	Deep-STORM: super-resolution single-molecule microscopy by deep learning (Y. Shechtman, Haifa, IL)
	10.00	Multimodal imaging for biosystems: a syntesis (A. Diaspro, Genoa, I).
	11.00	**Coffee break**
	11.20	Machine learning for single molecule dynamics (J-B. Masson, Paris, F)
	12.20	**Lunch break**
18 Jan 2021		PRACTICAL SESSION
Afternoon session	14.30	Design, limitation and analysis of an Optical microscopy imaging (M.Collini, Milano, I)
	16.00	**Coffee break**
	16.30	Super-resolution: when spectroscopy helps biological resolution (G. Vicidomini, IIT, Genoa)
19 Jan 2021		MACHINE LEARNING and diseases
Morning session	9.00	Machine Learning for mixed genetic/image stratification (G. Castellani, I)
	10.00	A data driven approach reveals disease similarity on a molecular level (I. Tsamardinos, GR)
	11.00	**Coffee break**
	11.20	Beyond vision, Machine Learning for Alzheimer (I. Castiglioni, I)
	12.20	**Lunch break**
19 Jan 2021		IMAGE CORRELATION ANALYSIS
Afternoon session	14.30	Correlative optical imaging and spectroscopy (S. Caponi, I)
	16.00	**Coffee break**
	16.30	Image Correlation Spectroscopy for intracellular studies (M. Bouzin, I)
20 Jan 2021		BIO-IMAGING: from tissue to organism, from structure to physiology
Morning Session	9.00	In-vivo infrared imaging, from animal models to humans (G. Ratto, I)
	10.00	Machine learning for nanoscopy (C. Zimmer, Paris, F)
	10.30	**Coffee break**
	11.00	Non-linear Optical imaging of the brain (F. Pavone, I)
	12.20	**Lunch break**
20 Jan 2021		MACHINE LEARNING FOR IMAGE RECONSTRUCTION/ENHANCEMENT
Afternoon session	14.30	Content-aware image restoration in fluorescence microscopy. (F. Jug, D)
	16.00	**Coffee break**
	16.30	Deep learning for Image reconstruction (F. Renna, P)
21 Jan 2021		LEARNING FROM FLUORESCENCE
Morning Session	9.00	Quantitative mobility and interaction analysis in living cells. (J. Hendrix, B)
	10.00	Computational Imaging for biophysics. (S. Stanciu, RO)
	10.30	**Coffee break**
	11.00	Phasor Analysis for quantitative fluorescence microscopy. (E. Gratton, USA)
	12.20	**Lunch break**
21 Jan 2021		PRACTICAL SESSION
Afternoon session	14.30	Phasor analysis for multimodal non-linear histopathology analysis (L. Sironi, I)
	16.00	**Coffee break**
	16.30	Deep Brain Microscopy, the Long Road (P.Pozzi, I)
22 Jab 2021		COHERENT IMAGING AND MACHINE LEARNING
Morning Session	9.00	Deep learning in Tomography (D. Psaltis, CH)
	10.00	Digital Holography and Machine Learning (P. Memmolo, I)
	10.30	**Coffee break**
	11.00	IRIR: Infrared-mediated image restoration. (N.Gritti, E)
	12.20	**Lunch break**
22 Jan 2021		DIGITAL PATHOLOGY
Afternoon Session	14.30	TimeSeq: time lapse imaging integration of single cell RNA seq. data. (N.Gritti, E)
	16.00	**Coffee break**
	16.30	Smart detection of pathogens (D. Ünay, TR)

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