SIBPA
Società Italiana di Biofisica Pura e Applicata
Fondata nel 1973

IUPAB
Connecting the World of Biophysics

Istituto Veneto di Scienze Lettere ed Arti

XXV INTERNATIONAL SCHOOL OF PURE AND APPLIED BIOPHYSICS on

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

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

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 SIBPA

Università di Milano-Bicocca Milano Università degli Studi di Milano Bicocca

Institute Pasteur, Paris Institut Pasteur

CNR, ISASI Napoli National Research Council of Italy

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)
Pietro Ferraro, Napoli (I)
Enrico Gratton, Irvine (USA)
Nicola Gritti, Barcellona (E)
Jelle Hendrix, Hasselt (B)
Florian Jug, Dresden (D)
Pasquale Memmolo, Napoli (I)
Francesco Pavone, Firenze (I)
Paolo Pozzi, Modena (I)
Demetri Psaltis, Lousanne (CH)
Gimmi Ratto, Pisa (I)
Laura Sironi, Milano (I)
Yoav Shechtman, Haifa (IL)
Stefan Stanciu, Bucharest (RO)
Ioannis Tsamardinos, Crete (GR)
Devrim Ünay, Ivrim (TR)
Christophe Zimmer (F)

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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	Probabilistic pipelines to map biomolecule dynamics in heterogenous environments (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	From Machine Learning to Automated Machine Learning: the JADBIO system (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 for biomedical applications (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	Coherent Spatio-Temporal Microscopy in Microfluidics (P. Ferraro, I)
	14.45	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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