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Multiphoton Microscopy in the Biomedical Sciences XVIII

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Editors

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Introduction

Multiphoton microscopy has been established as the 3-D imaging method of choice for studying biomedical specimens from single cells and whole animals to patients with sub-micron resolution. 27 years have passed since the realization of two-photon laser scanning microscopy. The ever-expanding scope of applications and the continuing instrumental innovations requires a forum where new ideas can be exchanged and presented. Our conference at the SPIE BIOS 2018 meeting continues to address this need.

This is the 18th year of this conference and we start our conference with four Keynote lectures from leaders in the field of Metabolism:

Dr. Wei Min, Columbia University, NY, USA, **"Seeing molecular vibrations: Chemical imaging for biomedicine."**
Dr. Enrico Gratton, University of California at Irvine, CA, USA, **"Spectroscopic signatures of cells metabolism and extracellular species using phasor-FLIM."**
Dr. Elena V. Zagaynova, Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russian Federation, **"Metabolic imaging of tumor for diagnosis and response for therapy."**
Dr. Lihong V. Wang, California Institute of Technology, CA, USA, **"Photoacoustic tomography: Ultrasonically beating optical diffusion for deep imaging."**

For 18 years in a row, the conference organized poster awards for the students and postdoctoral fellows. The poster award was donated by all the conference sponsors as acknowledged at the bottom of the page.

The 2 poster award winners are

1. James R. W. Ulcickas, Purdue University, USA, "**Mueller tensor approach for nonlinear optics in turbid media."** Paper 10498-109.
2. Mengran Wang, Cornell University, USA, "**Comparison of excitation wavelengths for *in vivo* deep imaging of mouse brain."** Paper 10498-110.

Some of the most valuable contributions in this volume are articles written by highly experienced practitioners of multiphoton microscopy. They have enumerated the most important considerations in designing multiphoton microscopes and imaging experiments. Further, updates on the state-of-the-art commercial multiphoton microscope systems are presented. This volume also includes articles describing some recent advances in major multiphoton microscope components and applications including laser light sources, ultra-fast optics, filters, FRET, FLIM, FCS, Raman, CARS, SRS and Coherent Raman microscopy and spectroscopy, single molecule, endoscopy, In Vivo/Intravital imaging, metabolism measurements including NADH, FAD, tryptophan in cells and tissues and various scientific and clinical applications.

On a personal note, the conference chairs are grateful for the participation of all authors and session chairs. We acknowledge the innovation-driven manufacturers and sponsors of this conference [Applied Scientific Instrumentation, Becker & Hickl GmbH, Carl Zeiss, Chroma Technology Corp., Coherent Inc., ISS Inc., JenLab GmbH, Leica Microsystems, PicoQuant Photonics, Semrock Inc., and Spectra Physics & Newport (An MKS Company)] for their enthusiastic support in organizing this conference successfully for the last 18 years. We look forward to other exciting conferences in the future and welcome your continued participation and support.

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