



BPS2023

67th Biophysical Society Annual Meeting
February 18–22, 2023

**SAN
DIEGO**
CALIFORNIA, USA

Sunday, February 19

12:30 PM – 2:00 PM

Room 10

PicoQuant Photonics North America Inc

Quantitative, Reproducible Fluorescence Microscopy Made Easy

Quantitative single molecule and time-resolved fluorescence techniques offer new insights into many samples in life and materials sciences. So far, their adoption has been slow because expert knowledge was required for correct data acquisition and analysis. Now, PicoQuant developed a new single photon counting confocal microscope, called Luminosa. It combines state-of-the-art hardware with cutting edge software to deliver high quality data while simplifying daily operation. The system software includes context-based workflows for each technique, which improve accuracy and reproducibility of experiments.

Advanced integration of hardware and software enables new features such as sample-free auto-alignment, excitation laser power calibration, and automatic configuration of hardware parameters for time-resolved measurements. These features make experiments more efficient and reliable.

Dr. Koenig and Dr. Sisamakias will present how Luminosa brings single molecule Förster Resonance Energy Transfer (smFRET) experiments to a new level. For example, FRET efficiency (E) and stoichiometry (S) are calculated online, corrected according to the standard procedure of the community, and displayed live in an E/S histogram during the measurement.

Finally, Dr. Koenig and Dr. Sisamakias will describe how fluorescence lifetime imaging (FLIM) is streamlined with Luminosa. Its rapidFLIM hardware can record several frames per sec with very high photon count rates. The software handles these with a novel dynamic binning format. In combination with GPU-accelerated algorithms, this enables high-speed analysis of FLIM images. The automated analysis algorithm suggests the best model for multiexponential fitting, calculates a phasor plot and offers pattern matching.

A lot of expert knowledge went into the design of Luminosa. This empowers researchers to confidently explore new paths with time-resolved fluorescence techniques.

Speakers

Evangelos Sisamakias, Product Manager Microscopy, PicoQuant GmbH

Marcelle Koenig, Senior Scientist R&D, PicoQuant GmbH