

# 19<sup>th</sup> International Workshop on "Single Molecule Spectroscopy and Ultra Sensitive Analysis in the Life Sciences"

September 4-6, 2013 Berlin-Adlershof, Germany

> Organized by PicoQuant GmbH





Program (as of August 19, 2013, subject to alterations)

# Wednesday, September 4, 2013

12:00 – 13:00	Registration and collection of workshop material
13:00 – 13:15	<i>Rainer Erdmann, Berlin, Germany</i> Opening Remarks
Session: Superres 13:15 – 13:45	Chair: Rainer Erdmann <i>Christian Eggeling, Oxford, United Kingdom (Invited Paper)</i> STED-FCS fluorescence microscopy: A tool for studying molecular membrane dynamics
13:45 – 14:05	Mathew Stracy, Oxford, United Kingdom (Student Award) Super-resolution imaging and tracking of gene transcription in live cells
14:05 – 14:25	Ying Hu, La Jolla, USA (Student Award) Taming optical aberrations for astigmatism-based three-dimensional super-resolution imaging
14:25 – 14:45	Niccolo Banterle, Heidelberg, Germany (Student Award) Absolute Stoichiometry of the Nuclear Pore Complex
14:45 – 15:05	Federico Leon, Oxford, United Kingdom (Student Award) Determining the blinking behaviour of photoactivatable fluorescent proteins in live bacteria
15:05 – 15:40	COFFEE BREAK
Session: Methods	and Techniques I Chair: Thorsten Wohland
15:40 – 16:10	<i>Jerker Widengren, Stockholm, Sweden (Invited Paper)</i> Transient state (TRAST) imaging/spectroscopy, concepts and applications
16:10 – 16:30	Fabian Wehnekamp, Munich, Germany (Student Award) 3D Real-Time Orbital Tracking microscopy: Break through the boundaries of time and space
16:30 – 16:50	Thorben Cordes, Groningen, The Netherlands Towards ultrastable self-healing organic fluorophores
16:50 – 17:10	Jaime Ortega Arroyo, Oxford, United Kingdom (Student Award) Investigating nanoscopic dynamics on the microsecond timescale interferometric scattering microscopy
17:10 – 18:45	POSTER SESSION I
19:00	RECEPTION

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### Thursday, September 5, 2013

Session: Methods and Techniques II

Chair: Vahid Sandoghar

- 09:00 09:30 *Fedor Jelezko, Ulm, Germany (Invited Paper)* Single NV centers in diamond: quantum registers and nanoscale sensors
- 09:30 09:50 Jana Berit Nieder, Castelldefels, Spain Femtosecond pulse-shaping spectroscopy on single light-harvesting complexes
- 09:50 10:10 Swati Tyagi, Heidelberg, Germany (Student Award) Long-term single-molecule TIRF observation of biomolecules without immobilization
- 10:10 10:30 David Bauer, Oxford, United Kingdom (Student Award) Nanofluidics to Enhance Single Molecule DNA Imaging: Detecting Genomic Structural Variation in Humans
- 10:30 11:05 COFFEE BREAK

Session: Methods and Techniques III

Chair: Christian Eggeling

- 11:05 11:35 Vahid Sandoghar, Erlangen, Germany (Invited Paper) Fluorescence-free detection, spectroscopy and tracking of nanoobjects
- 11:35 11:55 Arina Rybina, Heidelberg, Germany (Student Award) Investigation of reaction pathways in chemical processes by means of Single-Molecule Fluorescence Spectroscopy (SMFS)
- 11:55 12:15 *Felix Koberling, Berlin, Germany* With Photon Patterns Towards Species Selective Microscopy
- 12:15 12:35 Jan Vogelsang, Regensburg, Germany Watching excitons at work in model systems of conjugated polymer materials by single-molecule spectroscopy
- 12:35 12:50 GROUP PICTURE
- 12:50 13:50 LUNCH

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Session: Methods and Techniques IV

Chair: David Millar

- 13:50 14:20 *Mircea Cotlet, New York, USA (Invited Paper)* Tuning single molecule charge transfer in quantum dot-based hybrids via self-assembly
- 14:20 14:40 *Peter May, Oxford, United Kingdom (Student Award)* Multi-parameter tethered fluorophore motion studies of DNA recombination
- 14:40 15:00 Chen Pei-Yin, Hsinchu, Taiwan (Student Award) Conformation and Fluorescence Property of Ploy(3-hexylthiophene) Isolated Chains Studied by Single Molecule Spectroscopy: Effects of Solvent Quality and Regioregularity
- 15:00 15:35 COFFEE BREAK

Session: Biological Applications

Chair: Mircea Cotlet

- 15:35 16:05 David Millar, California, USA (Invited Paper) Assembly and Dynamics of Nucleic Acid – Protein Complexes Probed at the Single-Molecule Level
- 16:05 16:25 Aniruddha Mitra, Dresden, Germany (Student Award) Interpreting stepping trajectories of motor proteins on 3D microtubule lattices by characterization of microtubule rotations
- 16:25 16:45 Aravindan Varadarajan, Amsterdam, The Netherlands (Student Award) Investigation trans-membrane protein diffusion in living Escherichia coli bacteria
- 16:45 18:30 POSTER SESSION II
- 19:45 DINNER

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### Friday, September 6, 2013

Session: FCS/FLIM/FRET I

Chair: Jerker Widengren

- 09:00 09:30 *Thorsten Wohland, Singapore* (Invited Paper) Advances in Imaging Fluorescence Correlation Spectrosocpy
- 09:30 09:50 Ingo Gregor, Göttingen, Germany Multiplex fluorescence marker quantification with spectrally-resolved Fluorescence Lifetime Imaging
- 09:50 10:10 Ralf Kühnemuth, Düsseldorf, Germany Tuning microfluidic mixers for ultrasensitive kinetic measurements using FCS and numerical methods
- 10:10 10:30 *Elina Staaf, Stockholm, Sweden* NK cell education: advanced microscopy-based methods for assessing dynamics and interactions at single molecule level
- 10:30 10:50 Thomas Niehörster, Würzburg, Germany (Student Award) Advanced Multicolor Imaging by Spectrally Resolved Fluorescence Lifetime Imaging
- 10:50 11:25 COFFEE BREAK

Session: Superresolution Microscopy II

Chair: Fedor Jelezko

- 11:25 11:55 *Don Lamb, Munich, Germany (Invited Paper)* MFD-PIE, PIE-FI, 3cPIE: Learning more with Pulsed-Interleaved Excitation
- 11:55 12:15 Olaf Schulz, Göttingen, Germany Fast 3D Multicolor Super-Resolution Imaging using Confocal Spin Disk Imaging Scanning Microscopy
- 12:15 12:35 Simon Hennig, Bielefeld, Germany Super-resolution imaging of celullar structures labelled by nanoinjection of fluorescent probes
- 12:35 12:55 Christof Gebhardt, Ulm, Germany Single Molecule Imaging and Quantification in the Cell Nucleus by Reflected Light Sheet Microscopy
- 12:55 13:05 Rainer Erdmann, Berlin, Germany Presentation of "Student Award"
- 13:05 14:05 LUNCH

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Session: FCS/FLIM/FRET II

Chair: Don Lamb

- 14:05 14:35 *William Eaton, Bethesda, USA (Invited Paper)* Toward observing transition paths in protein folding by single molecule fluorescence
- 14:35 14:55 Daniel Nettels, Zurich, Switzerland Influence of Singlet-Singlet Annihilation on Single-Molecule FRET experiments
- 14:55 15:15 Alexandre Fürstenberg, Genève, Switzerland Improved super-resolution imaging in heavy water
- 15:15 15:35 Alexey Chizhik, Göttingen, Germany Metal-induced energy transfer for novel applications in imaging and spectrosocpy
- 15:35 15:55 *Kohki Okabe, Tokyo, Japan* Imaging of temperature in a living cell using a fluorescent polymeric thermometer and fluorescence lifetime imaging microscopy
- 15:55 16:15 Don Lamb, Munich, Germany Concluding Remarks
- 16:15 End of Workshop

Contact PicoQuant GmbH Berlin, Germany Workshop coordinator: Jana Rudolph Phone: +49-30-6392-6929 Email: workshop@picoquant.com

For all details visit our website: www.picoquant.com/\_workshop.htm