



## Program

28. International Workshop on

# Single Molecule Spectroscopy and Super-resolution Microscopy

Berlin, Germany

September 26 - 28, 2023

[www.single-molecules.org](http://www.single-molecules.org)



PICOQUANT

## Tuesday, September 26

09.15 - 10.15 REGISTRATION

10.15 - 10.30 **Rainer Erdmann**, Berlin, Germany  
Opening Remarks

Session: Biological applications

Chair: Rainer Erdmann

10.30 - 11.00 **Katrin Heinze**, Würzburg, Germany (*Invited Talk*)  
Unraveling fast GPCR mobility and binding: a multidimensional fluorescence approach

11.00 - 11.30 **Sonja Schmid**, Wageningen, Netherlands (*Invited Talk*)  
The timing of life at the nanoscale

11.30 - 11.50 **Stanimir Tashev**, Birmingham, United Kingdom (*Student Award*)  
Towards the study of protein recruitment kinetics

11.50 - 12.10 **Giovanni Ferrari**, München, Germany (*Student Award*)  
Beyond FRET: DNA-Protein Interactions with Ångström Resolution on a Confocal Microscope

12.10 - 12.30 **Hendrik Sielaff**, Singapore, Singapore  
Intranuclear live-cell FCS and SMT of SWI/SNF chromatin remodelers reveal a multi-modal landscape of chromatin-binding dynamics associated with cancer-specific mutants

12.30 - 12.50 FLASH TALK SESSION 1

Chair: Marcelle Koenig

**Line Lauritsen, Thomas-Otavio Peulen, Miyase Tekpinar, Dongxia Wang**

12.50 - 14.00 LUNCH BREAK

Session: Methods

Chair: Katrin Heinze

14.00 - 14.30 **Madhavi Krishnan**, Oxford, United Kingdom (*Invited Talk*)  
Rapid, high-precision molecular analytics exploiting high-throughput single molecule trapping in solution

14.30 - 14.50 **Guillermo P. Acuna**, Fribourg, Switzerland  
Deterministic orientation of single molecules in DNA origami

14.50 - 15.10 **Florian Steiner**, München, Germany  
Quantum optics meets microscopy – An ultra-sensitive resonator microscope for nano- and life sciences

15.10 - 15.35 **Maria Loidolt-Krueger**, Berlin, Germany  
Single-molecule FRET and FCS measurements for structural biology and phase separation studies

15.35 - 16.10 COFFEE BREAK and EXHIBITION

- 16.10 - 16.40      **Victoria Birkedal**, Aarhus, Denmark (*Invited Talk*)  
Conformational dynamics of G-rich DNA helicase roadblocks by single molecule FRET
- 16.40 - 17.00      **David Li**, Glasgow, United Kingdom  
Only a few photons - Deep-learning enhanced FLIM
- 17.00 - 17.20      **Johan Hummert**, Berlin, Germany  
Small SPAD-arrays for confocal fluorescence lifetime imaging
- 17.20 - 18.50      POSTER SESSION I and GET TOGETHER

## Wednesday, September 27

Session: Sensors and labels

Chair: Madhavi Krishnan

- 09.00 - 09.35     **Johannes Broichhagen, Berlin, Germany (Invited Talk)**  
Optimizing dyes and conjugates for modern microscopy
- 09.35 - 09.55     **Haggai Shapira, Beer Sheva, Israel (Student Award)**  
A High-Performance DNA Origami Rotary Motor Operated by a Microfluidic Device and Monitored by Defocused Imaging
- 09.55 - 10.15     **Alexandre Fürstenberg, Geneva, Switzerland**  
Probing hydration and molecular order locally and quantitatively with fluorophores
- 10.15 - 10.35     **Dirk-Peter Herten, Birmingham, United Kingdom**  
Towards Quantitative 3D Super-Resolution Correlative Light-Electron-Microscopy
- 10.35 - 10.45     GROUP PICTURE
- 10.45 - 11.20     COFFEE BREAK and EXHIBITION

Session: Super resolution microscopy I

Chair: Paul Wiseman

- 11.20 - 11.50     **Ralf Jungmann, Planegg, Germany (Invited Talk)**  
Localizomics: towards spatial omics using DNA-based super-resolution microscopy
- 11.50 - 12.10     **Gregor J. Gentsch, Jena, Germany (Student Award)**  
Nanotexture enables computational multiplexing of super-resolved intracellular structures with high fidelity
- 12.10 - 12.30     **Niels Radmacher, Göttingen, Germany (Student Award)**  
Doubling the resolution of single-molecule localization microscopy with image scanning microscopy
- 12.30 - 12.50     **Susanne C. M. Reinhardt, Planegg, Germany (Student Award)**  
Ångström-resolution fluorescence microscopy via Resolution Enhancement by Sequential Imaging (RESI)
- 12.50 - 13.10     **Philipp R. Steen, Planegg, Germany (Student Award)**  
Optimal fluorophores and spectral multiplexing for 3x faster DNA-PAINT
- 13.10 - 14.20     LUNCH BREAK

- 14.20 - 14.50      **Scott Blanchard**, *Memphis, United States (Invited Talk)*  
Progress and challenges towards establishing direct links between single-molecule FRET and static three-dimensional structural information
- 14.50 - 15.10      **Soohyen Jang**, *Frankfurt am Main, Germany (Student Award)*  
Neural network-assisted single-molecule localization microscopy with a weak-affinity protein tag
- 15.10 - 15.30      **Eitan Lerner**, *Jerusalem, Israel*  
FRETsael microscopy - localizing biomolecular interactions at enhanced spatial precision using confocal microscopy and simple dyes
- 15.30 - 15.50      **Dragomir Milovanovic**, *Berlin, Germany*  
Single-molecule imaging reveals synaptic vesicle confinement by liquid phase separation
- 15.50 - 16.10      FLASH TALK SESSION 2      Chair: Marcelle Koenig  
**Samrat Basak, Alicia Damm, Blaise Gatin-Fraudet, Yunqing Li**
- 16.10 - 16.45      COFFEE BREAK and EXHIBITION
- 16.45 - 18.15      POSTER SESSION II
- 19.15 - 22.15      DINNER

## Thursday, September 28

Session: Correlation spectroscopy

Chair: Sudipta Maiti

- 09.00 - 09.35 **Bidyut Sarkar, Tokio, Japan (Invited Talk)**  
Resolving structure-dynamics-function relationship of a noncoding RNA with a microsecond time resolution using 2D fluorescence lifetime correlation spectroscopy
- 09.35 - 09.55 **Julius Trautmann, Jena, Germany (Student Award)**  
Fluorescence Correlation Spectroscopy: Aberration Induction Using Adaptive Optics for Enhanced Molecular Dynamics Analysis
- 09.55 - 10.15 **Sara Illodo, Santiago de Compostela, Spain (Student Award)**  
Characterization of the  $\beta$ -amyloid (1-40) early aggregates' formation by Fluorescence Correlation Spectroscopy
- 10.15 - 10.35 **Tao Chen, Göttingen, Germany**  
Metal- and Graphene-Induced Energy Transfer (MIET/GIET) Spectroscopy on Membrane Biophysics
- 10.35 - 10.50 VOTING STUDENT AWARD
- 10.50 - 11.25 COFFEE BREAK and EXHIBITION

Session: Biological applications

Chair: Bidyut Sarkar

- 11.25 - 11.55 **Sudipta Maiti, Mumbai, India (Invited Talk)**  
Molecular Biophysics of Diseases: From Single Molecules to Human Neurons
- 11.55 - 12.15 **Thorben Cordes, Planegg-Martinsried, Germany**  
From accurate FRET studies in proteins to systematic assay design
- 12.15 - 12.35 **Freja Frederikke Pinderup, Aarhus C, Denmark**  
Single molecule fluorescence of conjugated polymers attached to DNA origami platforms
- 12.35 - 12.55 **Susann Zelger-Paulus, Zurich, Switzerland**  
RNA in motion: Exploring the interplay of folding and splicing by smFRET
- 12.55 - 14.25 LUNCH BREAK

- 14.25 - 14.55      **Paul Wiseman, Montreal, Canada (Invited Talk)**  
Digging deeper into the molecular noise: data mining fluorescence microscopy and STED super-resolution images using k-space image correlation
- 14.55 - 15.15      **Ashwin Balakrishnan, Frankfurt am Main, Germany**  
Multi-target STED microscopy using exchangeable labels
- 15.15 - 15.35      **Steffen J. Sahl, Göttingen, Germany**  
Fluorescence Nanoscopy in the Intra-Molecular Distance Range
- 15.35 - 15.55      **Marina Santana-Vega, Glasgow, United Kingdom**  
A new platform for single molecule imaging using the fluoruous effect
- 15.55 - 16.15      **Qianyi Wu, New York, United States**  
*Conformational dynamics of a glutamate transporter*
- 16.15 - 16.30      STUDENT AWARD PRESENTATION
- 16.30 - 16.45      Closing Remarks
- 16.45                End of 28th International Workshop on Single Molecule Spectroscopy and Super-resolution Microscopy

# Flash Talks

(as of September 20)

Presenter	Session	Poster Number	Title
Lauritsen, Line	Tuesday	P19F	Ratiometric STED nanoscopy and lifetime imaging of novel Nile Red analogs for analysis of membrane packing in living cells
Peulen, Thomas-Otavio	Tuesday	P23F	Crossing scales for Bayesian integrative microbiology: A peek into bacterial houses through molecular fluorescence microscopes
Tekpinar, Miyase	Tuesday	P35F	Improving Resolution in 3D Multiplane SOFI
Wang, Dongxia	Tuesday	P37F	Metal-induced energy transfer (MIET) imaging of cell surface engineering with multivalent DNA nanobrushes
Basak, Samrat	Wednesday	P2F	Advanced Fluorescence Lifetime DNA-PAINT Microscopy
Damm, Alicia	Wednesday	P10F	Single Molecule FRET Reveals Mechanosensitivity of an ABC Transporter
Gatin-Fraudet, Blaise	Wednesday	P12F	Fluorophores with optimized chemical and photophysical properties for smFRET
Li, Yunqing	Wednesday	P20F	Single-molecule FRET of the (MET:InIB) <sub>2</sub> receptor:ligand complex reveals an anti-parallel conformation

# Poster presentations

(in alphabetical order, as of September 20)

Presenter	Session	Poster Number	Title
Azizollahi, Farzaneh Alipoor	Tuesday	P1	The Mechanism of Cas3 at a Single-Molecule Resolution Using Magnetic Tweezers
Bennett, Timothy J D	Tuesday	P3	Detection of PTMs in proteins using ETe
Benyoucef, Mohamed	Tuesday	P5	Luminescent properties of Nd complexes and processing of photonic crystal structures
Bujnicki, Tuyen	Tuesday	P7	SuFIDA technology: ultra-sensitive and highly specific digital assays at single-molecule level
Cora, Diego	Tuesday	P9	Interaction between monomeric amyloid peptides and human serum albumin studied by fluorescence techniques
Erichson, Felix	Tuesday	P11	FRET assisted integrative modeling of a ribosomal tertiary contact
Ghosh, Swarnali	Tuesday	P13	Beneficial Intrinsic Hole Trapping and Its Amplitude Variation in An Ultra-stable, Highly-bright, Toxic-metal-free Quantum Dot
Hemmen, Katherina	Tuesday	P15	Multiparameter time-resolved fluorescence spectroscopy of G-protein coupled receptor dynamics and interactions in live cells
Hernández, Stella	Tuesday	P17	Thiazole Orange for detection and quantification of dsDNA
Lauritsen, Line	Tuesday	P19F	Ratiometric STED nanoscopy and lifetime imaging of novel Nile Red analogs for analysis of membrane packing in living cells
Marx, Daniel	Tuesday	P21	Mobility of Single Molecules at the Interfaces of Thin Polymer Films
Peulen, Thomas-Otavio	Tuesday	P23F	Crossing scales for Bayesian integrative microbiology: A peek into bacterial houses through molecular fluorescence microscopes
Postulkova, Klara	Tuesday	P25	Engineering of autocatalytic activity of HIV-1 protease
Rex, Tobias	Tuesday	P27	Phosphorescence of Amphiphilic Pt(II) Complexes with C <sup>N</sup> *N <sup>N</sup> C Ligands: synthesis, characterization and bio-application
Sansom, Henry G.	Tuesday	P29	Ultrasensitive Detection of Biomolecular Building Blocks via Pulse-shaped Multiphoton Excitation.
Sisamakias, Evangelos	Tuesday	P31	Fast analysis with minimal user interaction in Fluorescence Lifetime Imaging
Svoeglazova, Arina	Tuesday	P33	T1a nanobody as a tool for studying the F508del mutation effect in NBD1.
Rezania, Bitia	Tuesday	P39	Second-harmonic generation imaging microscopy with ps pulsed lasers
Tekpinar, Miyase	Tuesday	P35F	Improving Resolution in 3D Multiplane SOFI
Wang, Dongxia	Tuesday	P37F	Metal-induced energy transfer (MIET) imaging of cell surface engineering with multivalent DNA nanobrushes
Moya, Gabriel	Tuesday	P41	Brick-MIC, a compact and versatile 3D-printed microscopy platform

Presenter	Session	Poster Number	Title
Basak, Samrat	Wednesday	P2F	Advanced Fluorescence Lifetime DNA-PAINT Microscopy
Benyoucef, Mohamed	Wednesday	P4	Fabrication of telecom wavelength photonic crystal cavities for integration of lanthanide molecules
Bhoi, Anupam	Wednesday	P6	Conformational Dynamics of the ISWI nucleosome remodelling enzyme.
Ndege Simisi Clovis	Wednesday	P8	G-tetrad selective ligand binding kinetics in G quadruplex DNA probe by Fluorescence Correlation Spectroscopy
Damm, Alicia	Wednesday	P10F	Single Molecule FRET Reveals Mechanosensitivity of an ABC Transporter
Gatin-Fraudet, Blaise	Wednesday	P12F	Fluorophores with optimized chemical and photophysical properties for smFRET
Giezen, Sanne	Wednesday	P14	Revealing the interfacial dynamics between anti-freeze proteins and the ice-water interface at single-molecule level through subzero nanoscopy
Hepp, Christof	Wednesday	P16	Structural analysis of the influenza genome structure by high-throughput single virion DNA-PAINT
Hummert, Johan	Wednesday	P18	Next generation fluorescence lifetime imaging with novel SPAD sensors
Li, Yunqing	Wednesday	P20F	Single-molecule FRET of the (MET:InlB) <sub>2</sub> receptor:ligand complex reveals an anti-parallel conformation
Paez, Francisco	Wednesday	P22	How to design better nanocarriers using a microscope?
Popova, Mariia	Wednesday	P24	Studying the conformational changes of the cohesin complex and its interactions with DNA by single-molecule FRET.
Rathnayaka, Imesha	Wednesday	P26	Ribonucleoprotein Interaction in the Spliceosome
Weigert, Florian	Wednesday	P28	High resolution event time tagger with ultra short dead-time
Seijas, Jesús	Wednesday	P30	Characterization of the early aggregation of $\beta$ -Amyloid based on autofluorescence
Sisamakís, Evangelos	Wednesday	P32	An easy and reliable way to perform single molecule FRET measurements
Swain, Bikash Chandra	Wednesday	P34	The C-terminal region of eukaryotic translation initiation factor 4B is disordered and dynamically binds RNA
Tyagi, Arti	Wednesday	P36	Multiphase microscopy to uncover missing links in the role of BRCA2 in DNA damage repair
Weber, Mirko	Wednesday	P38	Enhancing Long-Range RNA Tertiary Contact Modeling: A Tool for Streamlined MD Simulation Preparation
Zhu, Xin	Wednesday	P40	Probing the structure of single stranded nucleic acids using Escape time electrometry (ETe)