

7th International Workshop on “Single Molecule Detection and Ultrasensitive Analysis in Life Sciences”

Organized by
PicoQuant GmbH



PICOQUANT GmbH
Unternehmen für optoelektronische
Forschung und Entwicklung

Technical Program

26. - 28. September 2001
at WISTA Campus
Berlin-Adlershof (Germany)

Aims and Purpose

The recent years have seen an ever increasing interest in the detection and spectroscopy of single molecules (SMD). Especially in genetics, molecular and cell biology, as well as in high-throughput screening and diagnostics, SMD under biologically native conditions became an important work tool. Three optical detection methods have shown their great potential in such applications: confocal laser (scanning) microscopy, wide-field microscopy with highly sensitive CCD-cameras, and near-field microscopy.

Confocal microscopy yields a wealth of spectral information with high temporal resolution; wide-field microscopy allows for the recording of complete images with single-molecule sensitivity; and near-field microscopy provides optical detection with highest spatial resolution. Complementary to optical detection and spectroscopy, force spectroscopy of single molecules developed into a powerful technique for gaining insight into structure and dynamics of individual molecules. Here, methods based on atomic force microscopy as well as optical tweezers have yielded a large number of exciting results over the past couple of years.

For six years now, the annual Workshop on SMD, organized by PicoQuant in Berlin, has proven to be an excellent forum for the discussion of the topics mentioned above. The main goal is to give an overview of most recent results in the field and to stimulate new research and industrial applications of SMD.

PicoQuant GmbH wants to encourage especially young scientists in SMD research. Therefore a special SMD students award worth 1500 DM is donated for the third year by the company.

Venue

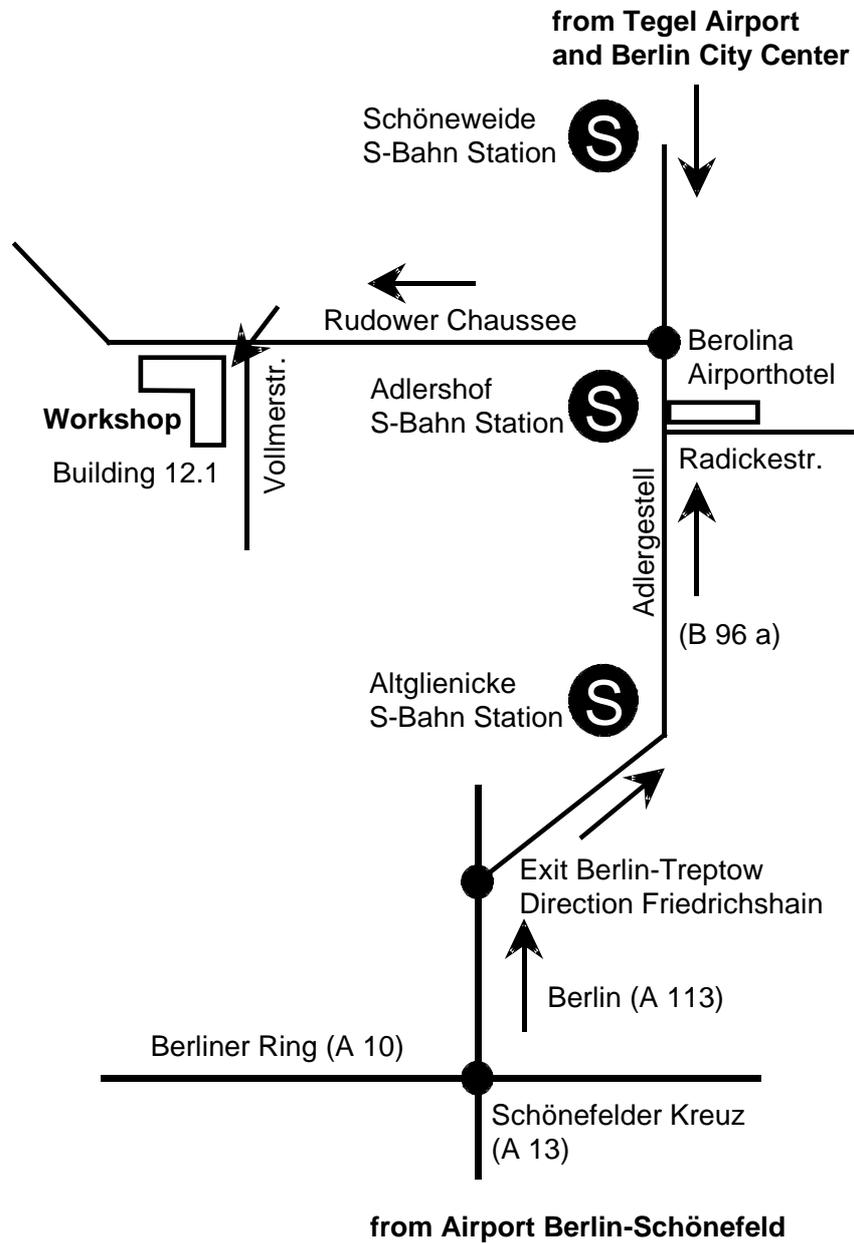
PicoQuant GmbH Berlin:	Rudower Chaussee 29 (IGZ) OWZ Building, Room 466 D-12489 Berlin
General Organization:	Angelika Zoufahl, Jana Grünig, Rainer Erdmann PicoQuant GmbH Phone: +49-30-6392-6560 Fax: +49-30-6392-6561 workshop@pq.fta-berlin.de http://www.picoquant.com
Registration office:	WISTA Conference Center Rudower Chaussee 17 Building 12.1 Einstein Kabinett Wednesday 11.30 a.m. - 1.00 p.m.
Hotel address:	
Berolina Airport Hotel (formerly Transhotel)	Radickestr. 76 (across the street Adlergestell) D-12489 Berlin Phone: +49-30-67095-0 Fax: +49-30-67095-222

How to get to PicoQuant GmbH

The workshop location is about 12 min walking distance from the S-Bahn station **Adlershof**. Please go through the railway bridge and follow the Rudower Chaussee on the left hand side until the you see the workshop signs. Then enter the building 12.1 at the WISTA campus and follow the signs.

- from Airport/Railway station Berlin-Schönefeld:
take S-Bahn **S9** or **S45**, go three stops to Adlershof
Ticket: Short-distance ticket, fare area AB (valid 3 stations, DM 2.50)
- from Railway station Zoologischer Garten:
take the S-Bahn into one of the following directions:
S9 or **S45** to Flughafen Schönefeld
S8 to Grünau
S6 to Zeuthen or
S46 to Königs Wusterhausen
and go to Adlershof
Ticket: Single ticket, fare area AB (valid 2 hours, DM 4.20)
- from Airport Berlin-Tegel:
take the Express Bus **X9** to railway station Zoologischer Garten
and then follow description given above.

Workshop Location



Program (subject to alterations)

Wednesday, 26 September 2001

- 11.30 - 13.00 Registration
- 13.00 - 13.15 Rainer Erdmann, Berlin
Opening Remarks
- 13.20 - 13.55 Xavier Michalet, Berkeley (**Invited Paper**)
Single Molecule Spectroscopy of Fluorescent Semiconductor Nanocrystals
- 13.55 - 14.20 Thomas Huser, Livermore
Single Cell Raman Spectroscopy of Protein-induced Packing of DNA in Sperm Cells
- 14.20 - 14.45 Harald Mathis, St. Augustin
Spatially Resolved Single Molecule Detection: Real-Time Tracking
- 14.45 - 15.10 Uwe Gerken, Stuttgart (*Students Award*)
Diffusion and Spectroscopic Properties of Single Antenna Complexes in Artificial Membranes
- 15.10 - 15.45 COFFEE BREAK
- 15.45 - 16.20 Frans de Schryver, Heverlee-Leuven (**Invited Paper**)
Single Molecule Spectroscopy of Dendritic Structures
- 16.20 - 16.45 Wunshain Fann, Taipei
Single Molecule Fluorescence Spectroscopy and Microscopy Luminescent Conjugated Polymers
- 16.45 - 17.10 Philip Tinnefeld, Heidelberg (*Students Award*)
Multidimensional Signal Processing in Single Molecule Spectroscopy: A Reliable Tool to Study Multichromophore Systems
- 17.10 - 17.35 Thomas Ruckstuhl, Zürich
n.a.
- 17.35 - 18.00 Tim Vosgröne, Siegen
Nanoscale Surface-enhanced Resonance Raman Scattering (SERRS) Spectroscopy of Single Molecules on Isolated Silver Clusters
- 18.15 - 21.00 RECEPTION

Thursday, 27 September 2001

- 09.00 - 09.35 Erwin Peterman, Amsterdam **(Invited paper)**
Orientation and Dynamics of Kinesin Bound to Microtubules Studied with Wide-field Polarization Microscopy
- 09.35 - 10.00 Christian Müller , Heidelberg
Fluorescence Resonance Energy Transfer (FRET) in Donor-acceptor Substituted DNA Strands: A Comparative Study of Ensemble and Single Molecule Data
- 10.00 - 10.25 Enno Schweinberger, Göttingen (*Students Award*)
Single Molecule FRET Dynamics Reveals an Equilibrium between a Closed and an Open Conformation of Syntaxin
- 10.25 - 11.00 COFFEE BREAK
- 11.00 - 11.35 Jörg Enderlein, Regensburg **(Invited paper)**
Single Molecule Fluorescence in Metallic Nanocavities
- 11.35 - 12.00 Leif Brand, Hamburg
Fluorescence Intensity and Lifetime Distribution Analysis: Resolving Ensemble and Single Particle Properties
- 12.00 - 12.25 Michael Wahl, Berlin
Lifetime-imaging Confocal Microscopy for Advanced Single-Molecule Studies
- 12.25 - 12.50 Chong-Woo Park, Heidelberg (*Students Award*)
Double-detection and Identification of Single Molecules in Submicrometer Capillaries
- 12.50 – 13:15 Ido Braslavsky, Pasadena
Single Molecule Measurements of DNA Polymerase
- 13.15 – 14.15 LUNCH
- 14.15 - 17.30 POSTER SESSION and PRODUCT PRESENTATION
- 19.00 DINNER

Friday, 28. September 2001

- 09.00 - 09.35 Gerhard Schütz, Linz (**Invited Paper**)
Microscopy of Dynamical Processes in Living Cells on a Molecular Scale
- 09.35 - 10.00 Hervé Rigneault, Marseille
Fluorescent Correlation Spectroscopy with Sub-wavelength Photonic Structures
- 10.00 - 10.25 Thomas Heimburg, Göttingen
Relaxation Processes and Diffusion in Membranes as Studied by FCS and Single Molecules
- 10.25 - 11.00 COFFEE BREAK
- 11.00 - 11.35 Watt Webb, Ithaca (**Invited Paper**)
Sub-resolution Optics
- 11.35 - 12.00 Johan Hofkens, Hervelee
Spectroscopy and Microscopy of Autofluorescent Proteins
- 12.00 - 12.25 Markus Lippitz, Mainz (*Students Award*)
Two Photon Fluorescence Spectroscopy of Tryptophan Containing Proteins
- 12.25 - 12.50 Ben Bowen, Tempe (*Students Award*)
Single Molecule Fluorescence Studies of Mg²⁺-ATP Driven Rotation and the Photophysical Behavior of Red Fluorescent Protein
- 12.50 - 13.50 LUNCH
- 13.50 - 14.25 Toshio Yanagida, Osaka (**Invited Paper**)
not finally confirmed yet
- 14.25 - 14.50 Christopher Hollars, Livermore
Non-classical Light Emission from Single Conjugated Polymers
- 14.50 - 15.15 Vaseduvan Pillai Biju, Tsukuba
Uniform Distribution of Fluorophores on Surfaces for Single Molecule Studies
- 15.15 - 15.40 Pierre-Francois Lenne, Marseille
Forced Unfolding of Alpha-helical Bundles
- 15.40 - 15.50 Rainer Erdmann, Berlin
Presentation of "SMD Students Award"
- 15.50 - 16.00 n.n.
Concluding remarks
- 16.00 - 16.30 Final COFFEE BREAK

Call for Papers 2002

We would like to invite all participants of this meeting and all other interested scientist to the

8th International Workshop on “Single Molecule Detection and Ultrasensitive Analysis in Life Sciences”

which will be held in Berlin late September 2002. The final date will be announced towards the end of this year on our web page.

[Http://www.picoquant.com](http://www.picoquant.com)

We would like to invite people to submit their papers as soon as possible. From our experience organising the previous meetings we recommend to do all correspondence by e-mail. Please send abstracts in RTF format or plain ASCII text.

Further, we would like to bring the following meeting to your attention:

Following the successful short courses on "**Principles and Applications of Time-Resolved Fluorescence**" by Dr. J.R. Lakowicz at the Center of Fluorescence Spectroscopy (CFS) in Baltimore a **European course** will be offered in September 2002 in Berlin, Germany. The course consists of lectures as well as instrumentation and software hands-on training. Local organization is handled by PicoQuant and the key lectures are given by Prof. J. Lakowicz and other invited speakers. The new event will complement our own workshops on Single Molecule Detection.

The final date will be announced towards the end of this year on the following web pages.

[Http://www.picoquant.com](http://www.picoquant.com)

[Http://cfs.umbi.umd.edu/course](http://cfs.umbi.umd.edu/course)