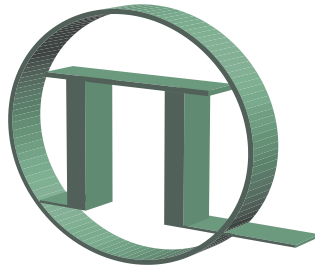


**5th International Workshop on
Single Molecule Detection
and Ultrasensitive Analysis
in Life Sciences**

Organized by
PicoQuant GmbH



PICOQUANT GmbH
Unternehmen für optoelektronische
Forschung und Entwicklung

Technical Program

29. September - 01. October 1998
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. Especially in genetic and biochemical screening and assaying, single molecule detection (SMD) under biologically native conditions became an important issue. The experimental method of choice in SMD is laser-induced fluorescence detection either on surfaces or SMD of freely moving molecules in liquids. In the first case, scanning techniques as Near-Field Scanning Microscopy or Confocal Scanning Microscopy, are the dominating techniques, although interesting results are emerging from the application of ultra-sensitive CCD camera systems. In the second case, the detection of single molecules in microdroplets, in flowing streams, and in (sub) picoliter detection volumes are the main approaches.

One of the most challenging topics in SMD is the application in fast DNA sequencing. There, the use of time-resolved techniques promises very compact systems capable of identifying the four nucleotides in a DNA-sequence according to their fluorescence lifetimes and spectra.

Already now, first applications have been reported from industry research groups concerning the use of SMD with picosecond diode laser systems. In the same context, two photon SMD has been reported using blue and green absorbing dyes as marker molecules. Similar techniques may prove very useful when incorporated into miniaturized systems for capillary electrophoresis, high density micro plate screening etc.

In the last couple of years, 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. PicoQuant GmbH wants to encourage especially young scientists in SMD research. Therefore a special prize of 1500 DM is donated by the company for the "Students SMD Award 1999".

Program (subject to alterations)

Wednesday, 29 September 1999

11.30 - 13.00 Registration

13.15 - 13.40 R. Erdmann, Berlin

Opening Remarks and Presentation of "SMD Students Award"

13.45 - 14.20 N. van Hulst, Enschede, **(Invited Paper)**

Near-field Optical Photodynamic Studies of Single Molecules & Proteins

14.20 - 14.45 B. Schäfer, Jena

Relaxation of Individual DNA Molecules Described by a Harmonic Oscillator Model

14.45 - 15.10 F. van Veggel, Enschede

Functional Self-Assembled Monolayers of β -cyclodextrines on Gold: Single Host-Guest Interactions probed by AFM

15.10 - 15.35 B. Hecht, Zürich

Direct Measurement of the Longitudinal Electric Field Component in a Focus using Single Molecules

15.35 - 16.10 **COFFEE BREAK**

16.10 - 16.45 Th. Schmidt, Leiden **(Invited Paper)**

Single Molecule Microscopy on Biomembranes

16.45 - 17.10 G. Schütz, Linz

Diffusion of Single Lipid Molecules on Cell Membranes

17.10 - 17.35 C. Tietz, Chemnitz

Single Light Harvesting C(LHC-II) of Higher Plants

17.45 - 18.10 n.n.

18.15 - 21.00 **RECEPTION**

Thursday, 30 September 1999

09.00 - 09.35 R. Rigler, Stockholm (**Invited paper**)
Non Markovian Processes in Enzyme Catalysis at the Single Molecule Level

09.35 - 10.00 C. Begon, Marseille
Spontaneous Emission Control and Detection of Biological Markers

10.00 - 10.25 M. Hattori, Tsukuba
Fluorescence Correlation Spectroscopy with Traveling Interference Fringe Excitation: Introduction of SMD Experimental Scheme

10.25 - 11.00 **COFFEE BREAK**

11.00 - 11.35 S. Soper, Baton Rouge (**Invited paper**)
Single Molecule Analysis in Genomics using Near-IR Fluorescence Detection and Microfluidic Devices

11.35 - 12.00 J. Enderlein, Regensburg
Tracking of Diffusing Molecules within Membranes

12.00 - 12.35 M. Sauer, Heidelberg
Single Molecule Detection and Identification in Submicrometer Channels: State of the Art and Future Prospects

12.35 - 13.00 M. Weber, Siegen
Triplet-state Lifetime of Single Molecules

13.00 - 14.00 **LUNCH**

14.15 - 17.30 **POSTER SESSION and PRODUCT PRESENTATION**

19.00 **DINNER**

Friday, 01. October 1999

09.00 - 09.35 N. Dovici, Edmonton (**Invited Paper**)
The Chemistry of Single Enzyme Molecules

09.35 - 10.00 M. Bennick, Enschede
Single DNA Molecule Approach to Homologous Recombination

10.00 - 10.25 V. Uhl, Jena
Microscopic Observation of Single Molecule Enzyme Kinetics in Femtoliter Droplets

10.25 - 11.00 **COFFEE BREAK**

11.00 - 11.35 M. Auer, Wien (**Invited Paper**)
Interfacing Novel Detection Technologies based on Single Molecule Fluorescence Spectroscopy with miniaturised High Throughput Screening in the Nanoliter Format.

11.35 - 12.00 A. Castro, Los Alamos
Detection of Specific Sequences in Individual Double-Stranded DNA Fragments

12.00 - 12.25 J. Schaffer, Göttingen
Multi-dimensional Site-specific Fluorescence Spectroscopy of Single DNA-Molecules in Solution

12.25 - 12.50 T. Ruckstuhl, Regensburg
Forbidden Light Detection from Single Molecules

12.50 - 13.50 **LUNCH**

14.00 - 14.35 C. Seidel, Göttingen (**Invited Paper**)
Applications of BIFL for Multi-dimensional Single Molecule Spectroscopy

14.35 - 15.00 P. Tinnefeld, Heidelberg
Characterization of Single Molecules by Time-resolved Fluorescence Scanning

15.00 - 15.25 M. Maus, Herverle
Intramolecular Excimer-like and Monomer Fluorescence of Multichromophoric Dendrimers Studied by Time- and Spectrally-Resolved Spectroscopy: From the Ensemble to the Single Molecule Behaviour

15.25 - 15.50 n.n.

15.50 - 16.00 S. Soper, Baton Rouge
Concluding Remarks

16.00 - 16.30 COFFEE BREAK