EOS Topical Meeting on Biophotonics and Biomedical Optics (TOM 1)

16 – 18 October 2006
Part of the EOS Annual Meeting 2006
Porte de Versailles – Paris, France

Sessions

- Microscopy and Nanoscopy
- Biophotonic Imaging
- Biochips, Nanoparticles, Micromanipulation
- Optical Probes, Biosensors and Tomography
- Spectroscopy

In cooperation with OPTO, EPS, STO, DGaO Deutsche Gesellschaft für angewandte Optik The German Branch of the European Optical Society
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TOM 1 - Biophotonics and Biomedical Optics

Monday, 16 October
Session: Microscopy and Nanoscopy
Session chair: Gert von Bally, Westfälische Wilhelms-Universität Münster (DE)

11:35 Scanning infrared near field microscopy: Chemical imaging of subsurface structures and self assembled monolayers with nm resolution
*Martina Havenith, Ruhr-University Bochum (DE) 30

12:05 Multiphoton imaging of extracellular matrix remodeling: quantitative scoring and three-dimensional architecture of collagenous fibrosis
A.M. Pena, CNRS (FR) 32
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<th>Title</th>
<th>Presenter and Institution</th>
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<tr>
<td>12:20</td>
<td>Combined multiphoton microscopy and cell surgery by femtosecond laser pulses</td>
<td>Judith Baumgart, Laser Zentrum Hannover e.V. (DE)</td>
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<tr>
<td>12:35</td>
<td>Coherent anti-Stokes Raman scattering (CARS) microscopy: Instrumentation and applications to biology</td>
<td>Nadia Djaker, Institut Fresnel (FR)</td>
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<td>12:50</td>
<td>CARS microscope based on a green pumped OPO</td>
<td>Herman Offerhaus, University of Twente (NL)</td>
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<td><strong>Monday, 16 October</strong></td>
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<td></td>
<td><strong>Microscopy and Nanoscopy</strong></td>
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<td></td>
<td><strong>Session chair: Colin Sheppard, National University of Singapore (SG)</strong></td>
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<tr>
<td>14:00</td>
<td>High-speed, wide-field optically sectioned, live cell fluorescence lifetime imaging</td>
<td>David Grant, Imperial College, London (GB)</td>
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<td>14:15</td>
<td>Rapid Hyperspectral Fluorescence Lifetime Imaging</td>
<td>Dylan Owen, Imperial College, London (GB)</td>
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<td>14:30</td>
<td>Digital Holographic Microscopy for quantitative micro-tomography of living specimen: volume estimation of <em>Hyalosphenia papilio</em></td>
<td>Florian Charrière, EPFL STI IOA (CH)</td>
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<td>14:45</td>
<td>Quantitative Digital Holographic Phase Contrast Microscopy: A New Marker Free Tool for Multi Focus Imaging of Living Cells</td>
<td>Gert von Bally, Westf. Wilhelms-Universität Münster (DE)</td>
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<td>15:00</td>
<td>Digital holographic microscopy with reduced spatial coherence for three-dimensional study of phospholipids vesicles in a shear flow under microgravity conditions</td>
<td>Frank Dubois, Université Libre de Bruxelles (BE)</td>
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<td>15:15</td>
<td>Third-harmonic generation microscopy of cells and tissues: contrast mechanisms and applications</td>
<td>Emmanuel Beaurepaire, CNRS (FR)</td>
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<td>15:30</td>
<td>Near field total internal reflection microscopy using surface plasmon</td>
<td>Emmanuel Fort, Université Paris VII - Denis Diderot (FR)</td>
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<td>15:45</td>
<td>Deeper nonlinear microscopy using pre-dispersion compensation</td>
<td>Gail McConnell, University of Strathclyde (GB)</td>
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**Session: Biophotonic Imaging**
**Session chair: Paul French, Imperial College, London (GB)**

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<td>16:30</td>
<td>Use of coherence in multi scale imaging of biological tissues</td>
<td>*Claude Boccara, ESPCI (FR)</td>
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<td>17:00</td>
<td>Diffuse optical imaging of the female breast</td>
<td>*Martin van der Mark, Philips Research (NL)</td>
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<td>17:30</td>
<td>Adaptive holography technique for acousto-optic imaging of highly scattering media</td>
<td>Max Lesaffre, Laboratoire d'Optique de d'ESPCI (FR)</td>
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</table>
17:45 Optoacoustic imaging modality in medical ultrasonic imaging device: Principles and performance.
Michael Jaeger, University of Bern (CH)

18:00 An Adaptive Optics System for Retinal Imaging using a Pyramid Wavefront Sensor
Elizabeth Daly, National University of Ireland (IE)

18:15 A polarization sensitive capillaroscope
Ian Stockford, University of Nottingham (GB)

Tuesday, 17 October
Session: Biochips, Nanoparticles, Micromanipulation
Session chair: Jean-Louis Martin, Ecole Polytechnique (FR)

10:30 Optical Cell Deformability – Molecular Marker Free Recognition of Cell Type and State
*Josef Käs, University Leipzig (DE)

11:00 Blue LED Arrays and Functionalised Nanoparticles for Biosensing
*Duncan Graham, University of Strathclyde (GB)

11:30 Luminescent lanthanide-ion doped oxide nanoparticles for single biomolecule tracking applications
Antigoni Alexandrou, Ecole Polytechnique (FR)

11:45 Lanthanides and quantum dots as efficient donor-acceptor pairs for sensitive homogeneous Förster Resonance Energy Transfer fluoroimmunoassays (FRET-FIA)
Niko Hildebrandt, Universität Potsdam (DE)

12:00 Motion of Apoptotic Cells in an Optical Trap
Caitriona Creely, ICFO (ES)

12:15 Photoluminescent diamond nanoparticles for biomolecules delivery
Francois Treussart, Ecole Normale Supérieure de Cachan (FR)

Tuesday, 17 October
Session: Optical Probes, Biosensors and Tomography
Session chair: Josef Käs, University Leipzig (DE)

14:00 Nanophotonics structures to study the subwavelenght organization of cells and biomembranes
*Hervé Rigneault, Institut Fresnel (FR)

14:30 In vivo Multiphoton-Endoscopy based on a GRIN-lens
Alexander Ehlers, Fraunhofer Institute of Biomedical Technology (DE)

14:45 Grating-assisted optical diffraction tomography with nearfield resolution
Anne Sentenac, CNRS (FR)

15:00 Multiphoton tomography in medicine using femtosecond lasers
Karsten König, Fraunhofer Institute for Biomedical Engineering IBMT (DE)
15:15 Tearfilm induced eye aberrations detected with high-speed Hartmann–Shack aberrometer
Maris Ozolinsh, University of Latvia (LT)

15:30 Focused ultrashort pulses remotely modulate cortical growth cones
Manoj Mathew, ICFO (ES)

15:45 Structural studies of sol-gel biomaterials as carriers of photosensitive dyes
Halina Podbielska, Wroclaw University of Technology (PL)

Wednesday, 18 October
Session: Spectroscopy
Session chair: Emmanuel Beaurepaire, Ecole Polytechnique (FR)

10:30 Raman-Spectroscopy - a valuable tool for biochemical analysis
*Juergen Popp, University of Jena (DE)

11:00 A novel hyperspectral lifetime probe for autofluorescence
Pieter De Beule, Imperial College London (GB)

11:15 Absolute measurement of molecular two-photon absorption cross-sections using a fluorescence saturation technique
Martin Kauert, University of Bern (CH)

11:30 Bimodal spectroscopy: an application to an orthotopic rat bladder model
Emilie Pery, CRAN - INPL (FR)

11:45 Reducing the effects of scattering in spectrophotometry
Stephen Morgan, University of Nottingham (GB)

12:00 Appropriate sampling frames for hyperspectral skin imaging for the estimation of blood volume and oxygen saturation
John Crowe, University of Nottingham (GB)

12:15 In vivo multiphoton microscopy of metabolic oxidation-reduction states and NADH fluorescence lifetimes in normal and pre-cancerous epithelia
Melissa C. Skala, Duke University, Durham (US)

Posters

Fiber-optic methods for curing and diagnostics of biocomposite materials
Emilia Anttila, Tampere University of Technology (FI)

Spectro-angular approach in surface plasmon resonance imaging: Applications to biomolecular surface interaction characterization.
Fabrice Bardin, Laboratoire Charles Fabry de l'Institut d'Optique (FR)

Total Internal Reflection Fluorescence for fluorescence lifetime imaging of bacterial biofilms
Pierre Blandin, LPPMLCFIO (FR)
Speckle and Polarisation for the study of the cutaneous radiation syndrome
Guy Le Brun, LSOL (FR)

Real-time temperature determination during laser photocoagulation of the retina
Ralf Brinkmann, University of Lübeck (DE)

Laser microbeams as versatile tools for the isolation and manipulation of cells
Andrea Buchstaller, University of Munich (DE)

Measurement of the integral refractive index of erythrocytes with a Digital Holographic Microscope
Florian Charrière, EPFL STI IOA (CH)

Holographic Optical Tweezers Raman Imaging of Dividing Cells
Caitriona Creely, ICFO - Institut de Ciències Fotòniques (ES)

Point Spread Function Filtering using Zernike Moments
Arnaud De Meyer, laboratory MIPS (FR)

3-Dimensional synchronous luminescence spectroscopy of pigmented skin lesions
Miroslav Dramicanin, Institute of nuclear sciences Vinca (YU)

Active substrates for enhanced fluorescence detection on thick samples: applications to cell and tissue imaging
Emmanuel Fort, Université Paris VII - ESPCI (FR)

Influence of the Raman depolarization ratio on radiation pattern in coherent anti-Stokes Raman scattering (CARS) microscopy
David Gachet, Institut Fresnel (FR)

Enhanced detection of metallic nanoparticles using surface plasmon coupling: applications to bioimaging.
Yannick Goulam Houssen, University Paris 7 (FR)

Ultrafast dispersion measurement of bR in the near IR range
Zsuzsanna Heiner, University of Szeged (HU)

The fabrication of a thin, circular polymer film based phase shaper for generating doughnut modes
Jun-ichi Hotta, Katholieke Universiteit Leuven (BE)

Integrated VCSEL trap arrays for microfluidic particle separation and sorting
Andrea Kroner, Ulm University (DE)

Dynamical optical biochips Application to DNA sensors and genetic diagnosis
Pierre Lecaruer de Lainsecq, Laboratoire Charles Fabry de l'Institut d'Optique (FR)

Femtosecond pulse fiber delivery for biological tissue non linear endoscopic imaging
Frederic Louradour, Limoges University (FR)

Assessment of the Optical Parameters of Food
Emmanuel Madieta, GRAPPE, Groupe ESA (FR)
Forward solver for photon diffusion through a three-layer medium: a model for photon migration through the adult head
Fabrizio Martelli, Dipartimento di Fisica, Università degli Studi di Firenze (IT)

Sub-micrometer ultra-short pulse laser surgery in Theileria-infected cells
Dominik Marti, University of Bern (CH)

Cells handling via interactive holographic optical tweezers
Serge Monneret, Chargé de Recherche au CNRS (FR)

Measurement of macula pigment optical density
Andrew O'Brien, NUI Galway (IE)

Interest of the finite element method to the light propagation in bilayered turbid media: comparison with analytical data, application to the assessment of the oxygenation of the muscle
Vianney Piron, LPMI - ENSAM (FR)

Antimicrobial semiconductor-laser-induced photodynamic activity
Halina Podbielska, Wroclaw University of Technology (PL)

Noninvasive optical sensing and monitoring of glucose content in phantoms of biotissues and in human subjects: state of the art, problems and prospects
Alexander V. Priezzhev, Lomonosov Moscow State University (RU)

Modelling of light diffusion in tissues with spatially inhomogeneous optical properties
Margarita Shendeleva, Institute of Physics (UA)

Optical properties of bioactive composites
Stanislawa Szarska, Wroclaw University of Technology (PL)

Backward second harmonic generation from starch for real time, in situ pulse characterization in nonlinear microscopy
Anisha Thayil, ICFO-Institut de Ciencies Fotóniques (ES)

Multiple Coaxial Foci for Optical Tweezers
Pedro J. Valle, University of Cantabria (ES)

Sidelobes Control in PSF engineering by pupil filters
Pedro J. Valle, University of Cantabria (ES)

Interference microscopy of subwavelength structures
Gennady Vishnyakov, VNIIOFI (RU)

Single-molecule fluorescence microscopy study of amino-acid incorporation in a protein
Nathalie Westbrook, Laboratoire Charles Fabry de l'Institut d'Optique (FR)