



ESF-FWF Conference in Partnership with LFUI

Trends in Optical Micromanipulation



Universitätszentrum Obergurgl (Ötz Valley, near Innsbruck) • AT
4-9 February 2007

What we call Optical Micromanipulation makes clever use of the physical properties of light to influence microscopic particles: The photon energy can be applied to heat, weld, cut or fuse; the momentum that light carries may accelerate, trap or stretch particles; and since light may carry angular momentum, we even have a "handle" to induce torques or induce rotations, respectively. Optical micromanipulation is very appealing as a technology for instance in cell biology, as it is clean, safe (typically one uses milli-Watt laser beams), relatively cheap and allows interactive monitoring under the microscope. Besides being a contact-free means for "manoeuvring" particles in desired ways, optical traps can also be used as measurement devices for tiny forces in the pico-Newton regime. Being strongly interdisciplinary and close to industry, the topic reflects the typical characteristics of present day research. Optical Micromanipulation is a very rapidly growing field, a fact that creates a large demand for cross-linking among the increasing number of groups on the development and on the application side.

The conference will be dedicated to these emerging new technologies for the laser-manipulation of particles in the micro- and nano-world and will cover topics on optical traps including holographic optical tweezers, optical binding and self-assembly of particles, laser micro-beams, and biological and technological applications of these. Apart from these main topics, stimulating "side-glances" to related topics ranging from nanotechnology to microfluidics will be included. We will bring together major trend-setters and promising young researchers in the field, in an environment with better opportunities for scientific discussion than typically possible at large scale conferences. We offer to be a platform for exchanging views and sharing experience in the challenging goal to bridge the gap towards applications in biology and other disciplines or to intensify and strengthen such existing links, respectively. Sessions for posters and short oral presentations are both planned to be included in the conference programme.



Chair: Monika Ritsch-Marte, Medical U. Innsbruck, AT

Vice-Chair: Stefan Bernet, Medical U. Innsbruck, AT

Invited Speakers will include

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| M. Allegrini, Pisa U., IT | W. Losert, Maryland U., US |
| J. Arit, Reading U., UK | P. Ormos, Hungarian Acad. of Sciences, HR |
| K. Berg-Sorensen, TU Denmark, DK | M. Padgett, Glasgow U., UK |
| J. Curtis, Heidelberg U., DE | D. Petrov, ICFO, ES |
| K. Dholakia, St. Andrews U., UK | H. Rubinsztein-Dunlop, U. of Queensland, AU |
| E. Fällman, Umeå U., SE | V. Sandoghdar, ETH Zürich, CH |
| J.-M. Fournier, Harvard U., US | A. Sasso, Napoli "Federico II" U., IT |
| J. Glückstad, Risø National Lab., DK | J. Schmiedmayer, Heidelberg U., DE |
| O. Greulich, Inst. für Molekulare Biotechnologie e. V., DE | G. Schütz, Johannes Kepler U., AT |
| D. Hanstorp, Chalmers U. of Techn. & Göteborg U., SE | K. Schütze, P.A.L.M. Microlaser Technologies AG, DE |
| K. Helmerson, NIST, US | G. Spalding, Illinois Wesleyan U., US |
| J. Käs, Leipzig U., DE | G. Swartzlander, Arizona U., US |
| V. Kralj-Iglic, Ljubljana U., SL | P. Zemánek, Czech Acad. of Sciences, CZ |

Application Form & Programme

available from
www.esf.org/conferences/07220

Closing Date for Application
20 November 2006

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