

*Program*

**ADVANCES IN OPTICS  
FOR  
BIOTECHNOLOGY, MEDICINE AND SURGERY**

**3-7 August, 2003  
Banff Centre for Conferences  
Banff, Alberta, Canada**

**Conference Co-Chairs**

***Molly Brewer***

University of Arizona

***Thomas Foster***

University of Rochester

***James Fujimoto***

Massachusetts Institute of Technology

**ENGINEERING CONFERENCES INTERNATIONAL, INC.**

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Bioengineering**

**Sunday, August 3, 2003**

16:00 – 18:00 Registration (Max Bell Foyer)

18:00 – 18:30 Welcome Reception

18:30 – 20:00 Dinner

20:00 – 20:10 Conference Welcome and Overview  
Conference Chairs and ECI Representative

20:10 – 22:00

**Session I: Photodynamic Therapy**

**Session Organizer: Michael Patterson** (McMaster University)

**Stephen M. Hahn** (Department of Radiation Oncology, U. Pennsylvania)  
*Measurement of tissue oxygenation, photosensitizer uptake, and tissue optical properties during intraoperative PDT*

**Dick Sterenberg** (Dr Daniel den Hoed Cancer Centre, University of Rotterdam Hospital)  
*Optical monitoring of PDT*

**Johan van Lier** (University of Sherbrooke)  
*Evaluating new photosensitizers by animal-PET: Photodynamic efficacy and action mechanisms*

**Brian C. Wilson** (Ontario Cancer Institute and University of Toronto)  
*Monitoring PDT response by singlet oxygen luminescence, ODT, and bioluminescence*

**Notes**

All technical sessions will be in the Max Bell Auditorium.

Poster presentations will be in Max Bell Rooms 251 and 253. Poster boards will be set up Tuesday morning and presentations must be removed by 12:30 pm on Thursday.

All ECI conference technical sessions, meals, and socials are smoke-free.

Please turn your cell phone to vibrate and have any telephone conversations outside the meeting room.

**Monday, August 4, 2003**

07:00 – 08:15

Breakfast

08:30 – 12:00

**Session II: Molecular Imaging**

**Session Organizer: Vasilis Ntziachristos** (Harvard University)

**Samuel Achilefu** (Washington University)

*Contrast agent-mediated organ function monitoring and tumor imaging by optical methods*

**Christopher H. Contag** (Stanford University)

*Revealing the molecular basis of disease and host responses using in vivo bioluminescent measurements*

10:00 – 10:30

Coffee Break

**Mark Dewhirst** (Duke University)

*Role of optical imaging in establishing points of HIF-1 $\alpha$  regulation during early tumor growth*

**Vasilis Ntziachristos** (Harvard University)

*Bringing in vitro assays to life with fluorescence molecular tomography*

12:00 – 13:30

Lunch

13:30 – 18:00

*ad hoc* discussions, free time

18:00 – 19:30

Dinner

20:00 – 22:00

**Session III: In vivo Spectroscopic Diagnostics**

**Session Organizer: Irving Bigio** (Boston University)

**Stefan Andersson-Engels** (Lund University)

*Time-resolved absorption and scattering spectroscopy for identification and treatment control of malignant tumours*

**Stephen G. Bown** (University College London)

*Clinical assessment of elastic scattering spectroscopy for detecting early cancer and pre-cancer*

**Lev Perelman** (Harvard Medical School)

*Non-invasive dynamic monitoring of sub-cellular morphology with light scattering spectroscopy*

**Nimmi Ramanujam** (University of Wisconsin)

*Fiber-optic probe designs for fluorescence based detection of epithelial precancers*

22:00 – 23:00

Social Hour (Max Bell Fish Bowl)

**Tuesday, August 5, 2003**

07:00 – 08:15 Breakfast

08:30 – 12:00

**Session IV: Cell Microscopy and Mesoscale Imaging**

**Session Organizer: Enrico Gratton** (University of Illinois)

**Nick Barry** (University of Colorado at Denver)

*Lifetime resolved microscopy in the time and in the frequency domain*

**Joachim Mueller** (University of Minnesota)

*Fluorescence fluctuation spectroscopy in living cells*

10:00 – 10:30

Coffee Break

**Nils Petersen** (University of Western Ontario)

*Image correlation spectroscopy*

**Peter So** (Massachusetts Institute of Technology)

*High throughput two-photon tissue image cytometry*

12:00 – 13:30

Lunch

14:00 – 18:30

*ad hoc* discussions, free time

18:00 – 19:30

Dinner

20:00 – 22:00

**Session V: Submitted Posters** (Max Bell Rooms 251 and 253)

**Session Organizers: Molly Brewer** (University of Arizona) and **Arjun Yodh**  
(University of Pennsylvania)

22:00 – 23:00

Social Hour

**Wednesday, August 6, 2003**

07:00 – 08:15 Breakfast

08:30 – 12:00 **Session VI: Optical Coherence Tomography**  
**Session Organizer: Joseph Izatt** (Duke University)

**Zhongping Chen** (University of California, Irvine)  
*Functional optical coherence tomography: simultaneous imaging of tissue structure and physiology*

**Wolfgang Drexler** (University of Vienna)  
*Ultrahigh resolution OCT in the 500 nm to 1700 nm wavelength region*

10:00 – 10:30 Coffee Break

**Matthew Everett** (Carl Zeiss Meditec Inc.)  
*Applications of OCT in the ophthalmic market with the Zeiss Meditec StratusOCT*

**Joseph Izatt** (Duke University)  
*Molecular contrast in optical coherence tomography*

12:00 – 13:30 Lunch

13:30 – 16:00 *ad hoc* sessions/free time

16:00 – 18:00 **Session VII: Photon Migration**  
**Session Organizer: Brian Pogue** (Dartmouth College)

**David Boas** (Harvard University)  
*NIR & tomosynthesis breast imaging*

**Jeremy Hebden** (University College London)  
*NIR neonatal brain imaging*

**Roger Springett** (Dartmouth Medical School)  
*Second derivative spectral NIR tomography*

**Lothar Lilge** (Ontario Cancer Institute and University of Toronto)  
*Colours tell the risk! Can spectroscopy be used in preventive oncology*

19:00 – 21:00 Conference Banquet (Dining Room 3-4-5)

21:00 – 22:00 Social Hour (Max Bell Fish Bowl)

**Thursday, August 7, 2003**

07:00 – 08:15 Breakfast

08:30 – 12:00

**Session VIII: Laser-Tissue Interactions**

**Session Organizer: Woody Ediger** (InLight Solutions)

**Kristian Helmersen** (NIST)

*Optical manipulation of liposomes as micro-reactors*

**Karsten Koenig** (Friedrich-Schiller University, Jena, Switzerland)

*Targeted transfection by femtosecond laser*

10:00 – 10:30

Coffee Break

**Vasan Venugopalan** (University of California, Irvine)

*Laser cellular interactions for cellular bioanalytics*

**Alfred Vogel** (Medical Laser Center, Lubeck, Germany)

*Mechanisms of material ejection in pulsed laser ablation*

12:00 – 12:15

Closing Remarks

12:15 – 13:30

Lunch

Conference Close and Departure