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ADVANCED STUDY INSTITUTE
International Summer School

TEL AVIV UNIVERSITY

Université du Québec en Outaouais

OPTICAL WAVEGUIDE SENSING & IMAGING
in Medicine, Environment, Security and Defence

October 12-21, 2006, Gatineau, Québec, Canada

Organized By: **Université du Québec en Outaouais, Gatineau, Québec, Canada**
Tel-Aviv University, Tel-Aviv, Israel
Vitesse Re-Skilling™ Canada Inc. , Kanata, Ontario, Canada

Rationale

The engineering applications of fiber and waveguide optics sensor technologies are an advanced and mature R&D area. It has historically developed before and independently of the optical telecom applications in the late 90's. Today, the intensity of optical telecom applications has been significantly reduced and the focus has changed to biomedical, environment and defense detection and sensing technologies. The fiber optics sensor engineering community can bring new and fresh ideas for revolutionary cross-disciplinary applications, in particular, in the field of life sciences.

Biophotonics sensing and imaging is an emergent R&D area and has made enormous progress in the last decade. Biophotonics advancements and applications in medicine, environment, security and defence have created a new optical sensing paradigm and provide an opportunity for both, the engineering and the life sciences research communities, to jointly contribute to the heath, environment, security and defense challenges faced by humanity in the 21st century.

Objective

The objective of the proposed ASI is to build a creative advanced research and learning environment by bringing together world experts, researchers, Ph.D. students and postdoctoral fellows from industry, university and government research organizations, to explore various aspects of both applied research and commercialization of existing and emerging optical waveguide, fiber, micro and nanophotonics imaging and also sensing technologies as well as their current and potential applications in the biomedical sciences, environment, security and defence.

Scientific Directors:

Dr. Wojtek J. Bock, Professor
Canada Research Chair in Photonics
Centre de recherche en photonique
Département d'informatique et d'ingénierie
Université du Québec en Outaouais,
Québec, Canada

Dr. Israel Gannot, Professor
Tel-Aviv University, Tel-Aviv, Israel, and
School of Eng. & Applied Sciences
George Washington University
Washington, DC 20052, USA

Scientific Secretary:

Dr. Stoyan Tanev, Program Manager – Photonics and Biophotonics
Vitesse Re-Skilling™ Canada Inc., 349 Terry Fox Drive, Kanata, Ontario, Canada
Tel. (613) 254-9880 ext. 228, Fax (613) 254-9881, E-mail: stoyan.tanev@vitesse.ca

For more information visit www.vitesse.ca

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Rick Claus
Virginia Tech, Blacksburg, VA, USA
Self assembled nanostructured fibers and sensors

Karl Fridriech Klein
Friedberg Gissen University, Germany
UV-fibers: materials, properties and applications

Jim Harrington
Rutgers University, NJ, USA
Infrared fiber optic sensors
Laser power delivery using infrared fiber optics

Anders Bjarklev
Research Center COM, Technical University of Denmark
Sensors and active devices based on hybrid photonic crystal fiber structures

Ilko Ilev
FDA/CDRH, HFZ-134, Rockville, MD, USA
Fiber optics nanobiosensors for biomedical applications

Julian Jones
Heriot-Watt University, UK
Optical fiber interferometric sensing systems

Tinko Eftimov
Plovdiv University, Sofia, Bulgaria
Advanced mechanisms for optical fiber sensing

Jacques Albert
Canada Research Chair in Advanced Photonic Components
Department of Electronics, Carleton University, Ottawa, ON
Novel sensing mechanisms using tilted fiber Bragg gratings

Francis Berghmans
SCK-CEN, Belgium
Ionising Radiation Effects and Reliability of Optical Fiber Components

Ulrich Krull
University of Toronto at Mississauga, ON, Canada
Optical waveguides as a platform for detection of DNA hybridization
Integration of microfluidics with waveguiding DNA biosensors

Leonid Butvina
Prohorov GPI RAS, Moscow, Russia
FTIR ATR infrared fiber sensors for field environmental and bio-chemical reactor monitoring

Wojtek Bock
Canada Research Chair in Photonics
Univeristé du Québec en Outaouais, Gatineau, PQ, Canada
Optical fiber sensing technologies for explosive detection

Israel Gannot
George Washington University and Tel-Aviv University
Sensors for the smart medical home

Yuji Matsuura
Tohuko University, Sendai, Japan
Deep UV, x-ray laser and Raman waveguides for medical treatments

Stoyan Tanev
Vitesse Re-Skilling™ Canada Inc., Kanata, ON, Canada
Simulation tools for waveguide mode and propagation modeling – biomedical and biosensing research implications

Participation Cost: $2,000 CAD (US$ 1,700 or EURO 1,380) + 7% tax
The cost includes shared accommodation, breakfast, lunch and coffee breaks, two receptions, course materials and one excursion.

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