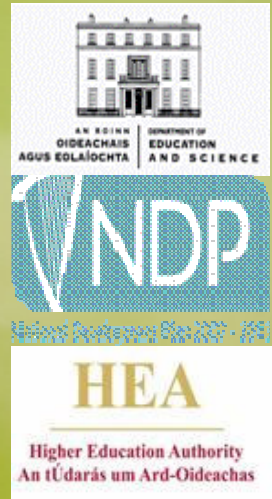


BIGSS'08 Programme Timetable

Organising Committee:

Martin Leahy (Chair)
Chris Dainty
Valery Tuchin
Peter Dockery
Alan Ryder
Paul Whelan
Brendan Wilkins
Hugh Byrne
Noel Buckley
Elfed Lewis
Conleth Hussey
Michael Connelly

Michelle Lanigan (admin)
Telephone 061 202746
Fax 061 202734
Email Michelle.Lanigan@ul.ie



**BIGSS' 08 BioPhotonics and Imaging Graduate
Summer School**

**August 29 – September 02, 2008
Ballyvaughan, Co. Clare, IRELAND**

Friday 29th August 2008

Valery Tuchin Tissue Optics and Optical Clearing of Tissues

- 09:30 Structural and optical models of tissues
- 11:00 Break
- 11:30 Mechanisms of optical clearing
- 13:00 Lunch
- 14:00 Optical Coherence Tomography (Gordon McKenzie)
- 15:00 Michelson Diagnostics OCT demo (Gordon McKenzie)
- 15:30 Break
- 16:00 Applications of Optical Clearing

Ivan Fedosov Fundamentals of laser speckles and their applications

- 17:00 Interference and coherence
- 17:30 Laser Speckles in free space
- 17:45 Laser Speckles in imaging geometry
- 18:00 Dynamic speckles
- 18:10 Statistical properties of dynamic speckles
- 18:40 Speckle interferometry and other applications

- 19:00 Hang Posters

- 19:30 Dinner at the Burren Coast Hotel

Saturday 30th August 2008

Peter So Fluorescence Imaging

- 09:00 Introduction
- 09:15 Basic fluorescence spectroscopy: history, Jablonski description, de-excitation mechanisms
- 10:00 Nonlinear optics: semi-classical treatment for 1P fluorescence, SHG, THG, & 2P fluorescence
- 11:00 Break
- 11:30 Nonlinear optics: semi-classical treatment for 1P fluorescence, SHG, THG, & 2P fluorescence (cont)
- 12:00 Optical imaging & microscopy: ray tracing, microscopy, interference, diffraction view of Abbè limit, Fourier view of Abbè limit
- 13:00 Lunch
- 14:00 Confocal and two-photon 3D microscopy: basic theory & applications
- 14:50 Advanced fluorescence microscopy: FCS, FLIM, FRET
- 15:40 Conclusion, Q&A
- 16:00 Break

Rodney Gush Laser Doppler and Speckle techniques for tissue blood flow imaging: Performance and Applications

- 16:30 Introduction and basic theory of LD and Speckle
- 16:40 Validation of the techniques
- 17:05 Clinical and Physiological Applications
- 17:20 Potential and Opportunities
- 17:30 Questions
- 18:00 Hands on Laser Doppler and Laser Speckle Imaging

Sunday 31st August 2008

Jannick Rolland Optical Coherence Tomography

- 09:00 Principles of OCT
- 09:45 Light Sources for OCT
- 10:15 Fourier Domain OCT (FD- OCT)
- 11:00 Break
- 11:30 Optical Coherence Microscopy
- 12:15 Functional OCT
- 13:00 Finish

- 14:30 Bus Transfer to Burren Perfumery
- 15:00 Burren Perfumery
- 16:00 Bus Transfer to Cliffs of Moher
- 16:30 Visit to the Cliffs of Moher
- 18:15 Bus Transfer to Bunratty Medieval Banquet
- 20:45 Bunratty Medieval Banquet

Monday 1st September 2008

Lihong Wang Photoacoustic Tomography: High-Resolution *in vivo* Imaging of Optical Contrast at new Depths

- 09:00 Motivation and challenges
- 09:20 Photoacoustic computed tomography
- 11:00 Break
- 11:30 Dark-field confocal photoacoustic microscopy, Part I
- 13:00 Lunch
- 14:00 Dark-field confocal photoacoustic microscopy, Part II
- 14:10 RF-induced thermoacoustic tomography
- 14:2 Summary and discussion
- 14:30 Break

Gert Nilsson Medical Needs meet New Technologies to form novel Bioengineering Innovations:

- 15:00 Introduction
- 15:10 Major Biomedical Innovations
- 15:30 The Innovation Grid
- 15:50 Minor Biomedical Innovations (Examples)
 - Evaporimeter
 - Laser Doppler Flowmetry
 - Tissue Viability Imaging
- 17:40 Hands-on TiVi

Public Event

- 19:00 NBIP Medical Technology Commercialisation
Colloquium: Bringing bioengineering innovations to the market

Gert Nilsson, Professor of biomedical instrumentation,
Linköping University, Sweden

Tuesday 2nd September 2008

Thomas Naughton Introduction to Digital Holography

08:00	Introduction and overview
08:50	Coherent light and diffraction
09:10	Conventional holography
10:00	Digital capture of holograms
10:30	Break
10:50	Phase-shifting digital holography
11:10	Reconstruction algorithms
11:30	Reduction of speckle and twin image
12:00	Digital holographic microscopy
12:30	Displays
12:50	3D information extraction
13:20	Lunch

Rasmus Larsen Hyperspectral Image Analysis - Methods for Regression and classification in Hyperdimensional Spaces

14.30	Linear methods for classification and regression and the curse of dimensionality
15.30	Regularization, Variable selection, and subspace projection
16.30	Break
17.00	Spectral Alignment
18.00	Applications and examples

END.