6th International Workshop on

*Adaptive Optics for Industry and Medicine*

11-15 June 2007, Galway, Ireland

Final Programme

**MONDAY 11th JUNE**

The short course on Adaptive Optics presented by Prof Robert Tyson will take place in Room AO208 in the Applied Optics Group, Physics Department, Arts and Sciences Building at NUI Galway, from 2:00 to 5:30 on Monday 11th June. Only those pre-registered for this course may attend *(no on-site registrations).*

**INDUSTRY EXHIBIT**

An informal exhibit by the conference financial sponsors will take place in Rooms 203 and 204 adjacent to the registration and poster areas. The exhibit will be open from 14:00 on Tuesday 12th to 16:00 on Wednesday 14th June, and in particular be available during the poster sessions:

*Tuesday 12th June 14:00 - 15:30 and 17:30 - 19:00. Wednesday 11:10 - 13:00 and 15:20 - 16:00.*
TUESDAY 12th JUNE

Registration  Tuesday 12th June 08:30 - 4:30
Registration takes place on Level 2 of the Information Technology Building, NUI Galway

All Sessions take place in Room IT250 of the IT Building.

Session 1.(a) Tuesday 12th June 09:30 - 10:30  Opening of the Workshop
Liquid Crystal Lenses
Chair: Chris Dainty

Liquid crystal lenses for correction of presbyopia (Invited) [91]
Guoqiang Li and Nasser Peyghambarian

Converging and diverging liquid crystal lenses [14]
Andrew K. Kirby, Philip J.W. Hands, and Gordon D. Love

Coffee 10:30 - 11:00

Session 1.(b) Tuesday 12th June 11:00 - 12:40
Liquid Lenses and Deformable Mirrors I
Chair: Gordon Love

Liquid lens technology for miniature imaging systems: status of the technology, performance of existing products and future trends (Invited) [95]
Bruno Berge

Carbon Fiber Reinforced Polymer Deformable Mirrors for high energy laser applications [7]
S.R. Restaino, J.R. Andrews, R. Martin, T. Martinez, R. Romeo, C.C. Wilcox

Tiny multilayer deformable mirrors [53]
Tatiana Cherezova, Alexander Sobolev, Alexander Alexandrov, Alexey Kudryashov, Olga Samarkina, and Vadim Samarkin

Performance analysis of piezoelectric deformable mirrors [79]
Oleg Soloviev and Gleb Vdovin

Lunch 12:45 - 14:00

Poster Session and Exhibit, 14:00 - 15:30

Coffee 15:00 - 15:30

Session 2.(b) Tuesday 12th June 15:30 - 17:30
Deformable Mirrors II
Chair: Alexis Kudryashov

Deformable membrane mirror with high actuator density and distributed control [18]
Roger Hamelinck, Nick Rosielle, Maarten Steinbuch, Rogier Ellenbroek, Michel Verhaegen, Niek Doelman

Novel Electro-Static Membrane Mirror Using COTS Membranes Characterization and Closed-Loop Control [50]
David Dayton, Justin Mansell, Bob Praus, John Gonglewski
Electrostatic micro-deformable mirror based on polymer materials [57]
Frederic Zamkotsian, Patrick Lanzoni, Veronique Conedera, Norbert Fabre

Recent progress in CMOS integrated MEMS AO mirror development [88]
Andreas Gehner, Michael Wildenhain, Jens Knobbe, Jan Uwe Schmidt

Compact Large-Stroke Piston-tip-tilt Actuator and Mirror [6]
W. Noell, A. Hugi, T. Overstolz, R. Stanley, S. Waldis, and N. F. de Rooij

MEMS Deformable Mirrors for High Performance AO Applications [92]
Paul Bierden, Thomas Bifano, Steven Cornelissen

POSTER SESSION, EXHIBIT AND RECEPTION 17:30 - 19:00
WEDNESDAY 13th JUNE

Registration  Wednesday 13th June 09:30 - 4:30
Registration takes place on Level 2 of the Information Technology Building, NUI Galway

Session 3.(a) Wednesday 13th June 09:30 - 11:10
Wavefront Sensing I
Chair: Scot Olivier

Wave front sensorless adaptive optics for imaging and microscopy (Invited) [52]
Martin J Booth, Delphine Debarre and Tony Wilson

A Fundamental Limit for Wavefront Sensing [89]
Carl Paterson

Coherent fibre-bundle wavefront sensor [76]
Brian Vohnsen and Pablo Artal

Maximum-likelihood methods in wave-front sensing: nuisance parameters [80]
David Lara, Harrison H. Barrett, and Chris Dainty

Coffee  11:10 - 11:40

Poster Session and Exhibit, 11:10 - 13:00
Lunch 13:00 - 14:00

Session 4.(a) Wednesday 13th June 14:00 - 15:20
Wavefront Sensing II
Chair: Xinyang Li

Real-time Wavefront Sensing for Ultrafast High-power Laser Beams [75]
Juan M. Bueno, Brian Vohnsen, Pedro M. Prieto, Luis Roso and Pablo Artal

Wavefront sensing using a random phase screen [73]
M. Loktev, G. Vdovin, O. Soloviev

Quadri-Wave Lateral Shearing Interferometry : a new mature technique for wave front sensing in adaptive optics [39]
Benoit Wattellier, Ivan Doudet, Sabrina Velghe, France Jérôme Primot

In Vivo Measurement of Ocular Aberrations with a Distorted Grating Wavefront Sensor [25]
P Harrison, L Diaz-Santana, DM Cuevas, GRG Erry, P Fournier, C Torti

Poster Session and Exhibit, 15:20 - 16:00
Coffee 15:20 - 16:00

Session 4.(b) Wednesday 13th June 16:00 - 17:20
Wavefront Sensing III
Chair: Ulrich Wittrock

Active Position-sensitive Detector for Low-light Hartman-Shack Wavefront Sensor [36]
Davies W. de Lima Monteiro, Andre S. O. Furtado, Luciana P. Salles, Jose A. Diniz, Gleb Vdovin
Adaptive Optics system to accurately measure wavefronts with a complex shape [55]
Miguel Ares, and Santiago Royo

A kind of novel linear phase retrieval wavefront sensor and its application in close-loop adaptive optics system [69]
Xinyang Li, Ming Li, Bo Chen, Wenhan Jiang

Measurement of the eye with the SHWFS: applications, limitations, and opportunities [83]
Daniel R. Neal, James Copland, David Baer, T.D. Raymond

Conference Dinner, Aula Maxima, 19:15
THURSDAY 14th JUNE

Registration    Thursday 14th June 09:30 - 4:30
Registration takes place on Level 2 of the Information Technology Building, NUI Galway.

Session 5.(a) Thursday 14th June 09:30 - 10:30
Sensing and Control
Chair: Carl Paterson

A prototype custom CMOS sensor for fast, low cost wavefront sensing [81]
I.M. Stockford, K.N. Modha, M. Clark, B.R. Hayes-Gill, R.A. Light and M.C. Pitter

Low cost, high speed AO control [13]
Christopher D. Saunter and Gordon D. Love

Edward Laag, Don Gavel, Renate Kupke, Mark Ammons

Coffee 10:30 - 11:00

Session 5.(b) Thursday 14th June 11:00 - 12:20
Adaptive Optics in Vision I
Chair: Sergio Restaino

Adaptive optics for the human eye (Invited) [9]
Enrique Joshua Fernandez

Visual simulation using electromagnetic adaptive-optics [97]
Nicolas Chateau, Laurent Vabre, Karolinne Maia Rocha, Ronald Krueger

High-resolution field-of-view widening in human eye retina imaging [34]
Alexander V. Dubinin, Tatyana Yu. Cherezova, Alexis V. Kudryashov

Lunch 12:30 - 13:30

Session 6.(a) Thursday 14th June 13:30 - 14:50
Adaptive Optics in Vision II
Chair: Joshua Fernandez

Psychophysical experiments on visual performance with an ocular adaptive optics system [45]
Dalimier E, Dainty J C and Barbur J

Does the accommodative mechanism of the eye calibrate itself using aberration dynamics? [82]
K. M. Hampson, S. S. Chin and E. A. H. Mallen

A Study of Field Aberrations in the Human Eye [58]
Alexander V. Goncharov, Maciej Nowakowski, Eugénie Dalimier, Matt Sheehan, and Chris Dainty

Dual wavefront corrector ophthalmic adaptive optics: design and control [61]
Alfredo Dubra and David Williams

Coffee 14:50 - 15:20
**Session 6.(b) Thursday 14th June 15:20 - 16:40**  
**Adaptive Optics in Vision III**  
**Chair: Luis Diaz Santana**

High speed simultaneous SLO/OCT imaging of the human retina with adaptive optics [86]  
M. Pircher, R.J. Zawadzki, J.W. Evans, J.S. Werner and C.K. Hitzenberger

Characterization of an AO-OCT system [59]  
Julia W. Evans, Robert J. Zawadzki, Steve Jones, Scot Oliver, John S. Werner

Adaptive optics optical coherence tomography for retina imaging [70]  
Guohua Shi, Zhuhua Ding, Yun Dai, Xunjun Rao, Yudong Zhang

Development, calibration and performance of an electromagnetic-mirror-based Adaptive Optics system for visual optics [62]  
Enrique Gambra, Lucie Sawides, Carlos Dorronsoro, Lourdes Llorente & Susana Marcos

**Break  16:40-17:00**

**Session 6.(c) Thursday 14th June 17:00 - 18:20**  
**Adaptive Optics in Optical Storage and Microscopy**  
**Chair: Tatyana Cherezova**

The application of liquid crystal aberration compensator for optical disc systems (Invited) [16]  
Masakazu Ogasawara

Commercialization of the Adaptive Scanning Optical Microscope (ASOM) [26]  
Scott Barry, Alex Cable, Benjamin Potsaid, John T. Wen

A practical implementation of adaptive optics for aberration compensation in optical microscopy [30]  
A J Wright, S P Poland, J Vijverberg, J M Girkin
FRIDAY 15th JUNE

Session 7.(a) Friday 15th June 09:30 - 10:50
Adaptive Optics in Lasers
Chair: Robert Tyson

Improved Beam Quality of a High Power Yb:YAG Laser [65]
Dennis G. Harris, Falgun D. Patel, Charles E. Turner, Jr. and Michael M. Johnson

Intracavity adaptive optics optimization of an end-pumped Nd:YVO4 laser [40]
Petra Welp, Ulrich Wittrock

New results in high power lasers beam correction [64]
Alexis Kudryashov, Vadim Samarkin, Julia Sheldakova, Alex Alexandrov, Alexey Rukosuev, Valentina Zavalova

Adaptive Optical Systems for the Shenguang-III Prototype Facility [66]
Zeping Yang, Chunlin Guan, Mingwu Ao, Ende Li, Muwen Fan, Ningping Shi, Yudong Zhang, Wenhan Jiang

Coffee 10:50 - 11:20

Session 7.(b) Friday 15th June 11:20 - 12:40
Adaptive Optics in Communications and Atmospheric Compensation
Chair: Chris Dainty

Fourier image sharpness sensor for laser communications [12]
Kristin N. Walker Robert K. Tyson

Fast closed-loop adaptive optics system for imaging through strong turbulence layers [44]
Ivo Buske, Wolfgang Riede

Correction of Wavefront Aberrations and Optical Communication using Aperture Synthesis [47]
R.J. Eastwood, A.M. Johnson, C. Kölper, A.H. Greenaway

Adaptive optics system for a small telescope [74]
M. Loktev, G. Vdovin, O. Soloviev

Lunch 12:45 - 14:00
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