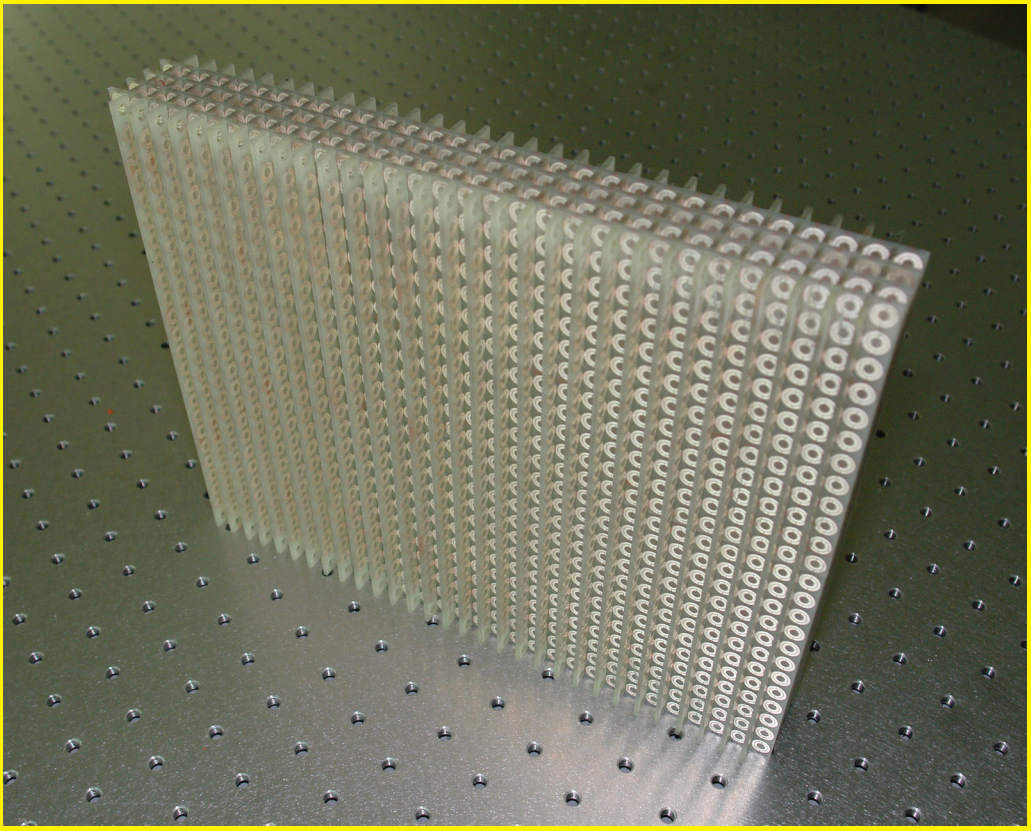
Australian Optical Society

NEWS



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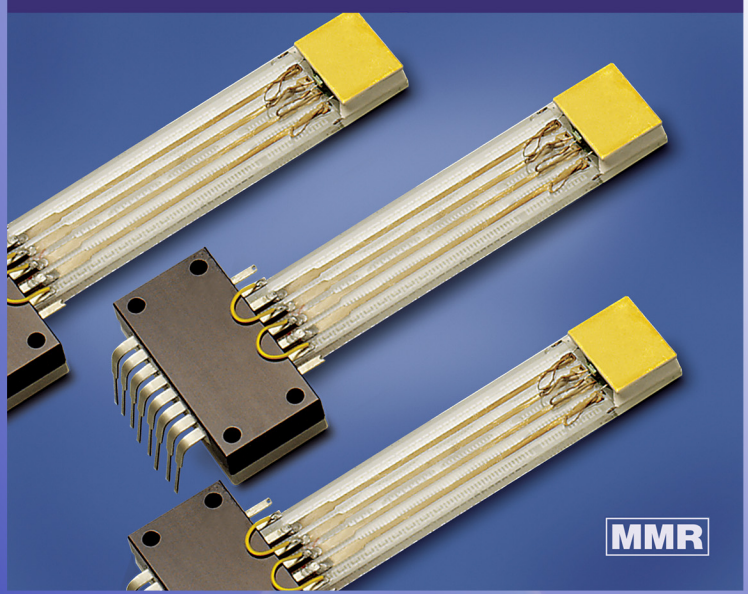

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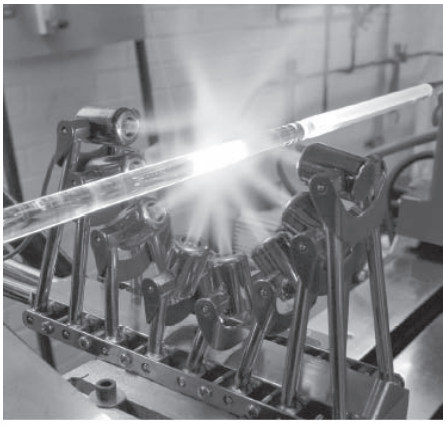

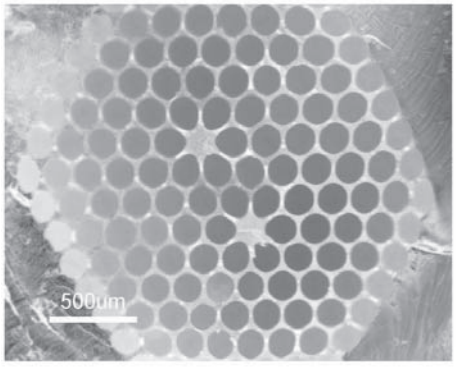

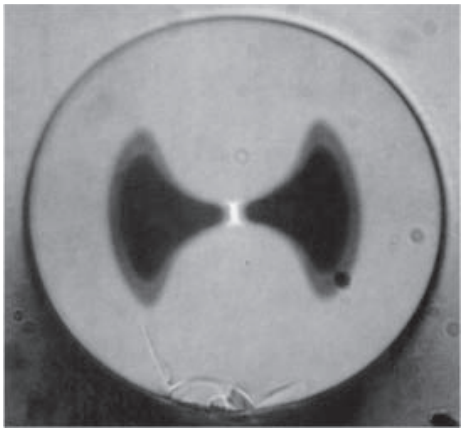

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AOS News is the official news magazine of the Australian Optical Society. Formed in 1983, the Society is a non-profit organisation for the advancement of optics in Australia. Membership is open to all persons contributing to, or interested in, optics in the widest sense. See the back page (or the AOS website) for details on joining the Society.

AOS News - Editorial Board

Submission guidelines

The *AOS News* is always looking for contributions, especially from AOS members. Here is a short summary of how to make a submission.

What can you submit?

* ***Scientific Article***

A scientific paper in any area of optics.

* ***Review Article***

Simply give a run down of the work conducted at your laboratory, or some aspect of this work.

* ***Conference Report***
* ***News Item***
* ***Book Review***
* ***Cartoon or drawing***

Reviewing of papers

On submission of a scientific or review article you may request that the paper be refereed, and if subsequently accepted it will be identified as a refereed paper in the contents page. The refereeing process will be the same as for any of the regular peer reviewed scientific journals. Please bear in mind that refereeing takes time and the article should therefore be submitted well in advance of the publication date.

How can you submit?

The easiest way is by email. We accept nearly all file formats. (Famous last words!).

Submitted articles will be imported into an Adobe InDesign file. It is best if the diagrams and other graphics are submitted as separate files. All common graphics formats are acceptable, but the resolution must be in excess of 300d.p.i.. Be aware that all colour diagrams will be rendered in grayscale, so if you do use colours, choose colours that show up well in grayscale.

When using Greek letters and mathematical symbols, use font sets such as Symbol or MT Extra. Please avoid using symbols that are in Roman fonts, where the Option or Alt key is used; e.g. Opt-m in Times font on the Mac for the Greek letter mu.

If using TeX, use a style file similar to that for Phys Rev. Letters (one column for the title, author and by-line, and two for the main body). The top and bottom margins must be at least 20mm and the side margins 25mm. Submit a pdf file with the diagrams included (no page numbers), as well as copies of the diagrams in their original format in separate files.

If using a word processor, use a single column. If you do include the graphics in the main document, they should be placed in-line rather than with anchors, but must be submitted separately as well.

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Contributions on any topic of interest to the Australian optics community are solicited, and should be sent to the editor, or a member of the editorial board. Use of electronic mail is strongly encouraged, although submission of hard copy together with a text file on CD will be considered.

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Copy for the next issue (Sept 07) should be with the editor no later than 21 August 2007.

EDITOR
Murray Hamilton
The University of Adelaide
Physics Department
Adelaide SA. 5005
Tel: (08) 8303 3994
Fax: (08) 8303 4380
murray.hamilton@
adelaide.edu.au

Australian Optical Society website
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June 2007 **Volume 21 Number 2**

AOS NEWS

ARTICLES

DEPARTMENTS

Cover Picture: Metamaterials are artificial structures with exotic electromagnetic properties which can be engineered at our will. The design principles for metamaterials are universal and apply for waves of different frequencies, from microwaves to optics. The first mechanically tunable composite structure shown in the photo has been fabricated and tested recently at the Nonlinear Physics Center of the Australian National University [I.V. Shadrivov, D.A. Powell, S.K. Morrison, Yu.S. Kivshar, and G.N. Milford, ``Scattering of electromagnetic waves in metamaterial superlattices'', App. Phys. Lett. 90, 201919 (2007)]. Photo courtesy of Y. Kivshar.

AUSTRALIAN OPTICAL SOCIETY

ABN 63 009 548 387

AOS EXECUTIVE

PRESIDENT
Hans-A Bachor
ARC Centre of Excellence for Quantum-Atom Optics, Building 38
The Australian National University,
Canberra ACT 0200
Tel: 02 6125 2811
Fax: 02 6125 0741
hans.bachor@anu.edu.au

VICE-PRESIDENT
Ben Eggleton
CUDOS
School of Physics,
University of Sydney
Sydney NSW 2006
Tel: 0401 055 494
Fax: (02) 9351-7726
egg@physics.usyd.edu.au

SECRETARY
John Holdsworth,
School of Mathematical and Physical Sciences, University of Newcastle,
Callaghan 2308 NSW
Australia
Tel: (02) 4921 5436
Fax: (02) 4921 6907
John.Holdsworth@newcastle.edu.au

HONORARY TREASURER
Stephen Collins
Optical Technology Research Lab
Victoria University
PO Box 14428, Melbourne, VIC 8001
Tel: (03) 9919 4283
Fax: (03) 9919 4698
stephen.collins@vu.edu.au

PAST PRESIDENT
Murray Hamilton
Department of Physics, University of Adelaide, Adelaide, SA 5005
Tel: (08) 8303 3994
Fax: (08) 8303 4380
murray.hamilton@adelaide.edu.au

AOS COUNCILLORS

Chris Chantler
School of Physics,
University of Melbourne
VIC 3010
Tel: (03) 8344 5437
Fax: (03) 9347 3732
chantler@physics.unimelb.edu.au

John Love
Optical Sciences Centre,
Research School of Physical Sciences and Engineering
The Australian National University
Canberra ACT 0200
Tel: (02) 6249 4691
Fax: (02) 6279 8588
jd1124@rsphysse.anu.edu.au

Halina Rubinsztein-Dunlop
Department of Physics,
University of Queensland,
St Lucia, QLD 4072
Tel: (07) 3365 3139
Fax: (07) 3365 1242
halina@kelvin.physics.uq.oz.au

Martijn de Sterke
School of Physics
University of Sydney NSW 2006
Tel: (02) 9351 2906
Fax: (02) 9351 7726
desterke@physics.usyd.edu.au

John Harvey
Department of Physics,
University of Auckland,
Private Bag 92019,
Auckland, New Zealand
Tel: (+64 9) 373 7599 X88831
Fax: (+64 9) 373 7445
j.harvey@auckland.ac.nz

Ann Roberts
School of Physics,
University of Melbourne
VIC 3010
Tel: (03) 8344 5038
Fax: (03) 9439 4912
a.roberts @physics.unimelb.edu.au

Ken Baldwin
Laser Physics Centre
ANU, RSPSE
Canberra ACT 0200
Tel. (02) 6125 4702
Fax. (02) 6125 2452
kenneth.baldwin@anu.edu.au

Adam Weigold
Photon Engineering Pty Ltd
PO Box 122 Rundle Mall, Adelaide, SA, 5000, Australia
Tel: + 61 - 8 - 8232 3444
Fax: + 61 - 8 - 8232 9333
Email: aweigold@ozemail.com.au

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President's Report

Dear colleagues,

Optics remains a very lively research field in Australia. It is an area where we we have both fundamental and applied research. One indicator is the success of optics topics with the ARC Centres of Excellence. In recent months we have seen to extension of four such Centres to the year 2011, namely CUDOS, for high bandwidth photonics , ACQAO for quantum and atom optics, CQCT for quantum computer technology and the Centre for Advanced Silicon Photovoltaics and Photonics. In addition there are the Centres for Vision Science and Coherent X-ray science which are funded for a similar period.

This is a major concentration of research. It shows that our research is very active, despite the ever decreasing funding for the Universities it is based on. In New Zealand we also have strong concentrations of optics research and both countries have a strong international reputation for their work in optics. We can only hope that this potential for a stronger optics based industry can be turned into real companies and jobs.

This research investment means that we presently have the largest number of PhD students in optics ever recorded. Only a few generations ago it was routine for us colonials to travel to Europe or the US for a PhD - now we are increasingly seen as an attractive place for a postgraduate degree. Some of the brightest students choose our laboratories for their training. This is strong indication of the quality of our research.

All of this makes for a exciting times, but it poses the question: why don't we have more student members. Is the AOS too old fashioned, does it not care about the next generation? Some of this is probably true. But there are some positive trends. We now have active OSA student chapters in Australia, who are run by students for students and already have come up with some impressive outreach activities. AOS student chapters could be founded - and we are welcoming new ideas from our young colleagues how to change and expand our activities.

We already have prizes for students: the AOS student prize, with a deadline in November. Can you provide some outstanding nominations ? The AOS sponsored conferences have additional student prizes for the best talks and posters.

The other area which always deserves our attention is the lack of support for schools and teachers in physics. Teaching can be very rewarding, but it is also rather undervalued. While it would be beyond the scope of a small association such as the AOS to solve such a nationwide problem, all scientists together can have some influence. At the same time you too can take the initiative: encourage those who enjoy teaching to take up this profession, or get involved yourself by helping teachers and students with motivating examples from your own experience in optics.

Hans Bachor

Conference Watch

International Conference on General Relativity and Gravitation	**Sydney**	**8 - 13 July 2007**
Eduardo Amaldi Conference on Gravitational Waves	**Sydney**	**8 - 14 July 2007**
CLEO Pacific Rim	**Seoul, S. Korea**	**26 - 31 August 2007**
Advanced Infrared technology and Applications Workshop, (www.cio.mx/AITA07/AITA07.htm)	**Leon, Mexico,**	**8 - 12 October 2007**
Quantum Atom Optics Down-Under (www.acqao.org)	**Wollongong**	**3 - 6 Decmber 2007**
21st ICO Congress (incorporating AOS conference) (www.iceaustralia.com/ICO2008)	**Sydney**	**7 - 10 July 2008**
OECC/ACOFT 2008 (www.iceaustralia.com/OECC_ACOFT2008)	**Sydney**	**8 - 10 July 2008**

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SPIE The International Society for Optical Engineering

SPIE was formed in 1955 as the Society for Photo-optical Instrumentation Engineers, and has been dedicated to providing the best possible service to the optical engineering community. SPIE is an international technical society dedicated to promoting the engineering and scientific applications of optical, photonic, imaging and optoelectronic technologies through its education and communications programs, meetings and publications.

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In addition, SPIE provides numerous services to its members, including on-line electronic databases, electronic bulletin board and networking services, and employment assistance. To further serve the public good, the Society sponsors a number of awards, scholarships, and educational grants every year, and publishes a comprehensive catalogue of educational resources in the optics field,
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ICO-21 2008 Congress

Optics for the 21st Century

Monday 7 - Thursday 10 July 2008
Sydney Convention & Exhibition Centre, Darling Harbour, Sydney

KEY DATES:

Call for Papers open: Thursday 31 May 2007
Call for Papers deadline: Friday 29 February 2008
Early Bird Registration open: Monday 8 October 2007
Early Bird Registration deadline: Thursday 27 March 2008
Registrations close: Thursday 19 June 2008

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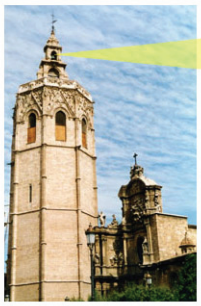

Focus on Microscopy 2007 – Reflections

By David Sampson, Optical+Biomedical Engineering Laboratory, University of Western Australia

Focus on Microscopy (FOM) is an annual conference hosted this year by the University of Valencia in Spain after being held in Perth in 2006. The city of Valencia appears to be largely under construction, seemingly the result of the Swiss defence of the America's Cup, to be held there this summer. The conference dinner was held in a very grand hotel on the beachfront overlooking the trials. Apart from yachts and cranes dotting the skyline, orange groves were also in evidence, managing so far to have staved off the march of development.

The conference, held on the university campus, only seems to grow in popularity with some 400 delegates present. For the first time, the scientific program commenced with a set of three tutorial lectures. The topic was Coherent Anti-Stokes Raman Spectroscopy (CARS), and the lectures were given by Hervé Rigneault (Domaine Universite St. Jerome), Andreas Volkmer (University of Stuttgart), and Michael Müller (University of Amsterdam). CARS microscopy is proving to be a rich area for the invention of new techniques, with its particular applications forte being the imaging of lipids, i.e., fats.

FOM is a highly interdisciplinary meeting in which no one is comfortably across the full scope. The opportunity to be stretched by talks from areas outside one's own specialisation and to interact with researchers from other disciplines is a unique feature of the meeting. The main disciplines include cell, molecular and microbiology, and physics, engineering and computer science. By contrast, there is an absence of medically orientated talks, both in disease treatment and medical imaging. In 2007, there were session streams in optical theory and image formation, image processing and analysis, live cell imaging, cell signalling, optical tweezers, manipulation, and microdissection. The emphasis between technique and application was split about 50:50.

There was a notable emphasis in 2007 on 3D imaging of whole specimens, typically small animal embryos, with millimetre dimensions at 10-50 micron resolution. Ernst Stelzer's (EMBL, Germany) Selective Plane Illumination Microscopy and Jim Swolger's (EMBL, Spain) Optical Projection Tomography both produce beautiful 3D images from a stack of 2D projections, but require careful sample mounting, long acquisition times and substantial computation. It is interesting to observe these optical projection techniques on a collision course with micro MRI and X-ray techniques, and it remains to be seen how they will compare and how widely they will be taken up. Optical coherence tomography remains attractive in comparison with such techniques because of its dynamic capability, and Arnaud Dubois (Université Paris-Sud) and Rainer Leitgeb (EPFL, Switzerland) showed some excellent 3D images of biological specimens. In particular, Leitgeb used an extended depth of focus capture using a clever adaptation of an axicon and optical frequency-domain processing to perform high-speed, high-contrast 3D imaging of mouse mammary gland, with impressive results. My own area of interest in holographic microscopy also showed somewhat of a surge in interest, with at least six groups presenting on this topic. Apart from the focus on surface topography and phase imaging, there was also strong interest in synthetic-aperture and 3D holography. Holography shares with OCT the advantage of dynamic single-capture acquisition, and the availability of digital processing. Perhaps the most surprising paper in this area was from Lauer's group (Université Paul Cézanne Aix-Marseille III), which showed a 3D reconstruction of a diatom (disk-like phytoplankton) from a heroic 372 holograms, each recorded at a different illumination angle.

Structured illumination is a favourite topic of this conference, with regular contributions from Wilson, Gustafsson and others. This year there was a paper from the left field of this topic given by Marc Levoy (Stanford University), ambitiously entitled "The Light Field Microscope". After half-expecting a histerical paper on the origins of the microscope, I was instead delighted to learn just how much depth information a computer scientist can obtain from a micro-lens array, used to capture multiple angularly diverse 2D versions of a scene. Levoy is translating his macroscopic work employing large camera arrays to the microscope with good effect. Once again the cross-disciplinary flow brings such fresh perspectives.

Although the conference is strongly focussed on optical microscopy, it seeks to broaden perspectives by updating delegates on developments in related non-optical fields. This year, one of these took out the Mr Smith's 'Matrix' award for best animated talk. Wolfgang Baumeister's (MPI of Biochemistry) truly jaw-dropping cryo-electron tomography movie of the molecular landscape inside a cell won hands down. Cryo-ET is able to produce 3D images at 2-4 nm resolution of macromolecular structures in their functional environment. The movie of the process of template matching fuzzy images with known macromolecular clusters inside the crowded cell cytoplasm was simply breath-taking. This really is molecular imaging!

Australia was well represented at the meeting; delegates I spotted include Damian Bird (U Melbourne), Russell Connally (Macquarie U) Guy Cox (U Sydney), Nicoleta Dragomir (U Melbourne), Tim Hillman (UWA), Min Gu (Swinburne U), Taras Plakhotnik (U Queensland), and Fred Reinholtz (UWA).

The conference wound up with a closing plenary on femtosecond laser nanoprocessing from Karsten König (Fraunhofer Institue of Biomedical Technology), and a closing reception. This nice feature kept attendance high to the end and closed the conference on a high note.

EDUCATIONAL OUTREACH

Optics in the Outback

Christian Romer Rosberg, Robert Fischer, and Amrita Prasad

In remote parts of Australia, where small towns and even individual homes are often separated by hundreds of kilometers, providing good educational resources to local children can be a great challenge. At the Australian National University in Canberra we have created a new science communication program that overcomes geographical barriers by reaching out to the children of the outback.

Few places in the world are more remote and sparsely populated than the great Australian outback. Because of extreme temperatures and permanent water scarcity, the large inland areas of our continent can support only a limited number of inhabitants, and living a modern life out there can be difficult, especially for children and young people. The children whose homes are in the outback deserve the same opportunities in life as children in more populated areas, but this goal can be hard to achieve in practice due to lack of resources and the sheer remoteness of the outback. As a result, younger children in isolated areas are generally less exposed to science and technology in their school education, and less likely to pursue academic careers when they grow up.

A group of PhD students in optics at the Australian National University (ANU) and the Centre for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS) recently took up the challenge to address these issues, and organised a unique outreach project to provide the children of the outback with science education in a new way. As part of the project, we designed an interactive presentation using exciting light phenomena to spark children's curiosity about optics, and to give them an inspiring glimpse of their own possible future in the world of science and research.

Because of the limited number of children of the same age in small outback towns, a main challenge of the project was to design and run our presentation in a way that would inspire and engage every child, regardless of age. This required scientific concepts to be sufficiently advanced to excite the older children, and yet simple enough to be understood also by the younger ones. Focusing on dialogue and hands-on experiments, the presentation aimed at clearly demonstrating to everyone that optics is fun and exciting, and also used in many technologies that influence our everyday life.

The project first ran in March 2007 and involved more than 3000 km of travel on a week long visit to five public schools in the towns of Ivanhoe, Wilcannia,

Group picture at the Tibooburra Outback School of the Air.

White Cliffs, Broken Hill and Tibooburra, in outback New South Wales. Two of the schools were "Schools of the Air," in which students living in extremely remote places attend virtual classes from home using a satellite video communication system. Since the beginnings of radio based distance education in the outback in the 1950's and until recently only audio communication was possible. The new satellite technology allowed for a unique way of presenting an optics show to the children and ensured that every one of them would be able to literally see the light.

Prior to the visits all children, including those participating live via satellite, were given a set of small experimental kits which they were able to use while following the presentation remotely or in the classroom. By experimenting and playing with diffraction gratings, laser

School children, teachers, and the visiting "science experts" outside Ivanhoe Central School.

"Optics in the Outback" broadcasting live from the School of the Air in Broken Hill.

School children and parents launching light signals into an optical fiber.

School children study the rainbow colors of white light by looking through an optical diffraction grating.

pointers, torches, and pieces of optical fiber, the children quickly became familiar with many fundamental aspects of optics, such as different light sources, color dispersion, reflection and refraction, and optical waveguiding. All these concepts were introduced in a visual and intuitive way so that the children could easily see and understand the ideas developing. For example, after discussing and testing the use of mirrors to redirect beams of light, total internal reflection was demonstrated at the surface of water. This naturally led to the introduction of the concept of optical waveguiding, first in a jet of water bent down by gravity (known as Tyndall's experiment), and then in a piece of thick optical fiber.

Towards the end of each presentation the children engaged in an exciting "code breaker" game, in which separate groups had to communicate secretly with each other by sending light signals of different colors through a long and thick polymer optical fiber. It was amazing to see how easily the children managed to accept and apply the basic concepts with which they had been presented only moments earlier.

A total of about 85 school children as well as several teachers and parents participated in the program, either in the classrooms or via satellite, and the presenters received many questions from curious minds and lots of positive feedback from both children and adults. The entire project proved to be an enriching experience for

Exploring optical waveguiding in a piece of thick polymer optical fiber.

PhD students Christian Rosberg and Robert Fischer.

both the participating ANU students and the children of the outback who - as many of them expressed - can't wait to discover more secrets of light!

The Optics in the Outback project is supported by the Optical Society of America (OSA) and by CUDOS (Centre for Ultrahigh-bandwidth Devices for Optical Systems) at the Australian National University. The authors also gratefully acknowledge support from the Rochester section of OSA. Prof. Yuri Kivshar is the Faculty Advisor of the OSA Student Chapter at ANU.
[The authors are all PhD students at CUDOS at ANU.]

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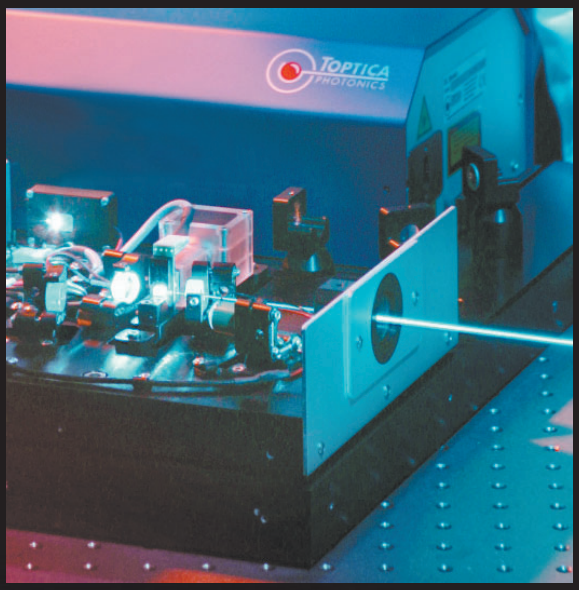
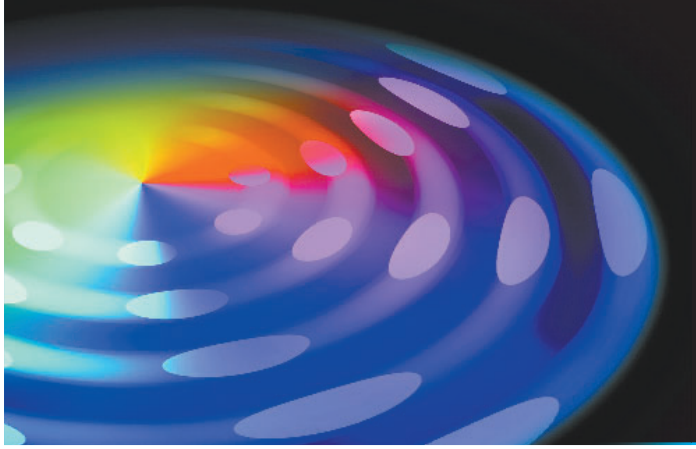


Toptica Photonics represent the future of lasers and photonics: cutting edge technologies expertly designed and engineered. Now Toptica lasers are represented in Australia and New Zealand by Lastek. To receive a copy of the new Toptica literature pack, or for further information on any Toptica products, contact Lastek at the address below.



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Fibre Optical Coupler & Splitter - Fibre optic coupler 1x2, 2x2 - Dual window coupler - 1x32 splitter/coupler for FTTH networks - Wideband tree coupler - Polarization maintaining coupler - 1x4, 1x8, 1x16, 2x16, 2x32 star or tree - 250um bare, 900um, 3mm cable version - packaging options	**Filter/WDM/ CWDM/DWDM** - Band pass filter - Fibre optic WDM 980/1550, 1310/1550 - Multimode WDM - Amplified spontaneous emission filter - C band/L band WDM - CWDM/DWDM 4 channel/ 8 channel - Filter WDM 980/1550 - Filter WDM 976/1064nm - Pump combiner
Specialty Fibre - Corning SMF28e fibre - Corning Hi1060 or Hi980 fibre - Fujikura PM panda fibre - Nufern PM panda fibre - Plastic fibre 1mm, 0.5mm core	**Fibre Optic Circulator** - 3 port or 4 port - 1030, 1064, 1310, 1550nm - SMF or PM panda fibre - 250um, 900um, 3mm pigtail version
Plastic Optical Fibre - POF - Polymethyl Methacryate –PMMA - 1mm or 0.5mm POF - Round duplex or duplex zip - Bare fibre 0.5mm or 1mm core	**Optical Attenuators** - Variable attenuator 1310, 1550nm, dual wavelength - PM fiber fixed optical attenuator - Fibre coupled attenuator FC/APC connector

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Lastek- A distributor with a difference

Alex Stanco

(#2 in a occasional series of Australian optical company profiles)

This is Lastek's last year as a teenager. Next year Lastek will be 20 years of age; quite a serious age for a company in our industy! And after 12 years at the University of Adelaide Thebarton Campus we have changed.

Lastek has grown from a 2 person operation in 1988 to a 16 person company specialising in advanced lasers, optics, spectroscopic and photonics instruments. Lastek has on staff three PhD's in physics as well as 5 science and engineering graduates, and two machinists/ toolmakers.

Equally importantly we have an established cadre of experienced administrative staff. The old adage about paperwork is certainly true in the high tech industry where detailed records concerning products sourced are essential for long term service support and quality control.

But what especially differentiates Lastek as a distributor?

Lastek's mission, and daily work, is to be technologists extraordinaire in support of the research community. This is certainly an unattainable goal for every remarkable technology that our corner of the research industry has to use, but we can attain world class expertise in a surprising number.

But how to develop a technological culture in a small trading company preoccupied with the next sale or solving the latest service issue?

The Lastek way is to involve its staff in R&D and custom design projects which regularly arise out of interactions with customers, and joint projects. All our technical staff are encouraged to become involved in such projects and to develop their own areas of expertise. Working together with others in our team on the design and prototyping process they grow as technologists. Some projects are custom prototypes for other organizations that lack our experience with optics, lasers and spectroscopy, or lack the time to do it themselves; others are products that we develop and manufacture for export. We also undertake consulting contracts.

Examples of the products we have supplied overseas include:

- Simultaneous eight channel CCD array detection systems for Rayleigh scattering, German University.
- CCD array upgrade for a 2m focal length spectrograph for mineral analysis, Argentinian laboratory
- Femtosecond laser diagnostic spectrometers, private company in Japan
- Gated CCD spectrometers for femtosecond spectroscopy, University in the USA
- InGaAs array NIR detectors for production control , USA

For Australian customers we have designed and manufactured custom spectrometers, diode laser systems for industrial processes, portable spectrometers for field studies, gated CCD systems for femtosecond laser diagnostics, systems for thin film monitoring, Plasma etch end point detection systems,custom lens systems for bragg grating fibre writing, coupling lasers and acr lamps to microscopes and a host of other projects.

Lastek's key technologies are:

- Optical spectroscopy
- Advanced software development
- Laser system integration
- Optical design
- Software development, electronic and mechanical design/production.

In addition we use consultants to augment our in-house capabilities.

Lastek's involvement with such projects has lead to three international patents with more in the pipeline. It has also given us the capability to be a partner for University research groups. Lastek has joint projects with the ANU, Swinburne University, Queensland University, Adelaide university and the University of South Australia.

Besides our scientific staff, a key ingredient in making possible such projects is having a fully equipped mechanical workshop staffed by two machinists/tool makers experienced with optical system requirements.

Elaine White, Jonathan Bowen (in office), Julie Djunaedi and Amelia Belperio talking about a file, Danika Rohde at filing cabinet.

Also are needed electronic workshops, a myriad standard components and a full range of test instruments. In addition one needs an optical laboratory with a range of spectrometers, standard lamps, integrating spheres and dozens of optical filters, lenses, optical mounts, lasers, power meters, beam profilers and optical fibres.

Then we come to the business of software development and support. Besides having gurus that understand scientific software, and who are willing to delve into the murky depths of Windows, it is useful to have PCs set up running every known version of that remarkable product range, and of course the occasional MAC.

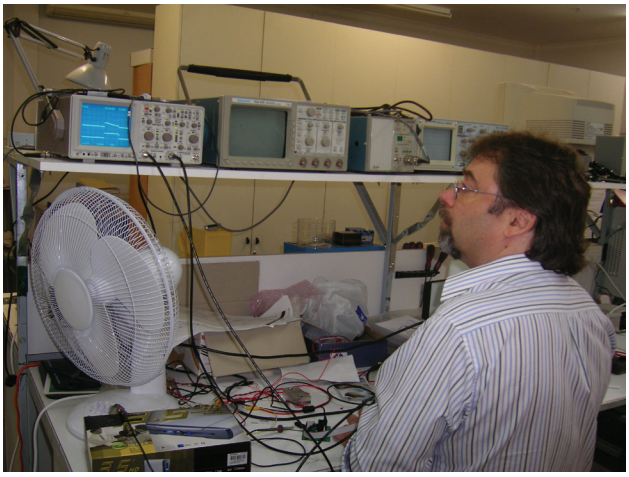
All of the above has been accumulated at Lastek and regularly put to good use.

But how to promote our products and capabilities overseas? In 2001 Lastek set up a subsidiary in the USA with a staff of two people, one for admin and one for sales. This has lead to us acquiring several OEM contracts as well as selling to end users such as Sandia Labs, Stanford University, MIT, UCLA, etc. In addition our US subsidiary set up distributors all over Europe and Asia.

A serendipitous consequence of having a US subsidiary is being able to use its office as a consolidation point in the USA for small shipments. This gave rise to Duggo and **OpticsShop**, our US buying service. By consolidating shipments we were able to reduce the importation costs to as little as A$50-, door to door, per small parcels, and not having to charge for multiple deliveries. For about 5 years now it is no longer permissable to ship small items by air parcel post from the USA. We soon noticed that importing a $200- 1" laser mirror from the US could cost between A$130- and $240-, depending on the air courier chosen by the supplier. And if you ordered two such mirrors, and only one was in stock, two deliveries could result costing $120-, or more, each. (This $120- includes the A$60- Australian Customs Processing fee.) **OpticsShop** is now the fastest growing part of our business as more and more customers realize its benefits. **Thorlabs** recognised the value of OpticShop and appointed Lastek as an Channel Partner and we have been the lowest cost source of **Edmund Optics** for years.

But the core business is still that of a distributor of advanced instruments that need expertise in their sales, installation, service. It is largely due to our technological capabilities that we have been so successful with leading product lines such as **Continuum**, **Toptic**a, **Jobin Yvon**, **Ocean Optics** and the other product lines that are listed on Lastek's website at **www.lastek.com.au** That is our main income and what pays for the art collection.

Lastek's pledge is that we will make your instrument work, not just on installation but throughout its expected working life. (ie "for as long as the manufacturer supports it, and then even longer if circumstances allow us to do some major surgery to the system".) Lastek's technical staff; sales, service, and engineering regularly travel overseas for training. During these training sessions they generally impress the overseas manufacturers by their level of technological competence. We like to think that it is not just Australian and New Zealand basic research that is disproportionately of high standard, so are the capabilities of some pockets of the industry that support it. When you are this isolated, you have to be resourceful, and we all are, our customers and us!



Ray Simonovic - Service Engineer & Production

Lyanage Perera - Precision Machinist

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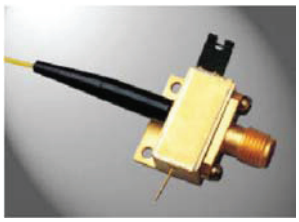
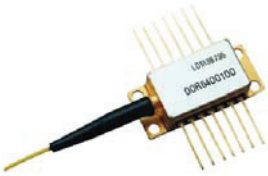


10Gbps PIN detector modules – InGaAs PIN integrated with low noise TIA, 1280nm to 1580nm, MSA butterfly package
10GHz PIN photodetector – 10GHz 3dB bandwidth, InGaAs/InP planar photodiode, 1100nm to 1650nm operating wavelength
1GHz ~ 2GHz photodiode – 1G~2GHz PIN, 3dB bandwidth, low cost
Optical power monitor – photodiode packaged with tap coupler, low cost optical power monitoring, 2GHz 3dB bandwidth

2.5Gbps receiver modules – multi-rate clock and data recovery circuits (four different bit rates), APD or PIN photodetector, high sensitivity, analog optical input level monitor, +5V single power supply, DIP metal package



DFB / FP laser diodes – coaxial pigtailed or butterfly package, 1310nm, 1490nm and 1550nm, integrated TEC and PD monitor, high output power, high modulation bandwidth, applications in analog and digital optical links.
SLED diodes
CWDM DFB Laser Diodes

Optical transceivers for passive optical networks – EPON transceivers, 1.25Gbps, burst-mode, single fiber bi-directional, 1310nm/1490nm WDM, +3.3V single power supply, metallic package, 10km and 20km reach.
Multimode transceivers – 1.25Gbps, 62.5/125μm multimode fiber links
155Mbps 1x9 transceivers – 1310nm, 2km, 15km or 40km reach
SFP transceivers – 1.25Gbps

Optical couplers – single mode, multimode, wideband, multi-band, miniature package, polarization maintaining, 1x3, 1x4, star or tree couplers, special wavelengths (from 460nm to 1625nm).
WDM couplers – low cost high quality, 1310, 980, 1480 or 1064nm WDM couplers, multimode WDM couplers
Triplexer WDM Couplers for FTTH – 1310, 1490 and 1550nm mux/demux
Customized WDM devices – red band splitter, 1310nm combiner, etc.
Planar Lightwave Circuits (PLC) Splitters
Polarization Maintaining Couplers

Optical attenuators – fixed attenuators, variable attenuators (all fiber device, collimator type or low cost adapter type), benchtop VOA instrument
Optical switches – opto-mechanical switches, 1x1, 1x2, 2x2,1x4,1x8, 1x16

Fiber Optical Products for the Industry

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- Spectroscopy
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- Analytical instruments
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- Pyrometry
- Semiconductor capital equipment

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- Broad UV / VIS / NIR spectral range:
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- 3mm outer cable diameter with connector boots behind the connector
- Available lengths 1, 2, 3m or custom length
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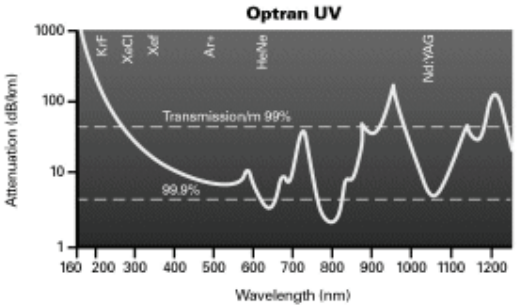

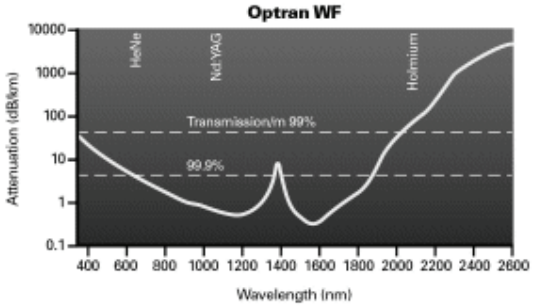

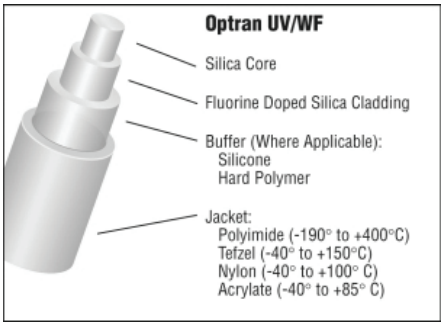

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Warsash offers a comprehensive range of detectors from the UV to the far IR including:

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Warsash can supply a complete range of Laser Safety products including:

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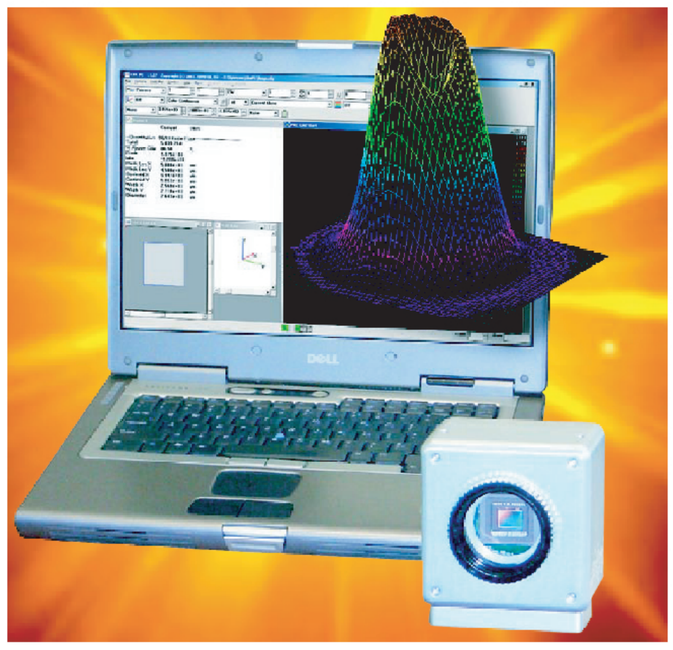

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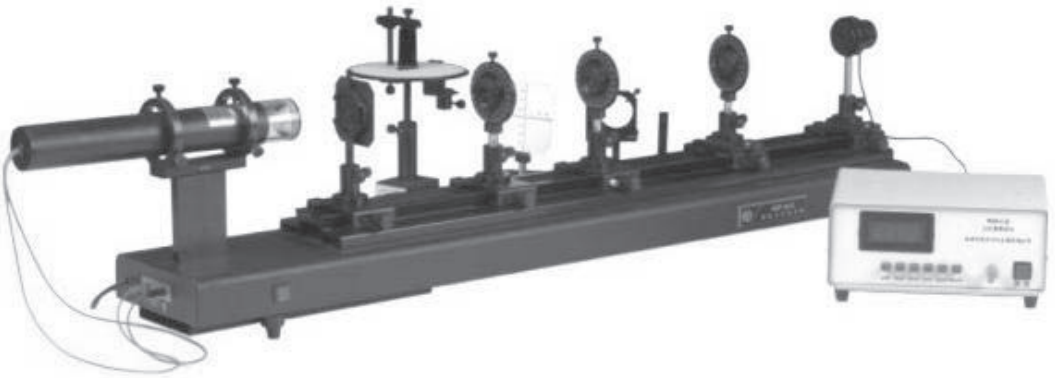
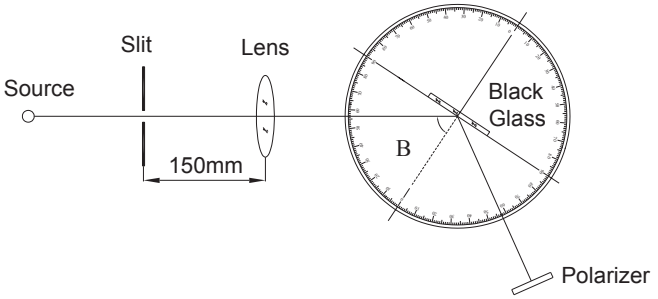
Optics Education

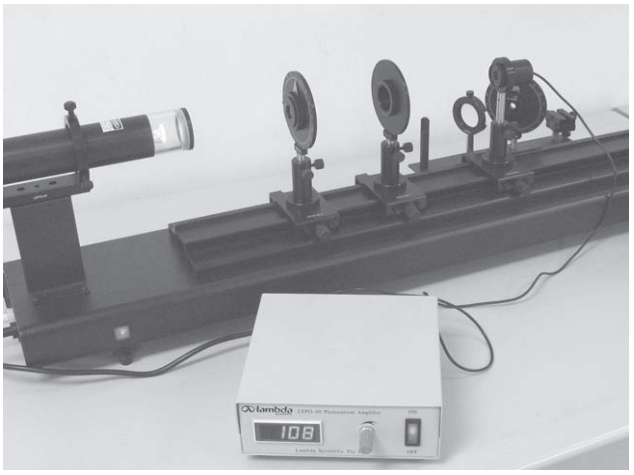
LEOI– 40 Experimental System for Polarized Light



A light wave is an electromagnetic wave which is a transverse wave. The polarization property of a transverse light wave describes the direction of oscillation in of electric field perpendicular to the direction of travel. The developed system is designed to help students grasp the concept and mechanism of polarization. It allows students to measure different types of polarization and working parameters of optical elements that affect polarization. The following experiments can be implemented by the students.



- Polarization by reflection
- Measurement of Brewster's angle
- Verification of Malus' law



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Product News

Hybrid Male-to-Female Optical Adapters from oemarket.com

Hybrid optical adapters with male to female configuration are very useful in connecting patchcords with different connectors. Because both a connector plug (male) and an adapter socket (female) are provided, this hybrid adapter fits in various circumstances, offering flexibility and reducing the size, weight and complexity of the system.

These adapters have low insertion loss and high return loss.

We provide hybrid adapters bridging popular connector types, such as FC, SC, ST and LC.

Handheld Optical Connector Cleaning Tool from oemarket.com

This hand held cleaning tool is designed to clean the contact surface of fiber optical connectors. It uses replaceable cleaning tape and does not require ethanol or other types of solvents. It provides quick and thorough cleaning to dirty connector surface due to oil, dirt, finger touch, etc. This tool can be used for various connector types.

New Radiometric Instruments cover the Spectrum

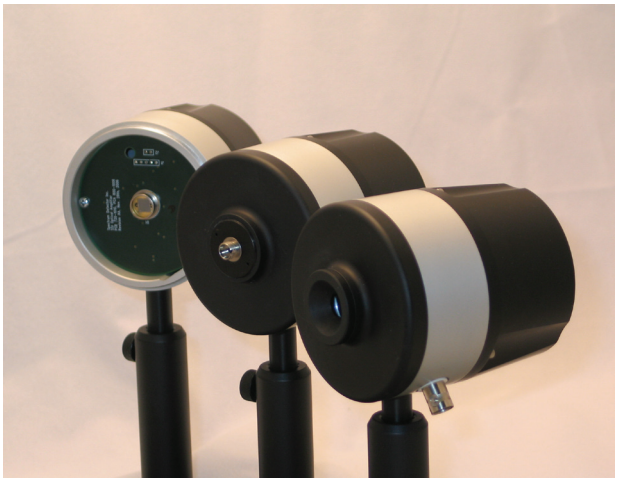
Warsash Scientific has announced the introduction of a family of analogue and digital Radiometric Detector Instruments that feature Pyroelectric, Silicon and Germanium detectors.

They are designed to measure Radiant Flux from Picowatts to Watts, DC to 10MHz and UV to Far IR.

The unique modular design includes interchangeable detector components and optical accessories. The Analogue models operate on 9V batteries or a DC wall power, while the Digital models are powered over the USB connection.

Powerful Radiometric Applications Software is included.

Further information on these and other light measurement systems is available from WARSASH Scientific Pty Ltd at (02) 9319 0122 or sales@warsash.com.au



Nanostepping Systems Speed 3-D Microscopy

- 10-ms focusing speed
- 1-nm resolution
- 100- or 400µm travel ranges

PI (Physik Instrumente) LP has developed a series of high-speed microscopy objective scanner systems that contain the driver, mechanics and all adaptors.

The PIFOC piezo Z-drive systems are designed for easy integration for high-resolution microscopes. They are available as components or as complete systems, including the piezo-objective scanner, a controller include 3-D imaging, auto-focusing, scanning and alignment tasks in microscopy, biotechnology, optics, semi-conductor technology and photonics packaging.

The units are intended for high-speed Z-stack image acquisition, the basis for the generation of 3-D views of samples in high-resolution optical microscopes.

Conventional Z-drives use a motorized actuator and motor controller to create numerous focus planes, and the individual "slices" are processed with special software to form one 3-D image.

The new systems are compatible with all major image acquisition packages.

They enable faster operation because the piezo-actuated Z-drives achieve higher focusing speed (typically 10 ms vs. 100 ms) and resolution (typically 1 nm vs. 100 nm) than stepper motor drives, and they provide higher quality images in less time. The compact, light and rigid objective scanner design provides fast response and does not disturb the sample, as can specimen scanners.

Users can choose a travel range of 100 or 400 µm and either a display controller or a compact one, both of which are UL- and CSA-certified. Custom tuning for 7 ms is available upon request.

Further information on these and other nanopositioning systems is available from WARSASH Scientific Pty Ltd at (02) 9319 0122 or sales@warsash.com.au

Low Cost Fluorescence System

Warsash Scientific has announced the release of the CXR-FS, a low cost system for fluorescence spectroscopy from StellarNet Inc. The components include a miniature fibre optically coupled, thermo-electrically cooled (TEC) UV-VIS spectrometer with concave grating, an LED-based excitation source, and a dual read cuvette sample holder.

The excitation source allows for interchangeable LEDs emitting a variety of wave-lengths from UV through to VIS. For example UV LEDs at 295nm and 345nm are used for analysis of aromatic hydrocarbons. This is a low-cost alternative to expensive lasers, band-pass filters, and monochrometers.

Liquid samples are placed in the CUV-F cuvette holder which accommodates the SLI-LED excitation source. The spectrometer detects fluorescence via dual port fibre optic Y-cable that doubles the signal and covers the 280-900nm detection range. The TEC improves signal to noise by 60% when exposure times >3 seconds.

The optical bench contains no moving parts for shock-proof durability in a truly portable environment for lab and field measurements. The SpectraWiz® software suite is included free and works for fluorescence applications including biomedical (DNA stains and dyes), amino acid analysis (tryptophan/tyrosine), environmental (water contaminants), and general chemistry experiments, to name a few. SpectraWiz® includes Windows drivers with customisable programs for LabVIEW, Visual Basic Automation for Excel, Visual C++, and Delphi Pascal.

Further information on these and other portable spectroscopy systems is available from WARSASH Scientific Pty Ltd at (02) 9319 0122 or sales@warsash.com.au

Newport Agilis™ Compact Motorised Optical Mounts

Agilis Optical Mounts– Newport's new piezo motor driven optical mounts take a completely new design approach to the adjustments needed for many laser setups. Agilis mounts provide the ultra-high adjustment sensitivity and convenient remote operation of a motorised component at the price and size of a high performance manual mount!

Agilis optical mounts are the first products that feature Newport's new, proprietary, non-resonant piezo direct motors. These highly integrated motors are directly coupled to the moving platen. When idle, spring forces lock the mirror's position for true set and forget long term stability. Agilis mounts have a faster adjustment speed than alternative screw driven designs and are free of the problems associated with backlash or hysteresis. In contrast to ultrasonic motors, the Agilis non-resonant motor concept makes small adjustments more predictable with its 50 nm incremental motion capability, ideal for ultra-sensitive optical alignments.

The Agilis optical mounts are manually operated via a battery powered, 2-axis remote controller. For each axis, the controller provides two rows of push buttons for step size settings, precise low speed adjustments and fast coarse motion. A network enabled computer controller is currently in the design stage.

Agilis optical mounts are the first members of an entire family of piezo motor, remote controllable components that will be introduced by Newport over the coming months. For further information please contact Neil McMahon at NewSpec (sales@newspec.com.au, 08 8273 3040).

Agilis AG-M100 Mount and 2-axis controller.

Newport Collimation Tester

This 2" diameter collimation tester is a wedged window that allows for quick testing of collimation by utilizing shearing interferometry. When the collimation tester is aligned at a 45 degree angle of incidence with respect to the incident beam, two wavefronts are formed - one from the front surface of the wedge and one from the back surface. Where these two wavefronts overlap, the user will see interference fringes. When the fringe pattern is horizontal then the collimation of the input beam is considered to be well collimated.

This optical element is also a good teaching tool for shearing interferometry. A separate application note (app note #25) that details shearing interferometry theory and an outline of the method of test is available as a free download from Newport's web site (www.newport.com).

For more information, please contact Neil McMahon at NewSpec (sales@newspec.com.au, Tel: 08 8273 3040).

Key Features

- For quick, easy testing of beam collimation
- Useable in the visible wavelength range
- Fused Silica Material
- 2" diameter size

Newport's PulseScout Autocorrelator

A versatile, easy-to-use diagnostic for measuring ultrafast pulses. The PulseScout™ is capable of measuring pulse widths from both high repetition rate (MHz) oscillators and low repetition rate (kHz) amplifiers in the visible and IR wavelength range. In the past, measuring ultrafast pulses from ultrafast lasers required separate autocorrelation technology: low repetition rate amplifier pulses were measured using single-shot autocorrelators, high repetition rate oscillator pulses were measured using a spinning glass block. With the PulseScout, separate autocorrelators are no longer necessary. The unit comes equipped with either a photodiode detector module to detect and measure high-energy amplified pulses, or a photomultiplier based detector to measure low-energy oscillator pulses. Conveniently, these detector modules use the same autocorrelator optical head and are fully interchangeable in seconds. Alignment is straight-forward and can also be done in seconds making the PulseScout the ideal diagnostic tool for all of your ultrafast applications.

For more information, please contact Graeme Jones at NewSpec (sales@newspec.com.au, Tel: 08 8273 3040).

Key Features

- <50 fs to >3.5 ps pulse width capability
- Optional short pulse (20 fs) capability
- 4 different wavelength ranges covering (420–1600 nm)
- CPU addressable
- On-board electronics – no oscilloscope necessary
- Small footprint (16 cm x 16 cm x 16 cm)

Newport's Supercontinuum Kit

The Newport Supercontinuum kit is a complete solution from Newport and Spectra-Physics designed specifically for the generation of supercontinuum with a femtosecond Ti:Sapphire laser such as the Tsunami™ or MaiTai™ ultrafast oscillators (laser not included in the kit).

The kit is intended to assist and educate the researcher in the part selection and design of a supercontinuum experiment setup in their laboratory and is the direct result of numerous interactions and requests for support from researchers getting into the new field of supercontinuum generation.

The Newport Supercontinuum kit leverages the powerful combination of Newport's SCG-800 Supercontinuum Fibre Module and high stability ULTRAlign™ manual positioners. The SCG-800 Supercontinuum Fibre Module is a polarization-maintaining supercontinuum device for use with 800nm range femtosecond lasers. It contains a highly nonlinear, polarisation-maintaining photonic crystal fibre with a zero dispersion wavelength of 750 nm. The fibre ends are sealed and mounted in quartz ferrules, and the polarisation axis is aligned to a line on the device. The nonlinear fibre is mounted in a robust aluminium housing, which is then securely mounted onto the ULTRAlign™ translation stage. The SCG-800 features built-in beam expansion at the end facets, facilitating easy coupling and a high damage threshold.

The kit also includes a faraday isolator, two steering mirrors, and a half waveplate and polariser combination for variable attenuation of the incident pump laser power. Considerable thought was put into the design of this kit to eliminate issues such as optical feedback to the laser and to maximize the stability of the laser beam in order to stay aligned to the small 1.6 micron fibre core inside the SCG-800 module.

All of the optics and mounts in this kit have been certified by Newport's Ph.D. scientists in the Newport Technology and Applications Centre to work together and to be compatible with the Spectra-Physics MaiTai™ or Tsunami™ Ti:Sapphire lasers. This kit allows the user to assemble the pre-selected and certified off the shelf components and put them together for a cost effective supercontinuum solution.

A much more detailed explanation of this kit, alignment procedures, recommended operating parameters and a detailed characterization of the supercontinuum generated as a function of launched pump power and wavelength can be found on Newport's web site (www.newport.com).

For more information, please contact Neil McMahon (sales@newspec.com.au Tel: 08 8273 3040).

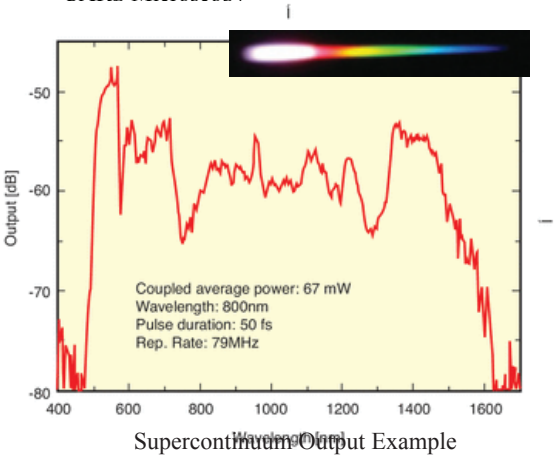
Benefits include:

- Solution for generating supercontinuum with a femtosecond Ti:Sapphire laser
- PCF module has built-in beam expansion at the end facets, facilitating easy coupling of the laser input beam and a higher damage threshold.
- Manual laser power control included in the kit

- Designed to work with Spectra-Physics ultrafast Ti: Sapphire lasers
- All parts tested and fully characterised

Applications:

- Ultrafast Spectroscopy
- Carrier Envelope Phase Stabilization
- Optical Coherence Tomography
- Metrology
- CARS Microscopy



Supercontinuum Output Example

Lyncée tec Digital Holographic Microscopy (DHM™)

For the first time, microscopes combine nanometric resolution, real-time and non-invasive three dimensional observation. These new instruments, based on a revolutionary patented technology called "Digital Holographic Microscopy" (DHM™), are developed, manufactured and commercialized by Lyncée Tec SA. They are now available in Australia and New Zealand through Lastek Pty Ltd.
DHM™ technique makes use of a video (CCD) camera to record a hologram produced by the interference between a reference wave and a wave emanating from the specimen. The captured image is transmitted to a computer where numerical procedures are applied to reconstruct a 3D image of the specimen. This process is called "image reconstruction". The innovation of the DHM™ patented technology is the intervention of digital processing at a level that had not been reached so far in microscopy.

Significant results have been obtained in microscopy where we have established that this new concept enables fast 3D imaging of microscopic specimen with a high resolution (nanometer scale in the vertical direction), with an easy to use, flexible and cost effective technology. This digital approach to holography allows the application of computer based procedures at a level unreached in video-microscopy. In particular the DHM™ principle features software compensation of optical aberrations, digital image focusing and numerical compensation for sample tilt and environmental disturbances, making DHM™ instruments robust and easy to use methods for routine inspections at the nanometer and micrometer scale.

Applications cross-over many areas including Life Sciences, Mems/Moems, Micro-optics, Microtechnology, Semiconductors, Nanotechnology.

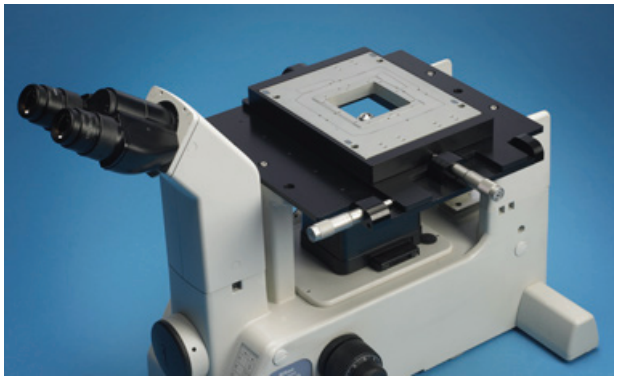
For more information please contact Lastek at sales@lastek.com.au and also visit www.lynceetec.com .

Nano-View™/M Series New from Mad City Labs Inc.

The Nano-View™/M system integrates manual micrometer driven XY coarse positioning with a high resolution, long range XY or XYZ nanopositioner - either ultra-low profile or ultra-high speed, depending on the application. Stepper motor coarse positioning is also available. The Nano-View™/M system provides both simplicity of operation and the highest level of positioning accuracy. A stable blocking force of 10 N built into each axis of the coarse positioning stage provides a secure base for precision nanopositioning. Standard manual microscope stages without this feature often drift enough to make accurate nanopositioning impossible.

Once the manual stage has been moved into position, high resolution nanopositioning can be used to acquire images over 50 μm to 200 μm ranges in X, Y, and Z. Closed loop control of the nanopositioner via the Nano-Drive™ results in sub-nanometer accuracy over the complete range of motion. Compatible with National Instruments LabView™, the Nano-Drive™ controller has standard analog control inputs or an optional USB digital computer interface. The Nano-View™/M is a cost effective, high performance positioning system for Olympus, Nikon, Leica, and Zeiss inverted microscopes.

For more information please contact Lastek at sales@lastek.com.au and visit www.madcitylabs.com or www.lastek.com.au



www.acqao.org

The Australian Research Council Centre of Excellence for Quantum-Atom Optics (ACQAO) is one of Australia's contributions to the rapid development of quantum science that is happening around the world.

The Centre brings together scientists working in three cities, at the Australian National University (ANU) in Canberra, the University of Queensland (UQ) in Brisbane and the Swinburne University of Technology (SUT) in Melbourne, and links them with scientific partners in Europe and New Zealand.

Quantum science will play a major role in future technology and eventually our daily lives.

One area will be optics and wave effects for both light and atoms. Scientifically we are now able to investigate the quantum behaviour of larger objects, involving thousands and even millions of atoms, and see the transition from the microscopic world of a few particles to the macroscopic world of classical effects.

Technically we are now able to use the process of entanglement that was just a concept in the 1930s, and employ it in practical applications, such as communication systems.

We now have the technology for cooling atoms to unimaginably low temperatures and for creating Bose-Einstein condensates. Combining these, we are at the threshold of turning fundamental science into practical applications over the next two decades.

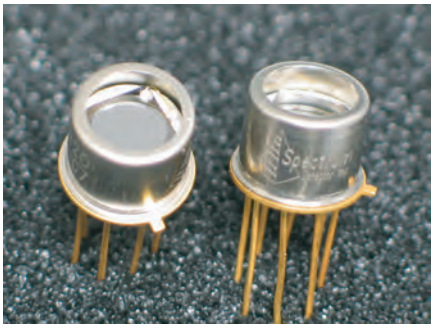
The Centre concentrates on fundamental science questions. It combines our well-established track record in quantum optics with our leading groups in atom optics and laser cooling into one team with common goals. We are combining pioneering theoretical work with experimental projects.

The Centre of Excellence is part of the vision of the Australian Research Council to promote excellence in the most successful fields of research and to give them the opportunity to become players in the international arena.

The funding and support provided by the Australian Research Council, the three Universities ANU, UQ and SUT and the Queensland and Australian Capital Territory governments will allow us to tackle ambitious Outreach projects, to have an intensive exchange of people, to provide opportunities for young scientists and to build the required research facilities.

New Advanced Detector Solutions

Spectrum Detector Inc.



Pyroelectric Detectors

These new Radiometric Detectors combine rugged LiTaO3 detector crystals with state of the art surface mount FETs and Operational Amplifiers in high performance voltage and current mode circuits.

These devices take full advantage of the Pyroelectrics potential …high voltage output, low noise, high bandwidth and broad spectral response.

Optical TRAP Detectors

Spectrum Detector Inc. have created a family of Silicon and Pyroelectric TRAP Detectors and Instruments based on several unique concepts developed at NIST Boulder.

Their new Silicon TRAP Detectors have a useful range of 0.2 to 1.0 µm...with calibration uncertainty from 0.45 to 0.96µm of <<1%. They are designed to handle collimated or divergent sources from pW to mW.

The new Pyroelectric TRAP products make use of a thermal detector and broadband mirror in a "wedge" configuration that ensures its flat spectral response from 0.1 to >100 µm. Measure in Joules or Watts to calibrate other sensors, joulemeters or power meters.

USB powered Digital Joulemeters

Spectrum Detectors Inc. have developed a family of USB powered, digital Joulemeter Instruments that feature single and two channel LabView Applications Software for laser energy measurements and experiments.

These products include models based on Pyroelectric Detectors for sources in the 0.1 to 100µm region and extremely sensitive models that include Silicon and Germanium Detectors for measurements down to the femtojoule range from 0.2 to 1.8µm.

A modular design allows the user to interchange the detector module with the digital backend and optical front end. All Joulemeter products feature NIST traceable calibration.

WARSASH Scientific

Advanced Instruments for Research & Industry

Sydney
PO Box 1685
Strawberry Hills
NSW 2012
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NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE ● INTERNATIONAL COMMISSION FOR OPTICS

ICO solicits bids for organizing ICO-22

Territorial Committees are invited to host the 2011 ICO Congress.

Prof. Gert von Bally of ICO.

The ICO Congress is organized every three years and comprises the general business meeting, as requested by the ICO statutes, and a scientific conference that should cover the wide disciplinary field of optics in its entirety.

ICO is now soliciting bids for organizing the 22nd ICO Congress to be held in 2011. The Congresses are usually held in August or in early September.

While ICO prefers that Congresses alternate between the various parts of the world, qualified proposals from all areas are encouraged and all bids will be considered.

The 21st ICO Congress will be held in July 2008 in Sydney, Australia, whereas the ICO-20 Congress was in Changchun, China, with the title: "Challenging Optics in Science and Technology". The 2002 Congress (ICO-19) was in Florence, Italy, and in 1999 (ICO-18) and 1996 (ICO-17) the Congresses took place in San Francisco, California (US), and Taejon, Korea, respectively.

Applicants preparing their bids should refer to the information and questionnaire on ICO Congresses and other major ICO events that can be found on the ICO website: www.ico-optics.org/meetings.html.

Please submit your bid by completing the questionnaire and sending it to me with the necessary enclosures, either electronically or by airmail, by 15 April 2007.

Prof. Gert von Bally, ICO associate secretary (in charge of meetings), LBiophys@uni-muenster.de.

Svetlana Boriskina wins ICO/ICTP Prize

The 2007 ICO/ICTP Prize has been won by Dr Svetlana V Boriskina for her contribution to optics and photonics in the Ukraine.

MSILVANO, PUBLIC INFORMATION OFFICE AND ICTP PHOTO ARCHIVES

Dr Svetlana Boriskina with prize diploma in hand at the award ceremony at ICTP in Trieste, Italy.

Dr Svetlana V Boriskina, from the School of Radiophysics, V Karazin Kharkov National University (KNU) in Kharkov, Ukraine, has been awarded the ICO/ICTP Prize for 2007. Dr Boriskina is recognized for "her original work in the development of numerical modelling techniques for optoelectronic devices, micro-optical resonators, dielectric lenses and waveguides and for her active commitment aimed at the diffusion of research in optics in Ukraine".

The ICO/ICTP Prize was established to recognize young researchers from developing countries (as defined by the United Nations), who conduct their research in these countries. The prize is awarded to a scientist younger than 40 years of age (on 31 December of the year for which the award is given), who is active in research in optics and has contributed to the promotion of research activities in optics in their own or another developing country.

Dr Boriskina received her MSc (hons) and PhD in radiophysics from KNU in 1995 and 1999. Between 2000 and 2005 she worked in the School of Electrical and Electronic Engineering at the University of Nottingham, UK, first as a postdoctoral fellow, and then as a research fellow. In 2005 she returned to KNU and is currently working there as a senior research scientist.

In the 1990s, Dr Boriskina's research at KNU focused on developing rigorous analytical methods and advanced software tools based on boundary integral equation techniques. These tools were initially applied to modelling reflector antennas and narrow-band dielectric waveguide filters. Later on, her research interests shifted to the field of optics and photonics, and now include micro- and nanophotonics and plasmonics.

During the last two years, Dr Boriskina has established an original research programme in micro- and nanophotonics at KNU. Her ongoing research focuses on the development of a theoretical framework and software tools for the spectral design and modelling of photonic and plasmonic micro- and nanostructures, both ordered and disordered. The results of this research hold great promise for improving the performance of existing photonic devices, as well as creating new photonic devices such as low-threshold semiconductor microlasers, wavelength-selective optical filters and temperature-sensitive switches, near-field imaging systems and biochemical sensors.

Dr Boriskina developed an innovative lecture course entitled "Electromagnetic theory on micro- and nanoscale", which was awarded

Dr Boriskina, a senior research scientist at V Karazin Kharkov National Univeristy (KNU), Ukraine.

Organizers and participants at the Young Researchers Career Development Workshop at KNU.

KNU OSA Student Chapter members.

an International Society for Optical Engineering (SPIE) educational grant (2006). She is also supervising several graduate and undergraduate student projects.

Dr Boriskina has contributed to around 90 journal and conference publications, and coordinated or participated in several international research projects. She has made numerous regular and invited talks at major international conferences and held tutorials at Ukrainian seminars for young researchers. She is the organizer of the Special Session on Micro-resonators and Photonic Molecules at the International Conference on Transparent Optical Networks (ICTON, www.itl.waw.pl/icton).

Dr Boriskina is also active in conducting various outreach activities for educating young people about optics, including adapting optics educational materials for non-English-speaking audiences and organizing outreach events for grade-school and university students.

She was a founder of the KNU Student Chapters of the Optical Society of America (www-radiophys.univer.kharkov.ua/theor/OSA/) and SPIE. She now serves as the faculty advisor for the chapters. Among their activities in 2006, the chapters organized a Young Researchers Career Development Workshop in Kharkov, which was partially supported by ICTP and brought together Student Chapters not only from various regions of the Ukraine, but also from the US and Australia.

Dr Boriskina has received numerous fellowships and scholarships including a graduate fellowship in advanced electromagnetics from the SUMMA Foundation; a graduate-student scholarship from the Institute of Electrical and Electronics Engineers' (IEEE's) Microwave Theory and Techniques Society (MTT) ; a postdoctoral fellowship from the Royal Society/NATO; scholarships from the ISSEP Foundation; and numerous travel grants to attend topical meetings. She is a senior member of the IEEE, and a member of the OSA and SPIE.

Dr Boriskina received the diploma and cash award at a special ceremony during the Winter College on Fibre Optics, Fibre Lasers and Sensors held at the Abdus Salam ICTP in Trieste, Italy, on 14 February 2007. She delivered the invited ICO/ICTP Award Lecture on "Scattering theory and modelling of light propagation in nanophotonic devices based upon boundary integral equations (BIE)".

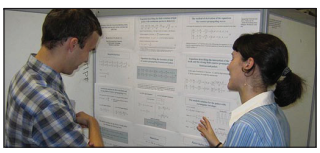
The ICO/ICTP Prize Committee consists of A Wagué (chair), A Consortini, G Denardo and M Danailov. The prize is now open for nominations for 2008. Information can be found at www.ico-optics.org/awards.html.

2006 ICO Topical Meeting focuses on optoinformatics

A report on the 2006 ICO Topical Meeting.

Prof. Vasilev opening the meeting. To the right, the three co-chairs: A Pavlov, M L Calvo and J Jahns.

Valentin L Vlad receives the 2005 Galileo Galilei Award diploma and medal from Anna Corsortini, president of the Italian Society for Optics and Photonics, while Ichirou Yamaguchi, chair of the ICO Galileo Galilei Award Committee, looks on.



Discussion at the poster session.

The International Commission for Optics (ICO) organizes every year one Topical Meeting (except for the years coinciding with the General Assembly), dedicated to specific topics of current interest to the global community. Continuing from the optoinformatics workshops held in previous years at Saint Petersburg State University of Information Technologies, Mechanics and Optics (ITMO), the 2006 ICO Topical Meeting on Optoinformatics and Information Photonics revealed the enormous activity and potential of this field.

The Topical Meeting was held on 4–7 September 2006 and was co-located with the Information Photonics 2006 series of meetings. Information Photonics is organized every two years under the ICO and Optical Society of America (OSA) Steering Committee initiative. The two meetings were organized within the framework of the IV International Optical Congress, "Optics – XXI Century", and were sponsored by ICO, the International Union of Pure and Applied Physics (IUPAP), OSA, the European Optical Society (EOS), INTAS and the Dynasty Foundation.

Prof. Vladimir N Vasilev, president of ITMO, opened the meeting. A total of 500 participants from all over the world attended the various parallel focus sessions:

- Applications of Optoinformatics;
- Bio-optics, Bio-photonics, High Resolution Imaging, Vision and Photoreceptors;
- In Memoriam of Emmet Leith and Yuri Denisyuk: Enlightening the World of Holography (to honour two of the three founders of holography – the third being Denis Gabor);
- Optical Microscopy and Metrology;
- Optical Transformations and their Applications in Optical Signal Processing;
- Quantum Optics and Quantum Information;
- Recent Advances in Femto-second Laser Technology;
- Signal and Image Processing and Digital Holography.

The speakers invited to present papers were specialists in the field: H John Caulfield, Michael Lebby, Ventseslav Sainov, Ichirou Yamaguchi, Hans I Bjelkhagen, Kevin Curtis, Asher Friesem, Rainer Hagen, Norbert Hampp, Dimitri Psaltis, Elena Korchemskaya, Levent Onural, Adrian Podoleanu, Arnaud Dubois, Dan Ferguson, Bahram Jalali, Yoshiaki Yasuno, Gerhard Birkl, Maria Chekhova, Claude Fabre, Serge A Massar, Eugene Polzik, Anastasia Rodichkina, Vladimir P Tychinsky, Brian Vohnsen, Gabriel Cristóbal, Ari T Friberg, Kurt Bernardo Wolf, Zeev Zalevsky and Christof Debaes.

The award ceremonies for the 2005 ICO Prize and 2005 ICO Galileo Galilei Award also took place at the meeting. Winners Immanuel Bloch

Immanuel Bloch receives the 2005 ICO Prize diploma and Ernst Abbe Medal from Ari T Friberg, ICO president, in the presence of Yoon Kim, chair of the ICO Prize.

Participants after the special session dedicated to PHOTONICS 21 and the closing ceremony.

and Valentin L Vlad delivered award lectures on "Exploring quantum matter in crystals of light" and "Spatial solitons and soliton waveguides in photorefractive crystals", respectively.

The meeting closed with a special session dedicated to PHOTONICS 21, the European Technology Platform, with contributions from Chris Dainty, Georg Kelm and Malgorzata Kujawinska. This was followed by a lively discussion between the attendees.

Owing to the high number of contributed papers, many had to be accommodated in the poster session. The result was a very interesting poster session with more than 100 posters.

Social activities comprised a visit to the Saint Petersburg monuments and a boat trip by night on the Neva River.

A special issue of *Optics and Spectroscopy* will appear by November 2007 with selections from the contributions to the 2006 Topical Meeting. It will reflect, to some degree at least, the results and subjects discussed most in the eight general focus sessions.

We would like to thank all our colleagues who participated in the event. Without their work, the meeting could not have been such a success. In particular, we thank the local organizers, the ITMO academic authorities for their hospitality, all the chairs of the focus sessions, the participants and attendees. The magnificence of Saint Petersburg was an additional benefit.

An important challenge for ICO is to organize international forums in which senior and junior researchers from all over the world can meet in a fruitful and creative atmosphere. We will do our best to achieve this goal.

Maria L Calvo, Jürgen Jahns and Alexander Pavlov, co-chairs.

ROMOPTO 2006 highlights Romanian success in optics

Clementina Timus, Valentin Vlad and Nikos Vainos review the conference held on 28–31 August 2006.

Norbert Kroo, vice-president of the Hungarian Academy of Sciences, addresses the audience at the conference's opening ceremony.

Some of the participants at the gate of the "Hermann Oberth" Faculty of Engineering at the "Lucian Blaga" University of Sibiu, Romania, where the conference was held.

The ROMOPTO 2006 international conference on optics and photonics was the eighth in a series of conferences in Romania initiated in 1982 by Prof. Ioan Ursu and academician Alexandr Michailovich Prohorov. The 2006 conference was organized by the National Institute of Laser, Plasma and Radiation Physics, Bucharest, and the "Hermann Oberth" Faculty of Engineering at the "Lucian Blaga" University of Sibiu. The chair of the conference was Prof. Valentin Vlad.

The conference topics were related to recent applications of modern micro- and nanophotonics in materials science, information science and technology, optoelectronics, biology and the environment, sensing and metrology. The conference provided scientists of all ages with the opportunity to share experiences, discuss results, stimulate interdisciplinary research and consider the prospects of applications.

As a partner in many international projects and activities, Romania works with institutes and universities in other countries and plays an active role in the promotion of scientific contacts. Collaborators become friends, admire and appreciate the culture of Romania, and are interested in learning about developments resulting from the country's recent admission to the European Union.

To introduce participants to different areas of the country, the organizing committee hosts the conference in different Romanian cities, such as Constanta on the border of the Black Sea (2003) and now in Sibiu, Transylvania, one of the best-preserved medieval cities in Romania. Sibiu is also one of the 2007 European Capitals of Culture (the other is Luxembourg).

More than 180 papers were submitted on the six topics, which were organized into three parallel sessions and six plenary sessions. In addition, Prof. V Lupei coordinated a workshop on Advanced Photonics Materials and Sources and Prof. V Vlad chaired a panel on "Photonic nonlinear devices and circuits".

The plenary sessions were honoured by the involvement of the following distinguished professors: M J Soileau, University of Central Florida, Orlando (US); Norbert Kroo, vice-president of the Hungarian Academy of Sciences; Guenter Huber, Institut für Laser-Physik, Universität Hamburg, Germany; Reshef Tenne, the Weizmann Institute, Israel; and Joseph Zyss, Ecôle Normale Supérieure, Cachan, France.

The contributed papers were organized into 36 invited lectures, 52 oral presentations and 76 posters. The plenary sessions had a very large audience, as the topics proposed by the authors were of great interest. It was a pleasure to notice the high level of international involvement in this conference, with 72 participants from 18 countries as well as about 90 Romanians.

The participation of many young scientists was made possible by the generous support of the International Society for Optical Engineering (SPIE), PhOREMOST, ICTP and ICO. Young scientists were invited to make oral presentations, giving them the opportunity to convince the auditorium about their own research. Many of these young scientists have contributed high-quality work in laboratories around the world in the framework of NATO or EU projects. The conference also aimed to educate young scientists and give them the opportunity to be in contact with the most prestigious professionals in the field, and defend their results.

Posters, magazines and leaflets were sent by SPIE and ICO so that participants could inform themselves about the professional societies and facilities offered to full members, especially for young scientists. It is necessary to mention that

Contacts

International Commission for Optics (www.ico-optics.org).

Bureau members (2005–2008)

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the Romanian SPIE chapter was organized in 1992, and since 1994 there has been an ICO Territorial Committee. The SPIE Student Chapter was established in 2001.

During the conference a trip was organized to visit Sighisoara, a well-preserved 15th-century city, which is on UNESCO's protected World Heritage List. The participants also enjoyed the Saxon churches in villages in Transylvania.

We would like to thank the local committee for their excellent organization and hospitality, which everyone greatly appreciated.

Clementina Timus, secretary, Valentin Vlad, chair, and Nikos Vainos, ICO representative.

Travelling Lecturer visits Brazilian centres

Dr Héctor Rabal visited several research centres in Brazil from 9 to 23 December 2006 through the ICO Travelling Lecturer Programme: the Federal University of Lavras (UFLA), the University of Campinas and the University of São Paulo.

Dr Rabal is a fellow of the National Council of Science and Technology (CONICET) and professor at the University of La Plata (UNLP), Argentina, and is currently ICO's Argentinian representative.

At UFLA, Minas Gerais State, he delivered a series of talks on topics relating to Fourier optics, including digital-speckle patterns interferometry (DSPI) and dynamic-speckle methods and applications, that were grouped into a brief course for engineering and computer-science students. He also had the opportunity to speak with several students who were preparing their graduation and post-graduation works on dynamic-speckle applications.

Dr Rabal's administrative tasks, involving the creation of a book on dynamic speckle, were carried out with Dr Roberto Alves Braga Jr, who runs the Laboratory of Lasers and Optics with Dr Giovanni Rabelo. In this laboratory several experiments are being conducted that use dynamic-speckle phenomena for biomedical and environmental-science applications.

At the University of Campinas, Dr Rabal participated in a meeting organized by the Brazilian Local Territorial Committee on Optics. Dr Jaime Frejlich coordinated the meeting, which was devoted to the organization of the forthcoming Ibero-American Conference on Optics (VI Reunión Iberoamericana de Optica – VI RIAO) and the Latin-American Meeting on Optics, Lasers and Applications (IX Encuentro Latinoamericano de Optica, Láseres y sus Aplicaciones – IX OPTILAS) to be held at the university on 21–26 October 2007. Dr Rabal also spoke with Dr Dal Fabbro and other local researchers about dynamic speckle and moiré.

Dr Rabal delivering a lecture at the Department of Physics of the University of São Paulo in Brazil.

At the University of Sao Pãulo, Dr Rabal was welcomed by Dr M Muramatsu, head of the Optics Laboratory. Dr Rabal delivered a talk on "Dynamic speckle: fundamentals and applications" at the physics department. He sat in on an interdisciplinary meeting of members of the Optics Group and the Hearth Institute (Instituto do Coração – InCor) and participated in an actual application of low-power laser therapy to the monitoring of the cicatrization process, using laser-speckle techniques.

Many fruitful talks were held with Dr M Muramatsu, Dr Armando Tavares (National University of Rio de Janeiro), Dr Walter Pontuschka and several enthusiastic students on dynamic-speckle characterization tools, optics measurement instruments and didactic experiments for teaching optics, in particular image formation and hand-drawn holograms. He also observed a workshop for undergraduate students in the Teaching Laboratory coordinated by Claudio Furukawa, which demonstrated concepts in optics, thermodynamics and mechanics.

Dr Rabal was very grateful for the warm hospitality and interest that he received in the centres, and made several useful contacts.

See www.ico-optics.org/travlecture.html for more on the Travelling Lecturer Programme.

Héctor Rabal

To find out information about forthcoming events with ICO participation, see the events page of the ICO website at www.ico-optics.org/events.html

Responsibility for the accuracy of this information rests with ICO. President: Ari T Friberg, Royal Institute of Technology, Optics, Electrum 229, SE-164 40 Kista, Sweden; e-mail: ari.friberg@imit.kth.se. Associate secretary: Gert von Bally, Laboratory of Biophysics, Medical Centre, University of Münster, Robert-Koch-Str. 45, D-48129 Münster, Germany; e-mail: lbiophys@uni-muenster.de.

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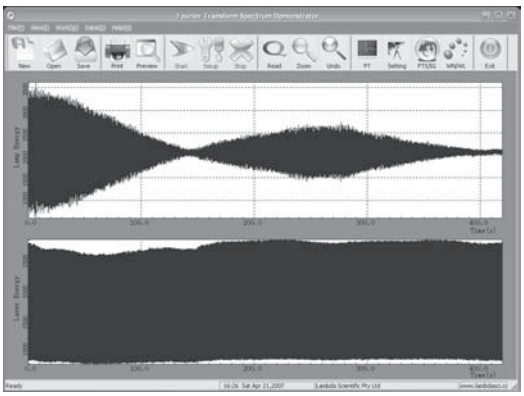


Fig. 1 Interferogram of the sodium lamp

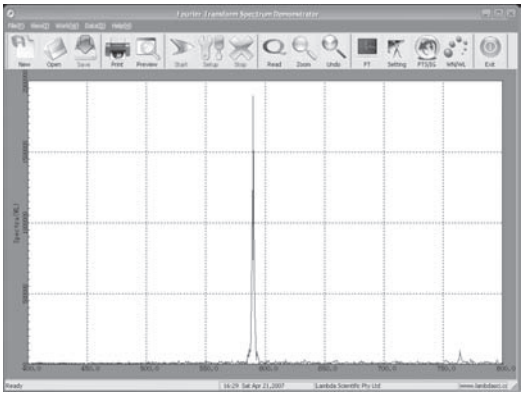
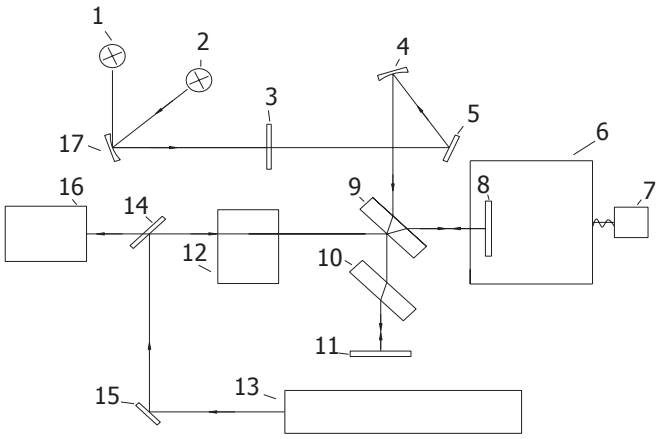


Fig. 2 The spectrum of the sodium lamp



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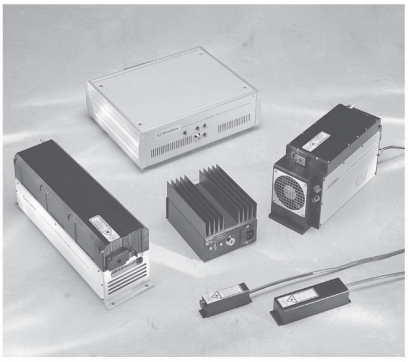

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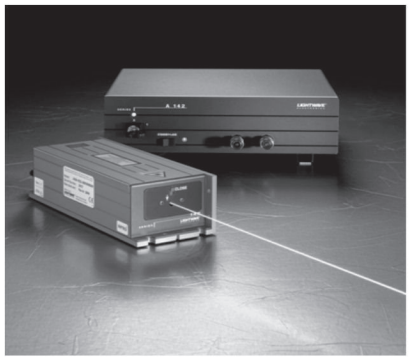

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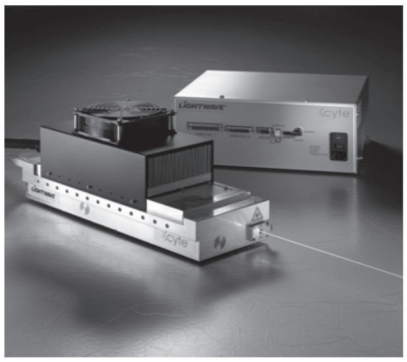

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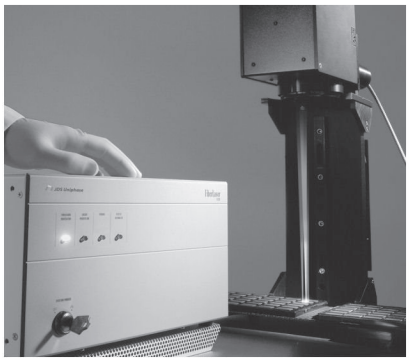

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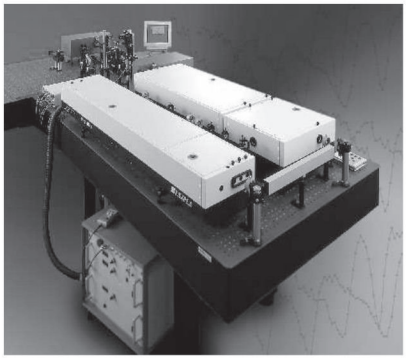

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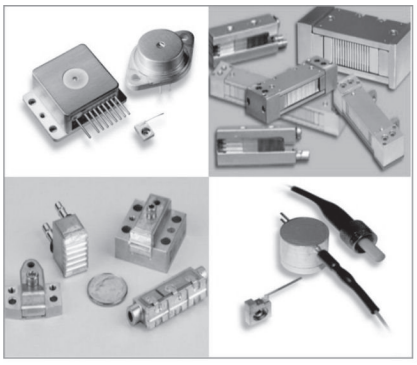

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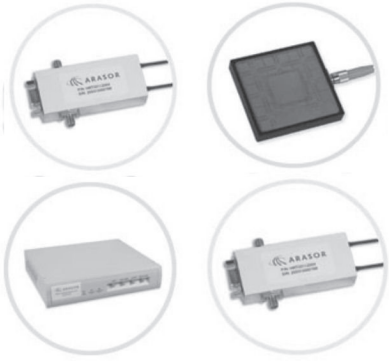

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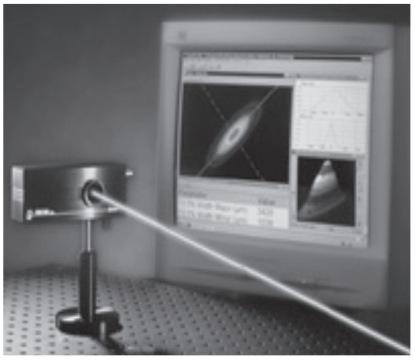

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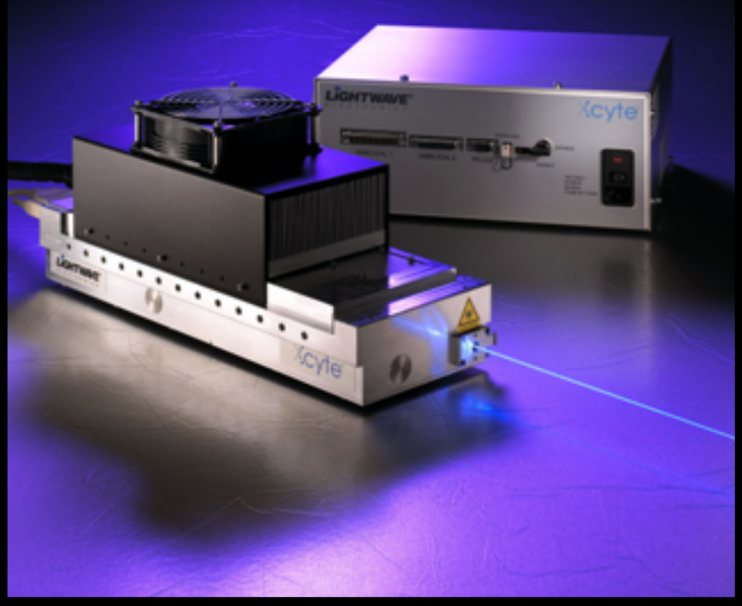

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