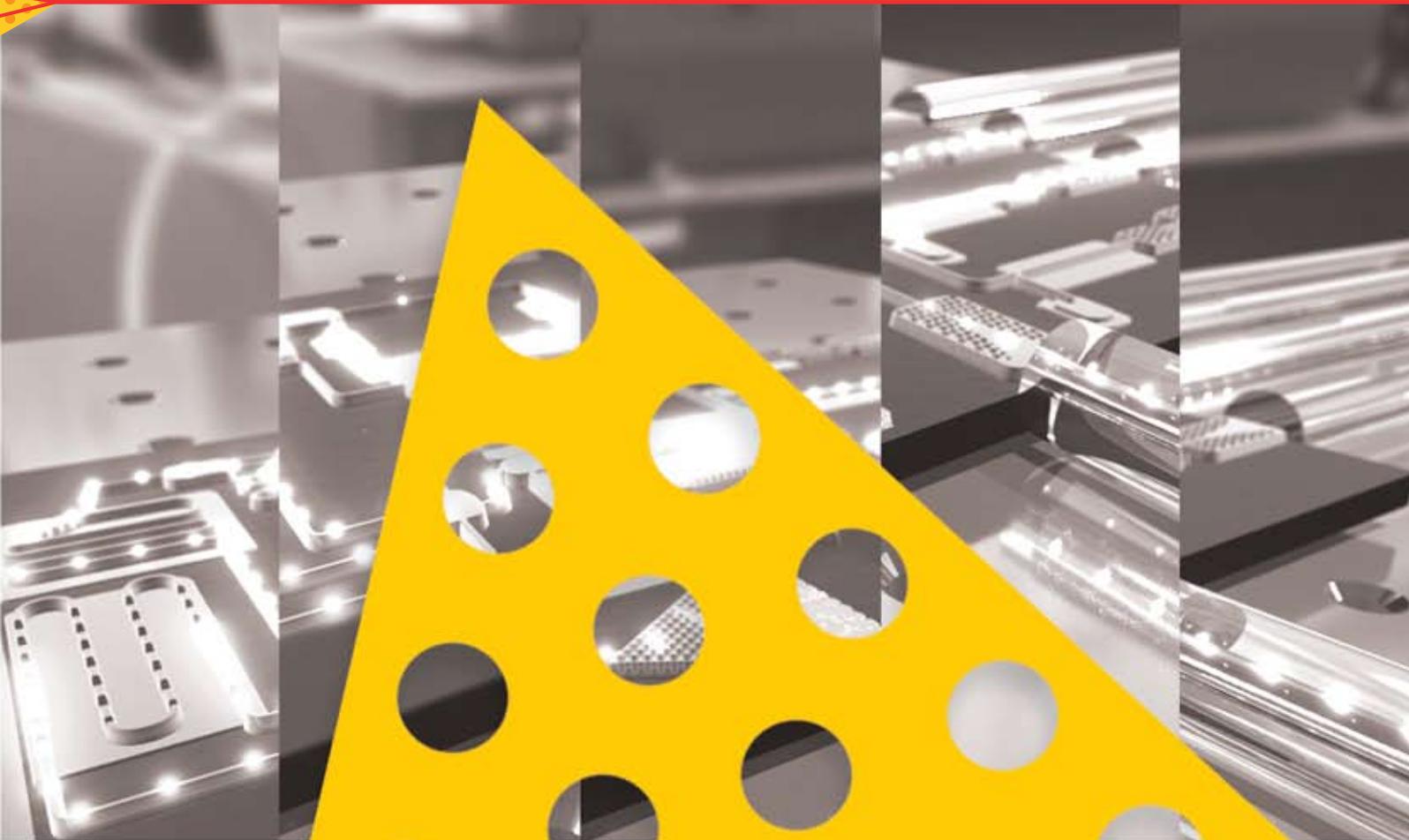




CUDOS

The Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS)
An Australian Research Council Centre of Excellence



Annual Report 2007

Links and Commercialisation

CUDOS is a Centre with strong national and international links and agreements in place. In Australia NICTA, DSTO and the Anglo-Australian Observatory are collaborators through the involvement of scientists from each institution as Partner Investigators. Centre researchers also collaborate with Optium Inc via a Linkage Grant and Redfern Polymer Optics, where co-location on the ANU campus has led to arrangements for shared facilities of significant benefit to both parties. The Centre also has links with Bandwidth Foundry International (equipment sharing) and makes its facilities at different nodes available as required for external users.

Internationally, the Centre now has formal collaborative agreements in place with two European Networks of Excellence (PHOREMOST and NEMO) and with Projects funded under the European Commission's Future and Emerging Technologies program. We are also formally a member of Action 299 of the European Cooperation in Science and Technology (COST) Program.

The Centre is working hard to establish strong relations with a range of Chinese Universities, both for research collaboration and student exchanges. Ben Eggleton visited Asia several times during 2007 and presented a series of lectures on CUDOS research. A significant outcome from these visits is a significant increase in the number of Chinese students who plan to study in CUDOS from 2009.



Prof. Limin Tong, Prof. Eggleton and Prof. Xu Liu (Dean of Faculty) at front gates of Zhejiang University.

Funding from the International Science Linkages Program has been obtained to support the collaboration with the Slow Photon Light Activated Switch (SPLASH) project and with Professor Martin Pemble and the Tyndall Institute, Ireland. In each case the grants provide funds for collaborative activities outside, but highly complementary to, the CUDOS CoE program. Technical aspects of each project are discussed in the Slow Light and 3D Photonic Crystal Flagship reports.

Our linkages have significant short and long term benefits. Each party accesses unique facilities and expertise of its collaborator; for example, through the SPLASH collaboration CUDOS can use world class lithography capabilities while the SPLASH team gain access to chalcogenide substrates for use in collaborative experiments. The linkages thus expand the research capacity of the Centre.

From 2008 we will have a new Chief Investigator (Dr Arnan Mitchell of RMIT) and a new set of Partner Investigators, all of whom will play a key role in one or other of our Flagship projects. The new Partner Investigators were listed in last year's report, however during 2007 three nominated PIs, Dr Mike Steel (Macquarie),

Dr Adel Rahmani (UTS) and Professor Joss Bland-Hawthorn (Federation Fellow, Sydney) joined Australian Universities. While they are no longer eligible to be PIs, they are now working at CUDOS Collaborating Universities and so continue to be closely involved in the research program. The 2008 PIs and their Flagship involvement are as follows:

Partner Investigator	Role in Centre
Prof John Harvey , U. Auckland	Nonlinear Optical Signal Processing
Dr John Haub , DSTO	Compact Waveguide Oscillator, Tunable Microphotonics
Prof Satoshi Kawata , Osaka	Three dimensional photonic crystals
Prof Thomas Krauss , St Andrews	Optical Switch, Slow Light
Prof Kobus Kuipers , FOM Amsterdam	Slow Light
Dr Thas Nirmalathas , NICTA	Nonlinear Optical Signal Processing
Prof Stojan Radic , UC San Diego	Nonlinear Optical Signal Processing
Prof Kathleen Richardson , U. Clemson	Nonlinear Optical Signal Processing, Optical Switch
Prof Hugo Thienpont , VUB Belgium	Tunable Microphotonics, Nonlinear Optical Signal Processing
Prof Alan Wilner , Univ Southern California	Nonlinear Optical Signal Processing
Prof Tony Wilson , Oxford	Three dimensional photonic crystals



Five of the Partner Investigators at the 2008 CUDOS Workshop: Thomas Krauss, Kathleen Richardson, Kobus Kuipers, John Harvey & Tony Wilson.

Conference and Workshop Activities

For perhaps the first time in our five year history, the Centre did not have a major role in a national or international conference. We were, however, very active in organising workshops. Two of these were focused on CUDOS activities but included external invited speakers while the third was an exciting initiative with the astronomy community to explore collaborative opportunities in astrophotonics.

6th CUDOS Workshop

The 2007 Annual Workshop was held at Murramarang Resort on the NSW South Coast over three days in February. This event is central in the CUDOS calendar, with virtually 100% attendance from all CUDOS members, including honours and postgraduate students. For our 2007 Workshop we also invited our new Partner Investigators to join the meeting and give presentations and were delighted that a significant number were able to attend – Thomas Krauss (St Andrews), Hugo Thienpont (VUB Belgium), Kobus Kuipers (FOM Amsterdam), Tony Wilson (Oxford), John Haub (DSTO), Thas Nirmalathas (NICTA) and John Harvey (Auckland). Stojan Radic (UC San Diego) gave his invited presentation by phone and Kathleen Richardson (Clemson) emailed a recorded presentation.

Astrophotonics Workshop

The growing range of applications of optical fibre technology to astronomy and the involvement of Professor Joss Bland-Hawthorn in CUDOS were the catalysts for us to organise a Workshop on Astrophotonics at Sydney University in November, attended by more than seventy representatives from different photonics and astronomy groups around Australia, France and the US.

The Conference organisation team of Chris Walsh and Emily Higginson worked with Program Committee Boris Kuhlmeier (CUDOS) and Peter Tuthill (Sydney University Astronomy Institute) to develop a two day program of invited talks that both outlined the key features of photonics of potential relevance to astronomy and, from the astronomy side, gave an overview of challenges in astronomical instrumentation where photonics might provide a solution.

Scene-setting presentations were given by Ben Eggleton, Joss Bland-Hawthorn, Ron Ekers (Australia Telescope) with other

presentations coming from the Anglo-Australian Observatory, UNSW, Grenoble Observatory and on the photonics side from RMIT, Sydney and Adelaide University.

The meeting was voted a great success and addressing a significant need within the astronomy community, so plans are in place to mount a second workshop in the near future.

Commercialisation

The CUDOS Commercialisation Committee met twice during the year. The Committee has a number of functions, including the provision of advice on IP protection and on commercialisation. The committee comprises Dr Chris Walsh (Chair), Prof Ben Eggleton (Research Director), Mr Malcolm Donnell (Commercialisation Manager – Licensing, Sydnovate), Mr Ben Smith (Business Development Manager, Information and Communication Sciences, Macquarie University), Dr Victor Pantano (Business Development Manager, ANU Office of Commercialisation and Investment Manager, ANU Connect Ventures), Dr Bruce Whan (Director, Swinburne Knowledge) and Mr Nick Marsh (Business Development Manager, Research and Innovation Office, UTS).

The Commercialisation Committee was established under the terms of the IP Agreement signed by all Collaborating Organisations at the commencement of the Centre. Under the terms of the Agreement, commercialisation of Centre IP is managed in the first instance by all Collaborating Organisations through the Commercialisation Committee. The Commercialisation Committee will act in the best interests of all Collaborating Organisations by assessing IP linkages across the Centre and providing recommendations to the owners of the IP to be commercialised for coordinated commercialisation strategies.

During the year the Centre received an expression of interest in commercialisation of the chalcogenide IP owned by Sydney and by ANU in the form of patents and know-how. The Commercialisation Committee reviewed the proposal and recommended strategies with regard to timing of a licensing arrangement and the possible establishment of a new company.

Centre researchers filed four patent applications during 2007. A number of these patents will proceed to the PCT stage in 2008 and commercialisation opportunities will be re-assessed at that stage.



The attendees of the Astrophotonics Workshop held in November 2007.

