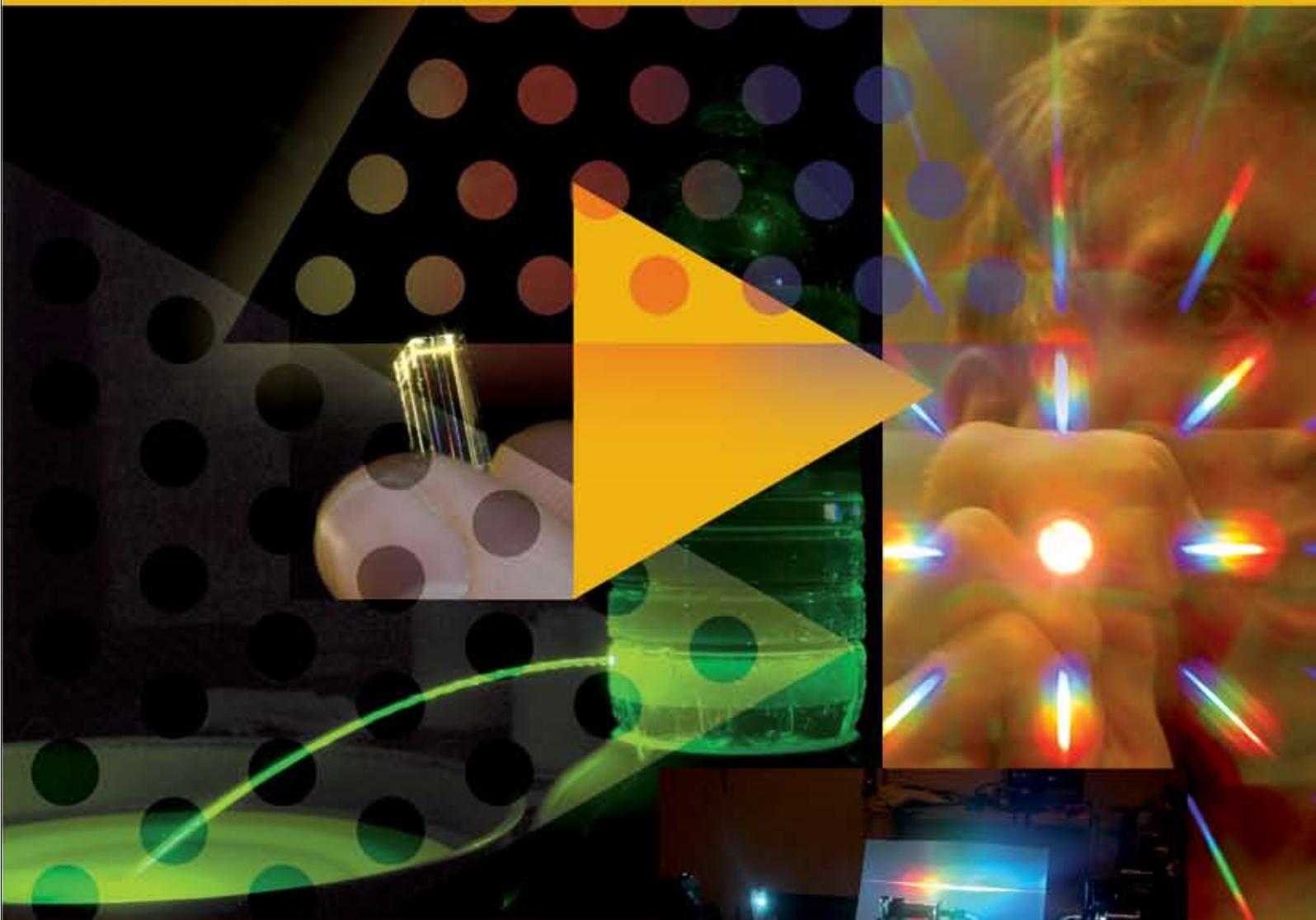


CUDOS

The Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS)



A N N U A L R E P O R T

2006



Structure

CUDOS is a collaborative research program between the University of Sydney, the Australian National University, Macquarie University, Swinburne University of Technology and the University of Technology, Sydney, funded under the ARC Centre of Excellence program. The University of Sydney manages the ARC grant and disburses funds in accordance with an agreement signed off between the Universities. The agreements covering the management of the Centre are the ARC Funding Contract, the Collaborator Agreement and the CUDOS Intellectual Property Agreement. The University of Sydney has also signed a Deed of Agreement with the state government of New South Wales (through the Department of State and Regional Development) for the disbursement and management of state government funds.

Centre management

During 2006 Centre administration was overseen by an Executive team comprising Prof Eggleton (Research Director), Prof Kivshar (Deputy Research Director and Canberra node coordinator), Prof de Sterke (Sydney node coordinator), Prof. Gu (Melbourne node coordinator) and Dr Chris Walsh (Chief Operating Officer). The Executive met by teleconference three times during the year.

The Chief Investigators, led by the Research Director, are the leaders of the Centre's research program. During the year the Chief Investigators met on three occasions. The first meeting in June was to formulate a research plan for CUDOS over the following four years. The second meeting was held immediately after the Science Review to discuss responses to the Committee's recommendations, and the third was held in November to review the year's progress against the plans that had been agreed to in the November 2005 meeting.

Advisory Board

The Centre's Advisory Board met on two occasions during 2006. The first meeting (April 2006) focused on commercialisation, while the Centre's four year strategic plan for 2007 – 2010 was reviewed at the September meeting. The composition of the Board is unchanged from 2005 (apart from Professor Crossley replacing Professor Hesketh as the University of Sydney's representative) but is included with this Report for completeness:

Dr Simon Poole (Chairman), a photonics industry pioneer who inventions include the Erbium-doped fibre amplifier (EDFA) and who has established two successful photonics companies;

Professor Merlin Crossley, Professor Jim Williams, Professor Jim Piper and **Professor Sue Rowley**, representing different universities in CUDOS;

Dr Mike Sargent, formerly CEO of ACTEW, a Board member of the ARC and currently chairing the DEST NCRIS Committee;

Dr Scott Rashleigh, formerly CEO of Australian Optical Fibre Research Ltd, a company he established in the early 1980's and still trading today;

Professor Rod Tucker, Director of CUBIN and a key researcher in National ICT Australia (NICTA);

Dr Ian Ritchie, Chairman of Redfern Polymer Optics and formerly CEO of JDS Uniphase (Australia)

Professor Simon Fleming, CEO of the Australian Photonics Cooperative Research Centre

Mr Warwick Watkins, Director General of the Department of Lands, Registrar General and Surveyor General (NSW);

Dr Steven Duvall, Intel Fellow and Head, Intel Capital (Australia).

ARC Review

The Centre's three –year review was held in 2005. The ARC's recommendations from that Review, including one to increase the publication output from 40 to 55 per year, were accepted by the Centre and were systematically addressed during 2006. Several of the major recommendations were:

- Hold annual or bi-annual meetings of the Chief Investigators to plan and review the scientific program – addressed;
- Hold more frequent meetings of the Science Review Committee – addressed, with a second review held in 2006 (see below);
- Develop and expand the Centre's Outreach program – accepted and addressed, with Ms Kali Madden appointed as Outreach Coordinator reporting to Dr Walsh.

The Centre was again reviewed in September 2006 as part of the process of evaluating our proposal to extend the Centre's period of funding by three years to 2010.

CUDOS Scientific Review

We are committed to validating our research performance by peer review. The CUDOS Advisory Board contains a number of photonics experts (Dr Poole, Professor Tucker, Dr Rashleigh, Dr Ritchie) who are kept well-briefed on the Centre's research activities but whose main focus is on strategic management.

The first CUDOS Scientific Review was held in 2005. The review was conducted by international peers and focused exclusively upon the Centre's science program. Following the encouragement by the ARC during the 2005 review to hold such reviews regularly, we convened a second review in 2006 that was held during the Centre Workshop, with review members both attending the technical sessions and presenting talks on their research. The members of the Science Review Committee are listed below. They cover the full spectrum of CUDOS research with representatives from industry (systems and components level) and academia (theory and experiment):

Professor John Dudley, Université de Franche-Comté – experimental and theoretical studies on nonlinear fibre-based processes

Professor Costas Soukoulis, Iowa State University and Ames National Laboratory (USA) - Analytical and numerical studies of ordered and disordered systems including photonic crystals;

Dr Yurii Vlasov, IBM – leader of a group producing exquisite silicon-based microphotonic systems;

Professor Rod Tucker, university of Melbourne – Federation Fellow and world authority on optical networks;

Professor Anders Bjarklev – COM (Denmark) – Director of a Danish research and teaching Institute with strong links to industry and a world leader in photonic crystal fibres.



▲ **Scientific Review Committee at the 5th CUDOS Workshop in August (left to right): John Dudley, Yurii Vlasov, Costas Soukoulis, Anders Bjarklev and Rod Tucker.**

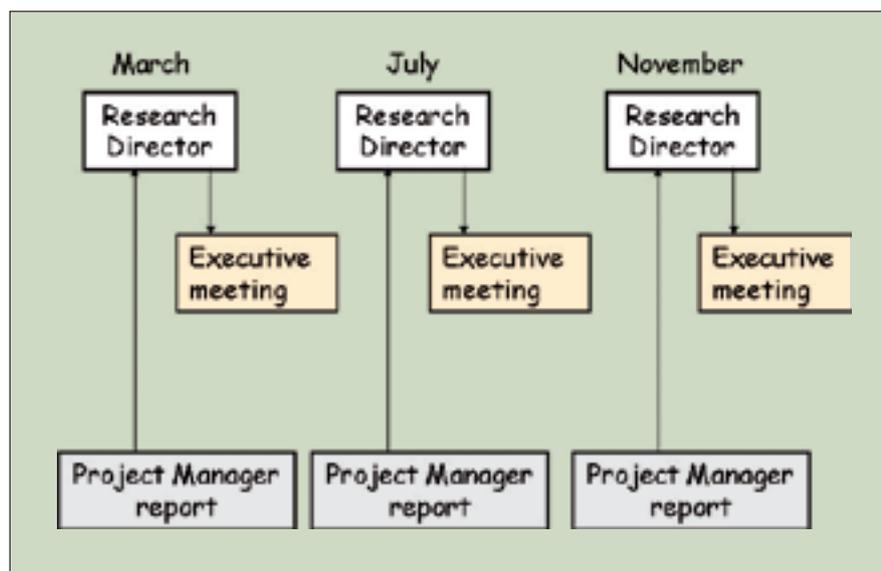
The Committee ranked the achievements of CUDOS as being “of the highest international standard, comparable to the best research centers in Europe, USA and Asia.” They ranked the performance of CUDOS doctoral students as being of the highest quality, and noted that CUDOS is viewed as “an international research destination comparable to the best international universities and research schools”. The Committee also commented favorably on our “facilities enabling research at the highest international level”. We were delighted that the Committee was impressed

with the Centre's strong commitment to collaborative research (“The CUDOS approach to managing inter-nodal collaboration and integration can be viewed as an outstanding example of a best practice model for international efforts of this type.”) We anticipate that the next Science Review will be held in 2008.

CUDOS Research Management

Organizational management structures should fit the purpose of the organization. In the early years of the Centre, our research program was structured along disciplinary lines to reflect our emphasis on building a strong base of fundamental science and technology in the range of disciplinary areas needed to support a Centre in microphotonics and nonlinear photonics. As this science base became established and our collaborative Flagship programs grew more prominent in the Centre's research activities, we realized that we needed a new organizational structure. This was developed by the Research Director collaboratively with the Centre's Chief Investigators and introduces a new role, that of Flagship Project Manager. These managers, drawn in many cases from the ranks of our more junior researchers, are responsible for achieving the yearly goals of each Flagship. Their function complements that of the Chief Investigators, who have the responsibility to maintain the long term scientific base.

At the same time we have broadened the membership of the Executive Committee to include a member from each research group in CUDOS. As of 2007, the Committee will meet bi-monthly by telephone with all Chief Investigators able to dial in. Every second meeting (three times per year) Project Managers will provide progress reports to the Research Director that will be discussed and reviewed at the Executive Meeting.



▲ **Reporting arrangements for Flagship projects.**

