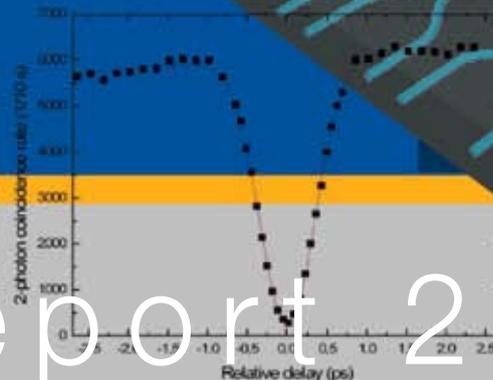
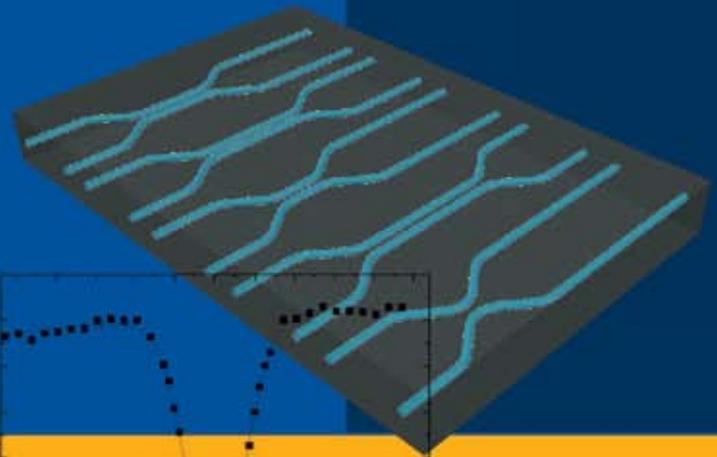
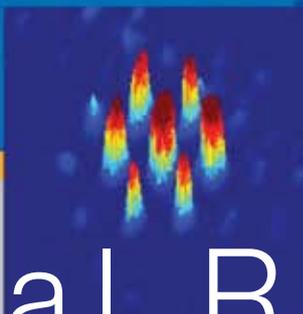
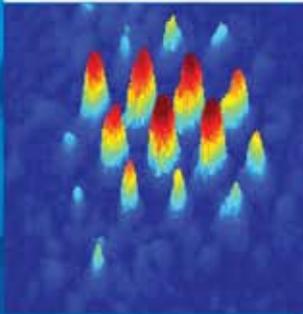
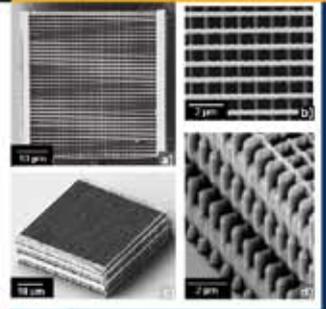
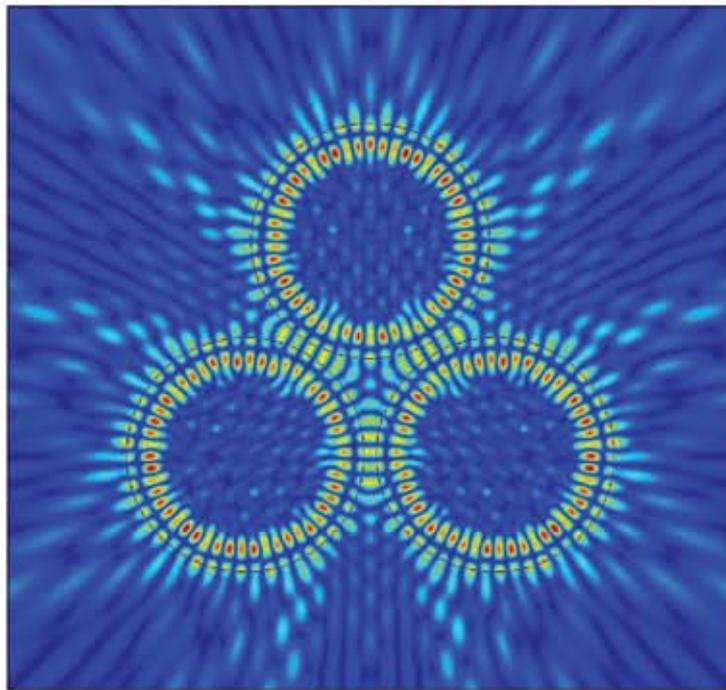
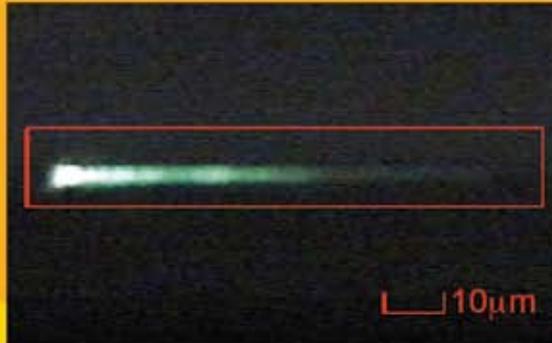


CUDOS

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



Annual Report 2008

Research Director: Benjamin J. Eggleton



CI short biography

Benjamin Eggleton is currently an ARC Federation Fellow and Professor of Physics at the University of Sydney. He is Research Director of the Centre for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS), an ARC Centre of Excellence. He studied at the University of Sydney, obtaining his BSc (Hons 1) in 1992 and his PhD in Physics in 1996. After graduation, he went to the United States to join the world's leading research institute in his field, Bell Laboratories, as a Postdoctoral Fellow in the Optical Physics Department. Soon after this, he became the Research Director of the Specialty Photonics Business Division of Bell Lab's parent company, Lucent Technologies where he drove Lucent's research program in optical fibre devices. He has co-authored more than 240 journal papers, presented more than 50 invited and plenary presentations at international conferences, and has filed 35 patents. He has received several significant awards. Most recently, in 2008 he received the NSW Science Prize for Physics. In 2007 he received the Pawsey Medal from the Australian Academy of Science and was awarded a Bright Sparks award from Cosmos Magazine, in 2004 he received the Prime Minister's Malcolm McIntosh Science Prize for Physical Scientist of the Year, in 2003 the ICO Prize (International Commission for Optics), and in 1998 was awarded the Adolph Lomb Medal from the Optical Society of America. Other achievements include the award of the Distinguished lecturer award from the IEEE/LEOS, a R&D100 award, and being made an OSA Fellow in 2003. He was an Associate Editor for IEEE Photonic Technology Letters from 2003-2007, and is current Chief Editor for Optics Communications. Professor Eggleton is currently the President of the Australian Optical Society.

Description of Expertise

Professor Eggleton is an experimental physicist with deep understanding of the fundamentals of photonics and optical propagation effects as well as a broad understanding of optical

communications, and other applications of photonics. His specific areas of interest are nonlinear optics and optical solitons, optical gratings and photonic crystals, optical communications, photonic crystal fibres, optofluidics, supercontinuum generation and integrated optics. He has specialized in the fabrication of optical gratings and microstructured optical devices, such as photonic crystals and holey fibres. He has experience with nonlinear pulse propagation effects and ultrafast propagation in different optical systems.

Contributions to Centre

As the CUDOS Research Director, Professor Eggleton is responsible for setting the vision and focus for the research program and establishing and directing the research collaborations. He oversees the six current CUDOS Flagship research projects and drives strong interactions with CUDOS Partner investigators and end-users. He also heads the University of Sydney CUDOS node and leads the Sydney experimental programs, in close collaboration with Professors de Sterke, and McPhedran, which will be reported here. He is the Science Leader for the Nonlinear Optical Signal Processing project, providing the scientific and technical guidance for this highly collaborative projects that span across four Universities and international collaborators. He actively collaborates with and supervises staff and students in the Optical Switching Project, Slow Light Project and Tunable Microphotonics project.

International links and roles

During 2008 Professor Eggleton served on several international review committees, including the Advisory committee for the New Zealand Dodds-Walls Quantum Photonics Centre. He also served on numerous Phd thesis committees. Professor Eggleton served as the General Chair for the OECC Conference held in Sydney in July, which was attended by over 400 people. He serves as the current President of the Australian Optical Society.

During 2008 Professor Eggleton visited and presented seminars at a series of international Laboratories including the: University of California, San Diego, hosted by Prof Stojan Radic; University of Stuttgart, hosted by Prof Harald Giessen; University of Karlsruhe, hosted by Professor Juerg Leuthold; University of Konstanz, hosted by Prof. Alfred Leitenstorfer; Danish Technical University, hosted by Dr Lief Oxenlowe; Bell Laboratories, hosted by Dr Dan Kilper; OFS Laboratories, hosted by Dr Misha Sumetski; St Andrews University, hosted by Professor Thomas Krauss; University of California, Los Angeles, hosted by Prof Bahram Jalali; and the University of Auckland, hosted by Prof John Harvey.

Eggleton's research interests are well aligned with the CUDOS Flagship projects and are well described in these sections of the Annual Report. Highlights in 2008 included demonstrations of all-optical signal processing functions at ultrahigh bit-rate, including OTDM optical switching from 640Gb/s to 10Gb/s and the recent demonstration of a photonic chip based RF spectrum analyzer with terahertz bandwidth (appeared in the February issue of Nature Photonics).

Eggleton presented numerous invited papers and plenary presentations at international conferences, including: a plenary presentation at Photonics India in Delhi, and invited presentations at the International workshop on Advances in Nanoscale Nonlinear Optics", in Rome, the SPIE Photonics annual meeting in San Diego, the International Conference on Optics, Optoelectronics, and Photonic Materials and Applications (ICOOPMA), in Edmonton, Canada, the LEOS Summer Topical Meeting, in Acapulco, Mexico, and at SPIE Photonics West in San Jose.