Tutorial Speaker	
Full Name	Benjamin Eggleton
Affiliation	University of Sydney
Presentation Title	Compact Brillouin devices through hybrid integration on silicon

Biography

Professor Benjamin Eggleton is a Professor of Physics at the University of Sydney, Director of the Institute of Photonics and Optical Science (IPOS) and co-Director of the NSW Smart Sensing Network (NSSN). He was previously an ARC Laureate Fellow and an ARC Federation Fellow twice and was Director of the ARC Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS) from 2003-2017. He obtained the Bachelor's degree (with honors) in Science in 1992 and Ph.D. degree in Physics from the University of Sydney in 1996.In 1996, he joined Bell Laboratories, Lucent Technologies as a Postdoctoral Member of Staff in the Optical Physics Department under the supervision of Dr Richard Slusher. In 1998 he transferred to the Optical Fiber Research Department as a Member of Technical Staff and was promoted to Research Director within the Specialty Fiber Business Division of Bell Laboratories, where he was engaged in forward-looking research supporting Lucent Technologies business in optical fiber devices. Eggleton is the author or coauthor of more than 460 journal publications, including Nature Photonics, Nature Physics, Nature Communications, Physical Review Letters and Optica and over 200 invited presentations. His journal papers have been cited 18,000 times according to web of science with an h-number of 64 (82in google scholar).Eggleton is a Fellow of the Australian Academy of Science (AA), the Australian Academy of Technology and Engineering (ATSE), the Optical Society of America and IEEE.

200 words abstract

One of the surprises of nonlinear optics – the field of optics with high intensity lasers – is that light may interact strongly with sound, the most mundane of mechanical vibrations. Intense laser light literally “shakes” the glass in optical fibres, exciting acoustic waves (sound) in the fibre. Under the right conditions, it leads to a positive feedback loop between light and sound termed “Stimulated Brillouin Scattering,” or simply SBS. This nonlinear interaction can amplify or filter light waves with extreme precision in frequency which makes it uniquely suited to solve key problems in the fields of microwave and optical communications amongst others. We recently achieved the first demonstration of SBS in compact chip-scale structures, carefully designed so that the optical fields and the acoustic fields are simultaneously confined and guided. This new platform has opened a range of new chip-based functionalities that are being applied in digital and analogue communications with record performance and compactness. My talk will introduce this new field, review progress and achievements and recent highlights that point towards a new class of silicon based optical phononic processor that is compatible with semiconductor CMOS foundries.