

Quantum Nonlinear Optics: Nonlinear Optics Meets the Quantum World

A Seminar of the IEEE WA joint EDS/SSCS/IPS Chapter

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**Venue: Billings Room 3.04, 3rd floor. Electrical & Electronic Engineering Building
University of Western Australia, Crawley**

This seminar is open to the public and admission is free to all IEEE members and non-members

Abstract:

This presentation first reviews the historical development of the field of nonlinear optics, starting from its inception in 1961. It then reviews some of its more recent developments, including especially how nonlinear optics has become a crucial tool for the developing field of quantum technologies. Fundamental quantum processes enabled by nonlinear optics, such as the creation of squeezed and entangled light states, are reviewed. We then illustrate these concepts by means of specific applications, such as the development of secure communication systems based on the quantum states of light.

Biography:

Robert W. Boyd was born in Buffalo, New York. He received the B.S. degree in physics from MIT and the Ph.D. degree in physics from the University of California at Berkeley. His Ph.D. thesis was supervised by Charles Townes and involves the use of nonlinear optical techniques in infrared detection for astronomy. Professor Boyd joined the faculty of the University of Rochester in 1977, and in 2001 became the M Parker Givens Professor of Optics and Professor of Physics. In 2010 he became Professor of Physics and Canada Excellence Research Chair in Quantum Nonlinear Optics at the University of Ottawa. His research interests include studies of “slow” and “fast” light propagation, quantum imaging techniques, nonlinear optical interactions, studies of the nonlinear optical properties of materials, and the development of photonic devices including photonic biosensors. He is the 2016 recipient of the Arthur L. Schawlow Prize in Laser Science of the APS, the 2014 recipient of the Quantum Electronics Award of IEEE Photonics Society, the 2010 recipient of a Humboldt Research Award, and the 2009 recipient of the Willis E. Lamb Award for Laser Science and Quantum Optics. Prof. Boyd is a fellow of the APS, OSA and SPIE. He is a past chair of the Division of Laser Science of APS and has been a member of the Board of Directors of OSA. Prof. Boyd has served as a member of the Board of Editors of Physical Review Letters and of the Board of Reviewing Editors of Science Magazine.

