

Photonic Phenomena in ZnO Nanostructures

Speaker: **Professor R.P.H. Chang**
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Venue: Blk EA, #02-11 (Seminar Executive Room), Faculty of Engineering
Date: 19 December 2005 (Monday)
Time: 11.30am – 12.30pm



Abstract:

ZnO has been shown to be an attractive wide band gap ($E_g=3.37\text{eV}$) semiconductor material for optoelectronic device applications. It has a high exciton binding energy of 60meV, which is significantly larger than other materials currently used for light emitting devices. In this talk we discuss how we have used ZnO nanostructures to study unique photonic phenomena and their potential applications in future integrated nanophotonic circuits. We present results on our study of the growth mechanisms for ZnO nanostructure using a variety of different processing techniques, ranging from laser ablation and atomic layer epitaxy to solution methods. We will report on the optical properties as well as unique photonic phenomena such as 'random lasing' in these ZnO nanostructures.

Biography of Prof RPH Chang:

Professional Preparation

Massachusetts Institute of Technology
Princeton University

Physics
Astrophysics

S.B. 1965
Ph.D. 1971

Appointments

2004-present	Director, National Center for Learning and Teaching in Nanoscale Sci. and Eng.
1997-present	Director, Materials Research Institute, Northwestern University
1986-present	Professor of Materials Science & Engineering and Electrical Engineering/ Computer Science, Northwestern University
1990 - 2003	Director, Materials Research Center, Northwestern University
1971 - 1986	Member of Technical Staff, AT&T Bell Laboratories

Honors

- National Science Foundation Director's Award, "Distinguished Teaching Scholar",
- Siu Lien Ling Wong Fellow, The Chinese University of Hong Kong, 1999/2000
- Fellow of the American Vacuum Society
- Recipient of 1988 MRS Woody Award
- Former President of the MRS (1989)
- Founding President and General Secretary of the IUMRS (1991-present)

Synergistic Activities

Organization of NSF International Workshops: The Materials World Network: the Next Ten Years (2005); Global Nanotechnology Network (2005); US-Mideast Workshop (2005); Pan-American Advanced Studies Institute on Materials for Energy Conversion and Environmental Protection (2003); Nanotechnology Networking and International Collaboration (2003); International Collaboration and Networking (2001); South Africa-NSF Materials Workshop (2000); Frontiers in Materials Research, Technology and Education: A Workshop to Advance Pan-American Collaboration (1998); US-Asian Pacific Materials Research, Technology, and Education for the 21st Century in Service of Society (1998); Workshop on Materials for Future Technologies (1996); Trilateral Materials Workshop (1995). Principal Editor, *Journal of Materials Research*, 1994-2002; Advisory Board Member of *Materials Chemistry and Physics Journal*, 1994- present

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