

CAPS COLLOQUIUM

Distinguished scientists in all disciplines are invited to lecture on topics of general interest. Objectives include the cross-fertilization of research initiatives at various institutions and the identification of possible uses of the Advanced Photon Source.

When: First Wednesday of each month at 3:00 p.m.

Where: Building 402, APS Auditorium

Refreshments served at 2:45 p.m.

Thursday, July 10, 2003

Keith A. Nugent

ARC Federation Fellow, School of Physics, University of Melbourne, Australia

"A New Phase in X-ray Imaging"

Professor Nugent is a world-recognized authority on the subject of Phase in x-ray, neutron, electron, atom, and optical physics, and its role in fundamental phenomena, quantum mechanics, coherence, imaging, and information science. His recent work has led to development of practical noninterferometric techniques that give quantitative phase measurements of quantum-mechanical wave fields with coherence requirements considerably reduced over those for interferometry. Professor Nugent has published and spoken extensively on this and related subjects, developed a powerful and practical new phase retrieval algorithm based on the Transport of Intensity Equation, and founded a company to develop commercial applications of it in x-ray, electron, and optical phase microscopy.

Professor Nugent currently holds the prestigious title of Australian Research Council Federation Fellow, mentors graduate students, and leads a research team based in Melbourne. He was Chair of the Department of Physics of the University of Melbourne for several years and professor of physics at Melbourne for many years prior. He has traveled and presented extensively at international conferences and colloquia in the US and abroad, conducted groundbreaking synchrotron experiments at APS, NSLS, ESRF, Photon Factory and elsewhere, and consulted on various projects such as x-ray laser experiments at Rutherford Appleton Laboratory (UK) and Lawrence Livermore National Laboratory.

Abstract:

"The high coherence of third-generation x-ray sources has allowed x-ray Phase to become an important source of image contrast. The ideas and mechanisms underlying the role of phase in x-ray imaging are reviewed. The talk will explore the role of phase as a central part of coherent x-ray optics - a relatively new and increasingly important field of research."

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