ARC Centres of Excellence Program

ARC Centre of Excellence for Advanced Silicon Photovoltaics and Photonics

Interim Director: **Professor S R Wenham**

Collaborating Institutions: The University of New South Wales
Max-Planck-Institut fur Mikrostrukturphysik
FOM Institute for Atomic and Molecular Physics
Pacific Solar Pty Ltd

Photovoltaics is the science and technology of converting light (generally sunlight) to electricity. Many studies have identified photovoltaics as the most promising of presently known energy conversion options for a globally sustainable energy future. Australia has been a large player in photovoltaics as a manufacturer, end-user, and source of new technology and, with appropriate nurturing, it is not impossible that Australia could reach a world-dominant commercial position in photovoltaics comparable to Denmark's 50% presence in the world wind generator market.

The Centre will undertake a large-scale, coordinated and cross-fertilizing program including top overseas researchers to capitalise on Australia's position in photovoltaic research. Projects will aim at improving 'first generation' technologies by developing low-cost buried contacts, 'second generation' technologies through the use of laser-induced doping interconnects that reduce cost and complexity, and 'third generation' technologies through the experimental investigation of novel materials and structures. Another exciting and innovative research strand will explore high-efficiency silicon light emitters and microelectronic light modulators, exploiting the deep understanding of silicon's photonic properties that has been built up by the Centre's researchers.

The Centre will also play a central role in training researchers, technologists and entrepreneurs for the booming photovoltaics industry, through higher degree programs and new undergraduate programs in photovoltaics and solar energy. The Centre will develop a range of exciting educational materials for school teachers and students, work with industry associations to provide training resources for solar energy system installers and maintainers, and contribute to discussions about Australia's and the world's sustainable energy future.

This new Centre of Excellence will incorporate two existing ARC research centres, the Special Research Centre for Third-Generation Photovoltaics and the Key Centre of Teaching and Research for Photovoltaics Engineering. Using the critical mass provided by this new funding and leveraging off these existing centres, the new Centre so formed will create a truly world-class facility with personnel who will place Australia at the forefront of a modern industry which will be critical to the advancement of society in the 21st century.