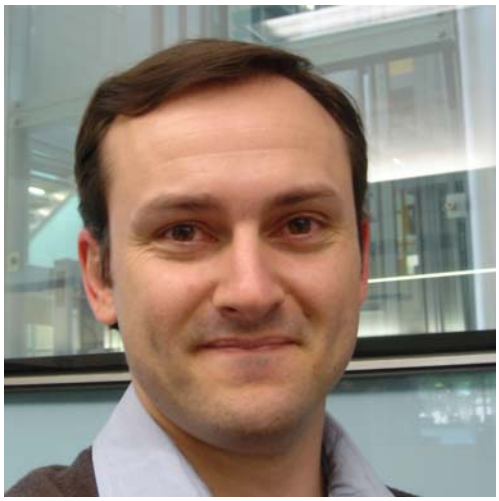
AINSE announces first two research fellows



The Australian Institute of Nuclear Science and Engineering (AINSE) announces its two research fellows. These are the first since 1993. AINSE took the decision to coincide with the commissioning of the neutron beam facilities at the OPAL research reactor at Lucas Heights. The fellows were selected from a strong field of applicants earlier this year which included people from all over the world.

Dr Darren Goossens is based in the Physics Department at ANU and is also attached to the Disordered Materials research group in the Research School of Chemistry at ANU. His primary research field, and work that is central to his AINSE fellowship, is the use of diffuse scattering – that is the weak, delocalised scattering that is not restricted to the Bragg peaks – as a means of studying short-range order in crystalline materials. Bragg diffraction can be used to study the *average* long-range ordered structure of a material, which can then be related to the physical properties; this process is very useful in developing new technological materials. However, often the short-range order is crucial in determining properties of a material, and this can be probed using diffuse scattering of neutrons and x-rays. Materials studied include ferroelectric oxide ceramics, ferroelectric organic molecular systems, and pharmaceuticals.

Dr Goossens has had a relatively long association with AINSE. He was one of their Postgraduate Research Award holders between 1996 and 1999 and his research during that time gained him recognition as an AINSE Gold Medallist. Since gaining his PhD he has held postdoctoral positions at ANU and at ANSTO.

The other research fellowship was won by Dr Daniel Riley who has been appointed at the University of Melbourne to the Faculty of Engineering (Mechanical) with an honorary position within the Bio21 Institute. His research will focus on the development of advanced materials using *in-situ* neutron diffraction to optimise atomic-scale processing. Central to this research are the high-intensity and high-resolution powder diffraction beamlines (Wombat and Echidna) presently being constructed by ANSTO at the OPAL Research Reactor. The use of these instruments will allow for the “real-time” characterisation of process kinetics; a process by which all stages of a materials synthesis might directly be observed. Using this information, industrial-scale development of advanced materials is significantly improved, while simultaneously resolving the fundamental science. The potential for discovery of previously unknown materials, combined with the specific tailoring of physical properties are the most significant attractions of this technique. Additional collaborations with the Institute of Materials Science & Engineering (IMES, ANSTO) and The University of Melbourne will aid the use of these materials in novel applications. More generally, Dr Riley has experience with neutron diffraction gained while researching at the Institut Laue-Langevin (ILL, France) and Rutherford Appleton Laboratory (ISIS, UK) in collaboration with Prof. Erich Kisi. This research was primarily funded through the Australian Research Council (ARC) during which time Dr Riley completed both an ARC-APA and ARC-APD Fellowship.