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Keywords: crystal structure prediction, organic polymorphism, computed crystal energies

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Crystallography at the new Australian research reactor OPAL

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The newly commissioned 20 MW research reactor OPAL in Australia houses a number of instruments dedicated to crystallography as well instruments for neutron spectroscopy. The initial suite of instruments includes two powder diffractometers and a quasi-Laue single crystal instrument and was selected to reflect the strengths and interests of Australian Scientists. OPAL is characterised by extensive use of state-of-the-art neutron guides that deliver higher fluxes to the instruments. In this presentation I will firstly describe the technical capabilities of these instruments as well that of the closely the allied Small Angle Scattering instrument. Next I shall introduce the scientific capabilities of these instruments demonstrating how the high flux available at the instruments can be utilised either for high-speed or high resolution crystallography.

Keywords: neutron diffraction, international science, diffraction neutrons X-rays electrons

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Current situation of the cold neutron research facility project at HANARO

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HANARO is the research reactor with 30 MW thermal power with 7 horizotal beam ports and has been operational since its first criticality in 1995. For last 10 years of its early phase, neutron beam instruments of high reolution powder diffractometer, four-circle diffractometer, small angle neutron spectrometer, neutron radiography facility, residual stress instrument, etc.. has been built sequentially around those beam ports using thermal beams. With rapidly increasing demand of cold neutron from continuously expanding users society of universities and industries, the project for the cold neutron research facility construction was launched in July 2003. The project consists of 4 parts; the liquid hydrogen cold moderator and its cooling system utility, the neutron guides, neutron spectrometers and the cold neutron laboratory building. There are 3 relocated neutron spectrometers with modification from the reactor hall and 3 newly developed spectrometers as day-1 instruments. In mid 2008, the cold neutron laboratory will be completed, and tight installation and commissioning schedule for all the four parts of the project is ahead from now to it expected project completion, April 2010. We report in this talk overall project status, schedule, instruments development strategy with users community, and long term prospects.

Keywords: cold neutron spurce, neutron instrumentation, neutron diffraction and scattering

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SNS and HFIR: Breaking new ground

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The Spallation Neutron Source (SNS) facility became operational in the Spring of 2006, and is now well on its way to become the world-leading facility for neutron scattering. Furthermore, the SNS and the HFIR reactor facility, newly outfitted with a brilliant cold source and guide hall, were brought together within a single Neutron Sciences Directorate at ORNL providing the opportunity to develop science and instrumentation programs which take advantage of the unique characteristics of each source. SNS and HFIR will both operate as scientific user facilities. Access to these facilities is being managed under an integrated proposal system which also includes the Center for Nanophase Materials Sciences (CNMS) and the electron microscopes in the Shared Research Equipment (SHARE) program. Presently SNS has three of the eventual 25 instruments operating in the User program and seven more will begin operations in 2008.
A project to upgrade the power of the SNS accelerator to 3MW is underway and government approval is being sought for construction of a long pulse (1ms) second target station. The future is bright for neutron scattering at Oak Ridge.

Keywords: SNS, HFIR, breaking new ground

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An advanced pulse neutron source and scientific challenges at J-PARC

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The J-PARC (Japan Proton Accelerator Research Complex) project, which aims at providing world best experimental facilities for condensed matter sciences, elementary particles and nuclear physics, and nuclear transmutation R&D, is now in progress toward its completion. For condensed matter science users, a MW pulsed neutron source will be realized with a number of advanced neutron instruments. The first operation for users is planned to start in December 2008. The MW neutron source with the mercury target system, the cryogenic hydrogen moderator system, and all other