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Australian Nuclear Science & Technology Organisation

Construction Progress and Neutron Instruments at OPAL, the new Australian Research Reactor

Andrew Studer

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The OPAL Reactor – A Brief Tourist Guide

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The OPAL Reactor – Guide Hall

OPAL in the media

smh.com.au Friday, June 3, 2005

Reflections on the heart of an atomic reaction

Descent into darkness ... workers lower the reflector vessel into the replacement research reactor at Lucas Heights. Photo: Steven Siewert

Richard Macey

Dozens of workers building Australia's new nuclear reactor burst into applause yesterday as the nation's biggest science ... took a big step towards ... Cameron, chief of operations at the Australian Nuclear Science and Technology Organisation, said.

It is the neutron reflector vessel, installed yesterday at Lucas Heights, that will be the real heart of the $330 million ... research reactor. 1.2 metres tall, will be filled with heavy water, a modified version of ordinary water.

The heavy water's molecules will serve as a sort of high-tech trap. Neutrons flying out of the radioactive core will strike the molecules and bounce back.

Some will be reflected back into the uranium fuel rods, ... chain reaction ... down shafts to be used for everything from analysing aircraft parts to developing new materials.

Dr Cameron said the reflector, installed yesterday at the bottom of a 13 metre deep silo-shaped "reactor pool" that will be flooded with ordinary water, will stay in place for at least 45 years.

"It will become radioactive," ... adding that only an ... rods designed to slow the nuclear reactions in the 10 kilograms of uranium ever failed, the reactor could be shut down by draining the heavy water from the reflector, a process that would take just 15 seconds.

Juan Pablo Ordóñez, the project director for INVAP, the reactor's Argentine builder, said the reflector had to be positioned to within a tenth of a millimetre of a predetermined spot.

(SMH 3 Jun 05)

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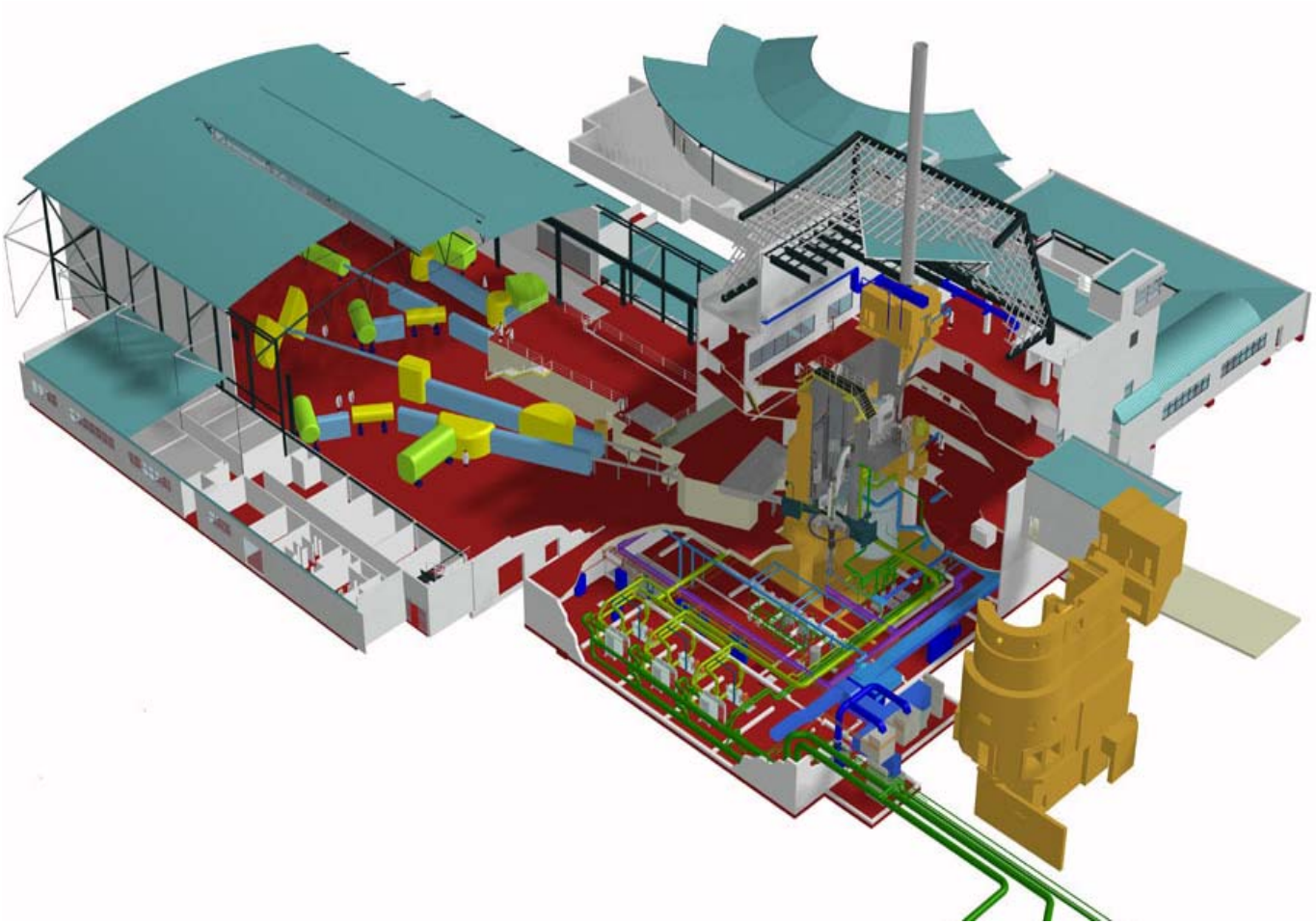
An OPAL Overview



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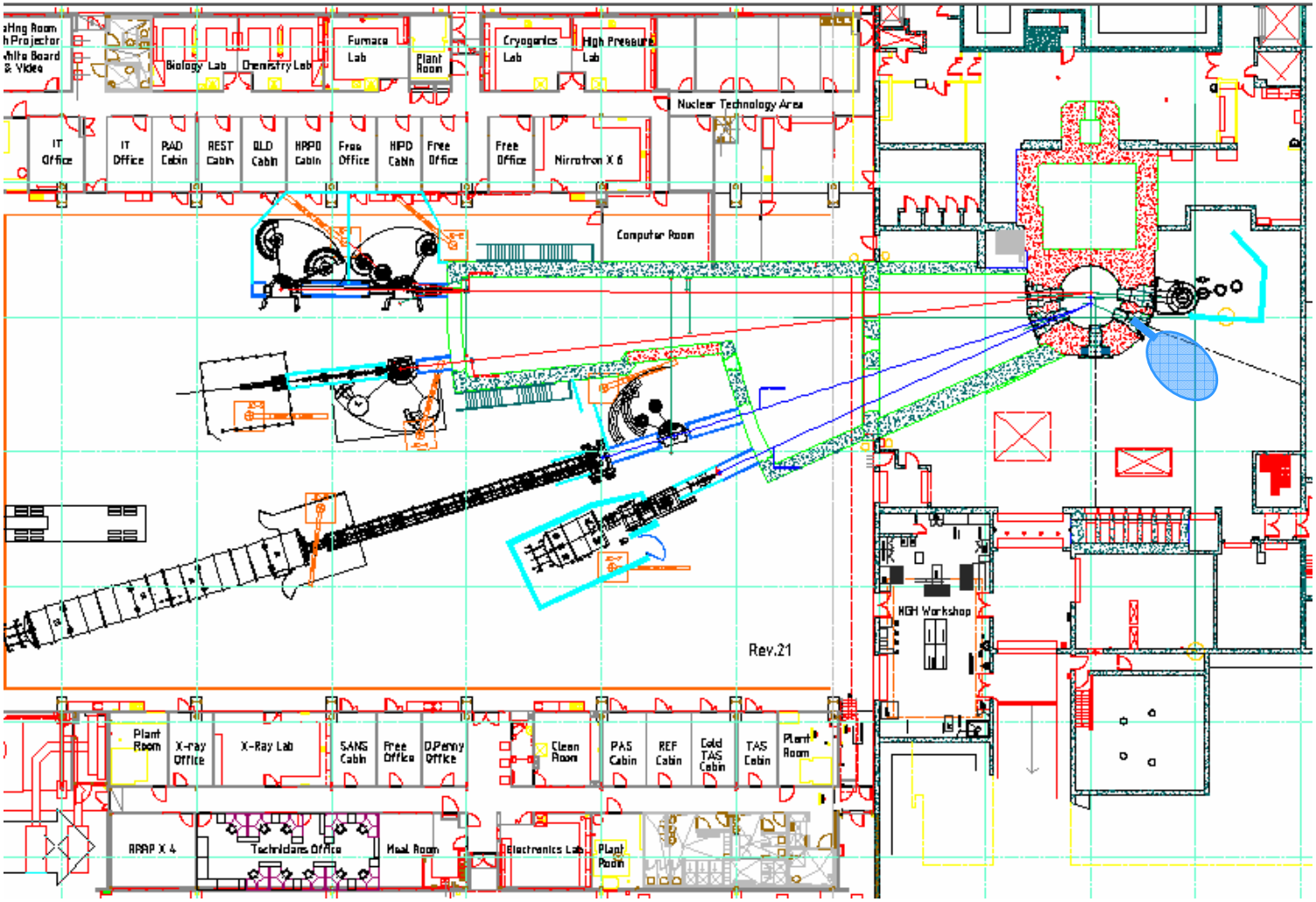
An OPAL Overview



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Current OPAL Status: Guide Hall

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(Not So) Current OPAL Status: Reactor Hall

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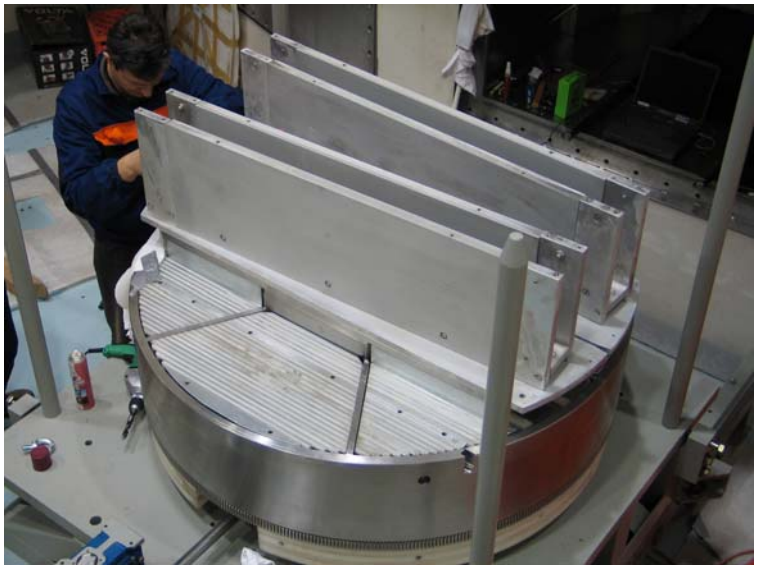
Current OPAL Status: Primary Shutter and Guide Installation



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Current OPAL Status: Primary Shutter and Guide Installation

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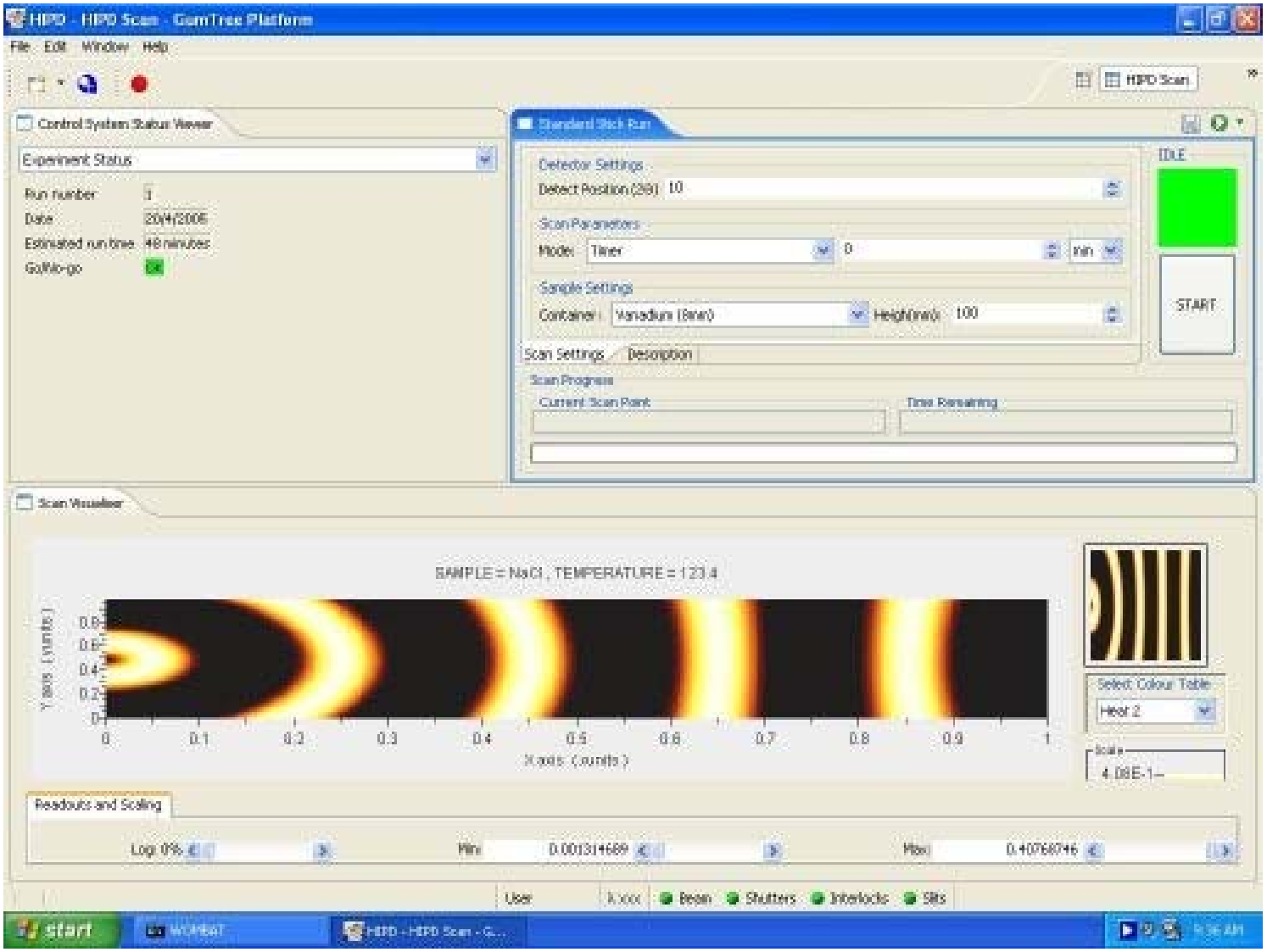
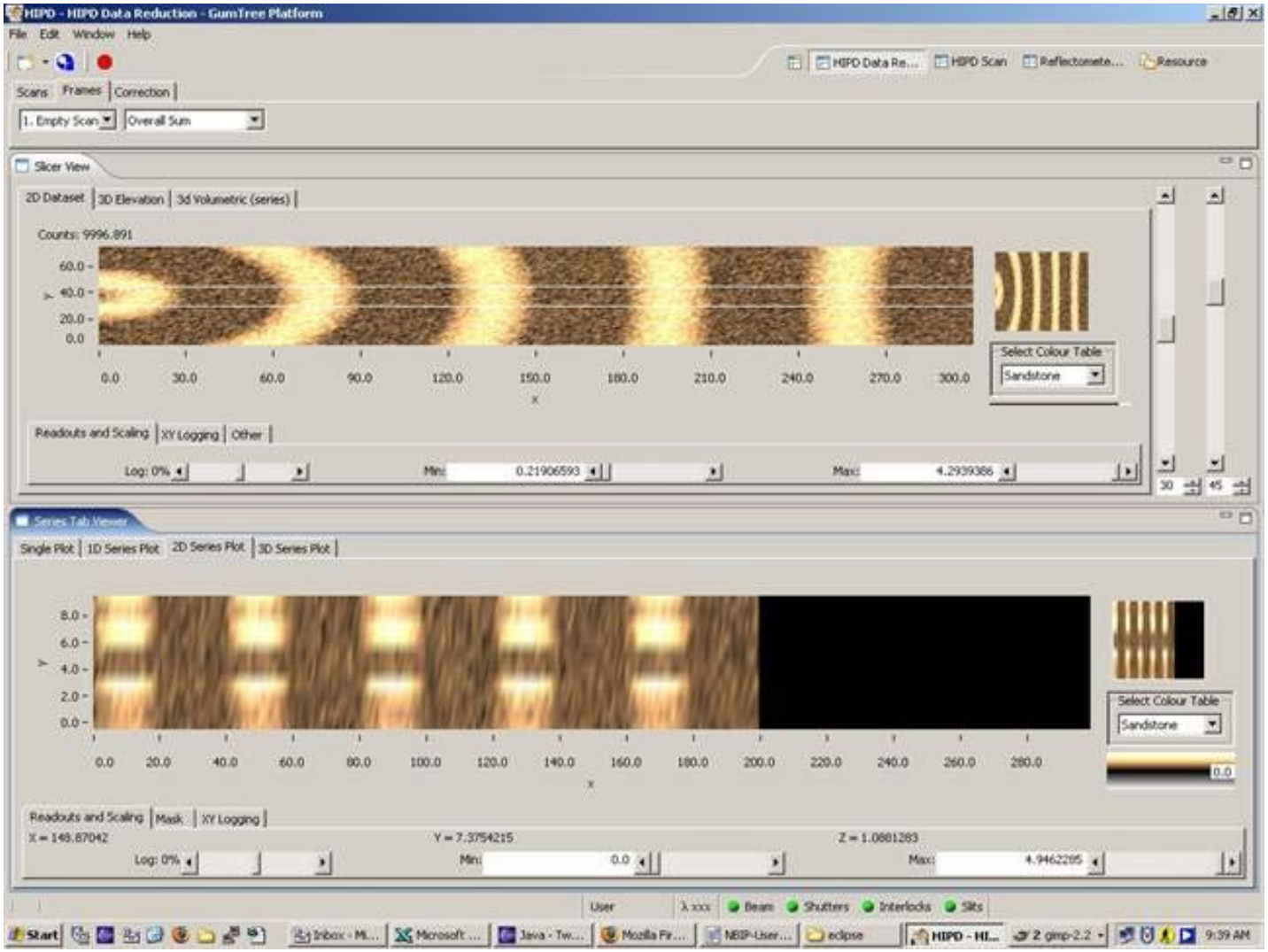
Instrument Standardisation

The Gumtree Project



The Gumtree Project



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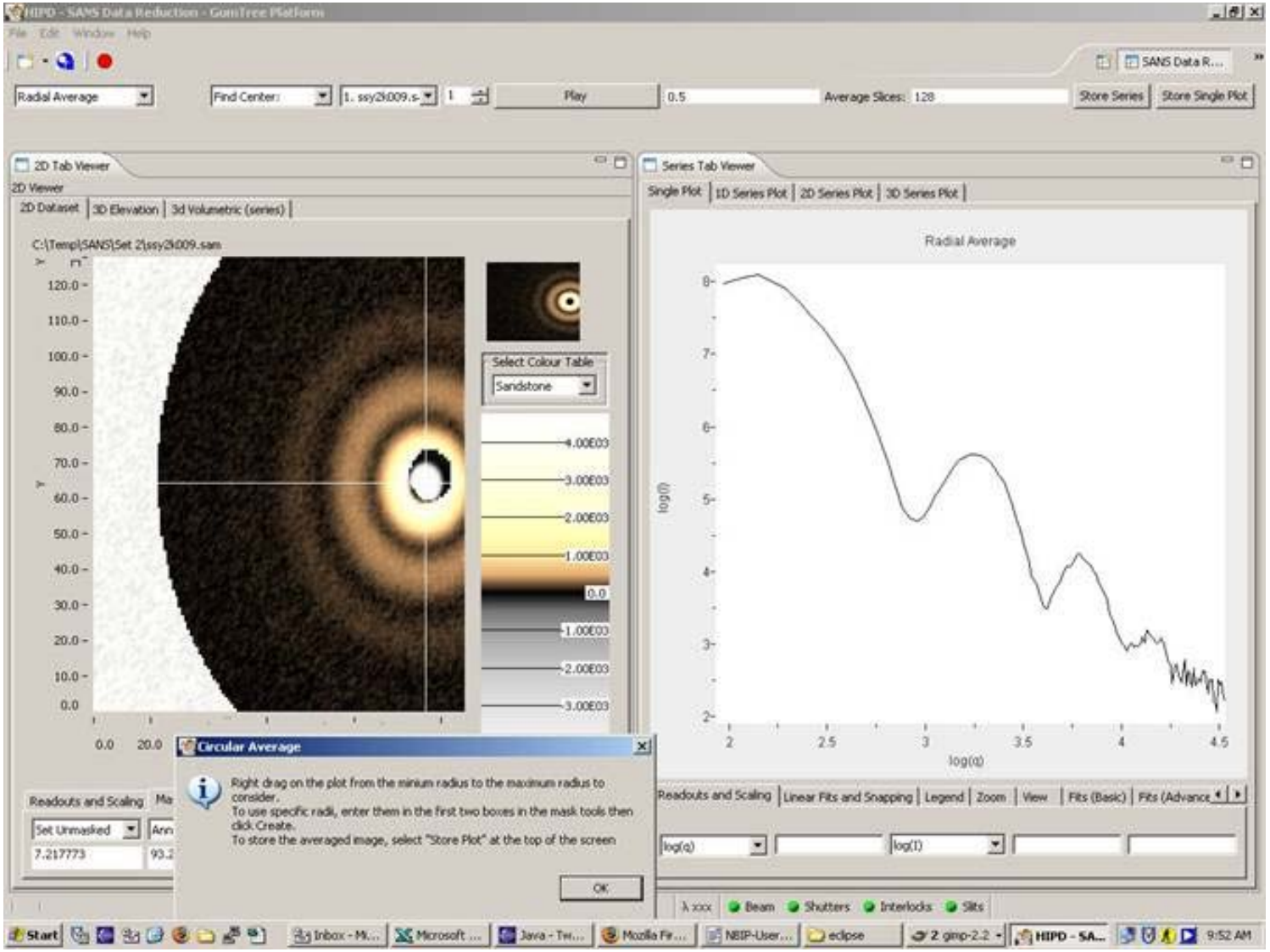
The Gumtree Project



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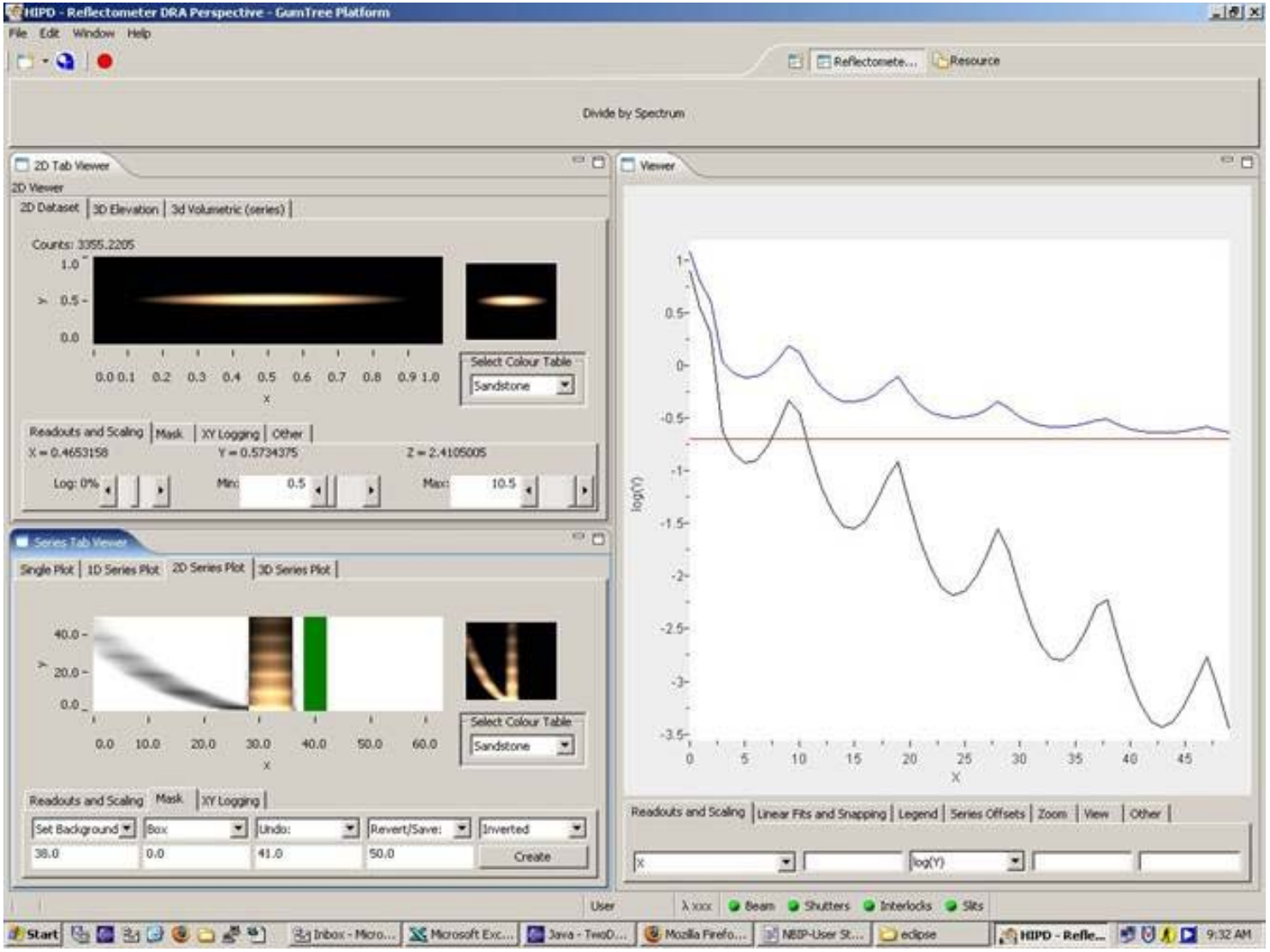
The Gumtree Project



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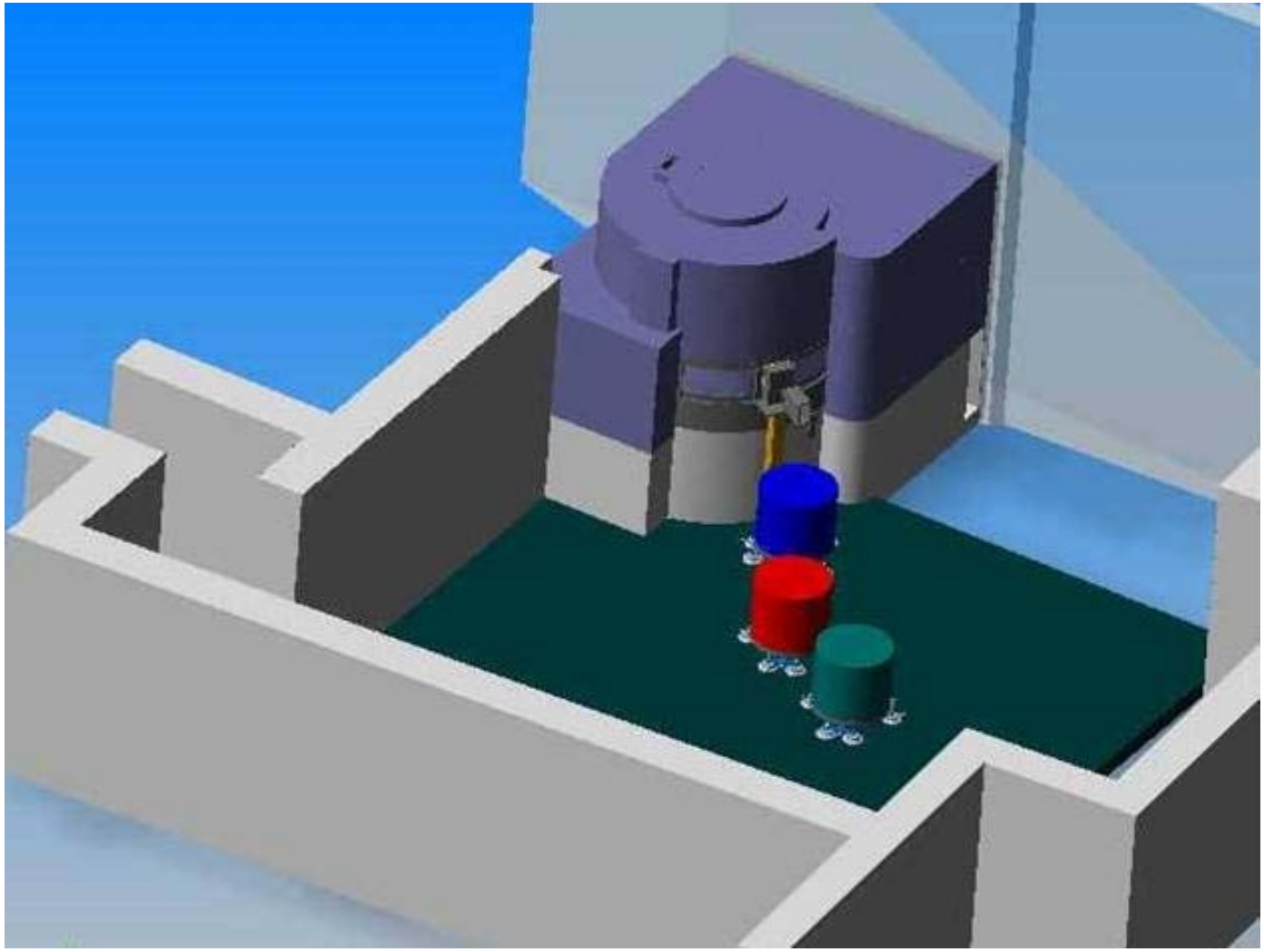
Taipan: The Triple Axis Spectrometer



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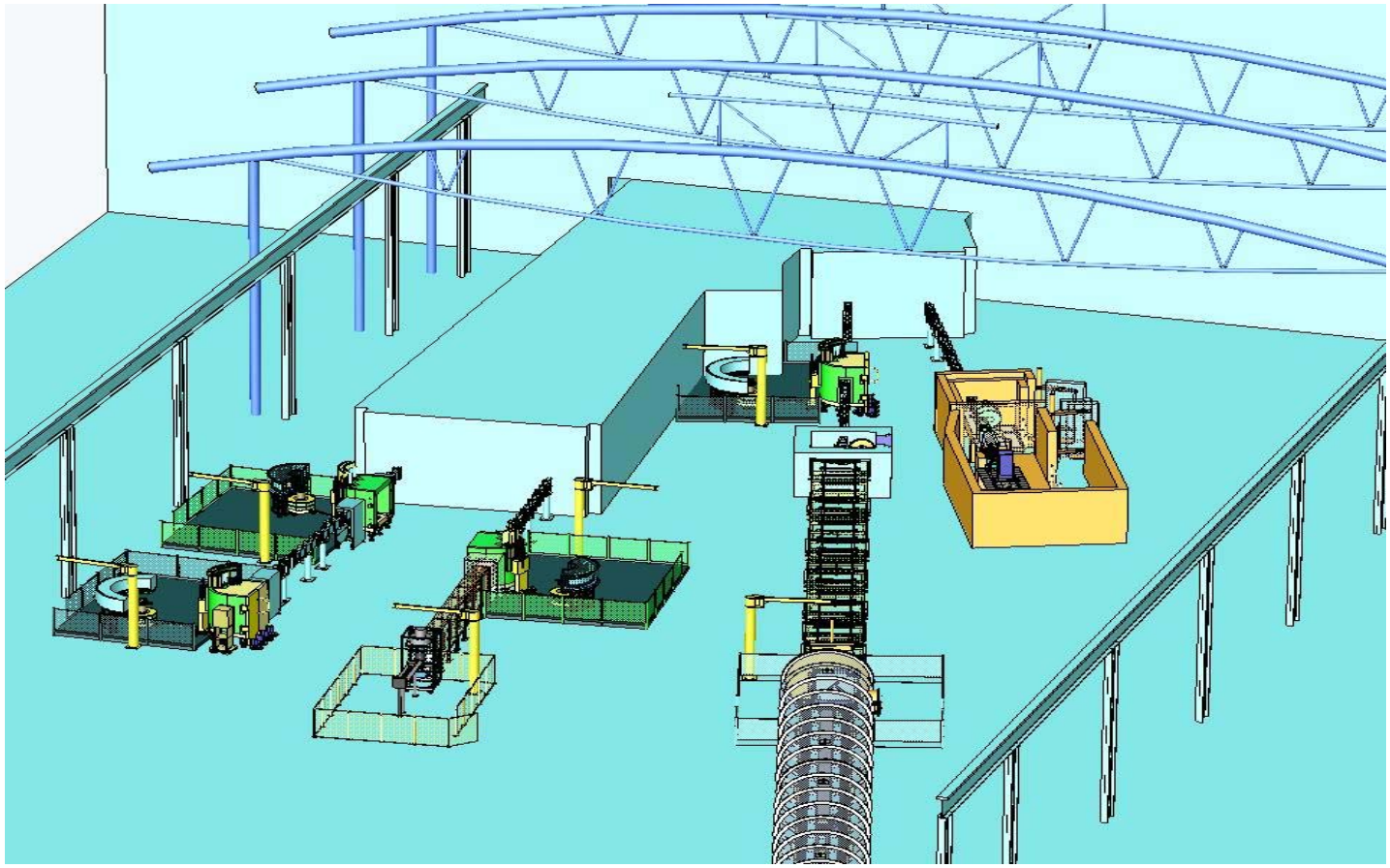
Guide Hall Instruments



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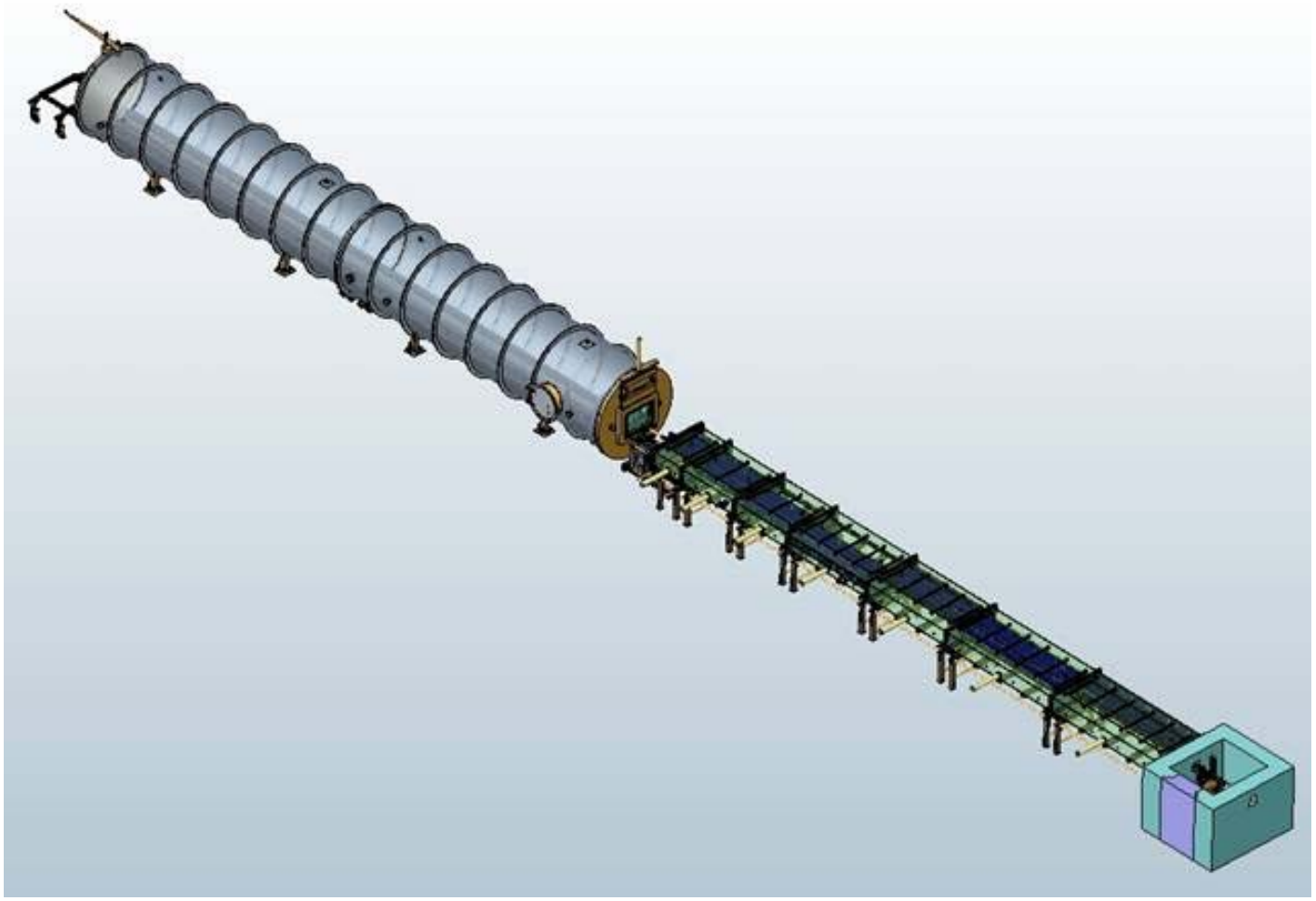
Quokka: Small Angle Neutron Scattering



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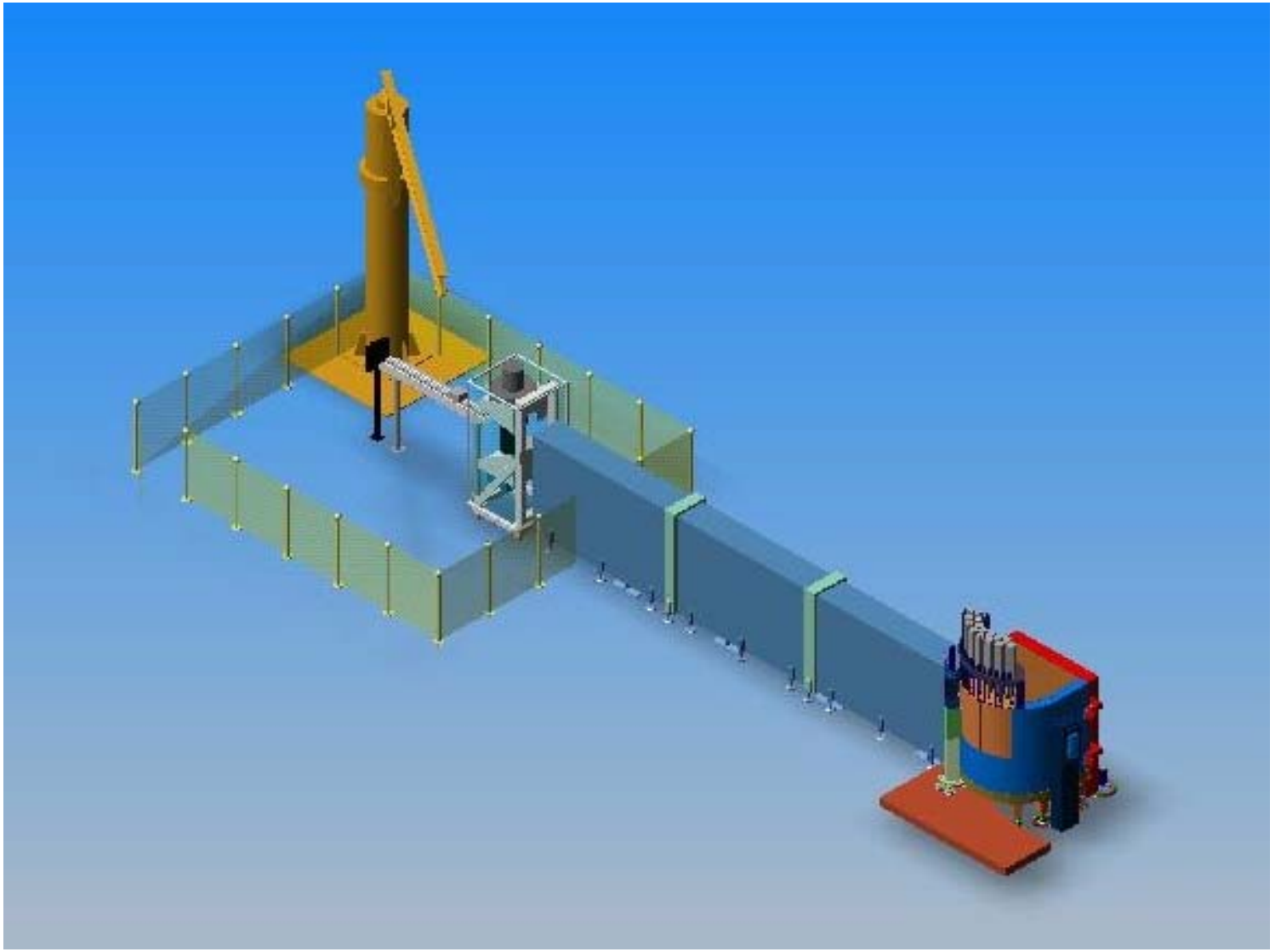
Koala: Single Crystal Quasi-Laue



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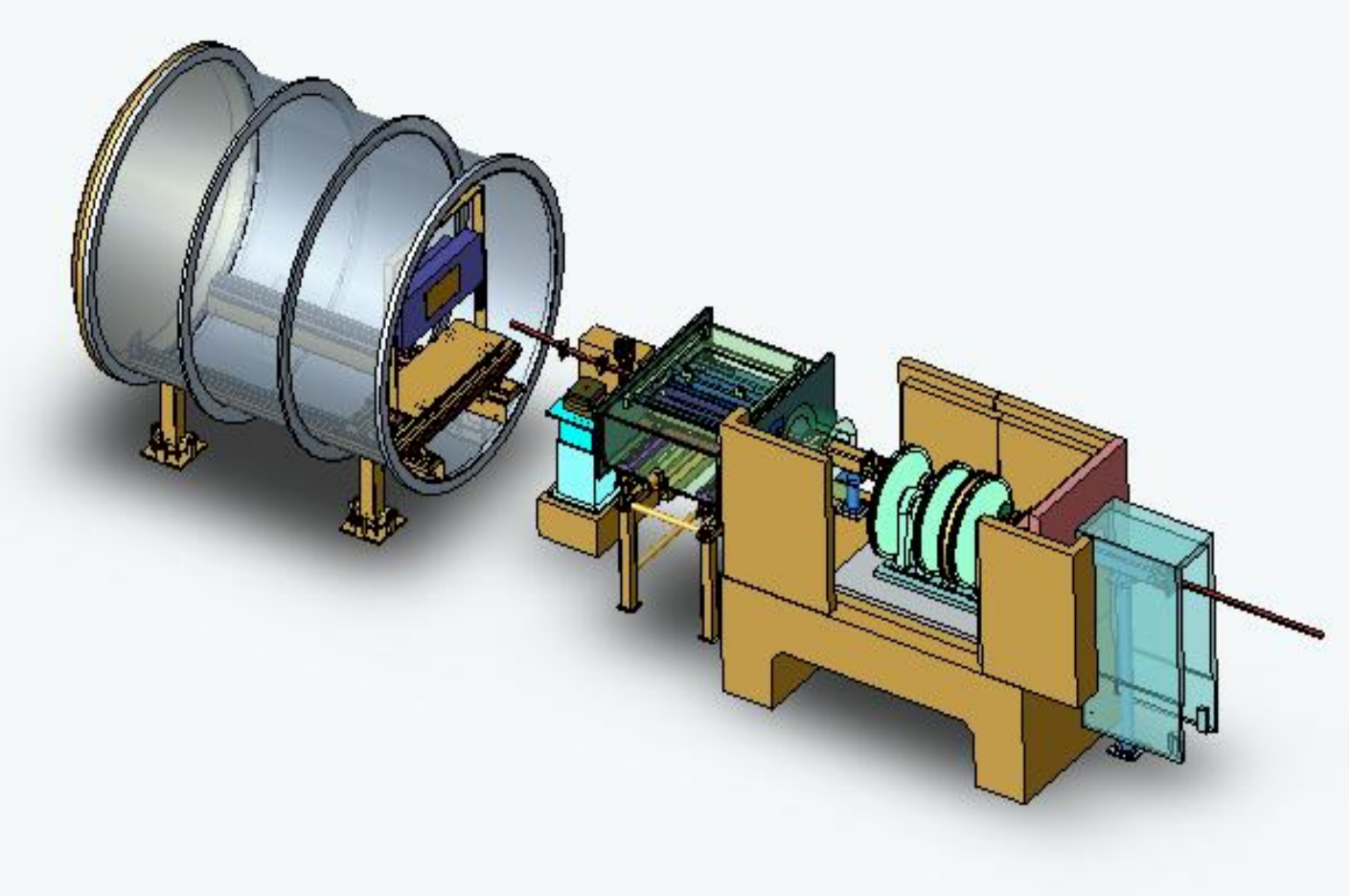
Platypus: Time of Flight Reflectometry



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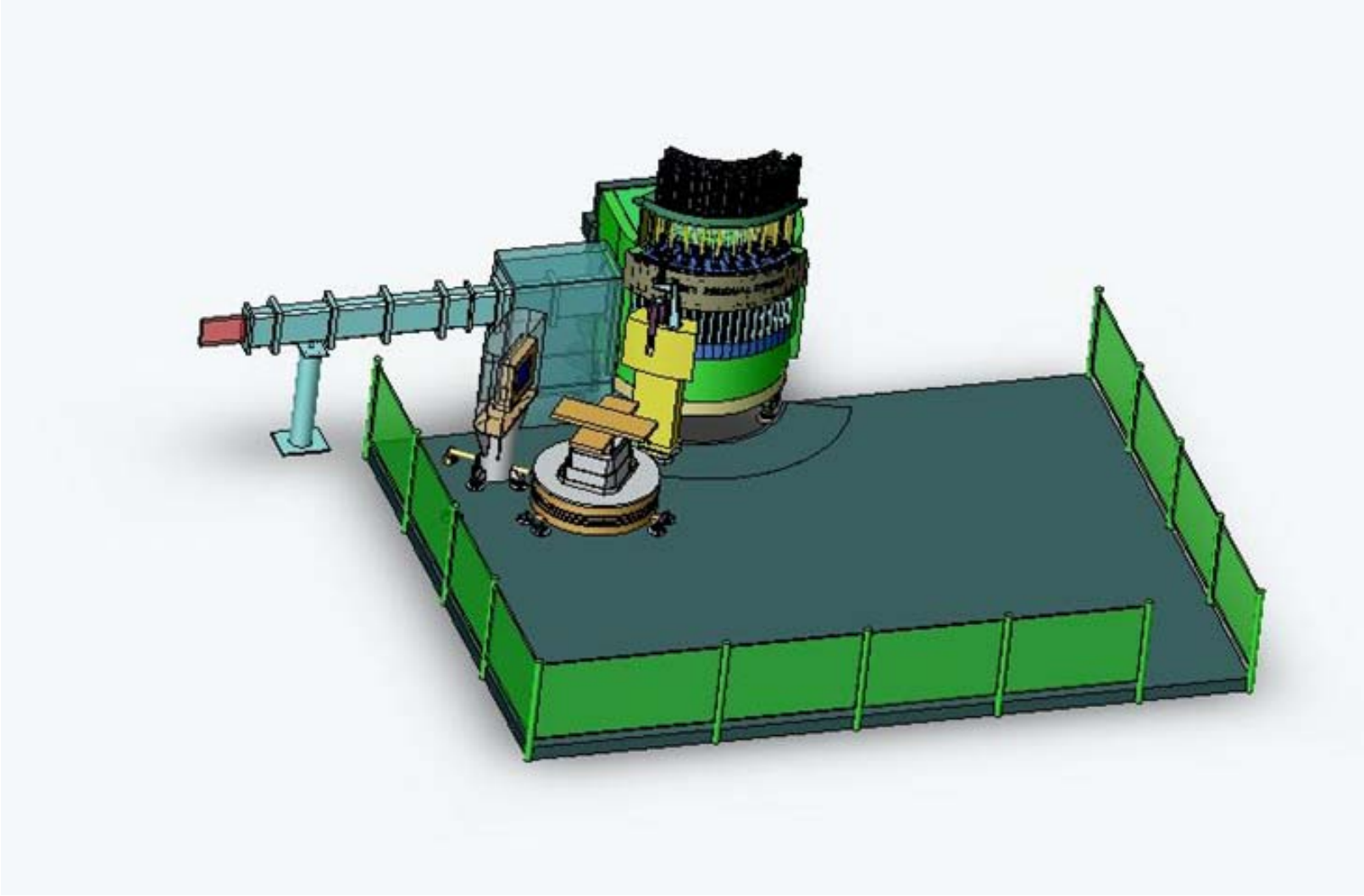
Kowari: Residual Stress



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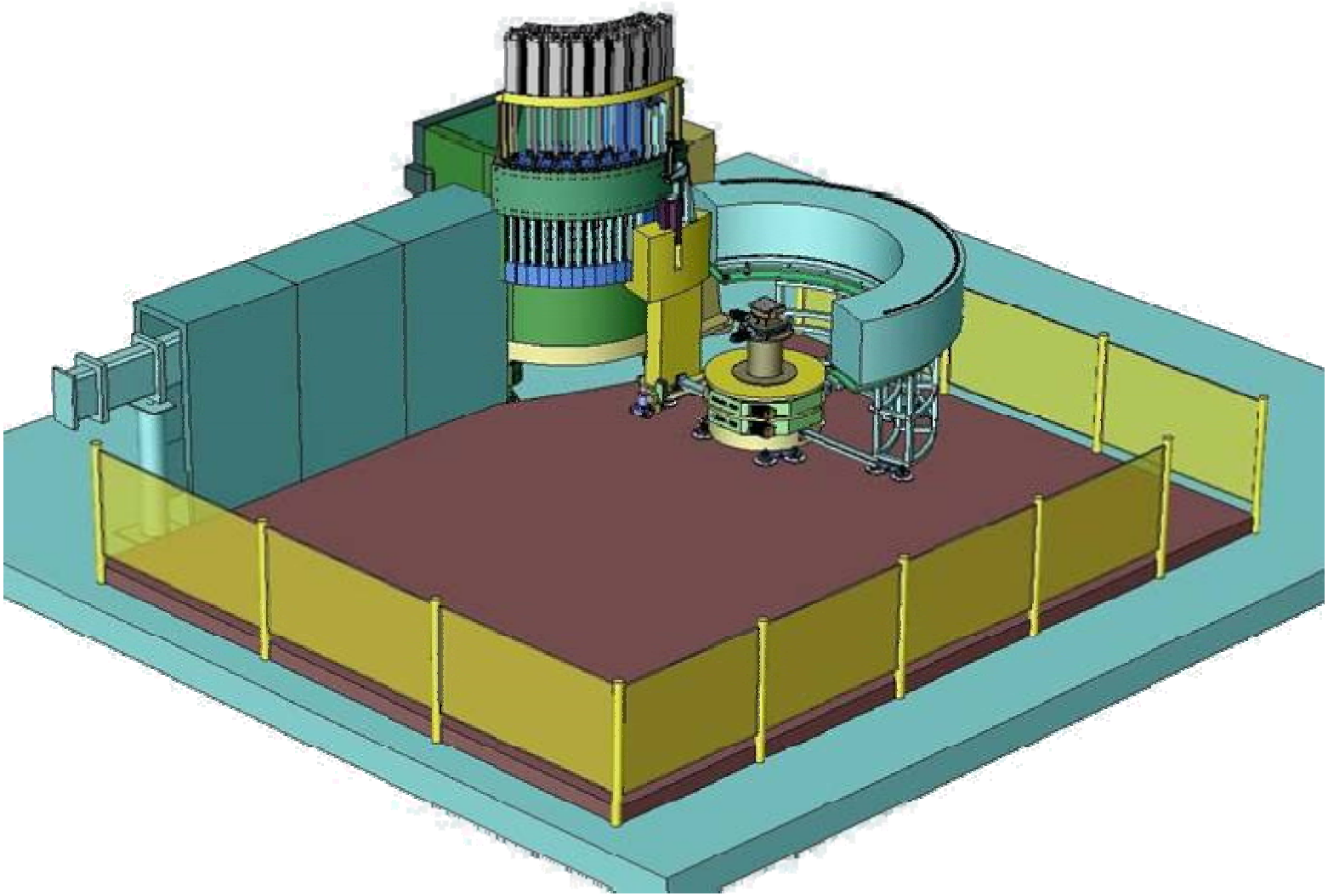
Echidna: High Resolution Powder Diffractometer



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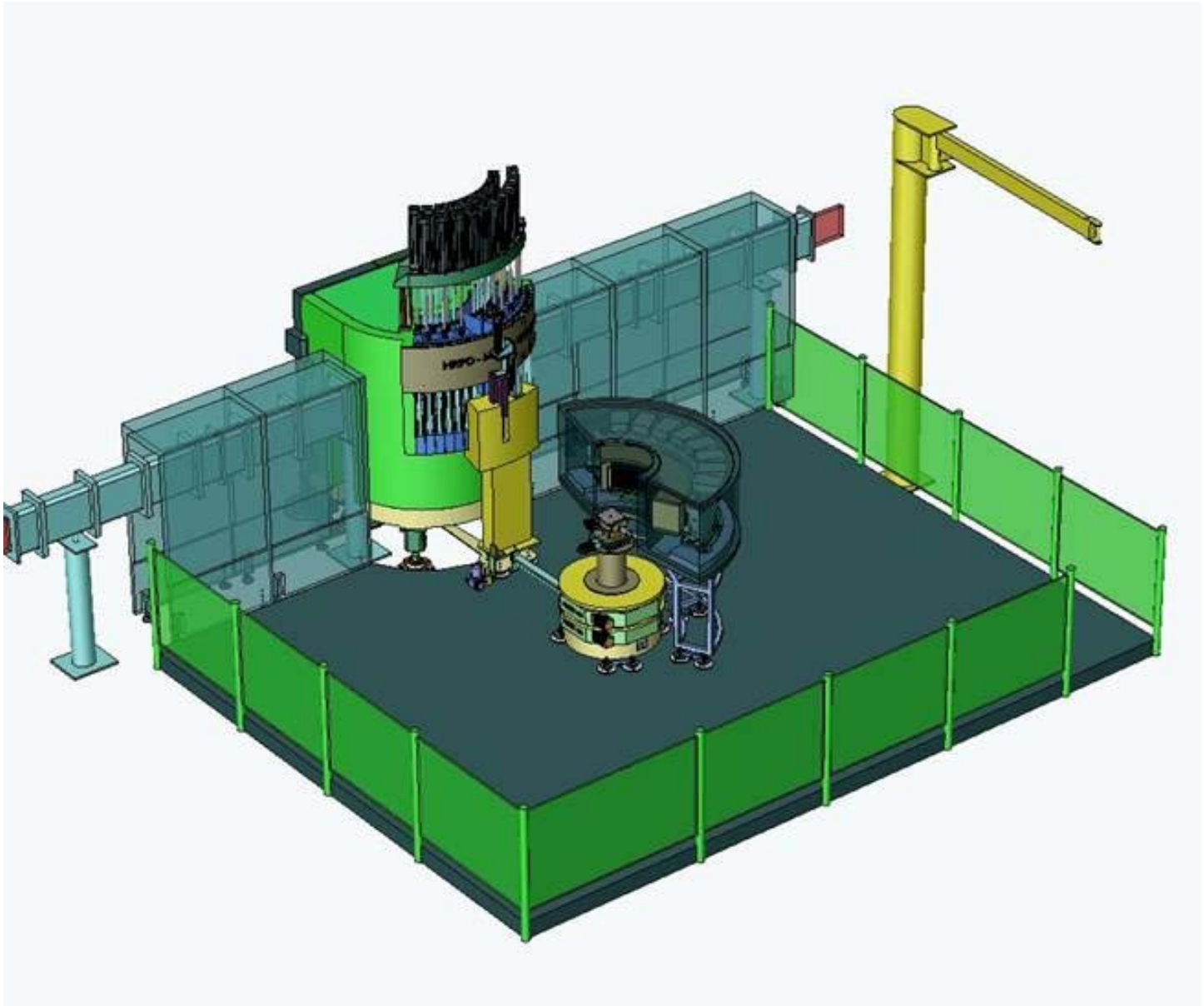
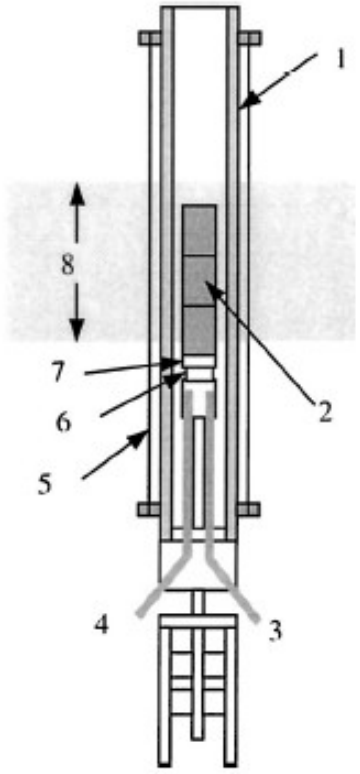
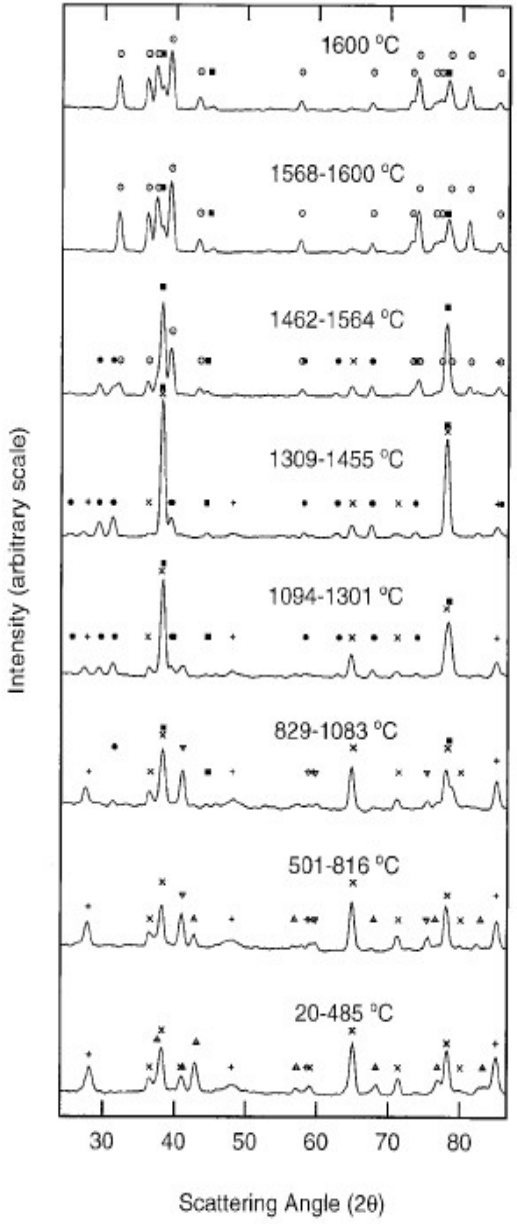
Wombat: High Intensity Powder Diffraction



Rapid Acquisition in One Shot Experiments: Where We Are Now

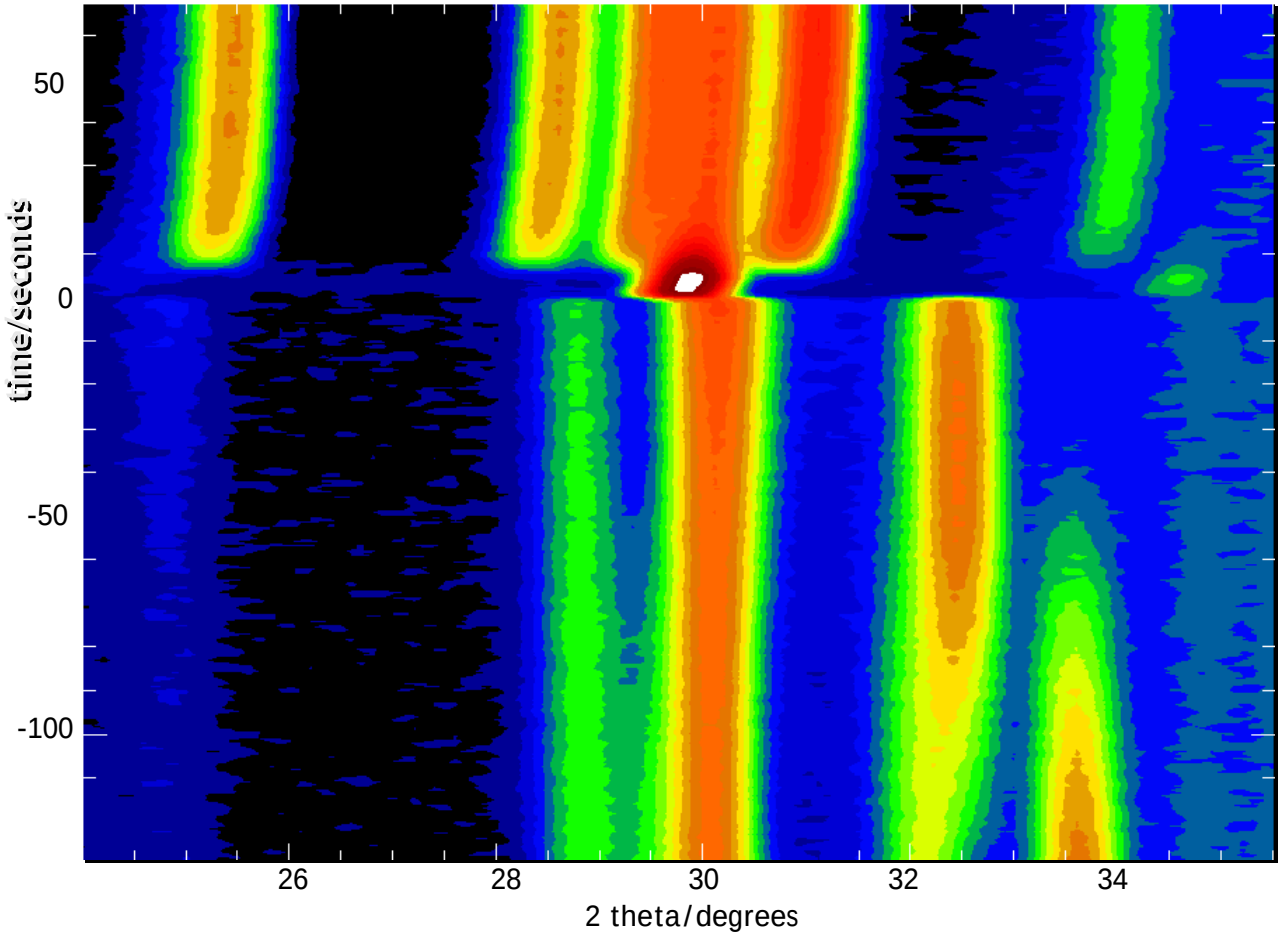




Results from MRPD

In situ Neutron Powder Diffraction Study of Ti_3SiC_2 Synthesis E. Wu, E.H. Kisi, S.J. Kennedy and A.J. Studer

Rapid Acquisition in One Shot Experiments: Where We Want To Be



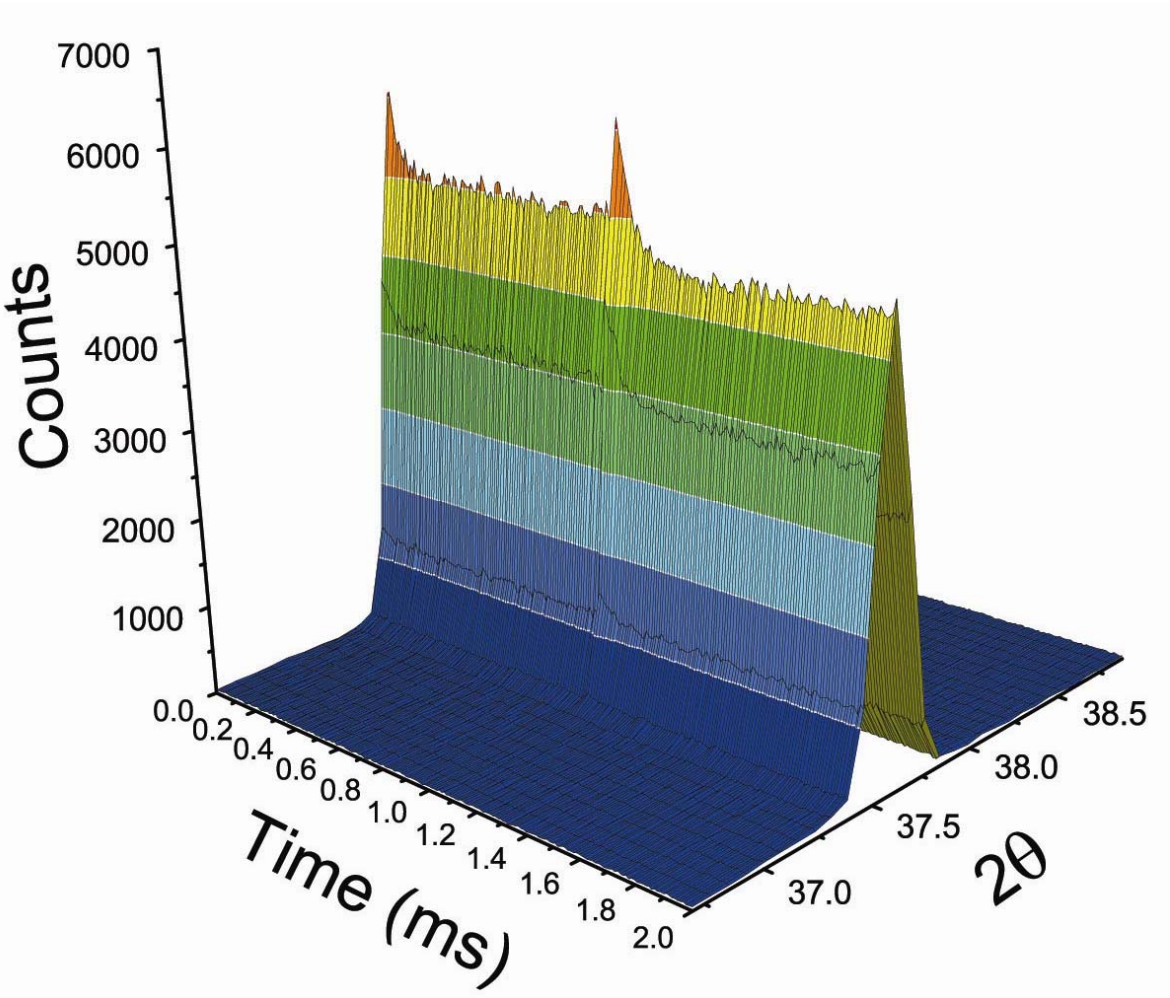
100K/min

~1s resolution

Results from D20 (courtesy Thomas Hansen)

D.P. Riley, E.H. Kisi, T.C. Hansen, A. Hewat, *J. Am. Ceramic Soc.* **85** (2002) 2417-2424.

Rapid Data Acquisition: Stroboscopic Experiments



(060) Bragg peak intensity of triglycine sulphate (TGS) during the application of a 500Hz 4.8kV/cm square wave

J. Daniels, M. Hagen, T. Finlayson and A.J. Studer

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Summary