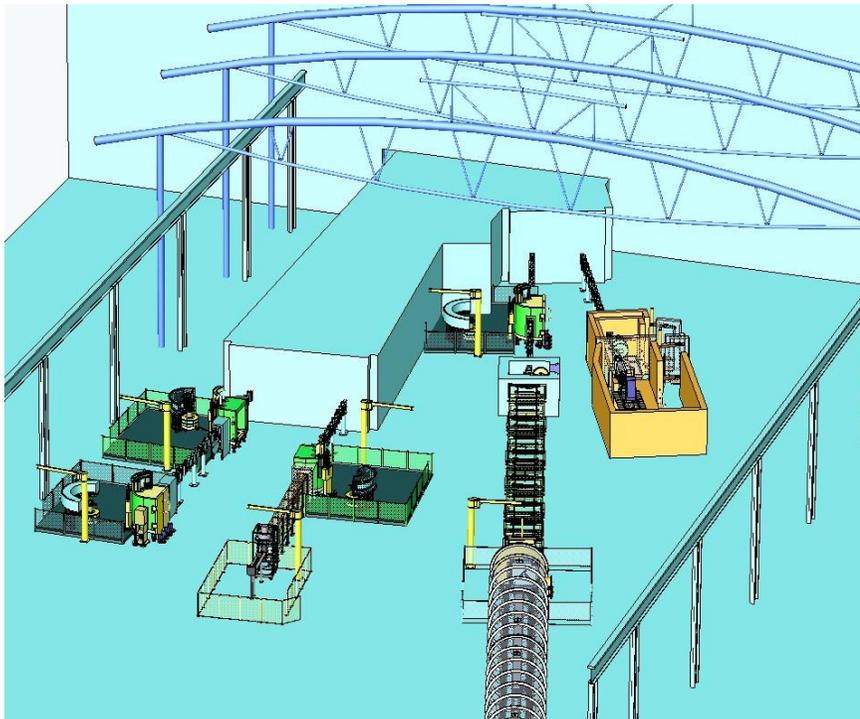


Opportunities for collaboration between U. of Melbourne and ANSTO



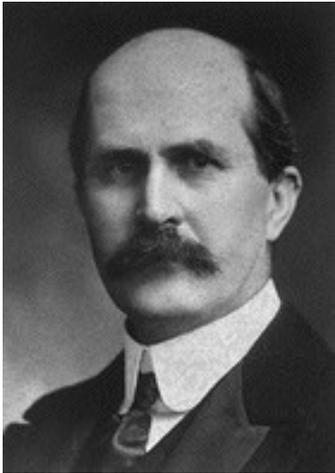
R. A. Robinson, September 2005



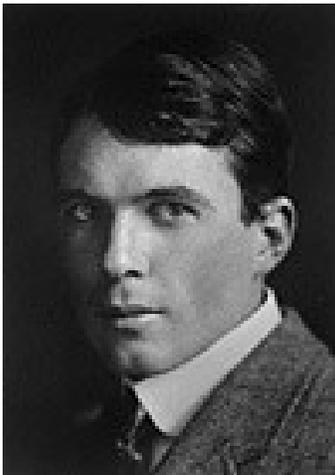
See <http://www.ansto.gov.au/ansto/bragg/index.html>

www.anbug.org

**William & Lawrence Bragg - The Australian Connection
1915 Nobel Prize in Physics**



William Henry Bragg
Professor of Mathematics & Physics, U. of Adelaide,
1885-1909
Married in 1889 the daughter of Postmaster
General/Government Astronomer for S.
Australia



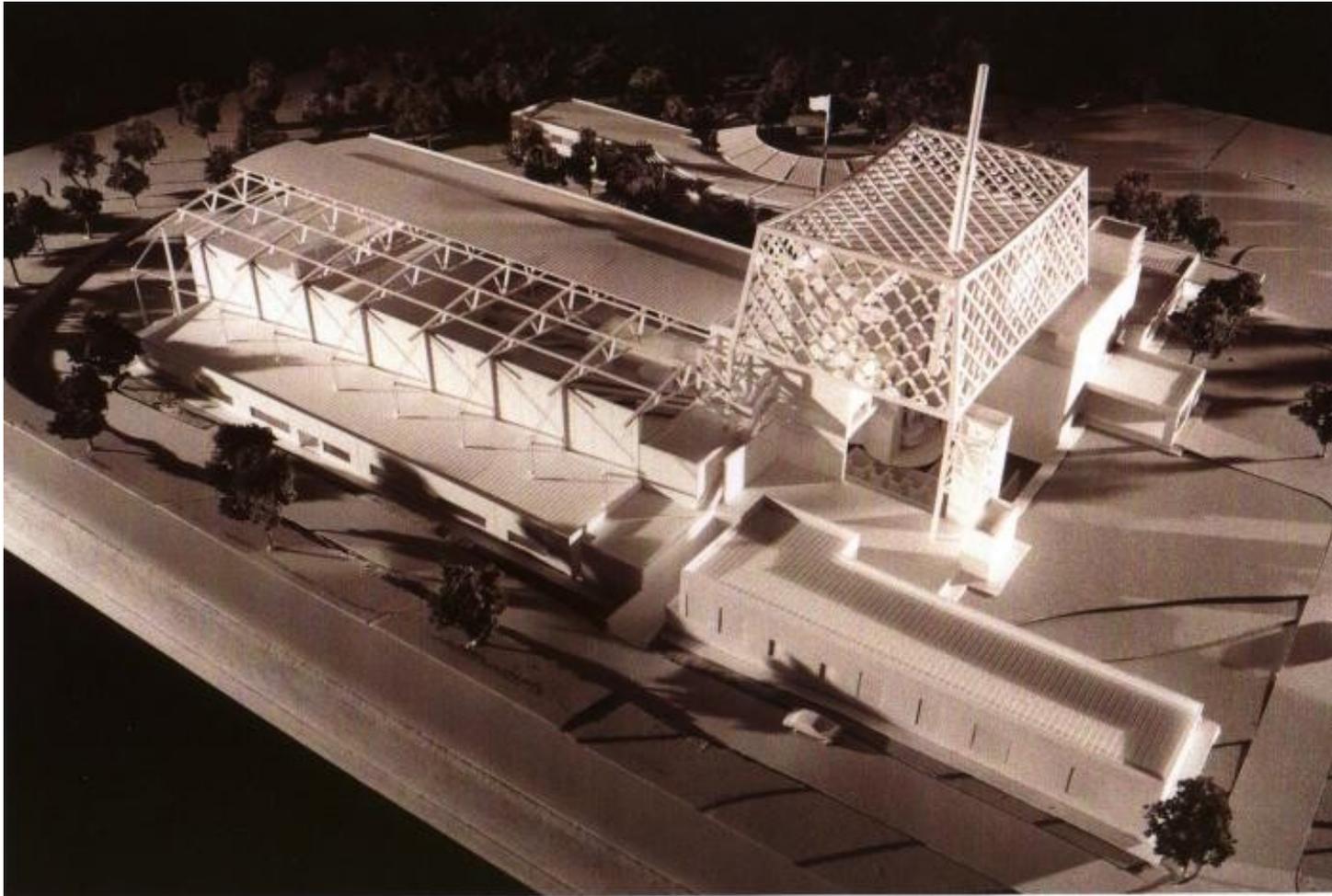
William Lawrence Bragg
born Adelaide, 1890
Left for England 1909, after a first in
Mathematics at Adelaide University
Youngest ever Physics Nobel Laureate (at 25)

The Bragg Institute at ANSTO
originally idea of Prof. Brian O'Connor (Curtin U.)



- **All Neutron-Scattering Facilities and Research (HIFAR & RRR)**
- **Staff of the Australian Synchrotron Research Program**
- **Dedicated building, adjacent to new Reactor in 2005**
- **Some in-house X-ray facilities (e.g. reflectometry, SAXS)**
- **Strong external partnerships (presently with Sydney U., UNSW, Curtin and CRC for Polymers – keen on others)**
- **Investor in beamlines at the Australian Synchrotron Facility**
Keen to be a major player there.
- **~45 people, growing, easily strongest scattering group in Australia**

**Model of Australia's Replacement Research Reactor:
Guide Hall to left, Reactor Hall under stack, Entrance
to rear.**





John Holland

Visitor's Pass

11 2 2003







NGH



7 10 2003

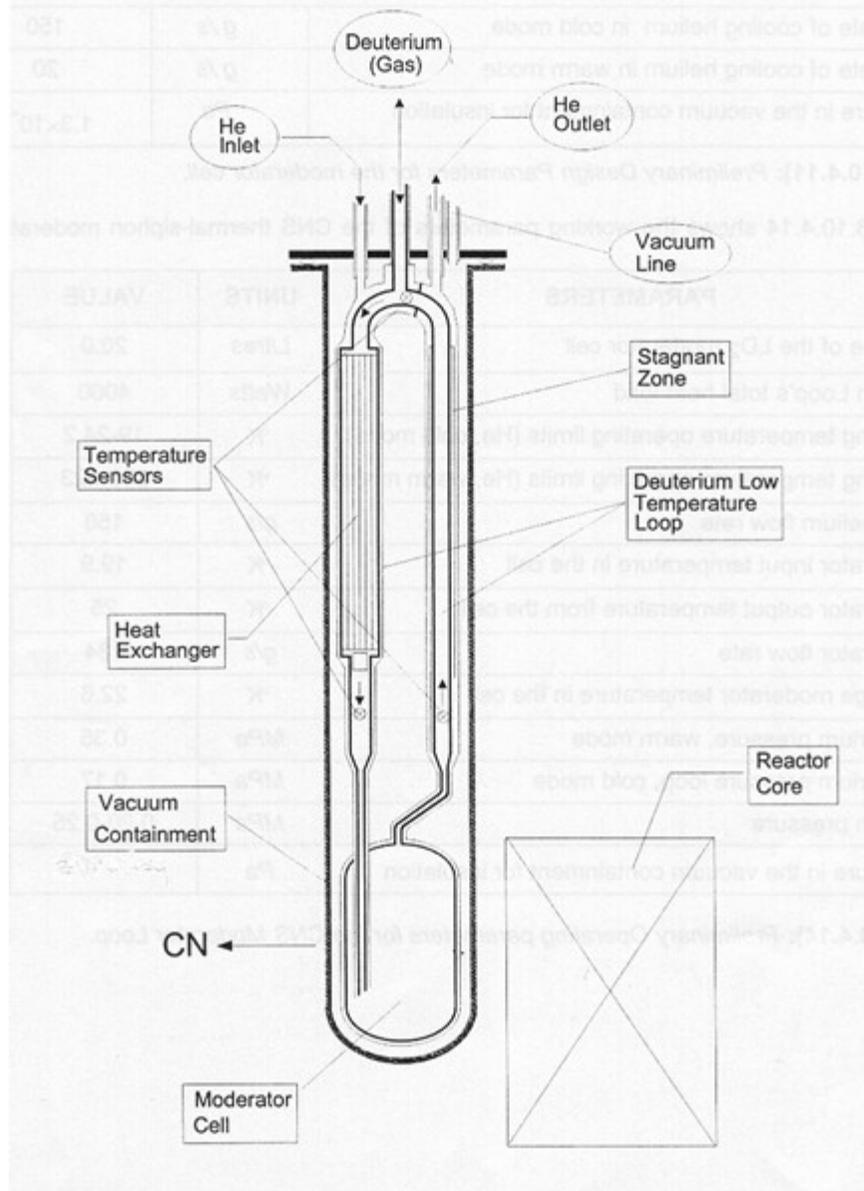
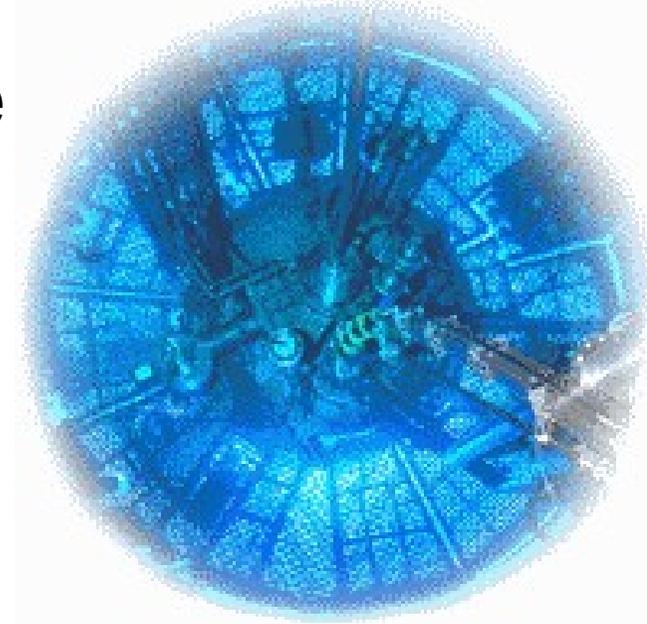


20 4 2004



10 9 2004

The Cold Neutron Source



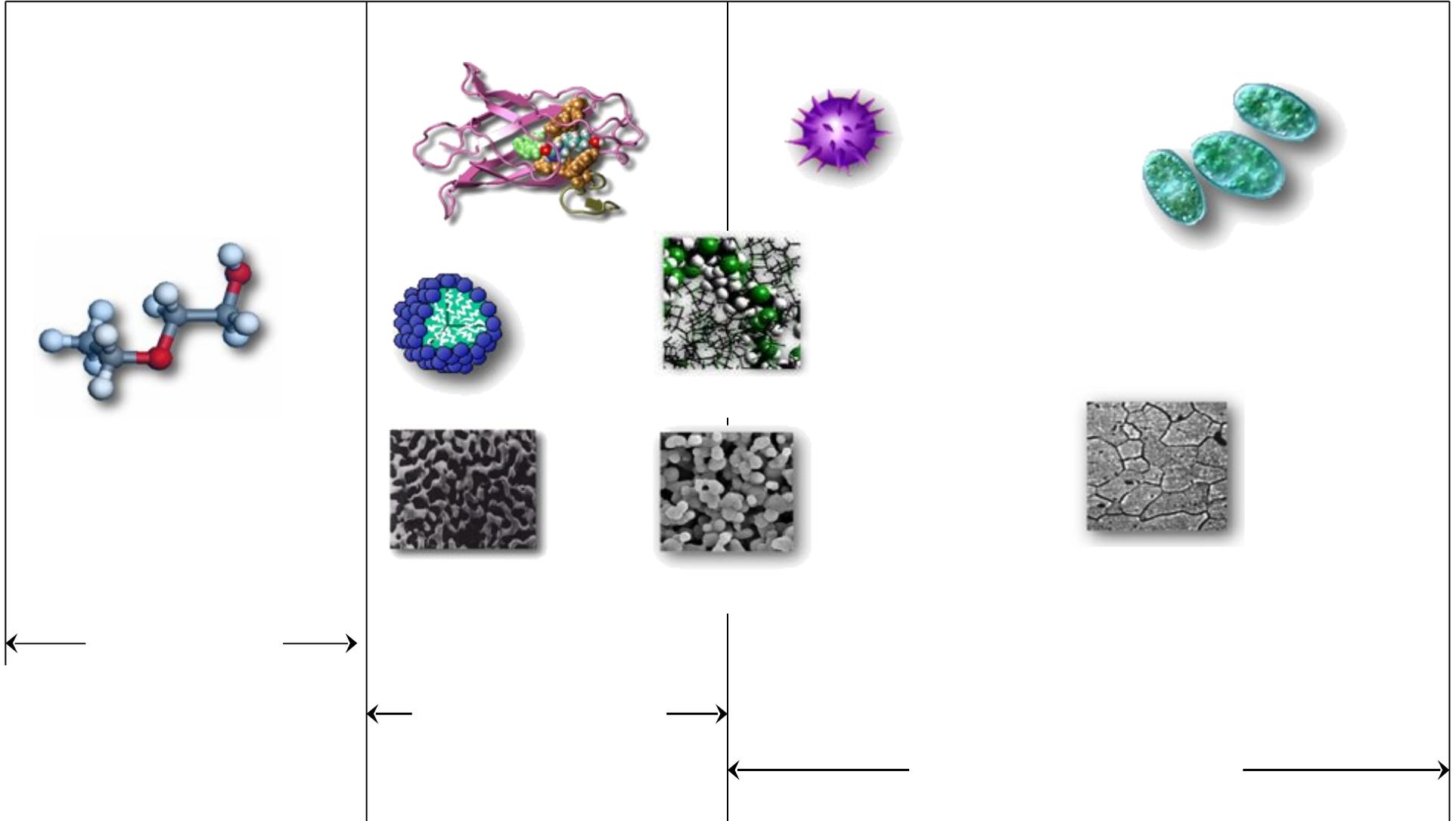
- D₂ liquid moderator (~20 litre)
- Re-entrant towards neutron guides ~20 litre
- Close as practicable to core
- Operating Temperature <24K
- Heat load ~4kW

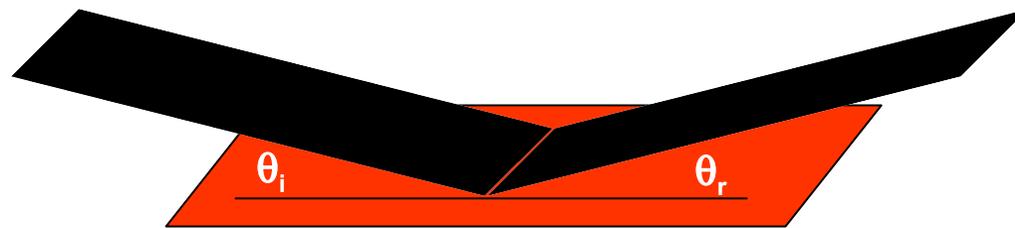
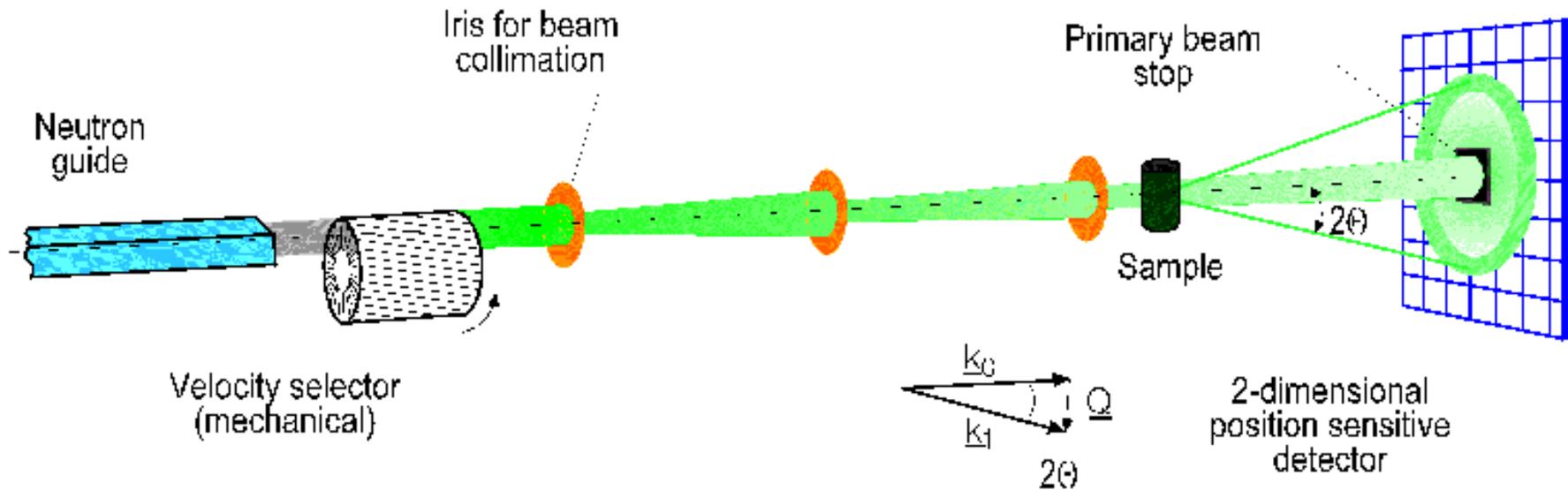
Key dates



mid - 2004	Guide Hall & Reactor Hall ready
July 2004	Start project on “Operations at the RRR”
November 2005	Bragg Institute building ready
November 2005	First fuel in reactor
November 2005	International Conference on Neutron Scattering, Sydney
July 2006	Reactor & instruments commissioned
Late 2006	HIFAR stops running

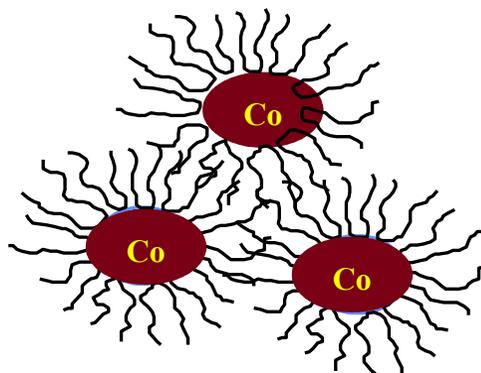
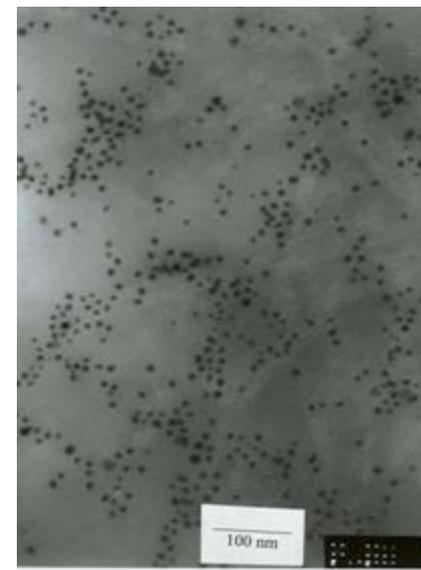
Size Scales Probed by Various Techniques



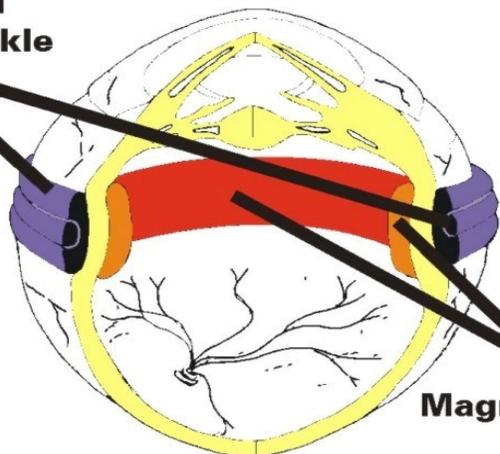




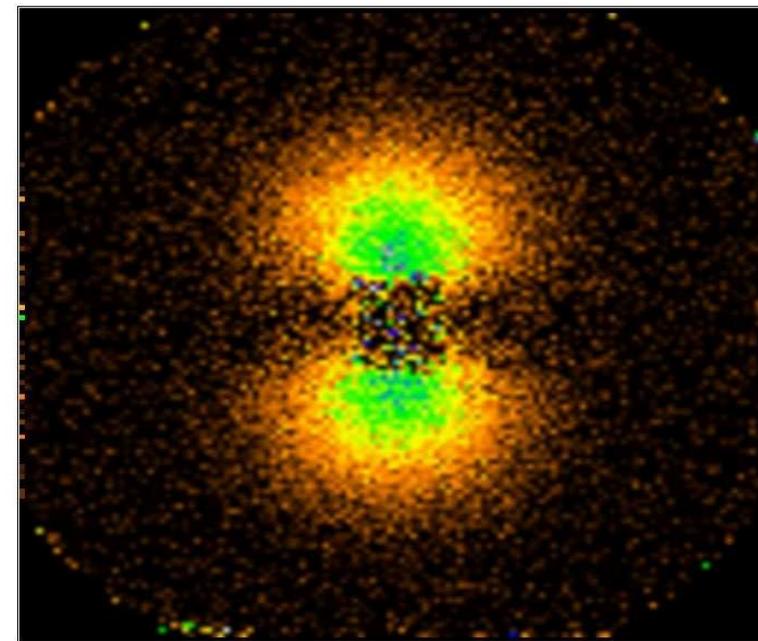
with E.P. Gilbert



**Magnetized
Scleral Buckle**



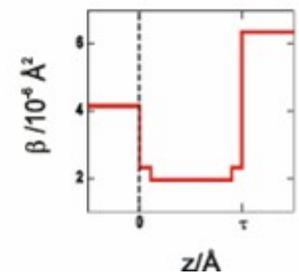
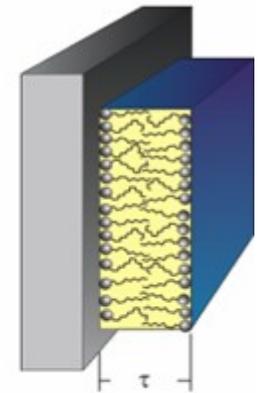
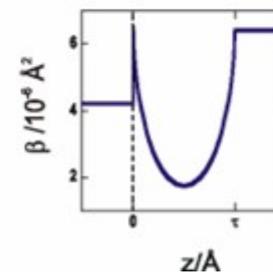
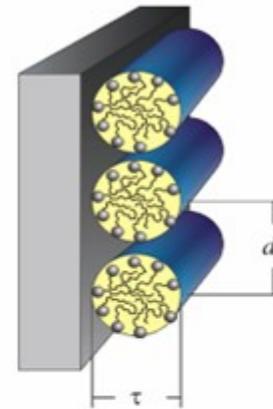
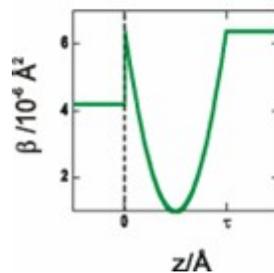
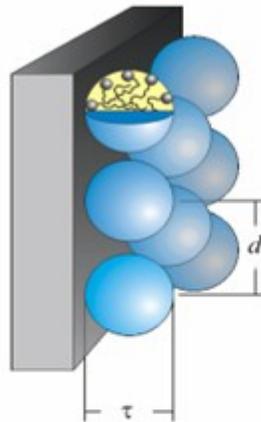
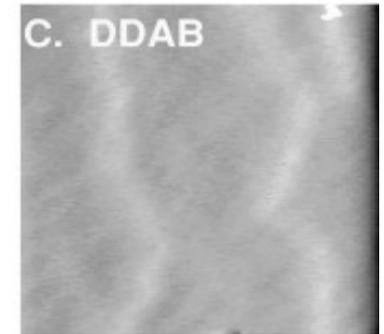
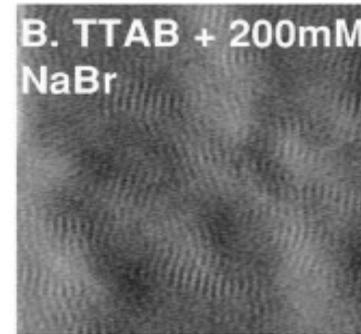
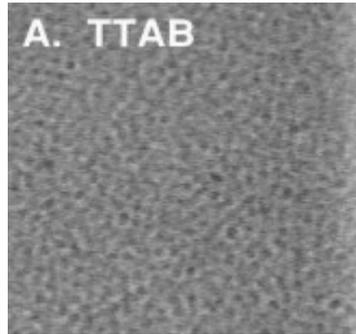
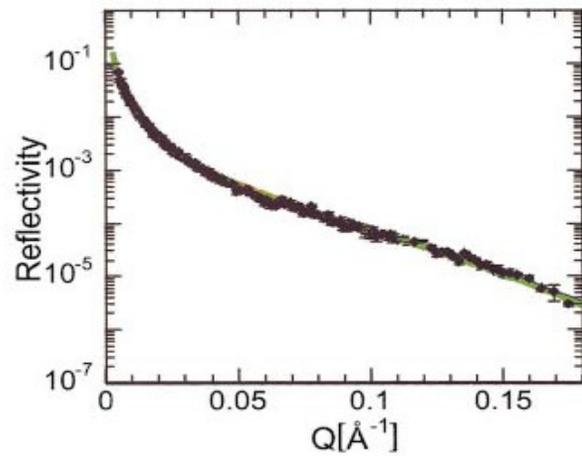
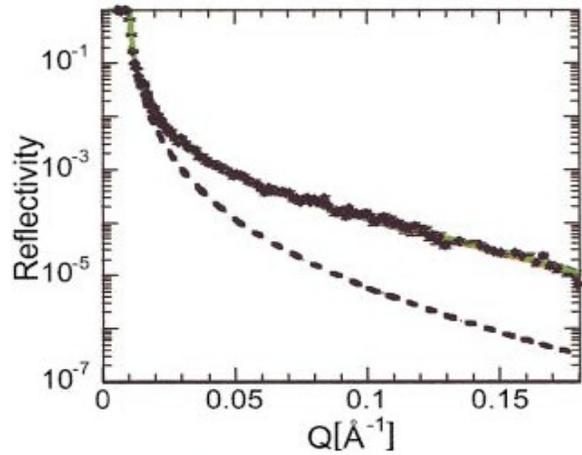
Magnetic Fluid





The University of Sydney
Australia

Surfactants at the Quartz/Solution Interface (NR and AFM complementarity) diblock adsorption on quartz/solution interface with Prof. Michelle Gee – Melbourne U. Chemistry

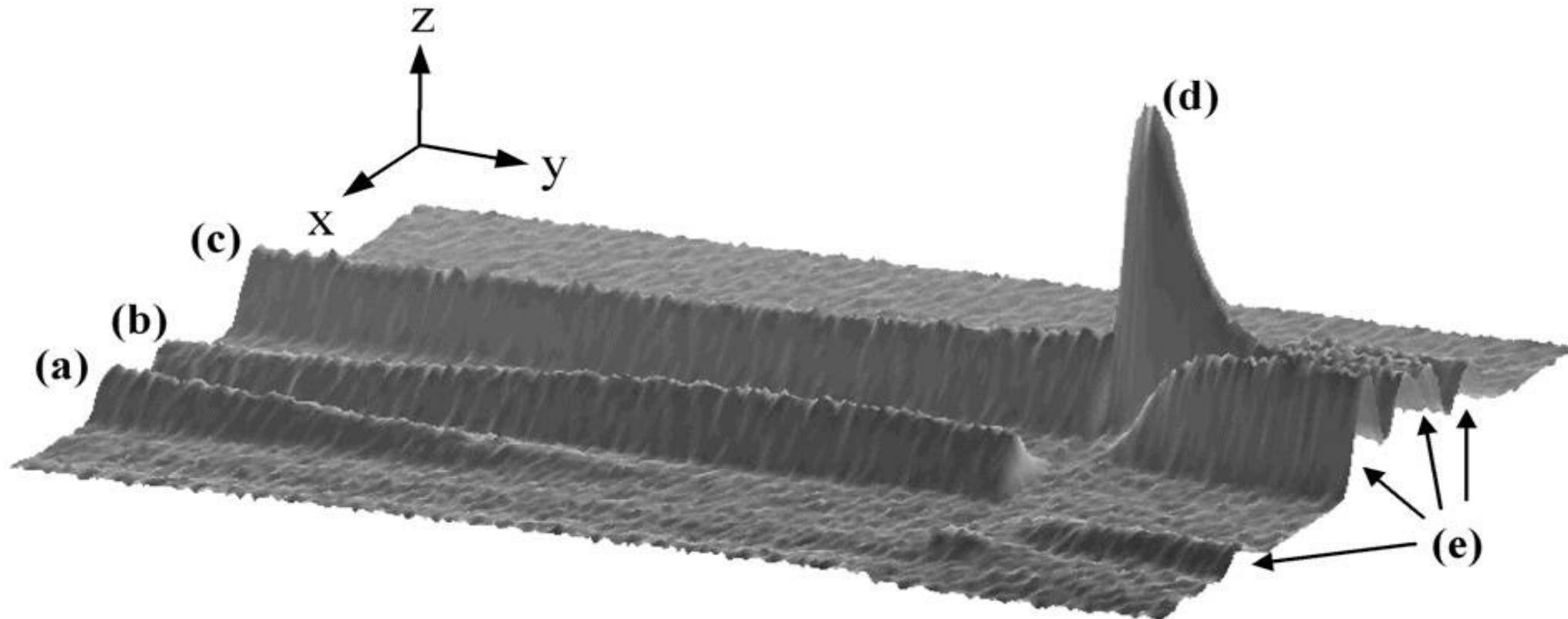




Australian Government

Ansto

Rapid irreversible reaction - Combustion Synthesis of Ti_3SiC_2



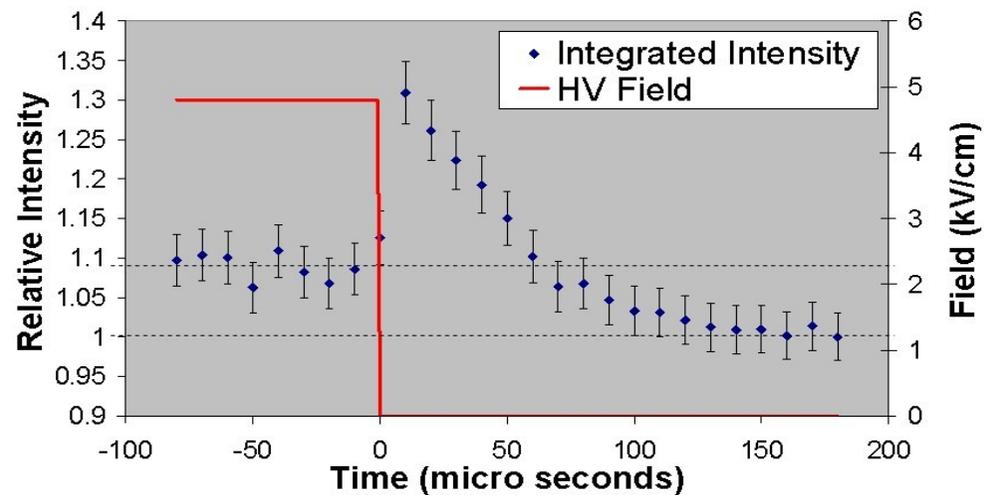
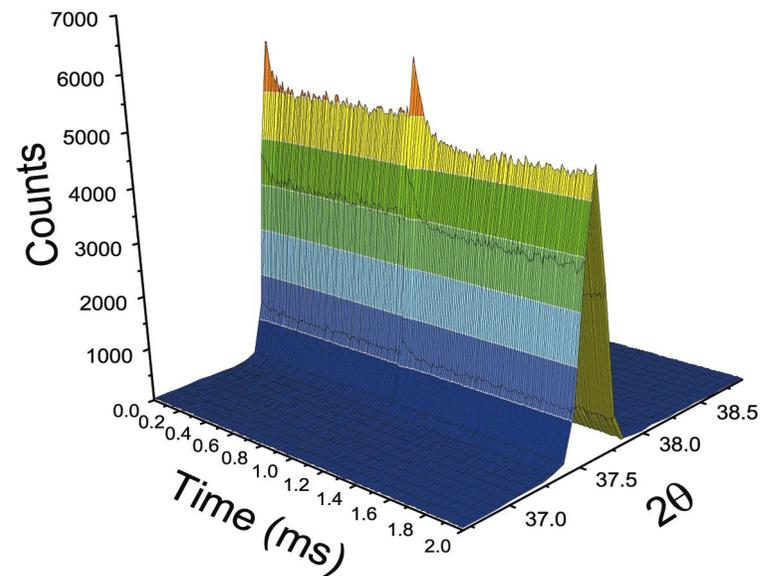


Australian Government

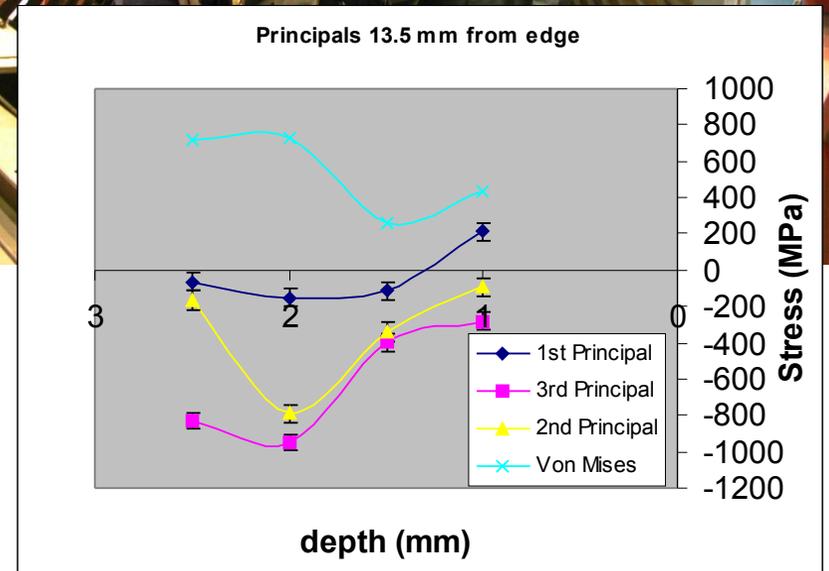
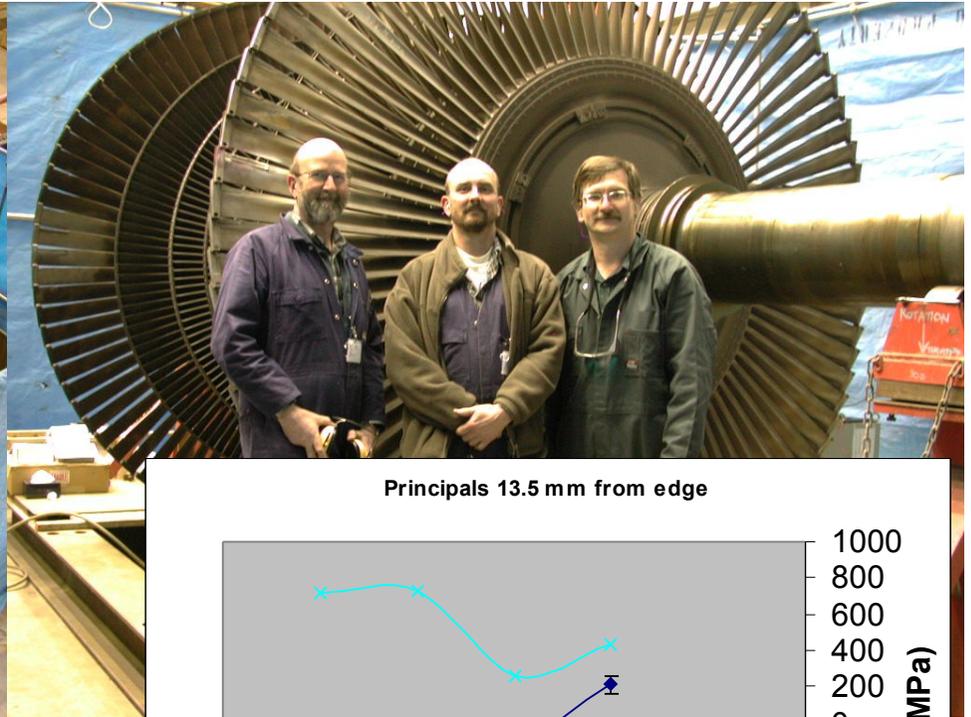
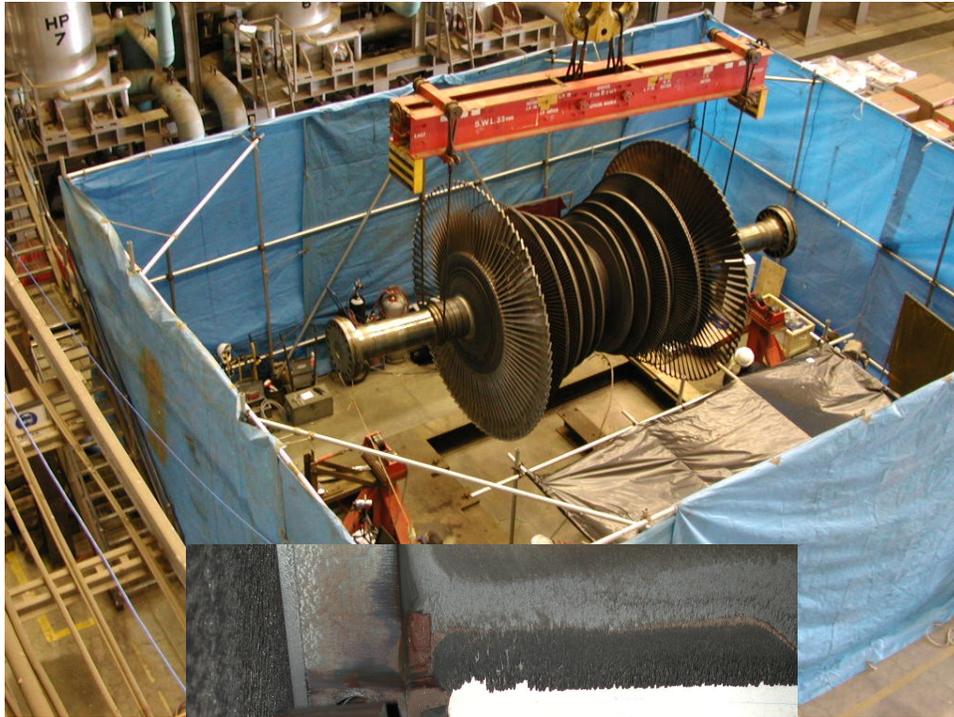
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First μs Time-Resolved Experiments

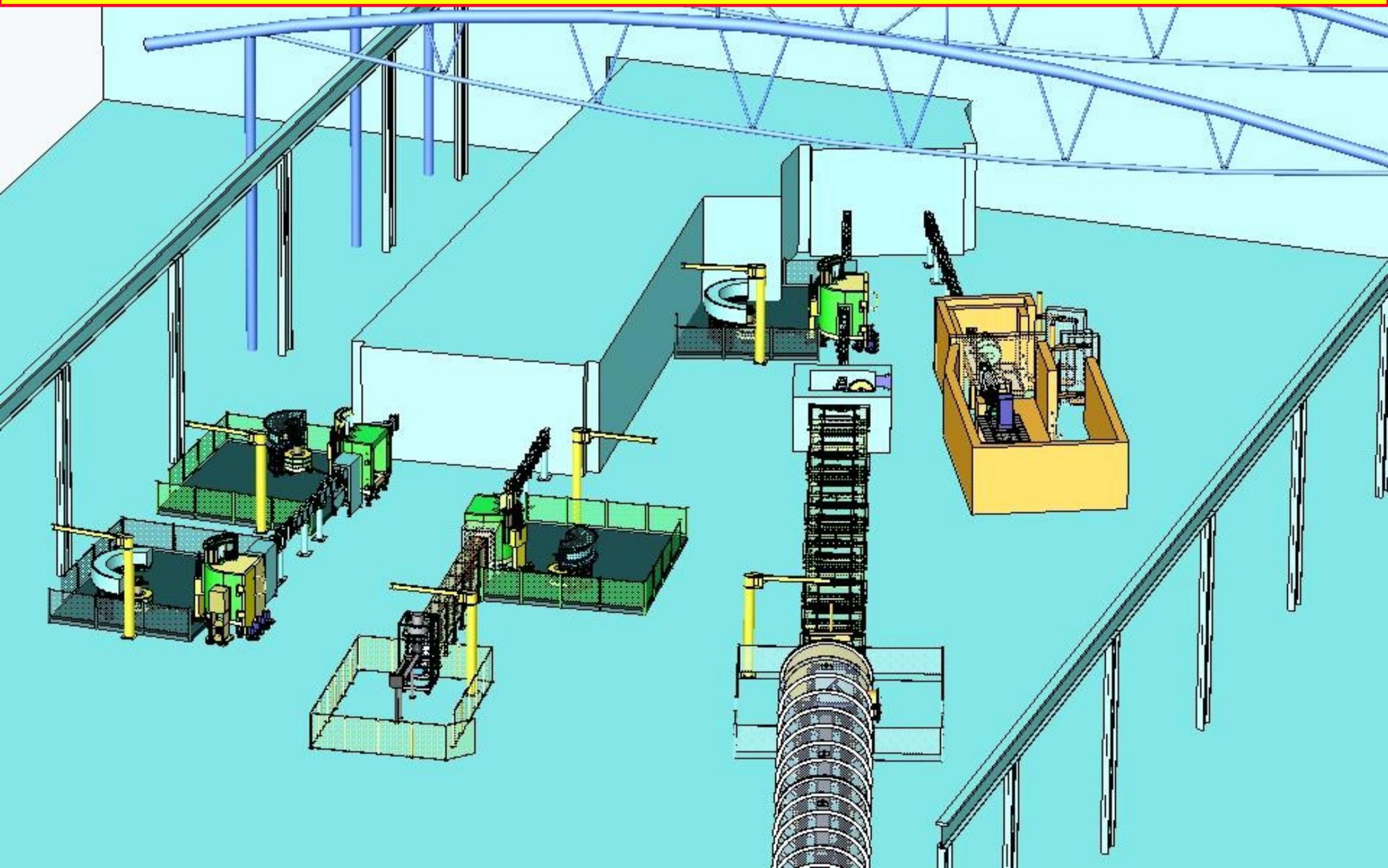
with Monash University (courtesy of John Daniels)

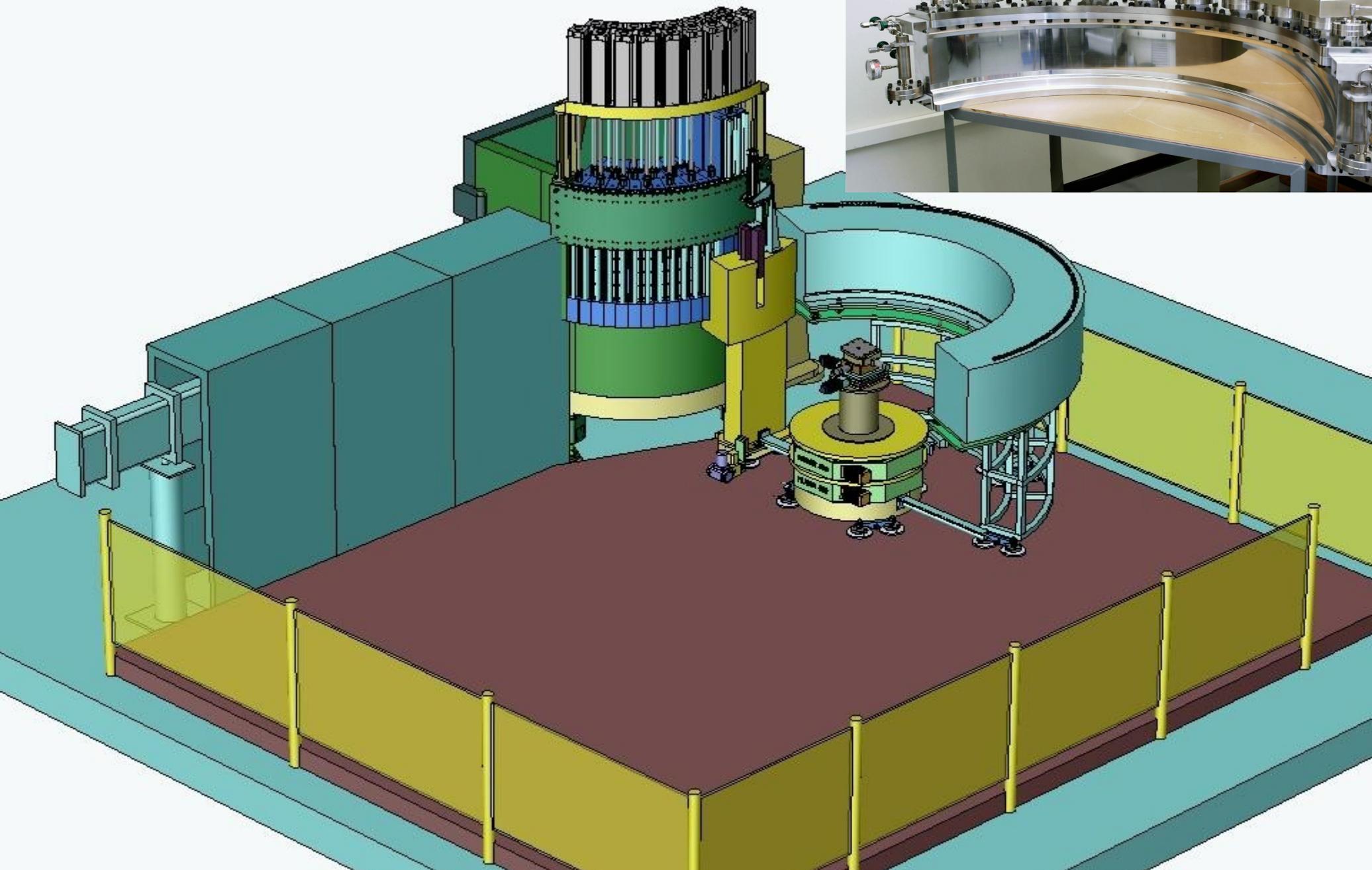


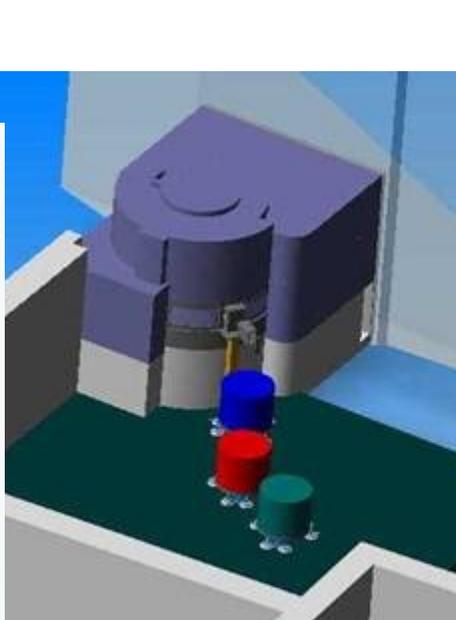
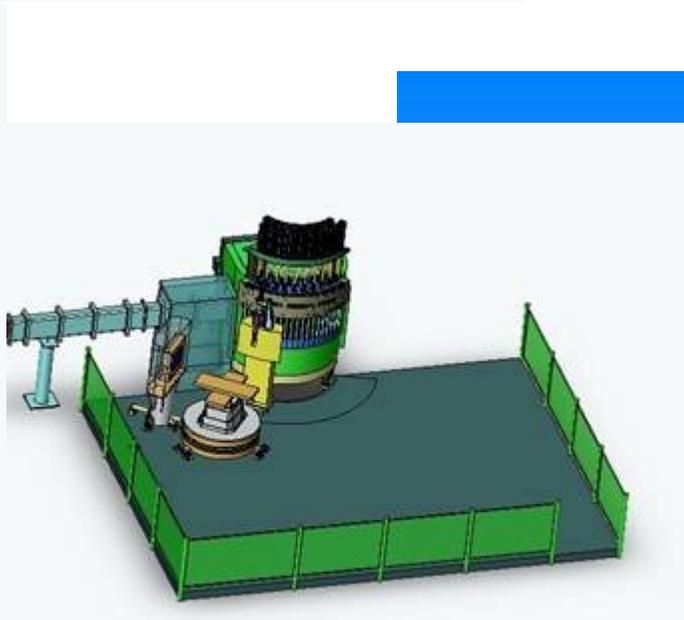
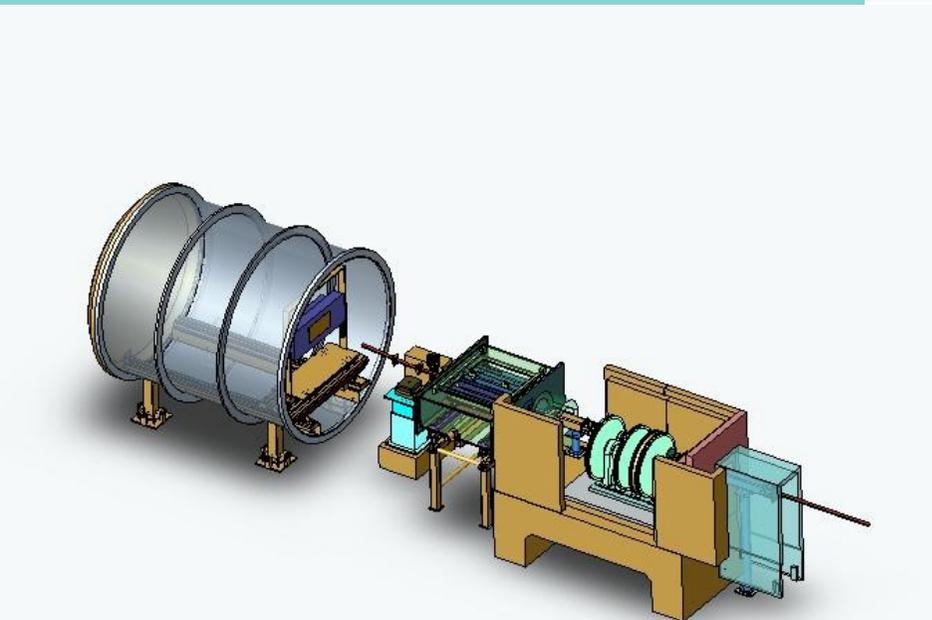
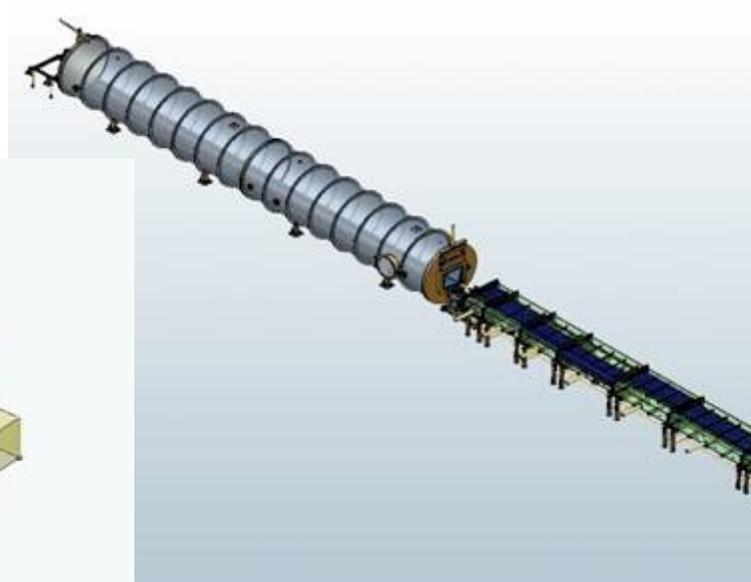
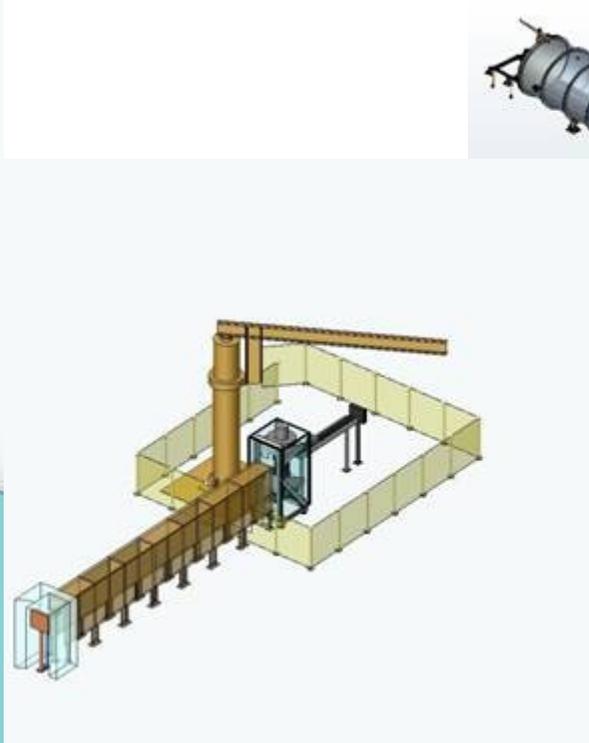
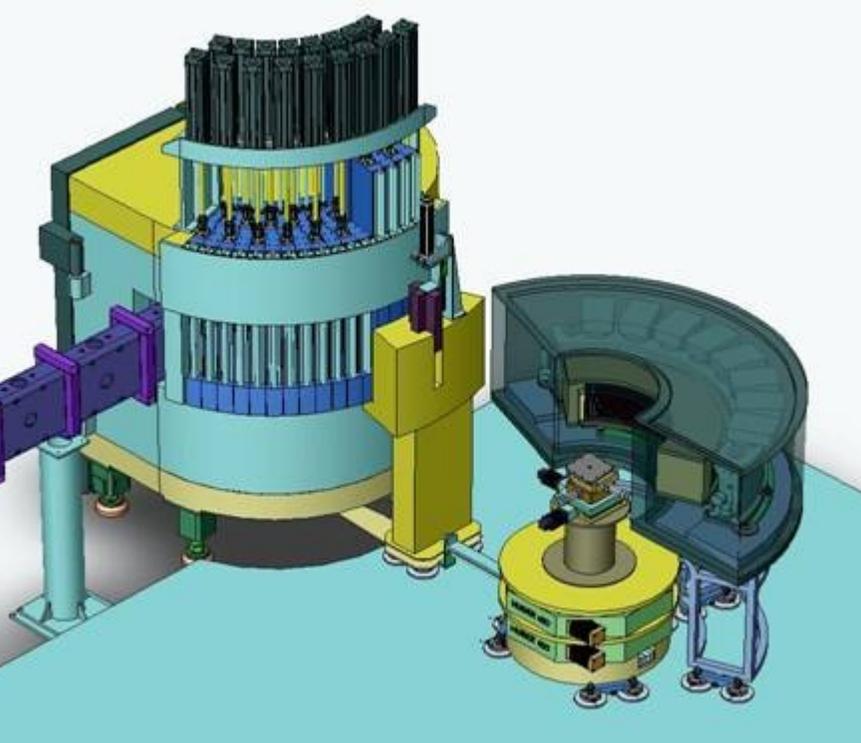
Laser Repair of Steam Turbine Blades (with CRC-Welded Structures)



View of Instruments in the Guide Hall







Performance of 8 Instruments for 2006

**High-Resolution Powder Diffractometer
Reflectometer**

intensity **>1x** D2B at ILL

intensity **40-50%** of D17 at ILL

and good for free liquid surfaces

Thermal 3-Axis Spectrometer

intensity **80%** of IN8C at ILL

Quasi-Laue Diffractometer

intensity **2x** VIVALDI at ILL

Small-Angle Neutron Scattering

intensity **50-80%** of D22 at ILL

High-Intensity Powder Diffractometer

intensity **>4x** that of D20 at ILL

Residual-Stress Diffractometer

intensity **90%** of new strain scanner at ILL

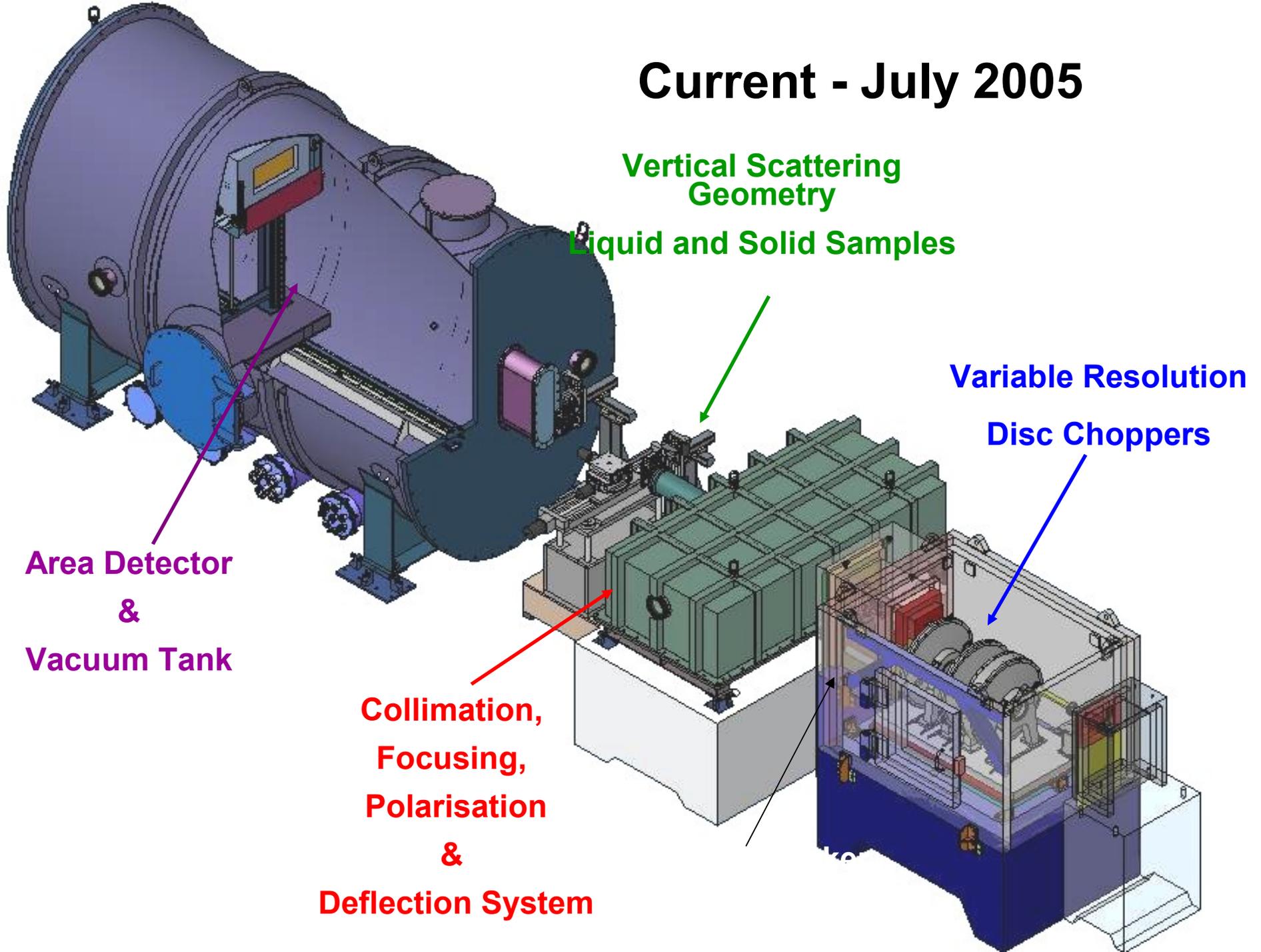
Time-of-Flight Spectrometer

to be determined (**>30%** of IN6???)

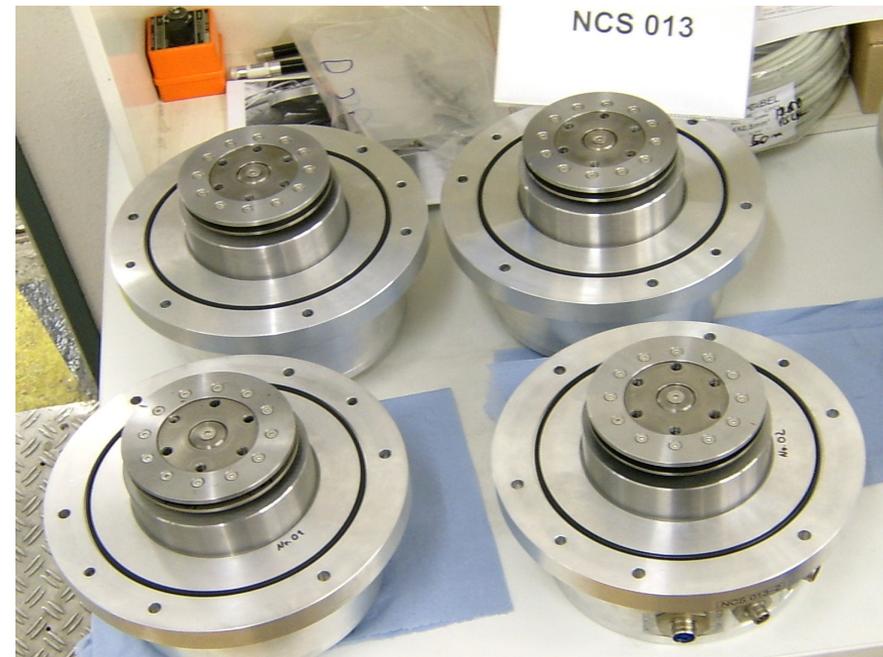
Cold 3-Axis Spectrometer (Taiwan)

to be determined (**could be best in world**)

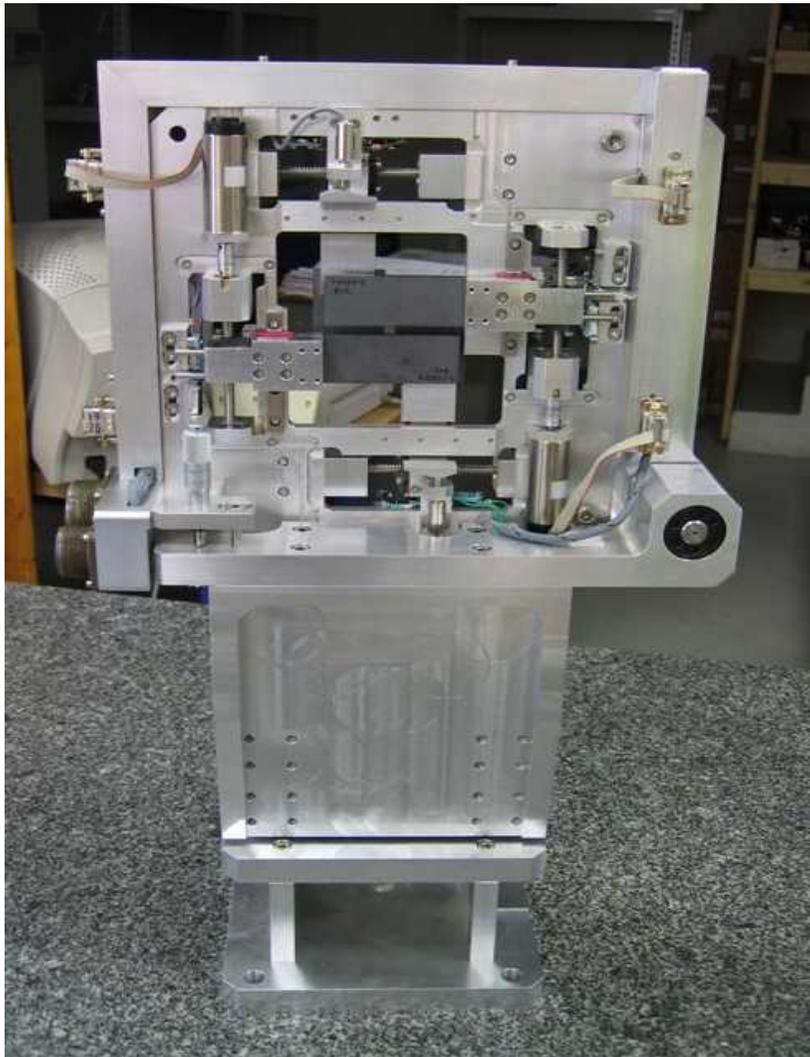
Current - July 2005



Disc Chopper System (EADS Astrium)

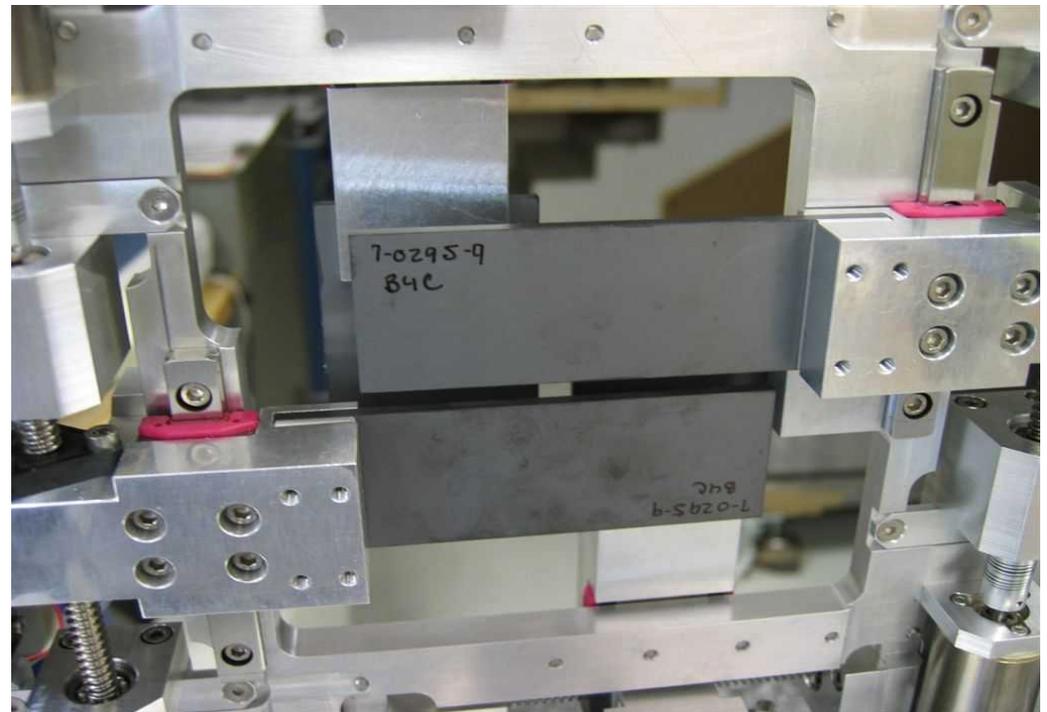


Slit Systems (AZ Systemes)



Pre-Chopper Slit Tower

Delivery:
December 2005



Sintered B₄C Slits



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Recent Progress (Fabrication)

QUOKKA – Small-Angle Scattering, Apr 2005, Melbourne





Model 21000N Electronics Encl.



Model 21000N Detector Cover and Base



Model 21000N Detector Base

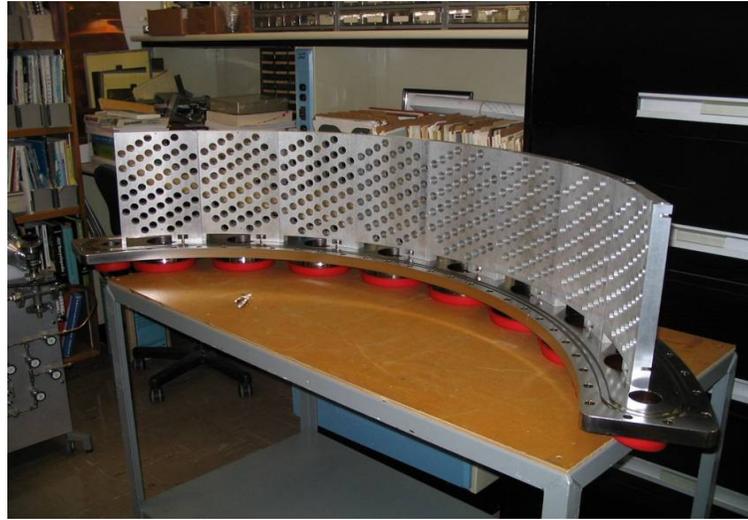


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Recent Progress on NBI Project

WOMBAT (Powder Diffraction) Detector, by BNL, USA, Nov'04



Powder Diffraction monochromator drums, Sydney, 24 Mar'05





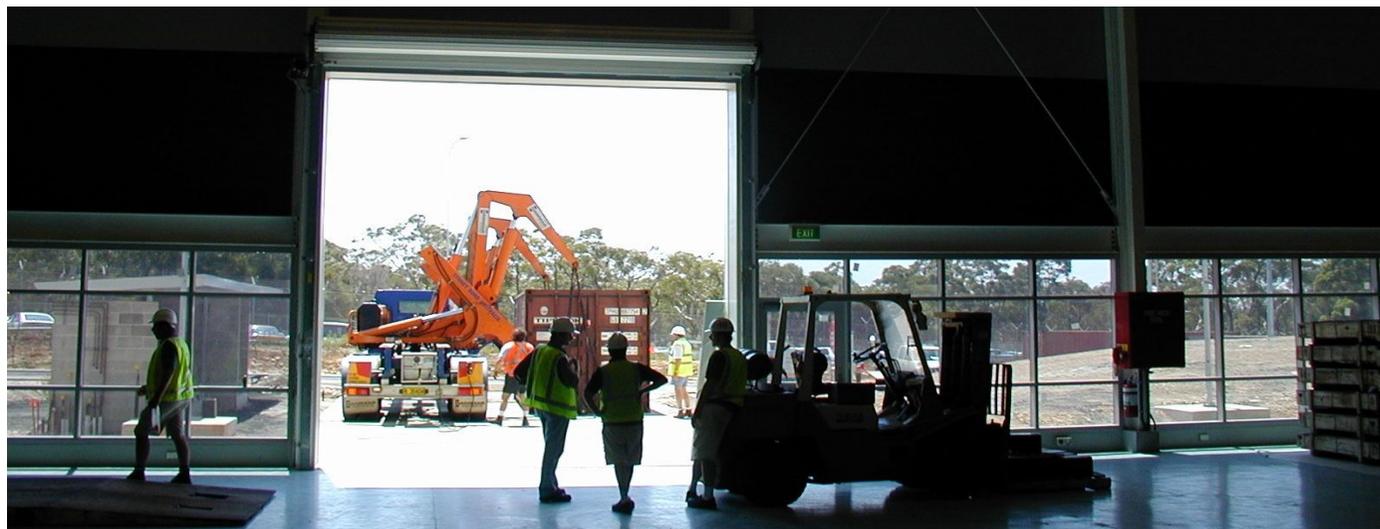
Australian Government

ansto

Recent Progress on NBI Project



Acceptance of ECHIDNA (Powder) Collimator, UK, Nov'04



Delivery Feb'05



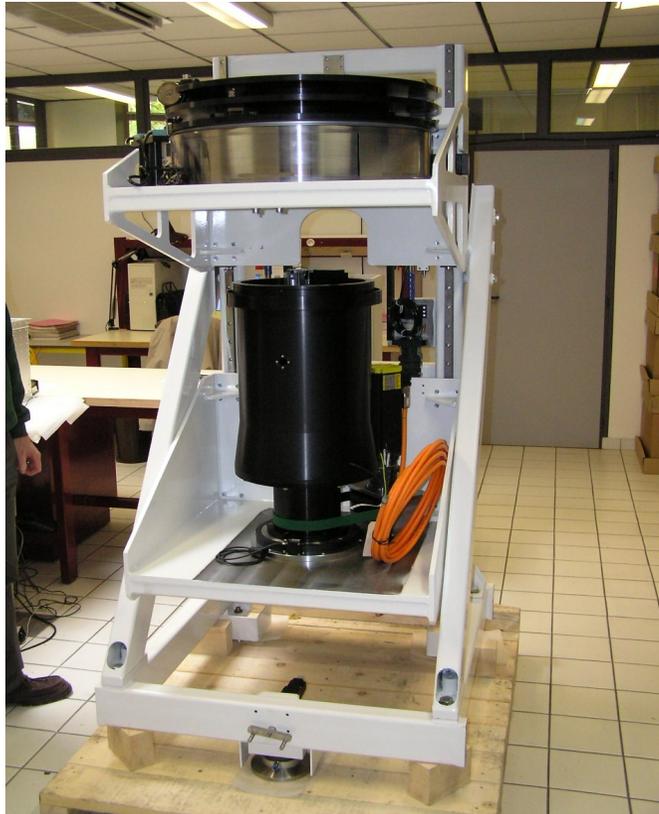
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Recent Progress on NBI Project

KOALA (Quasi-Laue Diffractometer), Maatel, Grenoble, France

Nov'04



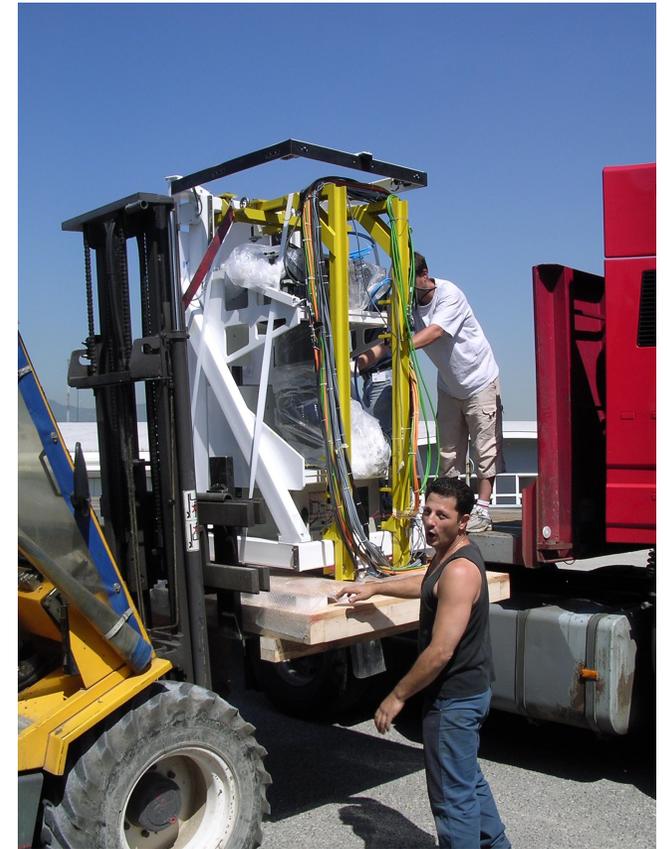


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Recent Progress (Acceptance Testing)

KOALA Quasi-Laue Diffractometer, May 2005, Grenoble, France

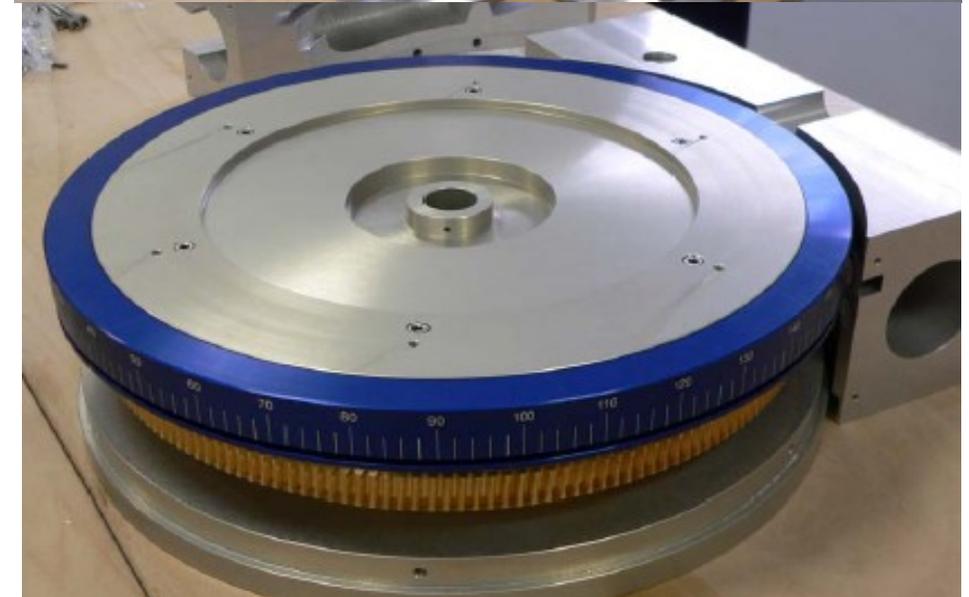
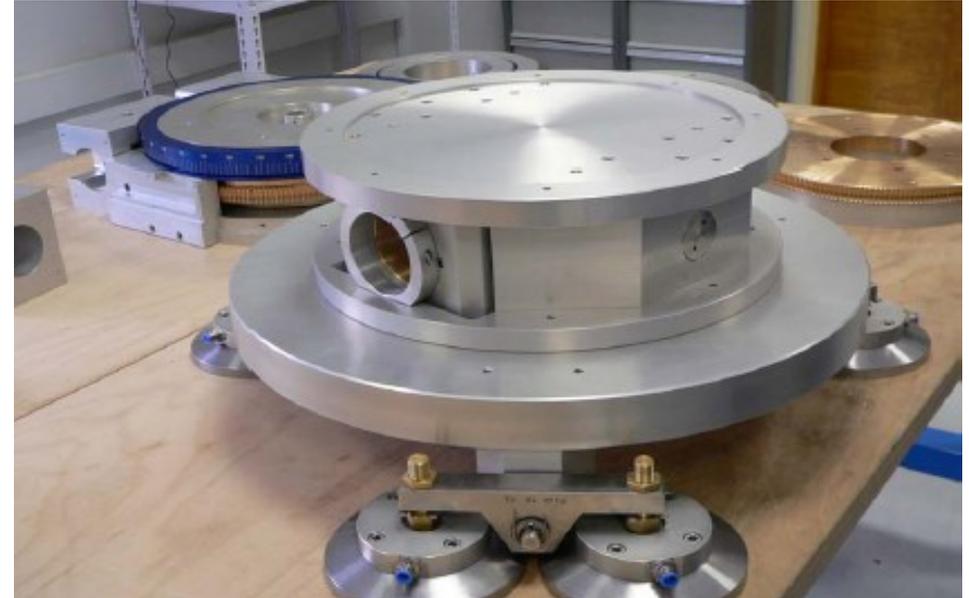
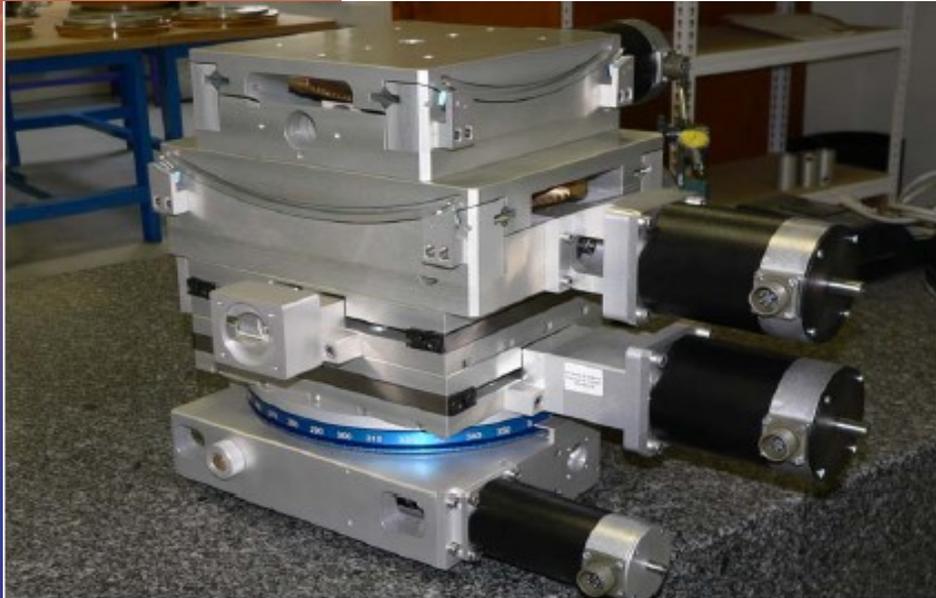




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Recent Progress (Fabrication)

Motion Stages, April 2005, Grenoble, France





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Recent Progress (Fabrication & Acceptance Testing)

Motion Stages, May 2005, Grenoble, France



Conclusions

- **On track to deliver 7 commissioned instruments by July 2006**
- **8th instrument soon thereafter**
- **At least 7 instruments will be “leading-edge”**
- **Have assembled world-class team of scientists**

- **Will be in top 3 such facilities worldwide**
- **Potential to be a flagship for Australian science**

**2005 International Conference on Neutron
Scattering, Sydney,
27 November – 2 December 2005**



www.icns2005.org

Keynote Speakers: Gabriel Aeppli, Masa Arai, Lyndon Edwards, Toshiji Kanaya, Bernhard Keimer, Shane Kennedy, Thom Mason, Matt Rosseinsky, Jill Trehwella, Christian Vettier, Po-Zen Wong