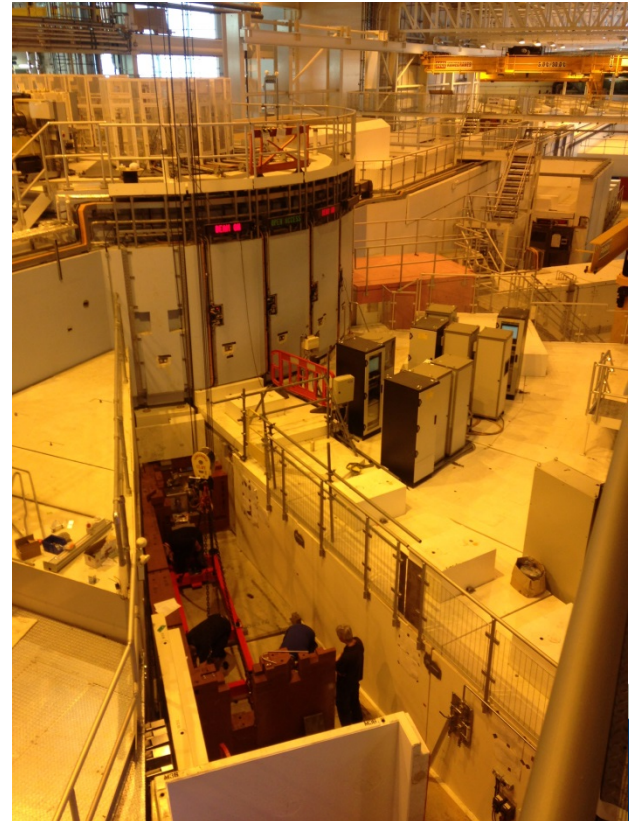
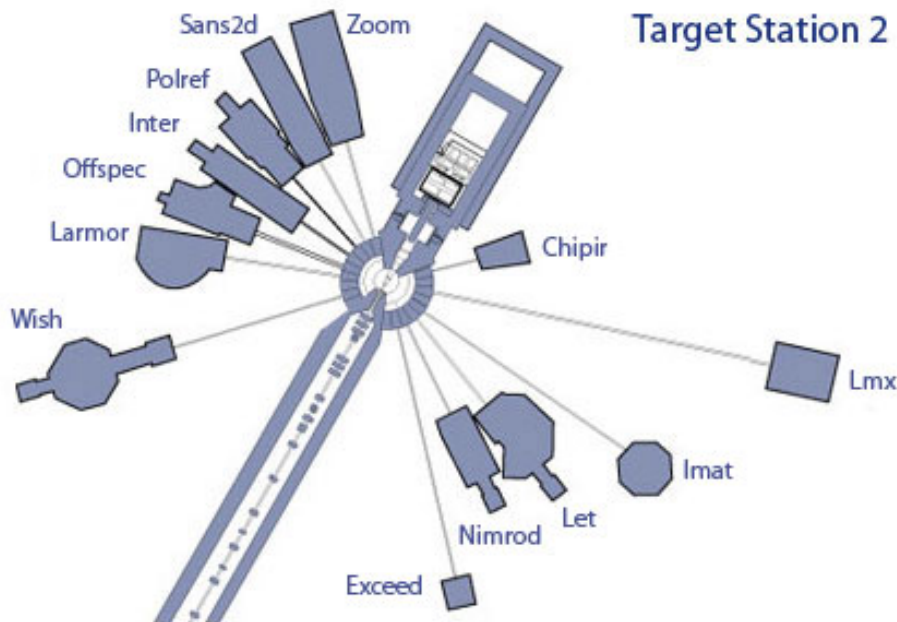


# The Design & Installation of the Zoom Instrument on ISIS's TS2

Mohammad Chowdhury

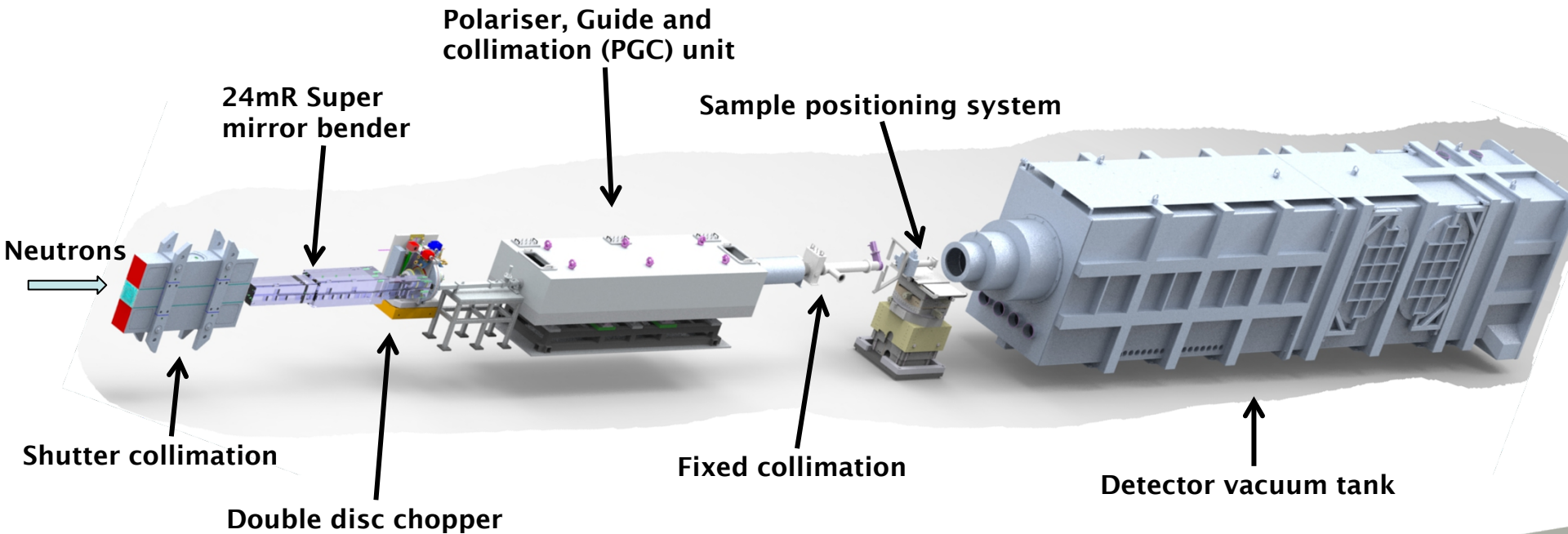
# The Zoom Instrument

1 of 4 instruments of 'Phase 2 Instruments' for ISIS Target Station 2



# The Zoom Instrument

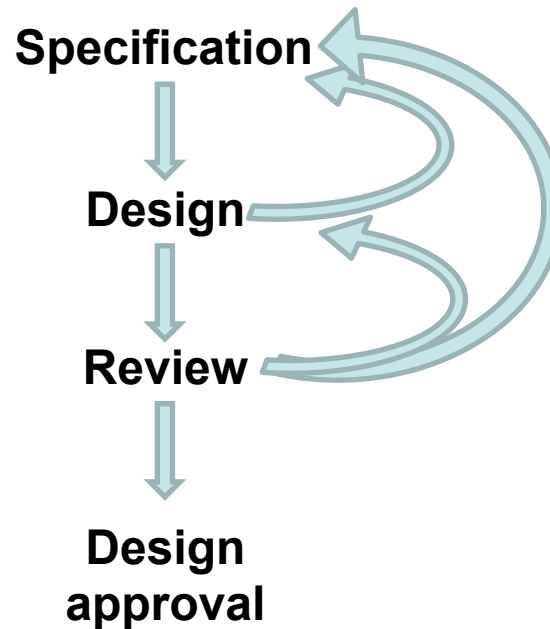
## Zoom beamline component overview



# The Zoom Instrument

## Outline design phase

Special case - Instrument  
'Engineering Specification'

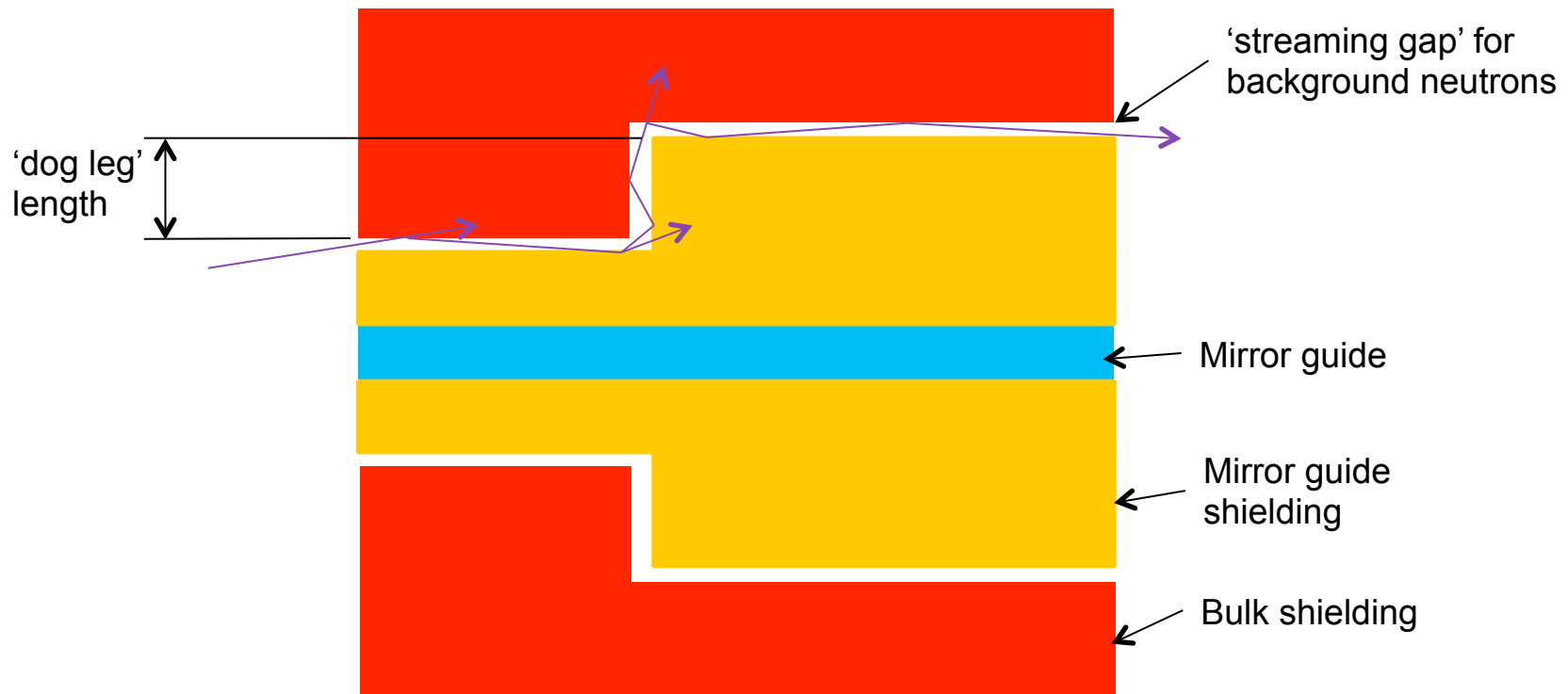


Groups involved at all stages:

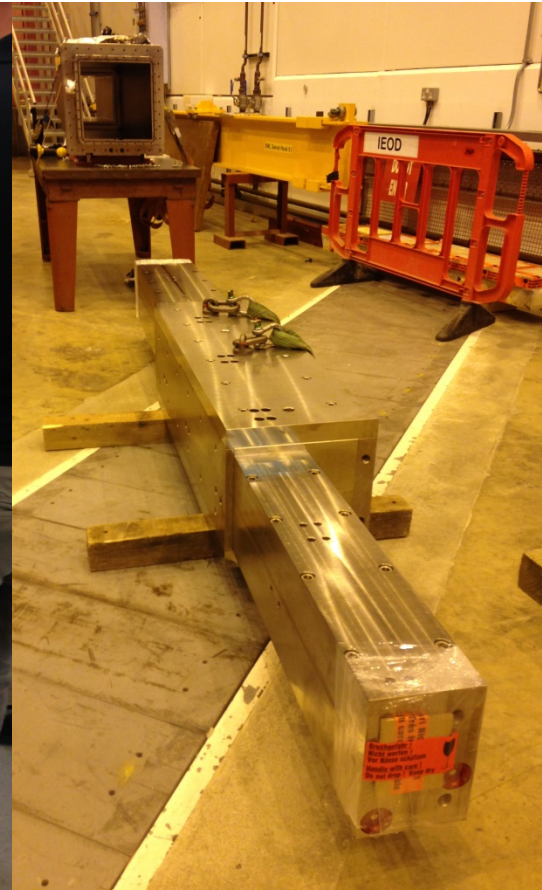
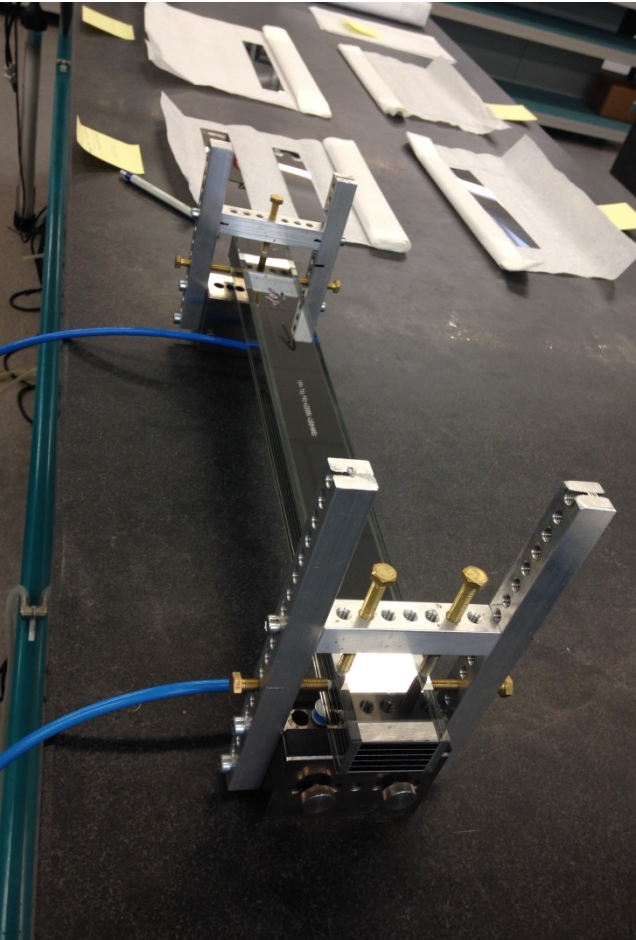
- Instrument scientists
- Installation teams
- Operations
- Neutronics

# The Zoom Instrument

## Design phase - Supermirror bender



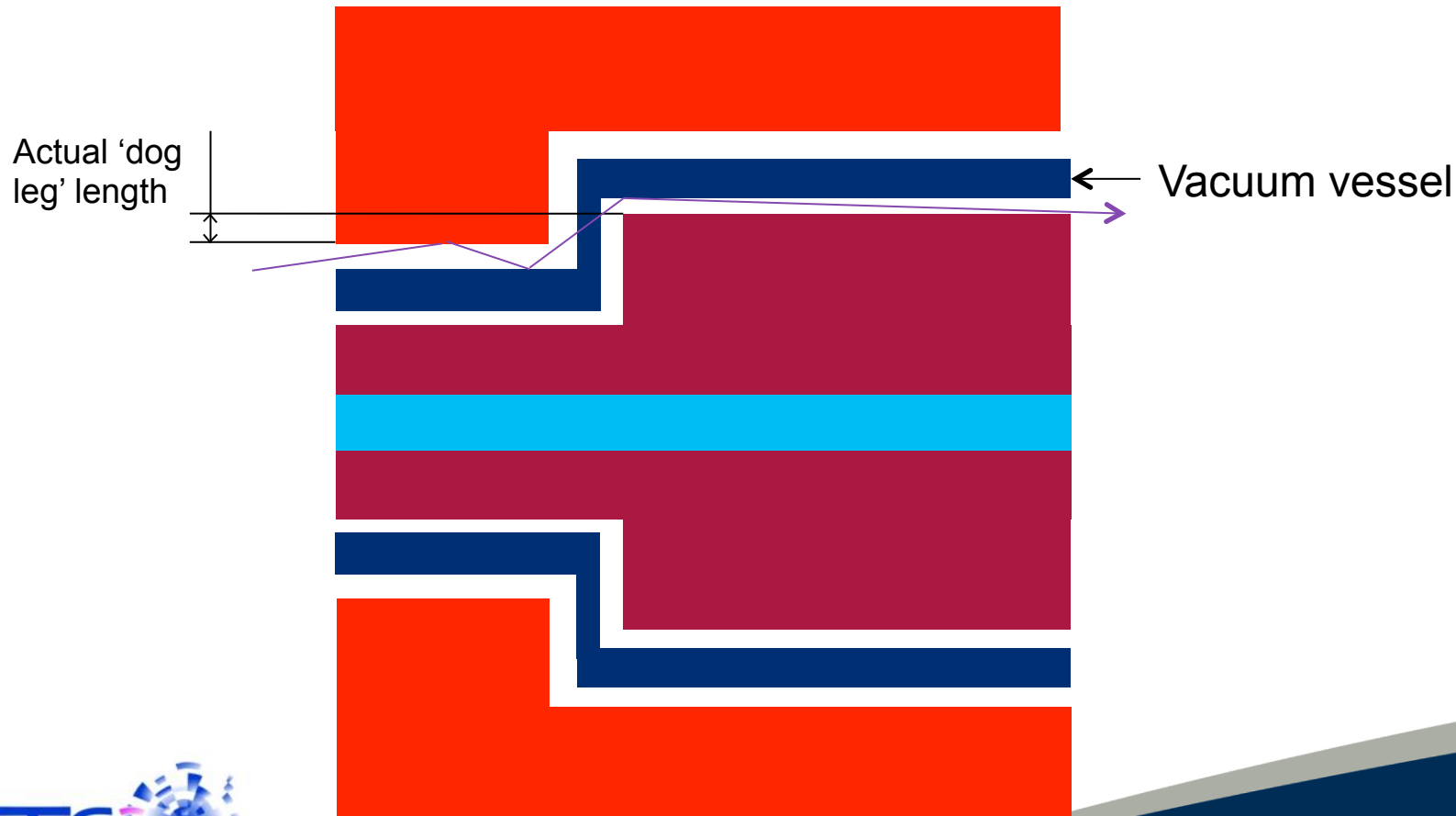
# Supermirror bender manufacture



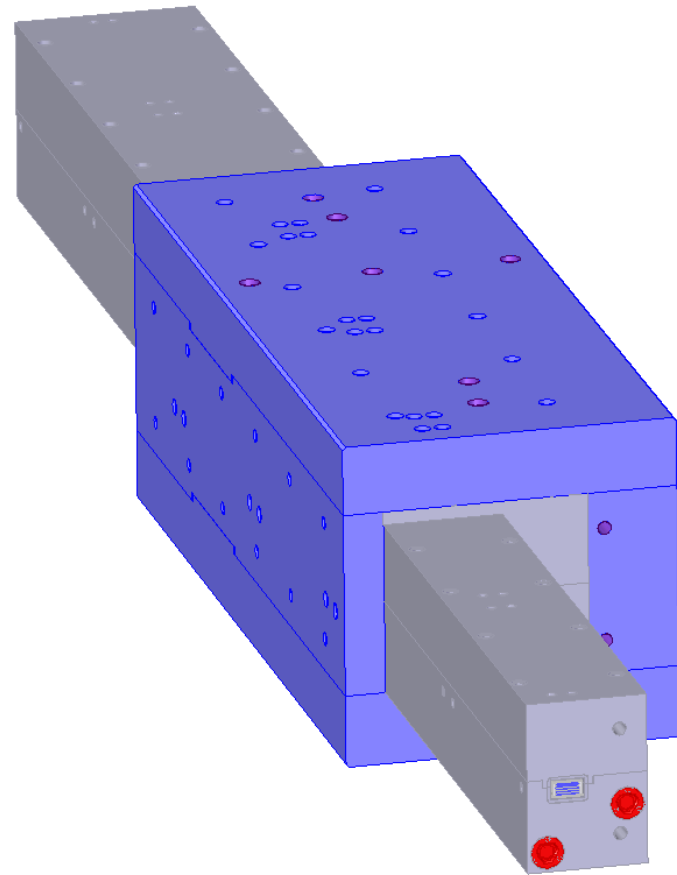


# Supermirror bender design

## Supermirror bender – actual ‘dog legs’







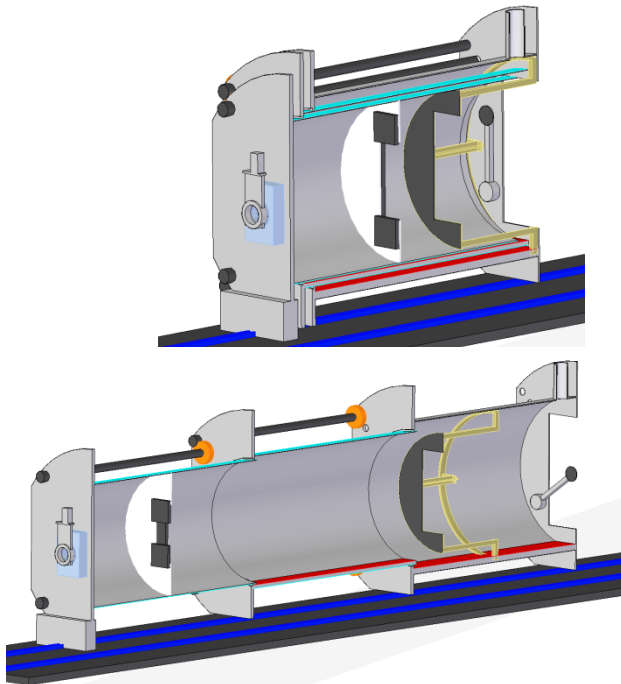
# The Zoom Instrument

## Design phase – detector vacuum tank key specification elements

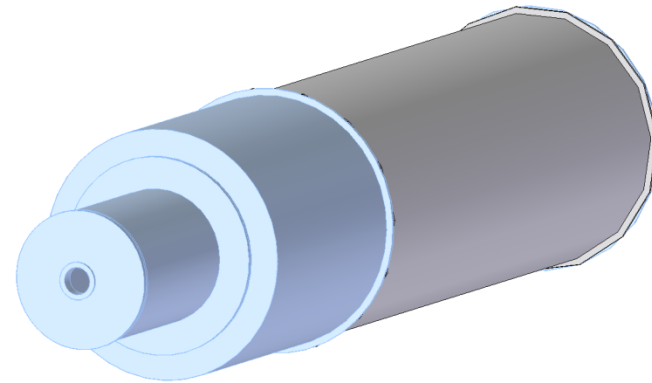
- Movement of the tank a range of up to 1.5 metres along the beam line. This allows the size of the sample area to be flexible and allows larger engineering samples to be accommodated. Also allows future focussing devices to be installed.
- Ability to change length between sample point and detector plane to a range of distances with a tolerance of 5 mm and a repeatability of 1 mm.
- The maximum turnaround time between detector length changes is 60 minutes.

# The Zoom Instrument

## Design phase - vacuum tank concepts



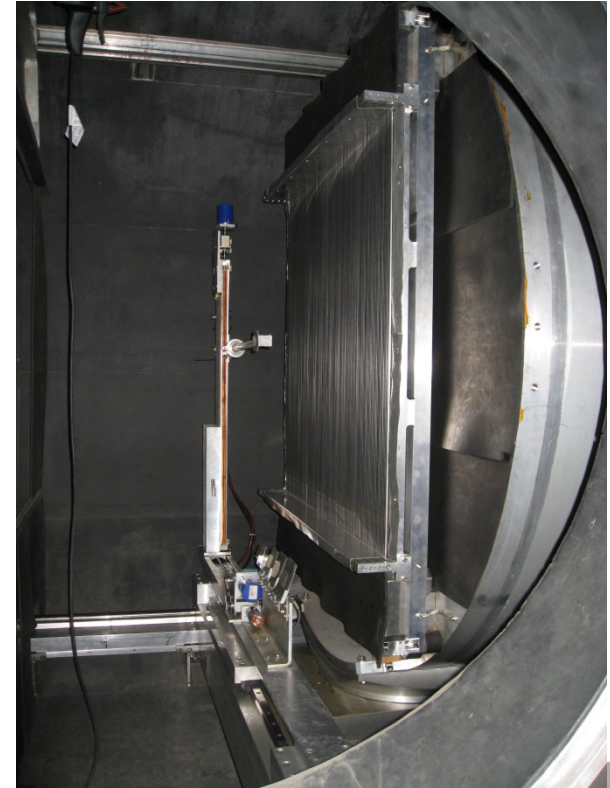
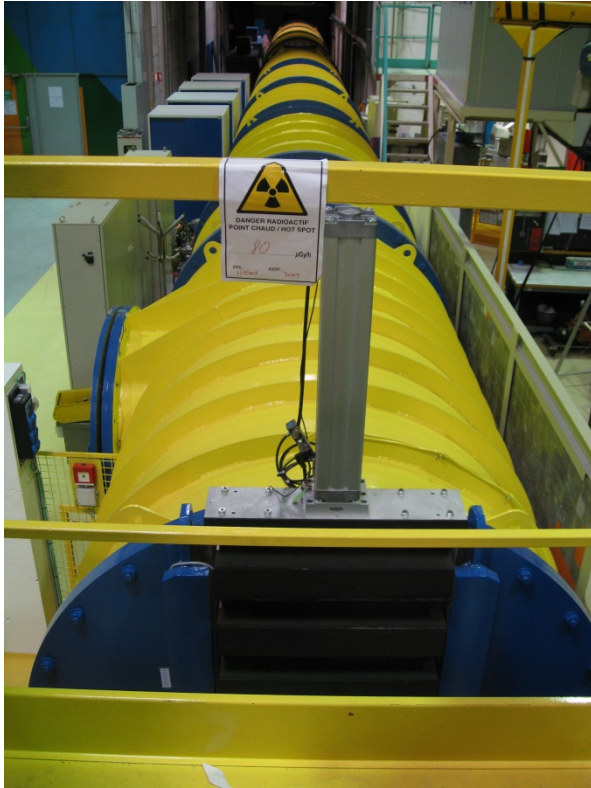
Telescopic vacuum tank



Removable section vacuum tank

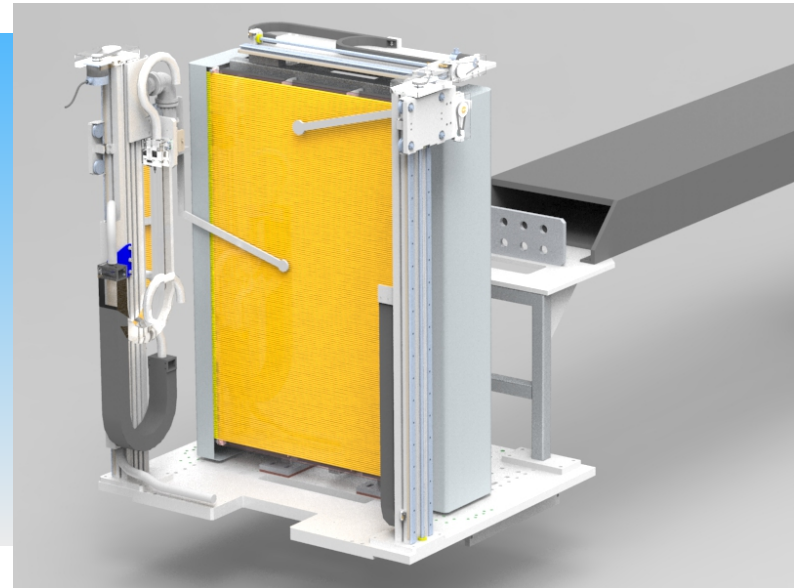
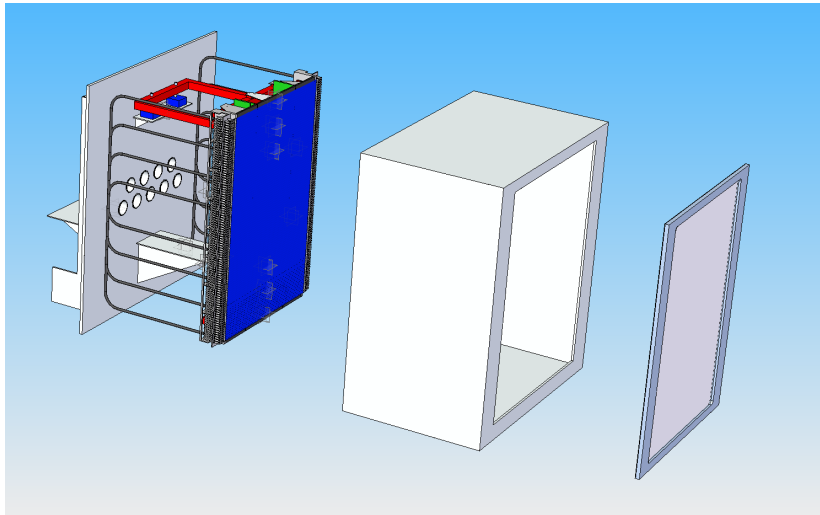
# Vacuum tank design

Key to simpler detector vacuum tank design was operation of He3 detectors in 0.1 mbar vacuum. Visit to ILL's D11 instrument followed...



# Vacuum tank design

To operate detector inside detector vacuum tank, could put whole detector in an air box, or put just the local detector electronics in an air box



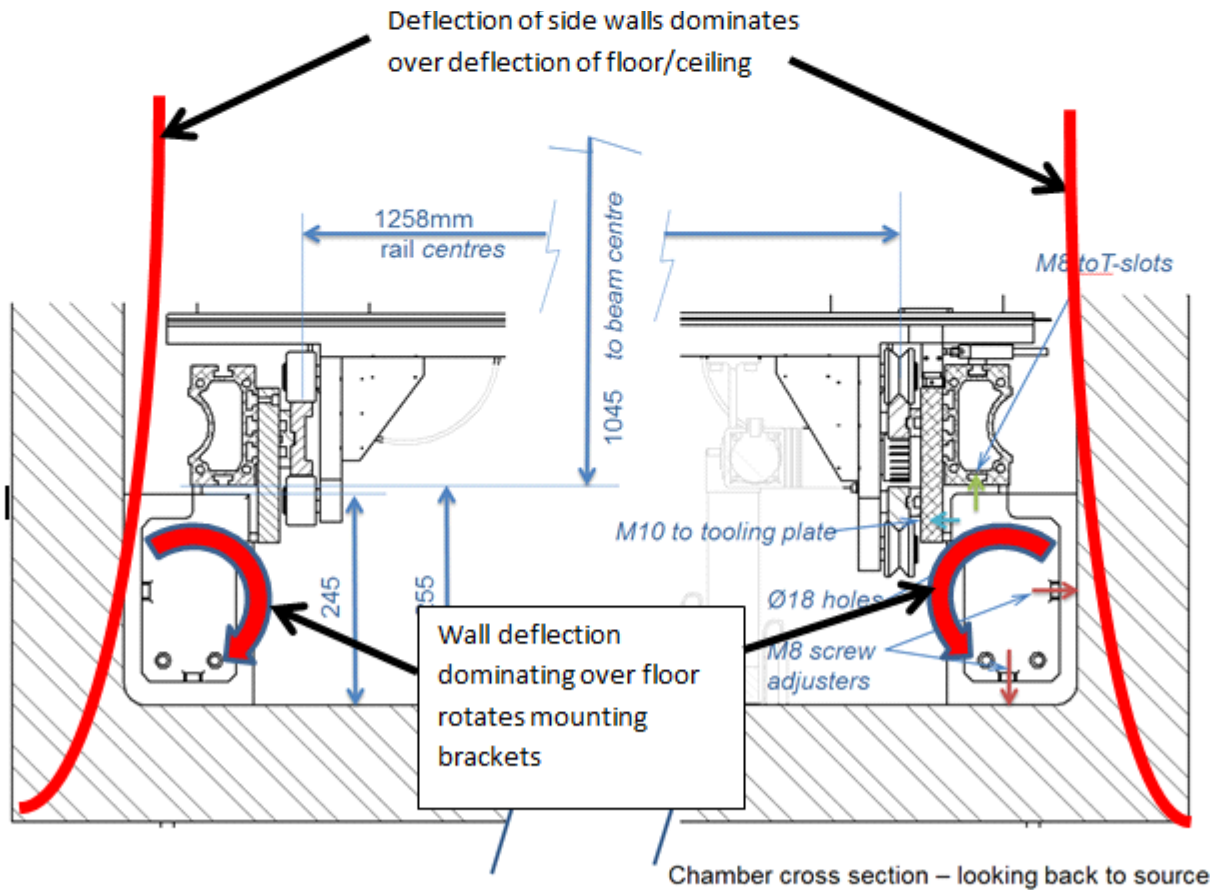
# Vacuum tank design

Resultant design of tank...



# Detector motion commissioning

## Detector carriage jamming...



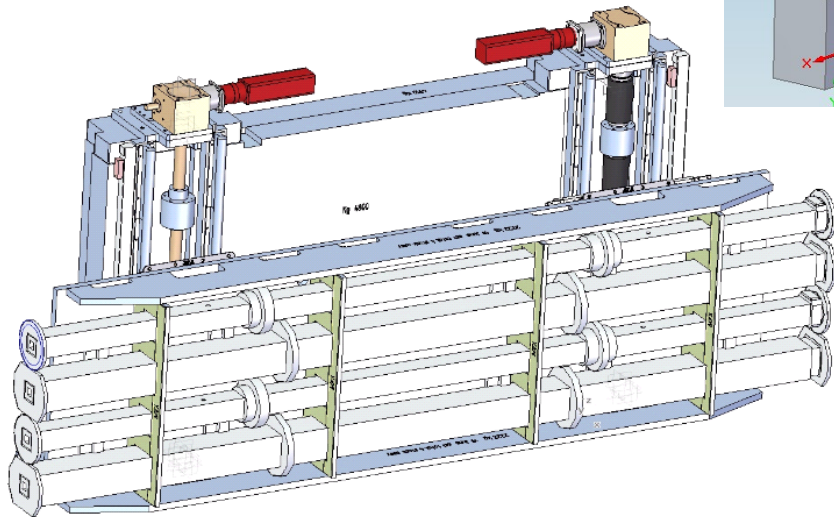
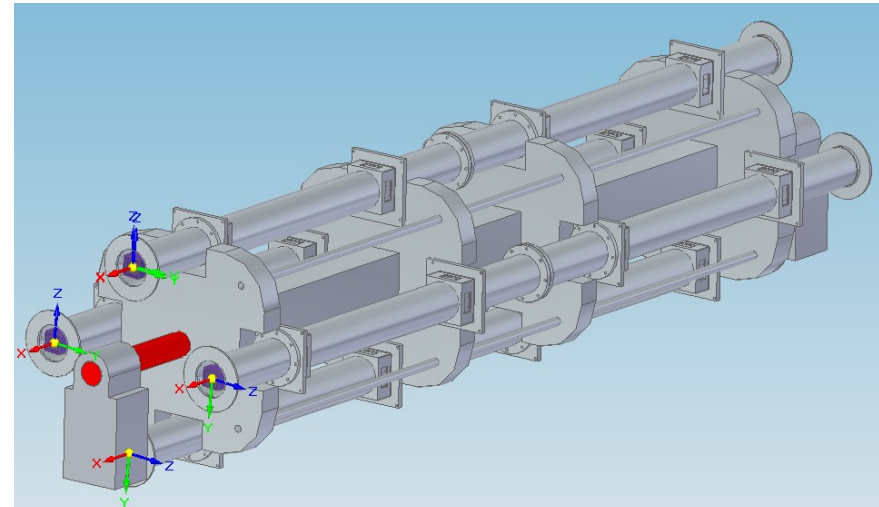
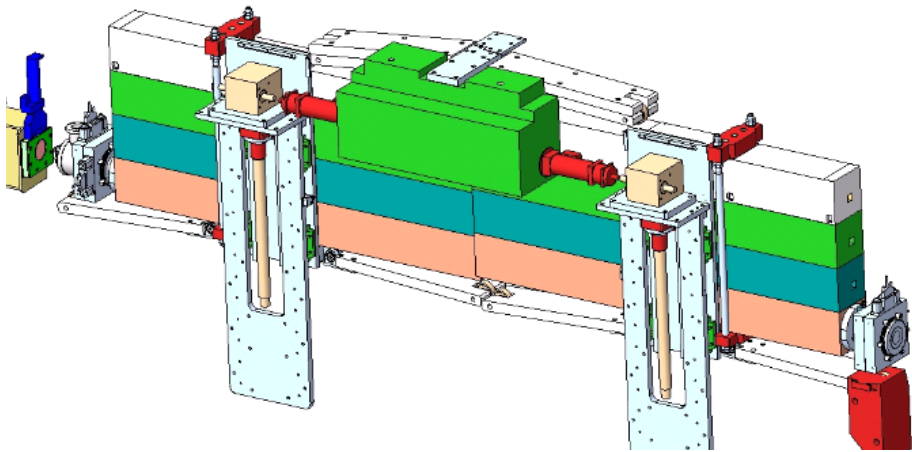
# The Zoom Instrument

## Design phase – PGC Unit

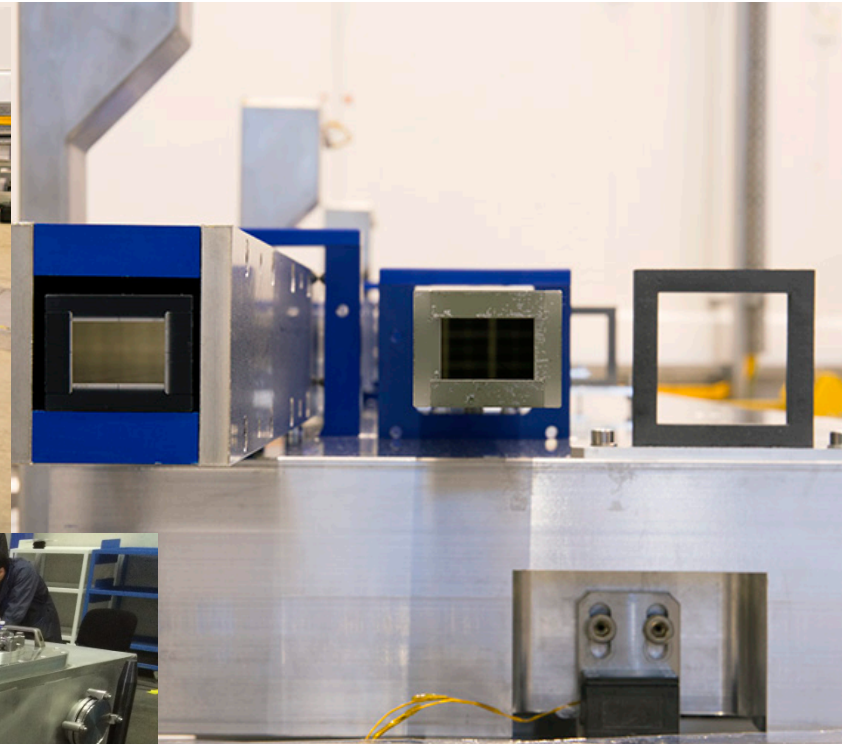
- Capability to select between polariser, guide, or collimation.
- Beam conditioning units to operate in 0.1 mbar vacuum
- Unit placed in beam is remotely selectable.
- Repeatability of insertion better than 0.1 mm for each module.
- Total change time better than 10 minutes.



# PGC Unit design



# PGC Unit design



# Design phase general

- Managing instrument scientists interpretation of the instrument specification
- If concept looks wrong, it probably is
- Problem most likely solved elsewhere
- Turning neutronic calculation results to real world

# Installation highlights Vacuum tank rails





# Sample stack testing

