

New Hardware for Soft Materials

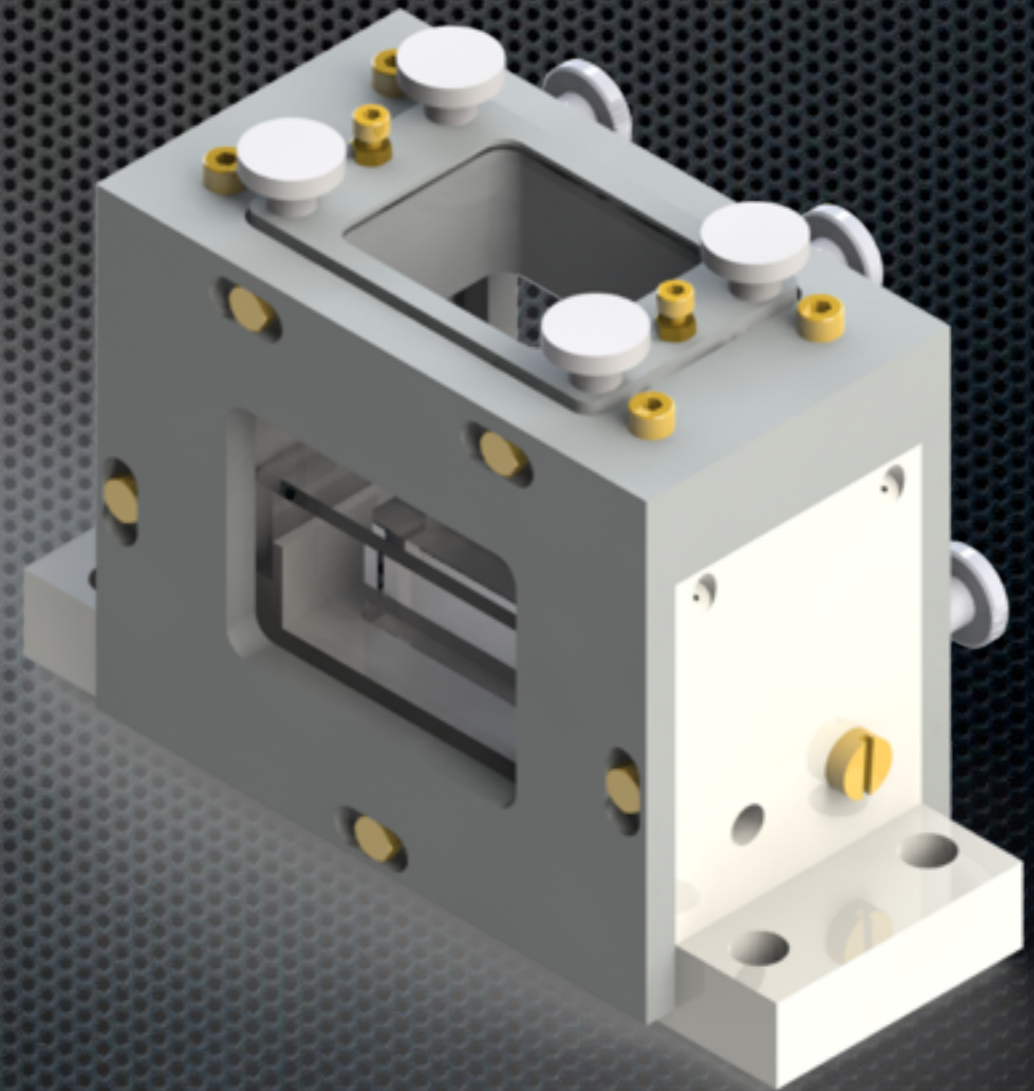
Julien Gonthier *et al.*

gonthier@ill.eu - <http://www.ill.eu/sane>

Liquid/liquid cell for neutrons

Investigate liquid/liquid interfaces with horizontal reflectometers

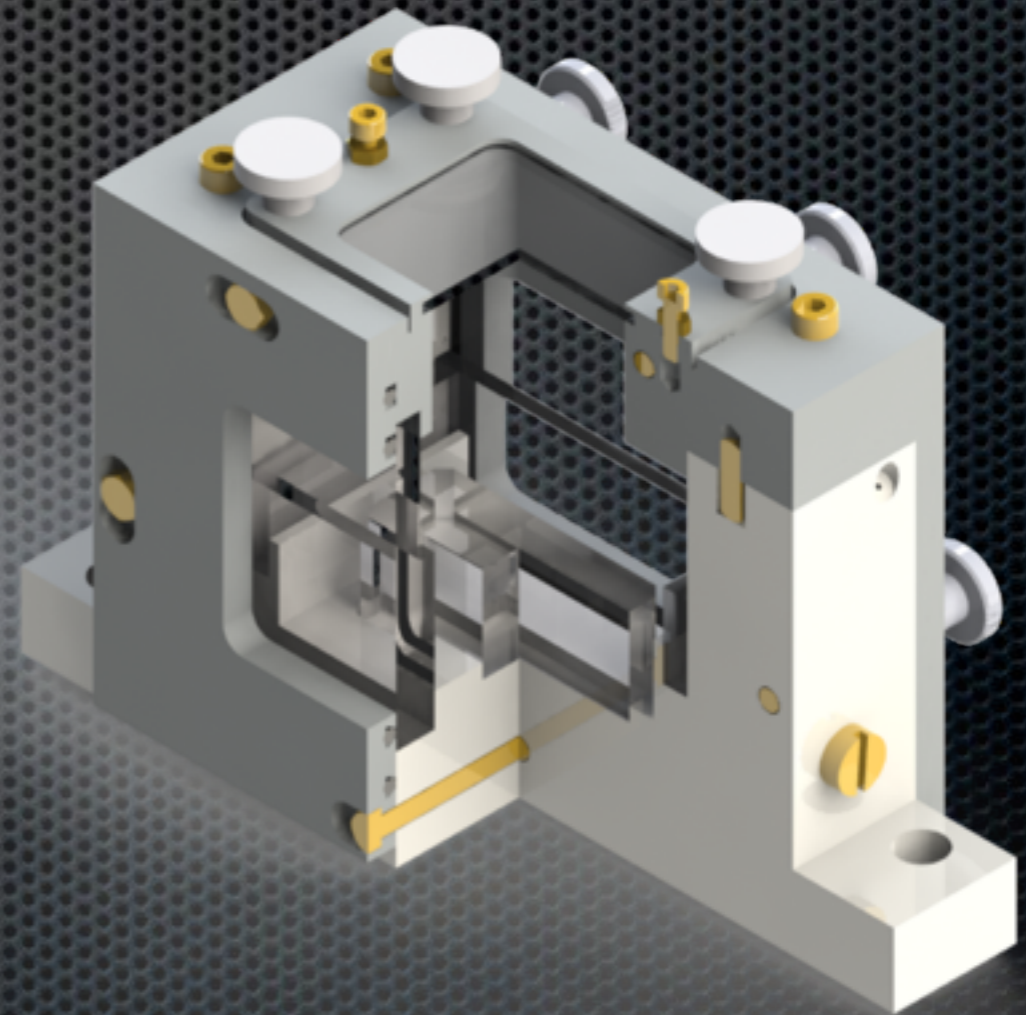
- ✦ 40 mm optimized neutron path
- ✦ Incident beam coming from below or above the interface through quartz
- ✦ Flattened meniscus
- ✦ Reduced sample volume
- ✦ Syringe ports for filling the cell
- ✦ Permanent visual access



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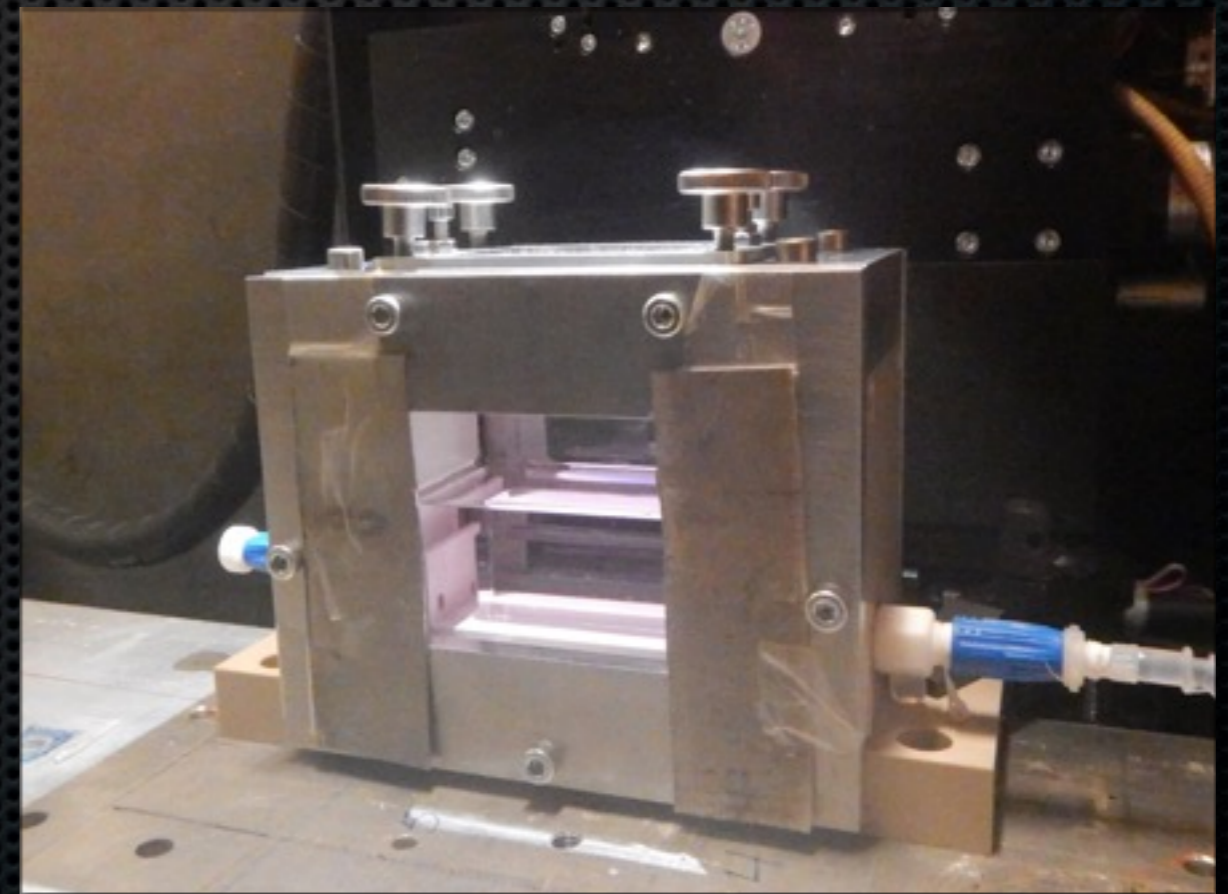
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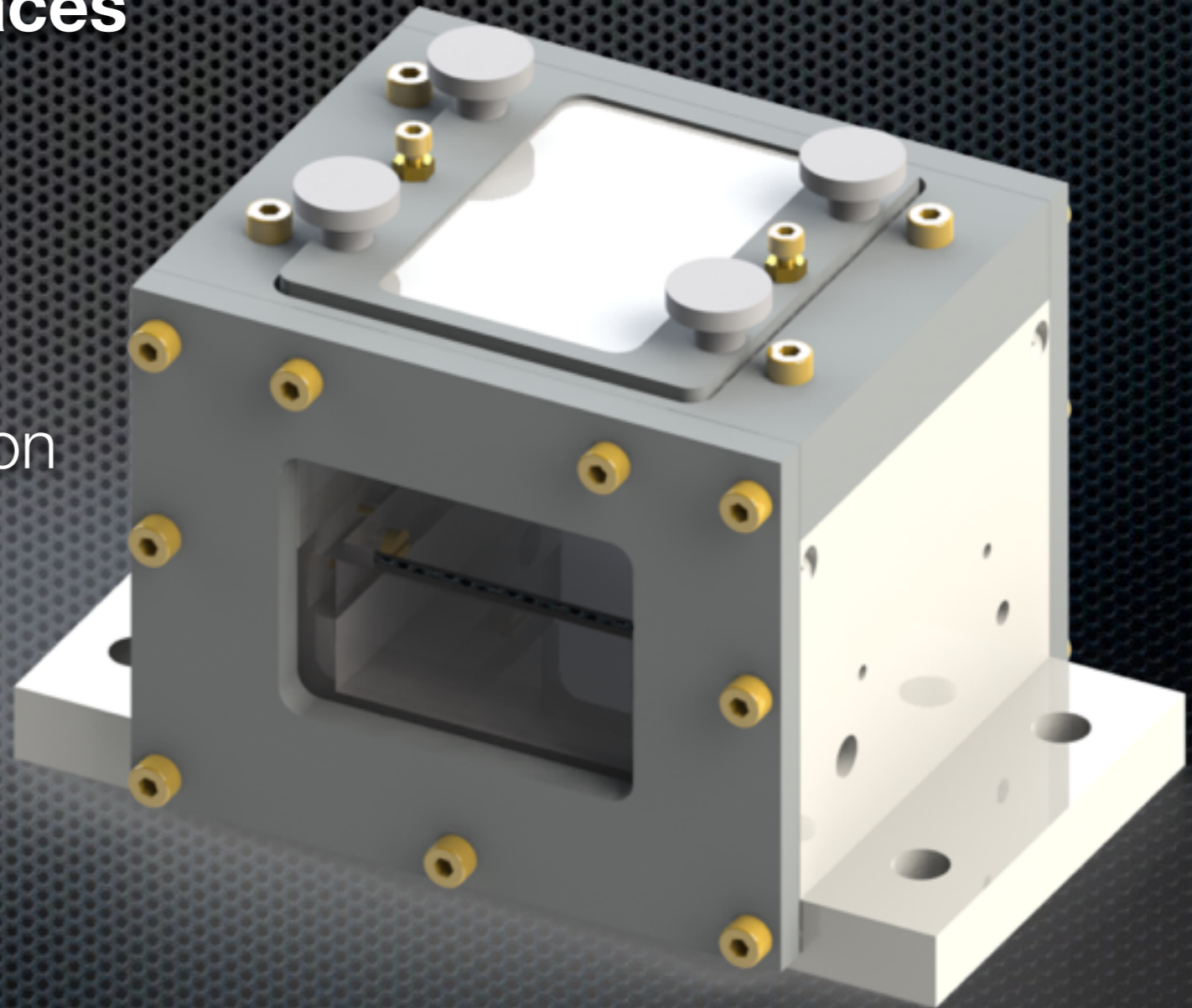


Cell in use on Figaro (ILL)

Liquid/liquid cell for X-rays

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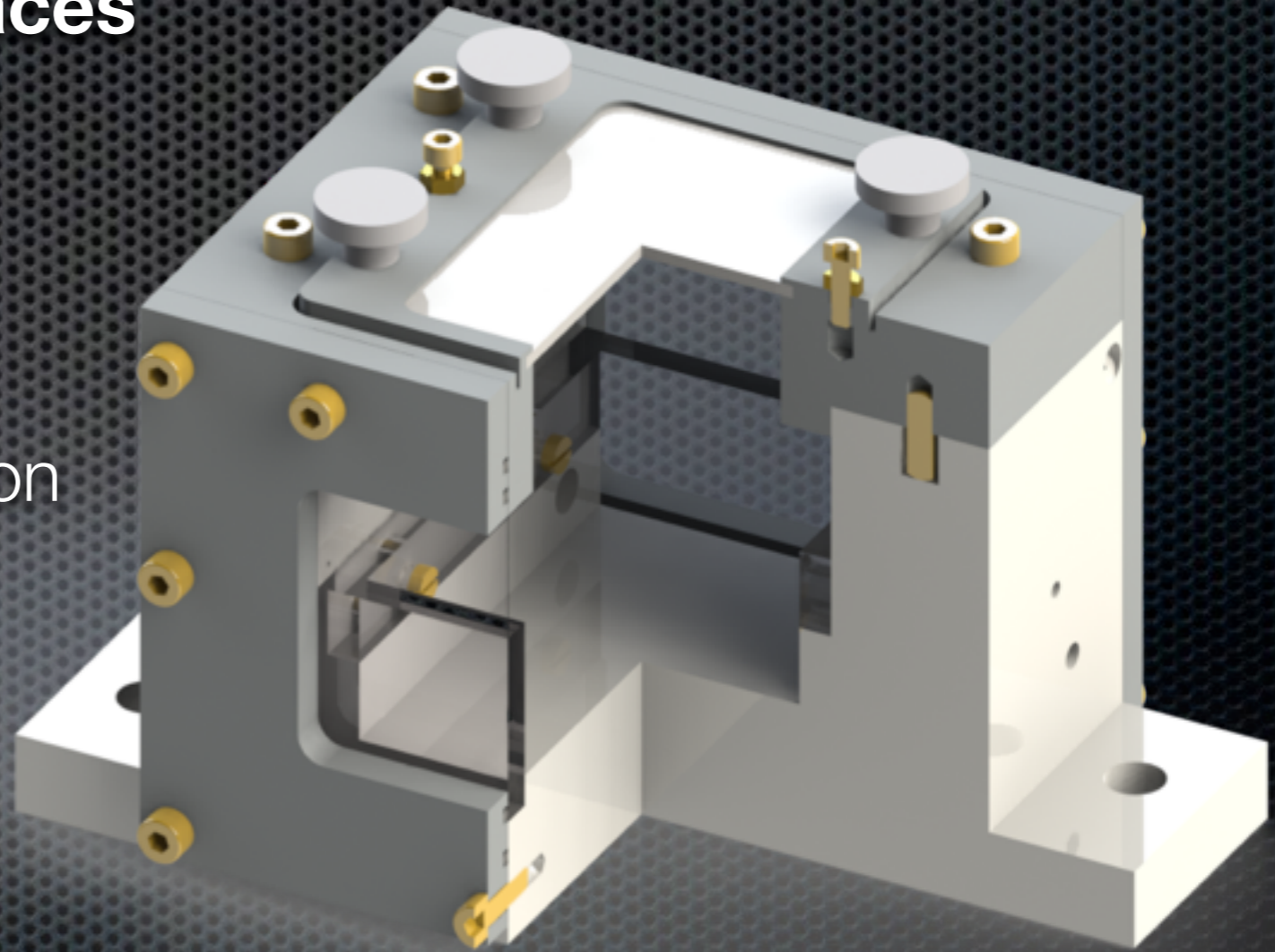
- ✦ 70 mm optimized X-ray path
- ✦ Incident beam coming only from above the interface through kapton
- ✦ Flattened meniscus
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Liquid/liquid cell for X-rays

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Photo de la cellule

Liquid/liquid cells... ;-)

*« We cannot solve our problems with the same thinking
we used when we created them. »*

Albert Einstein



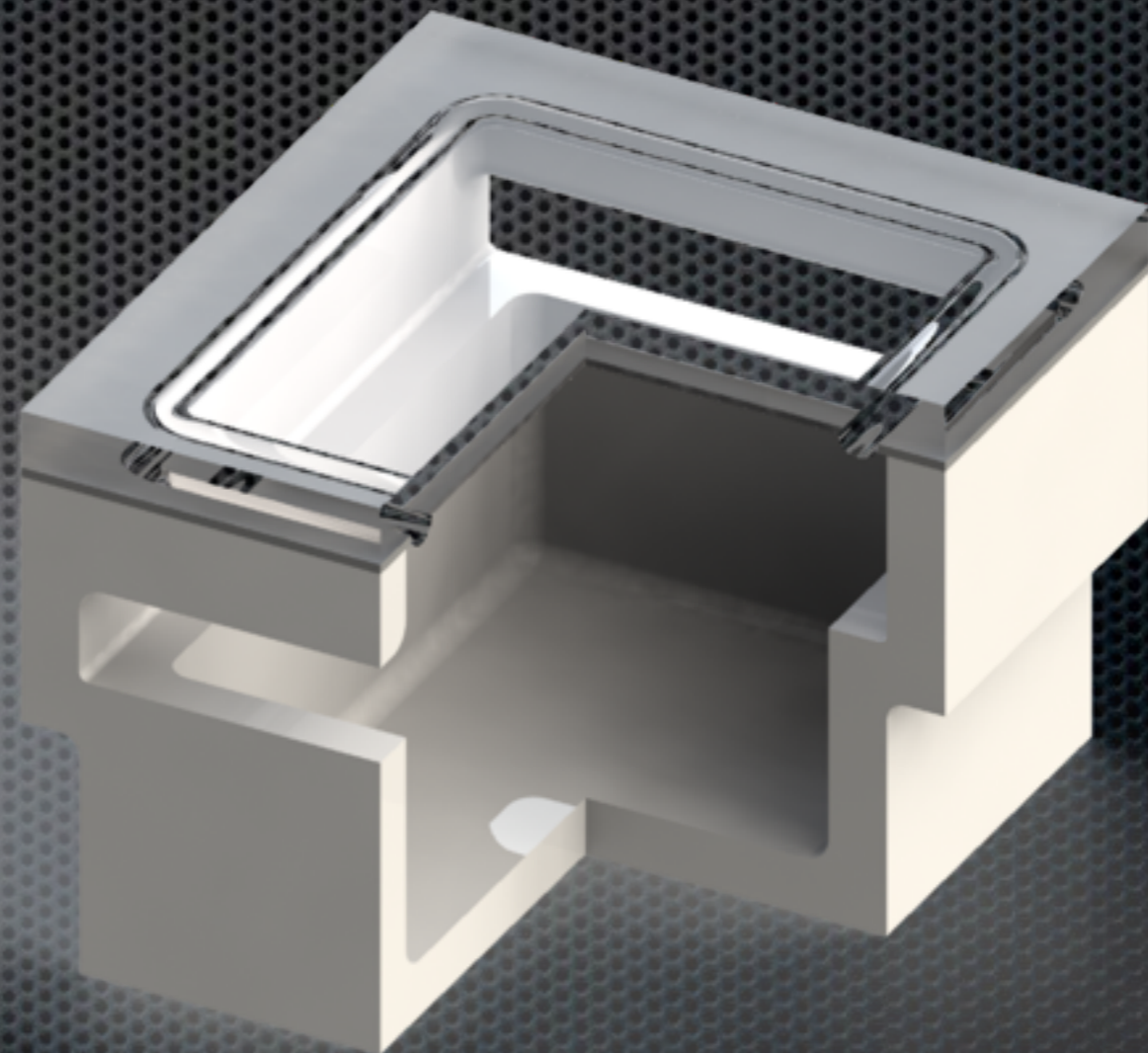
NEUTRONS
FOR SCIENCE®

T H I N K D I F F E R E N T .

Liquid/liquid cells...

Forget
machinists!

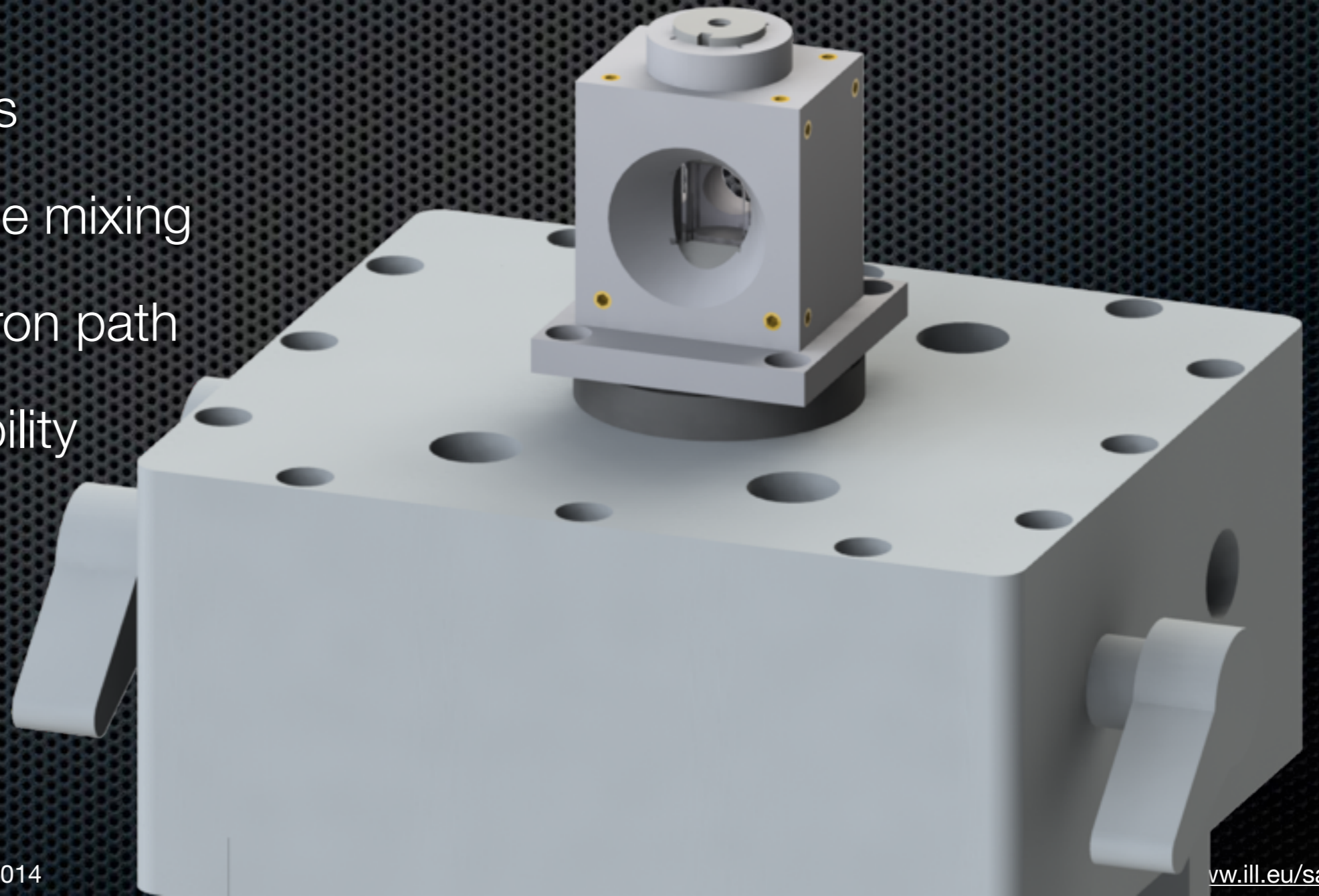
Work with
glass blowers!



New observation head for stopped-flow chambers

Needs

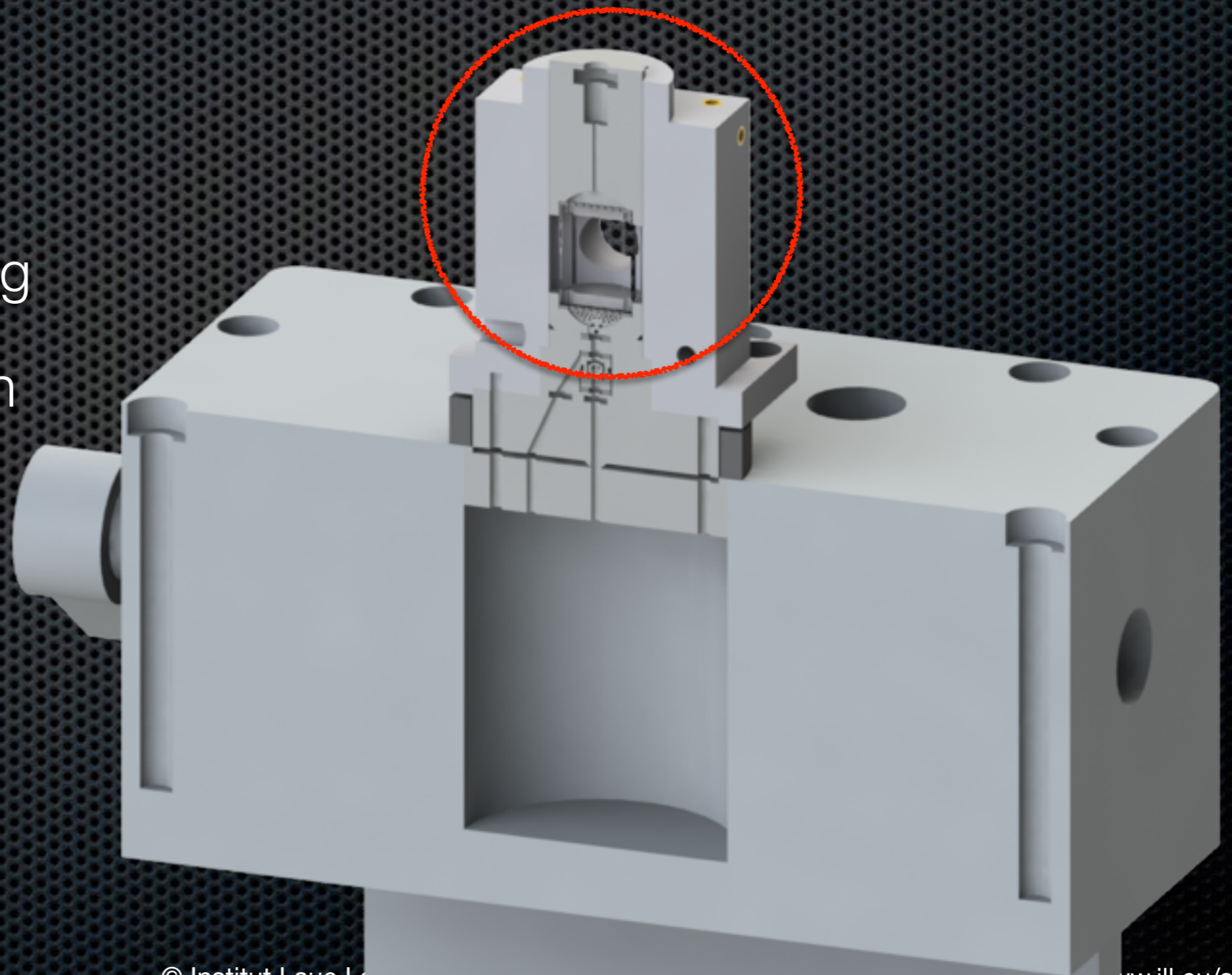
- ✦ Reduced wastes
- ✦ Improved sample mixing
- ✦ Selectable neutron path
- ✦ Improved T stability



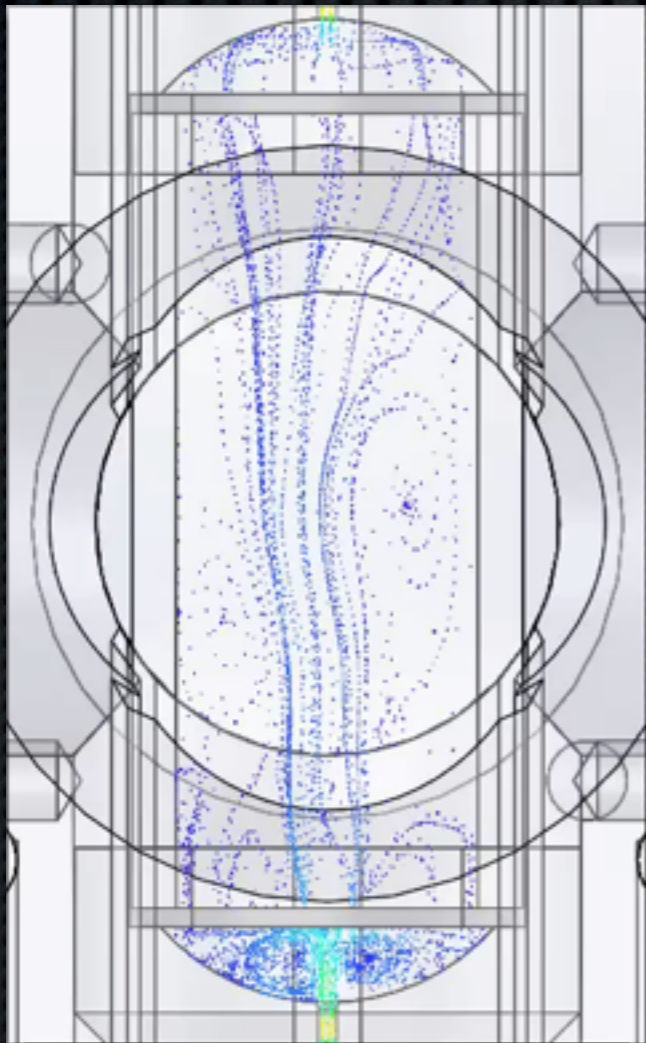
New observation head for stopped-flow chambers

Needs

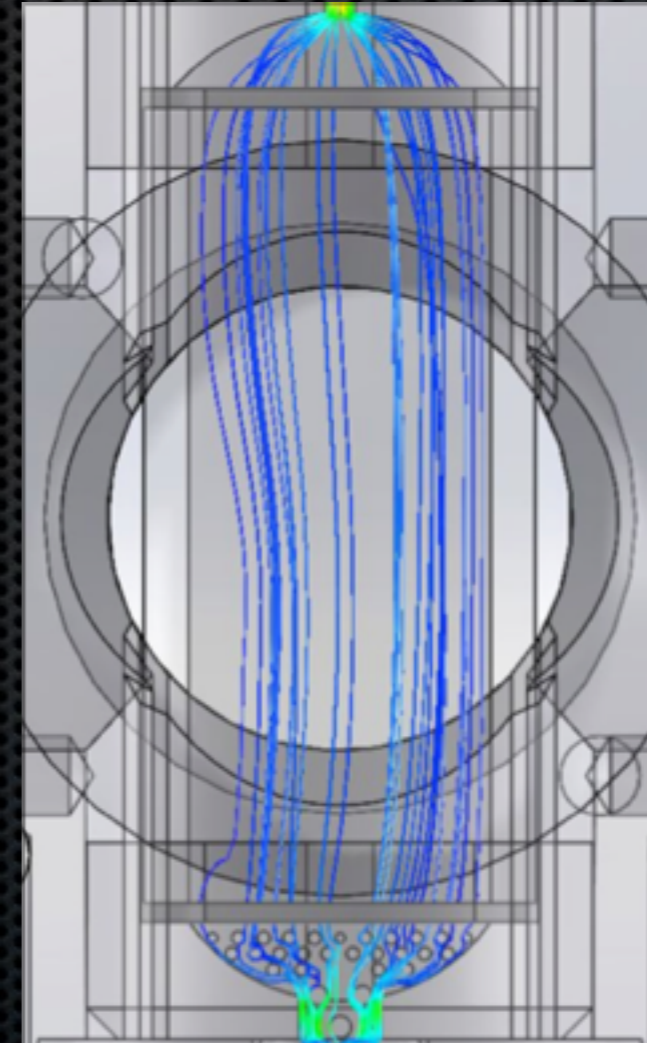
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New observation head for stopped-flow chambers



Without damping grid

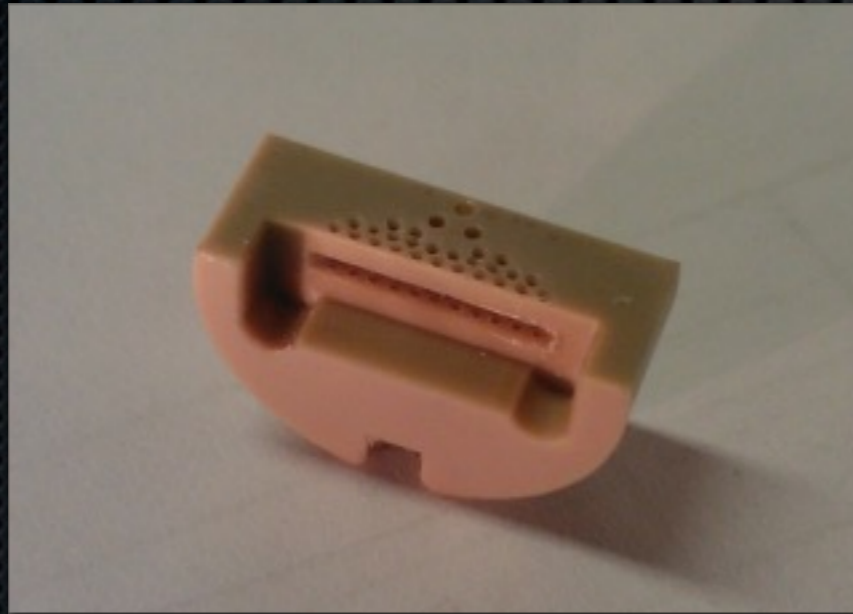


With damping grid

New observation head for stopped-flow chambers

Old design

New observation head for stopped-flow chambers



We love working with Andy, Colin, Oleg *et al.* (ISIS)
Thanks for their great help !

New observation head for stopped-flow chambers

New design

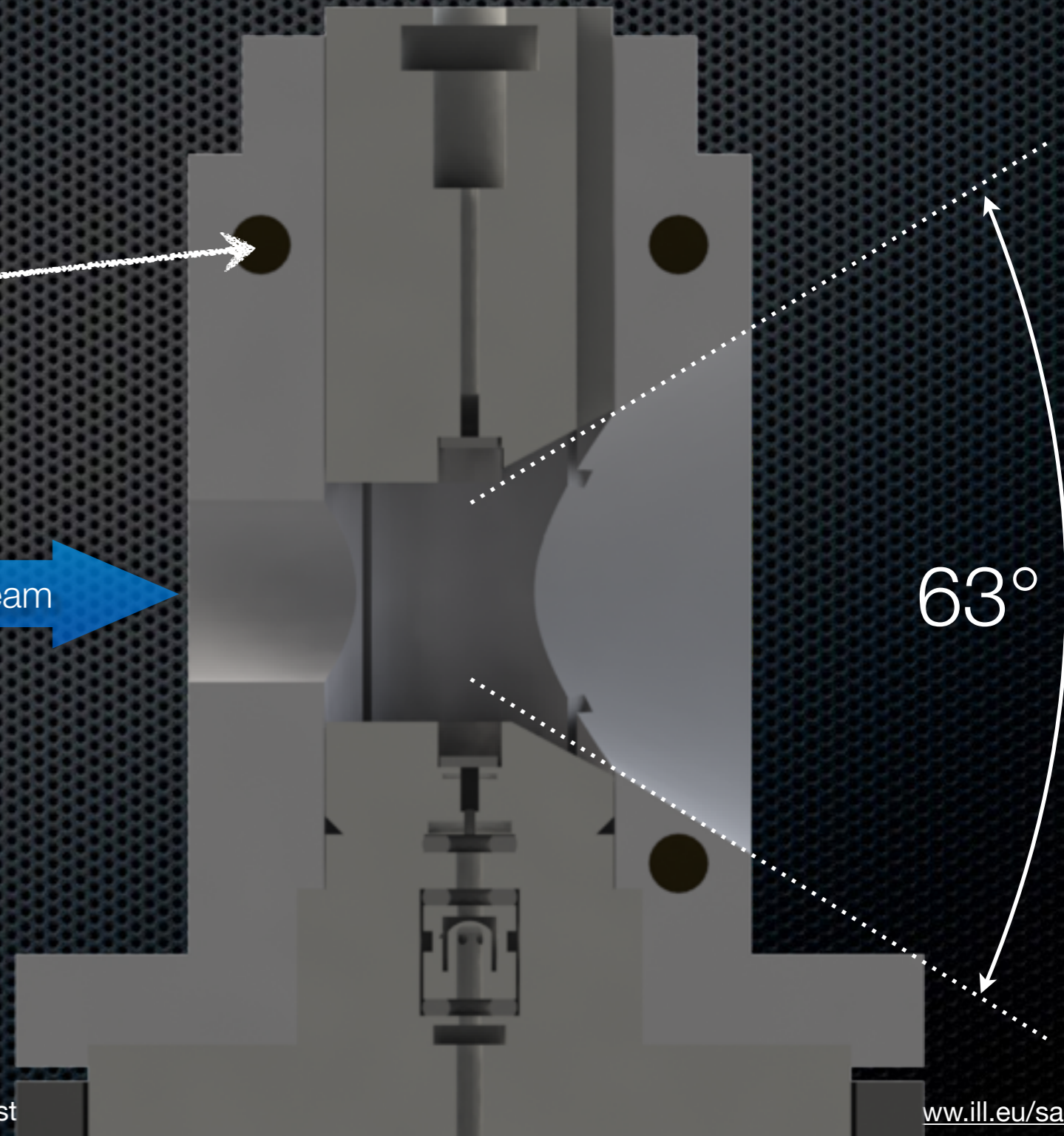
New observation head for stopped-flow chambers

Fluid circuit plugged
to schiller for T control



Perspectives:

- ✦ add insulating envelope
- ✦ use different neutron paths

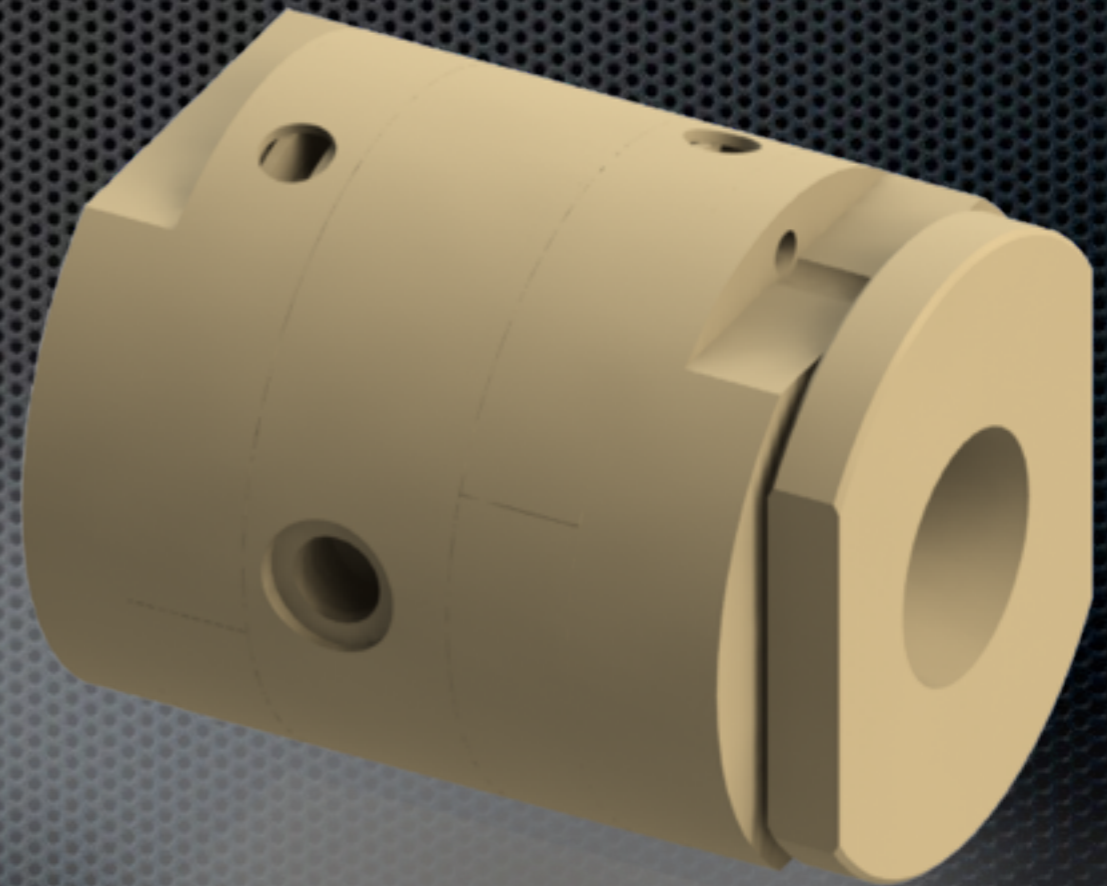


63°

5 kbar cells for NSE & SANS

Needs

- Non-magnetic for Spin Echo
- Bio-compatible
- 45° access to scattered beam
- No diffuse scattering
- Easy to manipulate and clean
- T controlled (0 - 100 °C)



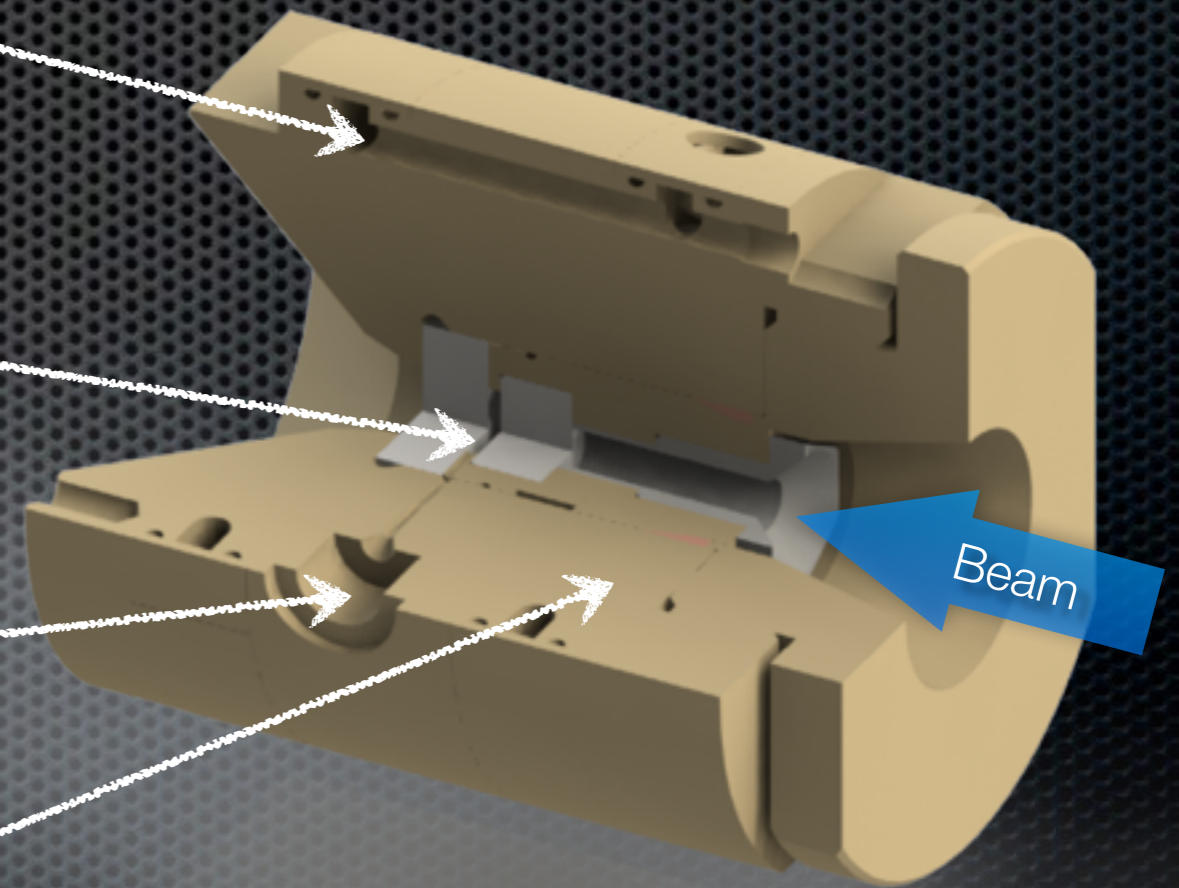
5 kbar asymmetric cells for NSE & SANS

Fluid circuit plugged
to schiller for T control

Adjustable sample volume

Sample circulation
under pressure

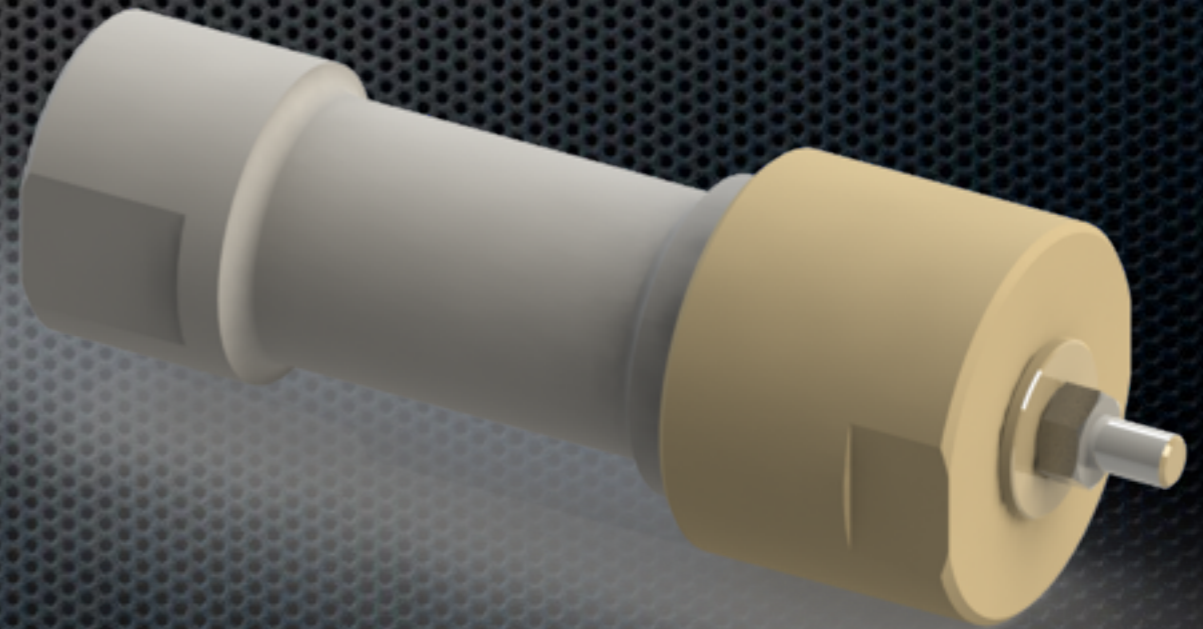
CuBe for Spin Echo
Custom 465 SS for SANS



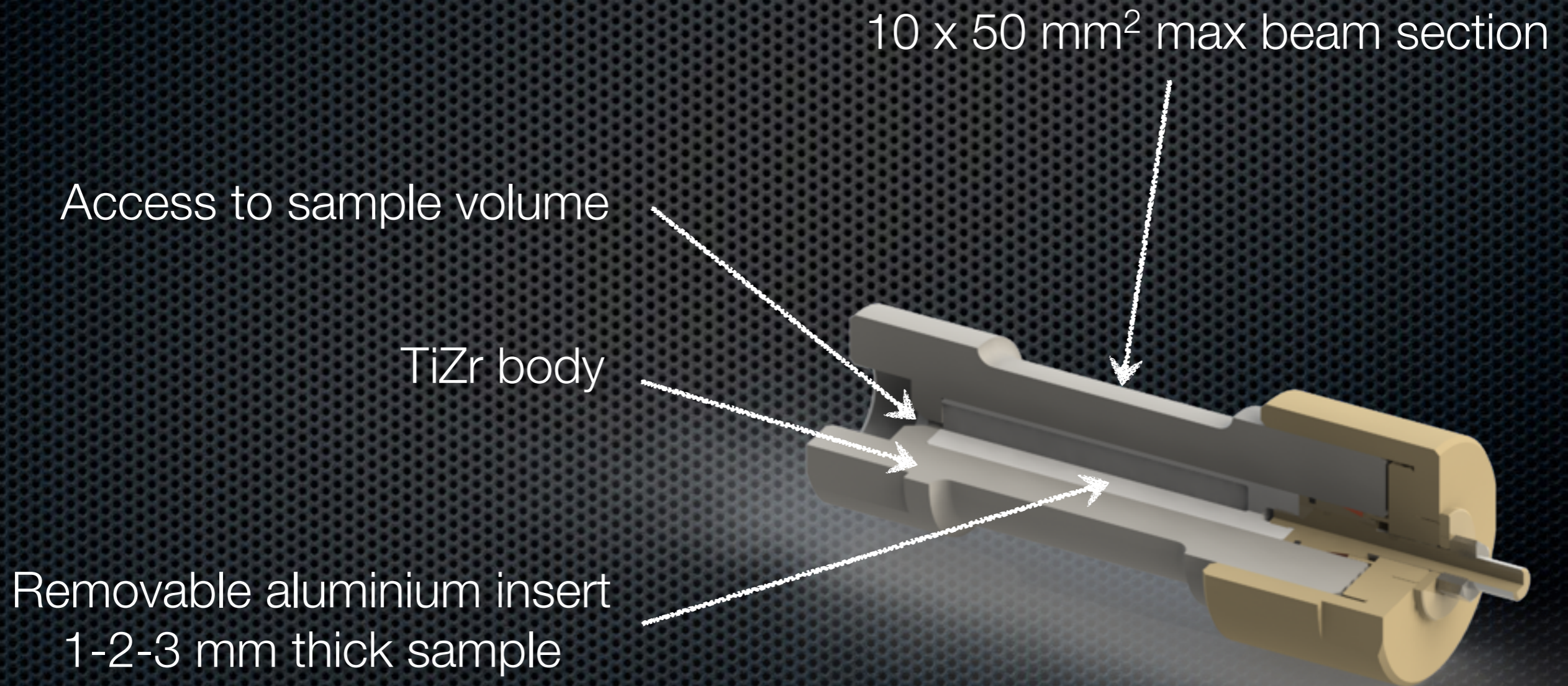
5+ kbar flat neutron windows cell

Needs

- Investigate biological samples on back-scattering spectrometer
- Pressure controlled up to 5-7 kbar
- Flat windows to simplify data analysis
- Easy to manipulate and clean



5+ kbar flat neutron windows cell



Special thanks to...

*S. Baudoin, B. Demé, G. Fragneto, F. Ivens, E. Lelièvre-Berna, P. Lindner,
C. Payre, A. Perkins, J. Peters, R. Schweins, E. Scoppola, E. Watkins
ILL — Grenoble, France*

*B. Annighöfer, A. Brulet, S. Combet-Jeancenel, C. Loupiac
LLB — Gif sur Yvette, France*

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INR — Moscow, Russia*

*O. Konovalov
ESRF — Grenoble, France*

Thank you for your attention