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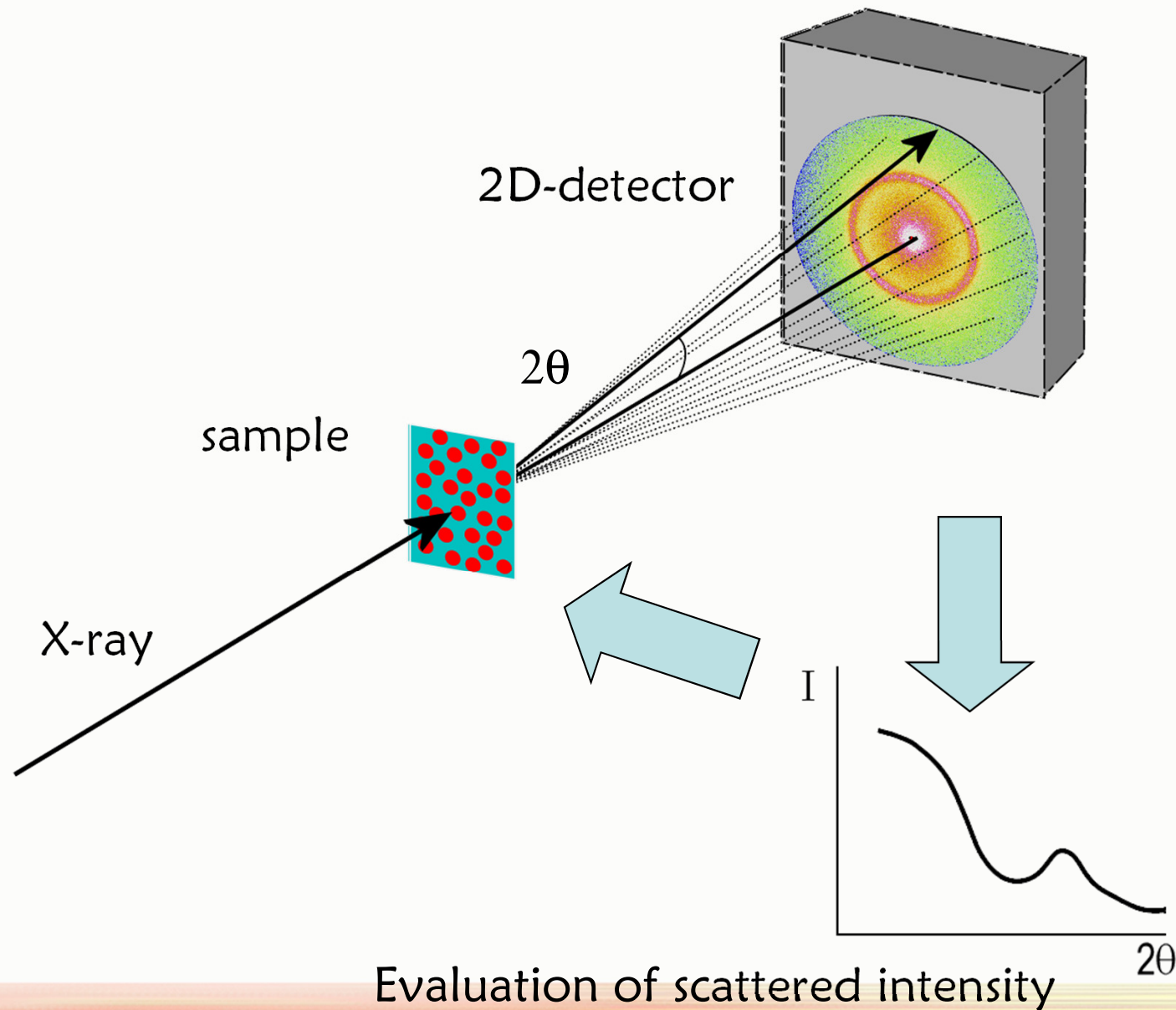
ieap



Nanodiffraction @ MINAXS of PETRA3

Christina Krywka

Small / Wide Angle X-ray Scattering



- * World's most brilliant source

- * 2.3 km circumference

- * 6.5 GeV positrons

- * 14 beamlines

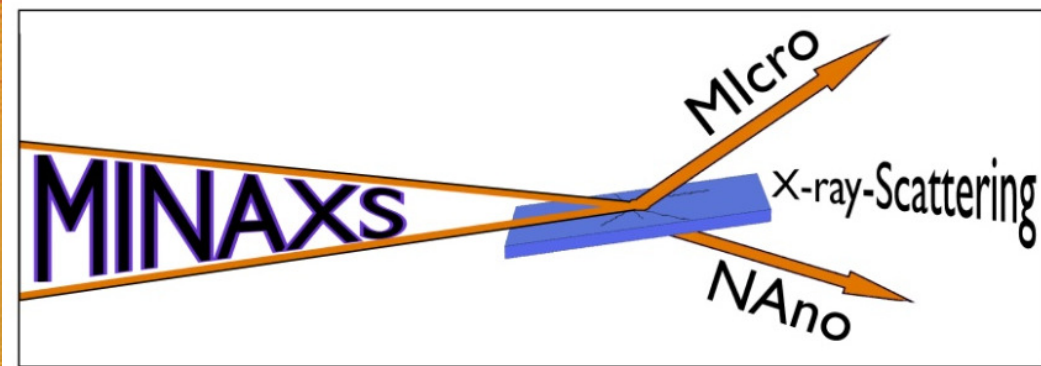
- * concrete floor $280 \times 24 \times 1 \text{ m}^3$

- * First beam on 13.4.2009

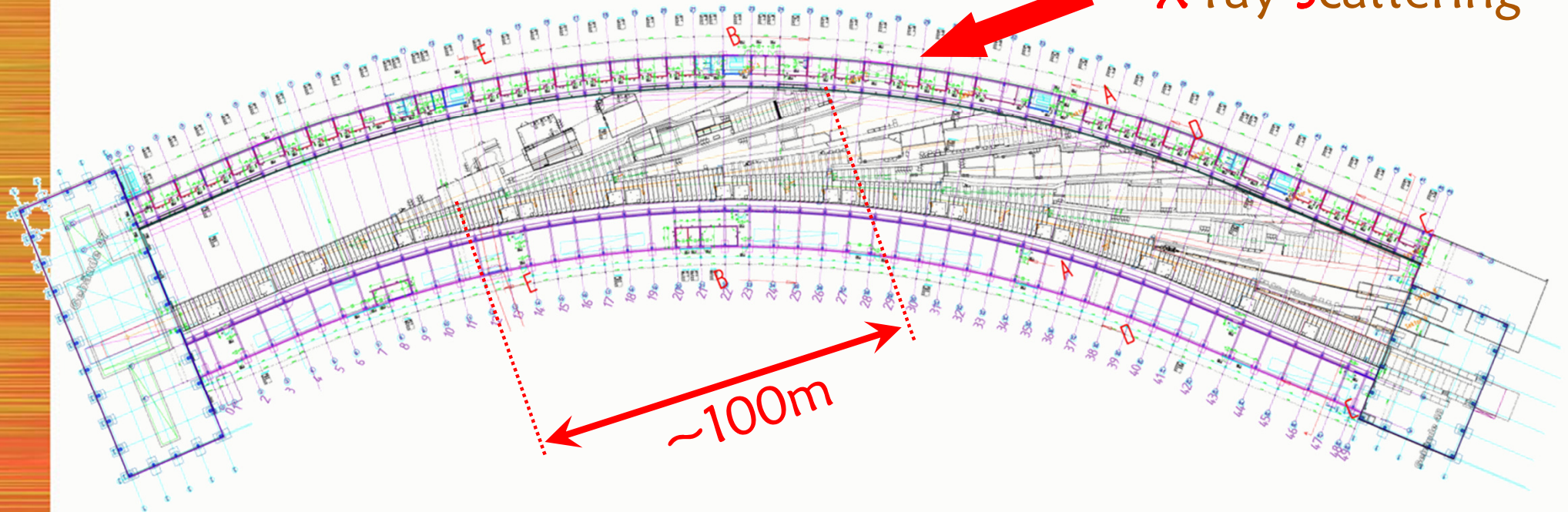
- * First xray on 17.7.2009



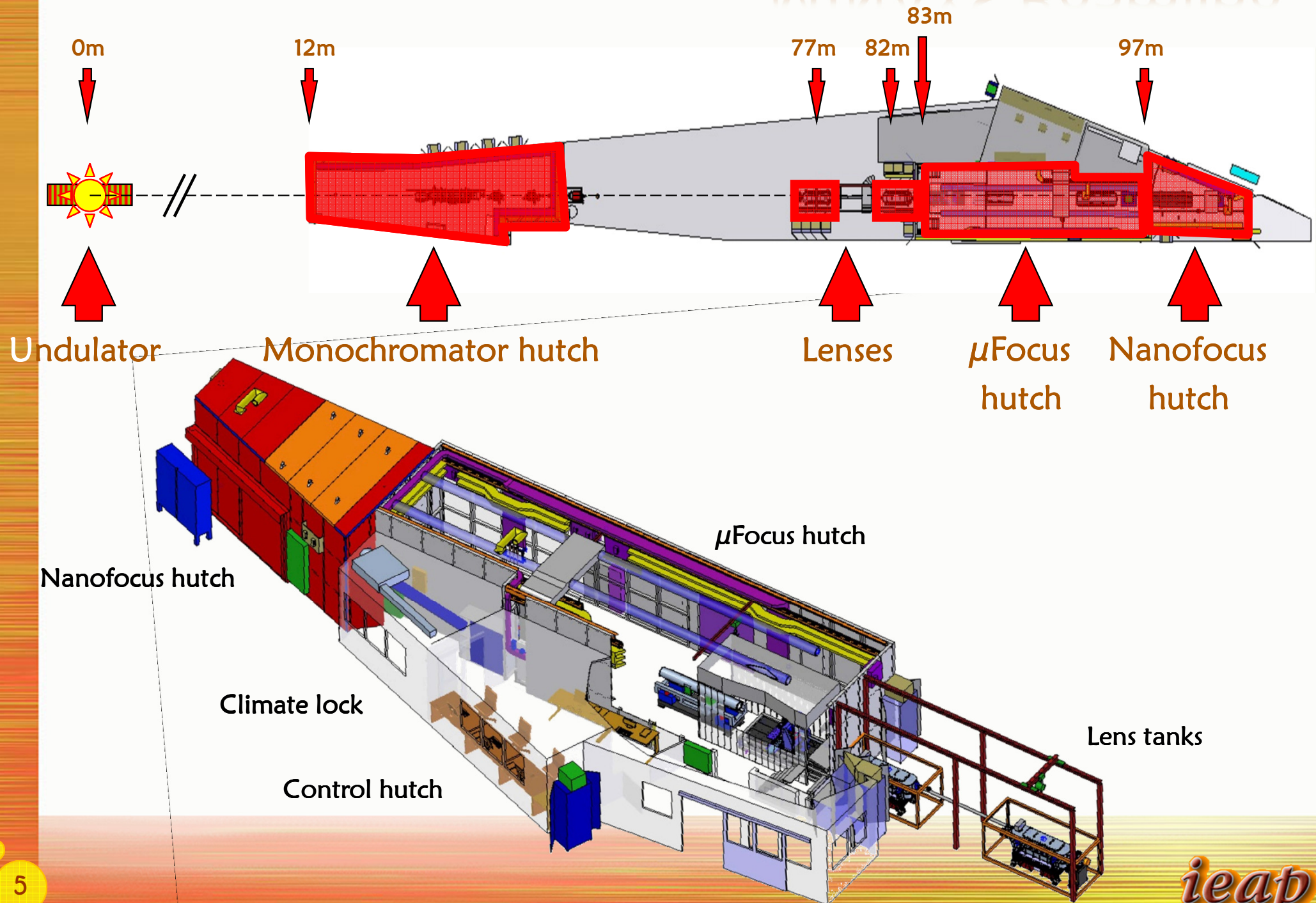
MINAXS Beamline



MIcro & NAAnofocused
X-ray S scattering



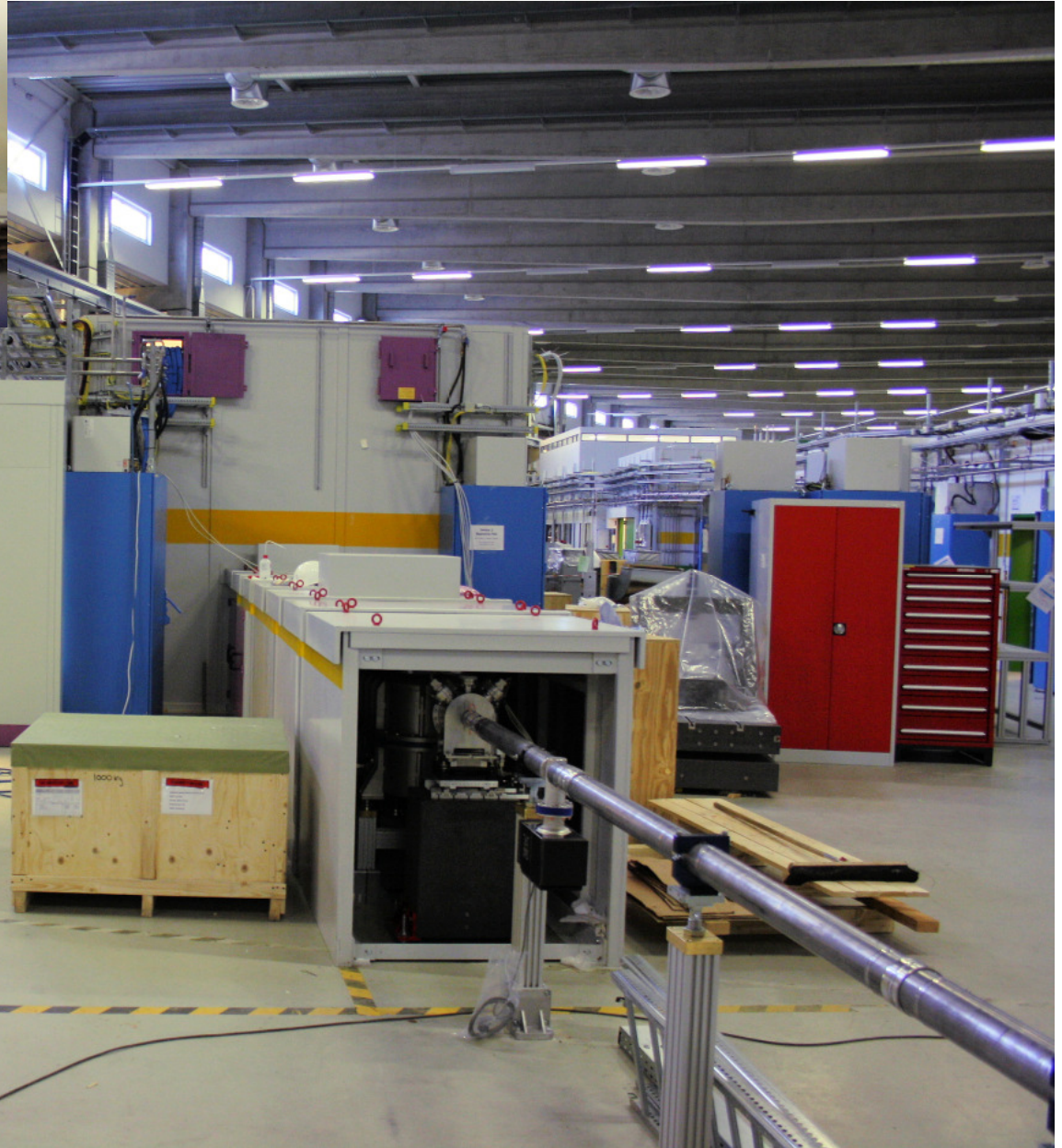
MINAXS Beamline



Petra III Hall

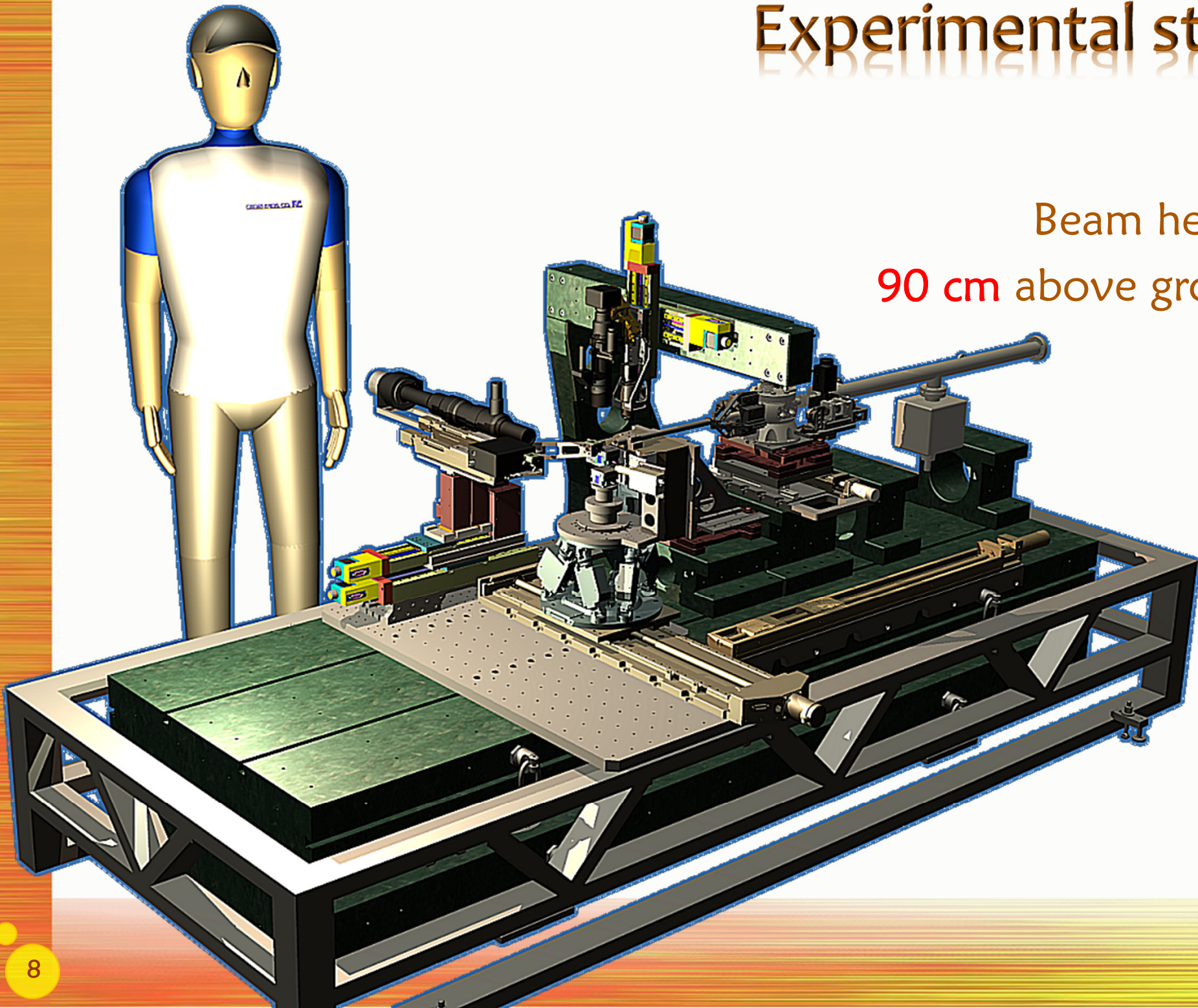


Experimental Hutch



Experimental stage

Beam height:
90 cm above ground



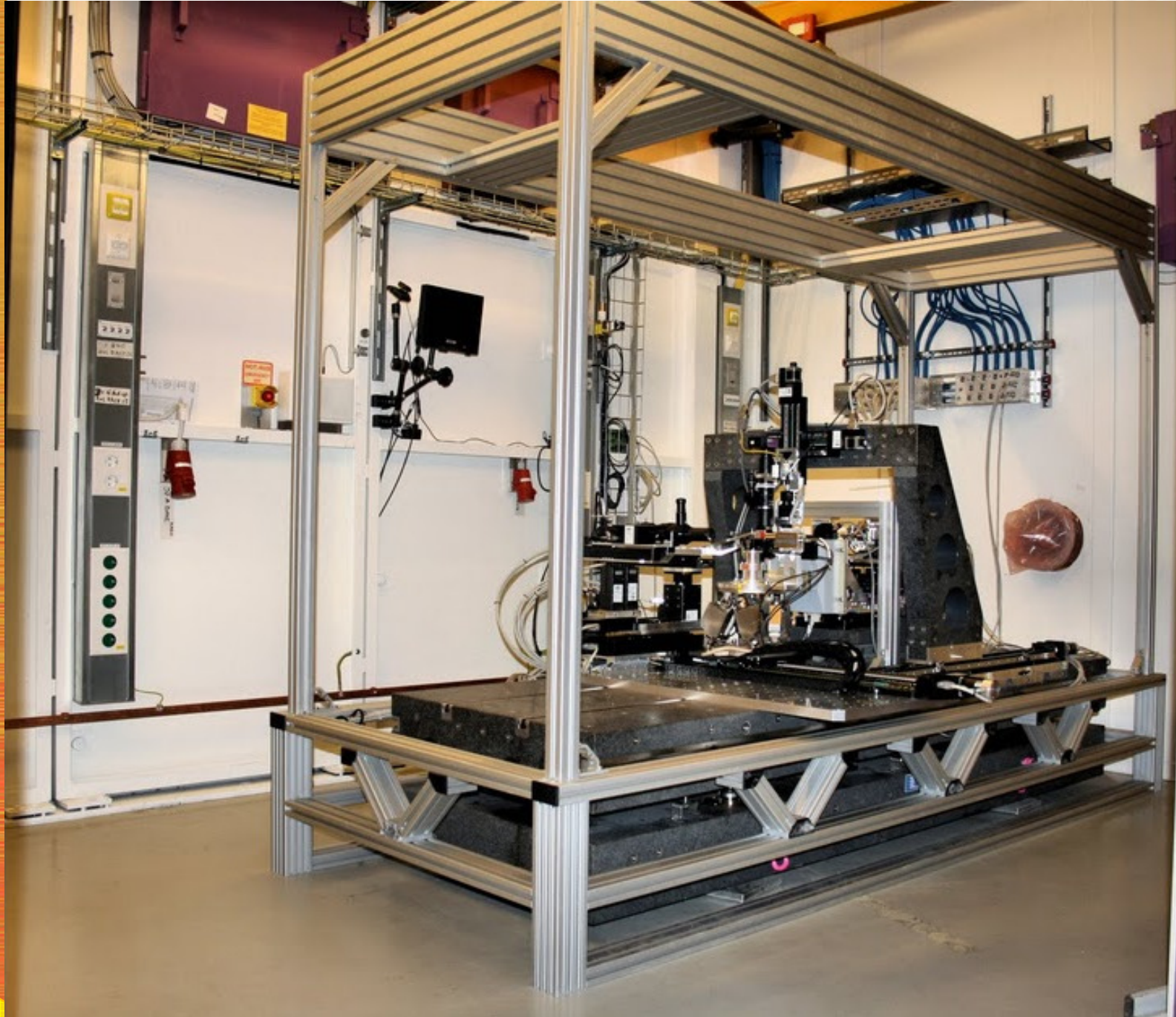
Experimental setup



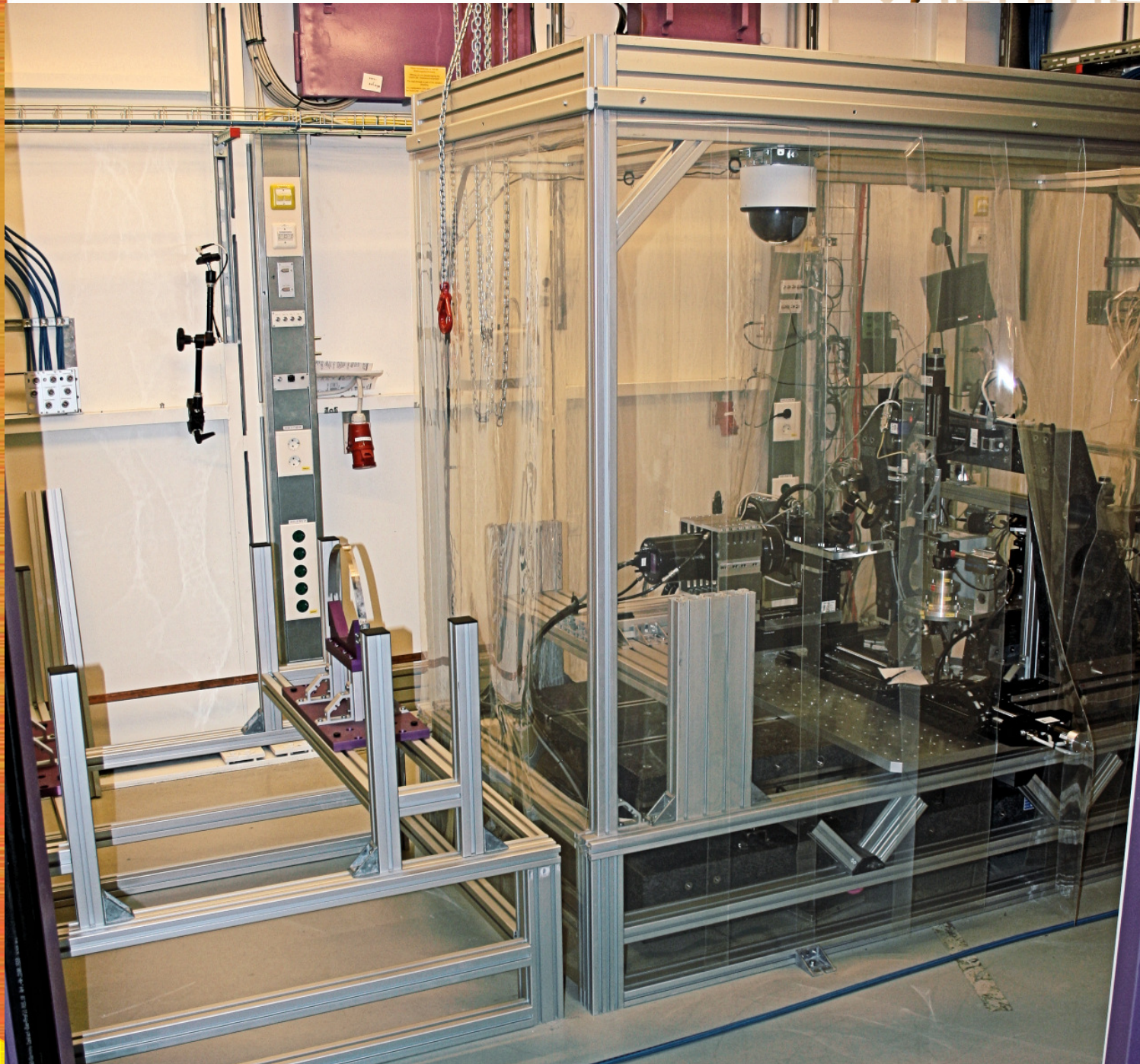
Experimental setup



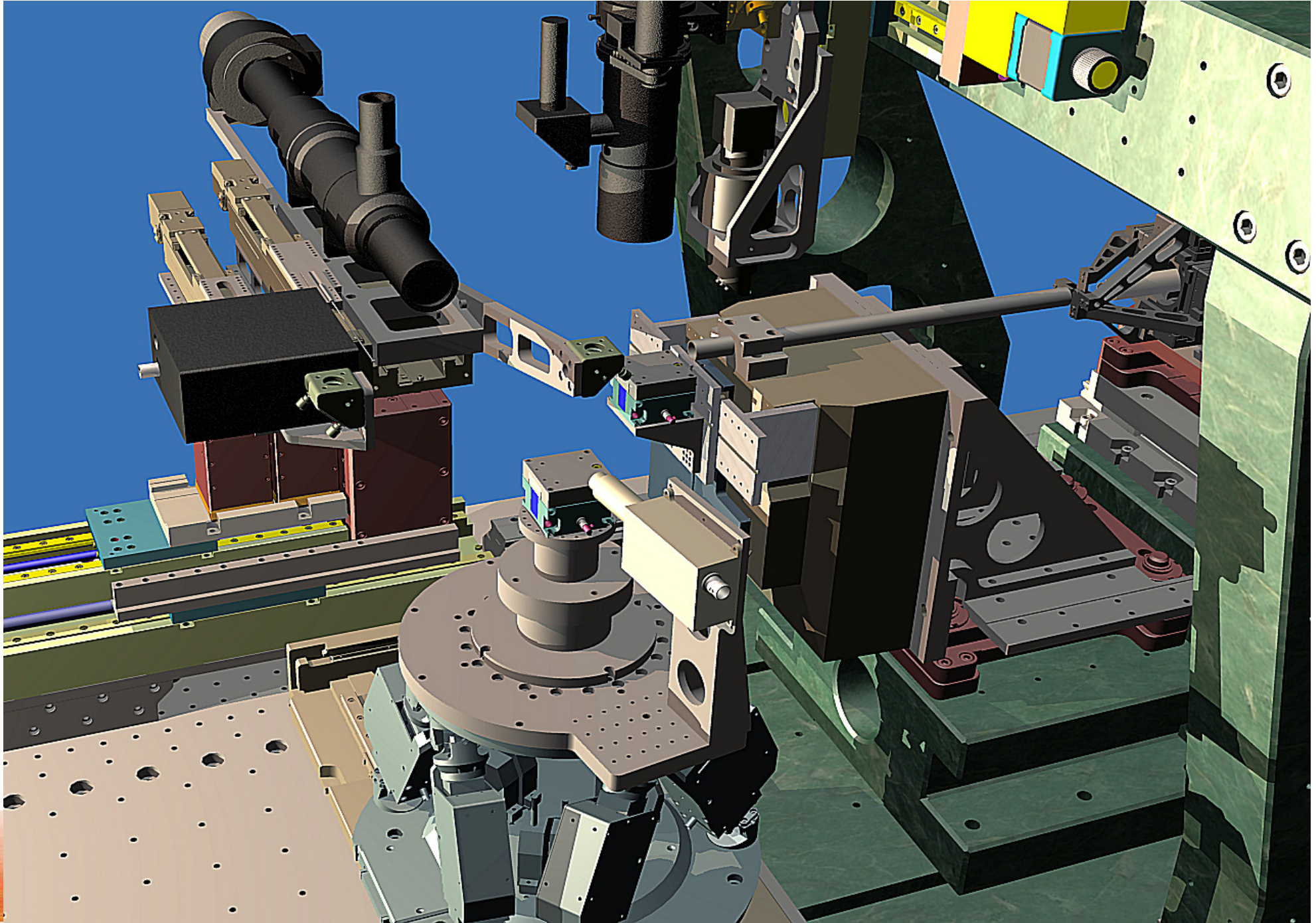
Experimental setup



Experimental setup

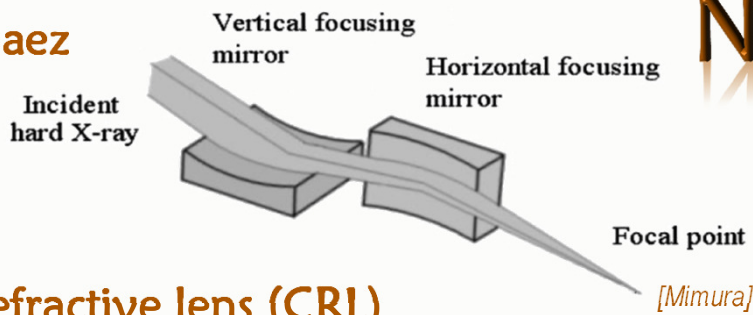


Experimental setup

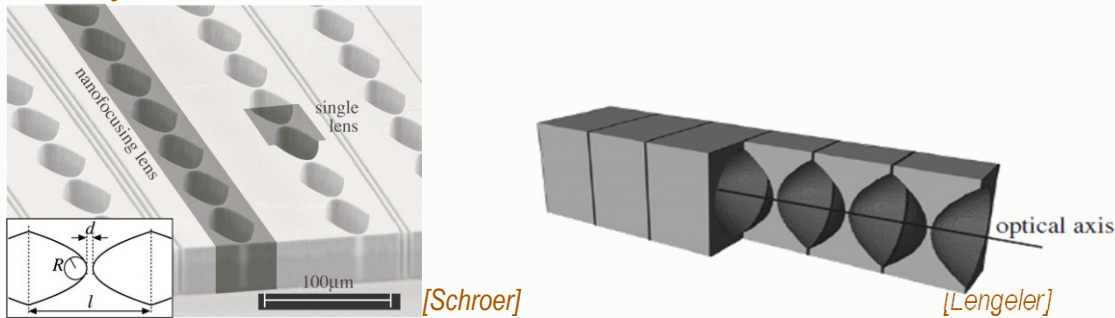


Nanofocusing Optics

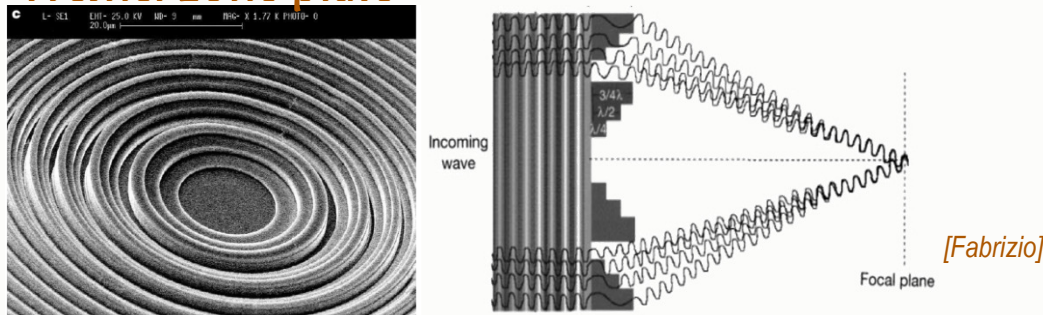
Kirkpatrick-Baez mirror



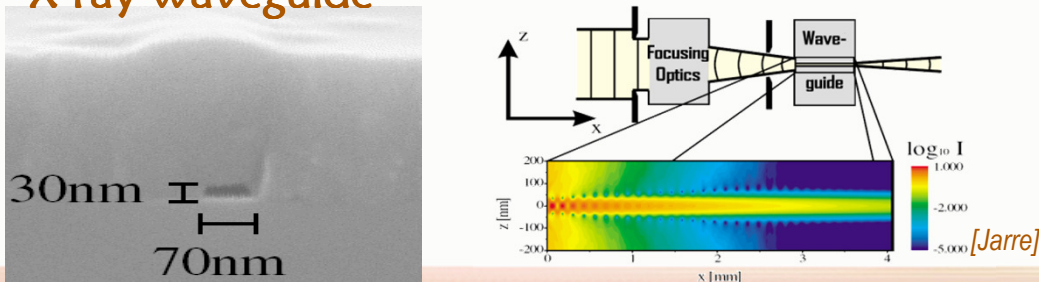
Compound refractive lens (CRL)



Fresnel zone plate



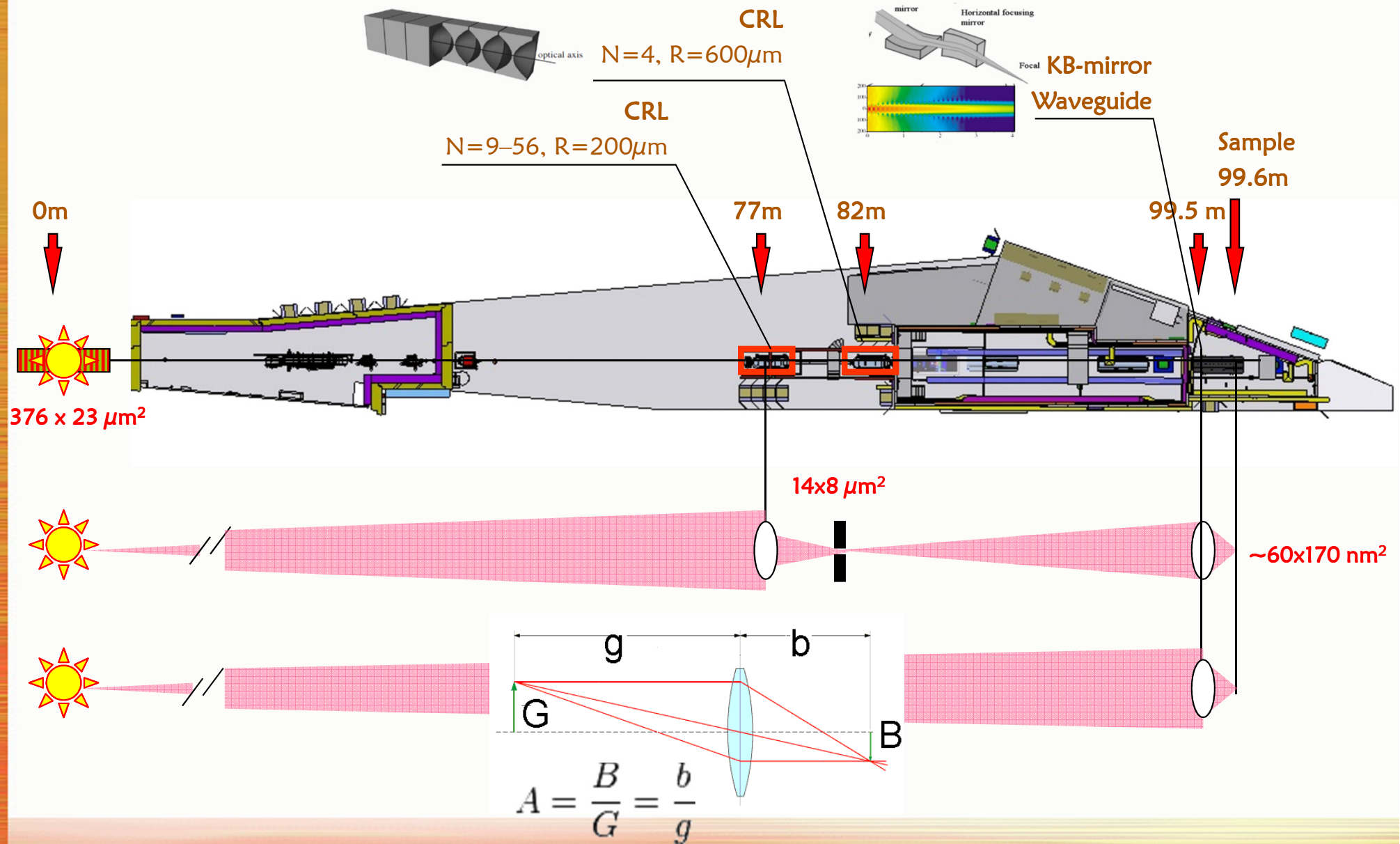
X-ray waveguide



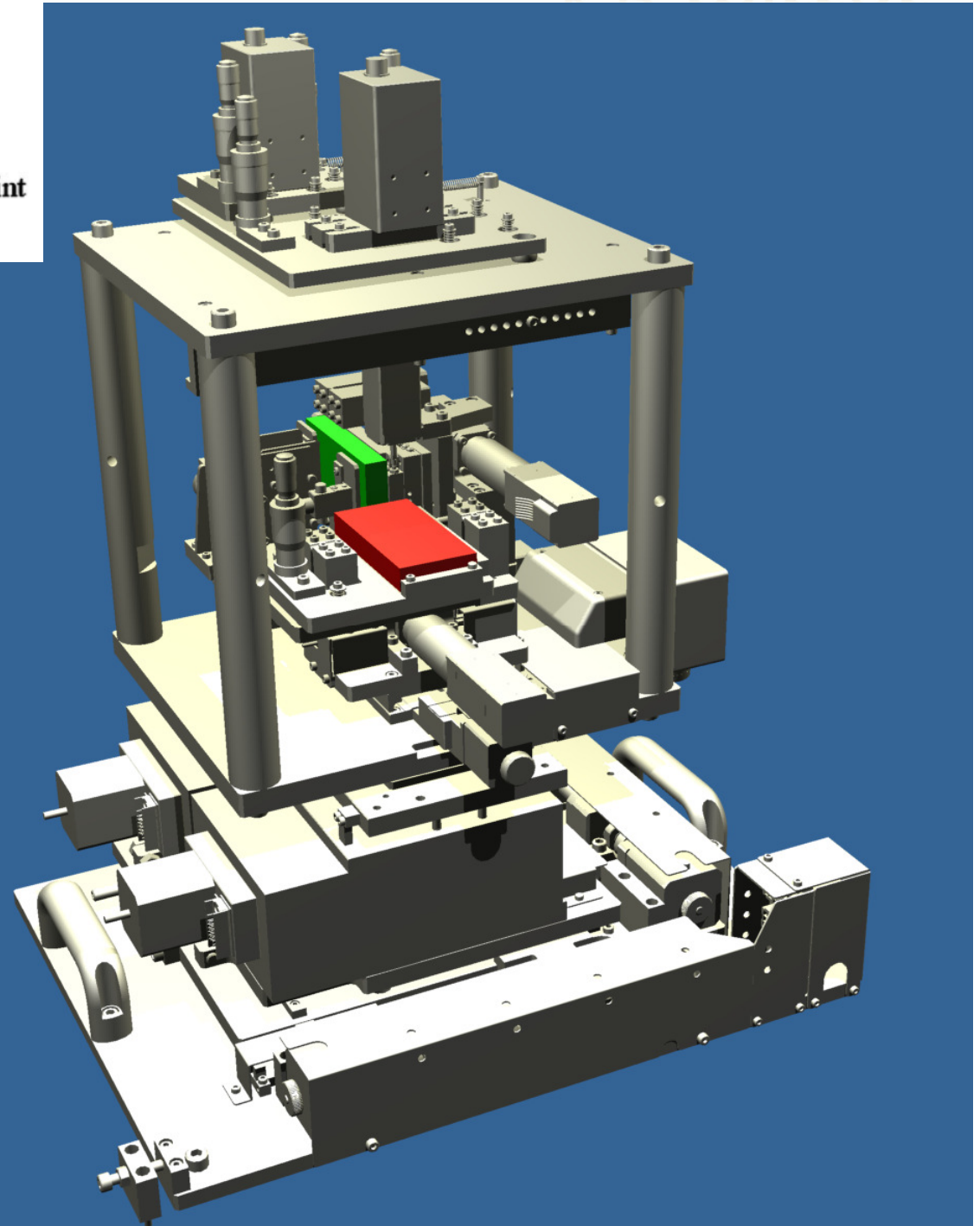
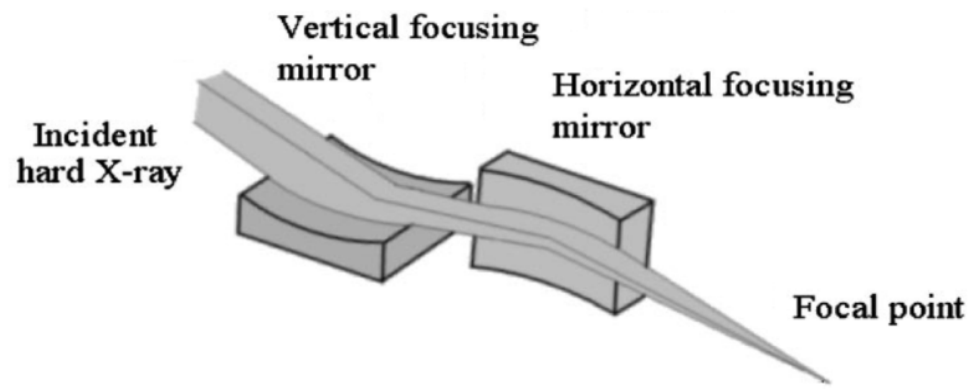
high acceptance and flux

small spot, high coherence

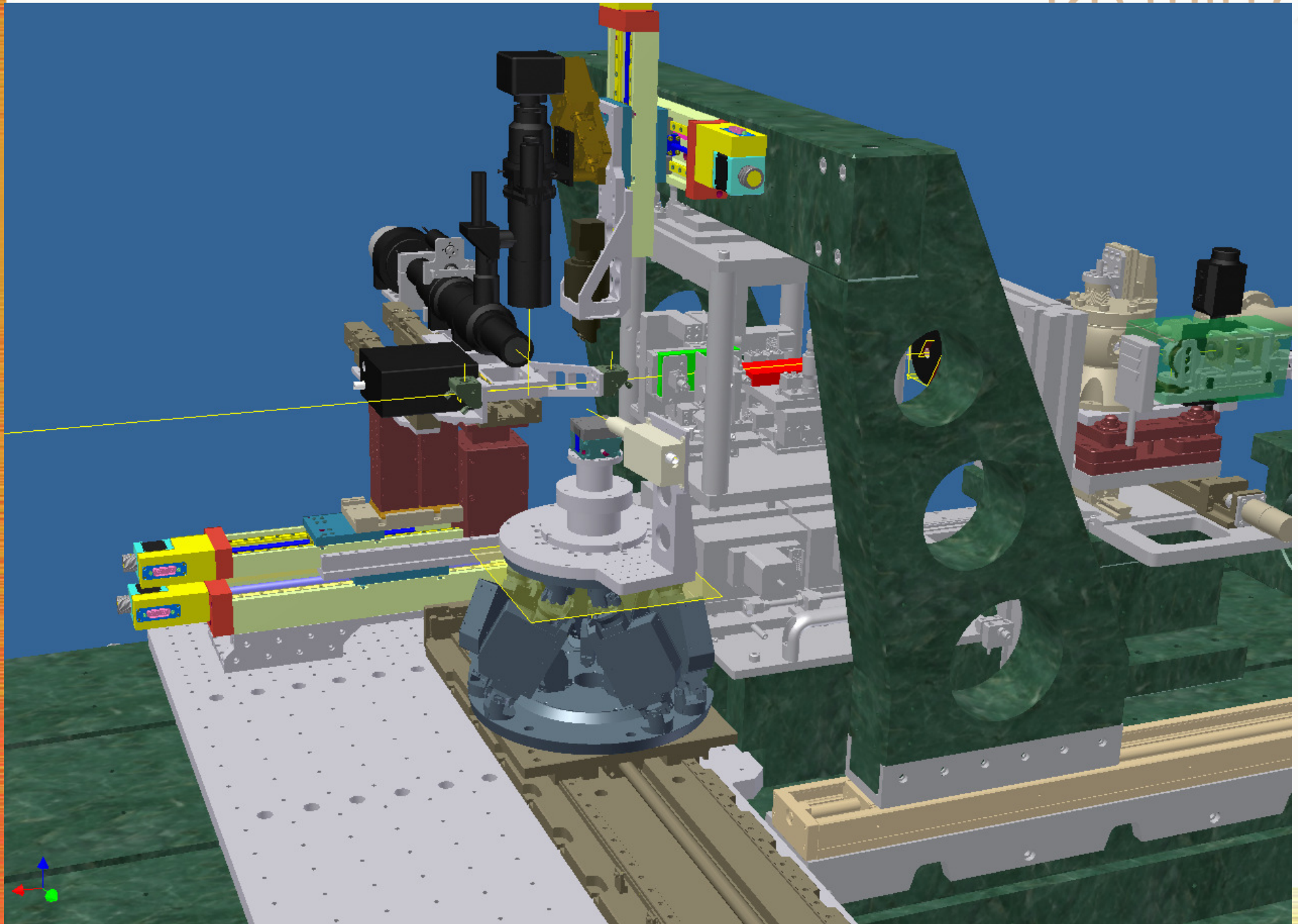
Focusing options



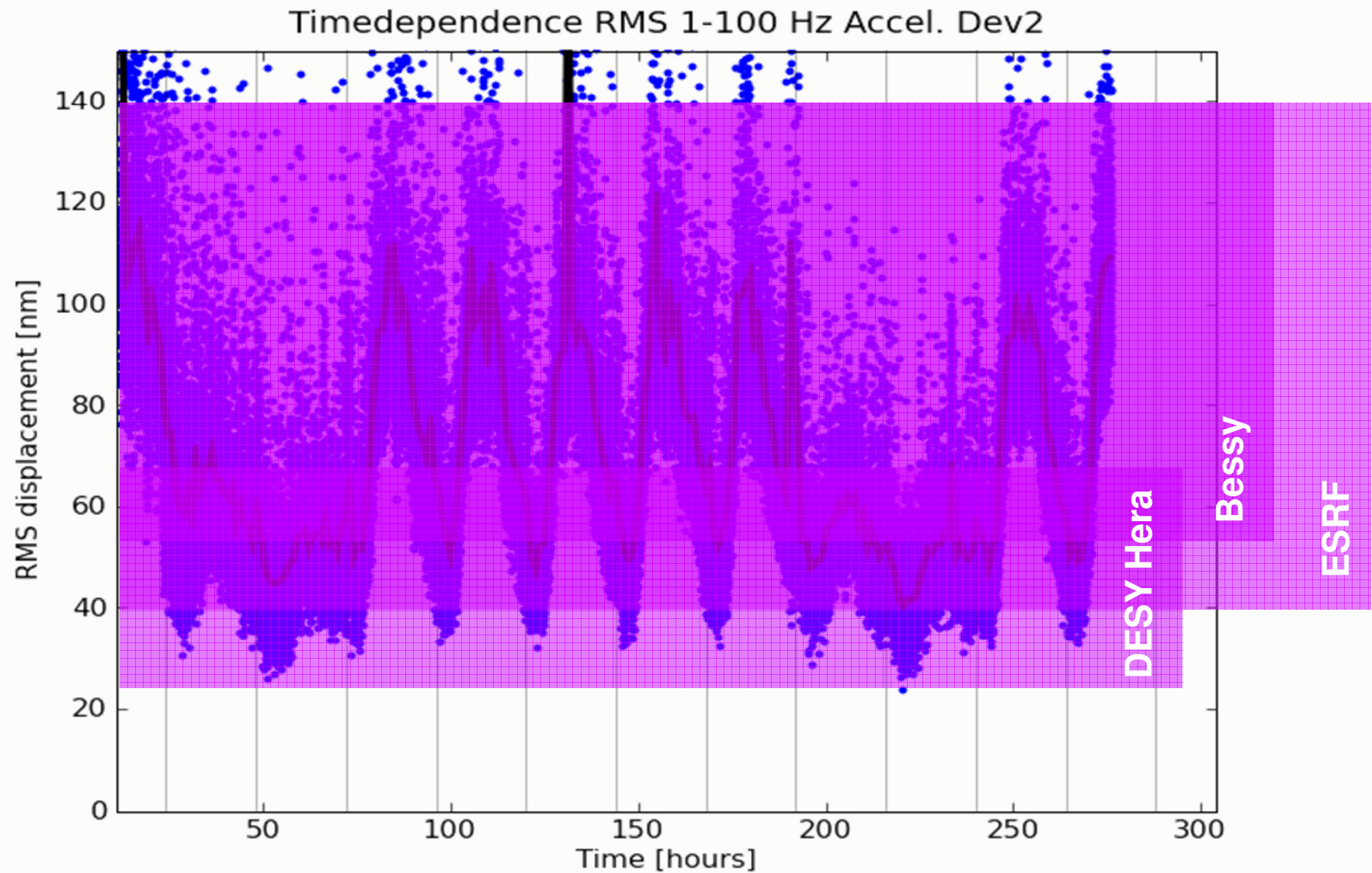
KB mirror

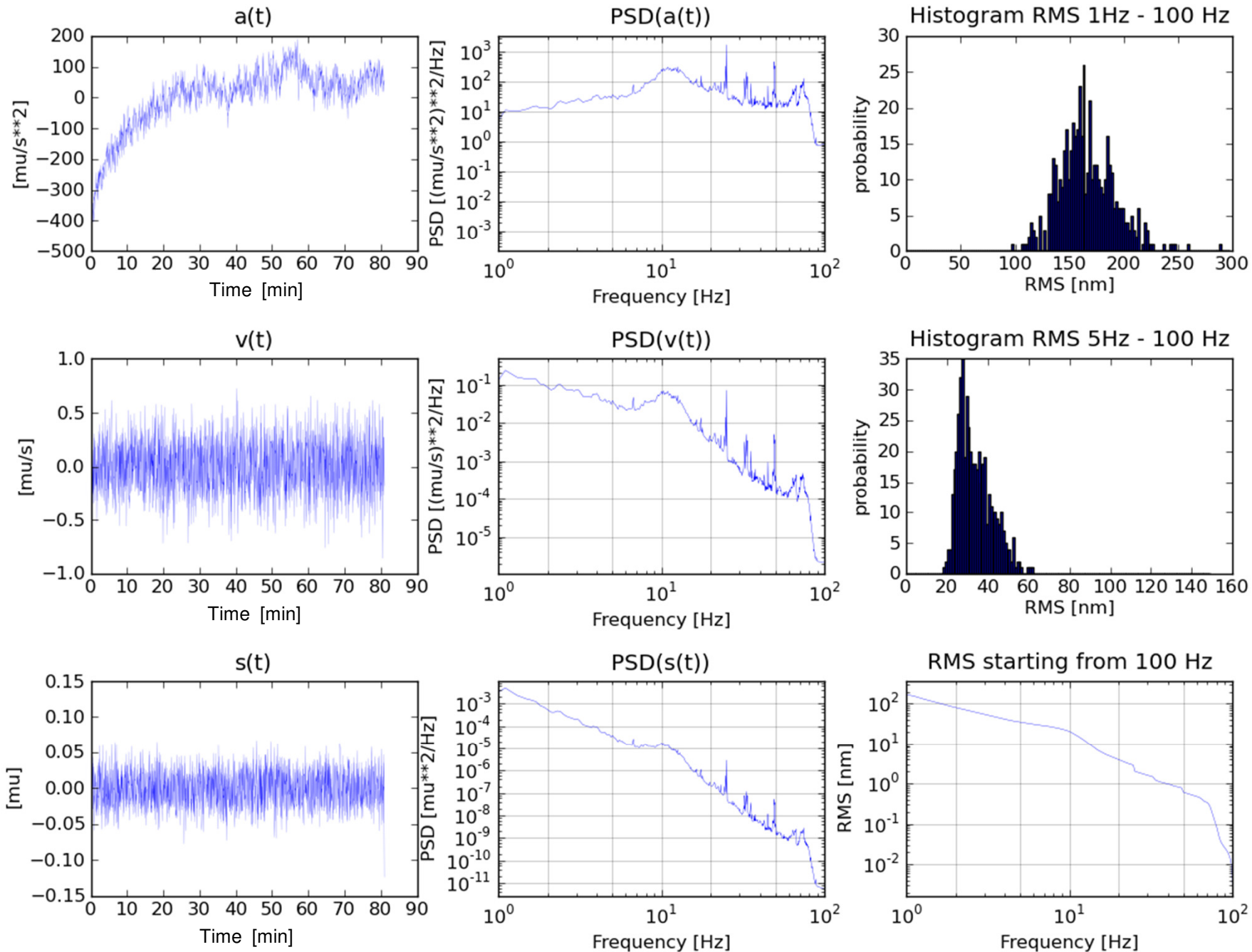


KB mirror



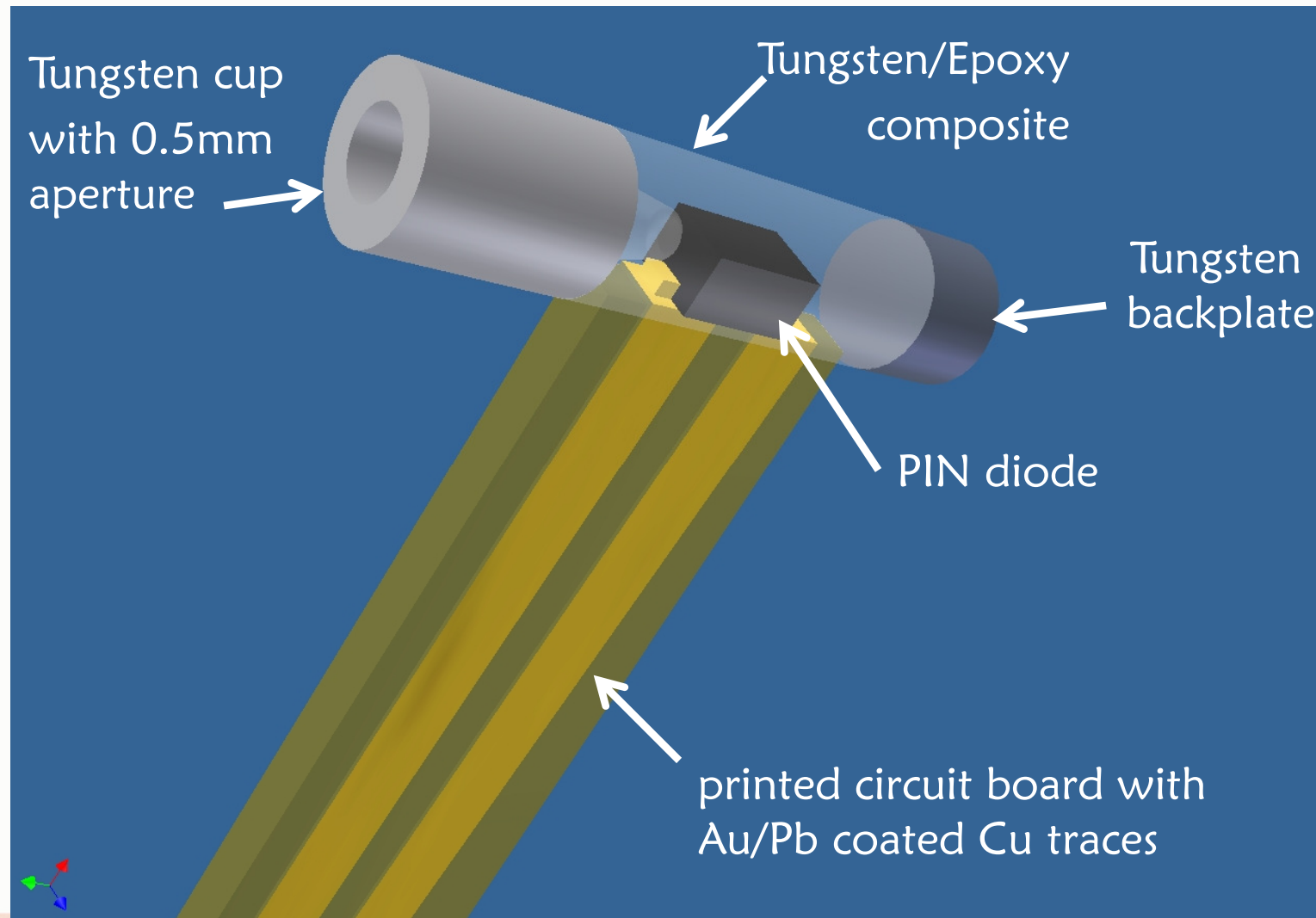
Vibrational issues





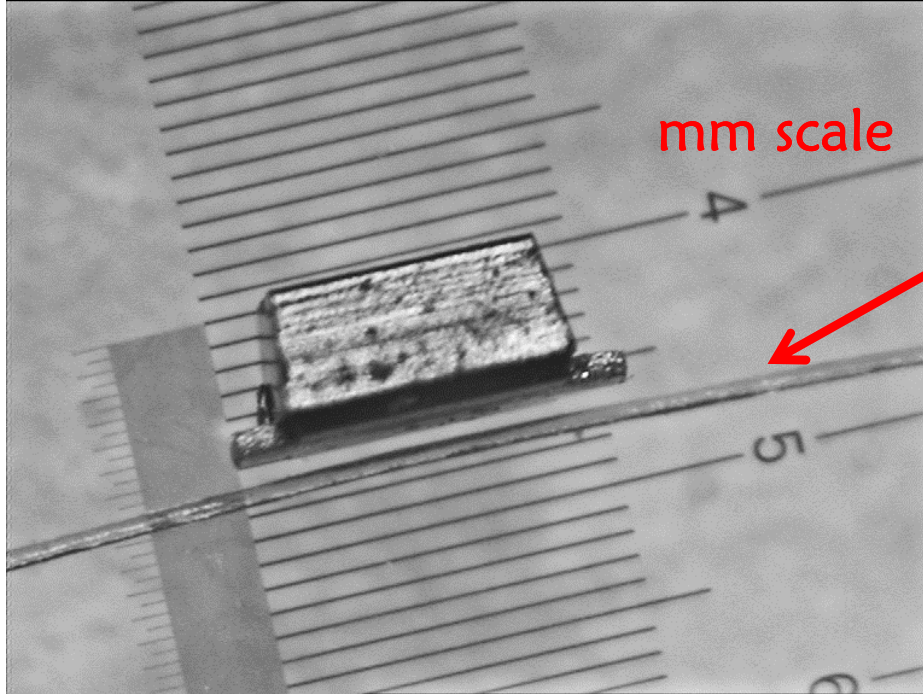
Minaturized active beamstop

3D CAD model of new beamstop (diameter: 1.5mm)

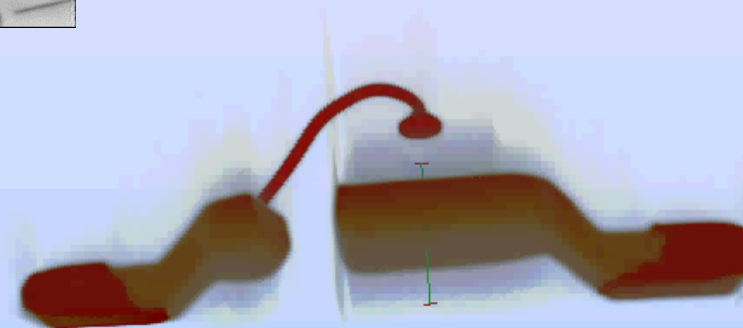


PIN diode

Scene

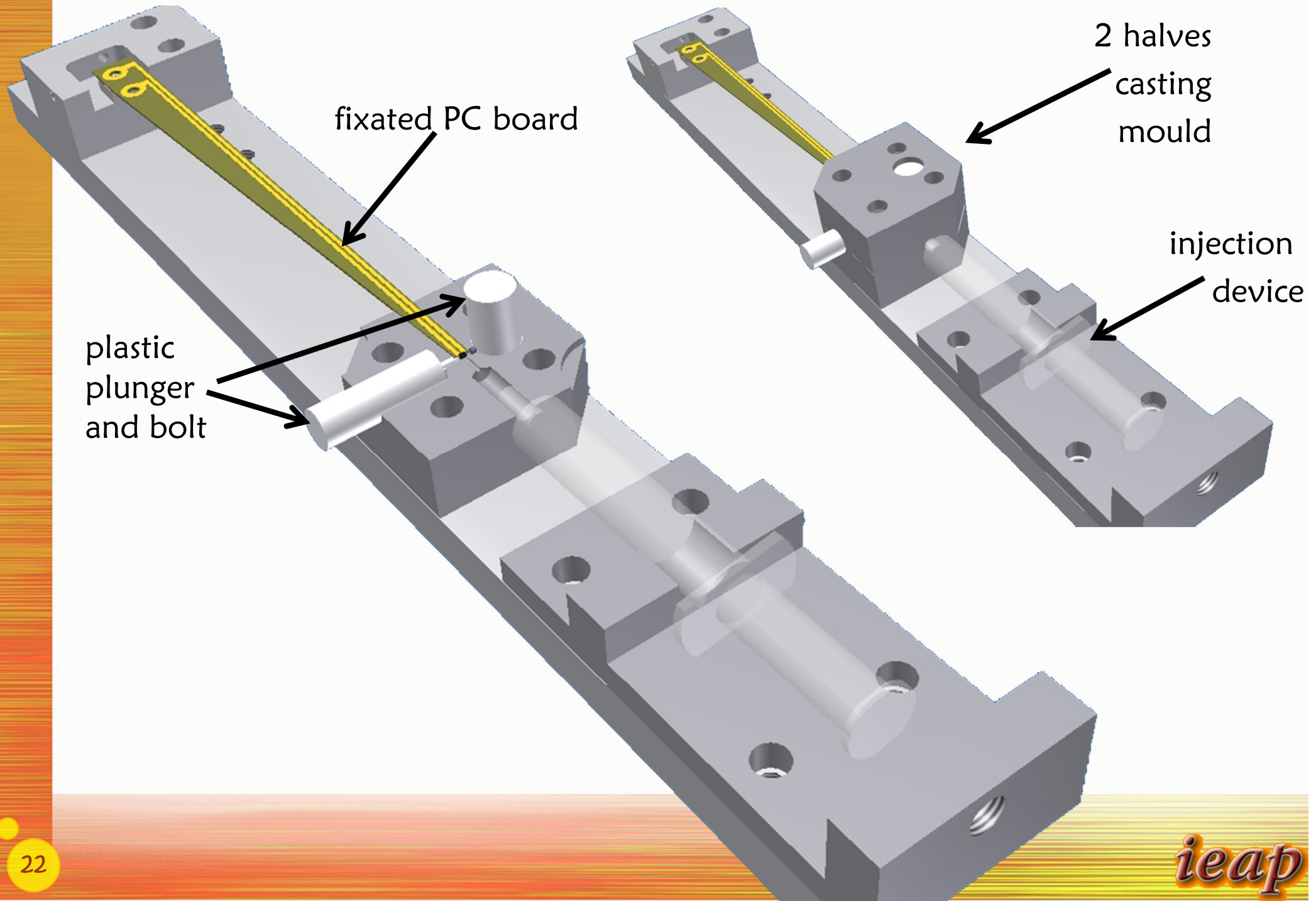


Human hair

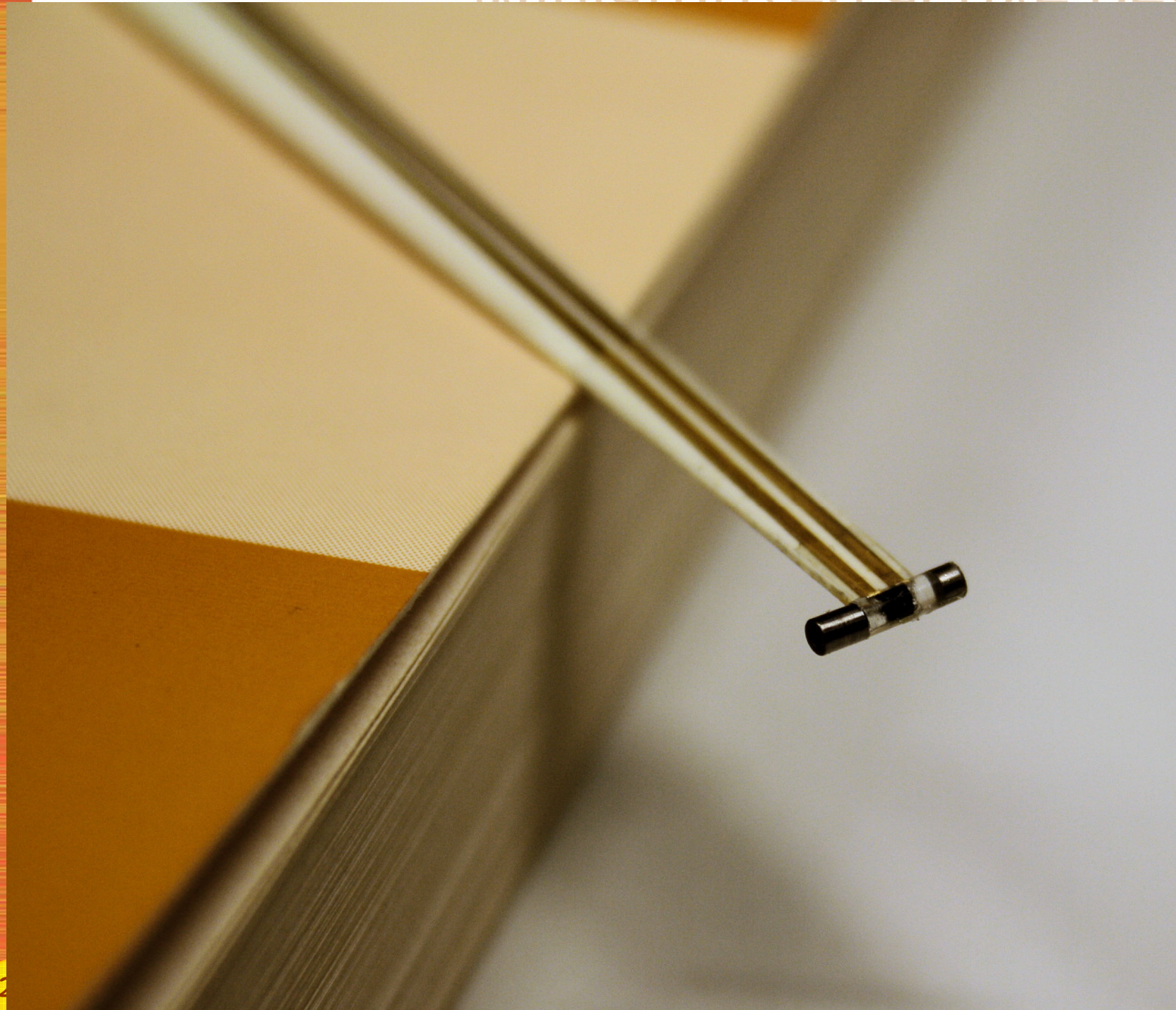


bar =
0.3mm

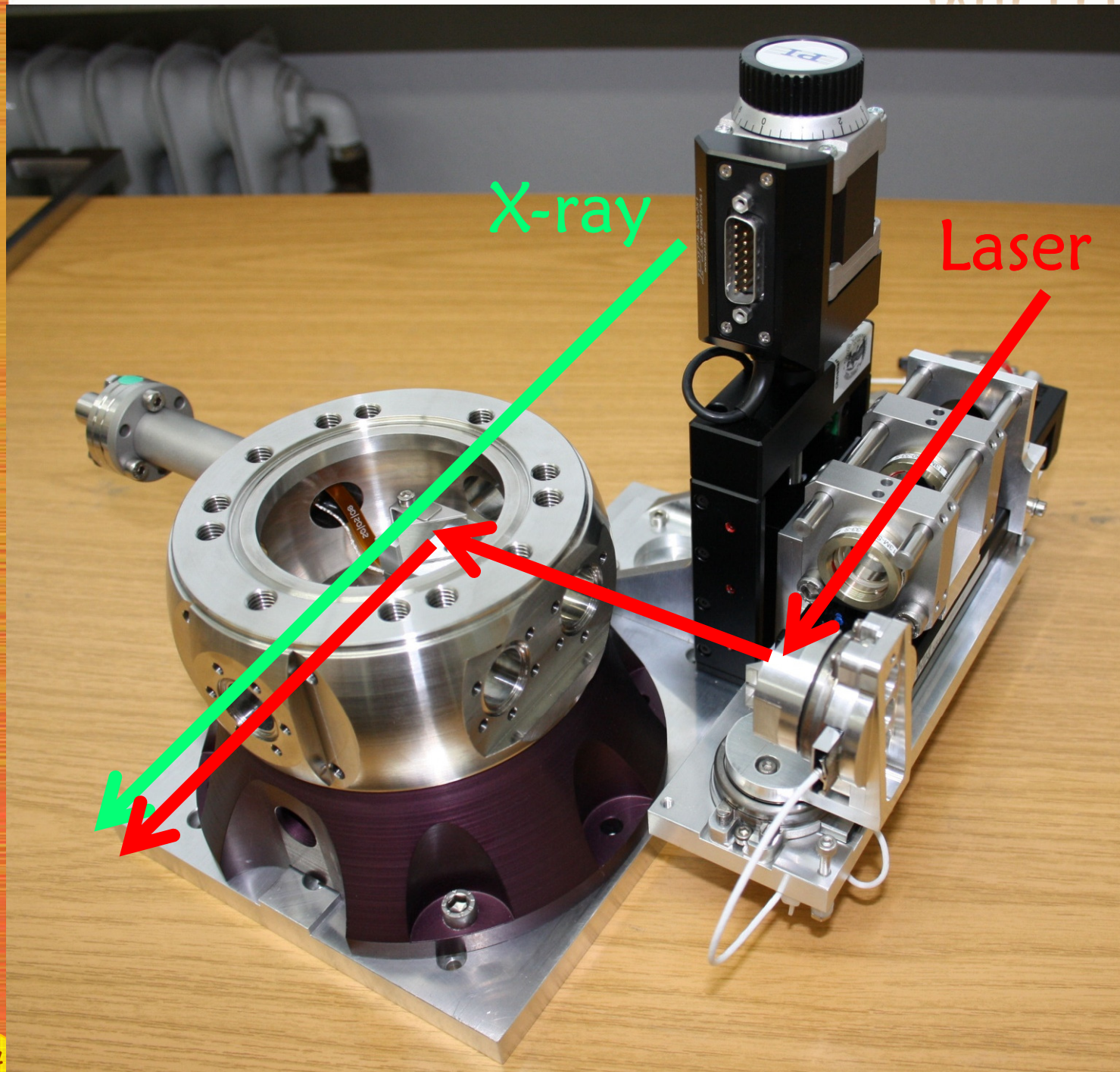
Beamstop fabrication



Miniaturized active beamstop

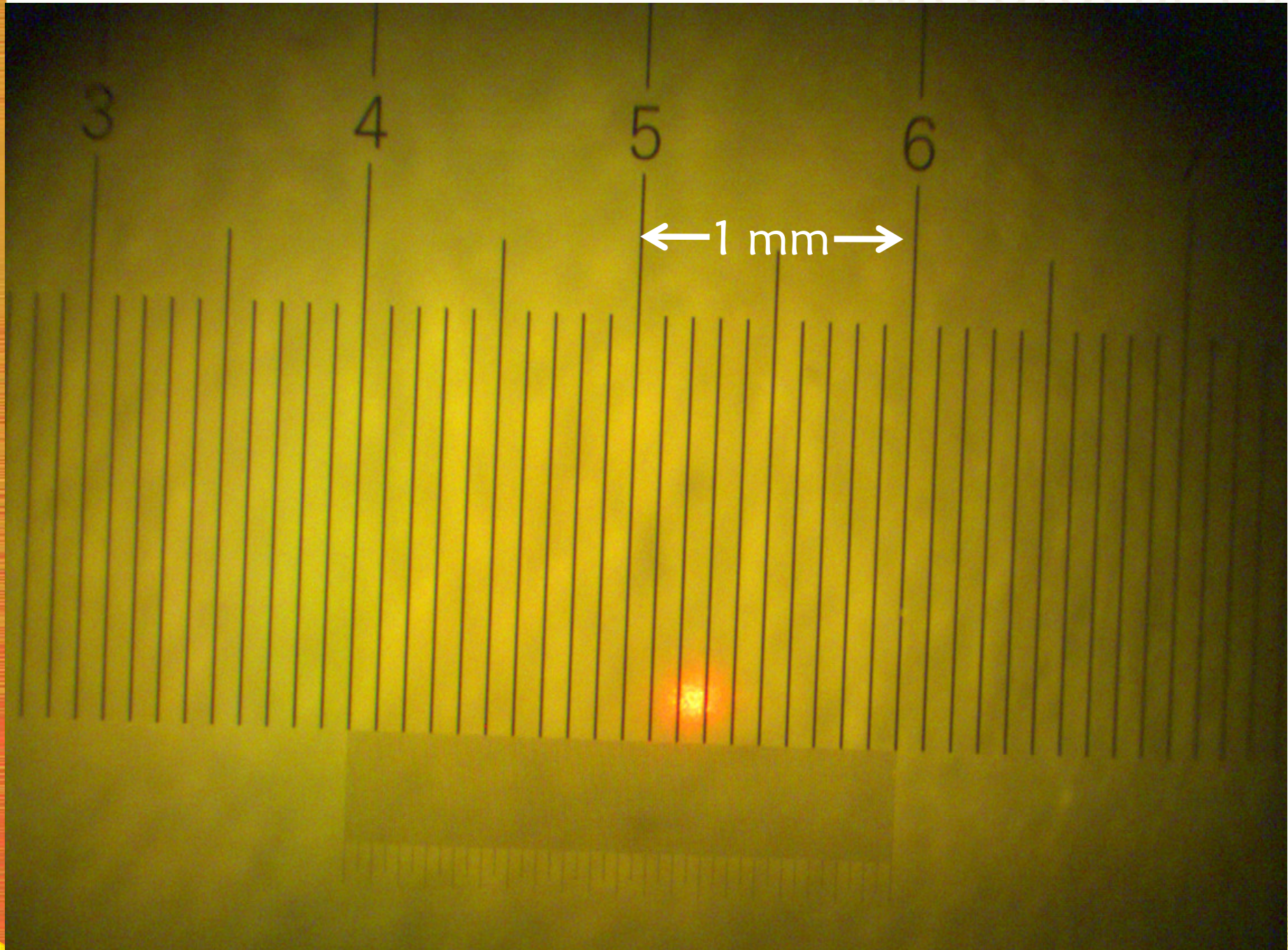


Microfocus laser



Laserspot
2d Bild

Microfocus laser



Microfocus laser



Silk (Silkworm *Bombyx Mori*)



Cocoons

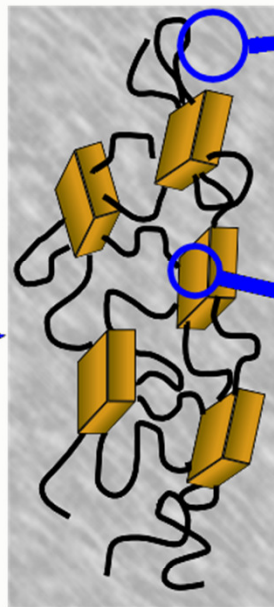


Isolated fibers



Diameter
~10 μ m

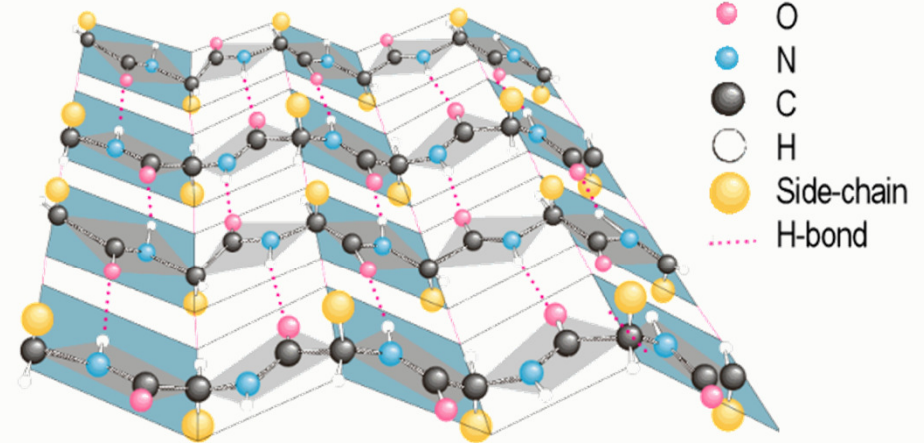
Silk fibre



Crystallites embedded
in less ordered matrix

(crystallites size $\geq 5 \times 2 \times 7 \text{ nm}^3$)

Amorphous + partially ordered matrix



Stacks of β -pleated sheets

- A lot of new and exciting equipment is coming up this year (at but not only at MINAXS)
- High spatial resolution a flux sufficiently high to study both biological and synthetic materials will become available at this endstation
- User status is expected by Spring 2011
- Potential applications can be found in virtually any kind of condensed matter research

Acknowledgements

MINAXS-Team

Stephan Roth

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Kai Stassig

Zola, Jannis, Jimmy



and

Martin Müller



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und Forschung