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Status of Nanofocus @ MINAXS

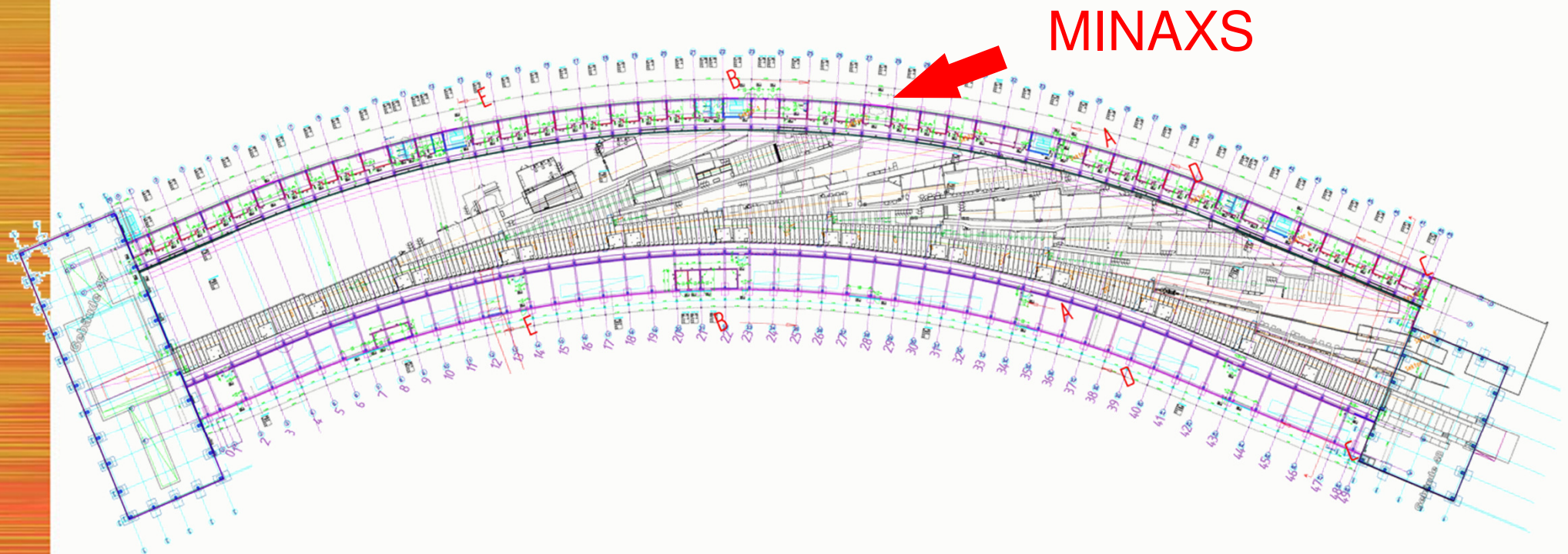
Christina Krywka

Petra III

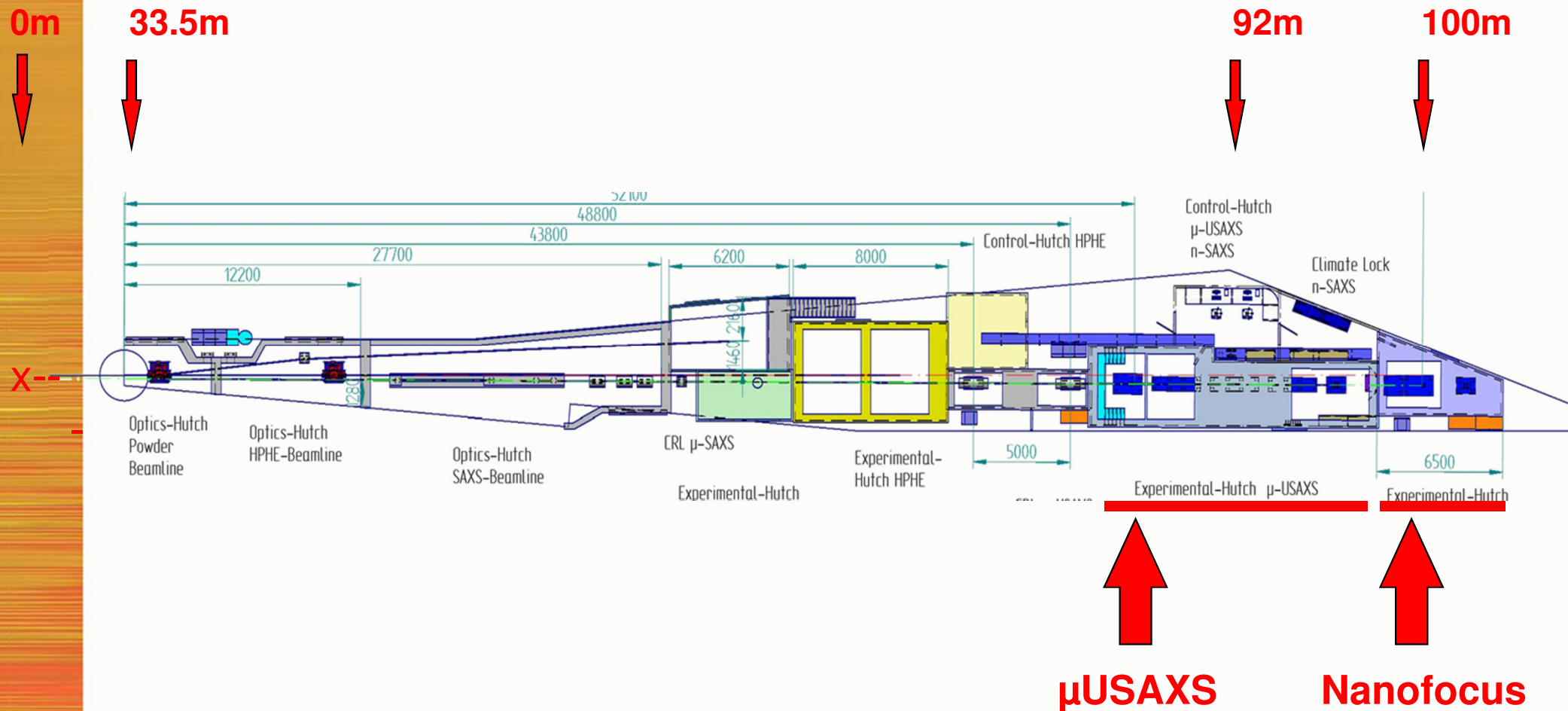


MINAXS Beamline

Micro & **N**anofocused **X**-ray **S**cattering



MINAXS Nanofocus Extension

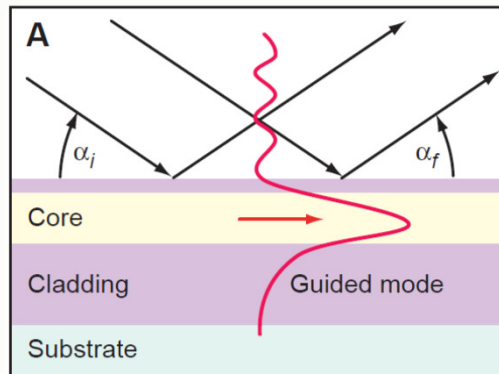
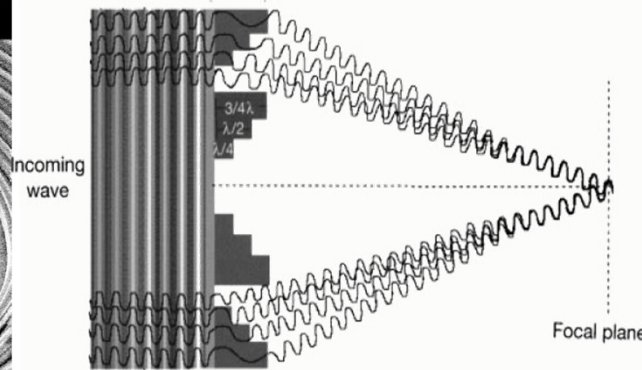
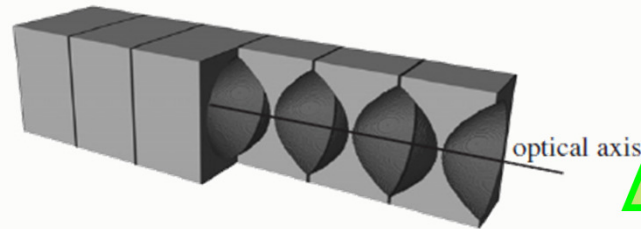
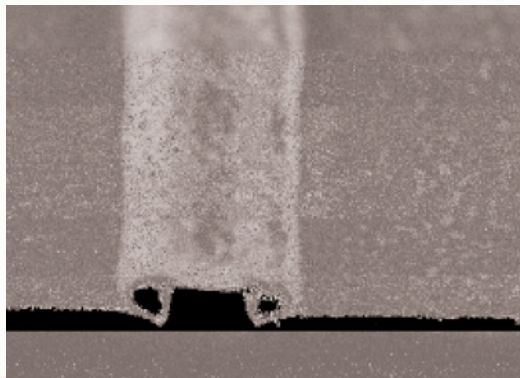
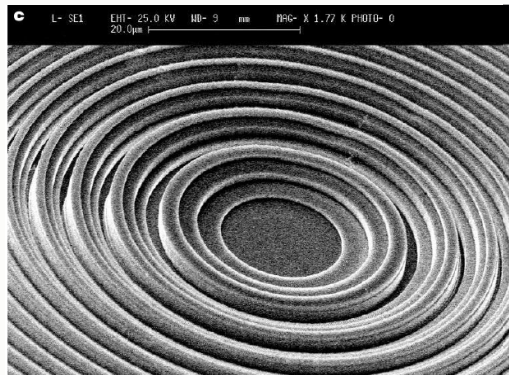
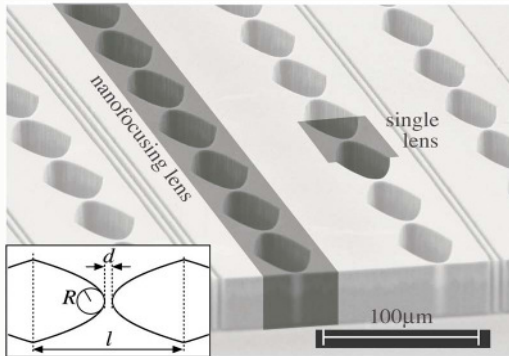


Experimental Hutch



Nanofocusing Optics

small focus, high coherence



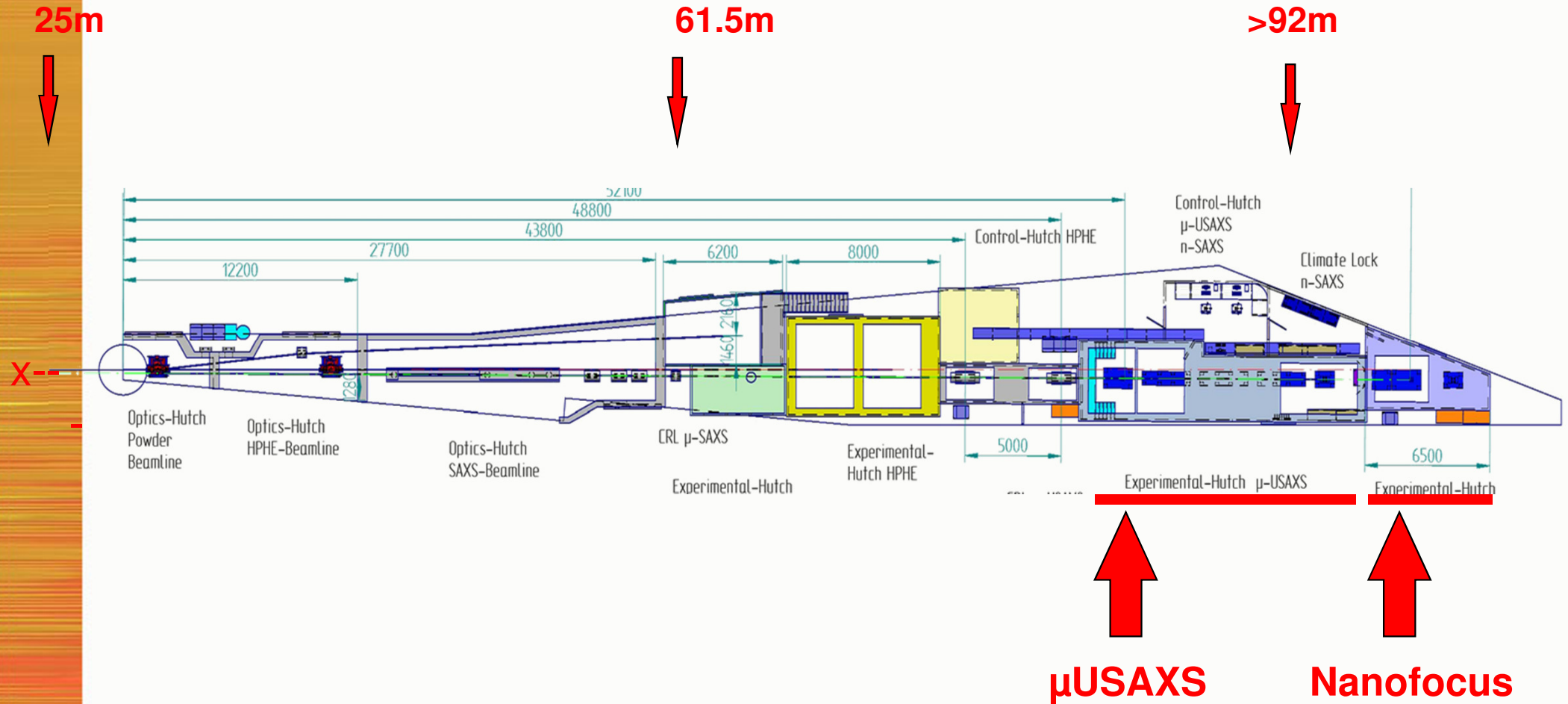
high acceptance and flux

Refractive
Lenses

Fresnel
Lenses

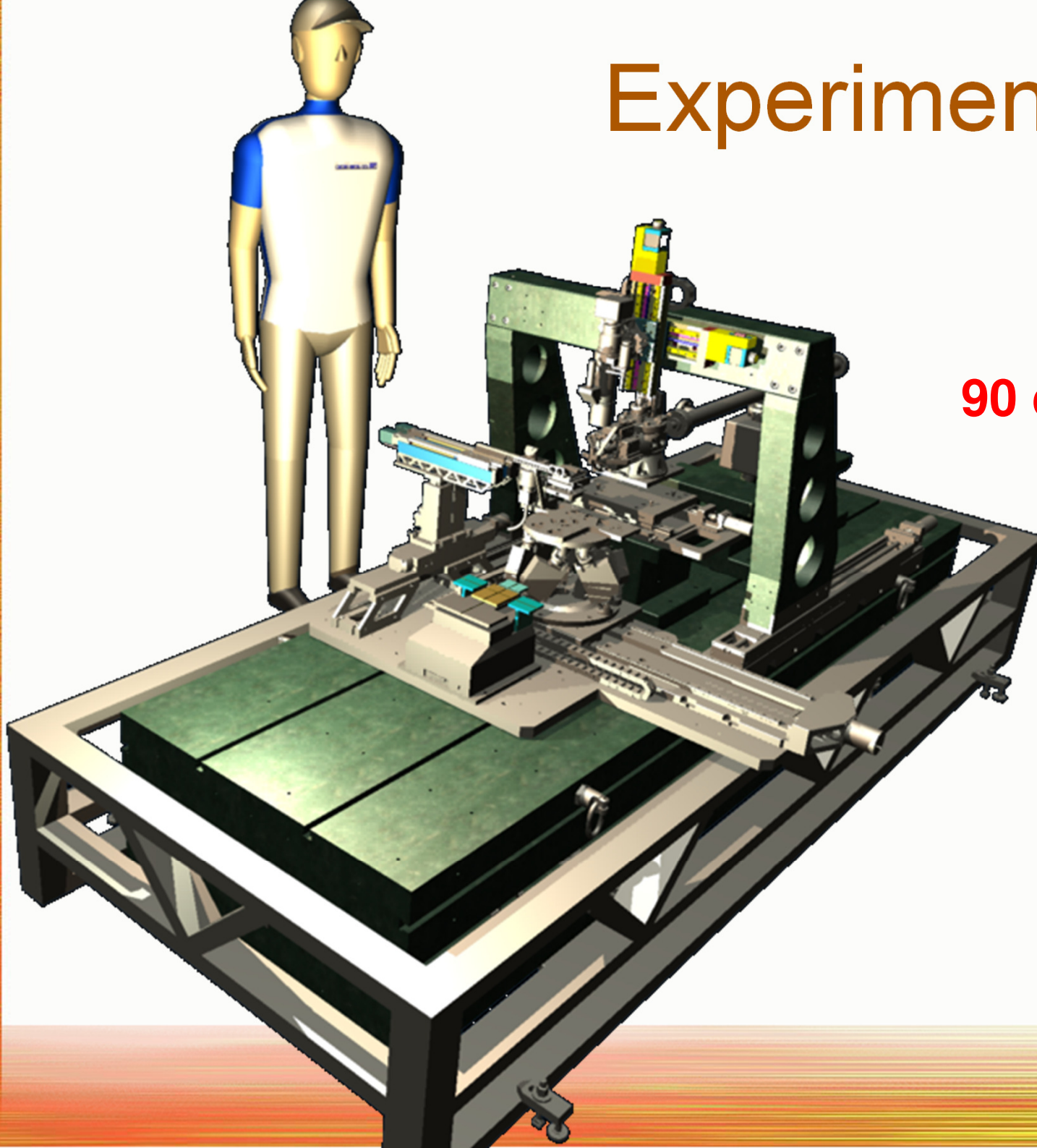
Waveguides

Refractive Lenses Positions



Experimental stage

Beam position:
90 cm above ground



Positioning



P-611xzs



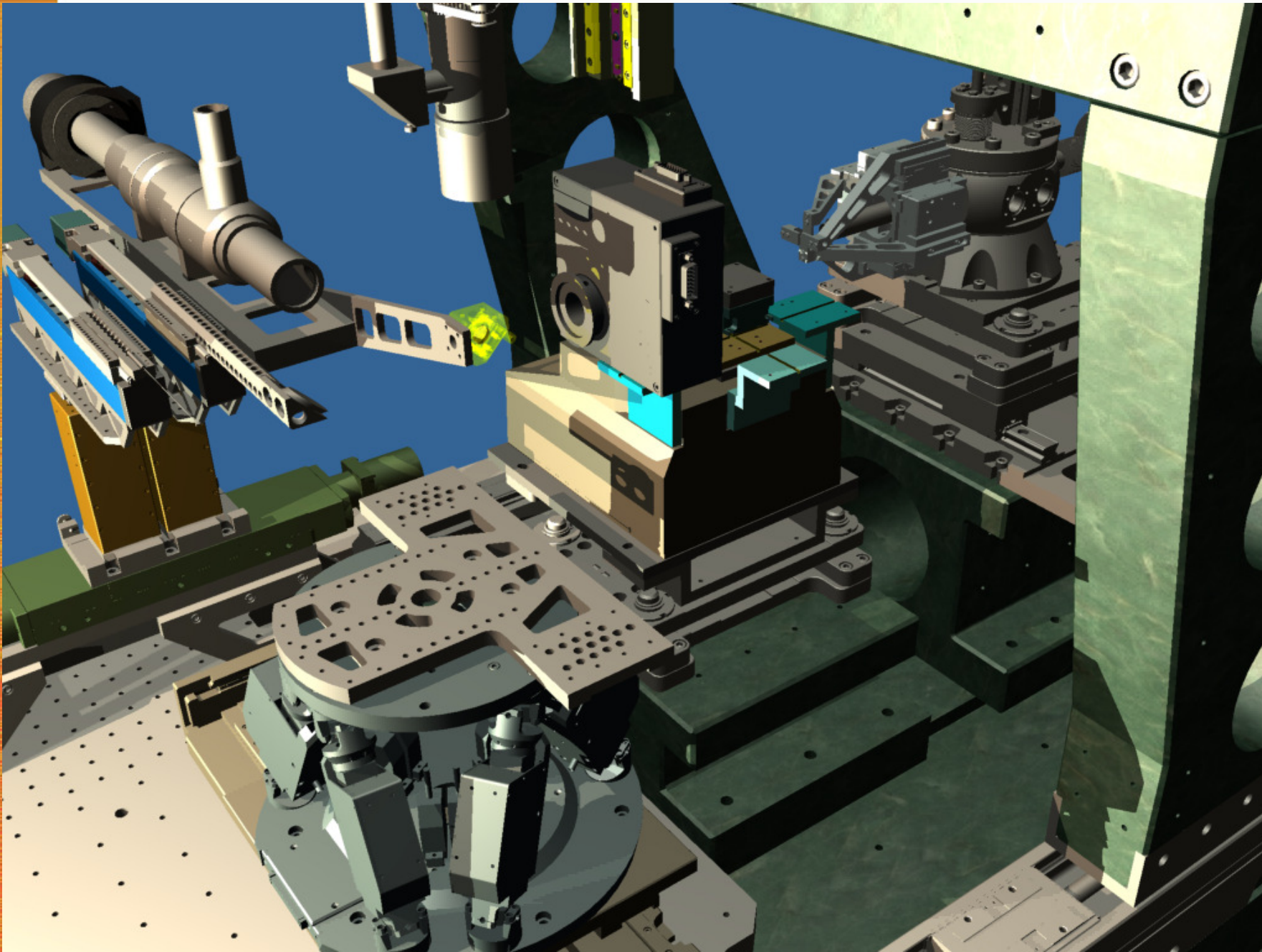
F-206



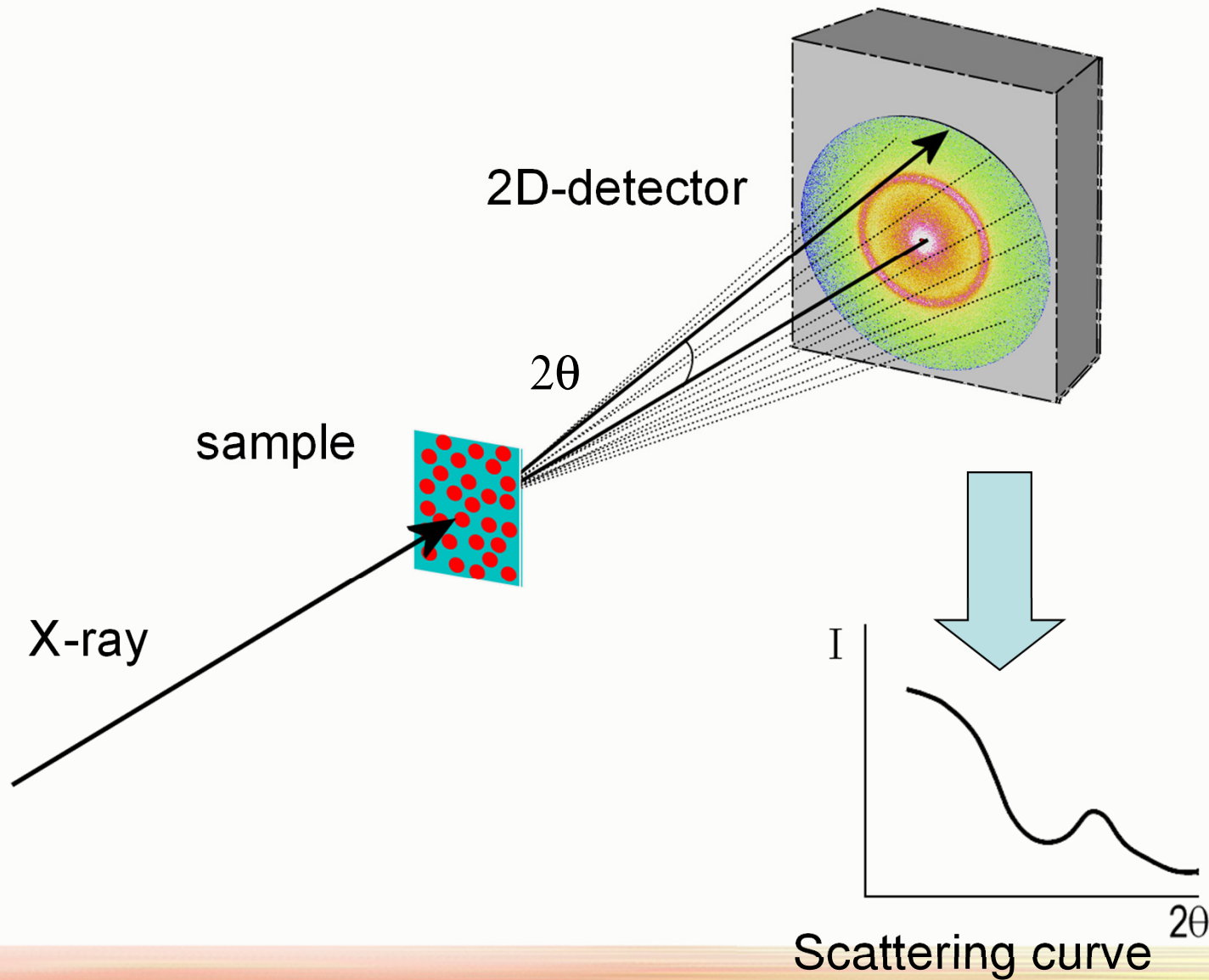
M-824

Type	P-611 XZ stage	F-206 hexapod	M-824 hexapod
max. load	1.5 kg	2 kg	10 kg
travel range	$\pm 100 \mu\text{m}$	$\pm 6 \text{ mm}$, $\pm 6^\circ$	$\pm 22.5 \text{ mm}$, $\pm 12.5^\circ$
resolution	$< 10 \text{ nm}$	100 nm, $2 \mu\text{rad}$	300 nm, $3.5 \mu\text{rad}$

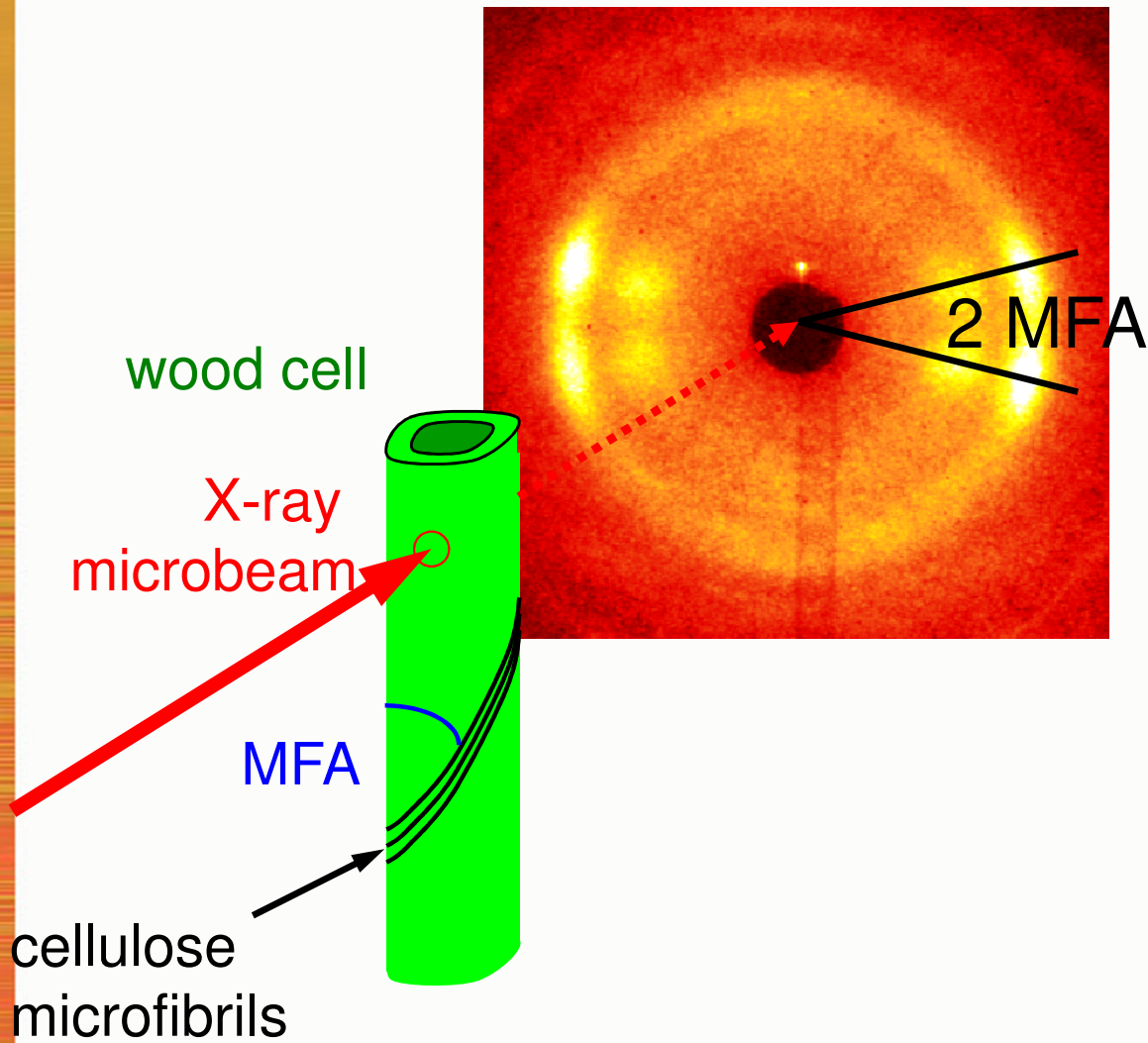
Initial setup



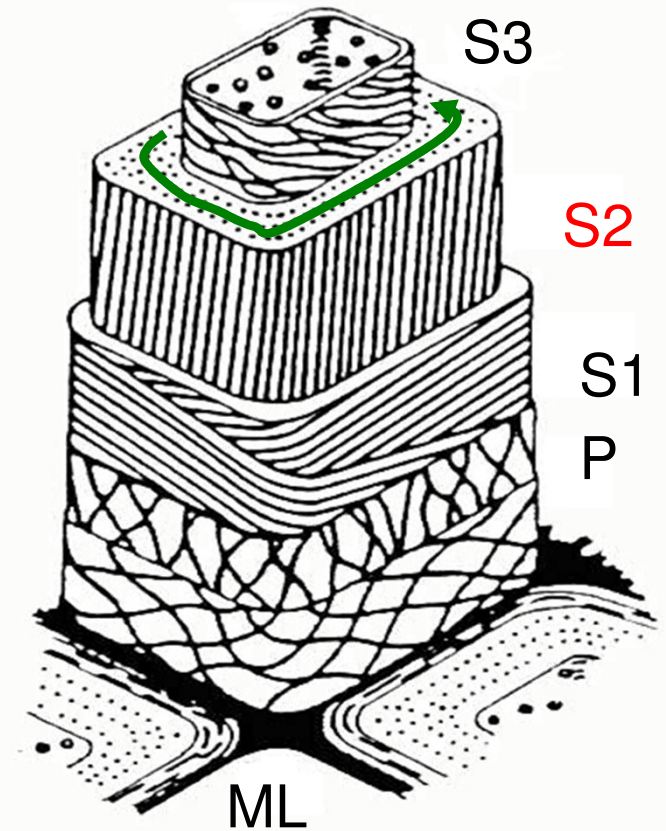
Small / Wide Angle X-ray Scattering



WAXS on wood cells



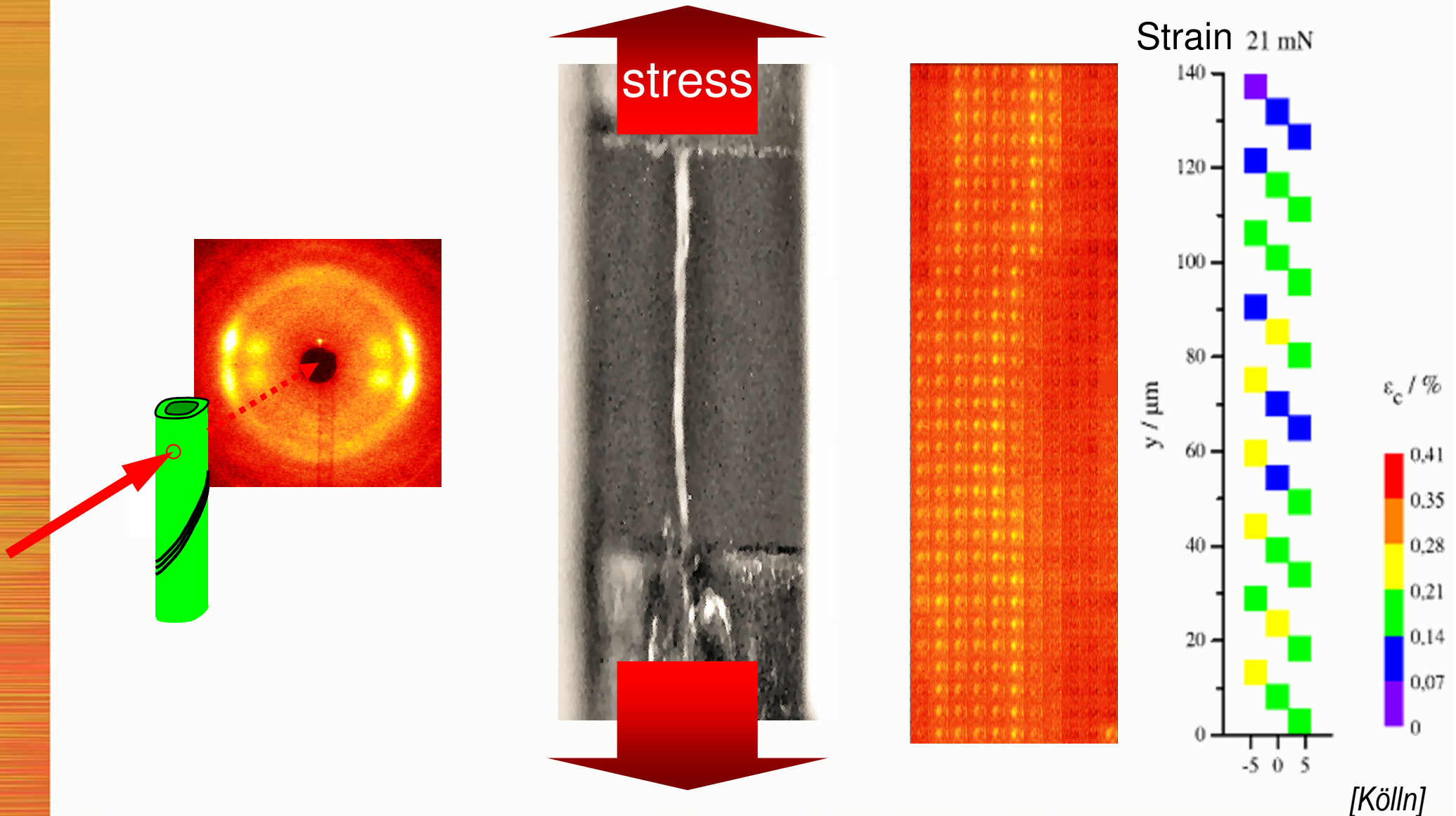
Applications



- ML: middle lamella
- P: primary cell wall
- S1...S3: secondary cell walls

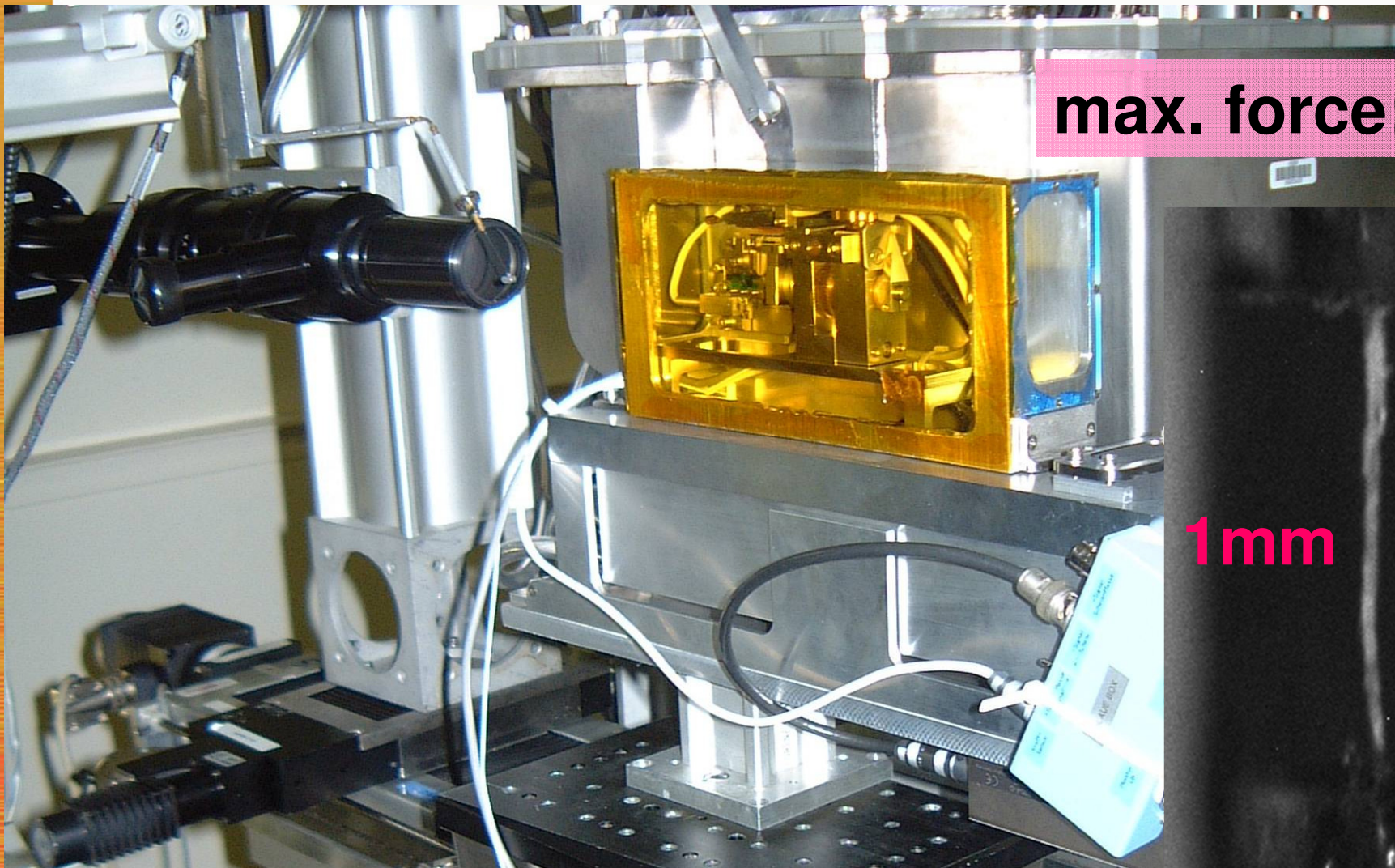
Scanning WAXS with *in situ* tensile tests

Applications



Scanning WAXS with *in situ* tensile tests

Applications



max. force: 0.5 N

1mm

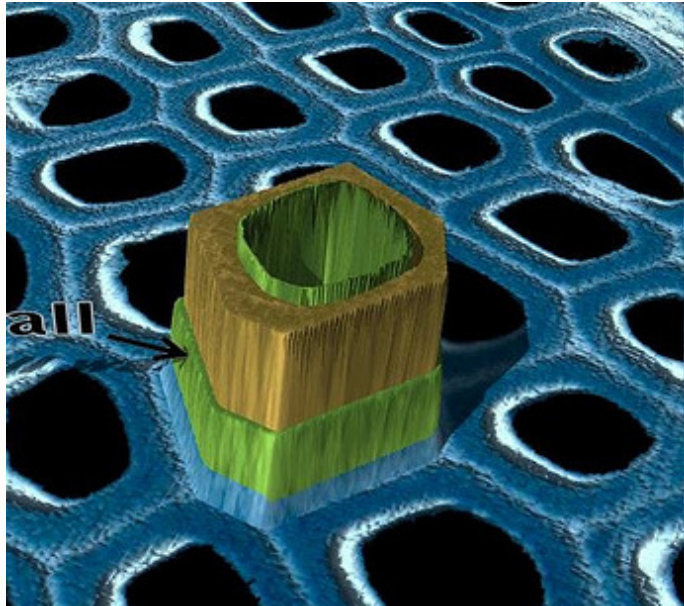


[Krasnov]

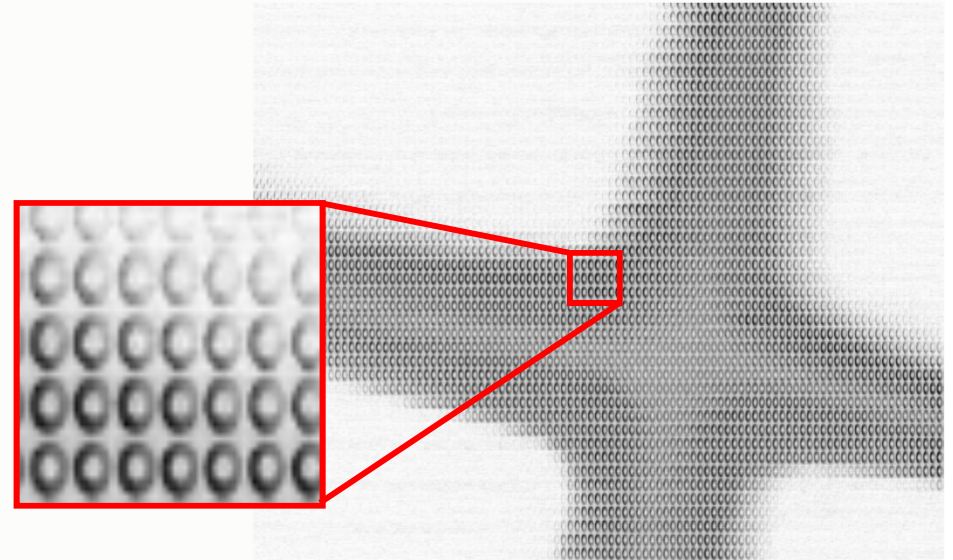
Igor Krasnov (2007)

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Sub- μm scanning SAXS

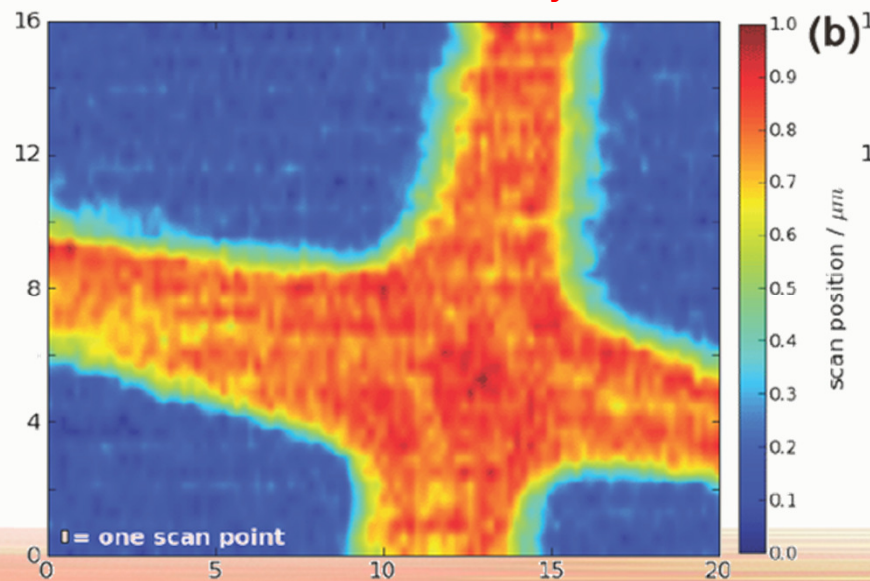


Applications

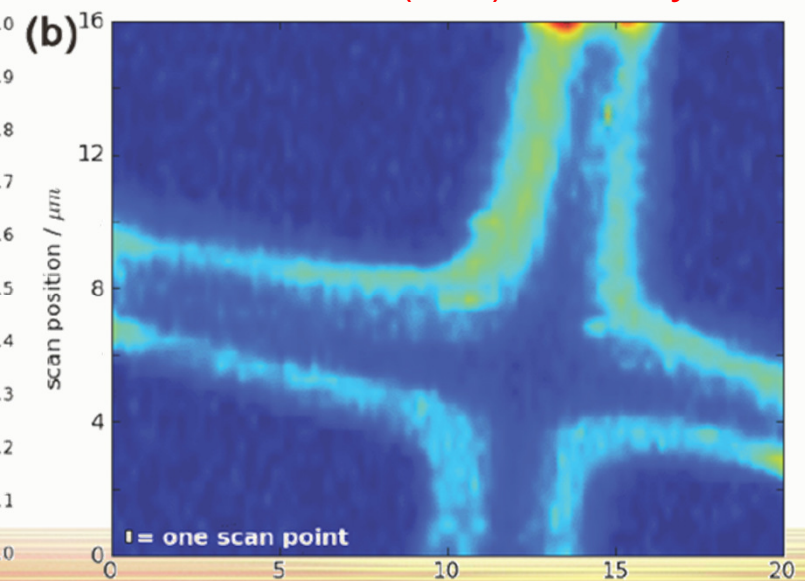


Beam:
200 x 200 nm²
(KB mirror)

Diffuse intensity

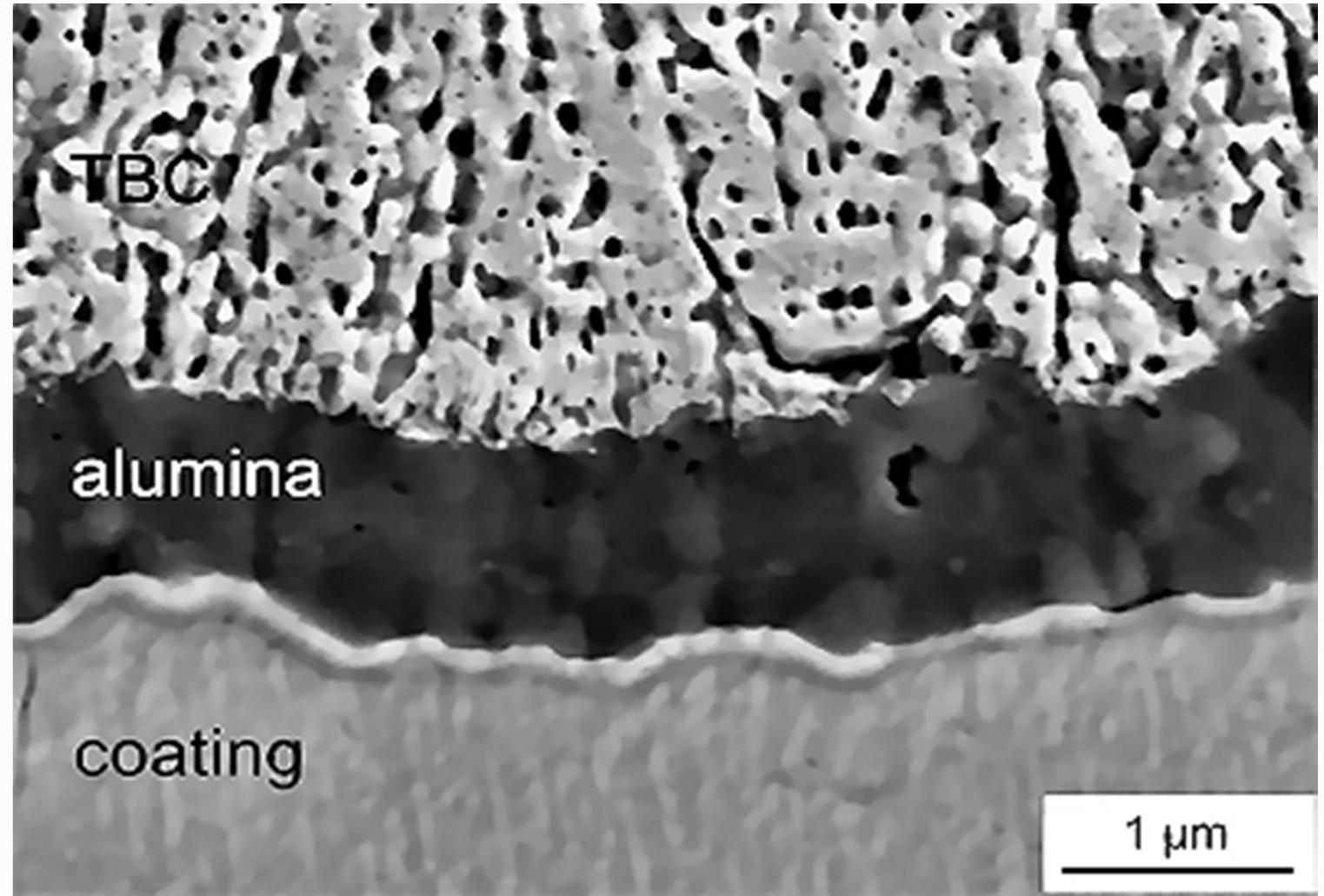


Cellulose (200) intensity



Scanning XRF
with sub- μm resolution

Applications



A thermal barrier
coating (TBC)
deposited onto
aluminidecoated
TiAl alloy
Ti-45Al-8Nb.

Summary

- A lot of new and exciting equipment is coming up in Hamburg
- Spatial resolution boundaries are about to be torn down
- Operational status is expected by the end of 2009 / beginning of 2010
- Potential applications can be found in virtually any kind of condensed matter research

Team: Christina Krywka
Stephan Roth
Martin Müller

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Thanks to: Ralph Doehrmann
Malte Ogurreck
Igor Krasnov



Thank you for your attention

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