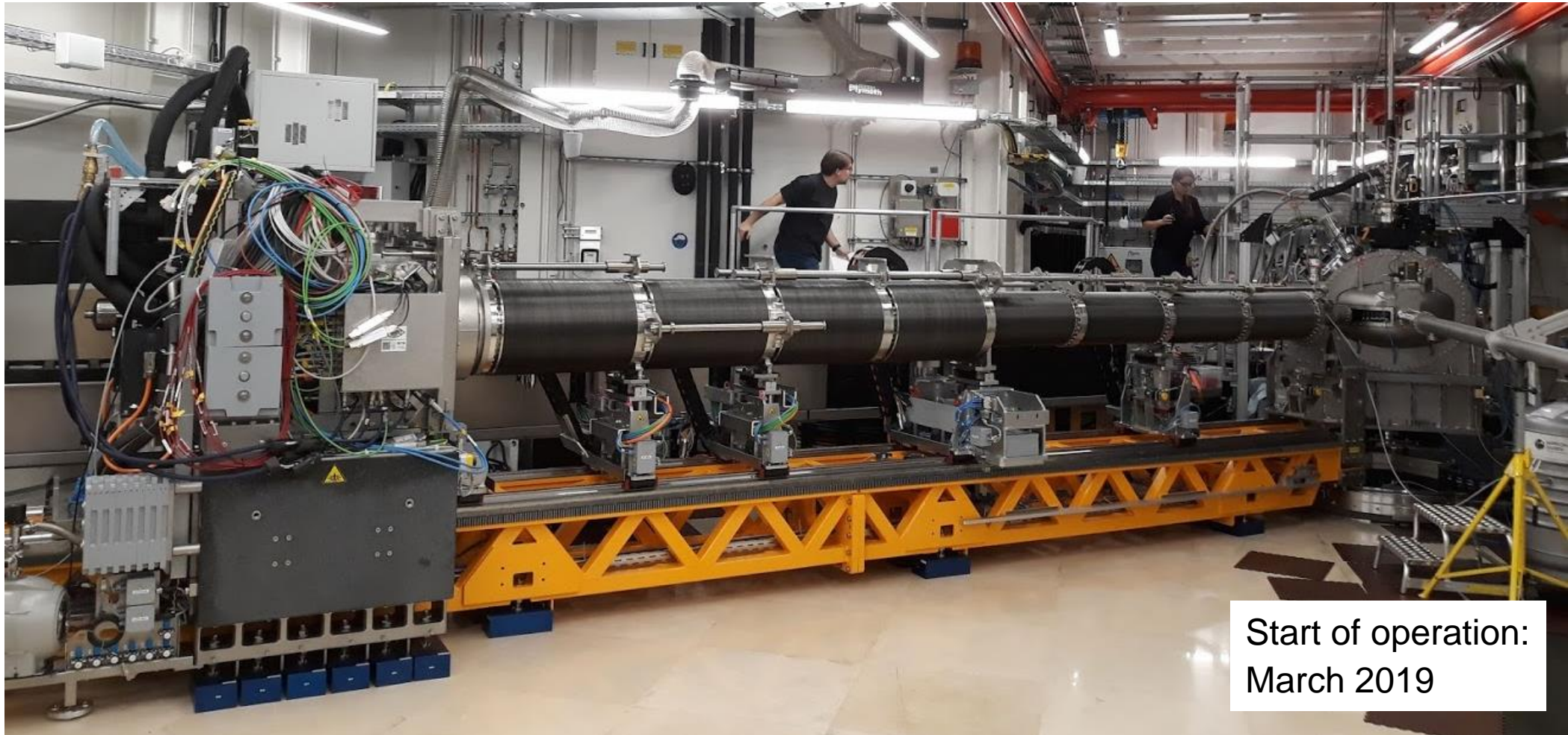
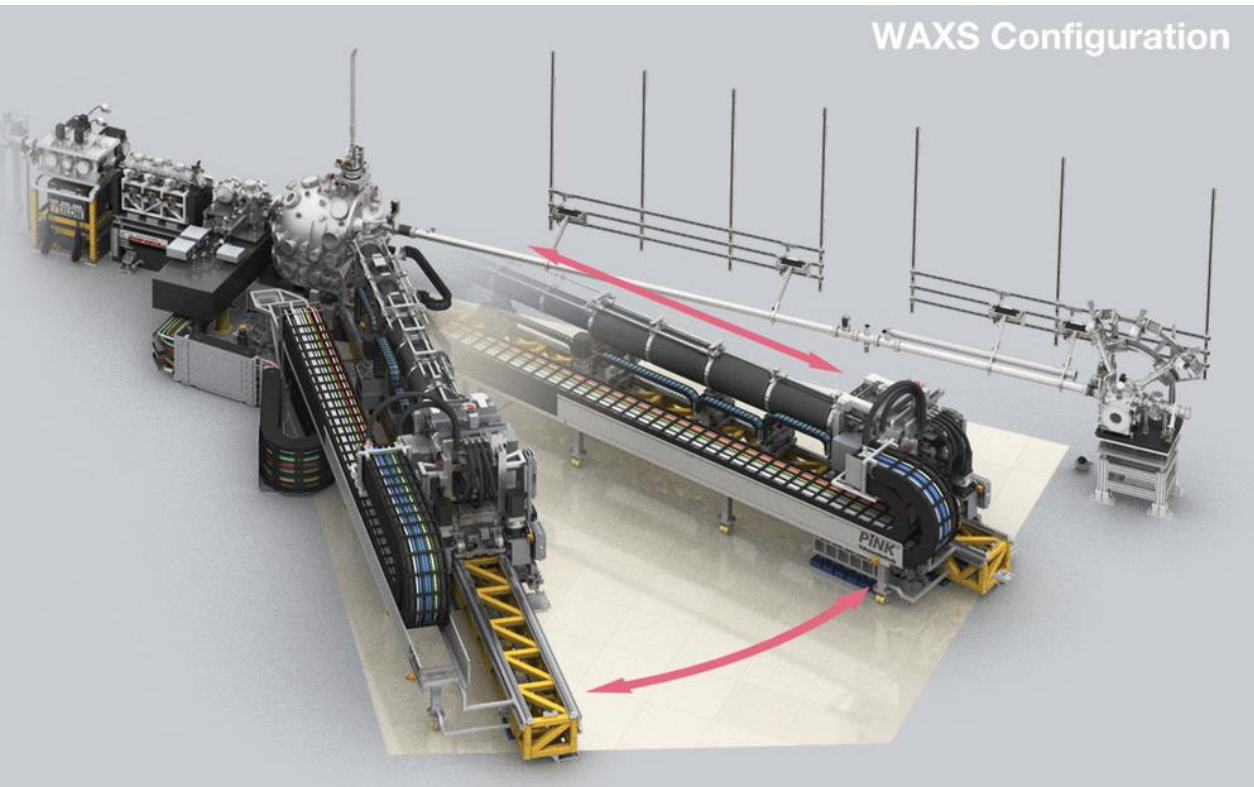


Call 8 Townhall Meeting, Nov 2021

MID: Materials Imaging and Dynamics Instrument

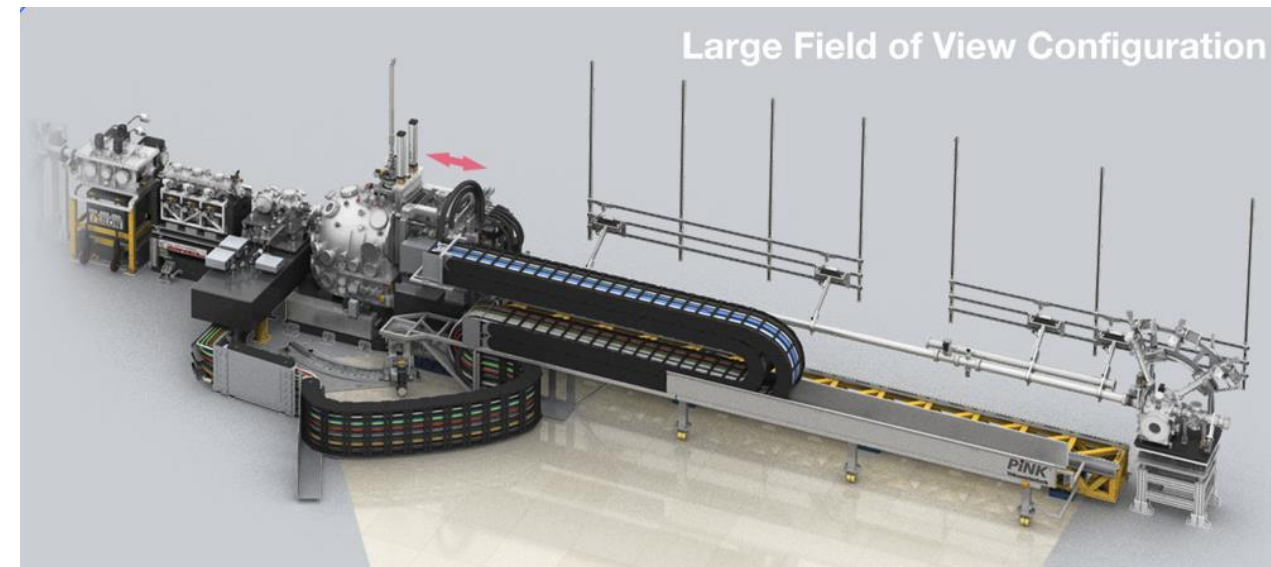


MID overview



MHz area detector, 10^6 pix of $200\ \mu\text{m}$ size (AGIPD)
ePix, Gotthard detector, CCD cameras, ...
Versatile setup, multi-purpose interaction chamber
Windowless (in-vacuum setup) or sample in air
Sample - detector dist: 0.2 m (LFOV) to 8 m (HiRes)
 2θ up to $\sim 50^\circ$, 5 - 24 keV (7-18 keV used so far)

X-ray scattering and imaging: SAXS, WAXS, XPCS,
phase contrast imaging and holography, CXDI,
nano focusing, fs laser pump - X-ray probe

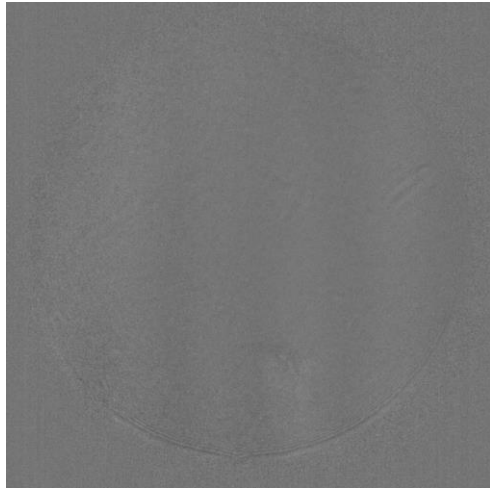


A. Madsen *et al.*, JSR (2021) **28**, 637

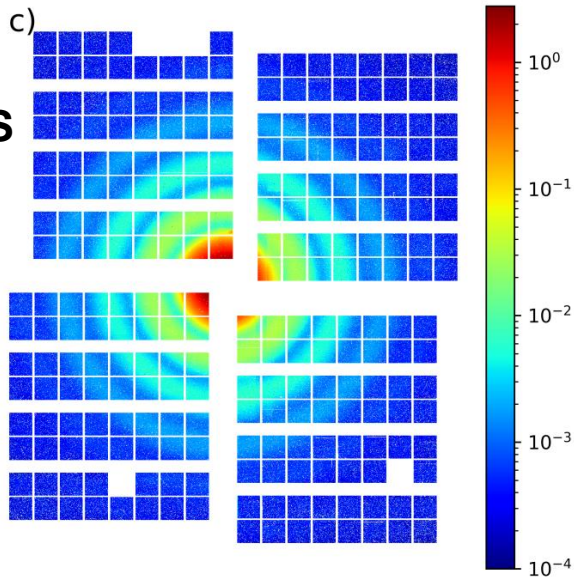
<https://scripts.iucr.org/cgi-bin/paper?S1600577521001302>

MID science

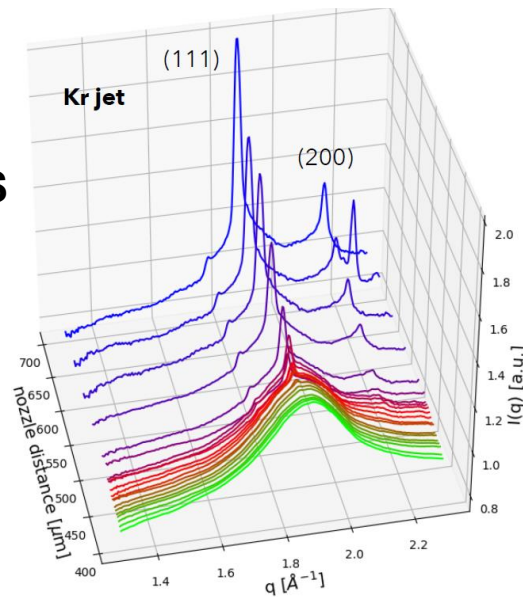
TR Imaging (holography)



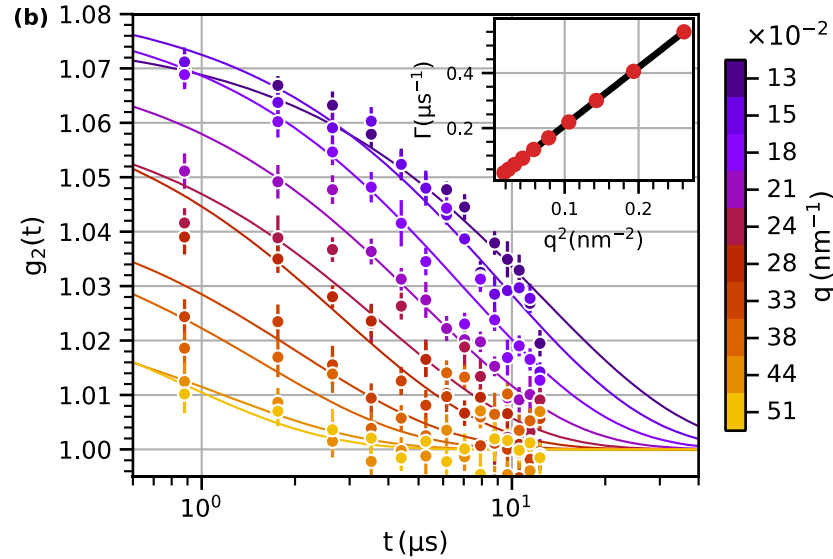
TR-SAXS



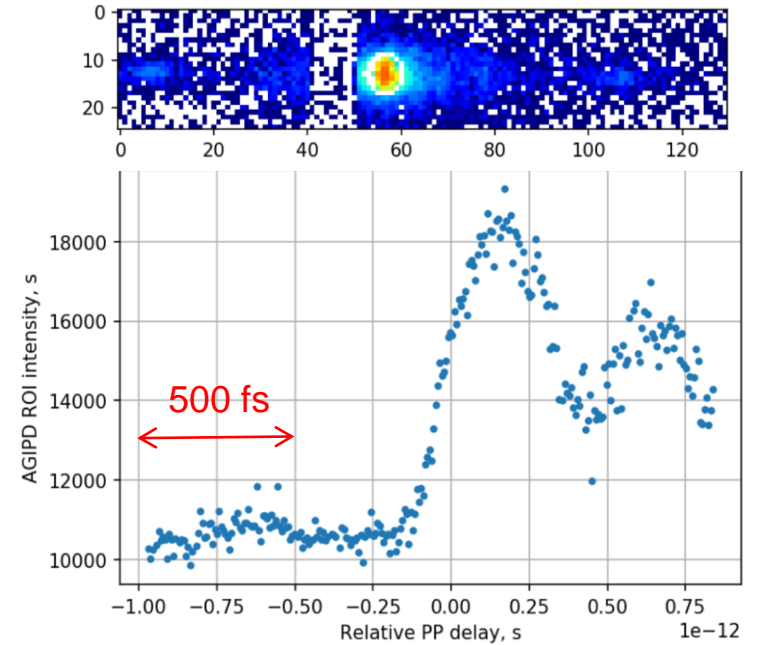
TR-WAXS



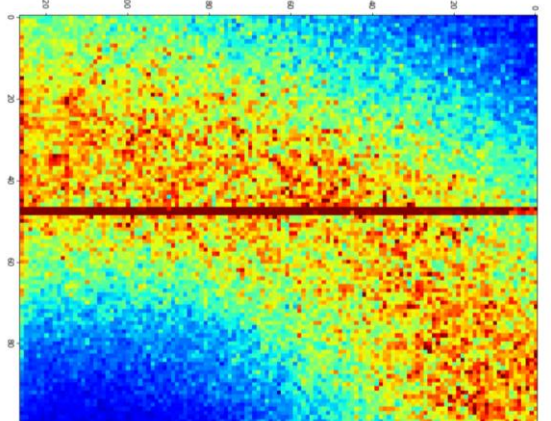
MHz XPCS



Laser pump – X-ray probe



Coherent scattering and speckle



What's new at MID for call 8?

■ Standard configuration available for small-angle MHz XPCS

AGIPD MHz area detector, 1M pixels, 200 μm pixel size

7–12 keV, ~ 2 mJ/pulse

Min. correlation function lag time 440 ns, max. lag time 88 μs

q-range (8 m sample–detector distance): $\sim 7 \times 10^{-3} - 0.1 \text{ \AA}^{-1}$ (small angle scattering)

Beam size on sample: $\sim 1-10 \mu\text{m}$ with EH optics, $>30 \mu\text{m}$ with tunnel optics

■ Hard X-ray split-and-delay line open for proposals

Photon energy: $\sim 7 - 10$ keV

Delay range: -10 – 800 ps

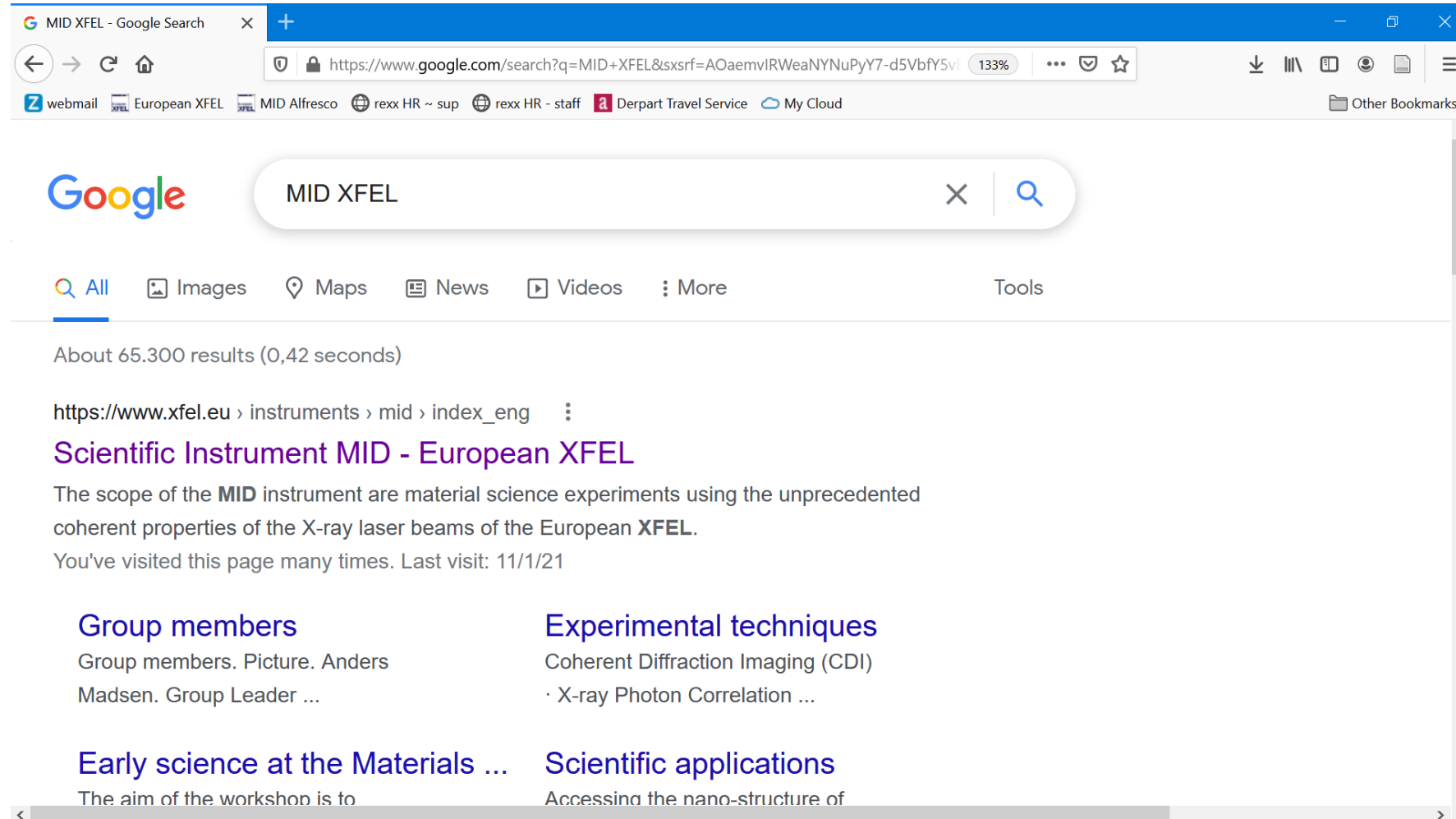
Bandwidth: $\sim 6 \times 10^{-5}$, 2×4 Si(220) reflections

■ Self-seeding available on a standard basis

Up to ~ 0.8 mJ achieved in 1-2 eV bandwidth

Tested up to ~ 13 keV, probably possible to go higher...

Need more information?



mid-info@xfel.eu