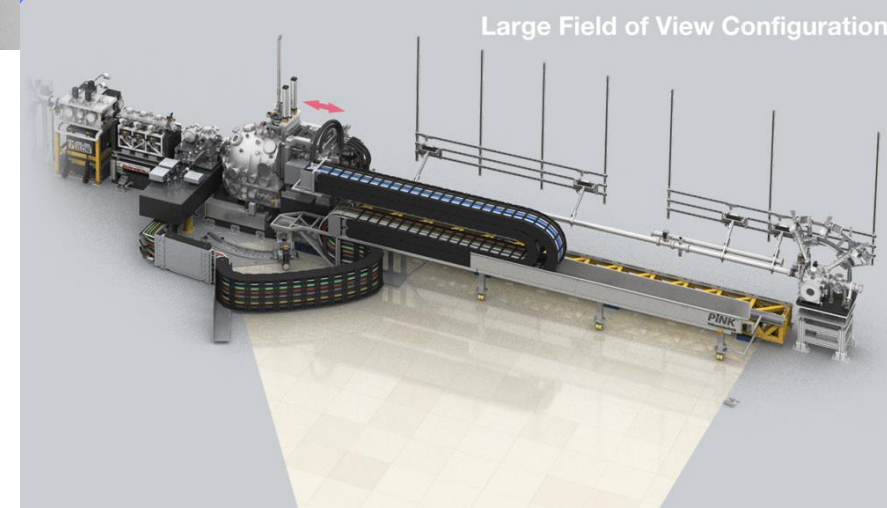
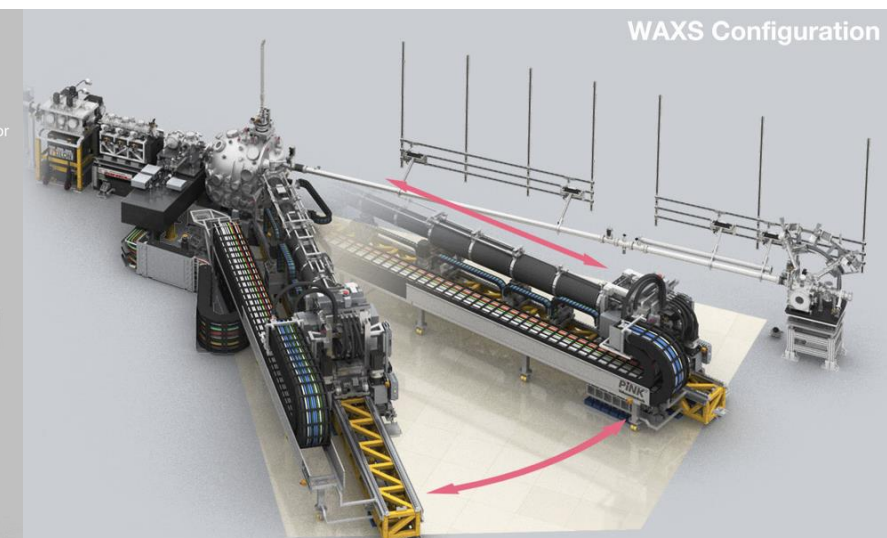
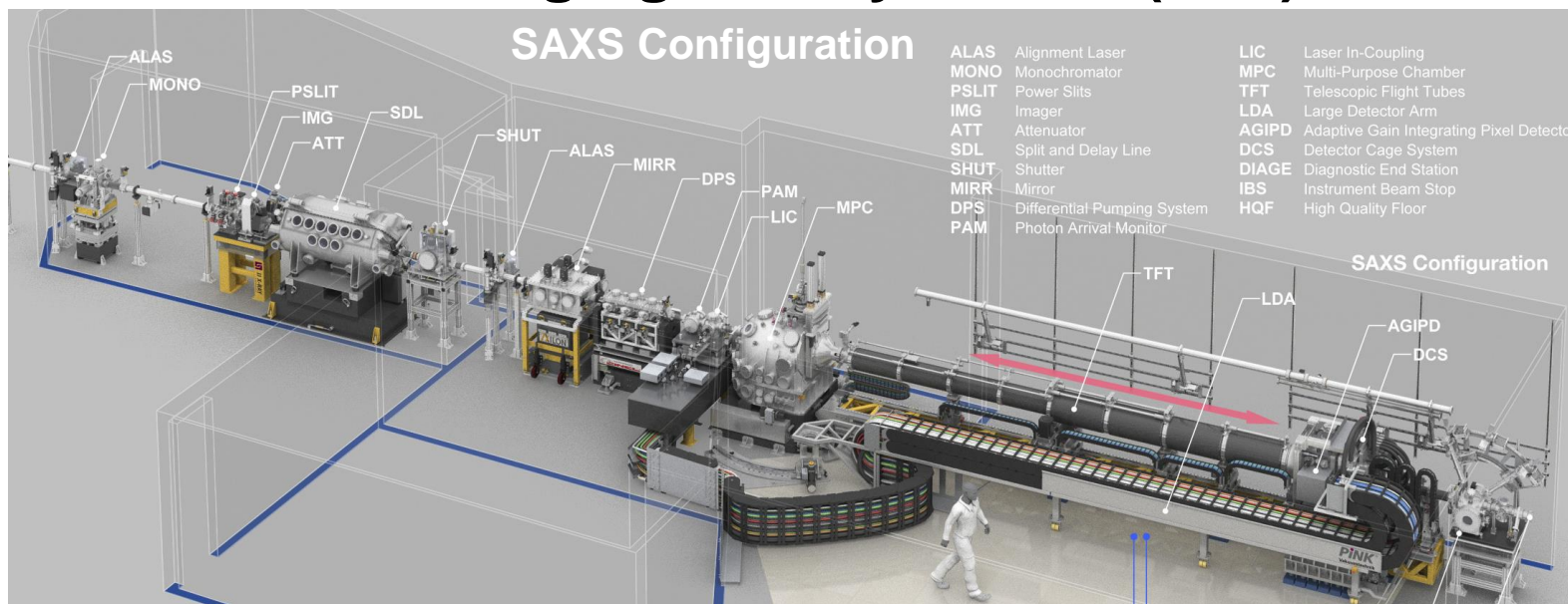
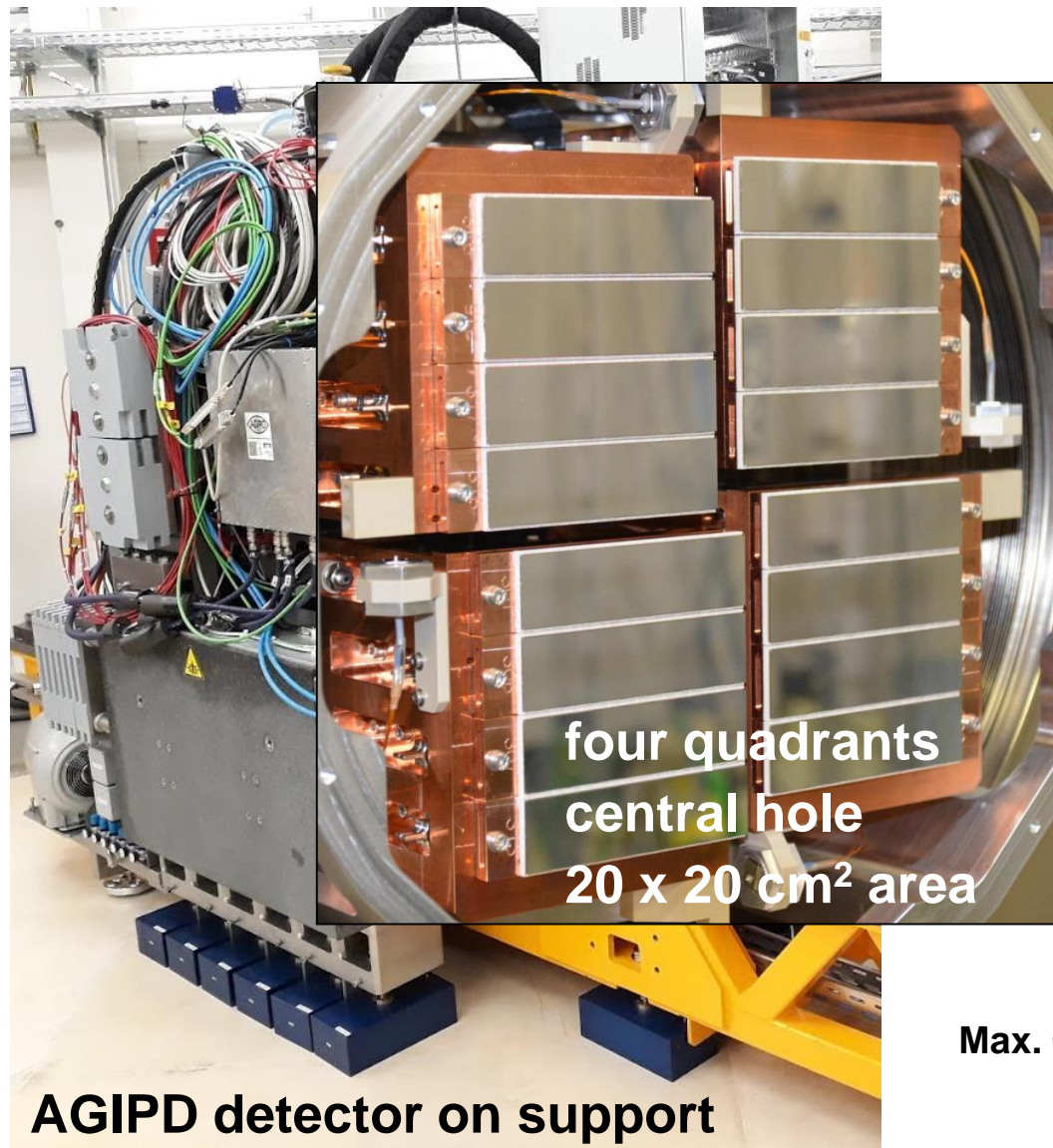


Materials Imaging and Dynamics (MID) instrument

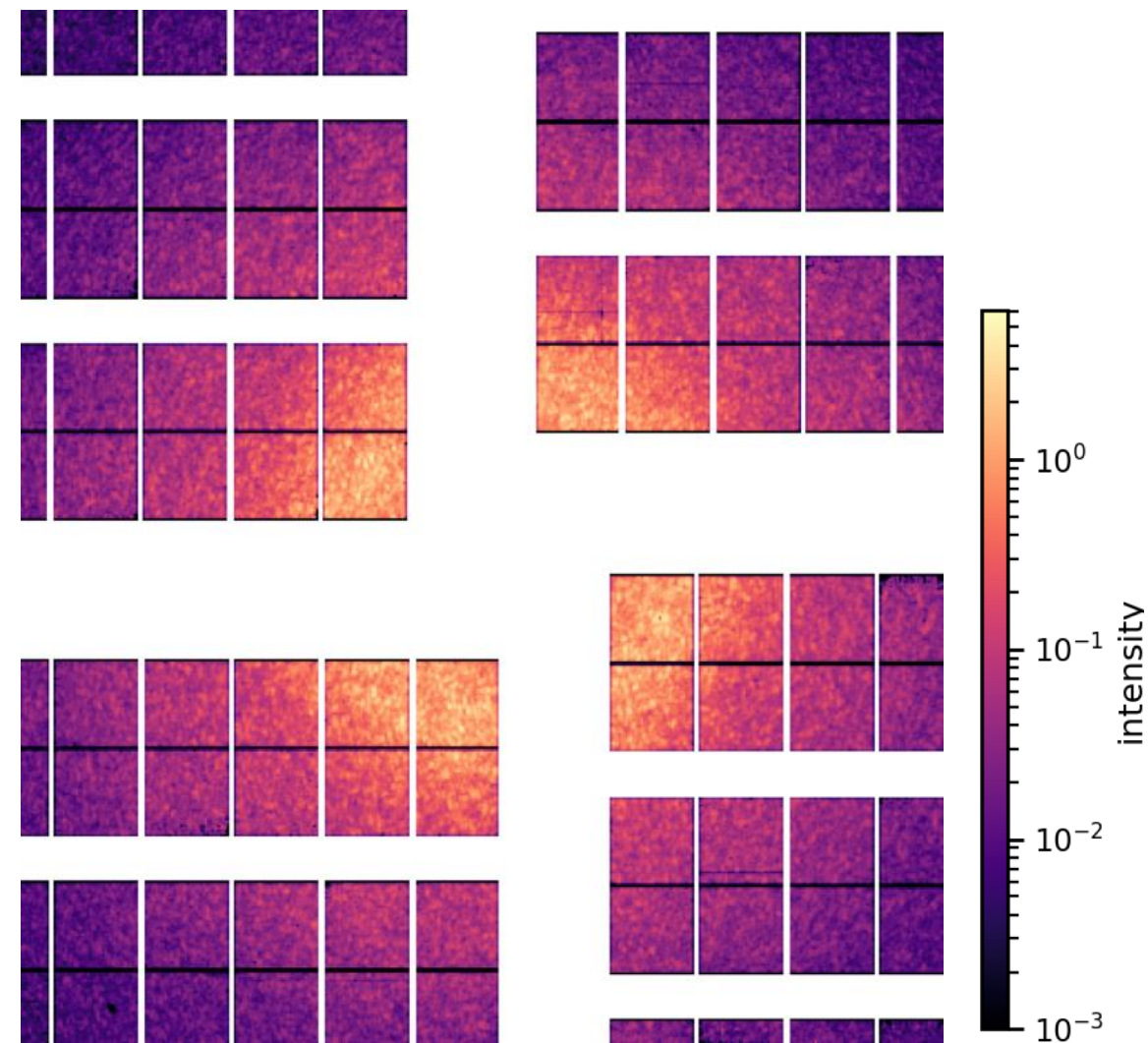


- MHz and Mpixel area detector, 200 μm pixels (AGIPD)
- Windowless (all in-vacuum setup) or sample in air
- Flexible geometry: SAXS, WAXS, Large Field of View
- Sample - detector distance $\sim 0.2 - 8$ m, 2θ up to $\sim 50^\circ$
- 5 - 24 keV, $\sim 10^{12}$ ph/pulse, ~ 20 fs pulse length
- Hard X-Ray Self-Seeding
- Standard Configurations to users (SAXS-XPCS, WAXS, LFOV)
- GI option compatibility (in-air or in-vacuum) with special care of direct and reflected beams (beamstops / detector gaps)

MHz data acquisition at MID

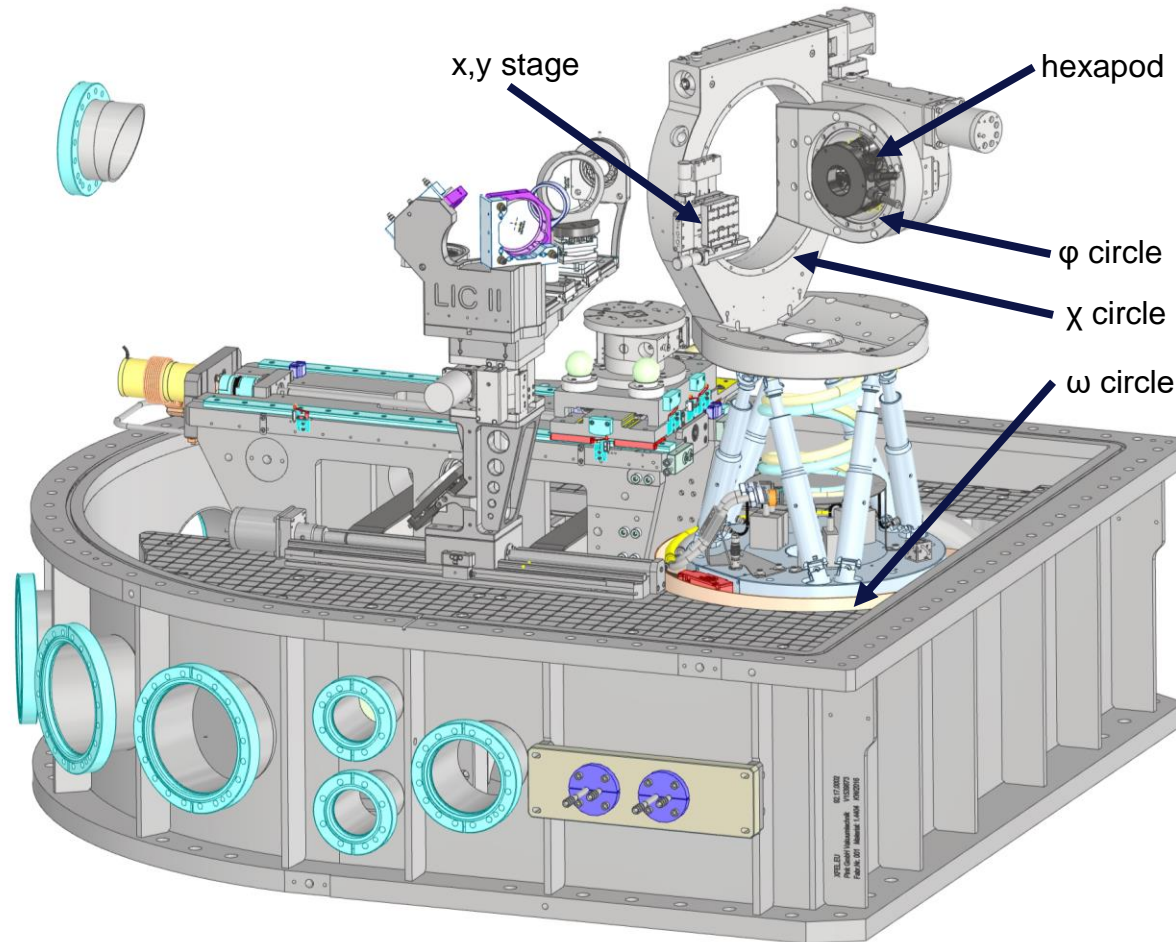


Speckle pattern (SAXS) on AGIPD



Max. Q-range: 0.12 Å⁻¹ (SAXS, SD @ 8m), 0.31 Å⁻¹ (SAXS, SD @ 3m), 3 Å⁻¹ (LFOV)

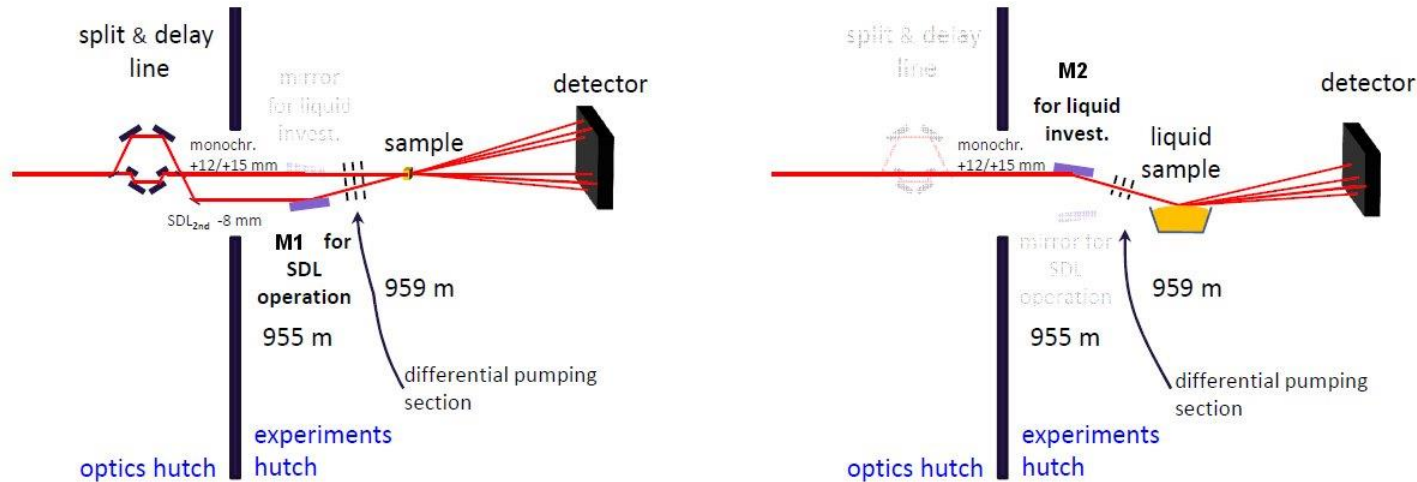
Diffractometer setup



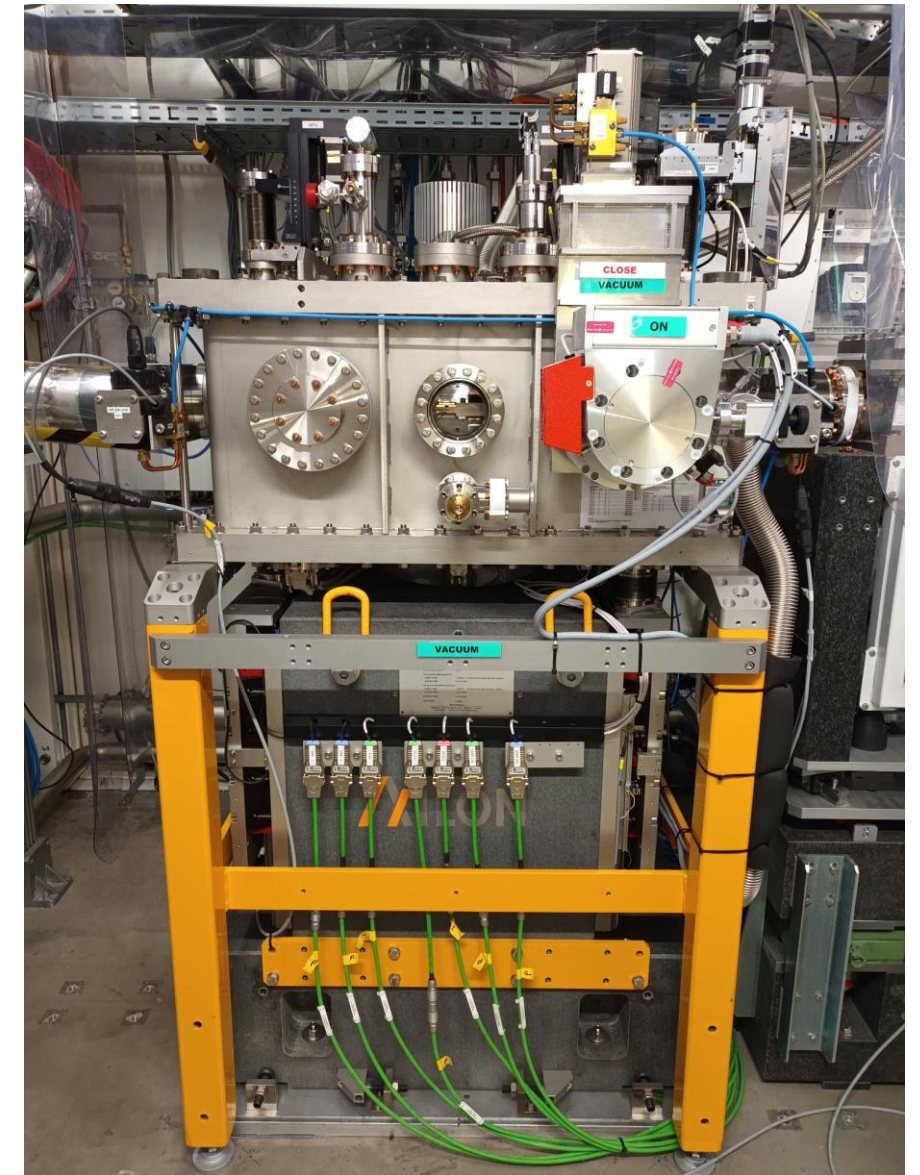
- χ -circle with 360° rotation
 - Up- or downstream configuration of chi circle
 - Possible mounting equipment opposite to sample (diagnostic unit)
- ϕ -circle with 360° rotation
 - Limited by hexapod cable or copper braids (cryogenic mount)
- Hexapod
 - x,y,z motion of sample
 - Additional rotation and tilt for sample alignment
 - 51.5 mm height for setups
- Sample stages
 - Piezo scanner
 - Magnetic kinematic mount
 - Cryo-cooled holder

Courtesy of J.-E. Pudell

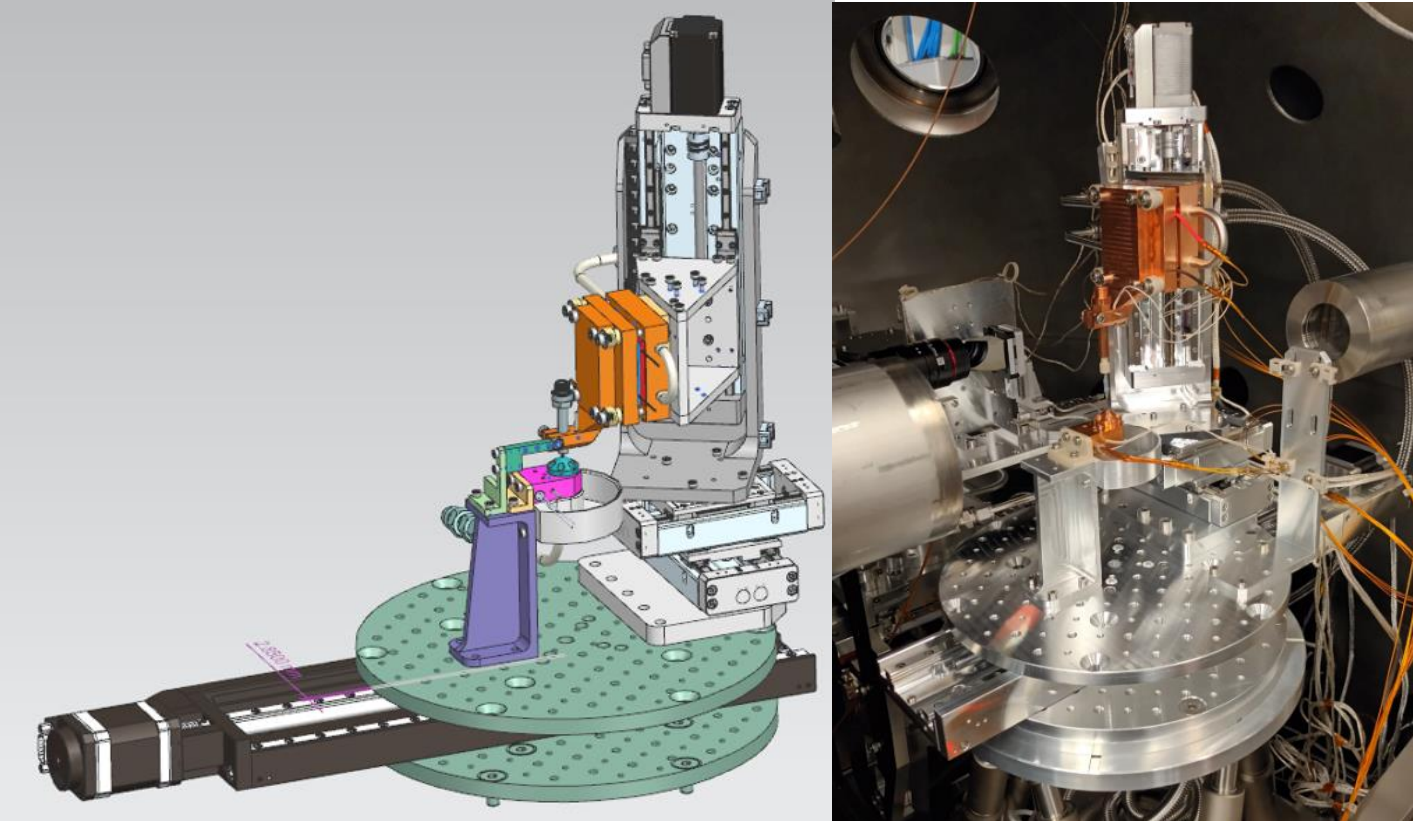
Dual-mirror X-ray optics



- Dual X-ray mirrors:
 - M1 (upwards reflecting for SDL geometry)
 - M2 (downwards reflecting for liquid scattering)
- In-vacuum mechanics (Axilon AG): pitch (coarse/fine) and roll adjustments of each mirror, Tx-translation
- B4C and Pt coating stripes
- 40 mm vertical gap between surfaces
- Alignment diagnostics (upstream/downstream vert. slits, photodiode)
- Cryocooling integrated



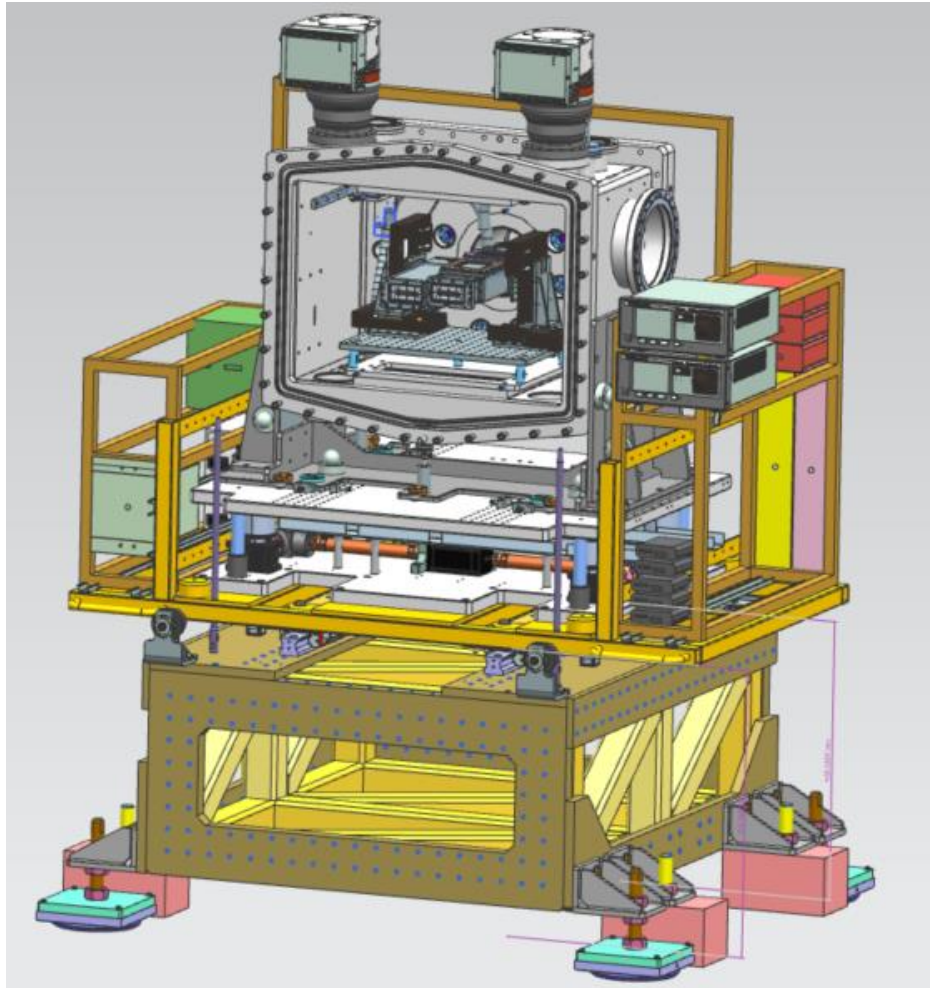
Compact liquid jet chamber



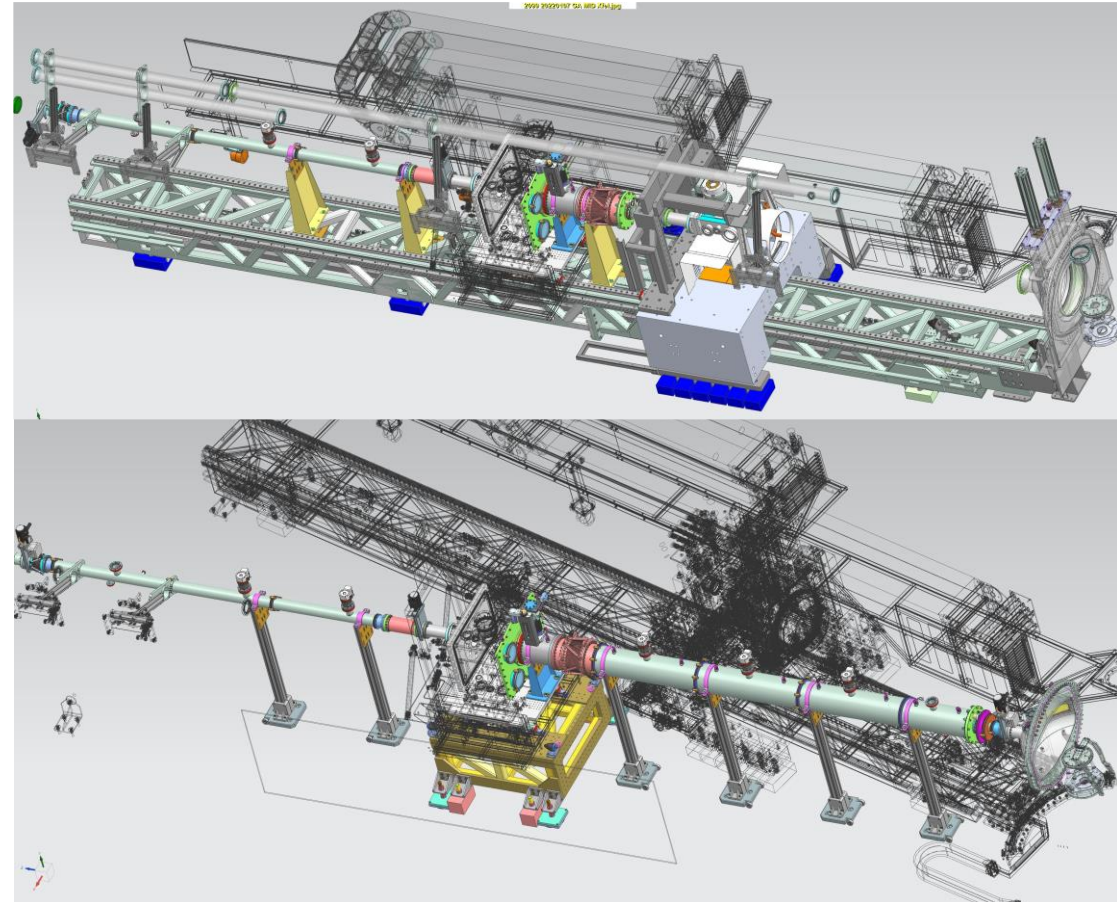
Courtesy of J. Möller

- Liquid sample delivery (up to three tubes)
- Nozzle
 - Temp. regulation
 - Temp. measurement
 - Alignment tools
- XYZ stage
- Catcher
 - Temp. measurement
 - Heating
 - Pumping
- Nozzle and catcher coupled movement
- Vacuum conditions

Multi-detector stage (MDS)



Courtesy of A. Schmidt and G. Ansaldi



- Complementary detector stage (in-vacuum)
- ePix (50 μm pixel), JF(75 μm pixel) detectors
- In-vacuum SAXS/WAXS configurations