

Small and Wide Angle X-ray Scattering at DND-CAT

Steven Weigand

weigansj@northwestern.edu

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NORTHWESTERN
UNIVERSITY



DND-CAT

- DuPont, Northwestern, Dow: 20/60/20
- Formed 1990,
agreement through March 2016
- GU time: 25% on all stations



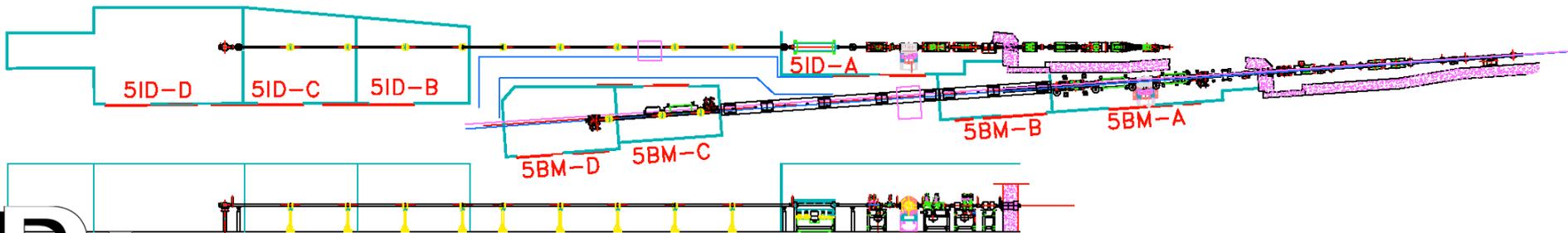
DND-CAT

– 5BM-C

- High resolution powder diffraction
- X-ray tomography

– 5BM-D

- EXAFS
- High-energy diffraction
- Polymer scattering



DND-CAT

– 5ID-B

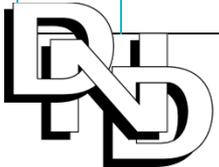
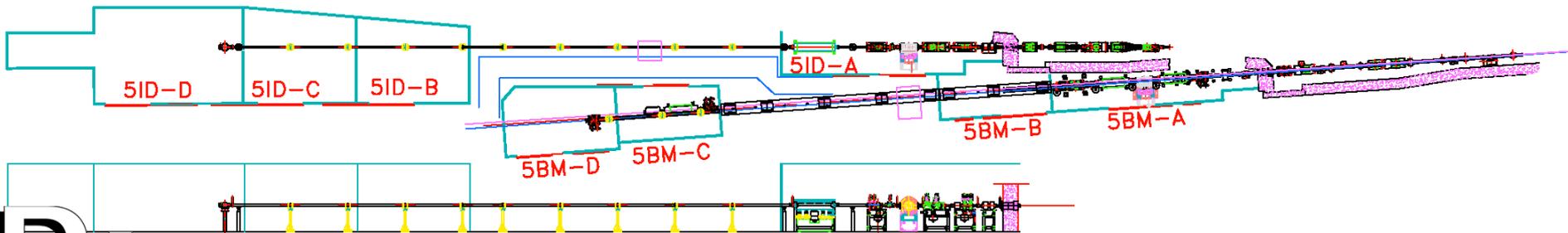
- Fiber diffraction
- Powder diffraction

– 5ID-C

- Surface science
- Standing waves and reflectivity

– 5ID-D

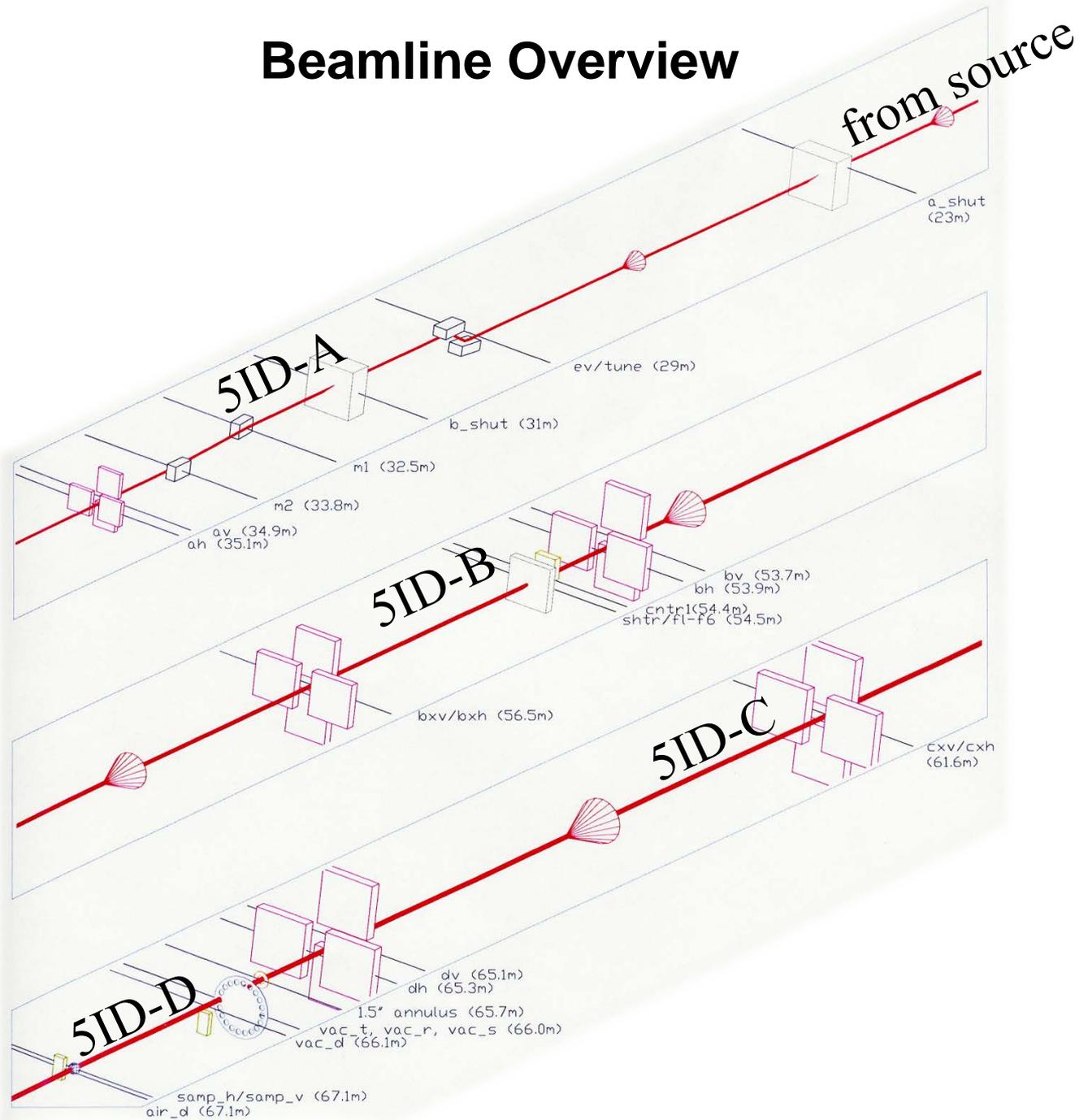
- Small and Wide angle scattering



Small and Wide Angle X-ray Scattering Capabilities at DND-CAT

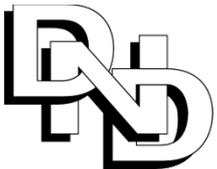


Beamline Overview



5ID-D SAXS Parameters

Energy (wavelength)	8 keV to 17 keV (1.5 Å to 0.73 Å)
Beam size V/H	50 μm × 50 μm to 1 mm × 2.5 mm
Camera length	0.2 m, 1.0 m and 8.5 m (simultaneous)
q range (d spacing)	0.001 Å ⁻¹ to 4.5 Å ⁻¹ : 6200 Å to 1.4 Å

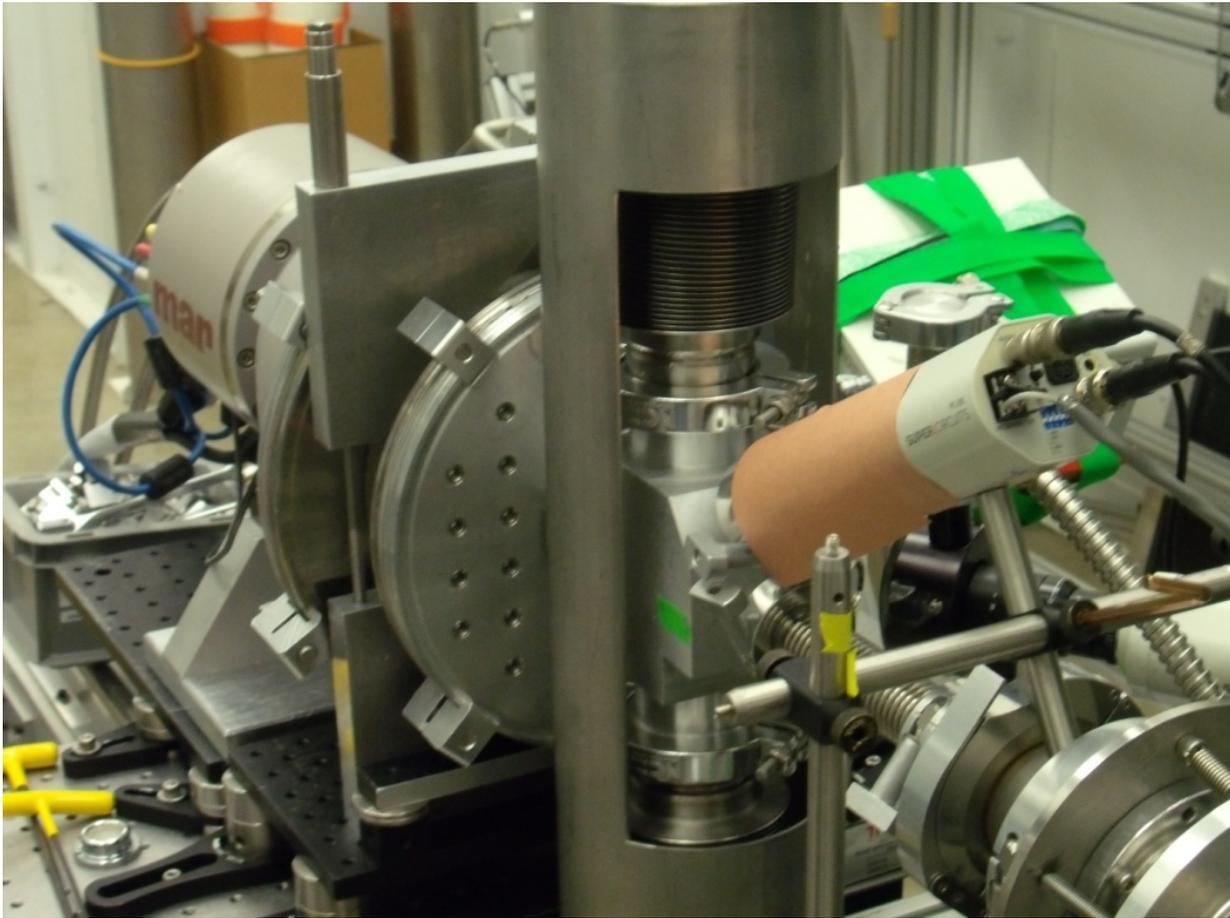


Supported Experiments

- Windowless (in vacuum) sample changers for ultra low background and high throughput measurement of static samples
- Linkam temperature control stage for flat samples or using an adaptor for samples in capillaries
- Linkam DSC for calorimetry studies on samples in DSC pans
- Custom Instron Materials Testing System for material stress-strain studies
- Flow-cell adaptor for Linkam temperature control stage for aqueous samples
- Simultaneous SAXS/MAXS/WAXS for dynamic samples
- In vacuum flow cell compatible with solvents with a water cooled multi-sample holder for low background solution scattering



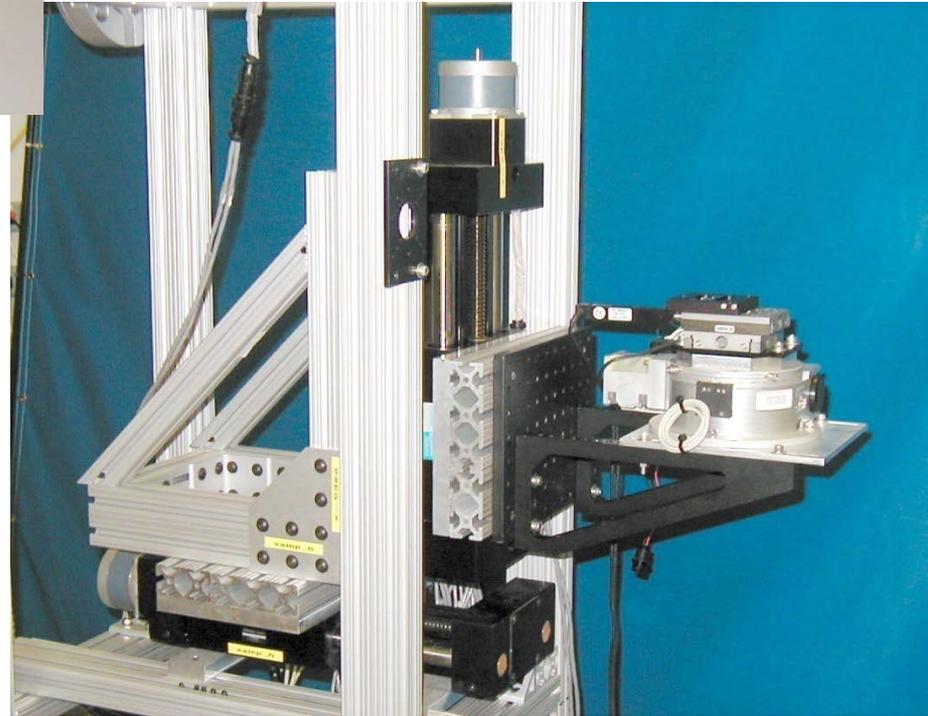
Windowless High Throughput



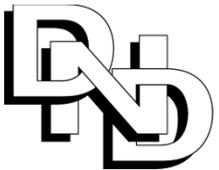
Flexible Sample Environment



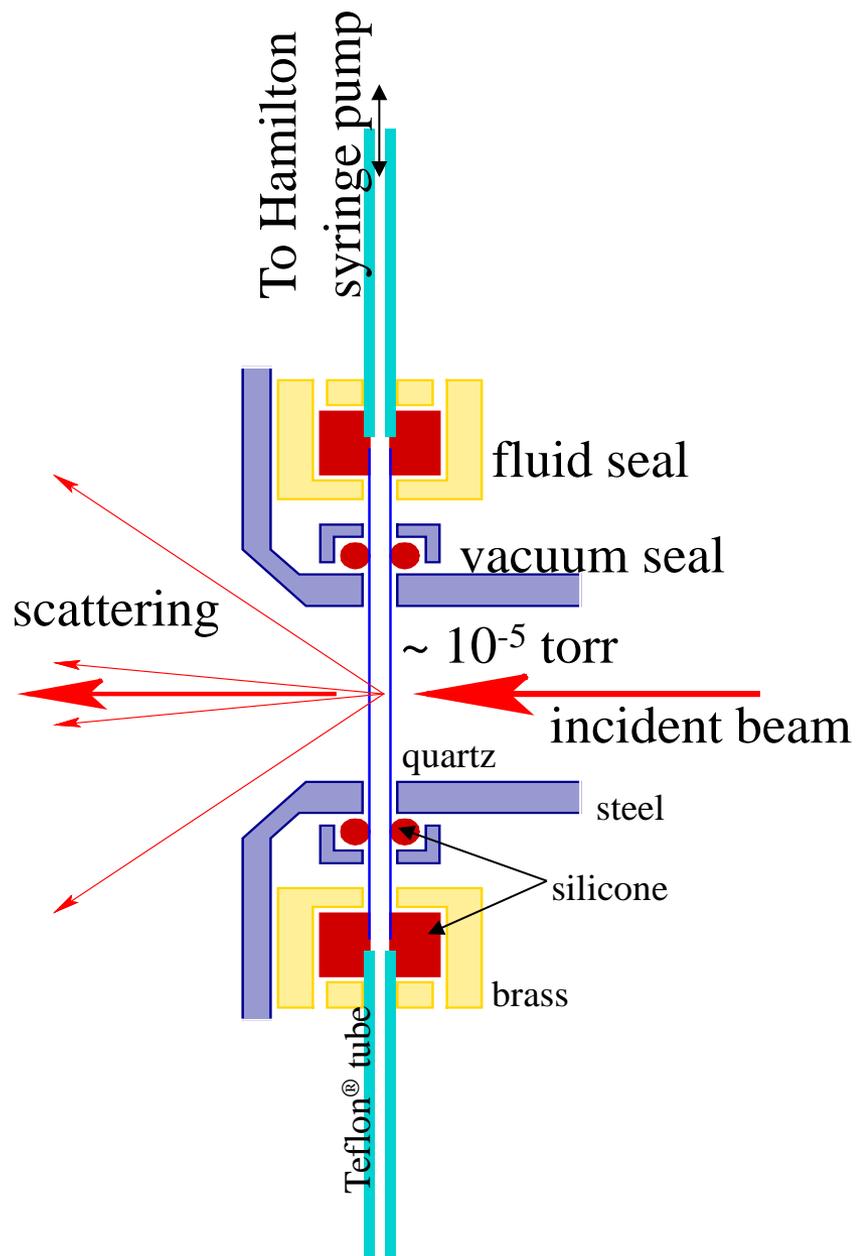
Standard sample environments



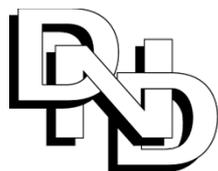
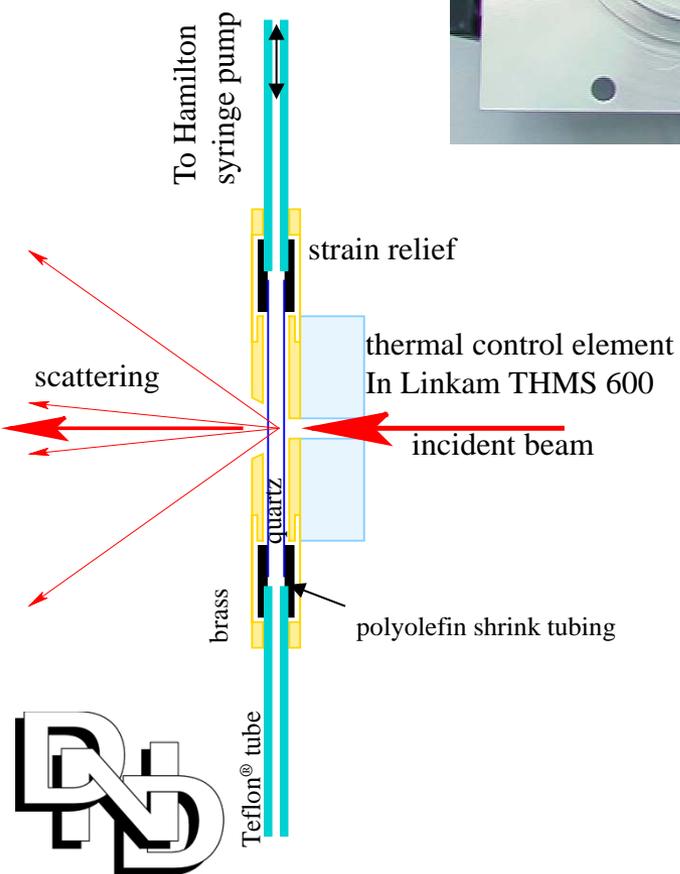
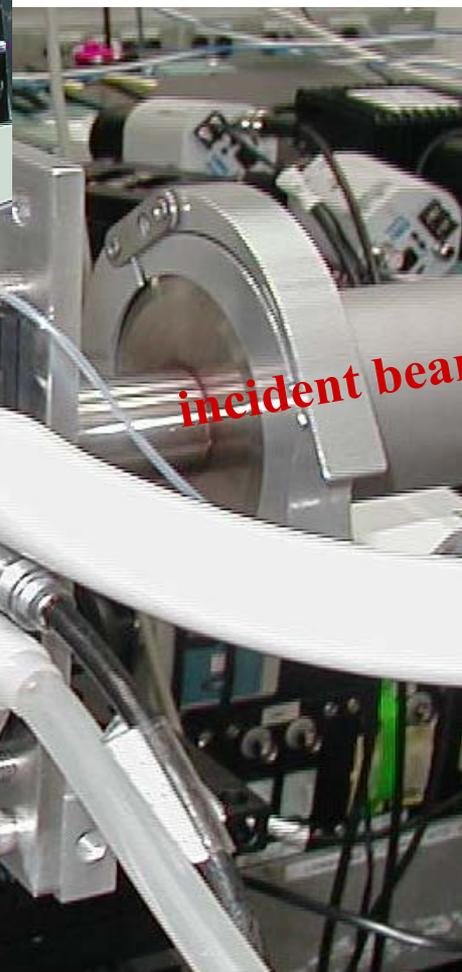
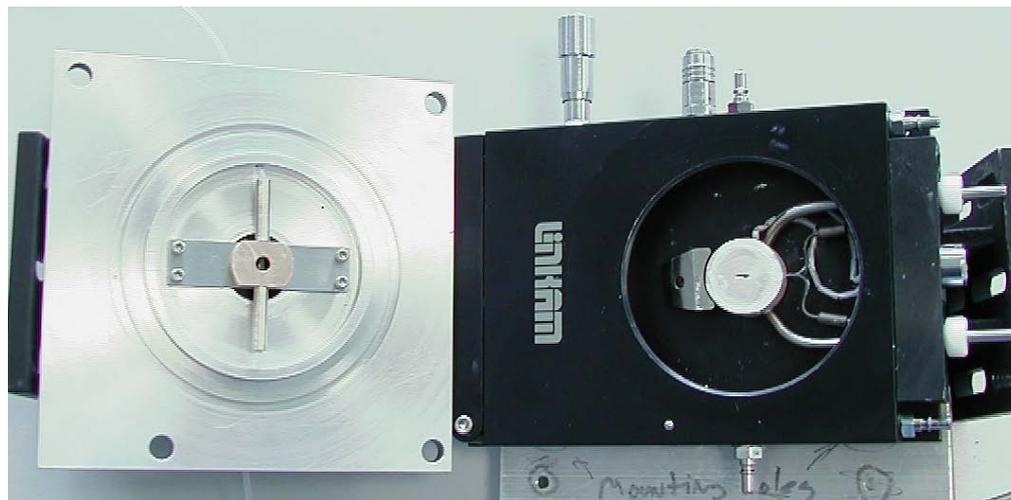
Sample tower in 5ID-D



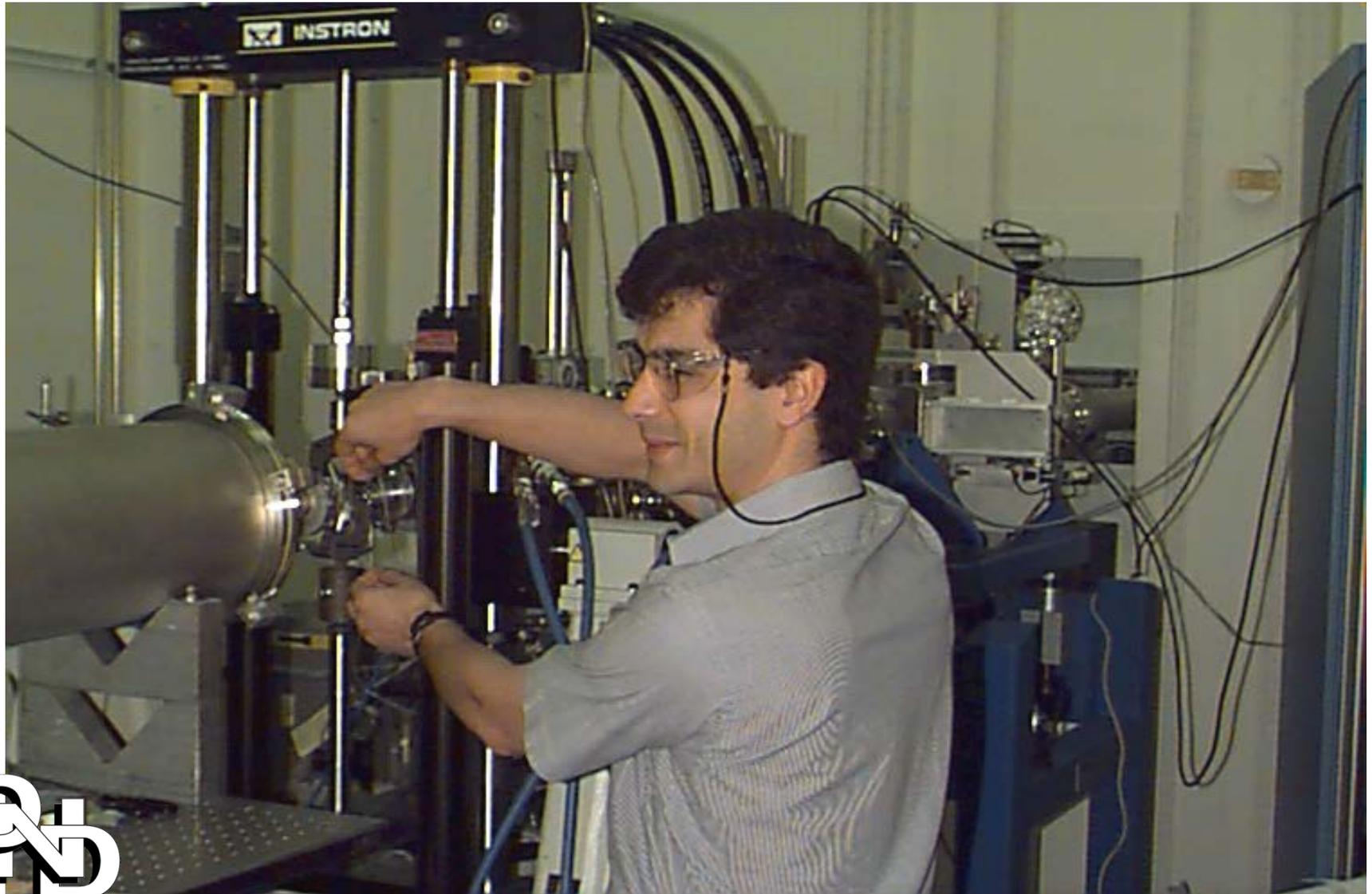
In Vacuum Flow-cell



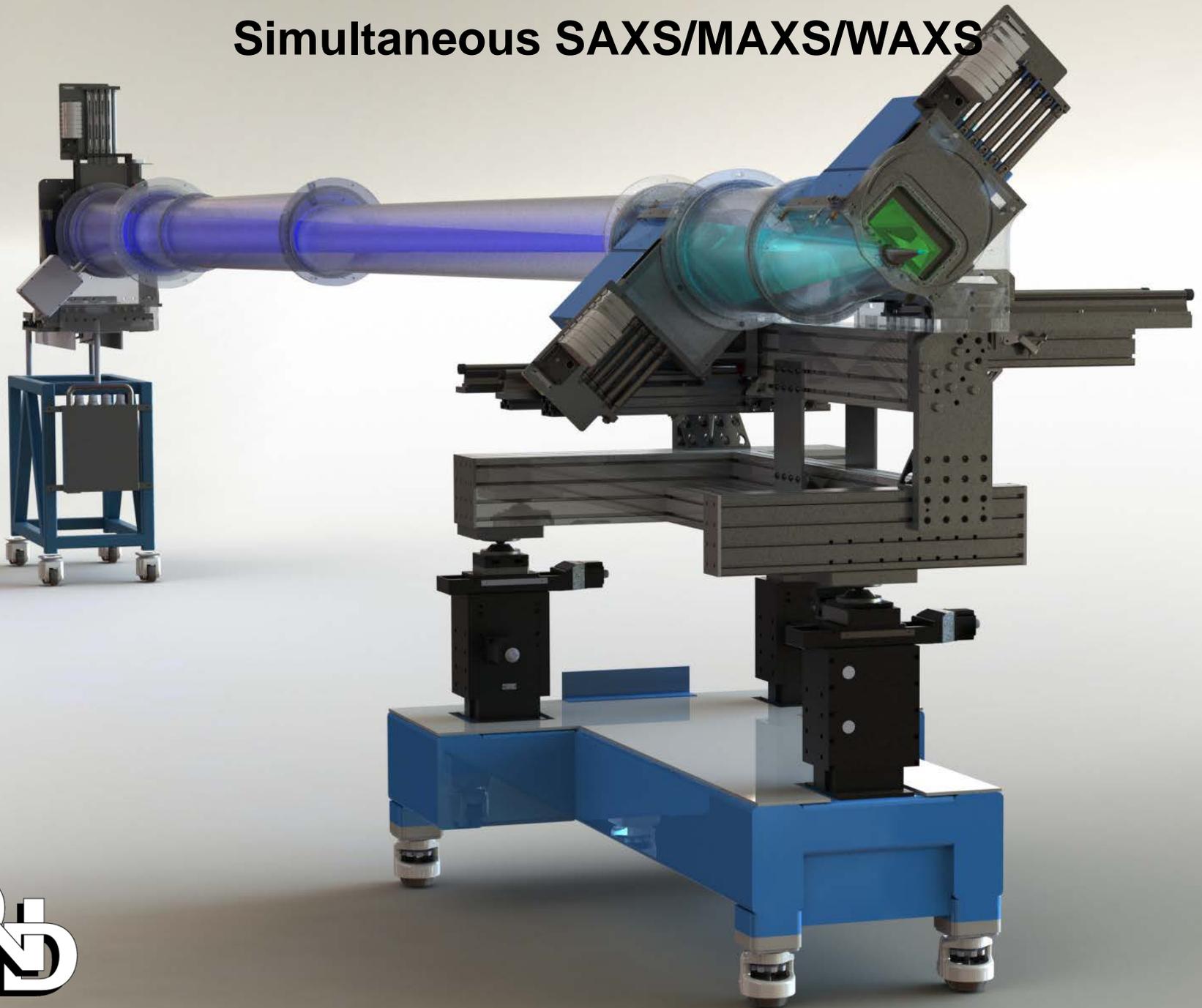
Heated Flow-Cell



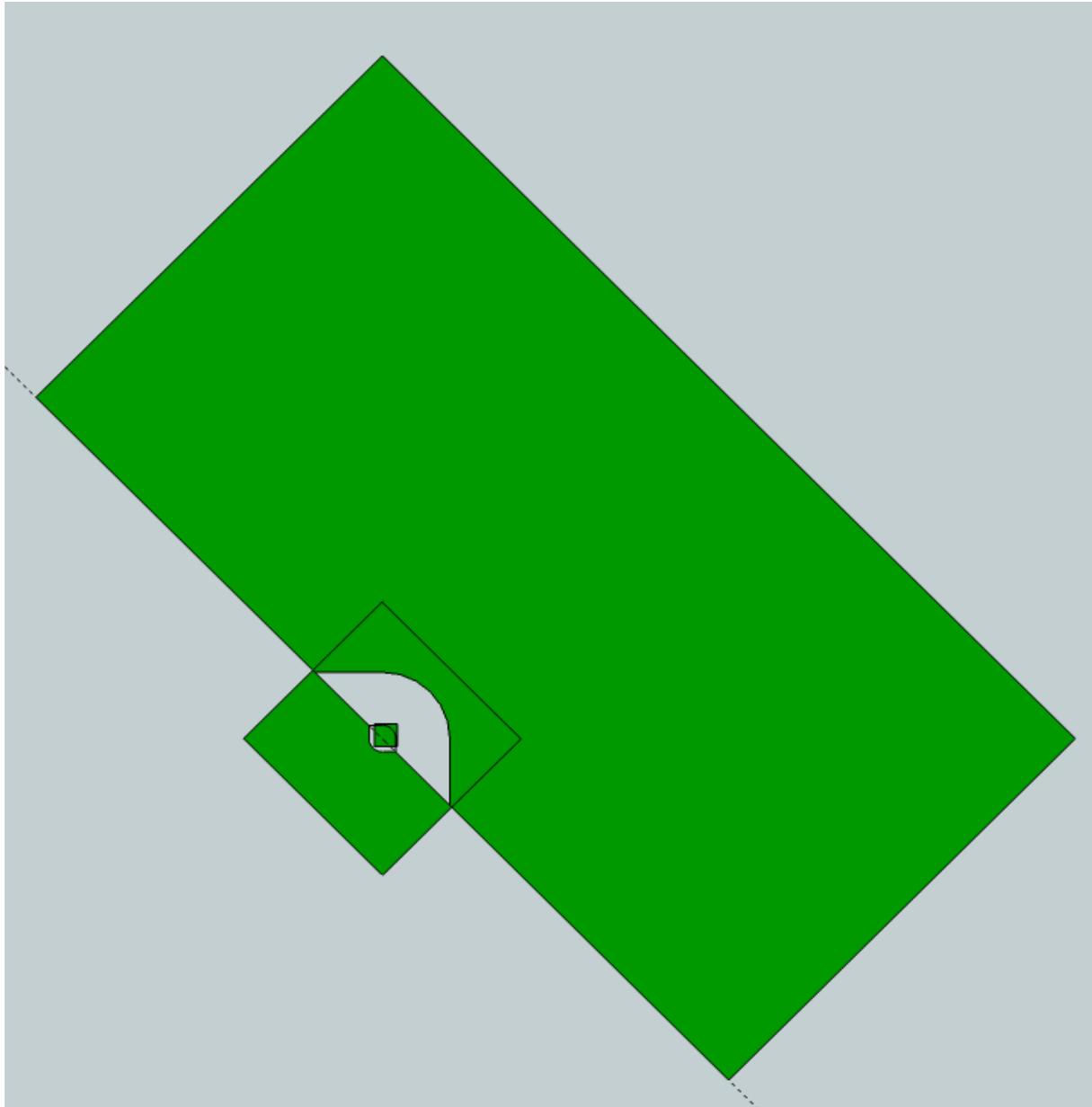
Stress-Strain Experiments



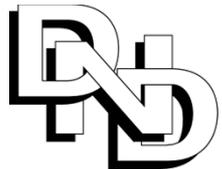
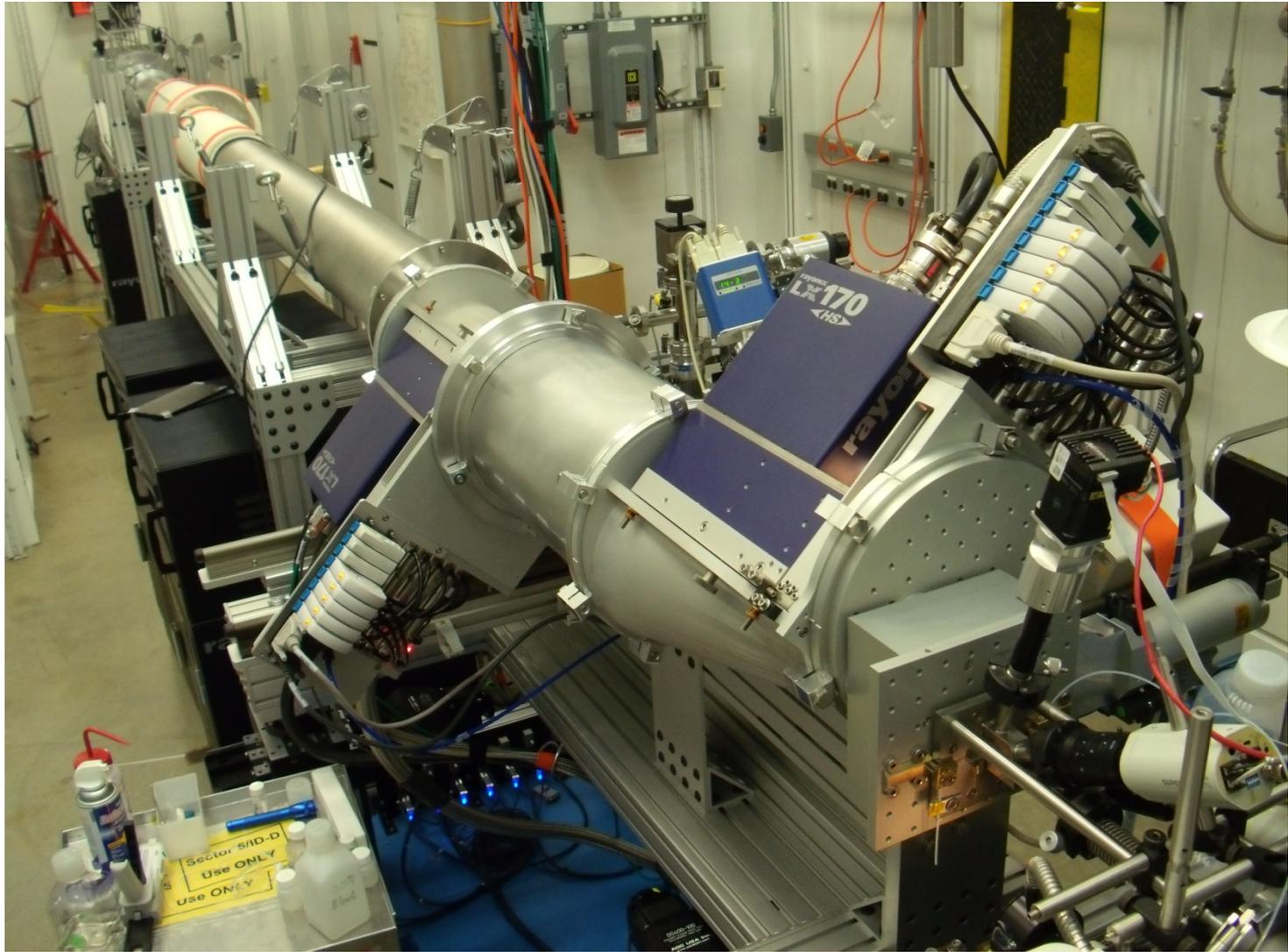
Simultaneous SAXS/MAXS/WAXS



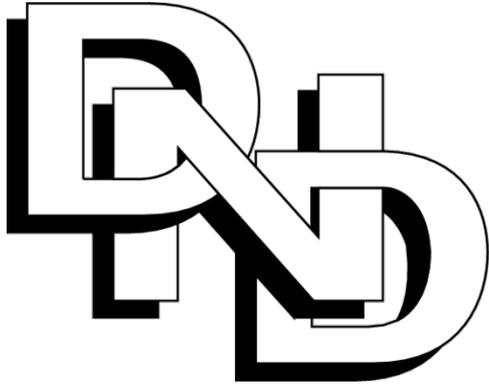
Simultaneous SAXS/MAXS/WAXS



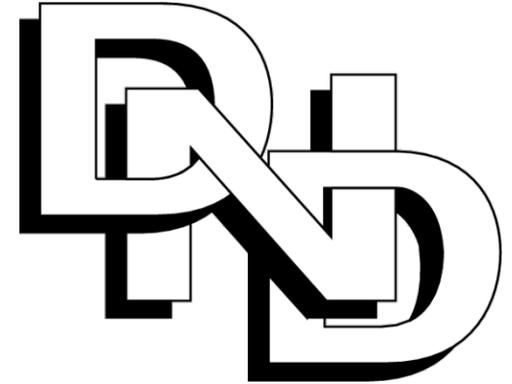
Simultaneous SAXS/MAXS/WAXS



DND-CAT Staff



Denis T. Keane
Steven Weigand
Qing Ma
James Rix
Monica Green
W. Mike Guise



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