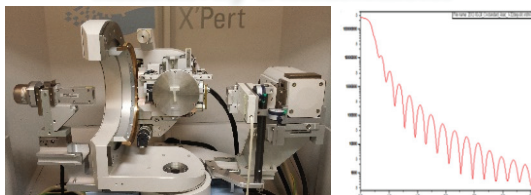


Advanced Diffraction

PANalytical X'Pert Pro MRD Reflectivity Diffractometer



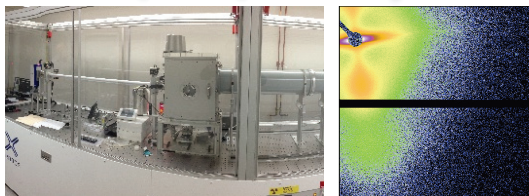
Equipped with:

- Parallel beam W-Si mirror
- 4 Circle goniometer with xyz motions
- Attenuator for direct beam measurement

Applications & Expertise:

- ☐ Low angle data collection down to $0.4^\circ 2\theta$
- ☐ Thin film reflectivity measurement
- ☐ High quality and high resolution patterns

Xenocs Xeuss SAXS/WAXS/GISAXS System



Equipped with:

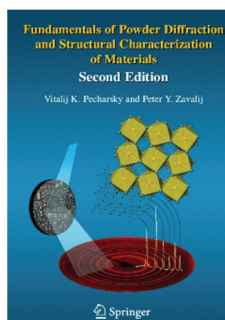
- Cu μ -source 30W x-ray tube
- 300K Pilatus detector for SAXS
- 100K Pilatus detector for WAXS
- 100 to 400 K low temperature system
- Multi-purpose sample chamber

Applications & Expertise:

- ☐ SAXS measurement at 0.25 to 2.5 m SDD
- ☐ Q range as low as $0.004 \text{ \AA}^{-1}$ (or even 0.002)
- ☐ WAXS measurement up to $60^\circ 2\theta$
- ☐ GISAXS for thin film samples on substrate

X-ray Crystallographic Center

- Trains students and researchers on the theory and operation of the instruments;
- Teaches **courses** on the crystallography, crystal structure determination and powder diffraction;



- Offers its equipment and expertise for **collaborative research** with other local universities, government institution as well as industrial research laboratories located in Maryland, Washington DC, Virginia, and nationwide.
- Performs **consulting** in the field of X-ray diffraction and crystallography, solid state, materials and pharmaceutical chemistry, and others.

Contact Info:

Dr. Peter Y. Zavalij, Director

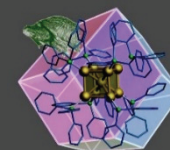
Department of Chemistry & Biochemistry
091 Chemistry Bldg., Room B0108B
University of Maryland
College Park, MD 20742-4454

- ☎ (301) 405-1861 Office, Rm. B0108
- ☎ (301) 405-3230 XRD Lab, Rm. B0112
- ☎ (301) 405-9597 SAXS Lab, Rm. B0108

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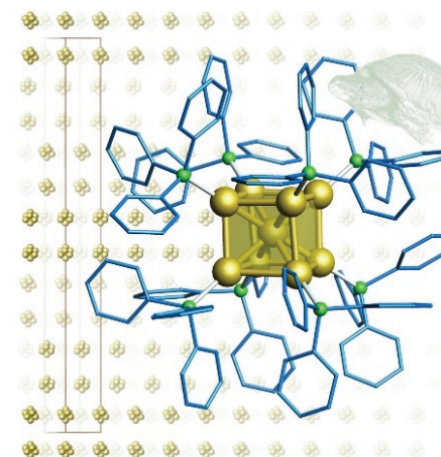
- ★ www.chem.umd.edu/crystallography
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X-Ray Crystallographic Center



XCC

Non-Destructive X-ray Diffraction Analysis for Structural Characterization of Materials



State-of-the-art Facility
Quality Service
& Competitive Rates
Experience & Expertise
Education & Training

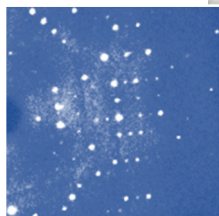


UNIVERSITY OF
MARYLAND

Department of Chemistry & Biochemistry
College of Mathematical & Natural Sciences

Chemical Crystallography

Bruker Smart Apex2 Single Crystal Diffractometer

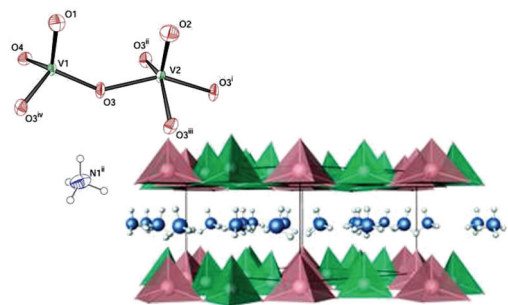


Equipped with:

- Mo sealed tube and graphite monochromator
- CCD area detector for rapid data collection
- Motorized detector to sample distance
- Glove box for handling air sensitive crystals
- Cryostream LT system (85 to 400K) to reduce thermal motions and preserve crystals
- Leica microscope with flat screen TV

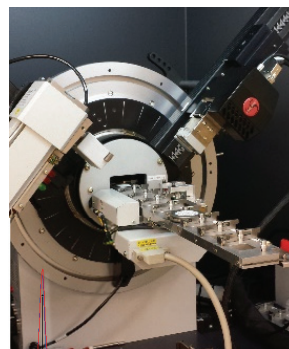
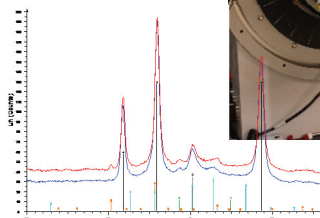
Applications & Expertise:

- ☐ Structure solving of all type of compounds
- ☐ Identification using CCDC database
- ☐ Solving Disordered & modulated structures
- ☐ Merohedral & non-merohedral twins
- ☐ Publication quality check



Powder Diffraction

Bruker D8 Advance Bragg-Brentano Diffractometer

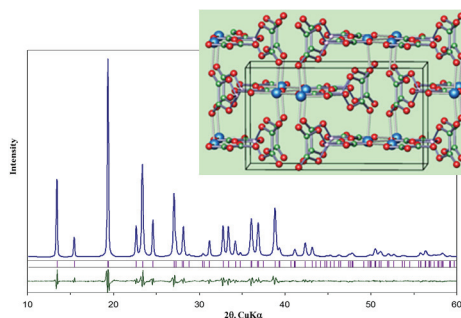


Equipped with:

- Cu sealed tube and Soller slits
- Position sensitive LynxEye detector for fast yet high quality data collection
- 9 position sample changer for batch mode
- Sample holders: for large and small amount, inert atmosphere, scatterless, back filling, etc.
- Coming soon: 12K low temperature stage

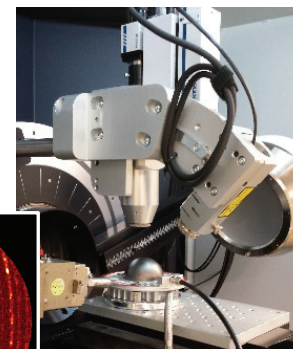
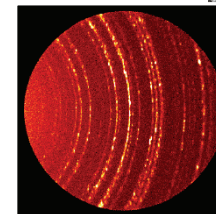
Applications & Expertise:

- ☐ Phase ID using ICDD and COD databases
- ☐ Quantitative analysis: RIR and Rietveld
- ☐ Crystallite size & strain determination
- ☐ Amorphous content quantification
- ☐ *Ab initio* crystal structure determination



Materials Characterization

Bruker D8/C2 Discover Parallel Beam Diffractometer



Equipped with:

- Göbel mirror providing parallel beam
- Low noise Vantec500 area detector
- HT stage up to 1200°C under vacuum, in air or inert gas (Ar and N₂)
- XYZ stage for combinatorial screening
- Capillary spinner
- Laser/video system for sample positioning

Applications & Expertise:

- ☐ High quality diffraction patterns from mini amount of sample and thin films
- ☐ In situ thermo-diffraction
- ☐ Combinatorial screening and mapping
- ☐ Capillary technique for air sensitive and coarse grain samples

