

*A central mission of the AMCL is the education, research, and training of students at the University of Delaware.
The AMCL also collaborates with researchers in industry and other academic institutes.*

Introducing the newly installed Xenocs Xeuss 2.0 SAXS/WAXS/GSAXS system



The AMCL is fortunate to house the new UD's next generation X-ray scattering system. Through the generous support from UNIDEL and Dr. Thomas Epps, the lab can now offer this technique to the UD community and our external partners. Equipped with the Q-Zoom feature, allowing sample to detector distance to be optimized from SAXS to WAXS seamlessly. Automated sample program control of various environments, temperature, tensile, and shear.

Short courses have been established and offered monthly, currently over forty users have attended.

Instruments currently being installed

Lakeshore low temperature probe station: The station has been installed and will begin welcoming users soon. The system features 4 probes and capable of measuring frequencies up to 67GHz. Temperature down to 5 Kelvin and a magnetic field of 0.6 tesla.

Thermo Fisher triple quad ICP mass spec with laser ablation: This Mass Spec system is capable of measurements in the parts per trillion! Normal ICP/MS systems require the digestion of solid samples, the new system has a laser ablation “front end” making the long process of sample digestion not necessary. An Ion Chromatograph stack is also incorporated into the system allowing separation of species prior to analysis.



Recently added Instruments

VCA contact angle measurement system: Provides very clear high resolution imaging with contact angle processing software. The VCA is able to measure the water contact angle on wafer surfaces up to 6 inch in diameter. Available training can be provided on demand.



Sigma 700 Surface Tension: Force tensiometers enable precise characterization of a number of material properties. Analysis of surface and interfacial tension, powder wettability, dynamic contact angles, critical micelle concentration, density and sedimentation provides valuable information on the interactions between gas, liquid and solid phases.



Advanced Dual Energy X-ray Imaging Facility (Spring 2019)

3D X-ray microscopes/ CT scanners: The AMCL is very excited to be working with the Department of Engineering Dr. Gonzlo Arce (UNIDEL award 2017J- Advanced Dual Energy X-ray Imaging Facility) and industrial partner, W.L.Gore in the acquisition of two new 3D X-ray microscopes that will greatly enhance the facilities’ ability to meet the current University of Delaware’s research needs. The creation of a CT scanner facility at the University of Delaware will create opportunities for cutting edge research currently not available to the UD community and will enhance the University of Delaware’s research competitiveness amongst our peer institutes.



The University of Delaware CT Scanner Facility will be an open access laboratory providing non-destructive X-ray computed tomography (CT) and a high performance image analysis services as part of the Advanced Materials Characterization Lab (AMCL). Based in Harker Interdisciplinary Science and Engineering building, this facility will offers open access to the general UD user community, including local researchers, companies and also remote users (both local and international, via sample shipment and data transfer). The laboratory will hosts two CT instruments, i.e. a micro-CT system, as well as a nano-CT system. A workstation-based Image Analysis Centre will equipped with computers with data analysis software packages, which are to the disposal of the facility users, along with expert supervision, if required. All research disciplines are accommodated at the X-ray CT laboratory, provided that non-destructive analysis will be beneficial to virtually all science disciplines.



nano3DX

Education and Outreach

In the summer of 2018

Jacqueline Lang, UD class of 2019 Chem E student worked in the lab while assisting a local company Stride Services.

Two high School students from a local school conducted research to be presented at the state Science Fair competition. They both took first place in there catagories.

