



2020 Graduate Student Research Award at NSF's ChemMatCARS (GSRAC)

CALL FOR PROPOSALS

NSF's ChemMatCARS (<https://chemmatcars.uchicago.edu/>) at the Advanced Photon Source (APS) of Argonne National Laboratory (ANL) is sponsoring summer research experiences for graduate students to pursue their PhD research and deepen their understanding of the sophisticated synchrotron x-ray techniques and capabilities at NSF's ChemMatCARS and the Advanced Photon Source. The purpose of our program is to provide students with hands-on experience and one-on-one training, thereby increasing their use of NSF's ChemMatCARS facility and establishing long-term collaborations between scientists in NSF's ChemMatCARS (<https://chemmatcars.uchicago.edu/education-and-outreach/>).

Interested students should submit a proposal by **December 20, 2019, 5:00 p.m. CST**. Selected graduate students will perform research and work with NSF's ChemMatCARS research staffs for a period of 4 to 6 weeks as described below.

Application Deadline: December 20, 2019, 5:00 p.m. CST

Eligibility and Benefits

The program is open to all graduate students. Preference is given to women and members of under-represented group (URG). The program will sponsor round-trip transportation to ANL, on-site lodging, a stipend of \$2,200 per month.

Duration and Location

The successful applicants will be hosted by NSF's ChemMatCARS for a continuous period of time during the months of **June or July 2020**, with the exact time duration and dates to be negotiated following proposal acceptance.

Research Areas

NSF's ChemMatCARS is the nation's premier facility for synchrotron X-ray studies of advanced small-molecule chemical and materials crystallography (<https://chemmatcars.uchicago.edu/experimental-facility/experimental-techniques/advanced-crystallography/>) and liquid surface/interface scattering (<https://chemmatcars.uchicago.edu/experimental-facility/experimental-techniques/liquid-surface-x-ray-scattering/>), and will accept research proposals in both areas.

For advanced crystallography, research project proposals should focus on high precision crystallography to study microcrystals, charge (i.e., electron) densities, bonding, resonant diffraction, and/or high-pressure single crystal diffraction for structure elucidation in the areas of chemistry or materials science. Applicants may be novices in crystallography with synthetic projects that would benefit from crystallographic characterization. Alternatively, applicants may have advanced knowledge of diffraction methods and crystallography and require complex crystallography experiments to advance their research.

For liquid surface X-ray scattering, research project proposals should focus on the study of static and dynamic assembly, recognition and reactivity of molecules and nanoparticles at the air-water interface using X-ray reflectivity, grazing incident X-ray diffraction and surface fluorescence spectroscopy.

Application Documents

- Curriculum vitae
- Letter of recommendation from the Thesis Advisor
- Proposal for research project (*1-2 pages*)
Applicants should describe the research project they would like to pursue in collaboration with NSF's ChemMatCARS beamline staff. Anticipated outcomes should be described and literature citations provided.
- Proposed duration of visit to NSF's ChemMatCARS.

Selection and Notification

GSRAC students will be selected based upon research match with the capabilities of the beamline, qualifications of the candidate, and the potential for establishing continuing research collaborations.

A committee of NSF's ChemMatCARS research staff and other experts will review applications. Applicants will be notified of their proposal status **by February 1, 2020**. Subsequently, arrangements for institutional agreements (<https://www1.aps.anl.gov/Users-Information/Legal-Financial/Argonne-User-Facility-Agreements>) between ANL will need to be made if not already in place.

Inquiries and Application Submission

For general program information, application submission, and liquid surface X-ray scattering, please contact

Prof. Binhua Lin, Executive Director of ChemMatCARS, lin@cars.uchicago.edu, (630) 252-0463.

The lead contact for advanced crystallography experiments is

Prof. Yu-Sheng Chen, yschen@cars.uchicago.edu, (630) 252-0471.

NSF's ChemMatCARS is supported by the Divisions of Chemistry (CHE) and Materials Research (DMR), National Science Foundation, under grant number NSF/CHE-1834750.