



Sarah A. Saslow, PhD

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Current Position Description: As a Senior Chemist at Pacific Northwest National Laboratory, I lead and support research projects that explore material technologies for capturing, immobilizing, and disposing of radionuclides and other contaminants found in subsurface environments and legacy nuclear waste. In particular, I pursue understanding of the fundamental mechanisms driving radionuclide/contaminant interactions with natural and engineered materials, like secondary minerals, cements, and polymeric resins, that lead to contaminant capture and immobilization. Integral to this research is materials characterization, for which synchrotron X-ray absorption spectroscopies (XANES/EXAFS), microprobe X-ray fluorescence mapping, and X-ray diffraction are relied upon to understand how spatially localized system chemistry and mineralogy influence the speciation, fate, and transport of target contaminants. With over 7 years of experience performing X-ray synchrotron measurements on radiological samples and navigating the DOE user proposal process, I steward X-ray synchrotron capability awareness and support (proposals, measurements, and data analysis) to PNNL and external university research programs studying radiological materials and systems.

Employment History

Pacific Northwest National Laboratory	Senior Chemist (IV)	2023 - Present
Pacific Northwest National Laboratory	Senior Chemist (III)	2020 - 2022
Pacific Northwest National Laboratory	Chemist (II)	2017 - 2019
Pacific Northwest National Laboratory	Postdoctoral Research Associate	2015 - 2017

Education History

Northwestern University	Ph.D. Chemistry	2015
University of Maryland, College Park	B.Sc. Chemistry (Geology Minor)	2010

Interests

- Subsurface contaminant fate, transport, and remediation
- Waste form development for nuclear waste immobilization and disposal
- Nuclear forensics
- Materials characterization using benchtop and synchrotron X-ray absorption, fluorescence, emission, and scattering techniques

Goals/ideas for advocacy for the user community

The APS upgrade will significantly advance the amount and types of information that can be determined from current and future X-ray synchrotron capabilities. One advocacy goal that I continue to pursue is broader access to current and emerging synchrotron capabilities for research teams studying radiological samples – a process that will require significant coordination between health physics, beamline staff, and users. Near term there are a few actions that would forward this goal:

- During the dark period, distribute a fact-finding survey to beamline staff to identify current and upcoming end stations that would be willing to accept radiological samples in the future and under what conditions. For those beamlines that cannot accept these samples, what are the limitations for doing so. The goal for this action is to identify common, but solvable challenges for radiological sample measurements that could be broadly addressed or on a case-by-case basis as needed.
- Establish a catalog of sample holders pre-approved by health physics personnel and beamline staff for typical radiological sample types according to isotopic hazards. These sample holders may leverage additive manufacturing capabilities that are becoming more common in academic, government, and industrial research facilities. Mike Pape at Sector 20 has been using this approach for Sector 20 users for years. Making these holder designs available to research groups I anticipate would help take the guess work out of preparing radiological samples for many of these groups.
- Offer a visual, get started guide to radiological samples/materials at the APS. There is a lot of content on the landing site (<https://www.aps.anl.gov/Safety-and-Training/Safety/Using-Material-Samples/Using-Radioactive-Samples-Materials-at-the-APS>) that may be intimidating to new users. A “Get Started” introduction video or set of slides would distill that information down to high-level, key process steps that is digestible in just a few minutes. This type of content could then be leveraged to generate new users’ interest by addressing some of the upfront concerns about shipping and handling radiological samples/materials at the APS.

Secondly, in my experience some national security research programs submitting general user proposals struggle for reviewer ratings that lead to scheduled beamtime because the expected level of background information cannot be provided due to topic sensitivities. I would like to see guidance developed for users in this situation and heighten reviewer awareness to user proposals that fall into this category. Since the proposal system is already being revamped during the APS dark period, this would be an ideal year to consider tools to help these user groups in the proposal portal and the accompanying instructions. A survey of successful users, proposal reviewers, APS staff, and funding offices for tips on writing successful proposals in these sensitive topic areas would be a good first step towards this goal.

Honors and Activities

- APS UEC member in 2022, filled in for elected member that could no longer participate.
- Review Editor for Frontiers in Nuclear Engineering – Radioactive Waste Management

- Invited presenter for the 2020 Virtual SSRL/LCLS Users' Meeting session "From the Molecular to the Macro-Scale: Spectroscopic Imaging in the Earth Sciences Across the Photon Spectrum"
- Active peer reviewer for Stanford Synchrotron Radiation Lightsource general user proposals and at scientific research journals, e.g., Environmental Science and Technology, Applied Geochemistry, ACS Applied Materials and Interfaces.
- Active collaborator and student mentor for programs supporting diversity and inclusion of underrepresented groups and women in STEM, e.g., Minority Serving Institute Partnership Program and National GEM Consortium.
- Recipient of Pacific Northwest National Laboratory's Exceptional Contribution Award (December 2018, 2022) and three Outstanding Achievement Awards (2020, 2017 (x2))
- Recipient of Pacific Northwest National Laboratory's Earth System Science Division "Of The Year" award for Early Career Researcher (2022)
- 2020 Graduate of the Scientist and Engineer Development Program (SEDP) at PNNL.