Fan Zhang

Materials Structure and Data Group
Materials Measurement Science Division
National Institute of Standards and Technology
100 Bureau Dr., Stop 8520
Gaithersburg, MD 20899-8520, USA

Tel: 1-301-975-5734
Email: fan.zhang@nist.gov

Candidate Statement:

Currently an X-ray Physicist at the National Institute of Standards and Technology (NIST), I have been an active APS user for nearly 20 years, where I have made use of scattering, diffraction, and imaging at 10+ APS beamlines. One of my major research interests is a project I lead in synchrotron characterization of additively manufactured metals at NIST's Material Measurement Laboratory. With the upcoming implementation of APS-U, we face important decisions regarding maximization of the exciting improvements in beam coherence and brightness, as well as dealing with foreseeable and unknown challenges. If elected to the APS UO, I would welcome the opportunity to contribute toward APS's and our users' success in this new venture.

Background:

- 2018-, Physicist, National Institute of Standards and Technology
- 2009-2018, Research Scientist, National Institute of Standards and Technology
- 2005-2009, Postdoctoral Appointee, X-ray Science Division, Argonne National Laboratory
- 1999-2005, Ph.D. in Physics, University of Pennsylvania
- 1994-1998, B.S. in Physics, Jilin University, China

Honors:

- 2017, NIST Distinguished Associate Award. Citation: "Establishing innovative new instrumentation and software to measure microstructure and dynamics in materials over many length scales and under real-world conditions".
- 2014, NIST Distinguished Associate Award. Citation: "Sustained excellence in scientific innovation in X-ray scattering, spectroscopy and imaging".
- 2005, Graduate Fellowship, University of Pennsylvania

Recent Activities:

- 2019, Symposium Organizer, Small Angle X-ray Scattering of Advanced Functional Materials, Denver X-ray Conference.
- 2018, Neutron Science Review Meeting, Co-chair, Oak Ridge National Laboratory.
- 2018-2020, JOM Advisor, TMS.
- 2016, Beam Time Allocation Committee, NIST Center for Neutron Research.
- 2015-2019, Neutron Sciences Review Committee, Oak Ridge National Laboratory.
- 2012-2015, Small Angle X-ray Scattering Proposal Review Panel, APS
- 2012, 2015, Lecturer, APS Beyond Rg Small Angle Scattering Short Course.

Interests:

- <u>Additive manufacturing of metals and ceramics</u>: we use synchrotron-based scattering, diffraction, and imaging methods to investigate the microstructural and phase evolution of additively manufactured materials to establish the fundamentally important processing, structure, and behavior relationship.
- <u>Small angle X-ray scattering</u>, including instrumentation, methodology development, algorithm development, and data analysis.
- <u>Structure and microstructure characterization of advanced materials using synchrotron methods.</u>

Goals:

I first became an APS user as a graduate student in 2000, did my postdoc with Dr. Gabrielle Long at the APS, and have continued to come back frequently (at least 3 times a year) since joining NIST. I am an X-ray scientist and APS is my intellectual home. I am very excited by this possible opportunity to contribute to its future growth during the exciting time of APS-U.

Specifically, my goals include

1. The data acquisition rate and data volume of APS-U will present significant challenge to all synchrotron users, expert or non-expert, in extracting information hidden in the data. I will promote dedicated infrastructure and software development, including leveraging machine learning and artificial intelligence, to reduce the time from experimental planning to publication.
2. Encourage APS to establish a dedicated sample environment team or group that helps researchers in all phases of an experiment with sample environment issues, so as to best take advantage of the in situ measurement capabilities that APS-U will provide.
3. Promote manufacturing research at the APS, particularly those that involve the companies that will bring new manufacturing technology to the market.
4. Promote interagency collaborations to best utilize the measurement capabilities at the APS.