

# **Pre-Conference Workshop: Introducing Scientific User Facilities and Proposal Writing Skills for Access**

**At the 12<sup>th</sup> African Materials Research Society Conference**

**Kigali, Rwanda | December 14-15, 2024**

**Date and time:** Sunday, Dec. 1 (15:00-17:00), Saturday, Dec. 14 (09:00-15:30), Sunday, Dec. 15 (09:00-18:30) *\*\*All times in Central African Time\*\**

## **Organizers:**

**Zachary D. Hood**, Group Leader, Applied Materials Division, Argonne National Laboratory

**Abdou Lachgar**, Wake Forest University, Sabin Center for Environment and Sustainability

**Kathleen Dollman**, Beamline Scientist, European Synchrotron Radiation Facility

**Ed Mitchell**, Head of Business Development, European Synchrotron Radiation Facility

**Innocent Nkurikiyimfura**, University of Rwanda, Rwanda

## **Workshop Description and Objectives**

Large-scale Scientific User Facilities, such as synchrotrons and neutron sources, are central elements to performing advanced fundamental, applied and industrial materials research and innovation. Public access to these facilities is usually via scientific excellence through “proposals” to the user facility concerned, which are evaluated by independent scientific panels. Successful proposals are awarded access (beam time), and sometimes support for travel and local costs depending upon the facility.

Such proposals are critical in science; however, most if not all final-year undergraduate and postgraduate courses overlook teaching practical skills in proposal writing. There is a very big difference between learning to write proposals and learning to write *successful* proposals. In this workshop, you will not only learn how to write an effective proposal, but more importantly learn how to write successful proposals. Participants in this workshop will develop proposal writing skills by preparing a two-page proposal to access Scientific User Facilities, such as synchrotrons and neutron sources, in the United States and in Europe. You will learn strategies to prepare proposals that detail an experiment (or series of experiments) to be performed at a Department of Energy (DOE) and/or a European Scientific User Facility. Many of these facilities provide free access for high-level experiments and characterizations upon successful review of a proposal.

This workshop will 1) introduce these facilities and you will learn of the scientific opportunities that they provide, particularly in materials science, 2) expose participants to scientific user facilities in the United States and Europe, 3) teach participants how to write effective user proposals, and 4) show participants how user proposals are generally reviewed. More specifically, participants will choose a user facility and prepare

a proposal that describes one or more experiments that will advance our fundamental chemical and physical understanding of a specific material for a defined application.

Participants are encouraged to come with information on specific experiments they would like to perform. Prior to the workshop, participants will be provided readings on the most recent perspective and review articles from the following academic journals: [Chemistry of Materials](#), [Accounts of Chemical Research](#), [Chemical Reviews](#), [JMCA](#), [JMCA](#), [JMCC](#), [Nature Materials](#), [Nature Energy](#), and [Nature Catalysis](#).

**Sample topics include materials for the following applications:**

- Biomaterials & Materials for Health
- Materials for Water & Environmental Monitoring
- Materials for Agriculture
- Materials for Energy
- Materials for Mining & Manufacturing
- Nanomaterials, Quantum Materials, Photonic Materials & Nanotechnologies
- Computational Materials Science
- *A topic of your choice*

**Participation:** About 24 participants (max)

**Audience:** Final-year Undergraduate, Postgraduate, Postdoctoral, Lecturers/Professors

Due to the interactive nature of this workshop, the organizers have designed the program for a limited number of participants. This workshop is particularly ideal for graduate students, postdoctoral researchers, and faculty members who are interested in learning about Scientific User Facilities in the United States and Europe, as well as the user proposal writing and review process. Participants from all branches of science and engineering are invited to apply for the workshop, with a special encouragement for female candidates to apply. Registration is required by Friday, November 15. **Participants must be available for all activities on December 1, 14, and 15.** Before the workshop, participants need to select a specific topic and complete the following: 1) a pre-proposal survey and 2) the suggested readings.

**Awards:** At the end of the workshop, participants who complete outstanding proposals will be awarded a Certificate of Completion with the AMRS stamp.

## **Agenda: “Proposal Writing Skills for Scientific User Facilities” Workshop**

### **To be completed before the workshop (by November 18, 2024):**

1. Complete a Pre-proposal survey (GoogleForm) that includes the following information:
  - Name, Institution, Nationality
  - Stage of career (undergraduate, graduate, postdoctoral, professor, etc.)
  - Material/topic of interest
  - Description of what you hope to learn from this workshop (2-3 sentences)
  - Description of what you hope to learn about your chosen topic (2-3 sentences)
  - Do you have an idea of the technique(s) that you’d like to access?
  - Do you prefer to work as a small team or individually?
2. Background reading on Scientific User Facilities (*to be provided by the organizers via e-mail*)

### **Virtual Pre-workshop Meeting (December 1, 2024):**

13:00 – 15:00 (Central Africa Time); a zoom link will be provided to registered participants

**Topics include:** overview of goals/deliverables of the workshop, capabilities and tools available at scientific user facilities, components of a user proposal

### **In-person workshop (December 14, 2024):**

09:00 – 09:15	Welcome and introduction to the workshop
09:15 – 10:30	Overview of synchrotron and neutron scientific user facilities for materials science
10:30 – 11:00	<i>Coffee break</i>
11:00 – 11:30	Introduction to the NEPHEWS European project on access to synchrotron and neutron facilities (Cormac)
11:30 – 12:00	Review of pre-proposal survey, organization of teams (3-4 participants per team) and discussion with team members to review their specific topics and user facilities
12:00 – 12:30	Share topic and chosen user facility with participants of the workshop
12:30 – 13:30	<i>Lunch break</i>
13:30 – 15:00	Interactive lecture on proposal writing, overview of the “proposal writing canvas”, and discussion of central hypotheses.

15:00 – 17:00            *(with coffee on hand)* Interactive session utilizing the "proposal writing canvas" to outline and structure an effective user proposal, followed by personalized feedback for each workshop participant

**In-person workshop (December 15, 2024):**

09:00 – 12:00            Interactive session to assist participants in editing the first draft of their proposals; preparation for group presentation (draft slides will be provided to participants)

**[Submit the first draft of proposals by 12 pm local time on Dec. 15, 2024]**

12:00 – 13:00            *Lunch break*

13:00 – 15:00            Interactive peer review session (each team will review two proposals)

15:00 – 15:30            Share reviewer feedback

15:30 – 16:00            *Coffee break*

16:00 – 17:00            Preparation for group presentation

17:00 – 18:30            Presentation and defense of user proposals (~10 minutes/team)

18:30 – 19:00            Presentation of “Certificates of Completion”

**To be completed after the workshop (by December 20, 2024):**

1. Post-proposal survey (*to be provided by the organizers via e-mail*)

**Continued discussion during the AMRS:**

We expect to have an exhibition booth where the workshop and AMRS participants may continue discussion with workshop organisers and trainers, as well as representatives of the African Light Source Foundation.

## About the Organizing Partners:



**Argonne National Laboratory** ([www.anl.gov](http://www.anl.gov)) is a multidisciplinary science and engineering research center, operated by UChicago Argonne, LLC for the U.S. Department of Energy's Office of Science. Located near Chicago, Illinois, Argonne conducts leading-edge basic and applied research in virtually every scientific discipline, from physics and chemistry to environmental science and engineering. Argonne's mission is to deliver scientific discoveries and technological innovations that drive U.S. energy security, economic prosperity, and global competitiveness. Argonne collaborates with a range of partners, including universities, industry, and other government agencies, to address critical national challenges in energy, environment, and security.



**Wake Forest University** ([www.wfu.edu](http://www.wfu.edu)) is a private research university located in Winston-Salem, North Carolina, known for its commitment to academic excellence and personal attention to students. With a rich history dating back to 1834, Wake Forest emphasizes a strong liberal arts tradition, offering a rigorous academic environment with small class sizes and a close-knit campus community. The university fosters a unique educational philosophy known as "Pro Humanitate" (For Humanity), which encourages students to use their knowledge and skills to serve others. Wake Forest is home to top-tier programs in fields such as business, law, medicine, and the liberal arts.



**nephews**

**NEPHEWS** ([www.beatime.eu](http://www.beatime.eu)) is a European Commission funded project delivering access to the world-class collective of Europe's premiere advanced neutron, synchrotron and free-electron laser research infrastructures to promote curiosity driven research excellence. NEPHEWS is a unique photon and neutron facility consortia which brings together the Leagues for Accelerator-based Photon Sources and European Neutron Sources (LEAPS and LENS), as well as the European Synchrotron Users Organisation (ESUO) and the European Neutron Scattering Association (ENSA). "NEutrons and PHotons Elevating Worldwide Science" (NEPHEWS) has received funding from the EU Framework Programme Horizon Europe under grant agreement n° 101131414.



**ESRF** ([www.esrf.eu](http://www.esrf.eu)) is a user research infrastructure providing synchrotron X-ray light for cutting edge science to academic and industrial users. Located in Grenoble, France, it is an intergovernmental facility supported by 21 countries. The ESRF is one of the world's largest synchrotron science centres. Every year, about 9,000 scientists from around the world use its extremely brilliant X-rays for research including life sciences, materials science, chemistry and physics. The 600-strong staff is from 40 nationalities, mutually benefiting from rich and diverse backgrounds, cultures and languages. The ESRF's Extremely Brilliant Source (ESRF-EBS) upgrade is a European Strategy Forum on Research Infrastructures Landmark recognising its strategic importance.