

## **X-ray Photoelectron Spectroscopy (XPS) 101**

*A practical guide to XPS data analysis*

**Wednesday, Feb 08, 2023; 10 am – 12 pm**

#### **Abstract:**

X-ray photoelectron spectroscopy (XPS) is a nanometer level surface-sensitive quantitative spectroscopic technique based on the photoelectric effect that can identify the elemental composition, their chemical states, and density of the electronic states in materials. At the WVU Shared Facilities, a PHI VersaProbe™ XPS system is available and heavily utilized by researchers across the campus. In this 2-hour Webinar, I will,

1. discuss the basic principles of the X-ray photoelectron spectroscopy technique.
2. provide a quick review of the operational procedure of the PHI VersaProbe™ XPS system at WVU.
3. demonstrate XPS data analysis using MultiPak™ software. This will cover the following topics:
  - 1) element identification
  - 2) atomic ratio concentration calculation
  - 3) XPS curve fitting to identify different chemical states

#### **Audience:**

Current SRF XPS users are strongly suggested to attend this webinar. Researchers who are using or interested in XPS techniques are also welcome.

#### **Registration:**

- ilab users please submit a request within iLab under the “services and supplies” tab and choose “WVU Shared Facilities XPS webinar registration” option, or use the following link directly: [https://wvu.corefacilities.org/service\\_item/new/4281?spt\\_id=29914](https://wvu.corefacilities.org/service_item/new/4281?spt_id=29914)
- Non-ilab participants please email [Qiang.Wang@mail.wvu.edu](mailto:Qiang.Wang@mail.wvu.edu) to register for the webinar.

#### **Instructor:**

Dr. Qiang Wang currently works as the manager for the Materials Characterization Facilities at WVU Shared Research Facilities and oversees instruments at SRF such as X-ray photoelectron spectrometer, powder/thin film X-ray diffractometer, atomic force microscope, Raman spectrometer, etc. He also works as a research assistant professor at the WVU Department of Physics and Astronomy. His research interests include interface magnetism in heterostructures, probed using polarized neutron reflectometry (PNR); and electronic structure of exotic matters, probed using angle-resolved photoemission spectroscopy (ARPES).



Dr. Wang received his Bachelor's degree in Physics from University of Science and Technology of China (USTC) in 2003, and his M.S. and Ph. D. degrees in Physics from University of Colorado Boulder in 2008 and 2011. He worked as a postdoctoral researcher at Los Alamos Neutron Science Center (LANSCE) at Los Alamos National Laboratory (LANL) from 2012 to 2015 and at the Material Science Division (MSD) at Argonne National Laboratory (ANL) from 2015 to 2016. He joined West Virginia University as a research assistant professor and a facilities manager in 2016.