

## Postdoctoral Associate – In-situ Characterization of Metal Additive Manufacturing

The Stanford Synchrotron Radiation Lightsource (SSRL), a directorate of the SLAC National Accelerator Laboratory, has an opening for a Postdoctoral Scholar to work on a team developing a platform for in-situ characterization of nucleation and growth kinetics which occur during metal additive manufacturing. The broad goal of the project is to develop fundamental understanding of and deliberate control over microstructure formation and alloying for additively manufactured materials and parts. SSRL and LCLS x-ray imaging and scattering end stations will be used to characterize the structural evolution at relevant length and time scales: micro-tomography will be utilized to visualize morphology and phase partitioning in 3D, x-ray fluorescence microscopy to image trace elemental content, and x-ray scattering to resolve crystalline nucleation, grain size, orientation and shape, and phase partitioning which occur during phase transitions which occur on ps-ns timescales. The postdoctoral appointment will involve:

- Development and commissioning of e-beam and laser powder bed additive tools for operando characterization at multiple end stations
- Analysis of small and wide angle x-ray scattering data to extract nucleation density, growth rates, strain evolution and phase evolution
- Collaborating with our data science team to develop high throughput analysis pipelines to automate the data analysis pipeline
- Collaboration with National Laboratory, industry and academic partners to build a consortium of users for the instrument
- The development of AM processes and alloy chemistries which design tailored microstructures

In addition to the tasks outlined above, there will also be room for the postdoctoral scholar to bring their unique perspective to this project and pursue research focused on the elucidation of the physical processes which occur during additive manufacturing, and the development of materials for the use of additive manufacturing beyond structural materials.

### Basic Qualifications:

- A Ph.D. in a physics, chemistry, materials science or chemical engineering
- Experience with synchrotron x-ray methods development
- Experience with instrumental design, development and deployment
- Experience with iterative, test driven development
- Good interpersonal skills and strong communication skills
- Ability to participate in a team
- Experience working within large inter-university collaborations is strongly desired.

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