

## 3D Printing of Nickel-based High-temperature Alloys

**Project Description:** Nickel-based high-temperature alloys are widely used in aerospace, shipbuilding, and other fields due to their excellent comprehensive high-temperature properties. The complex part generation capability of 3D printing has unique advantages in the manufacturing of nickel-based high-temperature alloys. The complex thermomechanical conditions during the 3D printing process will directly change the microstructure of the alloy, thereby affecting its high-temperature properties. In order to reduce or eliminate micro and macro defects of 3D printed parts and improve their overall performance, post-processing is often necessary. The goal of our project is to elucidate the effect process parameters of laser powder bed fusion manufacturing and post-processing process on the microstructure evolution of nickel-based high-temperature alloys and associated high-temperature properties, which is a crucial step for achieving quantitative control on structure-structure-property relationship.

**Job Description:** We are seeking a highly skilled and motivated research fellow specializing in metal 3D printing to contribute to our cutting-edge research initiatives. The ideal candidate will have a strong background in material science, mechanical design. The research fellow will play a key role in 3D printing process monitoring, advanced microstructure characterization, high-temperature mechanical performance testing. Collaborating closely with a diverse team of researchers and engineers, you will actively contribute to the development and submission of research papers in decent reputable journals. Throughout the experience as a Focused Research Extended Experience (FREE) research fellow, you will be able to cultivate the relevant scientific knowledge and experimental skills in a focused and extensive manner such that enhancing opportunities for advancing graduate studies or getting a long term well-paid industrial job.

The term of employment spans two years, and the contract is structured for annual renewal.

### Qualifications:

- Master's or Bachelor's degree in relevant majors such as Material Science and Engineering, Mechanical Engineering, etc., with a focus on metal and alloys processing.
- Experience with advanced microstructure characterization (such as TEM, SEM, EDS, EBSD), mechanical testing, thermal analysis, etc.