

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.

This position commences in or after early 2024, with individuals anticipated to initiate their responsibilities no later than Spring 2024. 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.

For questions regarding this position, please contact Dr. Shan Gong, at shan.gong@scu.edu.cn.