**基于氧化物弥散强化合金与仿生多孔结构的先进冷却体系研究**

【项目描述】：航空发动机及燃气轮机是关系国家安全和经济发展的核心动力装备，追求更高的热效率对其关键部件热防护技术提出了更加苛刻的要求。本项目将研发氧化物分散强化(ODS)高温合金优化先进冷却系统。项目采用相图计算发展集成计算材料工程框架，通过蠕变和氧化实验解析微观组织结构对其高温性能的影响规律，并建立最优增材制造及后处理工艺参数区间。

【职位概述】：我们正在寻求一位基础扎实、自我驱动且愿意开展研究工作的科研助理。理想的科研助理将在建立计算模型和实验操作等方面发挥关键作用，推进ODS合金设计和提高其高温性能。

科研助理的主要工作内容包括：

- 开发用于合金设计和工艺优化的 ICME 计算框架；
- 基于相图计算（CALPHAD）建立工艺参数-微观结构-高温性能计算模型；
- 结合高通量仿真-实验混合技术和增材制造技术以支持 ICME 模型校准和预测；
- 每年撰写一篇高质量期刊论文。

通过聚焦性科研延展项目（FREE），候选人将获得宝贵的实践研究经验，推动个人学术研究和未来职业发展。

【职位要求】：

- 材料科学与工程或相关领域的学士或以上学位，具备计算热力学、增材制造和/或集成计算材料工程方面的专业知识。
- 熟练掌握 CALPHAD、MATLAB 和 Python 等计算工具。
- 具备材料表征与分析经验者优先考虑。

有关此职位的问题，请联系吴英杰博士，电子邮件：yingjie.wu@scu.edu.cn。

**Research on Advanced Cooling Systems Based on Oxide Dispersion Strengthened Alloys and Bionic Porous Structure**

**Project Description:**
Gas turbines and jet engines require increasingly effective heat protection technologies as efficiencies rise. This project aims to address heat protection challenges for turbine blades through an integrated materials and design approach. Advanced cooling systems will be developed utilizing oxide dispersion strengthened (ODS) high-temperature alloys optimized for heat transfer. An integrated computational materials engineering (ICME) framework will be established through thermodynamic calculation with high-throughput screening to master the alloy design method of ODS alloys. The influence of microstructure evolutions on the high-temperature performance through creep and oxidation experiments will be analyzed to establish the optimal parameter interval for additive manufacturing and post-processing.

**Job Description:**
We are seeking a highly motivated research fellow to support development of advanced cooling systems utilizing oxide dispersion strengthened alloys. The successful candidate will play a key role in establishing computational models and experimental techniques to advance alloy design and high temperature performance.

The research scholar will be responsible for:

- Developing an Integrated Computational Materials Engineering (ICME) framework using CALPHAD thermodynamic modelling to enable high-throughput screening of alloy compositions.
- Establishing a processing parameter-microstructure-high temperature performance calculation model based on CALPHAD.
- Combining high throughput simulation-experiment hybrid techniques with additive manufacturing to support ICME model calibration and prediction.
- Coauthoring one SCI journal paper per year.

Throughout the experience as a Focused Research Extended Experience (FREE) research fellow, the candidate would gain valuable hands-on research experience, advancing both the research and own careers.

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:**

- A master's or bachelor's degree in Materials Science and Engineering or related field, with expertise in computational thermodynamics, additive manufacturing, and/or integrated computational materials engineering.
- Proficiency with CALPHAD modelling, computational tools such as MATLAB and Python.
- Materials characterization techniques is preferred.

For questions regarding this position, please contact **Dr. Yingjie Wu** at **yingjie.wu@scu.edu.cn**.