



Postdoc Opportunity: Self-Driving Laboratory for Autonomous Alloy Development and Manufacturing

Key areas: Manufacturing Automation Systems Integration Robotics
AI Self-Driving Labs High-Performance Alloys

Our research group, the [Autonomous Alloy Discovery Lab](#) lead by Prof. [Sebastian Kube](#), has a postdoctoral position open to start anytime, preferably within July to October 2026.

Background: We are actively building “AlloyBot”, a self-driving laboratory that can autonomously develop new alloy materials for performance in extreme operating conditions over 100× faster. This platform relies on tightly integrated automation and closed-loop control for alloy synthesis, processing, characterization, and testing. To make this possible, we need to develop robust sensing, actuation, and decision-making, along with a sophisticated coordination of various hardware, software, and AI modules. Overall, this enables AlloyBot to physically test new alloy materials and develop optimal manufacturing protocols orders of magnitude faster and more reliably than traditional human researchers. Specifically, we target alloys for extreme operating conditions including high mechanical stresses, extreme temperatures, and severely oxidizing environments, as found across applications in energy, aerospace, and defense, such as turbines, jet engines, novel propulsion systems, high-speed aerospace vehicles, nuclear reactors. Interested candidates are invited to look at our first [preprint and videos](#) related to this project.

Scope of project: Within our group, the postdoc will lead the following activities forward:

- (a) Development of automated alloy synthesis, processing, and testing modules.
- (b) Integration of robotics, instrumentation, and supervisory control systems.
- (c) Development of real-time data pipelines and closed-loop control architectures.
- (d) Application of AI for autonomous experimentation and performance optimization.

Candidate qualifications: This opportunity is particularly well-suited for researchers with backgrounds in manufacturing, automation, mechatronics, robotics, or control systems, who wish to expand their expertise into the development and manufacturing of high-performance alloys.

Why join this project?

- Build a real-world self-driving laboratory integrating AI and rapid physical experimentation.
- Apply automation and control expertise to a new frontier in materials innovation.
- Join our interdisciplinary team to solve urgent technological and commercial challenges.

Get in touch today: Interested candidates are invited to contact Sebastian.Kube@wisc.edu. Please enclose a CV along with a concise, compelling description of motivation and alignment.