PhD Positions in Advanced Manufacturing and Mechanics

School of Mechanical and Aerospace Engineering, Oklahoma State University

- Pranjal Nautiyal

I am looking to recruit 2 new PhD students in the areas of solid-phase metal additive manufacturing and electrotribology. There will be full tuition and stipend support, as well as travel funds to attend research conferences.

About the projects: The research projects will focus on cold spray-assisted manufacturing[1] of structural alloys and nanocomposites, coatings for harsh mechanical environments, and the study of electrical effects in tribology[2]. The students will perform experimental work in the areas of materials processing and characterization, acquiring expertise in cold spray, tribological testing, mechanical testing, electron microscopy, atomic force microscopy, and spectroscopy techniques. Moreover, there will be opportunities to collaborate across and beyond the university, including opportunities to work with industry and national labs.

The adoption of metal 3D printing and electric vehicles have revolutionized our world. However, there are many engineering challenges and technological bottlenecks that need to be solved. The proposed projects tackle with materials design and processing challenges at the core of these technologies. Obtaining a PhD in these emerging areas will position you to address some of the most critical problems in industry, make defining scientific discoveries, potentially launch your own company or research group, and contribute to the de-carbonization revolution.

About OSU and the School of Mechanical and Aerospace Engineering: You will find opportunities to interact and collaborate with faculty specializing in diverse areas of mechanical, materials, and aerospace engineering. You will have access to state-of-the-art instrumentation in the OSU Microscopy Facility and Helmerich Research Center. Moreover, Cowboy Innovations at OSU provides support to engage with the industry and launch startups.

Eligibility: Students with a Bachelor's degree in mechanical engineering, materials science and engineering, applied mechanics, metallurgy, or related disciplines are encouraged to apply. If you are interested or if you have any questions, please contact me at: pranjaln.23@gmail.com

About myself: I am an incoming Assistant Professor in the School of Mechanical and Aerospace Engineering at OSU, where I will establish a new research program on advanced manufacturing. I currently hold a Postdoctoral appointment in the Mechanical Engineering and Applied Mechanics Department at the University of Pennsylvania. My research focuses on the study of lubricants and coatings under harsh mechanical environments. Before moving to Penn, I obtained my PhD in materials science and engineering from Florida International University, where I studied the mechanics of nanostructured materials, including additively manufactured alloys and metal matrix composites. I have published 40 peer-reviewed articles and hold 5 US patents. I also collaborate with industry and national labs for technology development and commercialization.

[1]Zhou, Cold Spray Additive Manufacturing: Microstructure Evolution and Bonding Features, Acc. Mater. Res. 2021, 2, 1071

[2]Gould et al., The effect of electrical current on premature failures and microstructural degradation in bearing steel, Int J Fatigue 145, 106078 (2021)

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