University of Pittsburgh

Swanson School of Engineering
Department of Mechanical Engineering and Materials

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Position: Amorphous and Nanocrystalline Magnetic Materials Graduate Student Researcher (PhD, MS)

Position Contact: Prof. Paul Ohodnicki, pro8@pitt.edu

Position Description:
The Department of Mechanical Engineering and Materials Science (MEMS) at the University of Pittsburgh invites applications for a graduate student researcher with an emphasis on rapid solidification processing and advanced thermal processing of amorphous and nanocrystalline soft magnetic alloys, key materials for electrification of the transportation and industrial sectors. The graduate student position is fully funded as a result of a recently announced $1.2M donation from the Hillman Family Foundation to the Advanced Magnetics for Power and Energy Development consortium based at the University of Pittsburgh. The student will have an opportunity to collaborate with an interdisciplinary group of undergraduate, graduate, and PhD level researchers in the area of magnetic materials and electric power conversion applications. In addition, the student can expect close collaboration with other researchers from industry and the national laboratory system including NASA, Department of Energy, Department of Defense, and both large and small companies ranging from materials development to device integration.

The advisor will be Prof. Paul Ohodnicki, and the graduate student researcher will have full access to facilities available within the Ohodnicki Lab (https://www.engineering.pitt.edu/OhodnickiLab/) at the University of Pittsburgh, the extensive shared facilities of the Advanced Magnetics for Power and Energy Development (AMPED, https://www.engineering.pitt.edu/AMPED/), and the Petersen Nanoscale Fabrication and Characterization Facility (NFCF, https://www.tour.pitt.edu/tour/nanoscale-fabrication-and-characterization-facility) amongst other facilities across campus.

More information about the Ohodnicki Lab research focus and interests can be found here:
https://www.youtube.com/watch?v=7Vn7XJmHGr4&feature=youtu.be

Successful applicants should display a strong interest in synthesizing and characterizing magnetic materials and interest to learn and apply standard magnetometry techniques as well as high frequency measurements in the kHz-MHz range. In addition to magnetic property measurements, students should have a strong interest in understanding the impact of magnetic, electric, and thermal properties on performance as well as the origin of these properties in multicomponent alloy systems with unique structure.

Applicants should have an undergraduate degree in materials science and engineering, applied physics, electrical engineering or a related field. Prior experience research in rapid solidification, structural characterization, or magnetometry techniques is beneficial but not required. This project offers ample opportunity to develop relevant skills including arc melting, melt spinning, x-ray diffraction, electron microscopy, vibrating sample magnetometry, AC permeametry, electrical and thermal transport property measurements, and impedance analyzer characterization.

Anticipated project work assignments will include characterization and synthesis of amorphous and nanocrystalline soft magnetic materials as well as application of advanced thermal processing techniques to optimize microstructure. In addition to conducting research, duties will also include preparing reports, performing literature reviews, supervising undergraduate students, and assisting with other projects.

Application Process:
Interested students should contact Prof. Paul Ohodnicki (pro8@pitt.edu) and also submit an application for the MS or PhD program at the following link: https://www.engineering.pitt.edu/graduateapplications