



# AMPED

**ADVANCED  
MAGNETICS**  
FOR POWER & ENERGY  
DEVELOPMENT

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**Position:** Electrical Machine Simulation and Design Graduate Student Researcher (PhD, MS)

**Position Contacts:** Prof. Paul Ohodnicki, [pro8@pitt.edu](mailto:pro8@pitt.edu); Prof. Brandon Grainger, [bmg10@pitt.edu](mailto:bmg10@pitt.edu)

## **Position Description:**

The [Advanced Magnetics for Power and Energy Development](#) consortium at the University of Pittsburgh invites applications for a graduate student researcher with an emphasis on simulation and design of electrical machines, specializing in motors for electric vehicle applications. The graduate student position is funded through the University of Pittsburgh's newly established participation in the [Critical Materials Institute](#) managed by Ames Laboratory. 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 the Department of Energy, Department of Defense, and both large and small companies ranging from materials development to device simulation, optimization, and integration. Specifically, the work will be carried out in close collaboration with Ames Laboratory researchers and will focus on novel motor designs that optimally utilize new rare earth free and rare earth lean permanent magnet materials.

The student will be co-advised by Prof. Paul Ohodnicki and Prof. Brandon Grainger, 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/>), the GRID Institute ([Home | Energy GRID Institute | University of Pittsburgh](#)), 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>

A walk-through of some of the GRID Institute investments can be found here: [Electric Power Technologies Laboratory \(matterport.com\)](#)

Successful applicants should display a strong interest in motor design and applied electromagnetics, including simulation, design, and optimization methods. In addition to motor simulation and designs, students should have a strong interest in prototyping, testing, and comparing designed motors with simulated results to enhance understanding and demonstrate feasibility for scaling and technology transfer.

Applicants should have an undergraduate degree in mechanical engineering, applied physics, electrical engineering or a related field. Prior experience research in finite element modeling, applied electromagnetics, motor simulation and design, and electrical testing is beneficial but not required. This project offers ample opportunity to develop relevant skills including simulation methods, analytical modeling of electromagnetic and electromechanical components, circuit simulations, and experimental characterization of electrical and electromechanical systems.

Anticipated project work assignments will include finite element simulations and analysis of various motor topologies and designs as well as analytical modeling and experimental prototyping. 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](mailto:pro8@pitt.edu) ) and Prof. Brandon Grainger ([bmg10@pitt.edu](mailto:bmg10@pitt.edu)), and also submit an application for the MS or PhD program at the following link: <https://www.engineering.pitt.edu/graduateapplications>