

Dr. Randy Vander Wal, Professor of Energy and Mineral Engineering, and Dr. Ismaila Dabo, Associate Professor of Materials Science and Engineering (University Park, PA) are seeking a Distinguished Postdoctoral Scholar to work on a project to connect graphitic structure with bio-precursor chemistry aimed at developing green carbons for energy storage.

Graphitic carbons (GC) are ideally suited as electrode material for energy storage systems due to low cost, high electrical conductivity, and stable physicochemical properties. Additional clean energy uses include electric motors, sensors and capacitive energy storage devices. Presently graphitic carbon materials are formed from petroleum- and coal-derived products – imposing considerable energy and CO₂ penalties, and negative environmental impacts by volatile emissions and waste. Biopolymer (BP) lignin presents a renewable resource, for greener production of graphitic materials. Several sources of lignin or lignin containing materials are currently available at-scale; lignin as the byproduct of paper manufacture, forestry and agricultural residues. Broadly, this project addresses the question; *With what reliability and consistency can biopolymers be transformed to graphitic carbon materials for energy storage applications?* The successful candidate will develop relationships between lignin precursor, process conditions and heat treatment stages to the graphitic content of the resulting carbon material, supported by first-principles computational modeling. To connect structure to properties, carbons will be fabricated into capacitive electrodes and characterized for electrical conductivity. The overall goal is to develop a green sustainable path using lignocellulosic material to make graphitic carbons.

A PhD in chemistry, materials science, chemical engineering or a related field is required by the time of hire. Strong background and training in biomaterials chemistry and materials characterization techniques (e.g. TEM, XRD, NMR, TGA, Raman and XPS) is required. Applicants should have strong analytical skills with some competence or interest in applying first-principles computational models. Candidates should possess excellent written and verbal communication skills, be able to work independently and have requisite computer skills. The initial term of this appointment will be for 12 months from the date of hire; funding is available for 6 additional months with the possibility of further extension.

The successful applicant will interact with a diverse faculty team within the College of Earth and Mineral Sciences (EMS), liaison with the Dept. of Agriculture at Delaware State University and contribute to the emerging Carbon Hub at Penn State. The project will utilize instrumentation in the Materials Characterization Laboratory (MCL) and laboratory resources within the EMS Energy Institute at Penn State. Responsibilities will include biomass processing, material characterization and evaluation, summary reports and presentations. The position is supported by Dean's Fund for Innovation through Collaboration.

For full consideration, applicants must include the following materials with their application: 1) a cover letter, 2) a CV, and 3) the names and contact information for 3 references.

Apply online at: https://psu.wd1.myworkdayjobs.com/PSU_Academic/job/University-Park-Campus/Postdoctoral-Scholar_REQ_0000023841-2

The Pennsylvania State University's College of Earth and Mineral Sciences takes an active role in building talented, inclusive and culturally competent workforce. We understand that our shared future is guided by basic principles of fairness, mutual respect, and commitment to each other. Applicants should share this commitment to fostering diversity, equity, inclusive excellence, and belonging and of engagement that creates an inclusive environment in their department/workplace.

<https://www.ems.psu.edu/about/strategic-initiatives/educational-equity-diversity-and-inclusion-initiatives>

Penn State strives to build a welcoming, inclusive, and supportive environment for students, staff, and faculty. The College of Earth and Mineral Sciences relies on the expertise, sensitivity and commitment of an inclusive workforce to enhance diversity, seek equity, and create a welcoming environment within our community. We are committed to

nurturing a learning and working environment that respects differences in culture, age, gender, race, ethnicity, physical ability, sexual orientation, and religious affiliation.

To review the Annual Security Report which contains information about crime statistics and other safety and security matters and policies, please go to <https://police.psu.edu/annual-security-reports>, which will also explain how to request a paper copy of the Annual Security Report.

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Employment with the University will require successful completion of background check(s) in accordance with University policies.