UNIVERSITY OF WYOMING
Energy Science Graduate Stipends and Fellowships
NOVEMBER 1, 2016

2011 Session Laws, Chapter 88, Section 346(d)(ii)(D)

To the Joint Appropriations Committee; Joint Minerals, Business and Economic Development Committee; and Governor Mead

During its 2011 session, the legislature appropriated $6,247,930 in Abandoned Mine Lands funds to UW's Office of Academic Affairs for energy science graduate stipends and fellowships. The funds were to be expended over multiple years with not more than $1 million expended each year.

In FY 2017, approximately $743,000 in funding is allocated for support of 25 graduate assistantships over a two-year period. The Energy GA awards continue to elevate the stature of graduate education by providing competitive stipends for recruiting outstanding graduate students. As in prior years, the new awards for FY2017 support fundamental research in a wide array of energy topics important to Wyoming (Table 1). In the fall 2016 semester, 12 graduate scholars joined the program and 1 additional student will join in the spring 2017 semester (two additional students declined this UW support to commit to other institutions). Currently, there are 12 students in their second year of the program (Table 2.).

Since its inception, the awarding of Energy Science Graduate Assistantships has recruited outstanding students to be supported on two-year stipends. The two year awards support students to ensure continuity in their research progress. The funding has to date, enhanced Energy Science research within the Colleges of: Engineering & Applied Sciences (35 projects), Arts & Sciences (30) Agriculture & Natural Resources (8) and Business (3). Departments involved in the research include Atmospheric Sciences, Chemical and Petroleum Engineering, Mechanical Engineering, Civil and Architectural Engineering, Electrical and Computer Engineering, Chemistry, Geology & Geophysics, Global and Area Studies, Math, Physics and Astronomy, Ecosystem Science & Management, Plant Sciences and Molecular and Cellular Life Sciences.

Since AY 2011-12, 89 graduate students have been recruited into the Energy Science Graduate Assistantships. During this period 28 graduate degrees have been awarded (17 masters and 11 doctoral). There are 50 students pursuing graduate degrees who are current or past Energy GA awardees (11 masters and 39 doctoral). Nine students departed their program without degrees.

Remaining funds are due to revert in June 2018. At this time the amount of funding predicted to revert at the end of the currently awarded projects is approximately $1.6 million. This balance remains because funds were not awarded or went unused when a proposed project was unable to find a suitable GA candidate with high credentials or when the candidate declined the offer. In addition, Academic Affairs did not announce a new request for proposals in fall of 2016; had we done so, the newly recruited cohort of students arriving in fall 2017 would be supported only in their first year under the current time limits of this initiative.

One alternative to the reversion of the remaining balance would be to extend the appropriation to 2020 which would allow UW to *recruit an additional cohort of new graduate students*. This preferred approach would allow the UW to announce a new RFP in fall 2017 and the selected students would matriculate in fall 2018. The new cohort would complete two-year stipends in spring 2020. In effect, this would be a no-cost time extension for the use of remaining funds that would recruit a new cohort of graduate students to initiate additional research projects. We could award stipends for approximately 14-15 new projects. This extension would necessarily end in June 2020 to allow for two-year stipend awards. Regardless of whether or not the remaining funds are dispersed, UW is greatly appreciative of this initiative that has strengthened energy research on campus and of the support provided to attract these impressive students.

Table 1. Departments and project focus of FY17 energy GA awards.

Table 1. Energy GA awards made in AY 2016-17.

Department	Topic	M/F	Undergraduate Institution	Residency
Chemical Engineering	Developing Nanocatalysts from Wyoming Rare Earth Elements for Advanced Energy Conversion	F	University of Wyoming	In state resident
Chemical Engineering	Exploring Algal Biodiversity for Biofuel and Biogas Feedstock Production	M	University of Wyoming	International 150% rate
Chemical & Petroleum Engineering	Novel Nanostructured Materials for Energy Applications	M	University of Wyoming	Alumni rate
Chemistry	Dry Reforming of Methane over Lanthanide-based Perovskites for H2 Production	F	Shanghai Normal University	International 150% rate
Electrical & Computer Engineering	Control technology for wind turbines	M	University of Wyoming	In state resident
Geology & Geophysics	Reservoir-Scale Stratigraphy, Parkman Sandstone Member, Mesaverde Formation	F	University of Delaware	Out of state
Global & Area Studies	The graduate assistantship will support the work of a student looking at key government, industry and civil society stakeholders in the climate and energy security debate.	M	University of Texas	Out of state

Table 1 (continued)				
Department	**Topic**	**M/F**	**Undergraduate Institution**	**Residency**
Mathematics	Multiscale methods with application to fluid flow in heterogenous dynamic media	M	University of Wyoming	In state resident
Mathematics	Construction and Analysis of a Deflation Projector: Improving the Stability and Efficiency of Iterative Methods for Solving Ill-conditioned Linear Systems Found in Reservoir Simulations	M	Zhejiang University of Technology	International
Mechanical Engineering	Hydrogen Embrittlement in High Entropy Alloys For Oil & Gas Infrastructure Applications	--	- Student will be admitted in spring 2017 semester	--
Mechanical Engineering	High Fidelity CFD Modeling of Advanced Coal Combustion Concepts	M	University of Wyoming	In state resident
Mechanical Engineering	NANO-ADHESIVE LAYER FOR NEXT GENERATION METALLIC THIN-FILMS FOR USE IN ENERGY APPLICATIONS	M	Rowan University	Out of state
Petroleum Engineering	Molecular-scale Investigation of Solid/Fluid Interactions and Phase Behavior of Hydrocarbon Gas Mixtures in Nanopores of Unconventional Gas Reservoirs	M	China University of Petroleum	International

Table 2. Energy GA awards made in AY 2015-16. Students are provided funding for two years.

Department	Topic	M/F	Undergraduate Institution	Residency
Chemical and Petroleum Engineering	Biological conversion of synthesis gas to isoprene	M	University of Colorado, Boulder	Out of State Resident
Civil and Architectural Engineering	Coupling Lattice-Boltzmann and molecular Dynamics Models to quantify nano-composite membrane's performance in desalination	M	Harbin Engineering University	International
Economics and Finance	Incentives and additionality in energy efficiency subsidies	M	Bangladesh University of Engineering & Tech	International
Economics and Finance	Mergers & acquisitions for sustainability in the energy sector	F	Boston College; Louisiana State University-Shr.	In state resident
Geology and Geophysics	Prediction ahead of the drill-bit	F	China University of Petroleum	International
Geology and Geophysics	Unconventional Reservoirs of the Powder River Basin, Wyoming: Geochemical Interactions among Rocks, Formation Waters, and Hydraulic Fracturing Fluids	M	Denison University	Out of state
Mathematics / SER	Rapid robotic seismic survey data collection for estimating the shallow velocity corrections for geophysical exploration	M	Guangdong University of Foreign Studies	International

Table 2 (continued)

Department	Topic	M/F	Undergraduate Institution	Residency
Mathematics	Advance simulation methods for wind energy efficiency	M	Moscow Institute of Physics & Technology	International
Mechanical Engineering	Mechanochromic fluorescent materials application for early damage detection of composites used in wind turbine blades	M	University of Wyoming; Central Wyoming College	In state resident
Mechanical Engineering	Reactor development for combustion of coal and biomass blends	M	University of Wyoming; Western Wyoming Comm. College	International 150% rate
Mechanical Engineering	In-Situ carbon sequestration for chemical-oop combustion of Wyoming coal	M	Beijing University of Chemical Technology	International
Molecular Biology	Transgene induction of increased biofuel potential of yeast fermentative efficiency	M	University of Wyoming; Western Washington University; University of Utah	In state resident