

NASA West Virginia EPSCoR

About Us

The NASA West Virginia Experimental Program to Stimulate Competitive Research (NASA WV EPSCoR) is a joint activity of the West Virginia EPSCoR Committee and the West Virginia Space Grant Consortium, devoted to advancing West Virginia's scientific and technological development, and promoting research activities in direct support of NASA's mission and scientific enterprises. The program covers all aspects of Science, Technology, Engineering, and Mathematics (STEM) research in West Virginia.

NASA EPSCoR in West Virginia consists of two components: the **Research Infrastructure Development (RID)** and **Research Implementation (RI)**. Our goals, outlined by the NASA WV EPSCoR Committee, are as follows:

- (1) To contribute to and advance NASA's vision and strategic goals as outlined in various NASA documents, specifically in terms of STEM research and workforce development;
- (2) To contribute to the state of West Virginia's efforts at research infrastructure development particularly in the high-technology sector, and improved level of STEM capacity; and
- (3) To increase the participation of underrepresented groups in our programs for students and faculty.

Research Infrastructure Development (RID)

Under the RID program, NASA WV EPSCoR supports a variety of activities related to strengthening the research capabilities of faculty in science and engineering disciplines in West Virginia by sponsoring research seed grants, travel grants and a college-university collaboration program that promotes faculty mentorship roles from West Virginia University (WVU) or Marshall University alongside faculty from smaller universities and colleges in the state.

Dr. Miaocong Wu of the Center for Diagnostic Nanosystems at Marshall University School of Pharmacy is leading a team of researchers to investigate how obesity and metabolic syndrome affect bone health. As a recipient of several research seed grants, he was able to successfully compete at the national level and win NASA EPSCoR RI grant in 2013 in the amount of \$1,125,266 (inclusive of cost share).



Dr. Wu working in the lab as an awardee of
NASA WV EPSCoR research grants

This RI project will significantly increase the state's research and development capabilities as well as promote economic development. Dr. Wu's success is a prime example of RID's purpose to prepare researchers to compete for larger research grants and establish a viable and independent research infrastructure at their home institution.



Dr. Tesfaye Belay and his student at Bluefield State
College, a minority serving institution in WV,
conduct research as part of the College-University
Collaboration Program award

Research Implementation (RI) Grants

A major component of the NASA WV EPSCoR is competitively won cooperative agreements that are designed to strengthen and support activities that are beneficial to the research capabilities of the state as well as advancing NASA's research priorities. These are three-year competitive grants for up to \$750,000 of federal funds per winning project, supplemented with cost sharing from the researchers' home institution. Since 2007, seven teams at WVU and Marshall University have successfully competed for these grants. The following are a few of the RI projects that are underway in West Virginia:

A current research project aims to develop a model for the spray cooling process of air or spacecrafts in zero gravity environments is a partnership between NASA Goddard Space Flight Center, NASA Glenn Research Center and WVU. Drs. John Kuhlman and Donald Gray, professors in the Statler College of Engineering and Mineral Resources, are the science PIs (pictured). Also, Dr. Gray taught a new graduate course, *Fluid Mechanics of Drops and Sprays*, in the Fall. This was the first time a course on this topic has been taught at WVU.

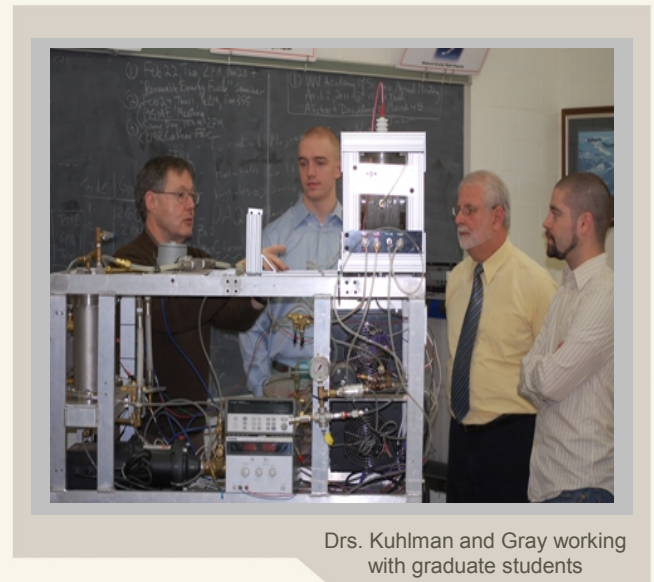
Another current research is being conducted by Professors Amy Keesee, Earl Scime, and Dimitris Vassiliadis of the Physics Department at WVU. The group is researching the thermal and magnetic energy balance in the magnetosphere by focusing attention on the ion populations of the plasma sheet and inner magnetosphere and examining their heating and transport during storms in a multidisciplinary approach (pictured below).

In an additional project, researchers are working to develop localized wing morphing technology with smart skins to improve aerodynamic efficiency. Working on this project is Dr. Wade Huebsch in collaboration with Professors Darran Cairns and Ever Barber, all from the Mechanical and Aerospace Engineering Department at WVU.

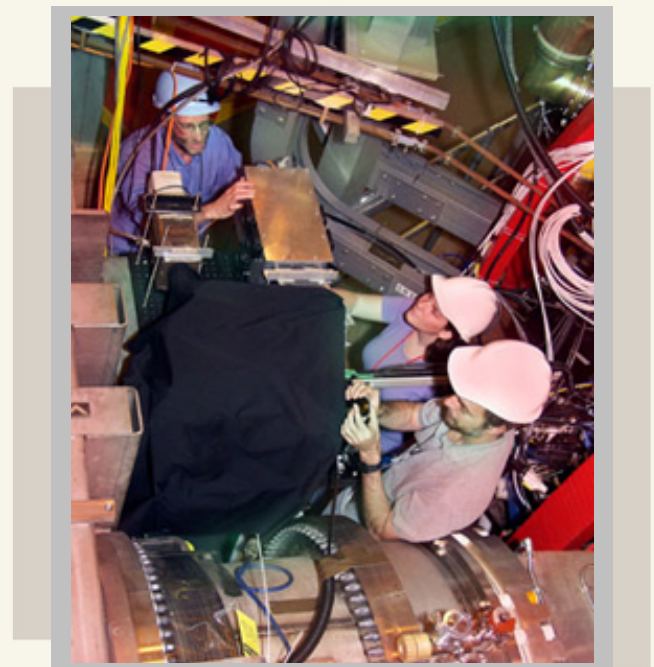
As a direct result of the three research programs listed above, \$1,365,000 has been obtained in additional grants. The program has supported 26 faculty/researchers, 16 undergraduate and 19 graduate students from 2010 through 2013. Of the students sponsored by NASA WV EPSCoR, 11% belong to underrepresented groups.

NASA WV EPSCoR Key Personnel

- ❖ **Dr. Majid Jaridi**
Director
- ❖ **Ms. Candy Cordwell**
Program Manager



Drs. Kuhlman and Gray working with graduate students



Dr. Keesee (in the middle) working on her NASA EPSCoR research project in the Plasma Physics Lab at WVU