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NASA selects university

BU shares \$100m

Alejandra Del Real

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The National Aeronautics and Space Administration has selected Boston University as one of four university teams that will share \$100 million to lead a satellite hardware program for a future mission to study near-Earth space radiation.

The mission, scheduled for 2012, will send two Radiation Belt Storm Probes to study radiation that would be hazardous to satellites and astronauts.

The university's involvement in the study, according to NASA Deputy Program Scientist Barbara Giles, will be to "provide particle experiments for the mission that will contribute to the understanding of particle acceleration in space and how planetary radiation belts are formed and sustained." The name of the university's project is "Energetic particle, Composition, and Thermal plasma" instrument suite.

The BU team, led by astronomy professor Harlan Spence, was awarded an eight-year \$42.5 million contract to fabricate, test and launch three instruments on each of the two RBSP satellites.

"There are four other instruments being built by four other teams," Spence said in an email, "but our measurements are the main focus of the mission. [They] measure the charged elementary particles (electrons and ions) that reside in Earth's radiation belts."

RBSP Project Scientist David Sibeck said although BU is counting on collaborators for the study, the university is a key part of the study because it is in charge of "coordinating and managing the creation of instruments that are central objectives of the mission due to the crucial observation they will provide of energetic particles, which is needed to understand this type of space radiation."

Radiation belts are donut-shaped regions that circle the Earth, and are filled with particles that produce radiation when they interact with matter. These particles can penetrate spacecraft shielding with potential catastrophic results.

"The aerospace industry cares [about the physics of radiation] because the intensity of the radiation affects the design and cost of satellites that operate in this harsh particle environment," Spence said.

The particles can also penetrate an astronaut's body, exposing tissue to radiation and increasing the risk of cancer. The RBSP mission will study how accumulations of this space radiation forms and changes during space storms.

Although this is not the first NASA mission designed to study this type of lethal radiation, it is the most comprehensive to date.

"Instead of understanding what is out there, this mission, using two shuttles, will also study how the radiation gets there," Sibeck said. "It will study the basic physics and distinguish what creates the phenomenon."

BU was selected for this mission after submitting a proposal responding to an August 2005 NASA Announcement of Opportunity. Review panels assessed competing proposals and NASA headquarters selected the winning teams.

"We are excited to be one of those rare few," Spence said. "We will be receiving funding during the first year to complete a feasibility study, which will fund our ECT team to further develop our instrument concepts."

The RBSP-ECT project is not BU's sole involvement with NASA. According to Spence, BU has many space flight programs ongoing throughout the BU Center for Space Physics.

"I am developing another instrument, called the Cosmic Ray Telescope for the Effects of Radiation, which will be launched by NASA to the Moon in 2008," Spence said.

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