22 June 2009

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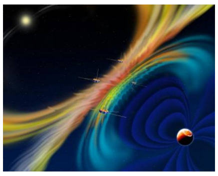
# NASA Approves Implementation Phase for Magnetospheric Multiscale

*The mission will analyze the phenomenon of magnetic reconnection*



NASA's Magnetospheric Multiscale mission will use four identical spacecraft, variably spaced in Earth's orbit, to make three-dimensional measurements of magnetospheric boundary regions and to examine the process of magnetic reconnection Southwest Research Institute via EurekAlert

Officials from NASA's headquarters, in Washington DC, gave the final confirmation to the Southwest Research Institute (SwRI) on the Magnetospheric Multiscale (MMS) misson, whose main objective is to analyze one of the most basic phenomena in the Universe, namely magnetic reconnection. Scheduled for launch in April 2014, the new mission will hopefully bring in considerable amounts of data, which could open up new avenues of research in the field of sustainable and cheap energy production for the world.

"Solving magnetic reconnection has the potential to unlock understanding of a fundamental energy process present throughout the universe that affects and limits our use of technologies on Earth," Dr. Barbara Giles, the NASA MMS program scientist, explains. Physicists say that magnetic reconnection is a fundamental process involved in creating such events as solar flares, auroras, high-energy cosmic rays, and X-ray emissions from accretion disks around stars and black holes.

Essentially, this type of reconnection allows the energy stored in a magnetic field to be converted into heat and charged-particle kinetic energy. It's also responsible for causing sawtooth oscillations in fusion plasmas, used for nuclear fusion research. Because of the large number of phenomena it triggers, it's very important for scientific studies. Solar flares, for instance, have the potential to directly affect our planet's magnetic field, and to cause widespread damage in communications and electrical networks.

"We see MMS as the culmination of many years of investigation into magnetic reconnection involving spacecraft and laboratory measurements as well as theoretical analysis and large-scale computer models," MMS science principal investigator Dr. James L. Burch, who is also the president of the SwRI Space Science and Engineering Division, adds.

"These previous efforts show clearly that special capabilities including spacecraft separations as close as 10 kilometers, rapid measurements of the properties of charged particles at speeds up to 100 times faster than previously performed, and high resolution three-dimensional measurements of electric and magnetic fields from spacecraft with controlled surface electric potential are required to unlock the secrets of how magnetic reconnection operates in space," he says.