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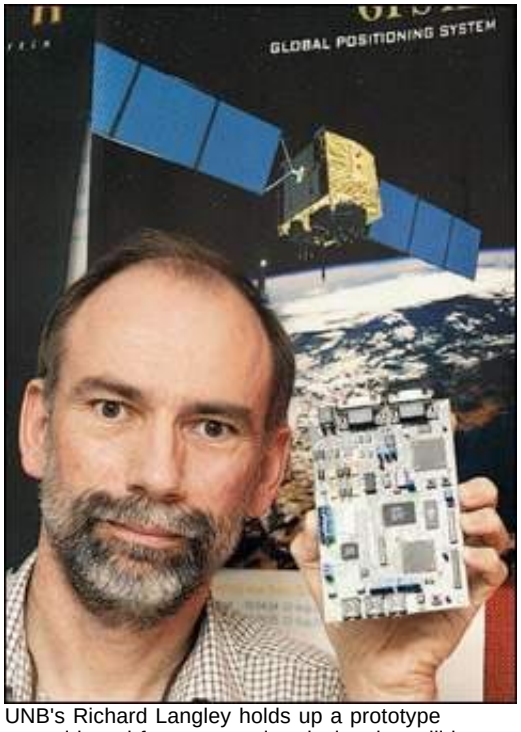
SCIENCE

UNB building device to explore mysteries of space storms

Gadget will be aboard Canadian satellite in 2007



UNB's Richard Langley holds up a prototype control board for a measuring device that will be put into space. Noel Chenier/Telegraph-Journal

Researchers at the University of New Brunswick are working on a device bound for Earth's orbit that should provide some insight into the mysteries of violent space storms.

Storms in the planet's outer atmosphere can wreak havoc in our electronic world, zapping power grids, knocking out cellular and other communications systems and frying satellites.

So scientists are trying to better understand the electrically charged upper atmosphere and how storms affect it.

The device now being built at UNB, set to be launched aboard a Canadian satellite in 2007, will help in this effort by taking new measurements of the ionosphere.

Bursts of energy from the sun regularly collide with the Earth and are absorbed and deflected by the magnetic cushion around the planet. Sometimes the sun fires out massive bursts into space called solar flares. When the angry flares smack into the cushion, turbulent geomagnetic storms result - sometimes with dramatic results here on Earth.

They play out in the northern sky as brilliant displays of Northern Lights, but can also interfere with our daily lives. In 1989, such a storm was responsible for knocking out the entire hydro grid in Quebec, leaving millions without power for hours. Five years later, two Canadian satellites - Anik E-1 and E-2 - were damaged by a similar-sized storm.

Late last year, the biggest recorded solar flares prompted space weather forecasters to warn of disruptions on the ground. Luckily, the disruptions were generally limited to satellite communications and some radio dispatches from airliners, and did not zap power supplies.

But the threat such storms pose are leading to a drive to more accurately understand and forecast them.

The UNB device, about the size of a toaster, will carry five sophisticated global positioning system sensors to keep track of the position of the Cassiope satellite it will ride on. The sensors will also be able to measure the density of the billions upon billions of electrons in the upper atmosphere.

It is those density readings, impossible to make with the same detail from here on Earth, that will contribute to the growing body of scientific data exploring the stormy interplay between the Earth and the sun.

"It will certainly provide additional data on the Earth's ionosphere and how it responds to geomagnetic storms. And that could be useful in better understanding how the Earth's atmosphere responds to such

influences," says Dr. Richard Langley, the principal investigator for the project and a professor of geodesy and precision navigation at UNB in Fredericton.

Research associate Donghyun Kim and graduate student Chungshin Kang are also working on the project, formally dubbed GPS Attitude and Profiling.

The federal government is spending more than $140 million on the Cassiope satellite, which will also carry instruments from a number of other universities and companies in Canada, the U.S. and Japan.

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