



## Canadian Space Portal Helps Researchers to Better Understand Space Weather Events and Reduce Their Impact on Earth

On a cold winter night in March 1989, several large solar flares struck the earth's northern hemisphere, and electrical ground currents created by the magnetic storm collapsed Quebec's power grid. According to the *New York Times*, the solar storm was caused by a blast on a quadrant of the sun that was 36 times larger than the earth.<sup>1</sup> This incident cost the province hundreds of millions of dollars and affected millions of lives.

With increasing dependence on electric and electronic systems, we have never been more interested in, or vulnerable to, solar and space weather events. In 2003, a series of solar storms damaged 60 percent of NASA's satellites, rendering two of these multi-million dollar devices completely useless. A similar storm today could be catastrophic, resulting in trillions of dollars in damage. As NASA and other science agencies anticipate the next major storm by 2013, it is critical to mitigate key risks associated with such space weather phenomena. Today, a research team enabled by CANARIE has launched a new online research platform to address these challenges.

The Canadian Space Science Data Portal (CSSDP) is a unique computer environment that provides access to a comprehensive collection of critical space information, tools and expertise. With an easy-to-use interface, the CSSDP allows scientists to source, analyze and exchange data; collaborate on common research challenges; and ultimately, advance their understanding of space phenomena and how it affects our planet.

"Through the portal, scientists who are involved in space exploration can access a range of data and information products generated by diverse space science instruments, including particle analyzers, radio, magnetic and optical devices that survey the near-Earth space environment," says Dr. Robert Rankin, Professor of Physics at the University of Alberta, and Principal Investigator of the CSSDP project. "This creates new opportunities to unlock the secrets of the sun and near-Earth space environments that lead to better predictions of space weather, helping to reduce the negative impact of this activity on society." This is particularly important for satellite and technology-intensive industries such as aerospace, communications and energy.

With leadership from the University of Alberta and Cybera, the organization that manages Alberta's high performance network, the CSSDP project brings together a multidisciplinary and internationally-distributed research team. This includes scientists from the Universities of Calgary, New Brunswick and Saskatchewan, Natural Resources Canada, and the University of California, Los Angeles.

The team relies on the advanced networking capability and support provided by Cybera and CANARIE. Leveraging \$1.1 million from CANARIE's Network-Enabled Platforms (NEP) program and \$200 000 from Cybera, the team has implemented many novel features during the first 12 months of the project. "With 350 registered users to date, our team is excited about the early adoption of this technology," said Jill Kowalchuk, Vice President, Project and Partnership Development of Cybera.

Dr. Rankin is also enthusiastic about the potential impact of this innovation, which could readily be adapted for use in other scientific disciplines. "The CSSDP project creates new opportunities to standardize space research terms and data collection methods," he says. "Perhaps most importantly, it facilitates the international collaboration required to truly understand and respond to the world around us." As scientists continue to explore the great unknown, this is for certain: the CSSDP promises to increase Canada's contribution to space weather research, support the development of new space data analytics, and accelerate space science discoveries.

<sup>1</sup> <http://www.solarstorms.org/SS1989.html>