STFC Media Release

**UK leads new international solar storm tracking initiative**

1 October 2014 – UK scientists have unveiled a new £2.5 million (€3.2 million) project that will improve forecasts of solar storms, including their arrival time and impact on the Earth. The three year project will provide the most comprehensive set of information to date about the Sun’s influence on interplanetary space and the effects space weather can have on the Earth. The project will enable governments to improve their strategies to lessen the potential negative impacts from the Sun.

Led by scientists at the UK Science and Technology Research Council’s (STFC) Rutherford Appleton Laboratory (RAL), the international HELCATS (Heliospheric Cataloguing, Analysis and Techniques Service) team is exploiting advanced visible-light imaging from NASA satellites combined with sophisticated computer modelling techniques.

The UK government already recognises the potential threat of disruption that could be caused by a severe space weather event, listing it high on the National Risk Register of Civil Emergencies.

To better monitor any potential threat the HELCATS team is tracking huge clouds of solar material as they are blown off the Sun and speed their way out into the heliosphere – the immense magnetic bubble containing our solar system, and which is influenced by the Sun.

Professor Richard Harrison, from STFC RAL Space, is the HELCATS coordinator. “Sometimes the Sun ejects billion-tonne hot plasma clouds into space,” he said. “Knowing how to understand and predict what might be impacting the region of space nearest the Earth is critical for many modern technologies”.

“The most severe solar storms could affect technological systems such as satellites, power grids and GPS signals,” said Dr Jackie Davies, the science and technical lead for the HELCATS project. “The novel imaging provided by the Heliospheric Imaging cameras on STEREO, combined with cutting-edge analysis techniques, will allow us to significantly improve forecasts of the arrival time and impact of these potentially hazardous events.”

The HELCATS project was developed in the wake of NASA’s successful STEREO mission, which features two spacecraft orbiting the Sun. On board STEREO are two Heliospheric Imagers, which can detect and record the outflow of material from the Sun.

The Imagers allow the continuous tracking and stereoscopic (3D) analysis of solar clouds ejected from the Sun. They were developed by a UK-led team, headed by STFC’s Professor Richard Harrison.

Observations from STEREO and other space missions, and from radio telescopes on the ground, will be fed in to computer models developed by the HELCATS team to exploit the combined data. The project will not only study the solar storms as they travel out from the Sun, but will also give an insight into the way they interact with the solar-generated plasma winds within the heliosphere.

“The result will be an unprecedented understanding of the nature of the heliosphere through a unique set of databases and software tools,” said Professor Harrison. “These elements will be crucial for our understanding of what we now call space weather.”

HELCATS is funded through the EU Framework 7 Programme.

**More information:**

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**Notes for editors**

1. **Images** from the Heliospheric Imagers on STEREO can be found at [www.stereo.rl.ac.uk](http://www.stereo.rl.ac.uk)
2. **HELCATS** is led from STFC RAL Space and brings together eight key European groups combining a wide range of scientific strengths and space instruments. They include the University of Graz, Austria; the University Paul Sabatier, France; The University of Göttingen, Germany; the Royal Observatory Belgium; Imperial College London, UK; the University of Helsinki, Finland; and Trinity College Dublin, Ireland. The project was one of the successful bids to the highly competitive EU Framework 7 Programme SPACE-2013 call.

<http://www.helcats-fp7.eu/>

1. **Professor Richard Harrison** is Head of the Space Physics Division within STFC RAL Space*.* He is HELCATS Project Coordinator and also the Principal Investigator for the Heliospheric Imagers aboard the two NASA STEREO spacecraft. Images and more information can be found at [www.stereo.rl.ac.uk](http://www.stereo.rl.ac.uk)
2. **RAL Space**, based at STFC's Rutherford Appleton Laboratory, carries out an exciting range of world-class space research and technology development. It has had significant involvement in over 200 space missions and is at the forefront of UK Space Research. <http://www.stfc.ac.uk/ralspace/>
3. **The Science and Technology Facilities Council (STFC**) is keeping the UK at the forefront of international science and tackling some of the most significant challenges facing society such as meeting our future energy needs, monitoring and understanding climate change, and global security. The Council has a broad science portfolio and works with the academic and industrial communities to share its expertise in materials science, space and ground-based astronomy technologies, laser science, microelectronics, wafer scale manufacturing, particle and nuclear physics, alternative energy production, radio communications and radar.

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It enables UK researchers to access leading international science facilities by funding membership of international bodies including European Laboratory for Particle Physics (CERN), the Institut Laue Langevin (ILL), European Synchrotron Radiation Facility (ESRF) and the European Southern Observatory (ESO).

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