

News story: UK to play a major role in space weather mission concept

Solar loops after eruption. Credit: ESA/ROB.

Space weather occurs when the sun ejects material which can be highly charged, super heated and hazardous to manmade infrastructure and human life in space.

The new mission aims to put a spacecraft at a fixed point away from the line between the sun and the Earth, known as the 5th Lagrange point, so it can monitor for these events and provide an early warning system. Three out of four teams developing the platforms and instruments to support the European Space Agency (ESA) mission are from the UK.

Airbus UK will lead on developing the overall mission, with the focus on mission operations, the spacecraft platform, and on how this interfaces with the instruments. STFC RAL Space will lead the development of instruments to observe the sun and heliosphere and UCL Mullard Space Science Laboratory will lead the development of instruments to make measurements of the solar wind. OHB, from Germany, will lead the fourth consortium, aiming to develop a competing platform, with all proposals to be assessed by ESA.

Supporting the UK's growing space sector is a core part of the government's Industrial Strategy, which aims to bring together the UK's world-class research base with business investment, ensuring we continue to develop the technologies and industries of the future.

Science Minister Sam Gyimah said:

"This project has the potential for UK space and engineering expertise to help ensure vital communications, navigation and power networks are protected, and is a great example of what we can achieve through continued scientific collaboration with our European partners.

"As set out in the Industrial Strategy, the UK's space sector is going from strength to strength, boosting the economy, employing around 40,000 people and developing innovative services with a global impact."

Dr Graham Turnock, Chief Executive of the UK Space Agency, said:

"The UK is a world leader in providing space weather forecasts and this mission will help the Met Office's Space Weather Operations Centre improve this further. It's a great example of the value of our work as a member of ESA to science and industry in the UK."

In 2016 the UK Space Agency committed €22 million, over 4 years, to ESA's Space Situational Awareness (SSA) programme.

Matt Perren, Head of Future Projects at Airbus space in the UK, said:

“A mission to the 5th Lagrange point will significantly enhance our capability to protect our planet against space hazards. We are excited to make available Airbus’ experience as leader of cutting edge solar observation and Lagrangian missions to support ESA and the UK Space Agency in strengthening the resilience of our valuable assets in space and on Earth.”

Dr Richard Cole, who will be managing the study contract at UCL, said:

“UCL has a long track-record in the science of space weather and in building instruments to investigate it. I am very pleased that UCL is able to lead a team of European institutes in developing this important mission that will help us develop an early warning system for space weather and better predict its harmful effects on both ground- and space-based technologies – something we’ve never been able to achieve before.”

Dr Jackie Davies, Consortium Lead for this study at STFC’s RAL Space, said:

“This mission is a fantastic opportunity to apply the extensive scientific and space instrument expertise and heritage here in STFC RAL Space to a growing societal problem. We have been advocates for such a space weather mission over many years, based on RAL Space’s leadership of the pioneering Heliospheric Imager instruments on NASA’s flagship STEREO mission. It is extremely satisfying to achieve this goal and we are now looking forward to the challenge of leading a multi-instrument, multi-national instrumentation development programme.”

Rare extreme space weather could disrupt modern technology by causing geomagnetic storms affecting satellite navigation, shortwave communications and power grids. A recent ESA study estimated the potential socio-economic impact in Europe from a single, extreme space weather event could reach €15 billion. Much of this disruption could be avoided through accurate forecasting.

ESA is planning to select a final design for the spacecraft and its instruments based on the results of these studies, which are due in about 18 months.