

**Preparing for When the Sun Wakes Up:
Workshop on Deep-Space Sun-Earth L5/L1 Space-Weather Missions
27-28 June 2019, BEIS Conference Centre, 1 Victoria Street, London, UK**

Space weather is recognised as a natural hazard that can disrupt and damage vital technological infrastructures across our planet and in space. It can affect all aspects of modern society. Space weather is driven by activity on the Sun, particularly through large eruptions of plasma (known as coronal mass ejections – CMEs) and the bursts of energetic particles that form radiation storms. The historical record contains multiple examples of “severe space weather” events that have had large disruptive and damaging consequences on technological systems. In some instances, this has led to the potential to add confusion to sensitive political and military situations. For around 15 years, the Sun has been less active, reducing the levels of space weather impacts at Earth, though it is clear that the Sun has still been ejecting CMEs that would have been severe if they had come our way. We must understand that the low levels of activity will not continue indefinitely, and in any case, disruptive events can still occur. Severe events will inevitably hit our planet in the future; we just lack the scientific ability to forecast whether that will be next week or even in a decade’s time. Thus, it is timely to prepare now for all eventualities and, in particular, for when the Sun wakes up again. ESA has instigated the Space Weather segment of their Space Situational Awareness (SSA) programme that has culminated in the development of a concept for a space-weather-monitoring mission to the Sun-Earth L5 point.

This workshop is intended to engage stakeholders, including policy makers, governments, service providers, science advisors, and the key scientific/technical experts, necessary to ensure international preparedness for future space-weather forecasting capability. This is to build on UK, European, and wider interests across all aspects of the space-weather community, particularly with an emphasis on Europe, to consolidate the case ahead of the ESA Ministerial later in 2019. The workshop will focus specifically on the ESA Lagrange L5 Mission in concurrence with the USA SWFO L1 Mission, to work in unison for maintaining, and improving, the current space-weather forecast capability to protect society’s critical infrastructures.

Below is an outline guide to the topics/areas envisaged to be discussed and presented throughout the workshop, which will commence around 09:30h on Thursday 27th June 2019 and conclude around 16:30h on Friday 28th June 2019.

Part 1 – Scientific, political and mission status.

- Setting the scene: Review of space weather science and impacts; the state of the Sun over the next 5-10 years; current space-weather forecasting methods and services and their success.
- The political view: The response of Government(s) and the risk register; the strategy of UKSA; the role of the UN; ESA’s SSA programme for space weather and preparing for the ministerial.
- Missions: The Lagrange L5 and SWFO L1 missions – status, instrumentation, and future planning; associated (SSA and other) space-weather projects.

Part 2 – Preparing for L1/L5.

- Strategy for using the L1/L5 platform combination effectively – including ESA-NASA/NOAA plans for the joint L1/L5 capability.
- Forecasting modelling methods to exploit the L1/L5 missions.
- Additional forecasting products.
- Making the economic case: Can we further assess the economic benefit of the L1/L5 capability?

Part 3 – The wider space weather strategy.

- Other pertinent/complimentary space-weather projects/facilities/missions: Do we need a projects/facilities/missions roadmap?
- Space weather standards: How should the international standards be defined – through COSPAR/UN?
- Selling space-weather science as well as space weather application.

Part 4 – Next steps.

- Preparing for the ESA ministerial for Lagrange L5 and the wider SSA programme. Securing the SWFO L1 mission: What actions are necessary?
- Beyond Lagrange/SWFO: Future follow-on platforms/capabilities...