

Abstracts and Biographies| Keeping the Lights on During Solar Storms: Space Weather as an Energy Sector Hazard

Wednesday 27 June 2023, 1:30pm – 5:30pm

Mr Simon Machin, Met Office

Biography: Simon Machin is the Manager of the Met Office Space Weather programme, having worked within the Met Office space weather programme for around 15 years. As well as providing the UK national weather and climate prediction services, the Met Office owns the space weather risk on behalf of government. This drives responsibilities to deliver space weather warnings, alerts and services to government, Critical National Infrastructure, industry and the public through the Met Office Space Weather Operations Centre (MOSWOC). Simon is responsible for oversight of space weather services and direction of scientific research to operations at the Met Office, leading to the delivery of space weather services aligned to user requirements. He also has a key role in ensuring that Met Office's responsibilities under the UK Space Weather Preparedness Strategy are delivered to support government and contribute to national resilience. The overarching aim being to develop understanding of space weather effects, impacts and mitigations, underpinned by robust science. With a career spanning over 35 years, alongside expertise in space weather, Simon is a qualified meteorologist and climatologist, having worked in a variety of roles where he has contributed to developing and applying understanding the natural environment and natural physical phenomena to support government and industry in making robust decisions to support resilience and successful operations.

Title: Met Office Space Weather Operations Centre – Space weather activities and support to the Energy Sector

Abstract: The Met Office space weather programme delivers warnings, alerts, forecasts and advice to users in government, critical national infrastructure and to the public. The presentation will explain space weather and the relevance of understanding phenomena and downstream impacts to modern society. The key role the Met Office plays in underpinning space weather risk assessment, supporting national resilience through key activities will be set out. The talk will highlight the need for resilience of national assets as set out in the National Space Strategy and the UK Severe Space Weather Preparedness Strategy, which underpins the Met Office space weather programme. The Met Office works with many partners across academia to develop capability and services and a key example of this is the Space Weather Instrumentation, Measurement, Modelling and Risk programme managed through STFC and NERC. New space missions such as the ESA Vigil mission will further enhance space weather measurements available to the UK science community and for use by the Met Office. These will ultimately lead to more reliable and sophisticated models with longer forecast lead-times which when pulled through into operations will provide the services demanded by government and industry to assure resilience.

Mr Mathew Hofton, National Grid ESO

Biography: Mathew studied Electrical engineering at Manchester and has worked as an engineer at the Electricity Network Control Centre in Wokingham for 15 years. His current role is National Planning Manager within the Network Access Planning department. The team work closely with the transmission system owners to plan network outages for construction and maintenance work while ensuring system security and energy balancing efficiency.

Title: The effects of severe space weather on the electricity transmission system

Abstract: The talk will focus on the impacts severe space weather events could have on the electricity transmission system. The risk space weather presents to transmission assets and system operation, and cover the current process the Electricity System Operator has in place to mitigate these risks.

Dr Gemma Richardson, British Geological Society

Biography: Gemma works in the Geomagnetism team at the British Geological Survey forecasting, researching, and providing services related to space weather. She has now spent over a decade studying the impacts of space weather on ground-based technological infrastructure, particularly power grids and, more recently, pipelines and railways. Her research is mostly focused on the UK, but she has also been involved in projects around the world including New Zealand, Ireland, France and the interconnected European power network.

Title: Understanding geomagnetically induced currents in the GB power network

Abstract: Space weather events can lead to damage in ground based technological infrastructure, such as power grids, pipelines and railways, and so have the potential to be incredibly disruptive to our daily lives. Disturbances in power grids occur due to geomagnetically induced currents (GIC) which can flow into the network through transformers during geomagnetic storms. To mitigate the impact of GIC on the power grid we need to understand their causes and how they flow through the system. We can identify the parts of the grid that may be most vulnerable to large GIC through computer modelling, and work towards reducing their impact.

Dr Alexi Glover, ESA

Biography: Dr Alexi Glover is ESA's Space Weather Service Coordinator, working within the ESA Space Safety Programme Office at the European Space Operations Centre (ESOC) in Darmstadt, Germany. Her current role involves leading the development of ESA's Space Weather Service Network: a diverse network of more than 50 entities including academic groups, institutes and industry from across Europe working together to develop reliable space weather services for end users. She holds a PhD in Solar Physics from University College London and has more than 20 years experience working in space weather applications and services, also representing ESA in a number of international committees and working groups in the field of space weather.

Title: ESA's Space Weather Service System in Support of the Energy Sector

Abstract: Part of the ESA Space Safety Programme Office, ESA's Space Weather Office addresses risks associated with the activity of our Sun, developing a service system with the goal of providing owners and operators of critical spaceborne and ground-based infrastructure with timely and accurate information on space weather conditions and their potential impacts. This presentation will highlight current service capabilities provided by ESA's Space Weather Service Network together with ongoing developments targeting the needs of the energy sector. It will also highlight new and future measurement systems in development such as the Vigil and Aurora missions which are expected to provide data underpinning substantially improved services in the coming years.

Mr Mark Prouse, BEIS

Biography: Mark Prouse is Deputy Director, State Threats, Energy Resilience & Cyber Security in the UK Government's Department for Energy Security and Net Zero. He has responsibility for countering state threats, resilience and security policy in the downstream gas and electricity sectors, and cyber security policy and regulation, working with government, international and industry partners on policy and response for national security risks, and resilience to Natural Hazards such as severe weather, space weather and industrial action. Mark is the Chair of NATO's Energy Planning Group considering the security and resilience of energy systems and supplies required in support of Alliance objectives. Before his current role, Mark has been a civil servant for more than twelve years, working in a number of posts across the security and resilience fields in Government. Mark has a BA (Hons) in International Relations and Politics from the University of Essex, and Masters degrees in Intelligence and International Security from King's College London, Terrorism Studies from the University of St Andrews, and History from the University of Wolverhampton.

Title: Developing our understanding of Severe Space Weather and its potential impacts on the UK

Abstract: The presentation will cover key workstreams happening across Government, industry, and academia to understand and forecast Severe Space Weather events and their potential impacts on the UK. This will include an overview of the Space Weather Instrumentation, Measurement, Modelling and Risk (SWIMMR) programme, which is developing instrumentation and modelling tools to enhancing understanding and prediction of Severe Space Weather, and a case study of work carried out with the energy sector in the UK to update our understanding of the likely impacts of Severe Space Weather events.