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Assuring a Safe, Secure and Sustainable Space Environment for Space Activities (4)

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SPACE WEATHER IMPLICATIONS FOR INFRASTRUCTURE AND SOCIO-ECONOMIC DEPENDENCE: THE STATUS OF NATIONAL AND INTERNATIONAL SCIENCE, POLICY AND COOPERATION FRAMEWORKS FOR ACHIEVING SPACE SUSTAINABILITY

Abstract

Space weather events can adversely affect everyone on Earth and in planetary orbit, from space assets (i.e. satellites, ISS) to space dependent ground technologies and applications on Earth (i.e. internet, GNSS, telecommunications). This can lead to partial or total loss of service and frustrate emergency response platforms dependent on these technologies. Moreover, science cannot reliably predict space weather threats with adequate warning at the present time. Consequently, space weather research and continuity of research plays an informative and indispensable role in Space Situational Awareness, for both infrastructure and socio-economic risk prevention and mitigation purposes. Since the 1950's a growing web of space actors, to include civil government, military, academia and industry, have played a vital role in obtaining and analyzing scientific data on space weather phenomena. Increasing the scientific knowledge base also goes hand in hand with developing advanced operational models and forecasting tools. As society continues to look toward a progressively secure, prosperous and technologically sophisticated future it is imperative that we continue to expand the global reach and understanding of space weather through multilateral collaboration, research and information exchanges by both governmental and nongovernmental entities and networks, worldwide.

This article will synthesize a global overview of the following issues: 1) provide a concise overview of space weather and identify the main risks that it poses to societal interests and critical infrastructure (in space and on Earth), and the implications to civil, military and private/ commercial sector interests; 2) outline the network of space actors currently engaged in researching and monitoring the space environment, highlighting each sector's unique contributions and challenges; 3) identify the main challenges inherent to space weather research and application at the global level; 4) provide a current survey of the legal frameworks, policy initiatives, and capacity building efforts on space weather at the international level, such as UNCOPUOS, WMO, and ICAO. In conclusion, this paper will highlight critical implications for space weather and recommend areas for continued/new sector collaboration, technological growth, and international governmental and nongovernmental cooperation.