Special session: Adapting to Extreme Risks: Safety Strategies for Space and Aviation

Organised by:

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Motivation: The space and aviation industries are undergoing a major transformation that can significantly impact public safety and risk. The space industry is advancing toward low Earth orbit space tourism and unmanned missions to the Moon. The NewSpace business model, which shifts space exploration from government ownership to private enterprise, is expected to introduce new risks. Known environmental risks, such as solar radiation, along with socio-technical risks, are becoming more prevalent in this era. In the aviation sector, the threat of armed conflict poses significant challenges. Operating civil aviation near or over conflict zones increases the risk of both intentional and unintentional downing of aircraft. Recent incidents, such as the downing of Malaysia Airlines Flight MH17 over Eastern Ukraine in 2014 and Ukraine International Airlines Flight PS752 over Iran in 2020, highlight these dangers. New models are needed to capture these risks and enable comprehensive analysis of these operations.

Objective: The aim of this Special Session is to provide an opportunity for researchers to share and exchange their knowledge and experience in fields relevant to risk and safety assessment of space and aviation infrastructure when subjected to extreme risks, such as those of low likelihood but catastrophic consequences. Related topics include, but are not limited to: 1) Modelling of stressors for space and aviation; 2) Armed conflicts and their impact on the aviation industry; 3) Space launch failure and consequence analysis; 4) Natural hazards arising from space and aviation accidents; 5) System-of-systems approach to risk and resilience assessment of interdependent space and aviation infrastructures; 6) Safety modelling and analysis of rescue and disaster response; 7) Artificial intelligence algorithms in security risk assessments; 8) Expert judgment elicitation methods in aviation security risk assessment; and 9) Risk assessment methodologies—approaches of regulators and international organizations.