

Abstract:

How are space weather and space climate connected to solar phenomena?

Many aspects of modern society are susceptible to space weather effects. Pertinent space weather effects include high-energy electromagnetic and particle radiation, changes of atmospheric drag, reduction of GPS accuracy or complete loss of GPS signals, communication outages, and the generation of potentially harmful DC currents in our electric power grid. Beginning in the early 1990s, researchers and government have been increasingly aware of the need to understand the causes of space weather, and to find ways to mitigate deleterious effects associated with it. New research and development programs have been created to address space weather primarily at NASA but also at other agencies. This investment has been very fruitful by generating a new class of entirely new space weather specification and forecast capabilities. This presentation provides an overview of space weather causes and effects, as well as of research and development to forecast and mitigate space weather effects. It will include a discussion of modern space weather analysis and forecasting, and conclude by pointing out paths into the future.