

Solar eruptions, CMEs and Space Weather

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Coronal mass ejections (CMEs) are large-scale magnetized plasma structures ejected from the Sun and propagate far into the interplanetary medium. CMEs represent energy output from the Sun in the form of magnetized plasma and electromagnetic radiation. The electromagnetic radiation suddenly increases the ionization content of the ionosphere, thus impacting communication and navigation systems. The plasma clouds can drive shocks that accelerate charged particles to very high energies in the interplanetary space, which pose radiation hazard to astronauts and space systems. The plasma clouds also arrive at Earth in about two days and impact Earth's magnetosphere, producing geomagnetic storms. The magnetic storms result in a number of effects including induced currents that can disrupt power grids, railroads, and underground pipelines. This lecture presents an overview of the origin, propagation, and geospace consequences of solar storms.