

THE
CATHOLIC UNIVERSITY
of AMERICA 

Department of Physics
Colloquium

Dr. Teresa Nieves-Chinchilla
GSFC-NASA / CUA

Let's Talk About...Space (Weather)

Space Science consists of scientific investigations about space. It does not constitute a new science by itself, but it represents an important extension of the boundaries of existing sciences, such as physics, life's sciences, chemistry, biology, and sociology. A fundamental element in Space Science is the Sun and their influence on Earth and human technology. Space Weather (SpW) refers to the study of the Sun's variability and its impact on the space environment. It includes the study of how the Sun works from its interior to its atmosphere, its environment, and the physics of the magnetic barriers surrounding Earth and other planets.

Coronal Mass Ejections (CMEs) are known to be the main drivers of SpW natural hazards, but they are also the most spectacular and enormous of solar phenomena. CMEs move away from the Sun with speeds greater than 500 km/s and carry approximately 10^{12} kg of magnetized plasma. When a CME collides with Earth, the magnetosphere is compressed, and the CME's magnetic field may reconnect with the Earth's magnetic field. When magnetic reconnection takes place, Earth's magnetospheric shield weakens, and energetic particles gain access to the ground. When/Why will this happen? These processes are still unpredictable and will depend on the CME's magnetic characteristics, topology, and evolution, which are not yet fully understood. Therefore, understanding these phenomena is critical to develop a reliable capability to forecast geomagnetic activity.

Our technological society depends on electrical and space-based technologies for security, electrical power, water supplies, health care, and more. Solar storms directed toward Earth can degrade, disrupt, or damage the ground- or space-based technology, as well as the infrastructures upon which society has grown so dependent. Modern societies need to be prepared for severe space weather hazards, and international strategic goals are critical to combine research and operational activities. Likewise, *'strong public-private collaborations must be established between the Federal Government, industry, and academia to enhance observing networks, conduct research, develop prediction models, and supply the services necessary to protect life and property and to promote economic prosperity. These partnerships will form the backbone of a space-weather-ready Nation.'* (National Space Weather Strategy, NSTC Executive Office of the President, October 2015)

Wednesday, November 15, 2017

4:00pm

108 Hannan Hall

Refreshments will be served at 3:45

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For more information or if you would like to request disability accommodations, please contact:

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