

Joint MIPSE/CLaSP Seminar



Wednesday
February 19, 2025
3:10 pm
Room 1003 EECS

Dr. George Clark

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Investigating Jupiter's Powerful Auroras with NASA's Juno Mission

Of all the planets in the solar system, Jupiter's space environment is often described using superlatives, e.g., *fastest* rotating planet, *strongest* magnetic field, *most powerful* aurora, *largest* magnetosphere. These qualities make experimental pursuits at Jupiter ripe for discovery. One example, is the pursuit of the underlying physics powering Jupiter's auroras. Prior to 2016, the phenomenological picture of Jupiter's northern aurora was established based on sparse ultraviolet and X-ray observations from Earth-orbiting observatories. Those auroral maps hinted that Jupiter's auroras were driven in a much different manner than other planets'; however, in situ measurements were lacking to test various hypotheses. In 2016, NASA's Juno mission provided the first measurements of Jupiter's polar magnetosphere and auroral regions, and revealed that Jupiter is more complex than theories originally established. Juno has been orbiting Jupiter for over eight years and has executed 70 polar orbits with altitudes as close as a few thousand kilometers over its one-bar "surface". This presentation will highlight Juno's major auroral discoveries with an emphasis on its enigmatic polar cap auroral region. We will discuss how Jupiter's space environment gives us access to a plasma parameter regime that is unlike other planets and how we can use that to explore similar and distinct properties of planetary magnetospheres.

About the Speaker: George Clark received his Ph.D. in physics from the University of Texas, San Antonio in 2014. George then joined the Johns Hopkins Applied Physics Laboratory in 2015 where his research specializes in the physics of energetic particle phenomena in the magnetospheric and auroral regions at Jupiter. He also builds energetic particle instruments for NASA and ESA missions. He is currently a science team member on NASA's Juno mission, the lead of the Jovian Energetic Electron sensor on ESA's Jupiter Icy Moons Explorer mission, and the lead of the Ultra energetic neutral atom imager on NASA's Interstellar Mapping and Acceleration Probe. George was awarded the NASA early career achievement medal for his scientific contributions in understanding Jupiter's magnetosphere and auroras.