



# IIA ASTROPHYSICS SEMINAR



27 August 2024, Tuesday, 03:30 PM

IIA Auditorium

## The response of Martian ionosphere and upper atmosphere to the solar forcing: MAVEN observations

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IIA

*Mars, with its thin and CO<sub>2</sub>-dominated atmosphere, presents a unique environment for studying the solar-planetary interaction. The ionosphere of Mars is primarily produced by the ionization of its dominant neutrals through solar extreme ultraviolet (EUV; 10-100 nm) and Soft X-ray (SXR; 1-10 nm) radiation. This process results in the production of photoelectrons and Auger electrons, which are primarily suprathermal (energy > 1 eV) in nature. These suprathermal electrons become thermalized through collisions, generating a thermal electron population. We have studied the response of these electron populations to their respective ionizing radiation, focusing on the response of Auger electrons to SXR radiation, He-II photoelectrons to 30.4 nm radiation, and thermal electrons to EUV radiation. Along with these results, I will also discuss how these electrons responded to the strong flare cases of the solar cycle 24. These insights are based on In situ observational data collected from scientific payloads on the Mars Atmosphere and Volatile Evolution (MAVEN) mission.*

*Understanding the behavior of these electrons is crucial for a planet with unevenly distributed crustal magnetic fields. This spatial asymmetry allows solar wind and IMF to penetrate the planet, leading to changes in Mars's magnetic topologies. I will end my presentation by discussing the upcoming work at IIA.*



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