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## POEMMA: Probe Of Multi-Messenger Astrophysics

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Developed as a NASA Astrophysics Probe mission concept study, the Probe Of Multi-Messenger Astrophysics (POEMMA) science goals are to identify the sources of ultra-high energy cosmic rays (UHECRs) and to observe cosmic neutrinos above 10 PeV. POEMMA consists of two satellites flying in loose formation at 525 km altitudes. A novel focal plane design is optimized to observe the UV air fluorescence signal in a stereoscopic UHECR observation mode and the Cherenkov signals from air showers from UHECRs and neutrino-induced tau leptons in an Earth-limb viewing mode. POEMMA is designed to achieve full-sky coverage and significantly higher sensitivity to the highest energy cosmic messengers compared to what have been achieved so far by ground-based experiments. POEMMA will measure the spectrum, composition, and full sky distribution of the UHECRs above 10 EeV to identify the most energetic cosmic accelerators in the universe and study the acceleration mechanism(s). POEMMA will also have high sensitivity to cosmogenic neutrinos by observing the upward-moving air showers induced from tau neutrino interactions in the Earth. POEMMA will also be able to re-orient to a Target-of-Opportunity (ToO) neutrino mode to view transient astrophysical sources. In this talk, the science goals, instrument design, launch and mission profile, and simulated UHECR and neutrino measurement capabilities for POEMMA will be presented.

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