

# Space Observatories of the Highest Energy Particles: POEMMA & EUSO-SPB

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## Content

*What are the mysterious sources of the most energetic particles ever observed? What are the sources of energetic cosmic neutrinos? How do particles interact at extreme energies?* Building on the progress achieved by the ground-based Auger Observatory in studying cosmic particles that reach 100 EeV, an international collaboration is working on space and sub-orbital missions to answer these questions. The Extreme Universe Space Observatory (EUSO) on a super pressure balloon (SPB) is designed to detect ultra-high energy cosmic rays (UHECRs) from above. EUSO-SPB1 flew in 2017 with a fluorescence telescope. EUSO-SPB2 is being built to observe both fluorescence and Cherenkov from UHECRs and neutrinos. These sub-orbital missions lead to POEMMA, the Probe Of Extreme Multi-Messenger Astrophysics, a space mission designed to discover the sources of UHECRs and to observe neutrinos above 20 PeV from energetic transient events. POEMMA will open new Multi-Messenger windows onto the most energetic events in the Universe, enabling the study of new astrophysics and particle physics at these otherwise inaccessible energies.

## Summary

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