

The Moon Burst Energetics All-sky Monitor (MoonBEAM)

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MoonBEAM is a SmallSat concept placed in cislunar orbit developed to study the progenitors and multimessenger/multiwavelength signals of transient relativistic jets and outflows and determine the conditions that lead to the launching of a transient relativistic jet. The distinguishing advantage of MoonBEAM is the instantaneous all-sky coverage, maximizing the gamma-ray transients observations and providing upper limits for non-detections. Gamma-ray observatories in low Earth orbit are not able to survey the entire sky at a given time due to Earth blockage as well as detector downtime from the high particle activity in the South Atlantic Anomaly region. The long baseline provided from a cislunar orbit, allows MoonBEAM to constrain the localization annulus when combined with a gamma-ray instrument in low Earth orbit utilizing the timing triangulation technique. Improving the localization precision of a gamma-ray burst aids the gravitational wave follow-up community in reducing the region needed to be searched to locate and identify the afterglow and kilonova emission. Furthermore, by providing a different vantage point for a gamma-ray detection, MoonBEAM can help extend the gravitational wave detection horizon by increasing the confidence of a simultaneous marginal gravitational wave signal. Through the all-sky coverage, MoonBEAM will also provide insight into the conditions that lead to a successful relativistic jet, instead of a shock breakout event, or a completely failed jet in the case of core collapse supernovae.

Track

Future Missions/Instruments

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