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The e-ASTROGAM mission

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e-ASTROGAM is a gamma-ray observatory to be proposed as a Medium-size mission for the ESA science program. It is dedicated to the observation of the Universe with unprecedented sensitivity in the energy range 0.3 –100 MeV extending up to GeV energies, together with a ground-breaking polarization capability. In this energy window, a variety of phenomena and sources await their discovery and many foundational questions can be answered. The e-ASTROGAM core science is focused on (1) the mysteries of the Galactic centre and inner Galaxy, including the supermassive black hole activity, the Fermi Bubbles, the origin of the Galactic positrons, and dark matter signatures in a new energy window; (2) nucleosynthesis and propagation of heavy elements in our Galaxy and beyond; (3) activity from extreme particle accelerators, including disk-jet transitions in active galactic nuclei and the origin of the extragalactic gamma-ray background. e-ASTROGAM will be uniquely complementary to a variety of ground and space observatories ranging from radio, optical, X-ray and TeV energies, as well as to neutrino and gravitational wave detectors. The e-ASTROGAM payload consists of a single instrument for the simultaneous detection of Compton and pair-producing gamma-ray events. It is based on a very high TRL for all subsystems and includes many innovative features for the main detectors and associated electronics.

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