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New Mission Concept: A Compton Telescope with a Coded Aperture Mask to investigate the MeV γ -ray Sky ALEXANDER MOISEEV, NASA Goddard Space Flight Center — The European Space Observatory INTEGRAL has been providing excellent results on X-ray and γ -ray astronomy since 2002. However, the nature of the Galactic Center (GC) region excessive γ -ray radiation, in particular 511 keV positron annihilation line is still a mystery. I will present a concept of a potential γ -ray telescope with the major objectives: a) understand the nature of the GC supermassive black hole environment and other heavily populated sky regions, including the 511 keV positron annihilation line, by creating an intensity map with high spectral and spatial resolution; b) probe the origin of the Fermi Bubbles by extracting the diffuse MeV spectrum from the base of the bubbles; c) explore Galactic chemical evolution and sites of explosive element synthesis by conducting high-sensitivity measurements of nuclear lines. A telescope will also be capable to detect gamma-ray bursts and measure polarization. The instrument is based on a novel CdZnTe Imager and deployable coded aperture mask. The unique feature of proposed instrument is that it operates simultaneously in two modes, high-angular resolution enabled by coded aperture mask, and in Compton telescope mode, enabled by CdZnTe Imager.

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