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The GECCO Mission: Technology and Science with GECCO

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The Galactic Explorer with a Coded Aperture Mask Compton Telescope (GECCO) is a novel concept for a next-generation telescope covering the MeV band. We will present the potential and importance of this approach that bridges the observational gap between the keV and GeV energy range. With the unprecedented angular resolution of the coded-mask telescope combined with the sensitive Compton telescope, a mission such as GECCO can disentangle the discrete sources from the truly diffuse emission. This also allows to understand the gamma-ray Galactic center excess and the Fermi Bubbles, and to trace the low-energy cosmic rays, and their propagation in the Galaxy. Nuclear and annihilation lines are spatially and spectrally resolved from the continuum emission and from sources, addressing the role of low-energy cosmic rays in star formation and galaxy evolution, the origin of the 511 keV positron line, and fundamental physics. Such an instrument also detects explosive transient gamma-ray sources, which enable identifying and studying the astrophysical objects in a multi-messenger context. In this talk we will present the technology used for GECCO and the science that can be addressed.

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