

The GECCO Mission and its Science

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Technological breakthroughs in telescope development have always driven discoveries in astrophysics. Discoveries are yet to be made in the energy band between a few hundreds keV and a few MeV, which is currently very little explored due to the lack of sensitive enough telescopes. In this band the telescope technology is challenged by the changing nature of the photon-matter interaction used to detect the astrophysical radiation. To address this issue, the Galactic Explorer with a Coded Aperture Mask Compton Telescope (GECCO) features a coded-mask telescope and a Compton telescope. The former allows disentangling sources in crowded regions with its high angular resolution of ~ 1 arcmin, which is complemented by the latter due to its high sensitivity to the diffuse emission. The ability to tell the diffuse and point sources apart allows exploring the acceleration of cosmic-rays, the origin of the so-called Fermi Bubbles, the 511 keV positron annihilation line, sites of explosive element synthesis, and testing for dark matter candidates. Also different classes of jetted galaxies that display a peak of power output in this unexplored energy range are a major target for GECCO to understand how their central supermassive black holes evolve over cosmic time and how they accelerate particles.

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