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## **PANGU: a High Resolution Gamma-Ray Space Telescope**

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We propose a high angular resolution telescope dedicated to the sub-GeV gamma-ray astronomy as a candidate for the CAS-ESA joint small mission. This mission, called PANGU (PAir-productionN Gamma-ray Unit), will open up a unique window of electromagnetic spectrum that has never been explored with great precision. A wide range of topics of both astronomy and fundamental physics can be attacked with a telescope that has an angular resolution about one order of magnitude better than the currently operating Fermi Gamma-ray Space Telescope (Fermi) in the sub-GeV range, covering galactic and extragalactic cosmic-ray physics, extreme physics of a variety of extended (e.g. supernova remnants, galaxies, galaxy clusters) and compact (e.g. black holes, pulsars, gamma-ray bursts) objects, solar and terrestrial gamma-ray phenomena, and searching for Dark Matter (DM) decay and/or annihilation signature etc. The unprecedented resolution can be achieved with a pair-production telescope that, instead of the high-Z converter commonly used, relies on a large number of thin active tracking layers to increase the photon conversion probability, and to precisely reconstruct the pair-produced electron and positron tracks. Scintillating fibers or thin silicon micro-strip detectors are suitable technology for such a tracker. The energy measurement is achieved by measuring the momentum of the electrons and positrons through a magnetic field. The innovated spectrometer approach provides superior photon conversion identification and photon pointing resolution, and is particular suitable in the sub-GeV range, where the opening angle between the electron and positron is relatively large. The level of tracking precision makes it possible to measure the polarization of gamma rays, which would open up a new frontier in gamma-ray astronomy. The sub-GeV full sky survey by PANGU would provide crucial link with GeV to TeV maps from current/future missions including Fermi, DAMPE, HERD, and CTA.

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