

# Discovering Galactic Supernova Remnants

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Supernova Remnants (SNRs) display a wealth of characteristics across the entire electromagnetic spectrum. These multiwavelength observations together with cosmic ray (CR) measurements make SNRs some of the first objects studied with multiple messengers. Answering some of the most compelling questions about Supernova Remnants requires not only multimessenger studies, but also sufficient populations of SNRs displaying each of their characteristics. For instance, to understand SNRs' evolution, we must observe them at all ages and in all the environments in which they evolve, and which they in turn sculpt. The high energy domain is a key component to disentangling these questions. For example, measuring nuclear decay line emission such as from  $\text{Ti44}$  with COSI-SMEX will reveal a new, younger population of Galactic SNRs, as the gamma-ray emission cuts through their typically dusty surroundings. COSI-SMEX's wide field of view 0.2-5 MeV Compton telescope on a satellite platform allows a uniform survey of the entire sky with the required high resolution spectroscopy. By finding and studying sufficient populations of SNRs using analysis techniques that account for remaining bias(es), we will gain insight into how these sources shape and are shaped by the environments and galaxies in which they live and their role in accelerating the most energetic particles in our Galaxy.

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