Future Gamma-Ray Observations of Pulsars and their Environments

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ABSTRACT: Pulsars and pulsar wind nebulae seen at gamma-ray energies offer insight into particle acceleration to very high energies under extreme conditions. Pulsed emission provides information about the geometry and interaction processes in the magnetospheres of these rotating neutron stars, while the pulsar wind nebulae yield information about high-energy particles interacting with their surroundings. During the next decade, a number of new and expanded gamma-ray facilities will become available for pulsar studies, including Astro-rivelatore Gamma a Immagini LEggero (AGILE) and Gamma-ray Large Area Space Telescope (GLAST) in space and a number of higher-energy ground-based systems. This review describes the capabilities of such observatories to answer some of the open questions about the highest-energy processes involving neutron stars.