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## Gamma-ray emission and variability of the Crab Nebula above 100 MeV: theoretically challenging AGILE observations

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AGILE is an Italian Space Agency (ASI) space mission, built and operated in cooperation with INAF, INFN and CIPS, dedicated to the observation of the gamma-ray Universe in the 30 MeV - 50 GeV energy range, with simultaneous X-ray imaging capability.

The AGILE satellite, launched on April 23rd, 2007, is substantially contributing to improve our knowledge on gamma-ray sources.

I will summarize recent AGILE highlights on neutron-star systems and their surroundings, focusing in particular on the ground-breaking discovery of strong and rapid gamma-ray flares from the Crab Nebula over daily timescales.

This discovery challenges emission models of pulsar wind and particle acceleration processes, and it won to the AGILE PI and the AGILE Team the Bruno Rossi Prize for 2012 by the High Energy Astrophysics division of the American Astronomical Society (AAS).

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