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## **Extended TeV Gamma-Ray Halos around Pulsar Geminga and B0656+14**

*Friday, 9 July 2021 06:30 (40 minutes)*

The HAWC gamma-ray observatory has discovered very extended TeV gamma-ray structures around two pulsars Geminga and B0656+14. The gamma-ray emission, with its size of tens of parsecs, is produced from high-energy electrons and positrons around these two nearby middle-aged pulsars. Morphology studies suggest that the diffusion in the vicinity of these two pulsars is 100 times slower than the average in our Galaxy. Nearby cosmic-ray accelerators, especially pulsar wind nebulae, are possible origins of the local multi-GeV positron excess. Pulsar Geminga and B0656+14, less than 300 pc from the Earth, have been postulated as the main sources of the positron excess. This result provides important constraints on the origin of positron excess, but raises questions like why diffusion is so slow near these pulsars. Observations of these TeV halos also provide a unique measurement on the diffusion coefficient in our Galaxy.

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