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Supernova remnants are sources of Galactic cosmic rays, or are they?

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Supernova remnants (SNRs) are widely considered to be the main candidates for sources of Galactic cosmic rays. The main argument for this remains the energy budget provided by SNRs, which is sufficient to explain the cosmic-ray energy density. It is also established that SNRs can effectively accelerate particles at their shocks, which is confirmed by detection of non-thermal X-ray and gamma-ray emission from a number of remnants. There are still, however, quite a few problems with this scenario, which will be extensively discussed in the lecture.

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