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Cosmic Ray PeVatrons: young stars versus dead stars

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The identification of major contributors to the locally observed Cosmic Rays would be a decisive step towards the understanding of the origin of Galactic CRs. The gamma-ray observations have revealed two major classes of CR factories in our Galaxy - Supernova Remnants (SNRs) and the Young Stellar Clusters (YSCs). In the context of the available energetics and the acceleration efficiency, both populations can support the production rate of CRs. The same is true for the speeds of outflows (stellar winds and SNR shocks) of several thousand km/s, which is a critical condition for effective utilization of the diffusive shock acceleration mechanism in the PeVatron regime. We argue that the recent gamma-ray observations give preference to YSCs compared to SNRs as long as it concerns the multi-TeV to PeV domain.

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