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Stellar Clusters as Pevatron Candidates

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Massive stars blow powerful winds and eventually explode as supernovae. By doing so, they inject energy and momentum in the circumstellar medium, which is pushed away from the star and piles up to form a dense and expanding shell of gas. The effect is larger when many massive stars are grouped together in bound clusters or associations. Large cavities form around clusters as a result of the stellar feedback on the ambient medium. They are called superbubbles and are characterised by the presence of turbulent and supersonic gas motions. This makes star clusters ideal environments for particle acceleration, and potential contributors to the observed Galactic cosmic ray intensity.

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