

The Theory of Efficient Particle Acceleration at Shocks

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The recent discoveries in the theory of diffusive shock acceleration (DSA) that originate from first-principle kinetic plasma simulations are discussed. We show that, when ion acceleration is efficient, the back-reaction of non-thermal particles and self-generated magnetic fields becomes prominent and leads to both enhanced shock compression and particle spectra significantly softer than the standard test-particle DSA theory. These results are discussed in the context of the non-thermal phenomenology of astrophysical shocks, with a special focus on the supernova remnant SN1006.

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Particle acceleration, supernova remnants, diffusive shock acceleration

Collaboration

other Collaboration

Subcategory

Theoretical Results

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