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Relativistic reconnection as source of high-energy particles

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Astrophysical magnetic fields may store significant amounts of energy. The process of magnetic reconnection can release this energy fairly rapidly and transfer it directly to particles. In the relativistic regime, when magnetic energy density dominates the rest-mass plasma density, most of participating particles can achieve relativistic energies. Relativistic reconnection is a complex process involving large separation of scales, very strong electric fields, dynamic interactions of magnetic flux tubes. Rapid progress in understanding relativistic reconnection is being made by means of numerical simulations (with kinetic or fluid plasmas), and even in laboratory experiments. Relativistic reconnection is also an important ingredient in the landscape of relativistic magnetized turbulence.

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