

Abstract Submitted
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Shock acceleration and magnetic field amplification. TONY BELL, Imperial College, London, UK — Recent developments, both theoretical and observational, indicate that high energy particles accelerated by a shock interact with the background plasma to amplify the magnetic field by an order of magnitude or more above its value far upstream. This new feature of shock acceleration resolves the long-standing difficulty that the galactic cosmic ray spectrum continues as an unbroken power law up to 10^{15} eV. It has been used to explain the narrow x-ray features seen at the outer shocks of supernova remnants. Magnetic field amplification is strongest for high velocity shocks propagating into relatively dense plasmas. This turns attention towards very young supernova remnants, gamma-ray bursts, jets and accretion systems. We consider scenarios for cosmic ray acceleration above 10^{15} eV within the galaxy and the possibility that cosmic rays might be important for the dynamics of relativistic jets.

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