APR20-2020-001430

Abstract for an Invited Paper
for the APR20 Meeting of
the American Physical Society

Progress in Simulating Particle Acceleration: Different Flavors of Fermi Mechanism

DAMIANO CAPRIOLI, University of Chicago

More than 70 years after Enrico Fermi's seminal paper *On the Origin of the Cosmic Radiation*, Fermi acceleration is still one, if not the most, prominent mechanism for producing non-thermal particles. I outline how the latest observations compare with the modern theory of cosmic ray acceleration, assessing the crucial role of kinetic plasma simulations in validating and furthering classical and newly-proposed models. In particular, I discuss the two flavors of Fermi mechanisms potentially responsible for the energization of both Galactic and extragalactic cosmic rays, namely diffusive shock acceleration in supernova remnants and *espresso* acceleration in the relativistic jets of active galactic nuclei.