



Contribution ID: 120

Type: **Contributed talk in mini symposium**

Arguments in Favor of Cluster Accretion Shocks as the Source of Ultra-High-Energy Cosmic Rays

Friday, 15 December 2023 10:06 (12 minutes)

The origin of ultra-high-energy cosmic rays remains unknown owing to the lack of definitive observational evidence and the lack of a source class without major theoretical objections. The primary challenge for cluster accretion shocks—formed by accretion of gas beyond the virial radius of galaxy clusters—is the purported lack of sufficient magnetic field strength to scatter cosmic rays at the highest energies. However, we argue that the many advantages of our revised cluster-shock model, including the abundance and power of the shocks, the lowest ambient photon background of any source, the growing cosmic ray luminosity with time, and an explanation for the transition from a light to heavy composition, warrant further investigation for this source class. We speculate on ways the upstream cosmic rays may incite magnetic fields of sufficient strength, and we highlight the observational tests of this model.

Primary author: Dr SIMEON, Paul (Stanford University)

Co-authors: Dr GLOBUS, Noémie (University of California, Santa Cruz); Prof. BARROW, Kirk (University of Illinois at Urbana-Champaign); Prof. BLANDFORD, Roger (Stanford University, KIPAC)

Presenter: Dr SIMEON, Paul (Stanford University)

Session Classification: Astroparticle