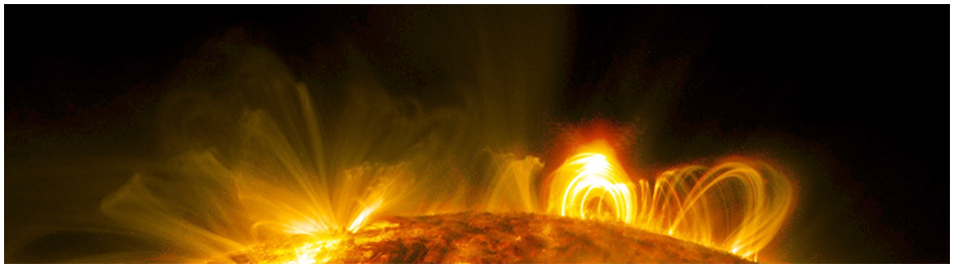

Contribution ID: **31** Type: **Invited talk**

Reconnection-Driven Particle Acceleration in High-Energy Astrophysics

Tuesday, 16 November 2021 12:00 (30 minutes)

Nonthermal particle acceleration (NTPA), including to ultra-relativistic energies, plays an extremely important role in astrophysics. Some of its most spectacular manifestations come from high-energy astrophysics, where we routinely observe very bright and often rapidly-varying flaring emission with broadband power-law spectra from a rich variety of objects, including the exotic environments around accreting black holes and neutron stars. Magnetic reconnection has been increasingly often invoked in recent years as the most viable mechanism for driving NTPA in many high-energy astrophysical contexts, powering the most violent, most extreme events, especially in relativistic plasmas. In this talk I will review some of the most remarkable examples of nonthermal high-energy astrophysical flares and will explain why magnetic reconnection presents the most natural explanation for them. I will also describe the recent theoretical and numerical progress in our understanding of reconnection-driven relativistic NTPA, highlighting the key differences and similarities with solar-flare reconnection. I will also outline the most important and promising directions for future research.

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Session Classification: Day 2 / Session 3