

Space Science Seminar
Tuesday, 2021 April 13
10:30 a.m.
NASA/MSFC TEAMS

Reconnection Outflows as Laboratories to Understand Turbulence and Particle Acceleration

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Host: Dr. Alphonse Sterling (Sponsored by NASA/MSFC/ST13) / Dr. Haihong Che (UAH/CSPAR)

Reconnection has one main effect: it generates high speed flows. High speed flows the tell-tale signatures of reconnection is space. High speed flows are generated in many astrophysical systems: coronal jets, bursty bulk flows in the magnetosphere, astrophysical jets. In these systems, we observe a flow starting very strong and seemingly relatively laminar at its outset and then evolve in collimated jets that eventually by interaction with the environment or by their own internal instabilities becomes turbulent and expand. Vast amounts of the energy in the flow and in the magnetic field embossed with it is converted to particle kinetic energy. We consider the conditions observed in the solar wind and in the magnetosphere for reconnection generated turbulent flows. We study the characteristics of turbulence within the flow and we determine how energy is converted. The results presented will cover especially the recent published results:

Lapenta, G. (2021). Detecting reconnection sites using the Lorentz Transformations for electromagnetic fields. *arXiv preprint arXiv:2103.02538*.