

**Space Science Seminar**  
**FRIDAY, 2017 September 29**  
**10:30 a.m.**  
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**Flux Cancellation: The Key to Solar Eruptions**

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Host: Dr. Alphonse Sterling (Sponsored by ST13)

Solar coronal jets are magnetically channeled eruptions that occur in all types of solar environments (e.g. active regions, quiet-Sun regions and coronal holes). Recent studies show that coronal jets are driven by the eruption of small-scale filaments (minifilaments). Once the eruption is underway magnetic reconnection evidently makes the jet spire and the bright emission in the jet base. However, the triggering mechanism of these eruptions and the formation mechanism of the pre-jet minifilaments are still open questions. In this talk, mainly using SDO/AIA and SDO/HMI data, first I will address the question: what triggers the jet-driving minifilament eruptions in different solar environments (coronal holes, quiet regions, active regions)? Then I will talk about the magnetic field evolution that produces the pre-jet minifilaments. By examining pre-jet evolutionary changes in line-of-sight HMI magnetograms while examining concurrent EUV images of coronal and transition-region emission, we find clear evidence that flux cancellation is the main process that builds pre-jet minifilaments, and is also the main process that triggers the eruptions. I will also present results from our ongoing work indicating that jet-driving minifilament eruptions are analogous to larger-scale filament eruptions that make flares and CMEs. We find that persistent flux cancellation at the neutral line of large-scale filaments often triggers their eruptions. From our observations, we infer that flux cancellation is the fundamental process for the buildup and triggering of solar eruptions of all sizes.

<https://solarscience.msfc.nasa.gov/colloquia/>

