Project Details

ROSES ID: NNH10ZDA001N
Selection Year: 2011
Program Element: Focused Science Topic

**Topic:** Jets in the Solar Atmosphere and their Effects in the Heliosphere

**Project Title:**
Investigation of the Production and Evolution of Chromospheric, EUV, and X-Ray Jets using Observations from Hinode, STEREO, and SDO

**PI Name:** Alphonse Sterling  
**PI Email:** asterling@solar.stanford.edu  
**Affiliation:** NASA/MSFC/NSSTC  
**Project Member(s):**  
- Moore, Ronald Lee; Co-I; MSFC/NSSTC

**Summary:**  
We propose a four-year program in response to the Living With a Star (LWS) Targeted Research and Technology (TR&T) solicitation, a Targeted Investigation under Focused Science Topic 1.2.1.(c): "Jets in the Solar Atmosphere and their Effects in the Heliosphere." We will study solar jets, using data primarily from the Hinode, SDO, and STEREO satellites. The solar jets include chromospheric spicules, especially type II spicules; EUV (transition region) jets; and X-ray (coronal) jets. We will use data from all three Hinode instruments: SOT, EIS, and XRT; from AIA and HMI on SDO, from SECCHI on STEREO; and we will also use data from other sources, such as SOHO/LASCO. Our study will focus on four main study topics: (1) the origin and evolution of spicules on and just inside the limb, using SOT/Ca ii data and image processing techniques; (2) the location of polar spicules (and other jets when possible) relative to the magnetic network, using mainly SOT/Ca ii data with SOT spectropolarimeter (SP) and HMI vector magnetograms; (3) the connection between jets and features at chromospheric, EUV, and soft X-ray (SXR) wavelengths; and (4) the detailed nature of the X-ray jet mechanism and the implications for the same mechanism occurring on the size scale of chromospheric spicules, and also the connection between X-ray jets (and other jets) and coronal outflows into the heliosphere visible in coronagraph images. Most of our projects can be completed with already-identified or readily-available data sets. New observations from Hinode may be requested but are not required for the success of the project. Both the P.I. and Co-I have extensive experience with the type of data sets to be used, and a worker at the postdoc level will be supported.
This work will address the Targeted Investigation objectives by increasing our understanding of jet origins, development, manifestations in different wavelength regimes, and connections to the coronal outflows at the base of the heliosphere. This work is relevant to NASA in that it will result in scientific output from several NASA-related satellites, and in that--in studying solar jets--this work will yield new insights into a likely major source of the solar wind, which is an important component of "space weather."

Publication References:

Summary: no summary


Summary: no summary


Summary: no summary


Summary: no summary


Summary: no summary
