Report for Thomas Metcalf Travel Award — Ying Li

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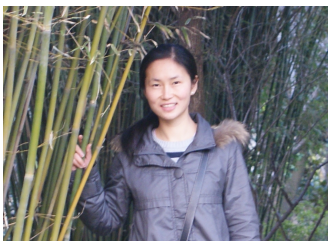
Ying Li earned her PhD in Astronomy from Nanjing University in China in June 2013. She is currently working at Montana State University as a post doctoral researcher with Dr. Jiong Qiu. Her research is on magnetic reconnection, heating, and dynamics in solar flares.



Contributed talk: Direct imaging of a classical solar eruptive flare

Solar flares are one of the most energetic events in the solar atmosphere. It is widely accepted that flares are powered by magnetic reconnection in the corona. An eruptive flare is usually accompanied by a coronal mass ejection, both of which comprise an eruption process that is likely driven by a magnetic flux rope (MFR). Here we report an eruptive flare on 2016 March 23 observed by the Solar Dynamics Observatory. The extreme-ultraviolet imaging observations exhibit clear rise and eruption of an MFR. The magnetic field structure in the corona extrapolated from a nonlinear force-free model confirms existence of the MFR. The observations also show solid evidence for magnetic reconnection from both the corona and chromosphere in different phases of the flare. We find that weak reconnection starts before the flare onset, which is accompanied by the slow rise of the MFR. The reconnection becomes much stronger in the rise phase of the flare and temporally correlates with the MFR eruption. In addition, the magnetic reconnection is more 3D-type in the early phase, as manifested in strong-to-weak shear variation in flare loops, and becomes more 2D-like in the later phase, as shown by apparent rising motion of flare loops.