MAS20-2020-000013

Abstract for an Invited Paper
for the MAS20 Meeting of
the American Physical Society

Understanding and Predicting Solar Eruptions with High Resolution Observations and Machine Learning[1]

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In this talk, I first review recent fundamental discoveries in the subject of solar flares, using high resolution observations from the 1.6 m Goode Solar Telescope at Big Bear Solar Observatory. (1) Flare ribbon fronts, as well as pre- and post-flare loops are in the scale of about 100 km, which are much smaller than previously thought. (2) In some special wavelengths, flare front may appear as narrow dark bands instead of normal brightening. (3) Eruption in low density higher atmosphere can cause back reaction in dense photosphere. I will then introduce the work of machine learning to process the above data, and carry out near real time forecasting of solar eruptions.

[1]NSF and NASA