

Predicting Solar Flares – A New Preflare Signal



Scientists investigated whether the sun's outer atmosphere shows warning signs hours before a solar flare erupts.

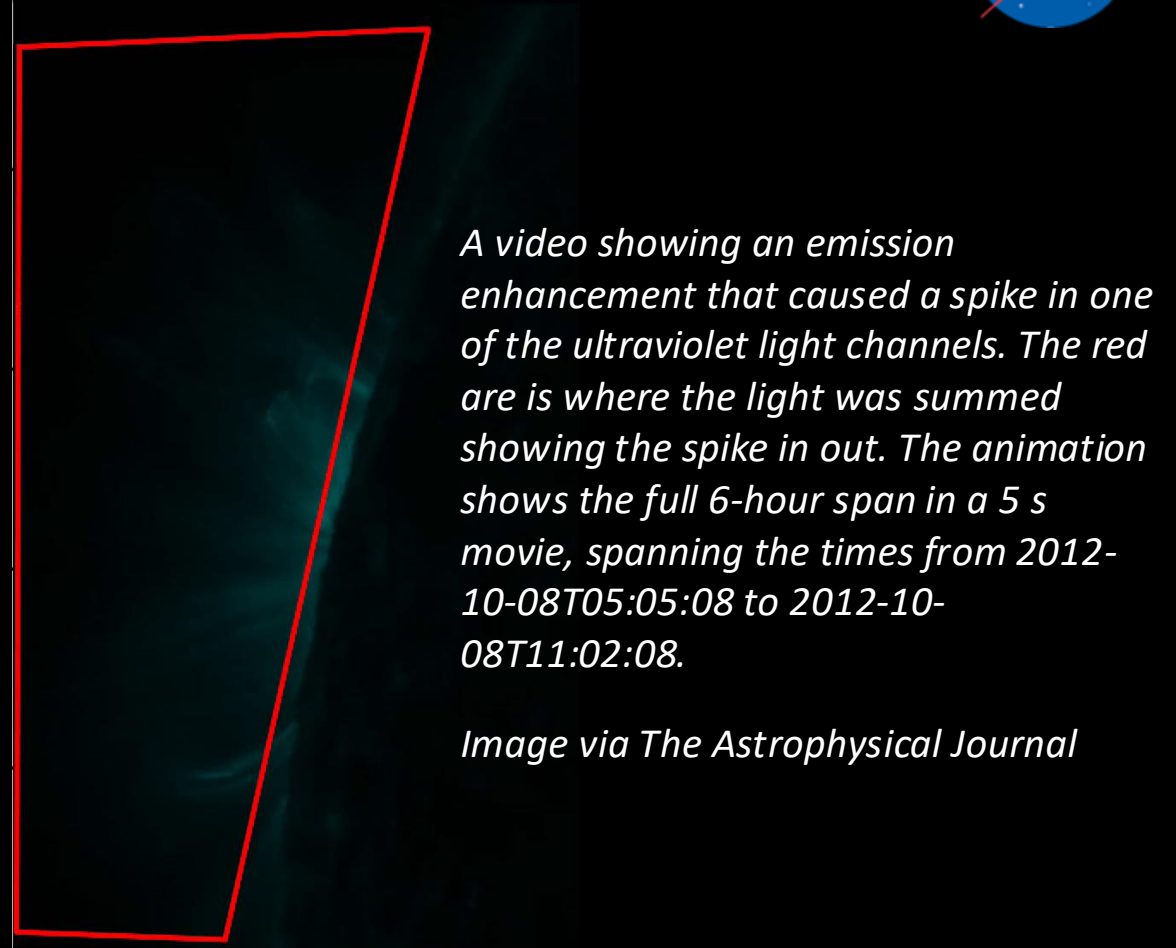
They studied ultraviolet light emissions from 50+ solar flares, comparing measurements from four different wavelengths over the 6 hours before each flare.

They discovered significantly increased emission variability 2-3 hours before flare onset (more than twice as variable as non-flaring regions).

This pattern appeared in 60-80% of flares studied, suggesting it could be a reliable predictor.

This discovery could provide a 2–6-hour early warning system for solar flares, giving space craft operators and space flight mission managers critical time to protect vulnerable infrastructure on Earth and humans in space.

Understanding these pre-flare signals could improve our fundamental knowledge of solar physics and the processes that trigger these energetic events.



A video showing an emission enhancement that caused a spike in one of the ultraviolet light channels. The red area is where the light was summed showing the spike in out. The animation shows the full 6-hour span in a 5 s movie, spanning the times from 2012-10-08T05:05:08 to 2012-10-08T11:02:08.

Image via The Astrophysical Journal

Predicting solar flares is one of the most difficult challenges in space weather forecasting. These results may prove to be a huge advancement in addressing the problem and ultimately protecting our technological society from our star.