

Explosive Phenomena in the Solar Atmosphere

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Solar flares are among the most powerful explosions in the solar system. The temperature of flaring plasma reaches tens of millions of degrees Kelvin, and flares cause strong variations in the EUV and X-ray output of the [Sun](#). We are fortunate to live in an age of powerful observing instruments that have allowed us to elucidate many of the properties of solar flares, but there remains much to learn about their underlying physics. I will present some of what is known about flares from an observational perspective and then I will discuss the challenges associated with numerical modeling. These challenges must be overcome because modeling studies provide crucial insights into the observational data. To conclude my talk, I will describe some of our recent progress in this area, including our major finding that the observed motions of hard X-ray emission cannot be consistent with a thermal driver for the flare (e.g. heating localized in the corona) and must be due to the deposition of non-thermal energy (e.g. from an electron beam) in the chromosphere.