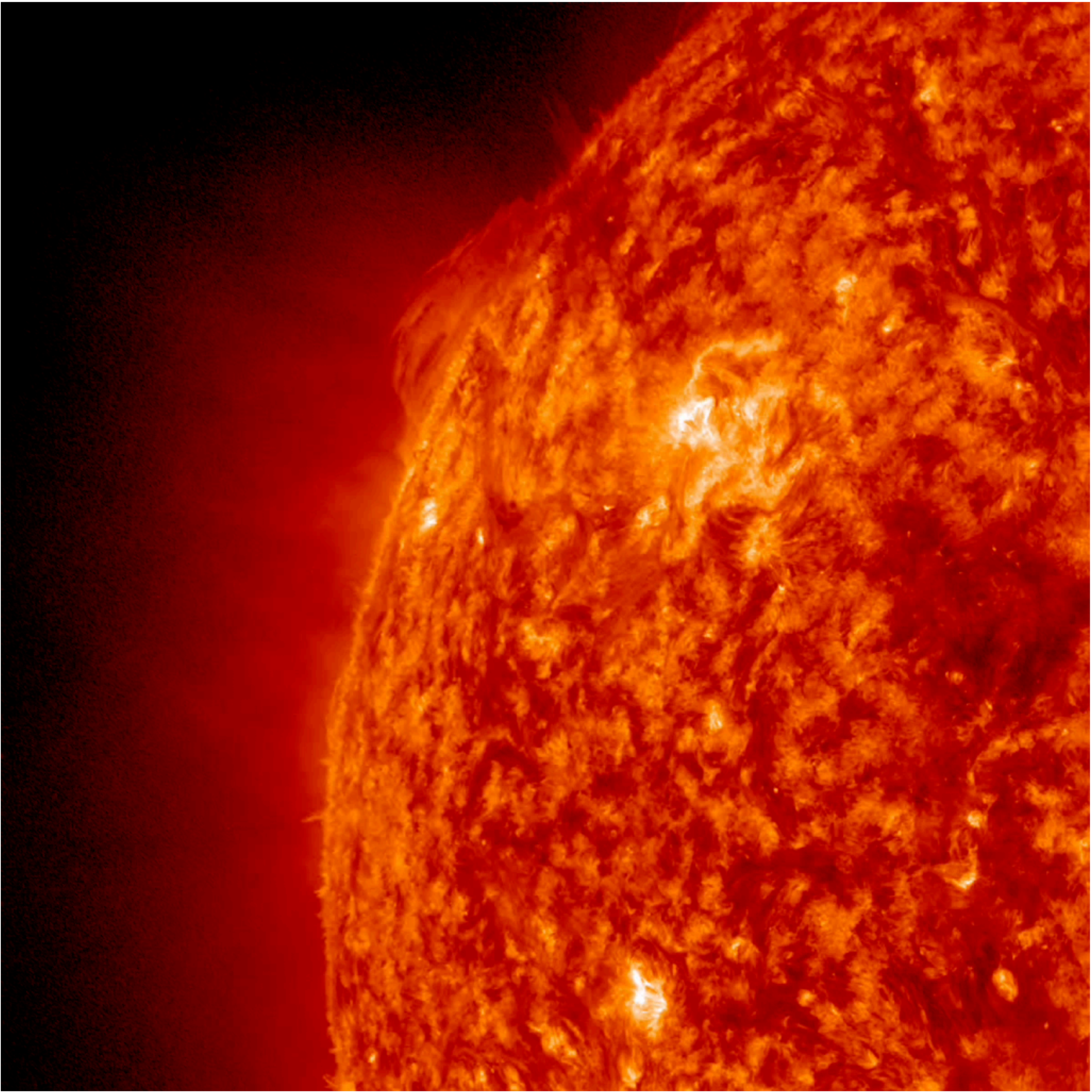

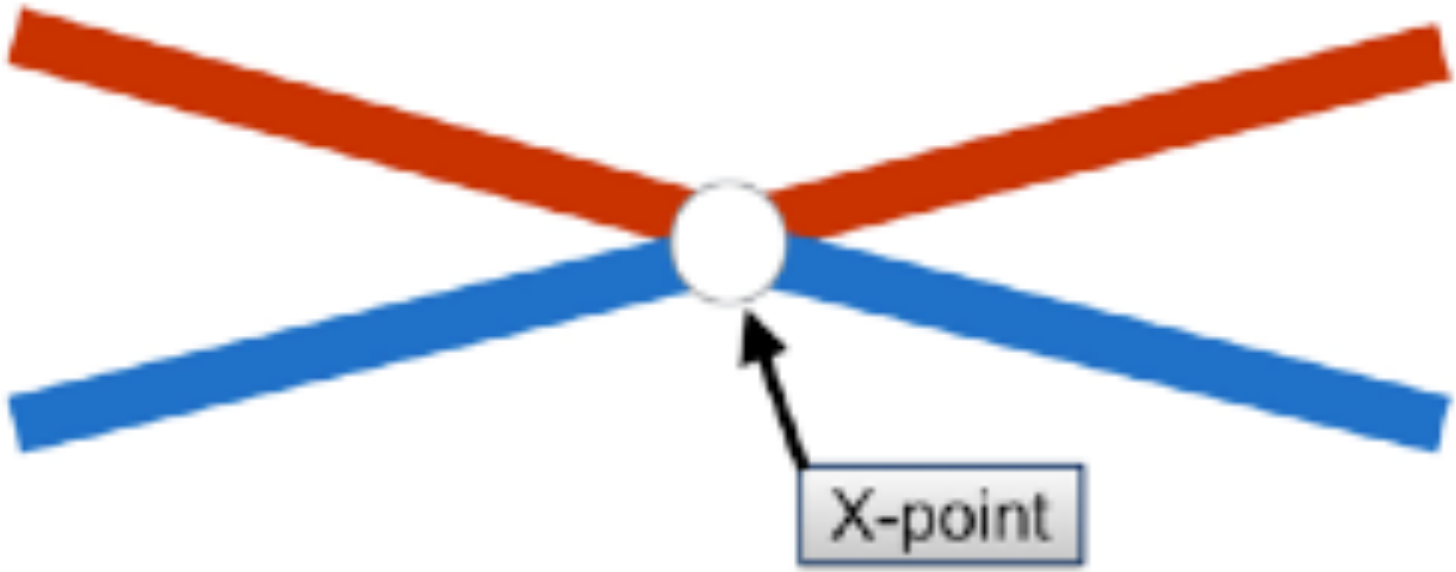
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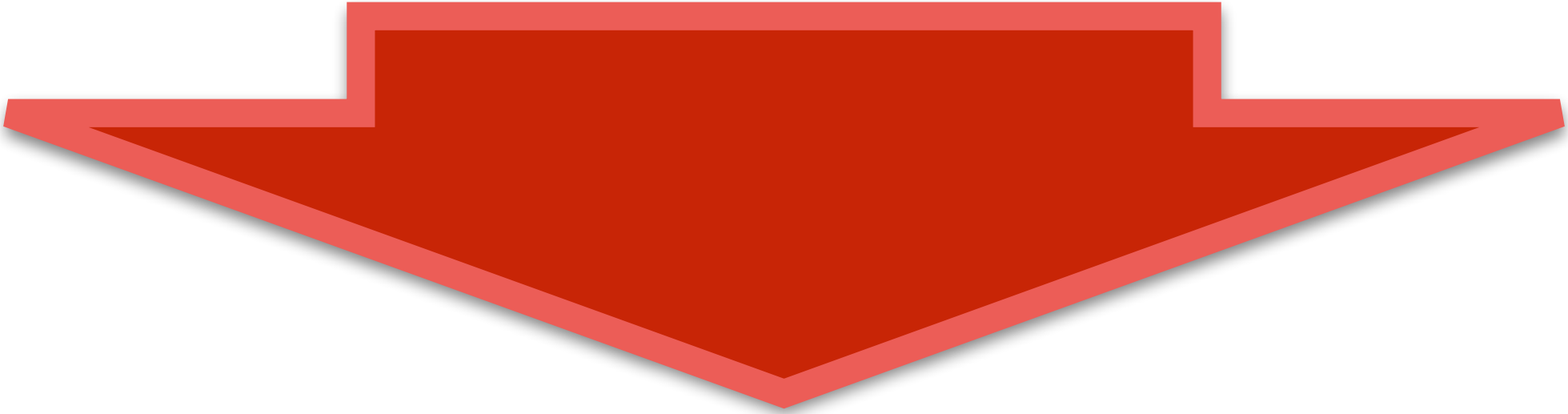
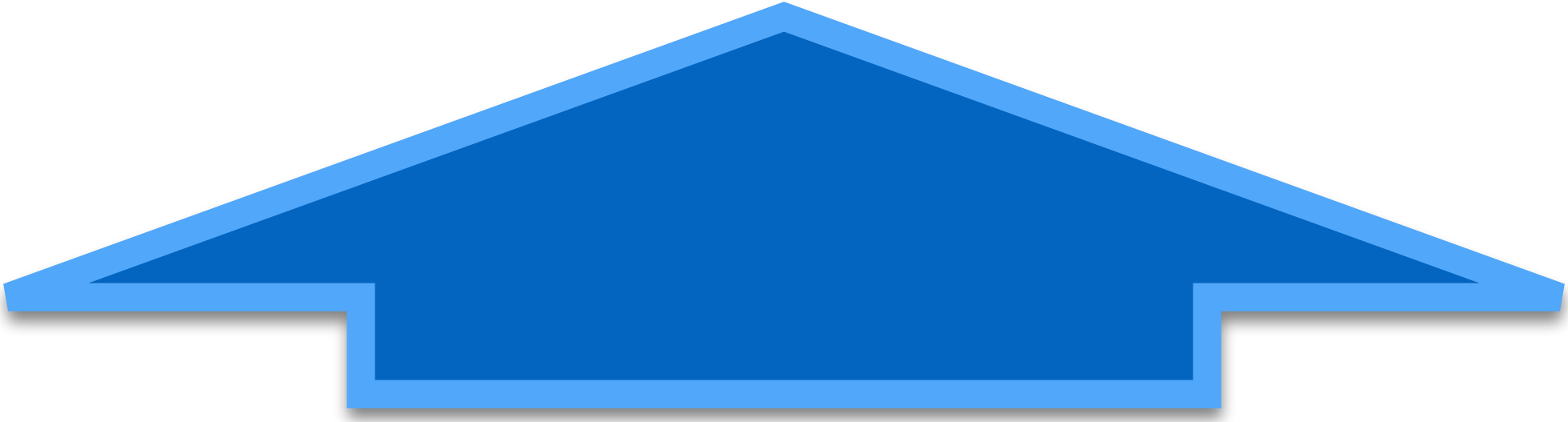
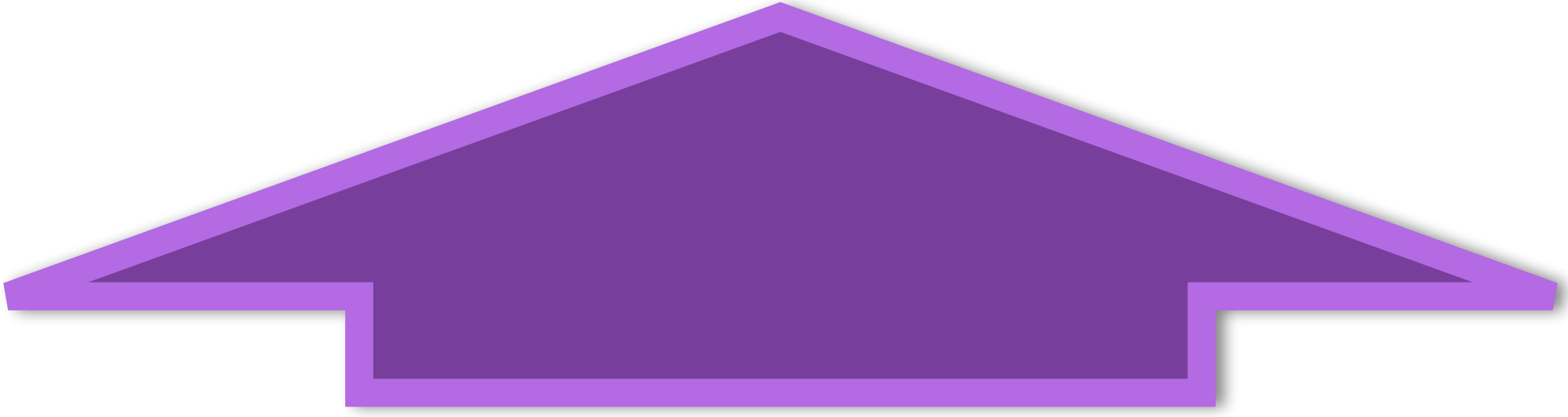
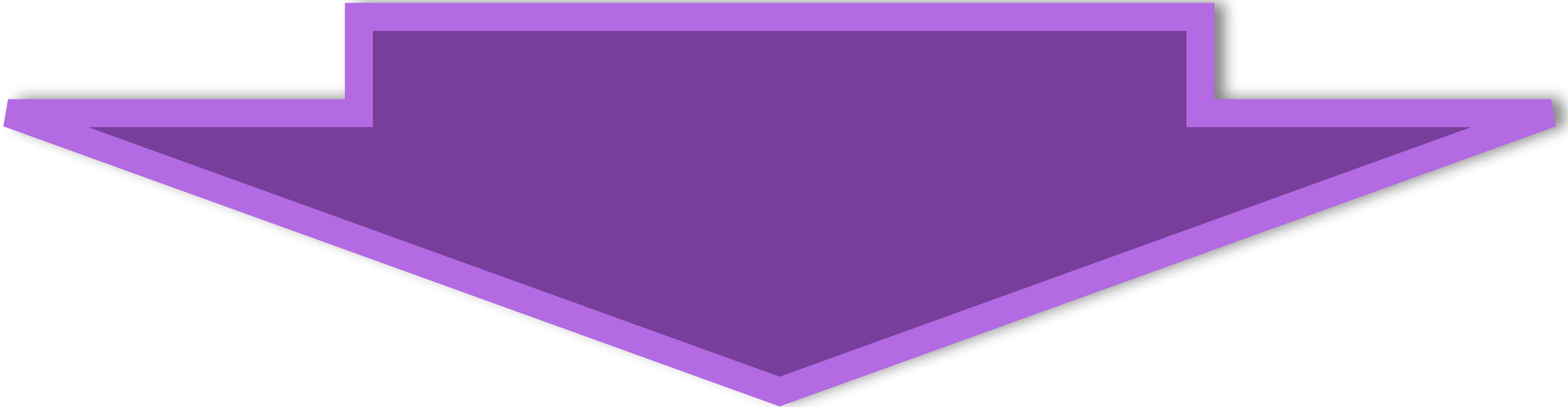
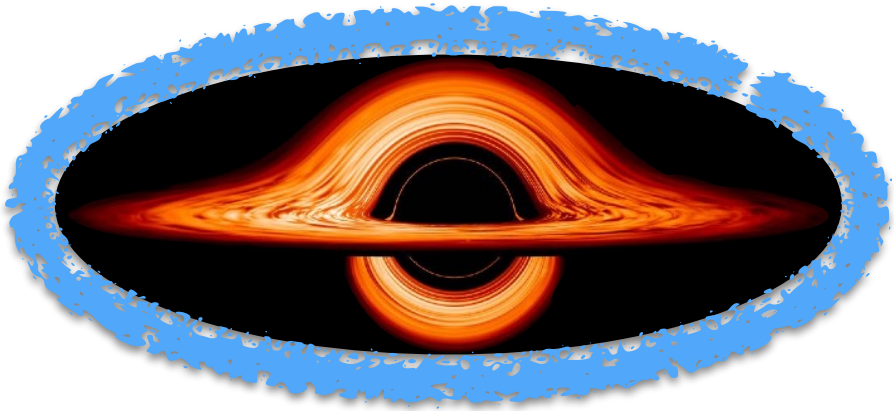


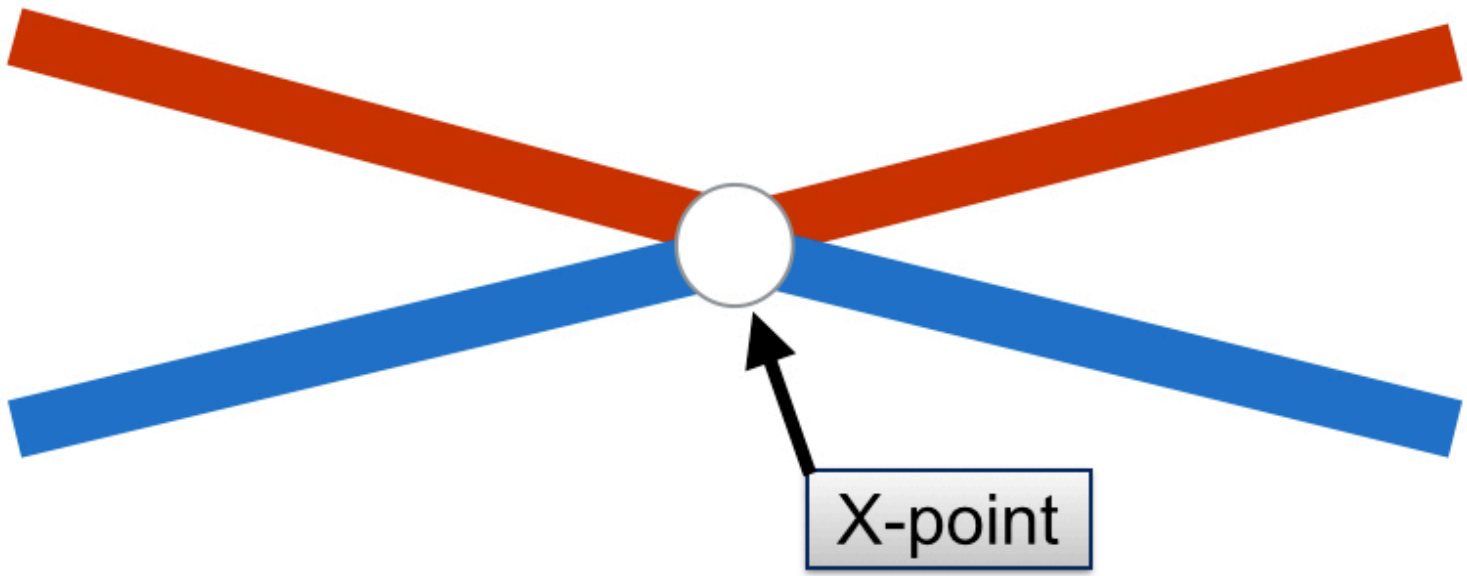






Black hole coronae

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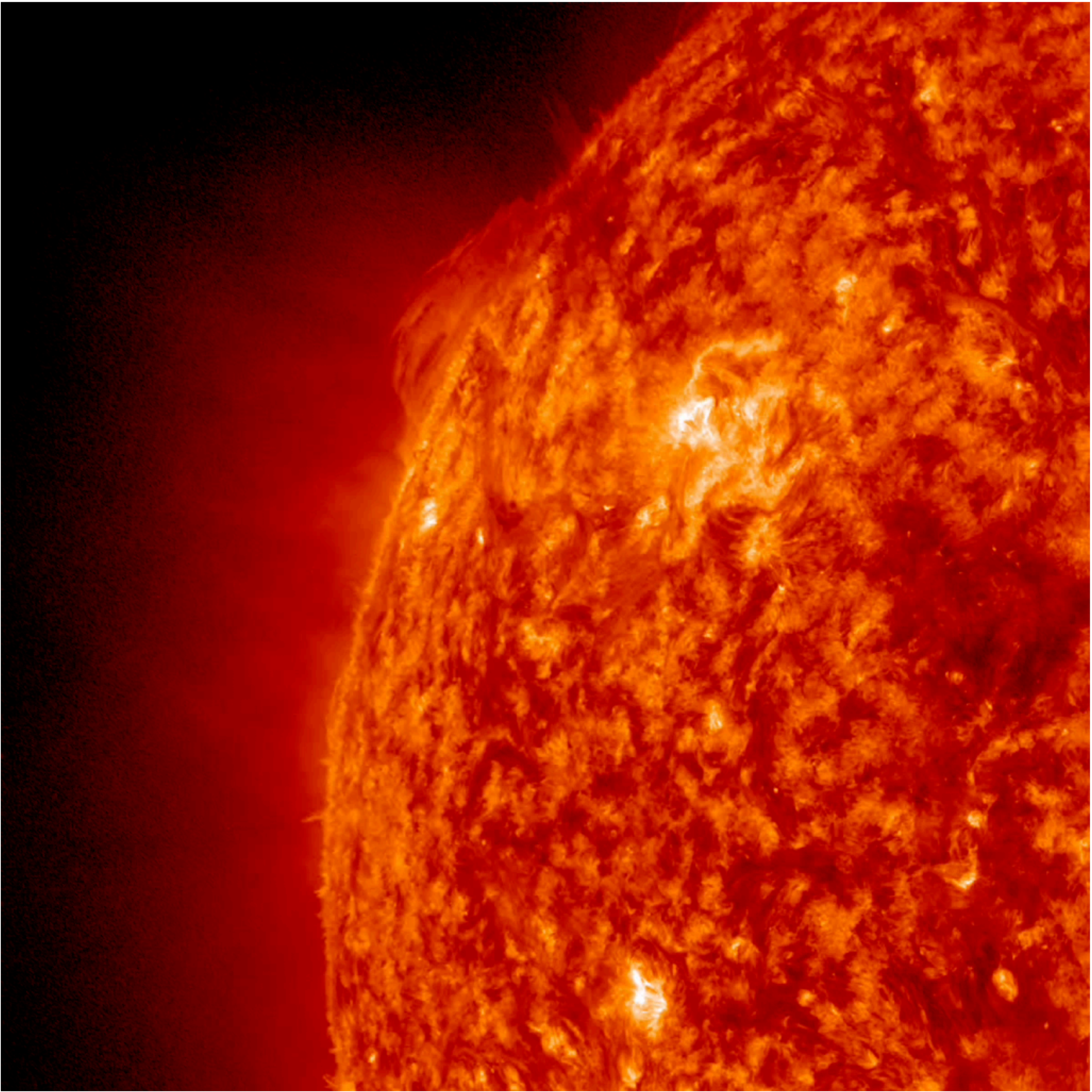
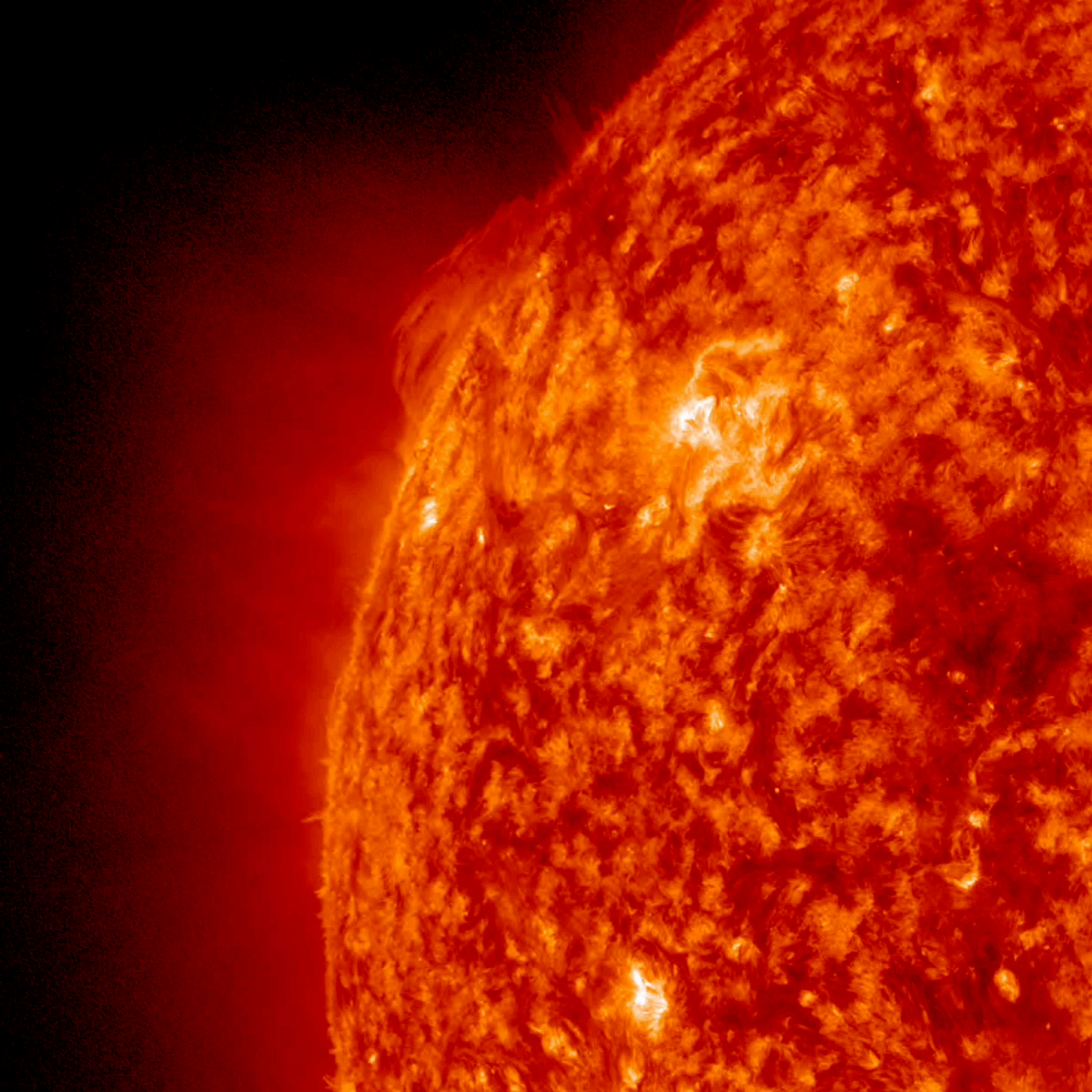




Reconnection can energize particles

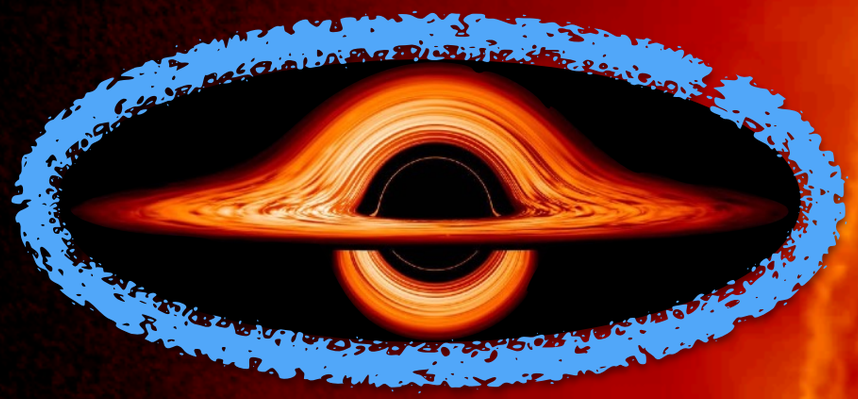
- Rearrangement of magnetic field lines
- Magnetic energy → particle kinetic energy

Happens many places:

Chromosphere

Magnetosphere

Black hole coronae



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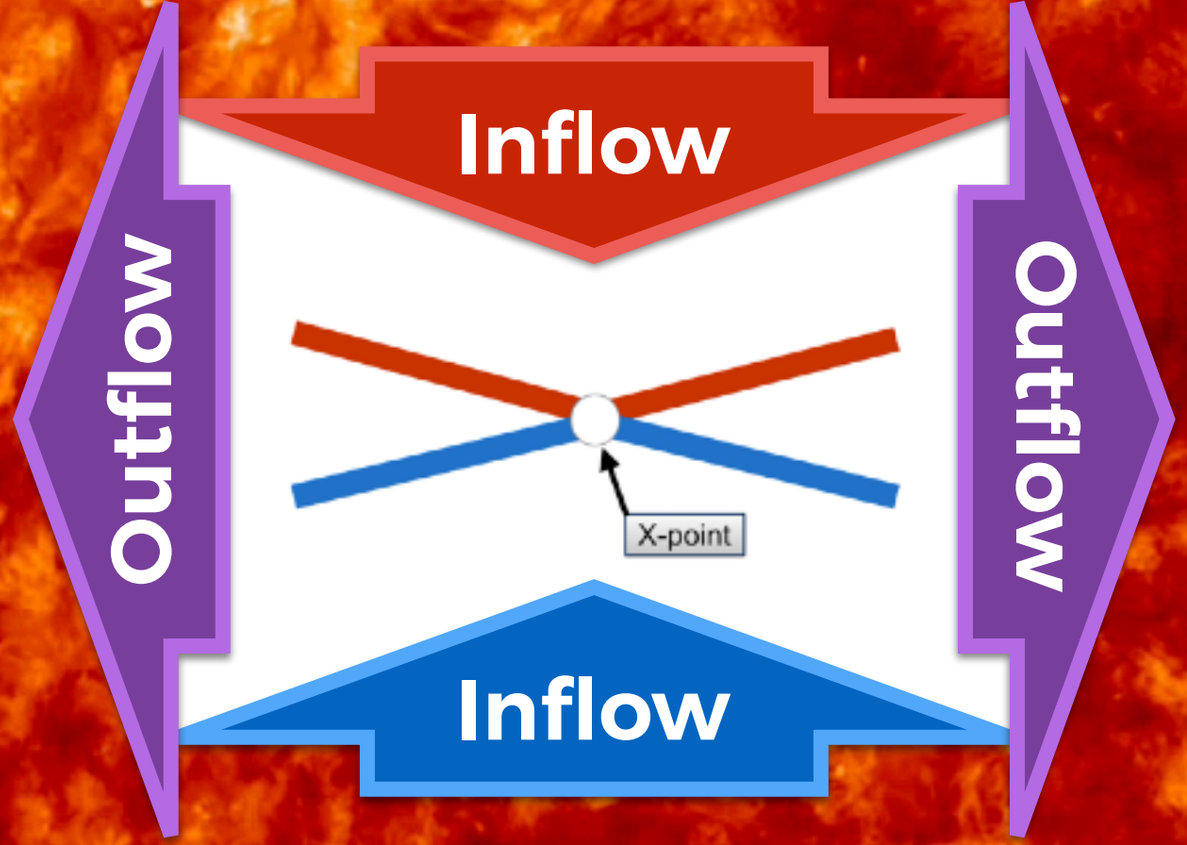

NASA SDO

Parameters: physical and computational

beta (of the ions)

$$\beta_i = \frac{n_i k_B T_i}{B^2/(8\pi)} = \frac{\text{thermal pressure}}{\text{magnetic pressure}}$$

sigma (of the ions)

$$\sigma_i = \frac{B^2/(4\pi)}{n_i m_i c^2} = \frac{\text{magnetic pressure}\,(\times 2)}{\text{rest-mass energy density}}$$

temperature ratio

$$\frac{T_e}{T_i} = \frac{\text{electron temperature}}{\text{ion temperature}}$$

Computational

d_{stripe}

dv_{stripe}

n_{stripe}

m_y

n_{times}

m_i/m_e

ppc

c/ω_{pe}