

How a Solar Storm Works

During a coronal mass ejection, the sun violently blasts high-energy particles traveling several million miles an hour into space. When these particles sweep into Earth's magnetosphere a day or so later, they set off a geomagnetic storm.

1 High-energy protons and electrons pass through spacecraft such as the International Space Station, damaging electronics and degrading solar arrays.

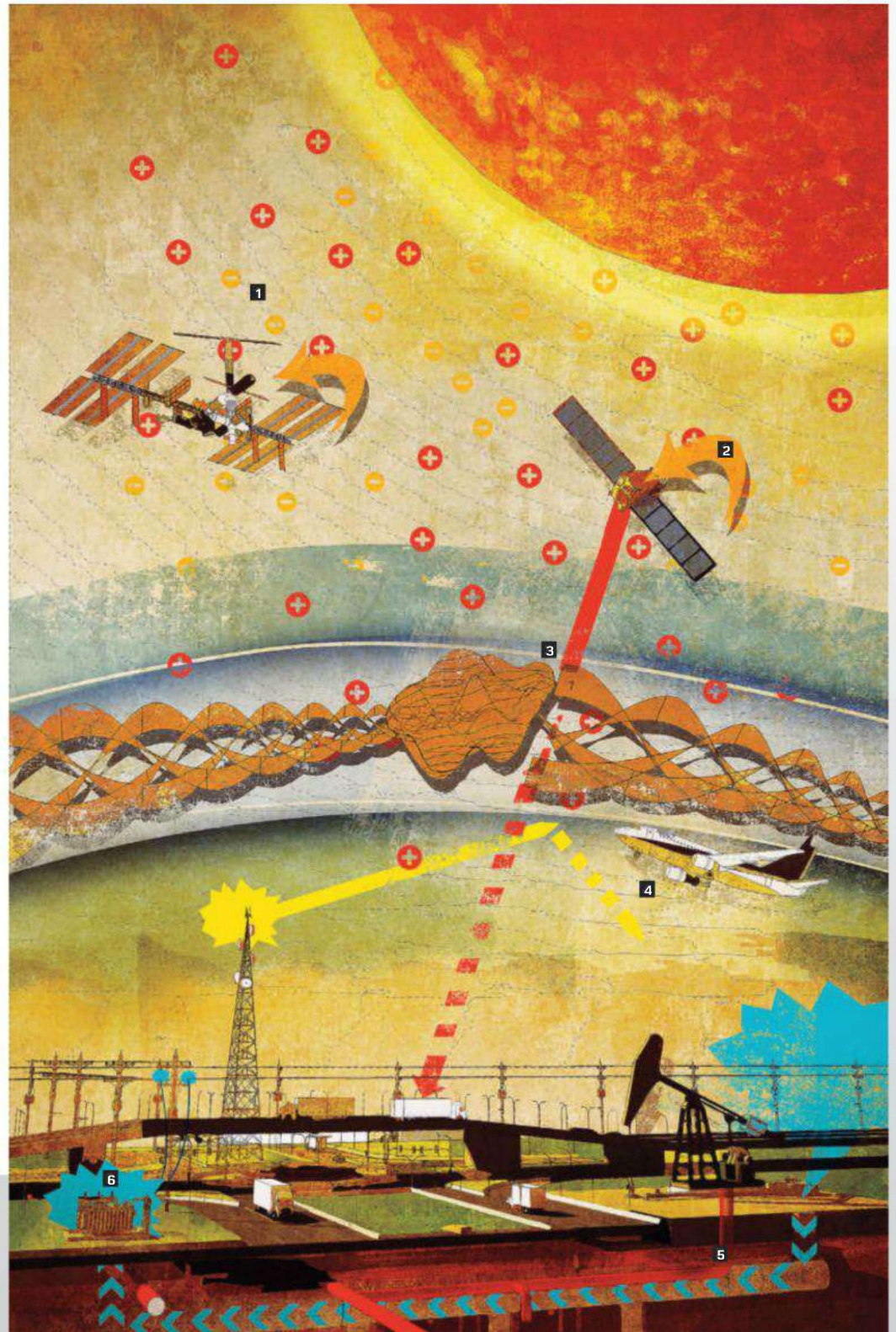
2 They also heat and expand the upper atmosphere, which increases **drag on satellites**, reducing their lifetimes in orbit.

3 Earth's ionosphere becomes distorted with radiation, and plasma bubbles form. **GPS signals scintillate, or break up**, as they pass through this region, disrupting the triangulation of points necessary for precise navigation.

4 Ionized particles also affect the propagation of radio waves. Airplanes flying above 85 degrees latitude rely exclusively on high-frequency radio communications, and so may be rerouted.

5 Vibrations in Earth's magnetic field induce strong electric currents in the ground. These follow the path of least resistance **into oil and gas pipelines, causing corrosion.**

6 They also flow **into power-grid infrastructure** such as transformers, which can blow out from the sudden burst of unregulated current.



NOT TO SCALE