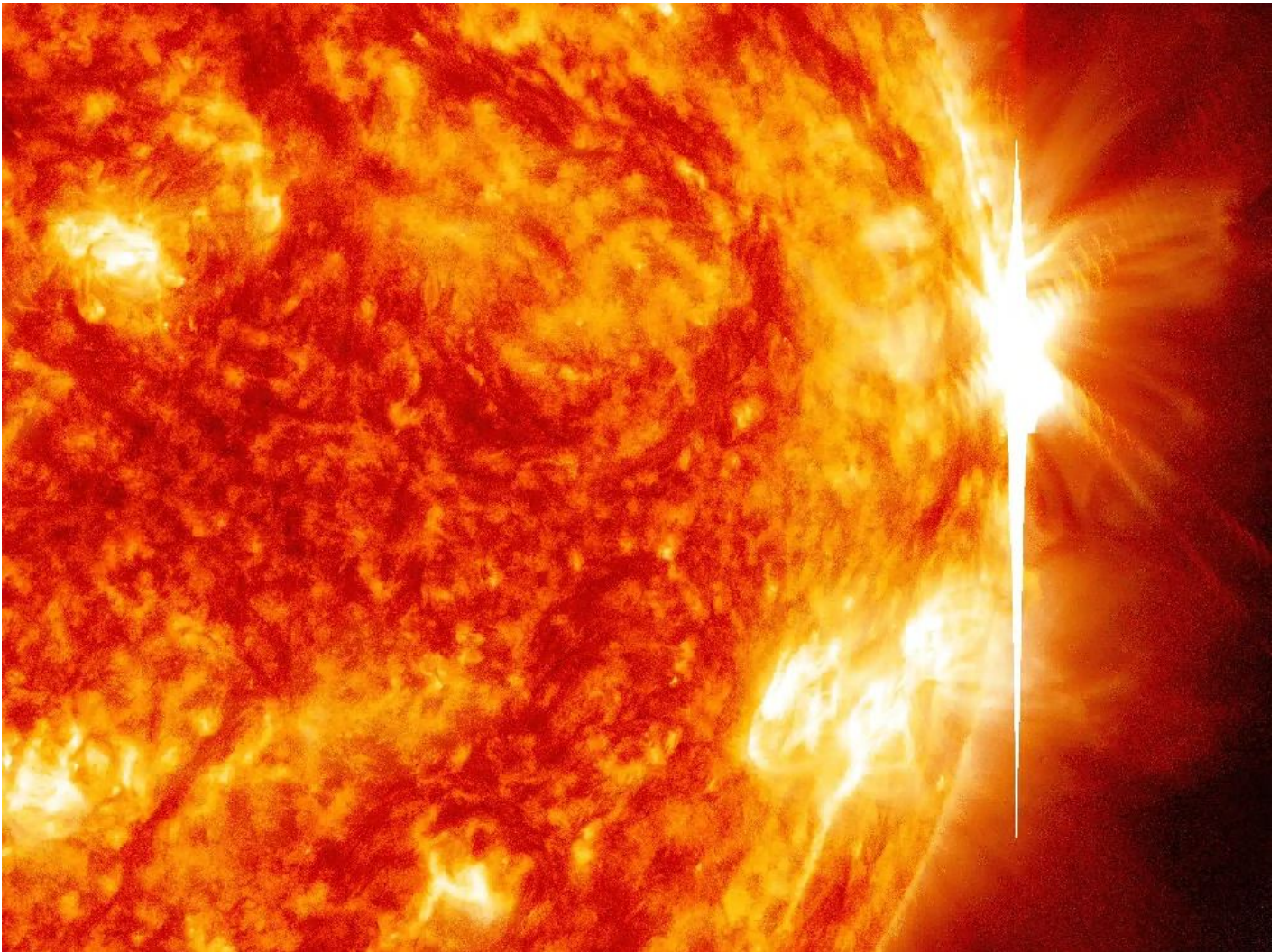


What are X-Class Solar Flares?

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What are Solar Flares?

- [Solar flares](#) are large explosions that occur at the sun's surface when twisted magnetic-field lines suddenly snap, emitting large bursts of electromagnetic radiation.
- Flares are our solar system's largest explosive events.
- They are seen as bright areas on the sun, and they can last from minutes to hours.
- In a matter of just a few minutes, they heat the material to many millions of degrees and produce a burst of radiation across the [electromagnetic spectrum](#), including from radio waves to x-rays and gamma rays.
- Although solar flares can be visible in white light, they are often more readily noticed via their bright X-ray and ultraviolet emissions.
- Effect of Solar Flare on Earth:

- The intense radiation emitted during a solar flare can affect satellite communications, disrupt radio signals, and even pose a risk to astronauts in space.
- Additionally, the increased solar radiation can lead to geomagnetic storms, which may impact power grids and cause auroras (northern and southern lights) at lower latitudes.

About X-Class Solar Flares

- Flares are classified according to their strength. The smallest ones are B-class, followed by C, M, and X, the largest.
 - Similar to the Richter scale for earthquakes, each letter represents a ten-fold increase in energy output.
 - So, an X is 10 times an M and 100 times a C.
 - Within each letter class, there is a finer scale from 1 to 9.
 - C-class flares are too weak to noticeably affect Earth. M-class flares can cause brief radio blackouts at the poles and minor radiation storms that might endanger astronauts.
 - The biggest X-class flares are by far the largest explosions in our solar system.
 - X-class flares are most common during solar maximum.
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Q1) What are geomagnetic storms?

A geomagnetic storm is a major disturbance of Earth's magnetosphere. These storms result from variations in the solar wind that produces significant changes in the currents, plasmas, and fields in Earth's magnetosphere. The solar wind conditions that are effective for creating geomagnetic storms are sustained (for several hours) periods of the high-speed solar wind and a southward-directed solar wind magnetic field (opposite the direction of Earth's field) at the dayside of the magnetosphere. The largest such storms are associated with solar coronal mass ejections (CMEs), where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrives at Earth.

Source: [Powerful X-class solar flare slams Earth, triggering radio blackout over the Pacific Ocean](#)

Source: <https://vajiramandravi.com/current-affairs/x-class-solar-flares/>

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