Sun can cause Internet Apocalypse

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According to a new study, **powerful solar storm** can cause a **disruption of the internet**, damage submarine cables and communication satellites.

- There is a 1.6 to 2% chance of an **extreme space weather event** happening within the next decade.
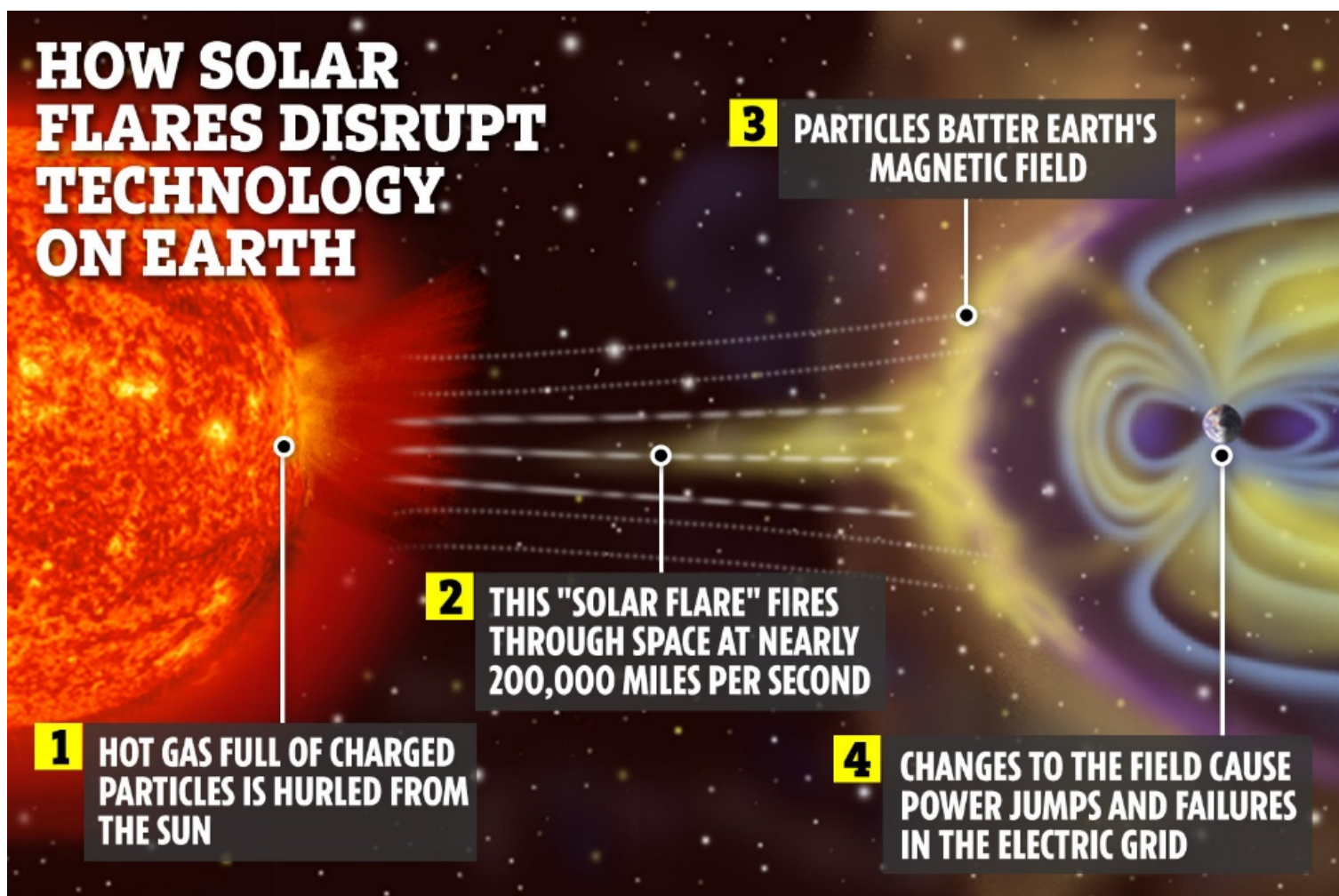
[Ref: Alarmy]

What is a solar storm?

- Solar storm or Coronal Mass Ejection is an ejection of **highly magnetised particles** from the sun.
- These particles can travel **several million km per hour** and can take about **13 hours to five days** to reach Earth.
- The atmosphere of **Earth** protects us from these particles. But the particles can interact with Earth's **magnetic field**, induce **strong electric currents** on the surface and affect man-made structures.
- At ground level, **solar storm-induced geomagnetic variations** can induce large currents in networks that can conduct electricity, which is potentially harmful.

Solar activity:

- Sun goes through an **11-year cycle** – cycles of high and low activity. It also has a longer **100-year cycle**.
- During the last three decades when the **internet infrastructure** was booming, it was a **low activity period of Sun.**
- Soon, in either in this cycle or the next cycle, will be the peak of the **100-year cycle.**
  - It is highly likely to see one **powerful solar storm** during in coming decades.

- ◦ **Longer submarine cables** and the **countries** in **lower latitudes** are at a much lower risk.

[Ref: The Sun]

Past incidences:

- **1859:** First **recorded solar storm**, it reached Earth in about 17 hours. It affected the **telegraph network** and many operators experienced electric shocks.
- **1921:** A solar storm impacted **New York telegraph** and **railroad systems**.
- **1989:** Small-scale storm collapsed the **power grid** in Quebec, Canada.
- As per an estimation, if a storm like 1859 hits the US today, about 20-40 million people could be without power for 1-2 years, and total economic cost will be $0.6-2.6 trillion.

India vs Internet:

- Modelling studies show that as compared to the US, the majority of cables connecting **India will be unaffected.**
- Even under the **high-failure scenario**, some international connectivity remains (e.g., India to Singapore, Middle East, etc.).

How to save internet?

- A **temporary Internet shutdown** can protect equipment **during a solar event** and ensure the continuation of services.
- The probes of **NASA** and the **European Space Agency** can detect a solar storm, and issue warning prior to 13 hours.