Why the sun was ‘smiling’ in an image shared by NASA

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A phenomenon called "coronal holes" was spotted on the sun. How does it occur and does it have any impact on life on earth?

What are coronal holes?

These are regions on the sun’s surface from where fast solar wind gushes out into space. Because they contain little solar material, they have lower temperatures and thus appear much darker than their surroundings. Here, the magnetic field is open to interplanetary space, sending solar material out in a high-speed stream of solar wind. Coronal holes can last between a few weeks to months.

The holes are not a unique phenomenon, appearing throughout the sun’s approximately 11-year solar cycle. They can last much longer during solar minimum – a period of time when activity on the Sun is substantially diminished, according to NASA.

Scientists study these fast solar wind streams because they sometimes interact with earth’s magnetic field, creating what’s called a geomagnetic storm, which can expose satellites to radiation and interfere with communications signals

What happens during a geomagnetic storm?

According to the US government agency National Oceanic and Atmospheric Administration (NOAA), geomagnetic storms relate to earth’s magnetosphere – the space around a planet that is influenced by its magnetic field. When a high-speed solar stream arrives at the earth, in certain circumstances it can allow energetic solar wind particles to hit the atmosphere over the poles. Such geomagnetic storms cause a major disturbance of the magnetosphere as there is a very efficient exchange of energy from the solar wind into the space environment surrounding earth.

In cases of a strong solar wind reaching the earth, the resulting geomagnetic storm can cause changes in the ionosphere, part of the earth’s upper atmosphere. Radio and GPS signals travel through this layer of the atmosphere, and so communications can get disrupted.

What is Geomagnetic Storm?

A Magnetic storm or popularly known as Geomagnetic Storm is a brief disruption in the Earth’s magnetosphere. The magnetosphere is a shield that protects our planet from dangerous solar and cosmic particle radiation, as well as solar wind erosion – the continual flow of charged particles pouring from the Sun.

When occurrences such as solar flares send higher-than-normal levels of radiation towards Earth, geomagnetic storms occur. When this radiation interacts with the Earth’s magnetic field, a geomagnetic storm occurs.

The frequency of occurrence of geomagnetic storms varies with the sunspot cycle, which causes significant changes in the currents, plasmas, and fields in the Earth’s magnetosphere.