



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

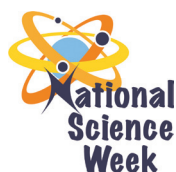
Living with Space Weather

What is space weather?

There is no greater influence on the Earth and its space environment than that of our local star, the Sun. Did you know, just like Earth, space has weather too? Snowstorms and thunderstorms occur on Earth while in space they are known as "solar storms" and like their counterparts on Earth they too may cause problems for us humans, especially because we are so dependent on satellite technology.

Can space weather affect life on Earth?

Although space weather can pose a health risk for astronauts in space, it will not harm humans and other life forms on Earth as we are protected by the Earth's magnetic field. However, space weather can cause a geomagnetic storm, which can result in disturbances to technological systems such as GPS, radio communications, internet, cell phones, DStv and our electrical power grids.





How do you monitor events on the Sun?

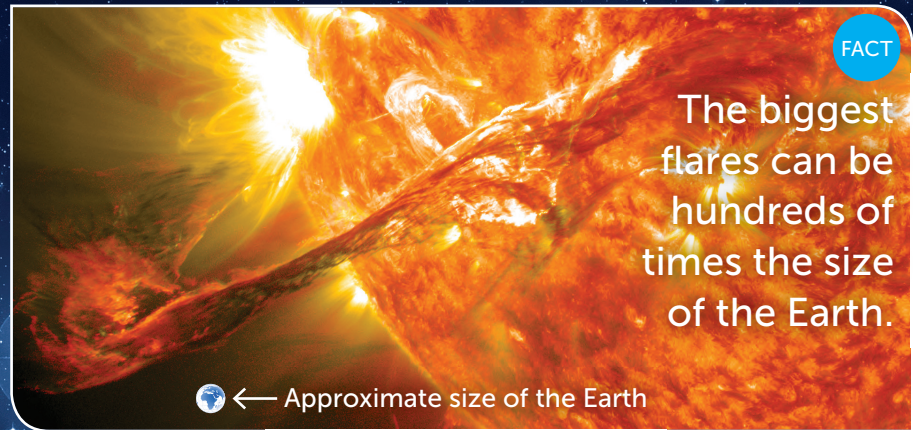
The South Africa National Space Agency (SANSA) is host to the only Space Weather Centre in Africa which provides an important service to the nation by monitoring the Sun and its activity. SANSA space weather forecasters utilise a variety of ground and space-based sensors and imaging systems to view activity at various depths in the solar atmosphere. With this information the Centre is able to form a picture of the environment from the Sun to the Earth providing forecasts and alerts to anyone affected by space weather.

What causes space weather?

Space weather is caused by four main components: solar flares, coronal mass ejections, high speed solar wind and solar energetic particles and refers to the effects that the Sun has on the Earth and the planets of the solar system.

Solar flares

The Sun is a huge ball of boiling gas with loop-like structures on the solar surface. When one of these loops becomes unstable, it breaks off from the Sun and creates a solar flare.



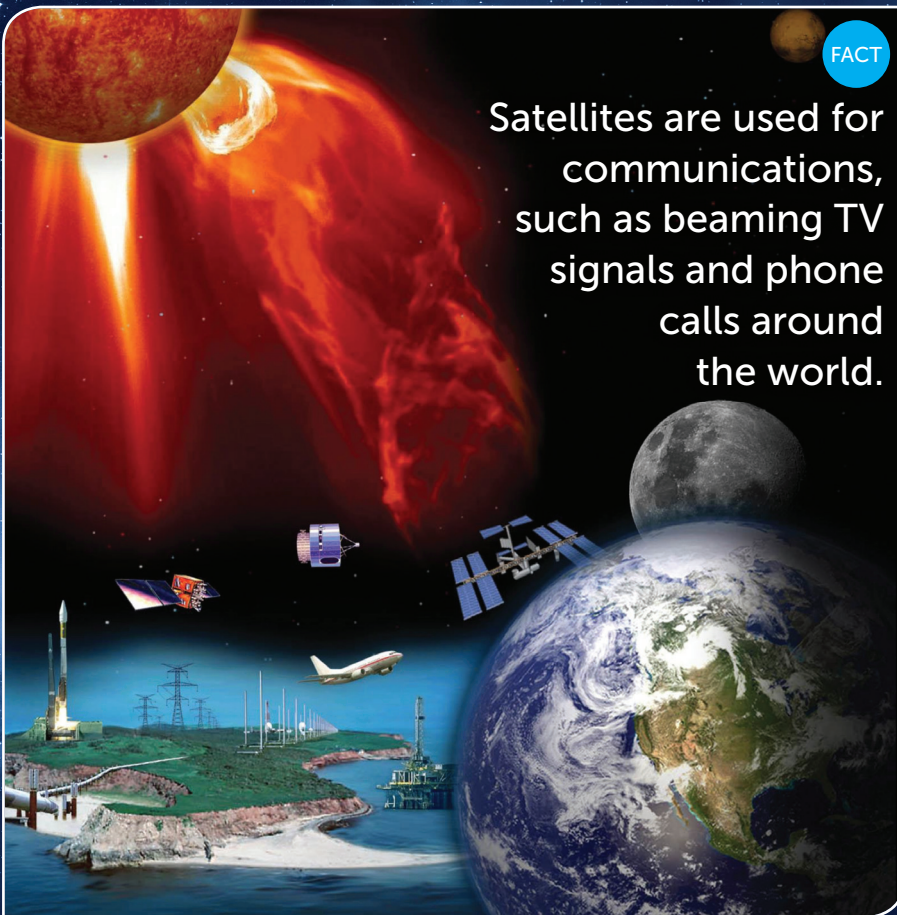
FACT

The biggest flares can be hundreds of times the size of the Earth.

← Approximate size of the Earth

What is a Satellite?

A satellite is a moon, planet or machine that orbits a planet or star. Earth and the moon are examples of natural satellites. Usually, the word "satellite" refers to a machine that is launched into space and moves around Earth or another body in space.

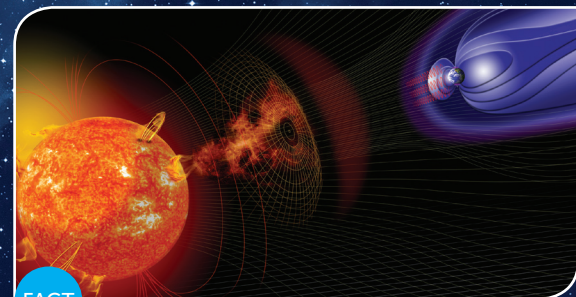


FACT

Satellites are used for communications, such as beaming TV signals and phone calls around the world.

Coronal mass ejections

A coronal mass ejection (CME) is a massive cloud of hydrogen ions which erupt from the surface of the Sun when stored energy is suddenly released. The impact of a CME causes a disturbance to the Earth's magnetic field and can interrupt communication and navigation systems.



FACT

CME's travel at supersonic speeds of up to 2 000 km per second. That speed would get you from Johannesburg to Cape Town in less than one second.

For more info on SANSA

See our website: www.sansa.org.za

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