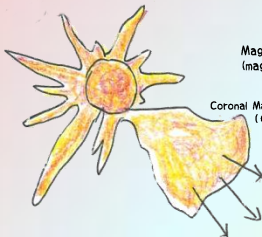


(*) In this poster, SWx means space weather.

Solar Flares



The most explosive phenomena in the heliosphere. Flares occur over sunspots.



Put on special glasses to look at the sun.



The most extreme space weather event recorded is the supergiant flare in September 1859, which was named after its discoverer Carrington. It was so bright that people could read a newspaper without a light at night.

Predicted economic loss caused by a Carrington-class flare.

Country, Region	Min USD	Max USD
USA + Canada	128 billion	164 billion
UK, Scandinavian Peninsula	29 billion	37 billion
Germany, France, Italy, Switzerland, Austria	74 billion	95 billion
All Europe	103 billion	132 billion
Japan	41 billion	54 billion
Australia	7 billion	9 billion

In 2010 July, a Carrington-class flare took place. Fortunately, it missed the Earth, so there was no effect on the earth.



International Space Environment Service (ISES) with 18 member countries @2017



A flare took place! What about SWx from now on!



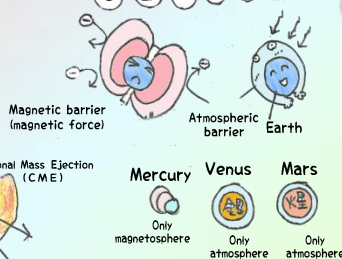
In Japan, only NICT belongs to ISES, and it observes & predicts solar flares, geomagnetic storms and ionospheric disturbances.



NICT Space Weather Center
http://swc.nict.go.jp/contents/
TEL : +81-42-327-6042
Mon.-Fri. 10:00-17:00 JST
swcask001@mswc.nict.go.jp

The Earth is protected by two barriers !!

Barriers of Planets



8 min. from the sun at light speed

250 days by rocket.

85 years by bullet train.

Locomotive

International Space Station (ISS) completed in 2011

Evacuation to a shelter during a flare occurrence.

Oh, no!

Protection from the solar wind by geomagnetic field.

Magnetosphere

Van Allen belt

Radiation belt

Risk of radiation exposure of pilots & cabin crew.

Atmospheric heating by UV and X-rays.

Electric charge

Device broken by static electricity & discharge.

Reflect ground radio waves.

Space shuttle launched in 1981

Research on re-entry became popular.

Breaking and loss of balance of satellites owing to atmospheric friction.

GPS, Car navigation systems

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Space Weather 宇宙天気

60th Anniversary of International Geophysical Year & Human Space Activity

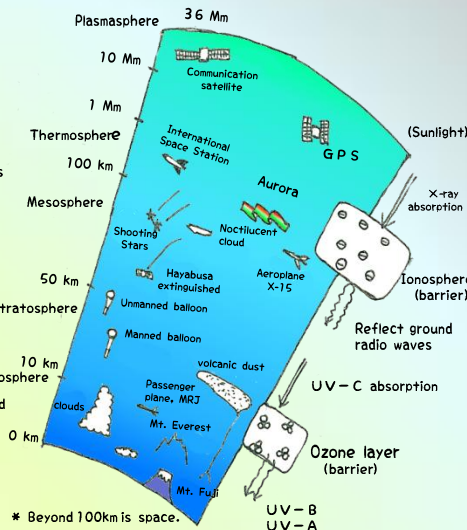
2017 is the 60th anniversary of the start of human space activity. In the International Geophysical Year 1957, the artificial satellite Sputnik 1 was launched. As space applications become popular, The risk of space weather affecting the social infrastructure increases. Therefore, space weather forecasting is an increasingly important task.

First artificial satellite launched in 1957



Sputnik 1
Start of Space Activity & Space Applications

The Russian dog Laika was the first creature to go into space. Unfortunately, he could not return to Earth.



1961 Yuri Gagarin Astronaut space activity
1963 Ms. Valentina Tereshkova Woman astronaut

International cooperation to observe the South Pole in International Geophysical Year.
Japan built the Syowa station.