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NASA, India sponsored research explains why sunspots go missing

Plasma currents deep inside the sun interfere with the formation of sunspots and prolong the solar minimum, a period characterized by lower frequency of solar storms

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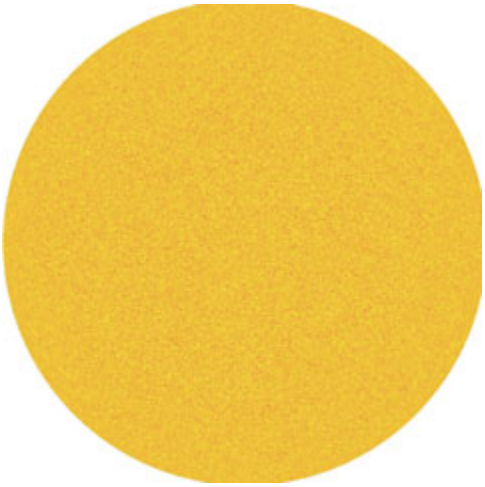
Washington: A joint research sponsored by India's top science body and NASA and done by a scientist from Kolkata has explained the 'puzzle' of recent period of decreased solar activity during the Sun's 11-year cycle.

Solar scientists around the world were puzzled by the extended disappearance of sunspots in 2008-2009. The recent solar minimum, a period characterised by a lower frequency of sunspots and solar storms, was the deepest observed in almost 100 years.

The solar minimum has repercussions on the safety of space travel and the amount of orbital debris our planet accumulates, a NASA release said.

"Plasma currents deep inside the sun interfered with the formation of sunspots and prolonged the solar minimum," said lead author Dibyendu Nandi of the Indian Institute of Science Education and Research in Kolkata.



Three years ago on March 2, 2008, the face of the sun was featureless — without any sunspot

The findings

Funded by NASA's Living With a Star Programme and the Department of Science and Technology (DST) of the Indian Government, the research revealed that during this deep solar minimum, the sun's magnetic field weakened, allowing cosmic rays to penetrate the solar system in record numbers, making space a more dangerous place to travel.

At the same time, the decrease in ultraviolet radiation caused Earth's upper atmosphere to cool and collapse, it said.

"This research demonstrates how observations from Heliophysics System Observatory missions stimulate new theories and advance modelling techniques," said Richard Fisher, director of the Heliophysics Division in NASA's Science Mission Directorate at the agency's headquarters in Washington.

Solar cycle

The solar cycle, or the solar magnetic activity cycle, is a periodic change in the amount of irradiation from the sun that is experienced on Earth.

It has a period of about 10.7 years (approximately 11 years), and is one component of solar variation, the other being a periodic fluctuations.

Solar variation causes changes in space weather and to some degree, weather on Earth. However, changes in solar brightness are too weak to explain recent climate change. The cycle is observed by counting the frequency and placement of sunspots visible on the Sun.

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