



1
00:00:00,080 --> 00:00:04,140
music throughout

2
00:00:04,160 --> 00:00:08,190
Narrator: : To every astronaut or spacecraft, the Sun is a damaging source of radiation.

3
00:00:08,210 --> 00:00:12,060
All objects traveling through space must contend with this hazard, including planets. Even the moon has the so

4
00:00:12,080 --> 00:00:16,170
to prove it. New NASA research suggests that some of the coloration

5
00:00:16,190 --> 00:00:20,380
we see on the moon could be a form of sunburn.

6
00:00:20,400 --> 00:00:26,920
Andrew Poppe: The leading hypothesis is that the magnetic fields are blocking

7
00:00:26,940 --> 00:00:31,110
some portion of the solar wind from reaching the surface

8
00:00:31,130 --> 00:00:35,300
Narrator: The solar wind is the Sun's continuous outflow of particles and radiation that fills the inner solar system

9
00:00:35,320 --> 00:00:39,400
global shield against it. However, the magnetic field on the moon is much weaker,

10
00:00:39,420 --> 00:00:43,650
and it forms only small, localized bubbles of protection. In these spots,

11
00:00:43,670 --> 00:00:47,840
the Sun's particles can be reflected back into the solar wind or funneled to nearby regions.

12
00:00:47,860 --> 00:00:52,000
The shielded areas under the magnetic field form pale swirls.

13
00:00:52,020 --> 00:00:56,740

The bordering parts become darker. The contrast is so prominent,

14

00:00:56,760 --> 00:01:00,940

we can see it from Earth.

15

00:01:00,960 --> 00:01:05,020

Poppe: Those are regions acting as this magnetic sunscreen. You know, sometimes you put on sunscreen

16

00:01:05,040 --> 00:01:09,190

and you miss a tiny little bit, and then you have are really bright red spot on your skin where you missed it.

17

00:01:09,210 --> 00:01:13,370

That's in some ways the analogy for the region of the moon that is extra exposed.

18

00:01:13,390 --> 00:01:17,550

Narrator: Unfortunately, the moon's patches of magnetic field are not

19

00:01:17,570 --> 00:01:21,600

robust enough to completely protect human explorers from the Sun's radiation,

20

00:01:21,620 --> 00:01:25,790

but further study of lunar magnetic fields could lay the groundwork for

21

00:01:25,810 --> 00:01:33,010

future innovations. Poppe: It gives a test case for what if we got a strong enough magnetic field that perhaps

22

00:01:33,030 --> 00:01:37,170

we could produce artificially? That's a question that remains to be answered,

23

00:01:37,190 --> 00:01:41,230

but I think that crustal magnetic fields on the moon and lunar swirls kind of provide a hint in that direction, that v

24

00:01:49,460 --> 00:01:45,330

tone