
NASA HELIOPHYSICS

1
00:00:08,060 --> 00:00:04,020
<<music>>

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00:00:08,080 --> 00:00:12,100
Narrator: The sun is always active. It influences the

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00:00:12,120 --> 00:00:16,130
environment around the Earth and other planets, and it also generates changes in

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00:00:16,150 --> 00:00:20,140
space for the entire solar system--something we call "Space Weather."

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00:00:20,160 --> 00:00:24,200
We feel its effects on Earth in many ways, and once we leave our protective

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00:00:24,220 --> 00:00:28,250
atmosphere, it affects our satellites, robotic missions, and human

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00:00:28,270 --> 00:00:32,290
explorers. The sun's reach goes to the edge of the solar system, and we

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00:00:32,310 --> 00:00:36,310
need to understand how it works. In its study of

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00:00:36,330 --> 00:00:40,330
heliophysics, NASA uses a fleet of satellites to take an unprecedented look at the

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00:00:40,350 --> 00:00:44,410
sun and how it affects us here on Earth. By taking high-resolution images

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00:00:44,430 --> 00:00:48,490
of the sun, modeling solar storms, and using multiple

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00:00:48,510 --> 00:00:52,520
observatories, NASA will improve our ability to predict not only when solar storms

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00:00:52,540 --> 00:00:56,550

will hit, but how they will affect our daily lives.

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00:00:56,570 --> 00:01:00,570
NASA also studies how the sun's variability

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00:01:00,590 --> 00:01:04,690
affects our home. Solar storms and solar winds have a strong effect

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00:01:04,710 --> 00:01:08,760
on the Earth and its magnetic field. By studying the sun's naturall ebb and flow,

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00:01:08,780 --> 00:01:12,800
we can learn more about its role in creating phenomena such as the northern lights.

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00:01:12,820 --> 00:01:16,830
As we explore the reaches of

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00:01:16,850 --> 00:01:20,860
our solar system, we must protect our satellites, astronauts, and robotic

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00:01:20,880 --> 00:01:24,920
missions from solar activity. Using the knowledge obtained from its heliophysics

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00:01:24,940 --> 00:01:28,960
observatories, NASA can help engineers develop new tools to

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00:01:28,980 --> 00:01:32,990
protect our exploreres as they venture out to new destinations.

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00:01:33,010 --> 00:01:37,030
But what causes the sun to vary so much? A closer

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00:01:37,050 --> 00:01:41,050
look at its structure may reveal the answer. Studying the magnetic field

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00:01:41,070 --> 00:01:45,130
and surface activity such as sunspots, solar flares, and coronal mass

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00:01:45,150 --> 00:01:49,190
ejections may provide vital clues. As NASA works to

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00:01:49,210 --> 00:01:53,230
reach its science objectives, it will pieces of the puzzles that will unlock the sun's

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00:01:53,250 --> 00:01:57,270
inner secrets. This will give us a clearer picture of the sun than

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00:01:57,290 --> 00:02:01,290
ever before, and what we will see will give us new understanding of what drives

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00:02:01,310 --> 00:02:05,300
it. Just as we need to understand

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00:02:05,320 --> 00:02:09,370
the sun, we also need to understand how the Earth and solar system react

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00:02:09,390 --> 00:02:13,440
to it. Current and future missions will reveal how the edge of the sun's

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00:02:13,460 --> 00:02:17,490
influence interacts with the greater universe. Others study how objects

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00:02:17,510 --> 00:02:21,500
in the solar system--such as comets--are affected by the sun.

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00:02:21,520 --> 00:02:25,520
Still more study how the Earth's magnetic field reacts to the sun's activity.

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00:02:25,540 --> 00:02:29,590
But the most important result of NASA's heliophysics research

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00:02:29,610 --> 00:02:33,640
is how it applies to our daily lives. Satellite and ground communications,

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00:02:33,660 --> 00:02:37,670

aircraft navigation systems, and power grids can all be affected by

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00:02:37,690 --> 00:02:41,690
solar activity, and predicting it allows us to take precautions to protect

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00:02:41,710 --> 00:02:45,710
our infrastructure. As our life-giving star,

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00:02:45,730 --> 00:02:49,800
we are dependent on the sun. As we learn more about it, we will better

42
00:02:49,820 --> 00:02:53,910
understand our home, our neighbors, and our place in the solar system.

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00:02:53,930 --> 00:02:57,960
We can then apply this knowledge--to our journeys in space,

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00:02:57,980 --> 00:03:01,960
and most importantly, to our lives here on Earth.