
2003/10/27 18:48:10

1
00:00:08,019 --> 00:00:05,830
people have been observing the Sun for

2
00:00:10,299 --> 00:00:08,029
thousands of years many cultures

3
00:00:12,489 --> 00:00:10,309
believed in a Sun Goddess and they

4
00:00:14,850 --> 00:00:12,499
thought of the Sun as the perfect object

5
00:00:17,170 --> 00:00:14,860
as soon as the telescope was invented

6
00:00:19,330 --> 00:00:17,180
people pointed it pretty much anything

7
00:00:20,860 --> 00:00:19,340
they could think of and they discovered

8
00:00:23,820 --> 00:00:20,870
that the Sun is actually not that

9
00:00:26,290 --> 00:00:23,830
perfect they were able to see sunspots

10
00:00:29,110 --> 00:00:26,300
today we know that the Sun is very

11
00:00:31,780 --> 00:00:29,120
dynamic and it has the largest eruptions

12
00:00:34,060 --> 00:00:31,790
in the solar system it's important for

13
00:00:36,819 --> 00:00:34,070

us to be able to predict solar weather

14
00:00:39,220 --> 00:00:36,829
using NASA satellites to help us look

15
00:00:42,369 --> 00:00:39,230
inside the Sun and better understand

16
00:00:45,040 --> 00:00:42,379
this giant violent star without the Sun

17
00:00:47,319 --> 00:00:45,050
life on the wouldn't exist the Sun is

18
00:00:50,079 --> 00:00:47,329
the big anchor that keeps our planet and

19
00:00:53,559 --> 00:00:50,089
the other planets of the solar system in

20
00:00:55,270 --> 00:00:53,569
a small area of space rather than just

21
00:00:57,340 --> 00:00:55,280
flying off into the rest of the universe

22
00:00:58,569 --> 00:00:57,350
since this is part of our everyday life

23
00:01:00,430 --> 00:00:58,579
I think this is something very

24
00:01:11,410 --> 00:01:00,440
fundamental to mankind just to

25
00:01:14,109 --> 00:01:11,420
understand what we are looking at hi my

26
00:01:16,690 --> 00:01:14,119
name is my Jordan and I'm student here

27
00:01:19,719 --> 00:01:16,700
at Parkland magnet Middle School in

28
00:01:22,060 --> 00:01:19,729
Rockville Maryland one of the cool

29
00:01:25,569 --> 00:01:22,070
things we study in astronomy class is

30
00:01:27,370 --> 00:01:25,579
actually the Sun and how we study it is

31
00:01:29,380 --> 00:01:27,380
we use the Sun spotter

32
00:01:33,069 --> 00:01:29,390
the Sun spotters actually show you a

33
00:01:35,289 --> 00:01:33,079
flexion or shadow of the Sun and you

34
00:01:39,010 --> 00:01:35,299
trace it and then over time we collect

35
00:01:42,300 --> 00:01:39,020
the papers and we can compare them to

36
00:01:46,050 --> 00:01:42,310
see how the sunspot heptane

37
00:01:48,139 --> 00:01:46,060
they move sunspots are regions on the

38
00:01:50,810 --> 00:01:48,149

Sun that are cooler than the surrounding

39
00:01:54,779 --> 00:01:50,820
areas in the sun's photosphere

40
00:01:57,630 --> 00:01:54,789
ruk is that the Sun yet we were so we

41
00:01:59,460 --> 00:01:57,640
invited NASA scientists 10 and Daniel to

42
00:02:00,840 --> 00:01:59,470
come and talk with the students about

43
00:02:02,669 --> 00:02:00,850
the Sun and help them with their

44
00:02:06,570 --> 00:02:02,679
calculations you know how to average

45
00:02:08,279 --> 00:02:06,580
these numbers together the final mean

46
00:02:10,169 --> 00:02:08,289
you add these numbers up and divide by

47
00:02:12,330 --> 00:02:10,179
the number of numbers the Sun is an

48
00:02:15,330 --> 00:02:12,340
active star that goes through regular

49
00:02:17,970 --> 00:02:15,340
cycles of maximum and minimum activity

50
00:02:20,250 --> 00:02:17,980
the students are calculating the solar

51
00:02:23,009 --> 00:02:20,260
maximum and solar minimum by looking at

52
00:02:25,320 --> 00:02:23,019
data over the last 50 years that covers

53
00:02:27,539 --> 00:02:25,330
how many sunspots occurred during every

54
00:02:29,550 --> 00:02:27,549
decade and it's and some of the really

55
00:02:30,780 --> 00:02:29,560
big sunspots you can easily see if you

56
00:02:33,630 --> 00:02:30,790
look at the Sun with the naked eye

57
00:02:36,300 --> 00:02:33,640
they're that big I think these sunspots

58
00:02:39,000 --> 00:02:36,310
were about you know 30 times as big as

59
00:02:42,690 --> 00:02:39,010
the earth they were just huge exactly

60
00:02:45,630 --> 00:02:42,700
how walking sunspots you look at the

61
00:02:46,890 --> 00:02:45,640
surface of the Sun and it's about 5,700

62
00:02:49,770 --> 00:02:46,900
degrees Kelvin

63
00:02:53,340 --> 00:02:49,780

I think the coolest sunspot goes down

64
00:02:56,160 --> 00:02:53,350
maybe 2000 to 2500 degrees cooler than

65
00:03:00,060 --> 00:02:56,170
that one of the most important things is

66
00:03:01,710 --> 00:03:00,070
that the Sun is a star it's the nearest

67
00:03:03,870 --> 00:03:01,720
example that we have in the entire

68
00:03:05,370 --> 00:03:03,880
universe what those little points of

69
00:03:08,250 --> 00:03:05,380
light in the sky are that we see at

70
00:03:09,660 --> 00:03:08,260
night the Sun is a very dynamic star and

71
00:03:11,520 --> 00:03:09,670
it changes all the time

72
00:03:14,640 --> 00:03:11,530
did you know it has the largest

73
00:03:17,220 --> 00:03:14,650
eruptions in all of the solar system we

74
00:03:19,380 --> 00:03:17,230
call these coronal mass ejections and

75
00:03:22,050 --> 00:03:19,390
they have an impact on us here on earth

76
00:03:24,210 --> 00:03:22,060
that's called solar weather in looking

77
00:03:26,340 --> 00:03:24,220
at that image do you guys have a

78
00:03:29,460 --> 00:03:26,350
prediction about which of those areas

79
00:03:35,190 --> 00:03:29,470
would be most likely to cause a coronal

80
00:03:37,849 --> 00:03:35,200
mass ejection yeah okay over here sir we

81
00:03:40,289 --> 00:03:37,859
care about solar weather because any

82
00:03:43,170 --> 00:03:40,299
communication devices that rely on

83
00:03:45,270 --> 00:03:43,180
transmitting information continuously

84
00:03:46,830 --> 00:03:45,280
can be affected high-precision

85
00:03:48,830 --> 00:03:46,840
electronics like electronics for

86
00:03:51,770 --> 00:03:48,840
high-speed trains can be affected by it

87
00:03:53,990 --> 00:03:51,780
and since high-speed train at 200 miles

88
00:03:57,199 --> 00:03:54,000

per hour is it is a pretty dangerous

89
00:03:59,960 --> 00:03:57,209
thing if it just runs loose so we want

90
00:04:01,940 --> 00:03:59,970
to know what's going on here the earth

91
00:04:04,280 --> 00:04:01,950
has its own way of protecting us from

92
00:04:06,259 --> 00:04:04,290
solar storms and solar weather it's

93
00:04:09,199 --> 00:04:06,269
something called a magnetic field you

94
00:04:13,040 --> 00:04:09,209
can imagine the earth magnetic field a

95
00:04:16,759 --> 00:04:13,050
bit like an egg shell around neck so

96
00:04:18,440 --> 00:04:16,769
without this shell we would be fried and

97
00:04:20,780 --> 00:04:18,450
what about if we were on the moon yeah

98
00:04:22,879 --> 00:04:20,790
if you're on the moon you would be fried

99
00:04:25,070 --> 00:04:22,889
as well so what you would have to do is

100
00:04:28,190 --> 00:04:25,080
go in your little spaceship wait until

101
00:04:29,960 --> 00:04:28,200
the storm is over today scientists are

102
00:04:32,750 --> 00:04:29,970
learning about solar weather using

103
00:04:35,030 --> 00:04:32,760
satellites that go around the Sun one of

104
00:04:37,790 --> 00:04:35,040
those satellites Soho is celebrating its

105
00:04:40,940 --> 00:04:37,800
10-year anniversary European Space

106
00:04:43,879 --> 00:04:40,950
Agency scientists Daniel came in to tell

107
00:04:45,680 --> 00:04:43,889
us how the Soho satellite is unique when

108
00:04:48,740 --> 00:04:45,690
compared to other satellites that use

109
00:04:51,860 --> 00:04:48,750
silver data the satellite the spacecraft

110
00:04:53,420 --> 00:04:51,870
contains twelve different experiments so

111
00:04:56,270 --> 00:04:53,430
we collect images of the Sun in

112
00:04:58,820 --> 00:04:56,280
different colors or different wavelength

113
00:05:00,350 --> 00:04:58,830

it is just very fascinating to look at

114
00:05:02,330 --> 00:05:00,360
the Sun and if you look at these images

115
00:05:04,670 --> 00:05:02,340
you'll see the Sun as most of us have

116
00:05:07,540 --> 00:05:04,680
never seen it before and you realize

117
00:05:10,760 --> 00:05:07,550
that this is a star that is violent and

118
00:05:12,800 --> 00:05:10,770
dynamic before the launch of Soho all we

119
00:05:15,529 --> 00:05:12,810
knew about space weather was from

120
00:05:19,730 --> 00:05:15,539
satellites in near Earth orbit and now

121
00:05:21,770 --> 00:05:19,740
we actually see the origin of stormy

122
00:05:24,640 --> 00:05:21,780
weather out in space this way we get a

123
00:05:29,000 --> 00:05:24,650
two to three days notice for

124
00:05:31,879 --> 00:05:29,010
disturbances that propagate to us and so

125
00:05:33,620 --> 00:05:31,889
the phrase that NASA invented that we

126
00:05:35,900 --> 00:05:33,630
are living with a star is actually true

127
00:05:37,070 --> 00:05:35,910
since this is part of our everyday life

128
00:05:38,930 --> 00:05:37,080
I think this is something very

129
00:05:41,690 --> 00:05:38,940
fundamental to mankind just to

130
00:05:44,330 --> 00:05:41,700
understand what we are looking at our

131
00:05:46,219 --> 00:05:44,340
teachers tell us every day that there

132
00:05:49,400 --> 00:05:46,229
are less and less scientists to discover

133
00:05:53,540 --> 00:05:49,410
new things when I go to college I am

134
00:05:56,570 --> 00:05:53,550
going to major in aerospace engineering

135
00:05:58,280 --> 00:05:56,580
and hopefully I will get a job for NASA

136
00:06:00,740 --> 00:05:58,290
and the

137
00:06:03,230 --> 00:06:00,750
spacecraft my personal goal is I just

138
00:06:04,730 --> 00:06:03,240

love to instill in them curiosity

139
00:06:06,830 --> 00:06:04,740
so I hope I'm raising the next

140
00:06:09,710 --> 00:06:06,840
generation of scientists and I hope that