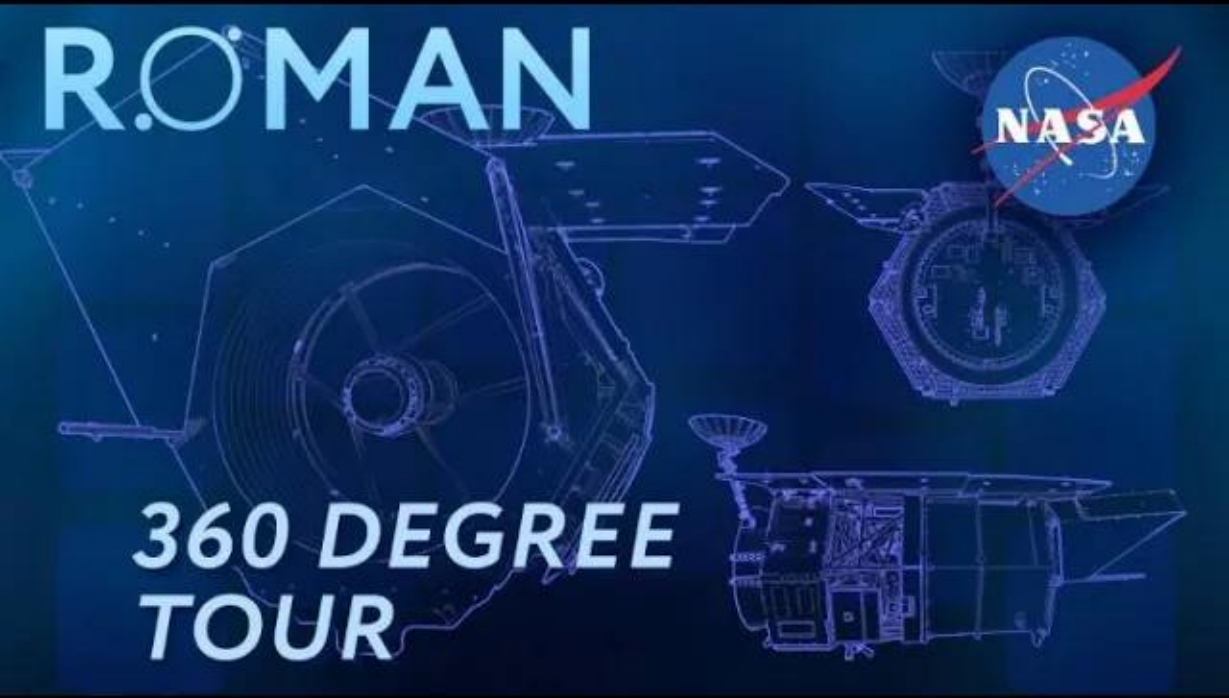
ROMAN
NASA
360 DEGREE
TOUR

1
00:00:07,030 --> 00:00:05,269
nasa's nancy grace roman space telescope

2
00:00:08,710 --> 00:00:07,040
is designed to answer big questions

3
00:00:10,709 --> 00:00:08,720
about the universe

4
00:00:12,150 --> 00:00:10,719
what is dark energy which seems to be

5
00:00:13,350 --> 00:00:12,160
speeding up the expansion of the

6
00:00:15,669 --> 00:00:13,360
universe

7
00:00:17,670 --> 00:00:15,679
how many planets exist among the stars

8
00:00:19,670 --> 00:00:17,680
and what are they like

9
00:00:21,910 --> 00:00:19,680
the roman space telescope is similar to

10
00:00:24,070 --> 00:00:21,920
hubble but benefits from 30 years of

11
00:00:25,910 --> 00:00:24,080
technological development

12
00:00:28,710 --> 00:00:25,920
it will view the sky on a scale never

13
00:00:31,189 --> 00:00:28,720

before accomplished from space

14
00:00:33,430 --> 00:00:31,199
this is where roman is closest to hubble

15
00:00:36,310 --> 00:00:33,440
it has the same size and type of main

16
00:00:38,549 --> 00:00:36,320
mirror a 2.4 meter precisely shaped

17
00:00:40,310 --> 00:00:38,559
piece of silver-coated glass

18
00:00:44,470 --> 00:00:40,320
the size of this mirror is partly how

19
00:00:48,310 --> 00:00:46,389
roman's main camera is the wide field

20
00:00:50,630 --> 00:00:48,320
instrument which will take infrared

21
00:00:53,029 --> 00:00:50,640
pictures of the sky to study dark energy

22
00:00:54,630 --> 00:00:53,039
observe galaxies and stars and find

23
00:00:56,310 --> 00:00:54,640
exoplanets

24
00:00:58,549 --> 00:00:56,320
instead of hubble's single first

25
00:01:01,430 --> 00:00:58,559
generation image sensor the wfi

26
00:01:03,270 --> 00:01:01,440
incorporates 18 third generation chips

27
00:01:06,550 --> 00:01:03,280
that allow it to take pictures capturing

28
00:01:09,109 --> 00:01:06,560
100 times greater sky area than hubble's

29
00:01:10,950 --> 00:01:09,119
each 300 megapixel image will enable

30
00:01:13,030 --> 00:01:10,960
scientists to study a large portion of

31
00:01:15,429 --> 00:01:13,040
the sky

32
00:01:17,510 --> 00:01:15,439
at roman's back is its primary means of

33
00:01:18,710 --> 00:01:17,520
communication with earth the high gain

34
00:01:23,030 --> 00:01:18,720
antenna

35
00:01:25,109 --> 00:01:23,040
sending nearly 1.4 terabytes of data to

36
00:01:27,590 --> 00:01:25,119
ground stations every day that's the

37
00:01:29,830 --> 00:01:27,600
equivalent of 460 hours of streaming

38
00:01:32,149 --> 00:01:29,840

video

39
00:01:34,710 --> 00:01:32,159
roman's critical systems such as power

40
00:01:37,190 --> 00:01:34,720
and data handling are located in six

41
00:01:39,510 --> 00:01:37,200
modules at the spacecraft's rear these

42
00:01:41,910 --> 00:01:39,520
include six rotating reaction wheels

43
00:01:44,230 --> 00:01:41,920
that control where the spacecraft points

44
00:01:46,550 --> 00:01:44,240
nearly one ton of propellant for larger

45
00:01:49,190 --> 00:01:46,560
movements and a 10 terabyte data

46
00:01:53,510 --> 00:01:50,710
roman's other instrument is its

47
00:01:55,910 --> 00:01:53,520
coronagraph technology demonstration

48
00:01:57,590 --> 00:01:55,920
a coronagraph blocks a star's light to

49
00:01:59,109 --> 00:01:57,600
capture the faint light from orbiting

50
00:02:00,630 --> 00:01:59,119
planets

51
00:02:03,109 --> 00:02:00,640
it will be the first time a space

52
00:02:05,270 --> 00:02:03,119
telescope has used deformable mirrors to

53
00:02:07,109 --> 00:02:05,280
precisely control the incoming light and

54
00:02:08,869 --> 00:02:07,119
special masks to block only the

55
00:02:10,949 --> 00:02:08,879
starlight

56
00:02:13,190 --> 00:02:10,959
this method will enable roman to capture

57
00:02:14,949 --> 00:02:13,200
direct images of distant planets and

58
00:02:17,270 --> 00:02:14,959
even analyze the light that is reflected

59
00:02:18,869 --> 00:02:17,280
off their surfaces allowing scientists

60
00:02:22,229 --> 00:02:18,879
to learn about their composition and

61
00:02:26,229 --> 00:02:24,150
the spacecraft's solar panels provide

62
00:02:27,670 --> 00:02:26,239
its power by converting sunlight into

63
00:02:29,830 --> 00:02:27,680

electricity

64
00:02:31,589 --> 00:02:29,840
they also shade the spacecraft helping

65
00:02:33,030 --> 00:02:31,599
to keep its instruments at their design

66
00:02:34,949 --> 00:02:33,040
temperatures

67
00:02:37,509 --> 00:02:34,959
the solar panels will be able to provide

68
00:02:39,430 --> 00:02:37,519
4100 watts of power

69
00:02:41,270 --> 00:02:39,440
enough to run two commercial microwave

70
00:02:43,350 --> 00:02:41,280
ovens

71
00:02:45,509 --> 00:02:43,360
with all these systems working together

72
00:02:48,070 --> 00:02:45,519
and in partnership with powerful future

73
00:02:50,309 --> 00:02:48,080
telescopes the nancy grace roman space

74
00:02:52,840 --> 00:02:50,319
telescope will be able to usher in a new