SPACECRAFT MAKERS

EUROPA CLIPPER

EPISODE 1

Jet Propulsion Laboratory
California Institute of Technology

1
00:00:04,309 --> 00:00:02,389
NASA's Europa Clipper will explore an

2
00:00:06,710 --> 00:00:04,319
icy moon of Jupiter to see if there are

3
00:00:08,210 --> 00:00:06,720
conditions that could support life let's

4
00:00:10,129 --> 00:00:08,220
head into the spacecraft assembly

5
00:00:11,340 --> 00:00:10,139
facility behind me to see how the

6
00:00:25,250 --> 00:00:11,350
mission is coming together

7
00:00:27,349 --> 00:00:25,260
[Music]

8
00:00:30,170 --> 00:00:27,359
I'm Raquel Villanueva here today with

9
00:00:31,970 --> 00:00:30,180
Jordan Evans and Trina Ray before we can

10
00:00:33,709 --> 00:00:31,980
head inside there is one more step we

11
00:00:35,510 --> 00:00:33,719
need to take we have to gown up we have

12
00:00:37,010 --> 00:00:35,520
to protect the spacecraft from us all

13
00:00:39,410 --> 00:00:37,020

the particles that might fall off of us

14
00:00:41,630 --> 00:00:39,420
so to cover our hair we have to not wear

15
00:00:42,889 --> 00:00:41,640
makeup no perfume the Europa Clipper

16
00:00:44,630 --> 00:00:42,899
mission is a spacecraft that we're

17
00:00:46,430 --> 00:00:44,640
sending out of the Jupiter system it's

18
00:00:49,430 --> 00:00:46,440
going to orbit Jupiter that fly by the

19
00:00:52,490 --> 00:00:49,440
moon Europa and it's a moon that is we

20
00:00:54,350 --> 00:00:52,500
think has an ocean underneath and we

21
00:00:56,209 --> 00:00:54,360
want to investigate that we'll be in

22
00:00:58,069 --> 00:00:56,219
this room until we ship to the Kennedy

23
00:01:00,770 --> 00:00:58,079
Space Center for our launch campaign in

24
00:01:02,750 --> 00:01:00,780
the late spring of next year 2024 during

25
00:01:05,509 --> 00:01:02,760
that time it'll make a couple of trips

26
00:01:07,550 --> 00:01:05,519
out of this building for testing we have

27
00:01:09,830 --> 00:01:07,560
so many questions about Europa we have

28
00:01:12,289 --> 00:01:09,840
an icy crust with an ocean underneath

29
00:01:13,730 --> 00:01:12,299
and the water that's in that ocean has

30
00:01:16,250 --> 00:01:13,740
been sort of you know churning and

31
00:01:18,230 --> 00:01:16,260
stewing for like four billion years and

32
00:01:19,670 --> 00:01:18,240
so we've got a lot of questions to try

33
00:01:21,830 --> 00:01:19,680
to answer about the interior or about

34
00:01:22,850 --> 00:01:21,840
the geology or about the composition to

35
00:01:24,649 --> 00:01:22,860
answer those scientific questions

36
00:01:26,149 --> 00:01:24,659
obviously we have to get to Europa first

37
00:01:28,130 --> 00:01:26,159
so one of the key elements of the

38
00:01:30,350 --> 00:01:28,140

spacecraft design is being able to bolt

39
00:01:31,609 --> 00:01:30,360
the spacecraft onto the rocket that'll

40
00:01:33,830 --> 00:01:31,619
give us the energy we need to get to

41
00:01:35,030 --> 00:01:33,840
Jupiter and then once we're at Jupiter

42
00:01:36,890 --> 00:01:35,040
being able to generate electric power

43
00:01:38,390 --> 00:01:36,900
and accommodate our very large solar

44
00:01:40,130 --> 00:01:38,400
panels on our very large High Gain

45
00:01:41,749 --> 00:01:40,140
antenna to send that science data back

46
00:01:43,310 --> 00:01:41,759
to Earth and all that has to be done

47
00:01:46,249 --> 00:01:43,320
with materials that are safe for the

48
00:01:48,050 --> 00:01:46,259
immense radiation environment at Europa

49
00:01:49,969 --> 00:01:48,060
Jordan what are we looking at here

50
00:01:51,230 --> 00:01:49,979
starting at the far end that's the

51
00:01:53,090 --> 00:01:51,240
interface of the launch vehicle that's

52
00:01:55,310 --> 00:01:53,100
where we vote Europa Clipper to the

53
00:01:57,350 --> 00:01:55,320
Falcon heavy rocket and from there that

54
00:01:59,690 --> 00:01:57,360
cylindrical portion inside there are

55
00:02:01,249 --> 00:01:59,700
propulsion tanks there's that red cover

56
00:02:03,109 --> 00:02:01,259
which is protecting some sensitive

57
00:02:04,969 --> 00:02:03,119
Communications Electronics where our

58
00:02:06,410 --> 00:02:04,979
large High Gain antenna mounts and

59
00:02:08,389 --> 00:02:06,420
you'll see there's some paper on the

60
00:02:10,490 --> 00:02:08,399
outside and those are actually patterns

61
00:02:12,410 --> 00:02:10,500
for the sewing that's required on our

62
00:02:14,570 --> 00:02:12,420
thermal blankets thermal blankets with

63
00:02:16,369 --> 00:02:14,580

the right Optical properties to maintain

64
00:02:18,650 --> 00:02:16,379
the temperatures of the vehicle as well

65
00:02:20,990 --> 00:02:18,660
as provide protection from micro meteors

66
00:02:23,330 --> 00:02:21,000
Trina can you kind of tell us more about

67
00:02:24,530 --> 00:02:23,340
the instruments that we can see here we

68
00:02:26,150 --> 00:02:24,540
don't have all of our instruments on

69
00:02:28,369 --> 00:02:26,160
board yet but what we do have is over

70
00:02:30,290 --> 00:02:28,379
here kind of around this way are three

71
00:02:32,449 --> 00:02:30,300
of our cameras they're installed on that

72
00:02:35,330 --> 00:02:32,459
far piece right there we have cameras

73
00:02:36,830 --> 00:02:35,340
that operate in The Invisible

74
00:02:38,750 --> 00:02:36,840
we have cameras that operate in the

75
00:02:41,509 --> 00:02:38,760
infrared hamburgers operate in the

76
00:02:42,770 --> 00:02:41,519
ultraviolet those all look at Europa at

77
00:02:44,750 --> 00:02:42,780
the same time just in different

78
00:02:46,550 --> 00:02:44,760
wavelengths but then we also have a

79
00:02:48,650 --> 00:02:46,560
thermal imager so think of that as like

80
00:02:50,690 --> 00:02:48,660
the like the night vision goggles right

81
00:02:52,850 --> 00:02:50,700
so what you're looking for there is a

82
00:02:55,550 --> 00:02:52,860
thermal signature so imagine you have

83
00:02:57,410 --> 00:02:55,560
this ocean and it's churning away and it

84
00:03:00,410 --> 00:02:57,420
makes the ice right above it a little

85
00:03:02,089 --> 00:03:00,420
bit warm and so the thermal imager will

86
00:03:03,710 --> 00:03:02,099
be able to tell you that and seeing this

87
00:03:05,449 --> 00:03:03,720
spacecraft up close I just want to know

88
00:03:08,150 --> 00:03:05,459

what does this mission mean to the both

89
00:03:10,490 --> 00:03:08,160
of you it represents the hundreds of

90
00:03:13,670 --> 00:03:10,500
thousands the millions of hours of the

91
00:03:16,670 --> 00:03:13,680
dedicated engineers and technicians and

92
00:03:18,589 --> 00:03:16,680
scientists I treasure my job every day I

93
00:03:20,210 --> 00:03:18,599
come to work and I'm like we're gonna do

94
00:03:21,589 --> 00:03:20,220
our part we're going to answer these

95
00:03:23,570 --> 00:03:21,599
questions but we're going to ask the

96
00:03:25,190 --> 00:03:23,580
next questions for the Next Generation

97
00:03:28,750 --> 00:03:25,200
to be inspired and to build their

98
00:03:33,110 --> 00:03:31,430
thanks for watching spacecraft makers if

99
00:03:34,850 --> 00:03:33,120
you have any questions about Europa