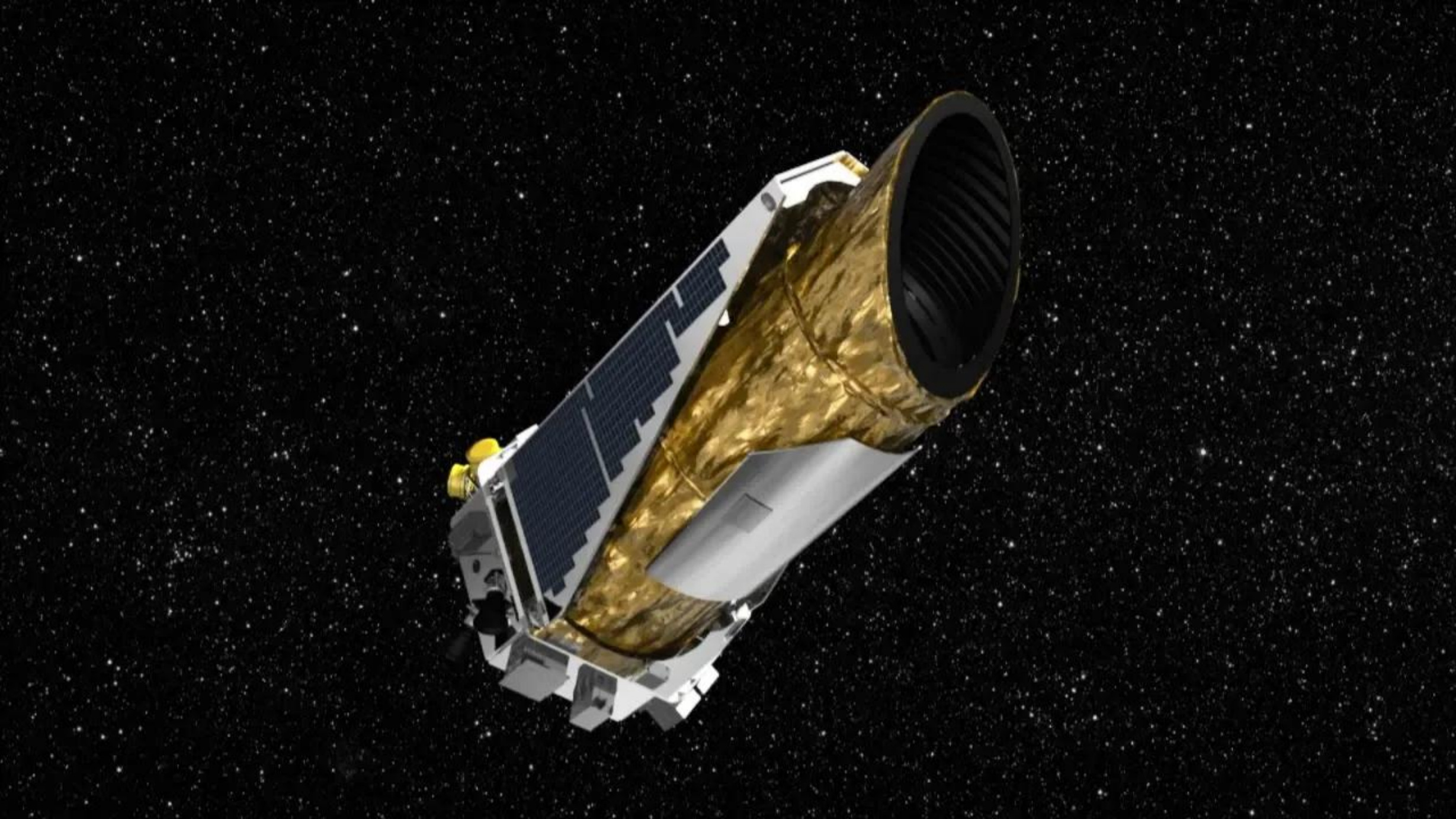

1
00:00:00,000 --> 00:00:03,600
(Wind rushes by, crickets chirp)

2
00:00:03,600 --> 00:00:05,600
Bill Borucki: For thousands of years, mankind has

3
00:00:05,600 --> 00:00:09,420
wondered "Are there planets around other stars?"

4
00:00:09,420 --> 00:00:11,590
"Is there life out there?"

5
00:00:11,590 --> 00:00:12,740
But we didn't know.

6
00:00:12,740 --> 00:00:15,110
We didn't know if there were any planets

7
00:00:15,110 --> 00:00:17,020
around other stars.

8
00:00:17,020 --> 00:00:19,280
Launch Announcer: Zero and liftoff of the Delta Two

9
00:00:19,280 --> 00:00:22,850
rocket with Kepler, on a search for planets

10
00:00:22,850 --> 00:00:25,500
in some way like our own.

11
00:00:25,500 --> 00:00:26,900
Courtney Dressing: Before the launch of Kepler,

12
00:00:26,900 --> 00:00:29,070
most of the planets we knew about were really big

13
00:00:29,070 --> 00:00:31,140

planets, like Jupiter.

14
00:00:31,140 --> 00:00:33,140
But Kepler was so sensitive, that we started

15
00:00:33,140 --> 00:00:35,690
finding smaller and smaller planets.

16
00:00:35,690 --> 00:00:37,790
Natalie Batalha: We discovered planets smaller

17
00:00:37,790 --> 00:00:39,750
than had ever been discovered before

18
00:00:39,750 --> 00:00:42,420
and just, many of them.

19
00:00:42,420 --> 00:00:45,410
Indicating that the galaxy is full of planets.

20
00:00:45,410 --> 00:00:48,000
Crazy worlds that we didn't predict,

21
00:00:48,000 --> 00:00:50,400
things that we hadn't imagined.

22
00:00:50,400 --> 00:00:52,640
We find planets orbiting so close to their

23
00:00:52,640 --> 00:00:55,120
parent star that the star-facing side has

24
00:00:55,120 --> 00:00:58,640
temperatures in excess of that required to melt iron.

25
00:00:58,640 --> 00:01:01,100
These planets have an entire hemisphere

26
00:01:01,100 --> 00:01:02,340
that's like a liquid ocean.

27
00:01:02,340 --> 00:01:03,960
But it's not an ocean of water.

28
00:01:03,960 --> 00:01:06,940
It's an ocean of molten rock.

29
00:01:06,940 --> 00:01:08,770
We see planets that are orbiting

30
00:01:08,770 --> 00:01:11,190
not one but two stars.

31
00:01:11,190 --> 00:01:13,540
That is, if you look in the east

32
00:01:13,540 --> 00:01:16,770
you would see not one star rise but two.

33
00:01:16,770 --> 00:01:20,910
(Star Wars theme music plays)

34
00:01:20,910 --> 00:01:22,350
Nick Gautier: Almost all the astronomers that I

35
00:01:22,350 --> 00:01:25,530
know grew up reading science fiction.

36
00:01:25,530 --> 00:01:27,800
That's why a lot of them got into the business

37
00:01:27,800 --> 00:01:30,710
of looking for planets in the first place.

38
00:01:30,710 --> 00:01:33,170

To find out if any of this, you know,

39
00:01:33,170 --> 00:01:36,240
fantastic speculation that inspired us,

40
00:01:41,100 --> 00:01:37,630
could be true.

41
00:01:41,100 --> 00:01:42,330
Courtney Dressing: We learned from Kepler that

42
00:01:42,330 --> 00:01:44,630
the most common types of planets in the galaxy are

43
00:01:44,630 --> 00:01:47,590
unlike the planets in our own solar system.

44
00:01:47,590 --> 00:01:49,640
These worlds are intermediate in size between

45
00:01:49,640 --> 00:01:52,660
the Earth and Neptune, but we're not exactly sure

46
00:01:52,660 --> 00:01:54,630
what they're made of.

47
00:01:54,630 --> 00:01:56,530
Jessie Dotson: What are the things that we know now,

48
00:01:56,530 --> 00:01:57,900
that we didn't know then?

49
00:01:57,900 --> 00:02:00,100
I mean, things like planets are ubiquitous.

50
00:02:00,100 --> 00:02:01,770
Planets are diverse.

51
00:02:01,770 --> 00:02:05,500
The stars that we find planets around are diverse.

52
00:02:05,500 --> 00:02:10,030
The systems that planets live in vary widely.

53
00:02:10,030 --> 00:02:12,830
Jon Jenkins: It was breath-taking to see all the

54
00:02:12,830 --> 00:02:15,510
planets come rolling in from this exquisite data

55
00:02:15,510 --> 00:02:16,600
over the years that we were

56
00:02:16,600 --> 00:02:18,570
collecting data with Kepler.

57
00:02:18,570 --> 00:02:20,950
In the end, we found dozens of small,

58
00:02:20,950 --> 00:02:23,470
potentially rocky worlds orbiting in the

59
00:02:23,470 --> 00:02:25,020
"Goldilocks zone" of their stars.

60
00:02:25,020 --> 00:02:27,840
That distance at which you could have liquid water

61
00:02:27,840 --> 00:02:30,680
pooling on the surface of the planet,

62
00:02:30,680 --> 00:02:33,430
capable of supporting life as we know it.

63
00:02:33,430 --> 00:02:35,300

Steve Howell: The science value of the collected

64
00:02:35,300 --> 00:02:39,220
data spans almost every field of astronomy

65
00:02:39,220 --> 00:02:41,300
and planetary science.

66
00:02:41,300 --> 00:02:43,790
It revolutionized not just exoplanets,

67
00:02:43,790 --> 00:02:46,460
not just stars, but a large number of the

68
00:02:46,460 --> 00:02:49,660
scientific fields of astronomy today.

69
00:02:49,660 --> 00:02:50,710
Jessie Dotson: There was one summer where I worked

70
00:02:50,710 --> 00:02:52,950
at an observatory and I would go outside at night

71
00:02:52,950 --> 00:02:55,340
and look up at the stars and just be blown away

72
00:02:55,340 --> 00:02:59,380
at how vast space was.

73
00:02:59,380 --> 00:03:02,900
And I actually felt a little lonely.

74
00:03:02,900 --> 00:03:05,600
And when I go out and I look at the night sky now,

75
00:03:05,600 --> 00:03:07,360
rather than being awestrucken by the vastness,

76
00:03:07,360 --> 00:03:09,820
I'm awestrucken by the possibility.

77
00:03:09,820 --> 00:03:11,110
Jon Jenkins: There aren't that many opportunities

78
00:03:11,110 --> 00:03:15,490
in life where you get to participate in a project

79
00:03:15,490 --> 00:03:18,040
as important as Kepler is that answers such

80
00:03:18,040 --> 00:03:20,770
a fundamental question that we've been asking

81
00:03:20,770 --> 00:03:23,130
ourselves for so long.

82
00:03:23,130 --> 00:03:25,000
Now we know when we look up into the night sky

83
00:03:25,000 --> 00:03:27,610
that every star we see has , on average,

84
00:03:27,610 --> 00:03:29,090
at least one planet.

85
00:03:29,090 --> 00:03:31,640
And that many of those planets are similar in size

86
00:03:31,640 --> 00:03:35,860
to the Earth and a chance for life as we know it elsewhere.

87
00:03:35,860 --> 00:03:37,440
Thomas Zurbuchen: Searching for life elsewhere is

88
00:03:37,440 --> 00:03:40,150

one of the key themes that drive our science

89
00:03:40,150 --> 00:03:45,400
portfolio and at the center of that is Kepler.

90
00:03:45,400 --> 00:03:49,040
New missions like the Transiting Exoplanet Survey

91
00:03:49,040 --> 00:03:52,160
Satellite, TESS, and the James Webb Space Telescope

92
00:03:52,160 --> 00:03:54,450
will build on Kepler's success and

93
00:03:54,450 --> 00:03:59,120
take our search for life to new heights.

94
00:03:59,120 --> 00:04:01,540
Bill Borucki: It has been extremely gratifying to

95
00:04:01,540 --> 00:04:05,110
see the data come back from the mission and show

96
00:04:05,110 --> 00:04:08,030
what we wanted to know, give us the answer.

97
00:04:08,030 --> 00:04:11,900
Many stars have planets, a lot of these planets

98
00:04:11,900 --> 00:04:13,770
are Earth-sized.

99
00:04:13,770 --> 00:04:15,100
That's Kepler's legacy.

100
00:04:15,100 --> 00:04:17,420
This new knowledge that we have