



1
00:00:00,234 --> 00:00:03,237
One billion miles away...

2
00:00:04,338 --> 00:00:07,207
[whoosh]

3
00:00:07,207 --> 00:00:09,409
The Cassini spacecraft
approaches

4
00:00:09,409 --> 00:00:11,078
its end of mission at Saturn.

5
00:00:11,078 --> 00:00:14,081
[■]

6
00:00:22,055 --> 00:00:25,058
A story over three decades
in the making

7
00:00:27,094 --> 00:00:29,263
Linda Spilker: When I first
started working on Cassini

8
00:00:29,263 --> 00:00:32,432
my daughter Jennifer had
just started kindergarten.

9
00:00:32,432 --> 00:00:35,435
And now she is married and
has a daughter of her own.

10
00:00:36,870 --> 00:00:38,205
I worked on the Cassini project

11
00:00:38,205 --> 00:00:40,073
for almost 30 years.

12

00:00:40,073 --> 00:00:43,710

And that's an entire
Saturn orbit.

13

00:00:43,710 --> 00:00:46,480

Part of Cassini's success is
really the tremendous

14

00:00:46,480 --> 00:00:49,116

international collaboration.

15

00:00:49,116 --> 00:00:50,817

Earl Maize: We had 3 space

16

00:00:50,817 --> 00:00:52,352

agencies contributing to this.

17

00:00:52,352 --> 00:00:55,455

NASA from the United States, ESA
the European Space Agency,

18

00:00:55,455 --> 00:00:58,725

and Agenzia Spaziale Italiana,
the Italian space agency,

19

00:00:58,725 --> 00:01:01,728

all contributing hardware
to this mission.

20

00:01:02,663 --> 00:01:03,830

Julie Webster: The beauty of

21

00:01:03,830 --> 00:01:05,766

Cassini is the design.

22

00:01:05,766 --> 00:01:08,769

It's the largest outer planetary
spacecraft ever built.

23

00:01:09,002 --> 00:01:11,571

Twelve different instruments
brought from all over

24

00:01:11,571 --> 00:01:13,840

the United States and Europe.

25

00:01:13,840 --> 00:01:17,611

The Huygens probe built by
the European Space Agency.

26

00:01:17,611 --> 00:01:23,617

When you put all that together
it's just a monumental machine.

27

00:01:24,017 --> 00:01:25,085

Cassini launch October 15, 1997

28

00:01:25,085 --> 00:01:28,155

3-2-1-

29

00:01:28,155 --> 00:01:31,091

and liftoff of the
Cassini spacecraft

30

00:01:31,091 --> 00:01:32,960

on a billion mile trek
to Saturn!

31

00:01:32,960 --> 00:01:35,228

[rocket roars]

32

00:01:39,399 --> 00:01:42,402

After a seven-year journey

33

00:01:42,402 --> 00:01:43,603

Cassini provided scientists

34

00:01:43,603 --> 00:01:45,105

with the first-ever

35

00:01:45,105 --> 00:01:46,406
in-depth study of Saturn.

36

00:01:46,773 --> 00:01:48,442
Uncovering the mysteries

37

00:01:48,442 --> 00:01:49,776
of its rings,

38

00:01:49,776 --> 00:01:52,846
atmosphere and moon system.

39

00:01:53,280 --> 00:01:54,614
And capturing some of

40

00:01:54,614 --> 00:01:55,515
the most stunning images

41

00:01:55,515 --> 00:01:56,216
of the ring world.

42

00:01:56,216 --> 00:01:58,118
Spilker: We turned the
Cassini cameras down

43

00:01:58,118 --> 00:01:59,586
to look at the rings

44

00:01:59,586 --> 00:02:02,789
revealing them in a way we had
never seen them before.

45

00:02:02,789 --> 00:02:05,592
I remember coming back to JPL
early in the morning

46

00:02:05,592 --> 00:02:07,661
just so I could be there

47
00:02:10,163 --> 00:02:13,467
and watch those pictures
one by one come down.

48
00:02:13,467 --> 00:02:17,137
And I felt like I could almost
reach out and touch the rings

49
00:02:17,137 --> 00:02:19,139
that were right there.

50
00:02:19,139 --> 00:02:22,142
[■]

51
00:02:27,447 --> 00:02:30,150
We basically tried to
carry in our tool box

52
00:02:30,150 --> 00:02:31,752
everything you could think of

53
00:02:31,752 --> 00:02:33,787
to explore the Saturn system.

54
00:02:35,555 --> 00:02:37,591
Maize: We had been collaborating
with the Europeans

55
00:02:37,591 --> 00:02:38,925
ever since launch

56
00:02:38,925 --> 00:02:42,396
to make sure that we had
everything right for Huygens.

57
00:02:44,331 --> 00:02:46,266

[soft boom]

58

00:02:46,266 --> 00:02:47,434

The Huygens probe

59

00:02:47,434 --> 00:02:48,902

was dropped onto Titan.

60

00:02:48,902 --> 00:02:52,672

These are images from
a billion miles away [chuckles]

61

00:02:52,672 --> 00:02:54,141

on the surface of Titan.

62

00:02:54,141 --> 00:02:56,309

It's just exhilarating.

63

00:02:56,309 --> 00:02:57,844

There were boulders.
There were pebbles.

64

00:02:57,844 --> 00:02:59,346

There's a dry lake bed.

65

00:02:59,346 --> 00:03:02,115

And I still get goose bumps
just talking about it.

66

00:03:03,216 --> 00:03:05,719

Webster: After everybody started
getting their science

67

00:03:05,719 --> 00:03:08,188

the beauty of what
I saw in Cassini

68

00:03:08,188 --> 00:03:10,524

was they started collaborating

with each other

69

00:03:10,524 --> 00:03:13,560
and saying "I have a picture
of this part of Titan--

70

00:03:13,560 --> 00:03:16,196
what does your picture
look like?" you know.

71

00:03:18,865 --> 00:03:21,001
Spilker: Looking back at what
we were planning to do

72

00:03:21,001 --> 00:03:24,171
in those first 4 years, we've
gone so far beyond that!

73

00:03:24,171 --> 00:03:26,807
Webster: We basically explored
the whole solar system

74

00:03:26,807 --> 00:03:29,476
contained within the
Saturnian system.

75

00:03:31,545 --> 00:03:34,815
Maize: We remapped our
investigations to concentrate on

76

00:03:34,815 --> 00:03:37,050
the questions that
Cassini raised.

77

00:03:38,218 --> 00:03:40,353
The fact that there's
interplanetary dust

78

00:03:40,353 --> 00:03:41,755
raining in on Saturn.

79

00:03:41,755 --> 00:03:44,724

And that collection of icy
satellites and moons.

80

00:03:45,659 --> 00:03:49,029

The fact we found subsurface
oceans on Enceladus

81

00:03:49,029 --> 00:03:51,364

which surprised everyone.

82

00:03:51,364 --> 00:03:52,532

Spilker: Two of our
instruments actually

83

00:03:52,532 --> 00:03:54,501

sampled the plume of Enceladus

84

00:03:54,501 --> 00:03:56,570

as we flew through

85

00:03:56,570 --> 00:03:59,339

tasting the gas,
measuring the particles

86

00:03:59,339 --> 00:04:02,275

in a way that we hadn't planned.

87

00:04:02,275 --> 00:04:04,311

Cassini has changed the paradigm

88

00:04:04,311 --> 00:04:06,546

of where we might look for life.

89

00:04:06,546 --> 00:04:08,615

That will be one of
her legacies.

90

00:04:10,650 --> 00:04:13,620

Maize: Thirteen years
of exploring Saturn--

91

00:04:13,620 --> 00:04:16,323

It really is just a...
just an awesome mission.

92

00:04:16,323 --> 00:04:19,326

[■]

93

00:04:21,928 --> 00:04:23,930

Mission's End

94

00:04:28,768 --> 00:04:31,037

September 15, 2017

95

00:04:32,038 --> 00:04:33,106

NASA Jet Propulsion Laboratory