



1
00:00:00,800 --> 00:00:02,201
Voyager 2 Enters
Interstellar Space

2
00:00:02,234 --> 00:00:04,004
[■]

3
00:00:07,239 --> 00:00:11,377
We have ignition, and we have
liftoff of the Titan-Centaur

4
00:00:11,410 --> 00:00:13,646
carrying the first of two
Voyager spacecraft

5
00:00:13,679 --> 00:00:16,749
to extend man's senses farther
into the solar system

6
00:00:16,782 --> 00:00:18,384
than ever before.

7
00:00:18,417 --> 00:00:21,521
Suzanne Dodd: They were launched
in 1977. That's a long time ago.

8
00:00:21,554 --> 00:00:24,624
We say 41 years, but it's
really two generations ago.

9
00:00:25,358 --> 00:00:27,593
You can think of what the
technology was.

10
00:00:27,626 --> 00:00:31,030
Your smartphone has 200,000
times more memory

11
00:00:31,063 --> 00:00:32,865

than what the Voyager spacecraft had.

12

00:00:32,898 --> 00:00:35,601

And so it's just exciting that we've been able to

13

00:00:35,634 --> 00:00:37,503

get it into interstellar space.

14

00:00:37,536 --> 00:00:39,238

Ed Stone: We launched two Voyager spacecraft.

15

00:00:39,271 --> 00:00:40,807

They're basically the same.

16

00:00:40,840 --> 00:00:42,675

But they were on different paths.

17

00:00:42,708 --> 00:00:46,846

Voyager 2 was the one that was chosen to do the Grand Tour.

18

00:00:46,879 --> 00:00:50,683

That is to fly by Jupiter and then Saturn

19

00:00:50,716 --> 00:00:52,719

and then Uranus and then Neptune.

20

00:00:53,386 --> 00:00:57,023

And then after 1989 we began what is now called

21

00:00:57,056 --> 00:00:58,858

the Voyager Interstellar Mission.

22

00:00:58,891 --> 00:01:01,194

We were on a path, we
hoped, to get to reach

23

00:01:01,227 --> 00:01:03,763

interstellar space while we
still had power on the

24

00:01:03,796 --> 00:01:06,132

spacecraft to transmit
the data back.

25

00:01:06,165 --> 00:01:09,202

And that's what Voyager 1
did in 2012.

26

00:01:09,235 --> 00:01:12,806

And that's now what Voyager 2 is
starting to do in 2018.

27

00:01:13,473 --> 00:01:17,510

The Sun creates this huge bubble
of plasma--ionized material

28

00:01:17,543 --> 00:01:19,212

goes outward at a
million miles per hour

29

00:01:19,245 --> 00:01:20,346

and creates a bubble.

30

00:01:20,379 --> 00:01:22,281

And inside the bubble,
most of the material

31

00:01:22,314 --> 00:01:24,350

has come from our Sun.
And the magnetic field

32

00:01:24,383 --> 00:01:25,518

has come from our Sun.

33

00:01:25,551 --> 00:01:28,154

Outside the bubble, most of
the material comes from

34

00:01:28,187 --> 00:01:32,358

other stars that exploded 5, 10,
15 million years ago.

35

00:01:32,391 --> 00:01:34,427

We have an instrument
which measures the wind

36

00:01:34,460 --> 00:01:37,396

coming from the Sun. And we
saw that, in fact, there was

37

00:01:37,429 --> 00:01:40,700

no longer any
measureable solar wind.

38

00:01:40,733 --> 00:01:42,668

We had left the bubble
basically.

39

00:01:42,701 --> 00:01:44,570

Dodd: The team has been
looking forward for this

40

00:01:44,603 --> 00:01:47,273

for a long time and
really working hard

41

00:01:47,306 --> 00:01:49,876

in an engineering sense to make
this day happen and

42

00:01:49,909 --> 00:01:52,745
to keep the spacecraft with
all the instruments on.

43

00:01:52,778 --> 00:01:56,749
So that all 5 instruments could
sense the heliopause crossing

44

00:01:56,782 --> 00:01:58,251
and have data for that.

45

00:01:58,284 --> 00:02:01,120
What that means is that the
Voyager 2 spacecraft

46

00:02:01,153 --> 00:02:03,857
is now traveling in
interstellar space.

47

00:02:04,257 --> 00:02:06,425
Stone: Well, this just
contributes to the number of

48

00:02:06,458 --> 00:02:08,494
discoveries that Voyager
has been making.

49

00:02:08,527 --> 00:02:10,696
And this is one we hoped we
would have the chance to do.

50

00:02:10,729 --> 00:02:13,799
And, fortunately, both
spacecraft were still operating

51

00:02:13,832 --> 00:02:15,368
when they reached
interstellar space.

52

00:02:15,401 --> 00:02:17,504

It's really quite...
quite remarkable.

53

00:02:17,804 --> 00:02:21,007
Voyager changed our view of the
solar system really.

54

00:02:21,040 --> 00:02:24,443
We saw this active volcanic
activity on Io.

55

00:02:24,476 --> 00:02:26,646
We saw the possibility of
an ocean on Europa.

56

00:02:26,679 --> 00:02:29,248
Just time after time we were
discovering things

57

00:02:29,281 --> 00:02:31,484
that we had not really
even imagined

58

00:02:31,517 --> 00:02:33,786
some years before the
Voyager mission.

59

00:02:33,819 --> 00:02:36,656
What makes it so exciting is
that not only do we confirm

60

00:02:36,689 --> 00:02:38,858
what we thought we knew,
but, even better,

61

00:02:38,891 --> 00:02:40,760
it tells us where we didn't know

62

00:02:40,793 --> 00:02:42,595
that there was something to

be discovered.

63

00:02:43,262 --> 00:02:46,632

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