1
00:00:06,240 --> 00:00:12,680
In February 2005, we had our first close fly-by of Enceladus, and the magnetometer signal

2
00:00:12,680 --> 00:00:15,509
saw something unusual.

3
00:00:15,509 --> 00:00:21,640
What a magnetometer does is it measures the
magnetic field in the vicinity of the instrument.

4
00:00:21,640 --> 00:00:24,519
We had a look at the wiggles, and they looked strange.

5
00:00:24,519 --> 00:00:29,070
The magnetic field of Saturn is moving towards
it, and it couldn't penetrate down onto the

6
00:00:29,070 --> 00:00:33,130
surface, which was pointing to an atmospheric
signature of some kind.

7
00:00:33,130 --> 00:00:36,460
Here it looked like it had a tiny atmosphere.

8
00:00:39,180 --> 00:00:45,000
Then in March, we came even closer looking
for that same strange signal.

9
00:00:45,000 --> 00:00:49,780
What it showed was that the signature, the
atmospheric signature that we were seeing

10
00:00:49,780 --> 00:00:52,670
was focused at the south pole.

11
00:00:52,670 --> 00:00:57,360
It was almost like there was a cometary plume
of water vapor coming off from the south pole.

12
00:00:57,360 --> 00:00:59,620
People were saying, "It's got to be jets!

13
00:00:59,620 --> 00:01:00,620
It's got to be jets!"

14
00:01:00,620 --> 00:01:03,680
Then the imaging team was saying, "No, we don't want to say that you know until we're sure."

15
00:01:04,239 --> 00:01:05,630
So, we went closer.

16
00:01:05,630 --> 00:01:09,070
We came within 175 kilometers of Enceladus.

17
00:01:09,070 --> 00:01:13,090
Then we got the data back, and it was spectacular.

18
00:01:13,090 --> 00:01:15,159
And then we found the evidence.

19
00:01:15,159 --> 00:01:20,619
Geysers coming out of the south pole with
water vapor and water ice particles.

20
00:01:20,619 --> 00:01:24,060
They were active geysers at the south pole
of Enceladus.

21
00:01:24,060 --> 00:01:29,409
Because we were so close all of the other
instruments were able to take really good

22
00:01:29,409 --> 00:01:34,390
data and we put together all of this data
and we saw the cracks, the tiger stripes at

23
00:01:34,390 --> 00:01:35,420

the south pole.

24
00:01:35,420 --> 00:01:38,960
We saw heat leaking out from these tiger stripes.

25
00:01:38,960 --> 00:01:45,460
On subsequent fly-bys we found organic material,
dust, water vapor coming out of the plume.

26
00:01:45,929 --> 00:01:49,850
The Cassini discoveries in the first three
flybys were so amazing.

27
00:01:49,850 --> 00:01:56,870
We changed our focus and added 20 more flybys of Enceladus, including seven through the icy jets

28
00:01:57,480 --> 00:02:04,040
The surprising magnetometer reading led us to the liquid water ocean underneath Enceladus's icy crust.

29
00:02:14,280 --> 00:02:20,030
After over a decade of research with Cassini,
we now know there's a potential for the ocean