



1
00:00:05,059 --> 00:00:02,629
we embark on a journey that will bring

2
00:00:05,860 --> 00:00:05,069
us a billion times closer to Titans

3
00:00:09,320 --> 00:00:05,870
surface

4
00:00:11,180 --> 00:00:09,330
Titan is Saturn's largest moon right in

5
00:00:15,110 --> 00:00:11,190
front of Saturn's disk in this image

6
00:00:17,450 --> 00:00:15,120
taken by the Cassini spacecraft Saturn's

7
00:00:20,450 --> 00:00:17,460
atmosphere shows a banded structure and

8
00:00:23,420 --> 00:00:20,460
a number of storms we view the edge of

9
00:00:25,880 --> 00:00:23,430
Saturn's gigantic ring system the Rings

10
00:00:29,120 --> 00:00:25,890
cast major shadows onto Saturn's

11
00:00:31,690 --> 00:00:29,130
southern hemisphere Titan is surrounded

12
00:00:35,389 --> 00:00:31,700
by a partially transparent brown haze

13
00:00:37,910 --> 00:00:35,399

features on Titan's surface appear the

14

00:00:40,760 --> 00:00:37,920

dark regions along Titans equator are

15

00:00:43,569 --> 00:00:40,770

mostly dune fields the brighter regions

16

00:00:46,760 --> 00:00:43,579

are Highlands a few hundred metres high

17

00:00:49,880 --> 00:00:46,770

images taken from the Huygens probe show

18

00:00:52,069 --> 00:00:49,890

Titans surface in more detail the probe

19

00:00:54,020 --> 00:00:52,079

had spectrometers that measured small

20

00:00:56,869 --> 00:00:54,030

variations in the color of Titan's

21

00:01:00,470 --> 00:00:56,879

surface that are exaggerated here most

22

00:01:03,170 --> 00:01:00,480

of Titan's surface is brown north of the

23

00:01:05,690 --> 00:01:03,180

landing site a pair of parallel dark

24

00:01:08,870 --> 00:01:05,700

dunes stretch east-west along the image

25

00:01:11,899 --> 00:01:08,880

a large Highland of triangular shape

26
00:01:14,080 --> 00:01:11,909
lies to the northwest more and more dark

27
00:01:16,550 --> 00:01:14,090
canyons appear in this area a

28
00:01:19,219 --> 00:01:16,560
complicated network of channels where

29
00:01:22,160 --> 00:01:19,229
rivers of methane flowed at some time in

30
00:01:24,859 --> 00:01:22,170
the past to the east of the landing site

31
00:01:28,100 --> 00:01:24,869
is a system of bright ridges standing

32
00:01:29,960 --> 00:01:28,110
out above the dark dry lakebed the

33
00:01:32,600 --> 00:01:29,970
ridges have intricate structures that

34
00:01:34,550 --> 00:01:32,610
tell stories about their past the

35
00:01:37,190 --> 00:01:34,560
Huygens probe descended toward one of

36
00:01:40,039 --> 00:01:37,200
these ridges as we approach the surface

37
00:01:43,010 --> 00:01:40,049
further we can see this Ridge in finer

38
00:01:45,260 --> 00:01:43,020

detail some regions were imaged with

39

00:01:48,050 --> 00:01:45,270

high resolution just before Huygens

40

00:01:50,630 --> 00:01:48,060

landed on Titan especially the area to

41

00:01:52,700 --> 00:01:50,640

the west of the landing site most of

42

00:01:54,740 --> 00:01:52,710

Titan's surface is covered by dark

43

00:01:57,679 --> 00:01:54,750

organics that are produced in the

44

00:02:00,109 --> 00:01:57,689

atmosphere and slowly settle down the

45

00:02:02,749 --> 00:02:00,119

bright spots may be exposed patches of

46

00:02:05,149 --> 00:02:02,759

water ice the white dot in the center of

47

00:02:07,730 --> 00:02:05,159

the image is the landed Huygens probe

48

00:02:10,639 --> 00:02:07,740

while the probe rotated during the

49

00:02:13,170 --> 00:02:10,649

descent its orientation after landing

50

00:02:15,390 --> 00:02:13,180

had the camera looking to the south

51
00:02:17,099 --> 00:02:15,400
the camera saw a field of pebbles that

52
00:02:20,280 --> 00:02:17,109
were carried around by a river of

53
00:02:22,709 --> 00:02:20,290
methane in the past some pebbles are

54
00:02:25,440 --> 00:02:22,719
larger than a human hand the descent

55
00:02:27,479 --> 00:02:25,450
imager spectral radiometer is the dark

56
00:02:30,360 --> 00:02:27,489
green instrument at the south side of

57
00:02:32,910 --> 00:02:30,370
the Huygens probe it's lamp illuminated

58
00:02:35,849 --> 00:02:32,920
the surface allowing spectral analysis

59
00:02:38,849 --> 00:02:35,859
the lamps spotlight stands out brightly

60
00:02:41,580 --> 00:02:38,859
since days on Titan are even darker than

61
00:02:44,069 --> 00:02:41,590
cloudy days on earth a little sunlight

62
00:02:47,339 --> 00:02:44,079
reaches Titans surface due to its thick

63
00:02:49,440 --> 00:02:47,349

haze and large distance from the Sun the

64

00:02:51,960 --> 00:02:49,450

right side shows the green dizzer

65

00:02:53,759 --> 00:02:51,970

instrument with the gold-coloured lamp

66

00:02:56,190 --> 00:02:53,769

and the three camera windows to its

67

00:02:59,099 --> 00:02:56,200

right the cameras that provided the