



1  
00:00:08,720 --> 00:00:04,390  
three two one ignition

2  
00:00:11,660 --> 00:00:08,730  
rocket launches its thrusting out flames

3  
00:00:14,509 --> 00:00:11,670  
and you watching and you have all those

4  
00:00:19,939 --> 00:00:14,519  
emotions and the rocket goes along on

5  
00:00:22,849 --> 00:00:19,949  
this journey and a deploys spitzer the

6  
00:00:26,589 --> 00:00:22,859  
spitzer space telescope is a member of

7  
00:00:35,690 --> 00:00:29,689  
Spitzer is the infrared member of this

8  
00:00:38,150 --> 00:00:35,700  
family Spitzer has unveiled the infrared

9  
00:00:42,380 --> 00:00:38,160  
universe it has enabled humans to see

10  
00:00:44,150 --> 00:00:42,390  
what our eyes could not see we see a

11  
00:00:48,979 --> 00:00:44,160  
whole new side to the universe that's

12  
00:00:52,069 --> 00:00:48,989  
hidden from us normally you can peer

13  
00:00:56,360 --> 00:00:52,079

inside of clouds so dust to see the baby

14

00:00:59,090 --> 00:00:56,370

stars called proto stars being born yet

15

00:01:01,819 --> 00:00:59,100

let us see into more distant galaxies

16

00:01:03,979 --> 00:01:01,829

and see how the patterns of dust tell us

17

00:01:05,990 --> 00:01:03,989

about the motions of gas and the

18

00:01:08,600 --> 00:01:06,000

dynamics of gravity that operate in

19

00:01:10,969 --> 00:01:08,610

these objects all of a sudden we could

20

00:01:13,160 --> 00:01:10,979

create these vast panoramas at

21

00:01:14,300 --> 00:01:13,170

incredibly sharp resolutions that we'd

22

00:01:16,609 --> 00:01:14,310

never been able to do before

23

00:01:19,160 --> 00:01:16,619

and as a result everything that was

24

00:01:21,170 --> 00:01:19,170

familiar in the sky every nebula we're

25

00:01:23,090 --> 00:01:21,180

used to seeing in visible light images

26  
00:01:25,070 --> 00:01:23,100  
from the ground things from the Hubble

27  
00:01:27,530 --> 00:01:25,080  
they became completely different when

28  
00:01:30,640 --> 00:01:27,540  
seen through the infrared eyes Spitzer

29  
00:01:34,069 --> 00:01:30,650  
it was this combination of a scientific

30  
00:01:37,710 --> 00:01:34,079  
insight that itself was just stunningly

31  
00:01:42,790 --> 00:01:40,510  
the biggest surprise in terms of what

32  
00:01:46,090 --> 00:01:42,800  
was revealed with Spitzer is its ability

33  
00:01:49,450 --> 00:01:46,100  
to characterize exoplanets of planets

34  
00:01:51,640 --> 00:01:49,460  
around other stars most notably we

35  
00:01:54,550 --> 00:01:51,650  
identified a system called Trappist one

36  
00:01:57,330 --> 00:01:54,560  
which has seven earth sized planets sort

37  
00:02:01,300 --> 00:01:57,340  
of snuggling up to what's a very cool

38  
00:02:03,250 --> 00:02:01,310

star and of those planets three of them

39

00:02:05,800 --> 00:02:03,260

at least are in the habitable zone when

40

00:02:08,590 --> 00:02:05,810

spitzer launched exoplanet science was

41

00:02:11,410 --> 00:02:08,600

absolutely not part of the science

42

00:02:12,910 --> 00:02:11,420

portfolio we were offering for spitzer

43

00:02:14,170 --> 00:02:12,920

because it wasn't considered to be

44

00:02:16,450 --> 00:02:14,180

sensitive enough to do that kind of

45

00:02:18,820 --> 00:02:16,460

observations but while in flight

46

00:02:20,410 --> 00:02:18,830

astronomers became clever about how they

47

00:02:21,790 --> 00:02:20,420

could use that engineers became very

48

00:02:24,220 --> 00:02:21,800

clever about how we could repurpose

49

00:02:26,920 --> 00:02:24,230

Spitzer and exoplanet Sciences actually

50

00:02:29,200 --> 00:02:26,930

become one of the core science projects

51  
00:02:33,040 --> 00:02:29,210  
of Spitzer since then the Google Doodle

52  
00:02:34,960 --> 00:02:33,050  
that day which was trafficed one is what

53  
00:02:38,860 --> 00:02:34,970  
kind of finished me off on a glorious

54  
00:02:41,620 --> 00:02:38,870  
day when your adult children point out

55  
00:02:43,840 --> 00:02:41,630  
that you know my mom works on that

56  
00:02:49,180 --> 00:02:43,850  
telescope you know that's that's very

57  
00:02:51,400 --> 00:02:49,190  
rewarding Spitzer Space Telescope it's a

58  
00:02:53,470 --> 00:02:51,410  
technological marvel I never had any

59  
00:02:55,120 --> 00:02:53,480  
conception that we'd be going for 16

60  
00:02:58,120 --> 00:02:55,130  
years it's a little machine that could

61  
00:03:00,729 --> 00:02:58,130  
go beyond its primary design the

62  
00:03:04,600 --> 00:03:00,739  
longevity of the mission is a direct

63  
00:03:07,100 --> 00:03:04,610

result of the engineers and scientists

64

00:03:10,940 --> 00:03:07,110

and people that have supported them

65

00:03:12,890 --> 00:03:10,950

in a place that dares mighty things you

66

00:03:17,390 --> 00:03:12,900

can do it together

67

00:03:21,770 --> 00:03:17,400

and so when you have that kind of Union

68

00:03:26,180 --> 00:03:21,780

I think what happens is magic I'm hoping

69

00:03:31,040 --> 00:03:26,190

Spitzer will be remembered as in a

70

00:03:33,500 --> 00:03:31,050

really amazing scientific gift and that

71

00:03:36,530 --> 00:03:33,510

it allowed us to kind of transform our

72

00:03:40,010 --> 00:03:36,540

understanding of some very important

73

00:03:42,890 --> 00:03:40,020

aspects of astronomy and I think Spitzer

74

00:03:45,230 --> 00:03:42,900

has been integral to all that we have a

75

00:03:48,260 --> 00:03:45,240

huge archive that is waiting to be mined

76

00:03:50,600 --> 00:03:48,270

and it's it's revelations already have

77

00:03:52,850 --> 00:03:50,610

been tremendous and revolutionary that

78

00:03:54,950 --> 00:03:52,860

only time will tell what is Spitzer's