
Allan Cheuvront
Stardust-NExT Spacecraft Team Chief

1
00:00:07,789 --> 00:00:05,780
start us next is a mission to reuse the

2
00:00:11,150 --> 00:00:07,799
start of spacecraft to further the

3
00:00:15,140 --> 00:00:11,160
exploration of comet Tempel 1 the temple

4
00:00:17,029 --> 00:00:15,150
1 was the target of deep impact deep

5
00:00:19,880 --> 00:00:17,039
impact discovered that this is a most

6
00:00:21,950 --> 00:00:19,890
interesting comet we want to see more of

7
00:00:24,500 --> 00:00:21,960
the surface and we also want to see what

8
00:00:27,230 --> 00:00:24,510
changes have occurred since deep impact

9
00:00:29,510 --> 00:00:27,240
over five years ago primary purpose is

10
00:00:31,430 --> 00:00:29,520
to observe how the comet has changed how

11
00:00:33,619 --> 00:00:31,440
the nucleus has changed - compared to

12
00:00:36,079 --> 00:00:33,629
what it was like back in 2005 with the

13
00:00:38,750 --> 00:00:36,089

previous past near the Sun we call him

14
00:00:40,340 --> 00:00:38,760
perihelion passes we also would want to

15
00:00:42,680 --> 00:00:40,350
extend the mapping and the observation

16
00:00:44,419 --> 00:00:42,690
of the nucleus to see new areas or the

17
00:00:45,950 --> 00:00:44,429
nucleus that we haven't seen before so

18
00:00:47,989 --> 00:00:45,960
that would help complete the mapping of

19
00:00:49,700 --> 00:00:47,999
the nucleus of this comet and then if

20
00:00:51,380 --> 00:00:49,710
possible we would like to be able to

21
00:00:54,110 --> 00:00:51,390
image the crater that was left behind

22
00:00:55,639 --> 00:00:54,120
the key challenges for an extended

23
00:00:57,229 --> 00:00:55,649
mission like this or one dealing with

24
00:00:59,540 --> 00:00:57,239
the age of the spacecraft the spacecraft

25
00:01:00,889 --> 00:00:59,550
is almost 12 years old very little fuel

26
00:01:03,680 --> 00:01:00,899
is left we've used most of it already

27
00:01:06,080 --> 00:01:03,690
and then the third challenge for a comet

28
00:01:07,700 --> 00:01:06,090
mission is the navigation one of the

29
00:01:10,220 --> 00:01:07,710
navigation challenges with getting close

30
00:01:12,260 --> 00:01:10,230
to comet is predicting its trajectory we

31
00:01:14,660 --> 00:01:12,270
know that as they get close the Sun

32
00:01:16,670 --> 00:01:14,670
comets generate a lot of activity the

33
00:01:19,130 --> 00:01:16,680
Jets the outbursts all of those change

34
00:01:21,050 --> 00:01:19,140
the trajectory somewhat of the comet we

35
00:01:22,850 --> 00:01:21,060
have a navigation camera and we

36
00:01:24,290 --> 00:01:22,860
photographed where the comedy is on

37
00:01:26,450 --> 00:01:24,300
approach and then we take that

38
00:01:28,280 --> 00:01:26,460

information turn it into trajectory

39
00:01:30,410 --> 00:01:28,290
corrections to put us at the right place

40
00:01:33,290 --> 00:01:30,420
at the right time one of the challenges

41
00:01:34,900 --> 00:01:33,300
of designing a spacecraft to to go to

42
00:01:37,670 --> 00:01:34,910
accommodate how do you protect it

43
00:01:39,380 --> 00:01:37,680
there's a coma that goes out in front of

44
00:01:41,900 --> 00:01:39,390
the comet and that coma contains

45
00:01:43,610 --> 00:01:41,910
particles it could be large we're flying

46
00:01:45,260 --> 00:01:43,620
by a little over 10 kilometers per

47
00:01:47,540 --> 00:01:45,270
second that's someone the order of

48
00:01:50,630 --> 00:01:47,550
25,000 miles per hour it doesn't take

49
00:01:52,520 --> 00:01:50,640
much of a particle to cause damage the

50
00:01:55,310 --> 00:01:52,530
starna spacecraft is a very unique

51
00:01:57,890 --> 00:01:55,320
spacecraft it was built for comet flyby

52
00:02:00,200 --> 00:01:57,900
so it was built to fly close to a comet

53
00:02:01,730 --> 00:02:00,210
and because of that has some very robust

54
00:02:03,590 --> 00:02:01,740
shields on the front of the spacecraft

55
00:02:05,930 --> 00:02:03,600
that will be able to stop a centimeter

56
00:02:08,449 --> 00:02:05,940
sized particle traveling six kilometers

57
00:02:09,889 --> 00:02:08,459
per second and not damage the spacecraft

58
00:02:11,570 --> 00:02:09,899
these are exciting things they're all

59
00:02:13,050 --> 00:02:11,580
different every time we go near one we

60
00:02:14,520 --> 00:02:13,060
find something new