1
00:00:05,829 --> 00:00:03,590
hi my name is martin richard i work for

2
00:00:09,030 --> 00:00:05,839
the canadian space agency on a payload

3
00:00:11,350 --> 00:00:09,040
called bcat c1 which stands for binary

4
00:00:14,310 --> 00:00:11,360
colloidal alloy test

5
00:00:16,470 --> 00:00:14,320
c1 stands for canadian one

6
00:00:18,150 --> 00:00:16,480
the b-cat experiment is led by the

7
00:00:21,189 --> 00:00:18,160
mission manager at the canadian space

8
00:00:23,189 --> 00:00:21,199
agency his name is charles gautier and

9
00:00:25,509 --> 00:00:23,199
the mission scientist representing the

10
00:00:27,509 --> 00:00:25,519
pi at all times with me

11
00:00:28,630 --> 00:00:27,519
is lukino cohen

12
00:00:30,550 --> 00:00:28,640
and

13
00:00:33,350 --> 00:00:30,560

we work from the canadian space agency

14
00:00:36,069 --> 00:00:33,360
near montreal in canada

15
00:00:39,190 --> 00:00:36,079
the room there is called the p-talk

16
00:00:41,990 --> 00:00:39,200
payload telescience operations center

17
00:00:45,110 --> 00:00:42,000
and we interface directly with the poic

18
00:00:46,069 --> 00:00:45,120
in huntsville alabama and when the crew

19
00:00:48,150 --> 00:00:46,079
asks

20
00:00:50,069 --> 00:00:48,160
questions about the experiment they talk

21
00:00:53,189 --> 00:00:50,079
to huntsville but we hear what they say

22
00:00:55,590 --> 00:00:53,199
and we respond directly to poic and they

23
00:00:56,630 --> 00:00:55,600
voice the answer back to the crew

24
00:00:58,470 --> 00:00:56,640
sometimes

25
00:01:00,869 --> 00:00:58,480
when it gets complicated and the crew

26
00:01:03,430 --> 00:01:00,879
has more difficult questions to answer

27
00:01:05,830 --> 00:01:03,440
they will enable us on space to ground

28
00:01:07,190 --> 00:01:05,840
so we can talk directly to the crew

29
00:01:09,030 --> 00:01:07,200
it happens

30
00:01:11,350 --> 00:01:09,040
a few times here and there but usually

31
00:01:14,310 --> 00:01:11,360
we interface directly with the husk in

32
00:01:17,350 --> 00:01:14,320
huntsville alabama what we do in bcat is

33
00:01:19,749 --> 00:01:17,360
we study the behavior of colloidal

34
00:01:23,109 --> 00:01:19,759
samples what does that mean

35
00:01:25,910 --> 00:01:23,119
colloid is a fluid that has particles in

36
00:01:27,510 --> 00:01:25,920
it that we may not see

37
00:01:28,870 --> 00:01:27,520
everyday products

38
00:01:29,990 --> 00:01:28,880

are colloidal

39
00:01:31,350 --> 00:01:30,000
like

40
00:01:34,710 --> 00:01:31,360
toothpaste

41
00:01:37,030 --> 00:01:34,720
shaving cream detergent

42
00:01:41,109 --> 00:01:37,040
milk is even colloid

43
00:01:43,910 --> 00:01:41,119
and the researchers want to find ways to

44
00:01:45,350 --> 00:01:43,920
extend the shelf life of some products

45
00:01:47,910 --> 00:01:45,360
and also

46
00:01:50,550 --> 00:01:47,920
understand the behavior behavior of the

47
00:01:51,749 --> 00:01:50,560
particles inside these products and

48
00:01:54,149 --> 00:01:51,759
probably

49
00:01:56,310 --> 00:01:54,159
for many of them improve the

50
00:01:59,350 --> 00:01:56,320
manufacturing of those products

51
00:02:01,910 --> 00:01:59,360
the particles that are in our fluids

52
00:02:04,870 --> 00:02:01,920
would sediment with gravity they would

53
00:02:06,709 --> 00:02:04,880
go down the cuvettes

54
00:02:11,670 --> 00:02:06,719
and this would not

55
00:02:15,190 --> 00:02:14,070
a long-term exposition to

56
00:02:16,150 --> 00:02:15,200
real life

57
00:02:17,430 --> 00:02:16,160
so

58
00:02:20,790 --> 00:02:17,440
an example

59
00:02:24,869 --> 00:02:20,800
if you have a fabric softener in your

60
00:02:26,790 --> 00:02:24,879
laundry room it will take months before

61
00:02:29,670 --> 00:02:26,800
the product's sediment

62
00:02:31,509 --> 00:02:29,680
and uh it will take months before you

63
00:02:34,229 --> 00:02:31,519

see the effect of

64
00:02:36,710 --> 00:02:34,239
time on it but it will have an effect

65
00:02:39,270 --> 00:02:36,720
time will have an effect on your product

66
00:02:41,750 --> 00:02:39,280
in space we can

67
00:02:44,070 --> 00:02:41,760
simulate that with bigger particles in

68
00:02:44,869 --> 00:02:44,080
the in the fluids

69
00:02:47,270 --> 00:02:44,879
and

70
00:02:49,830 --> 00:02:47,280
that's over 10 days approximately

71
00:02:52,630 --> 00:02:49,840
instead of months we can simulate aging

72
00:02:56,229 --> 00:02:52,640
of a product over 10 days so that's what

73
00:02:58,949 --> 00:02:56,239
we try to simulate and track

74
00:03:00,550 --> 00:02:58,959
the experiment consists of mixing the

75
00:03:02,149 --> 00:03:00,560
sample and

76
00:03:05,110 --> 00:03:02,159
following the evolution of the sample

77
00:03:08,149 --> 00:03:05,120
over 10 days by taking

78
00:03:10,390 --> 00:03:08,159
photographs of the sample

79
00:03:12,550 --> 00:03:10,400
every hour or so

80
00:03:14,949 --> 00:03:12,560
and we see the evolution of the crystals

81
00:03:17,430 --> 00:03:14,959
in them the actually samples phase

82
00:03:19,990 --> 00:03:17,440
separate like oil and water

83
00:03:22,790 --> 00:03:20,000
and then crystals start to form

84
00:03:24,309 --> 00:03:22,800
and the challenge in this experiment is

85
00:03:27,030 --> 00:03:24,319
to

86
00:03:28,070 --> 00:03:27,040
obtain the optimal

87
00:03:31,190 --> 00:03:28,080
lighting

88
00:03:32,470 --> 00:03:31,200

orientation we have a camera the module

89
00:03:34,949 --> 00:03:32,480
itself

90
00:03:37,589 --> 00:03:34,959
and a flash unit in the back

91
00:03:39,350 --> 00:03:37,599
and we have to illuminate the sample at

92
00:03:41,350 --> 00:03:39,360
the right angle so we can see the

93
00:03:44,309 --> 00:03:41,360
crystals otherwise the sample looks

94
00:03:46,390 --> 00:03:44,319
clear it's it looks like water

95
00:03:48,869 --> 00:03:46,400
so you need an

96
00:03:51,270 --> 00:03:48,879
uh the proper angle plus minus five

97
00:03:54,630 --> 00:03:51,280
degrees approximately to see the

98
00:03:56,630 --> 00:03:54,640
crystals and then the pi can determine

99
00:03:58,470 --> 00:03:56,640
the behavior of the sample over those uh

100
00:04:01,589 --> 00:03:58,480
those ten days

101
00:04:03,910 --> 00:04:01,599
so crew members the operations consist

102
00:04:06,710 --> 00:04:03,920
of mixing the sample

103
00:04:09,429 --> 00:04:06,720
setting the camera and the flash

104
00:04:11,190 --> 00:04:09,439
and once this is all set it runs for 10

105
00:04:13,429 --> 00:04:11,200
days automatically on the