



1
00:00:06,869 --> 00:00:05,030
the spacex is preparing for a launch on

2
00:00:08,549 --> 00:00:06,879
next friday exactly a week from now

3
00:00:10,070 --> 00:00:08,559
it'll be delivering some more supplies

4
00:00:12,709 --> 00:00:10,080
and equipment to the international space

5
00:00:14,789 --> 00:00:12,719
station as well as a lot of research and

6
00:00:17,189 --> 00:00:14,799
experiment hardware as part of that

7
00:00:19,990 --> 00:00:17,199
it'll be carrying up a special payload

8
00:00:21,029 --> 00:00:20,000
for about 12 different student teams for

9
00:00:22,470 --> 00:00:21,039
student experiments that will be

10
00:00:24,150 --> 00:00:22,480
performed on the international space

11
00:00:26,230 --> 00:00:24,160
station to talk with us a little bit

12
00:00:28,630 --> 00:00:26,240
about this special payload is dr jeff

13
00:00:30,630 --> 00:00:28,640

goldstein from the national center for

14

00:00:32,389 --> 00:00:30,640

earth and space science and education

15

00:00:34,790 --> 00:00:32,399

thanks for joining us

16

00:00:36,470 --> 00:00:34,800

thanks for being uh for having me

17

00:00:37,750 --> 00:00:36,480

so why don't we start with uh if you

18

00:00:39,750 --> 00:00:37,760

could just tell us a little bit about

19

00:00:41,190 --> 00:00:39,760

the special payload the yankee clipper

20

00:00:42,389 --> 00:00:41,200

payload can you tell us a little bit

21

00:00:44,389 --> 00:00:42,399

about that and how many students have

22

00:00:46,389 --> 00:00:44,399

been involved in these experiments

23

00:00:49,190 --> 00:00:46,399

yeah that that's our eighth flight

24

00:00:50,869 --> 00:00:49,200

opportunity to low earth orbit and the

25

00:00:52,790 --> 00:00:50,879

yankee clipper payload is part of

26

00:00:56,150 --> 00:00:52,800

mission six to the international space

27

00:00:58,229 --> 00:00:56,160

station there are 18 experiments aboard

28

00:01:00,310 --> 00:00:58,239

yankee clipper and each experiment

29

00:01:02,389 --> 00:01:00,320

represents the culmination of hundreds

30

00:01:04,710 --> 00:01:02,399

of students at the local level in a

31

00:01:06,950 --> 00:01:04,720

school district or a community

32

00:01:09,190 --> 00:01:06,960

um designing microgravity experiments

33

00:01:12,149 --> 00:01:09,200

and and writing formal research

34

00:01:15,510 --> 00:01:12,159

proposals just like professionals so

35

00:01:17,590 --> 00:01:15,520

across the entire yankee clipper payload

36

00:01:19,270 --> 00:01:17,600

those 18 experiments represent the

37

00:01:22,469 --> 00:01:19,280

combination of 6

38

00:01:25,710 --> 00:01:22,479

900 students fully immersed in formal

39

00:01:28,149 --> 00:01:25,720

microgravity experiment design and 1

40

00:01:30,230 --> 00:01:28,159

1487 proposals

41

00:01:33,350 --> 00:01:30,240

submitted by student teams for flight

42

00:01:35,350 --> 00:01:33,360

experiments and then one experiment is

43

00:01:37,350 --> 00:01:35,360

selected to fly for each community so

44

00:01:39,990 --> 00:01:37,360

the student flight team

45

00:01:42,950 --> 00:01:40,000

truly represent an ambassadorial corps

46

00:01:44,870 --> 00:01:42,960

for the hundreds of students back home

47

00:01:47,350 --> 00:01:44,880

that are absolutely invested in this

48

00:01:49,429 --> 00:01:47,360

effort and feel that they are part of

49

00:01:51,190 --> 00:01:49,439

america's space program

50

00:01:53,270 --> 00:01:51,200

that's amazing

51
00:01:54,950 --> 00:01:53,280
so some of these experiments are at

52
00:01:57,990 --> 00:01:54,960
least some of them are reconstituted

53
00:02:00,469 --> 00:01:58,000
experiments that were lost on the recent

54
00:02:02,789 --> 00:02:00,479
loss of the orbital cygnus vehicle and

55
00:02:04,950 --> 00:02:02,799
these teams turned around in less than

56
00:02:07,109 --> 00:02:04,960
two months to get their experiments

57
00:02:09,270 --> 00:02:07,119
reflown on spacex can you tell us a

58
00:02:10,630 --> 00:02:09,280
little bit about that effort yeah well

59
00:02:12,949 --> 00:02:10,640
the these teams are designing

60
00:02:15,589 --> 00:02:12,959
experiments over a whole range of

61
00:02:17,270 --> 00:02:15,599
possible uh science disciplines um you

62
00:02:19,270 --> 00:02:17,280
know i'm looking down at my spreadsheet

63
00:02:21,750 --> 00:02:19,280

here crystal growth composting seed

64

00:02:23,670 --> 00:02:21,760

germination life cycle of micro aquatic

65

00:02:26,070 --> 00:02:23,680

life tin whisker growth

66

00:02:28,550 --> 00:02:26,080

food preservation bacterial studies i

67

00:02:30,550 --> 00:02:28,560

mean it's a smattering of what we see

68

00:02:33,190 --> 00:02:30,560

from the professional community

69

00:02:34,270 --> 00:02:33,200

and on october 28th

70

00:02:37,589 --> 00:02:34,280

we had

71

00:02:39,110 --> 00:02:37,599

130 delegates from the ssep the student

72

00:02:40,390 --> 00:02:39,120

space flight experiments program

73

00:02:43,910 --> 00:02:40,400

communities

74

00:02:45,270 --> 00:02:43,920

um at the launch site we had 42 student

75

00:02:47,830 --> 00:02:45,280

researchers

76

00:02:50,150 --> 00:02:47,840

and we were at a public site arbuckle

77

00:02:52,869 --> 00:02:50,160

neck road which i think is the closest

78

00:02:54,070 --> 00:02:52,879

viewing site that's um within the safety

79

00:02:56,630 --> 00:02:54,080

zone

80

00:02:59,589 --> 00:02:56,640

it's only 1.7 miles away from the launch

81

00:03:02,470 --> 00:02:59,599

pad and the road terminates on the water

82

00:03:04,390 --> 00:03:02,480

oyster bay and looking a lot

83

00:03:06,949 --> 00:03:04,400

past the water you can see the the

84

00:03:08,630 --> 00:03:06,959

rocket on pad 0a

85

00:03:11,589 --> 00:03:08,640

and just to give you a sense of what it

86

00:03:13,110 --> 00:03:11,599

was like um this was a night launch um

87

00:03:16,470 --> 00:03:13,120

the sun was setting

88

00:03:19,110 --> 00:03:16,480

the moon hung very low um in the sky the

89

00:03:21,830 --> 00:03:19,120

rocket was awash in in spotlights

90

00:03:23,830 --> 00:03:21,840

floodlights it was a beautiful night

91

00:03:25,670 --> 00:03:23,840

this was the second time we came we had

92

00:03:27,670 --> 00:03:25,680

been there the night before

93

00:03:28,789 --> 00:03:27,680

uh but that was scrubbed because if you

94

00:03:30,390 --> 00:03:28,799

remember there was a boat in the

95

00:03:32,869 --> 00:03:30,400

restricted zone

96

00:03:35,670 --> 00:03:32,879

and this time we got past that t-minus

97

00:03:37,190 --> 00:03:35,680

12-second hold and everybody felt that

98

00:03:38,229 --> 00:03:37,200

that it was going to fly this time

99

00:03:41,270 --> 00:03:38,239

around

100

00:03:42,710 --> 00:03:41,280

and we had a patch to mission control

101
00:03:45,509 --> 00:03:42,720
and brought up

102
00:03:47,990 --> 00:03:45,519
a portable pa system with us so we had

103
00:03:49,350 --> 00:03:48,000
mission control filling the air on the

104
00:03:51,990 --> 00:03:49,360
shoreline

105
00:03:53,750 --> 00:03:52,000
and uh we we all got together and did

106
00:03:55,910 --> 00:03:53,760
the 10 second countdown and you could

107
00:03:58,229 --> 00:03:55,920
look at the faces i remembered it i took

108
00:04:00,869 --> 00:03:58,239
time to look at everybody's face

109
00:04:03,429 --> 00:04:00,879
and you could see a for euphoria um in

110
00:04:05,750 --> 00:04:03,439
both young and old young and old across

111
00:04:08,949 --> 00:04:05,760
generational lines there was this

112
00:04:10,630 --> 00:04:08,959
euphoria and this spirit of exploration

113
00:04:14,229 --> 00:04:10,640

in everyone's face

114

00:04:16,710 --> 00:04:14,239

and the rocket ignited and everybody was

115

00:04:19,509 --> 00:04:16,720

cheering and then it became very clear

116

00:04:21,110 --> 00:04:19,519

that something was very wrong and a few

117

00:04:22,469 --> 00:04:21,120

seconds later there was a massive

118

00:04:24,469 --> 00:04:22,479

detonation

119

00:04:25,590 --> 00:04:24,479

two seconds after that the blast wave

120

00:04:28,790 --> 00:04:25,600

hit us

121

00:04:31,189 --> 00:04:28,800

and it went from euphoria to despair and

122

00:04:33,670 --> 00:04:31,199

security was incredibly effective they

123

00:04:35,670 --> 00:04:33,680

hustled us out of there very quickly

124

00:04:37,909 --> 00:04:35,680

and many of our teams we didn't have any

125

00:04:40,550 --> 00:04:37,919

time to decompress they they were they

126
00:04:43,430 --> 00:04:40,560
were scattering and many

127
00:04:45,430 --> 00:04:43,440
drove through the night to get back home

128
00:04:47,350 --> 00:04:45,440
in the midst of this depression

129
00:04:49,430 --> 00:04:47,360
and this was a national news story there

130
00:04:52,550 --> 00:04:49,440
were media outlets that were waiting for

131
00:04:54,870 --> 00:04:52,560
them in the in the early morning hours

132
00:04:57,430 --> 00:04:54,880
and what we were trying to do on social

133
00:04:58,950 --> 00:04:57,440
media is keep their spirits alive and

134
00:05:01,029 --> 00:04:58,960
let them understand that you know

135
00:05:02,150 --> 00:05:01,039
failure is a part of life failure

136
00:05:04,550 --> 00:05:02,160
happens

137
00:05:06,469 --> 00:05:04,560
and what we do in the face of failure

138
00:05:08,950 --> 00:05:06,479

defines who we are

139

00:05:11,430 --> 00:05:08,960

and we didn't know how mission 6 was

140

00:05:13,590 --> 00:05:11,440

going to proceed but we

141

00:05:15,749 --> 00:05:13,600

we sort of got a glimpse of this very

142

00:05:18,629 --> 00:05:15,759

quickly within with le within less than

143

00:05:21,350 --> 00:05:18,639

an hour of the accident

144

00:05:23,430 --> 00:05:21,360

jeff member the uh managing director of

145

00:05:24,950 --> 00:05:23,440

nanorack's alarm services provider

146

00:05:27,909 --> 00:05:24,960

called me

147

00:05:30,870 --> 00:05:27,919

and said we are uh working on

148

00:05:32,629 --> 00:05:30,880

on on how we can re-manifest this and

149

00:05:35,110 --> 00:05:32,639

behind the scenes he was talking with

150

00:05:37,430 --> 00:05:35,120

nasa the space station uh the space

151

00:05:38,950 --> 00:05:37,440

station office he was talking to folks

152

00:05:41,029 --> 00:05:38,960

at the white house

153

00:05:42,710 --> 00:05:41,039

and we were just telling the students

154

00:05:44,310 --> 00:05:42,720

we're trying to figure out how we can

155

00:05:46,310 --> 00:05:44,320

make this work whether it's going to be

156

00:05:48,469 --> 00:05:46,320

six months a year we didn't know what

157

00:05:51,749 --> 00:05:48,479

the turnaround time would be our hearts

158

00:05:53,830 --> 00:05:51,759

went out to nasa and orbital sciences

159

00:05:55,270 --> 00:05:53,840

and then within a week we were notified

160

00:05:58,790 --> 00:05:55,280

we were given marching orders by

161

00:06:02,070 --> 00:05:58,800

nanoracks that we need to move forward

162

00:06:03,189 --> 00:06:02,080

and process a new uh yankee clipper two

163

00:06:06,629 --> 00:06:03,199

payload

164

00:06:09,909 --> 00:06:06,639

by november 21st it had to be in houston

165

00:06:12,150 --> 00:06:09,919

my by november 21st just three weeks

166

00:06:14,390 --> 00:06:12,160

after the accident because nasa had

167

00:06:16,950 --> 00:06:14,400

pulled non-essential payload

168

00:06:19,749 --> 00:06:16,960

off of spacex five and was making room

169

00:06:21,749 --> 00:06:19,759

for this um for this new uh

170

00:06:25,029 --> 00:06:21,759

reconstituted payload

171

00:06:27,590 --> 00:06:25,039

and um all of the teams um really

172

00:06:29,270 --> 00:06:27,600

stepped to the plate on this um they

173

00:06:32,150 --> 00:06:29,280

they felt that you know this was a

174

00:06:34,390 --> 00:06:32,160

life-changing experience that they were

175

00:06:37,590 --> 00:06:34,400

really part of

176
00:06:40,070 --> 00:06:37,600
the space program and they all

177
00:06:43,270 --> 00:06:40,080
17 of the 18 experiments

178
00:06:45,749 --> 00:06:43,280
um were reconstituted and got to houston

179
00:06:47,189 --> 00:06:45,759
for payload integration on time

180
00:06:49,029 --> 00:06:47,199
they stepped to the plate and did

181
00:06:51,350 --> 00:06:49,039
everything expected of a profession

182
00:06:53,350 --> 00:06:51,360
professional microgravity researchers

183
00:06:55,589 --> 00:06:53,360
and the 18th experiment didn't make it

184
00:06:56,790 --> 00:06:55,599
on only because there was a swap out of

185
00:06:59,029 --> 00:06:56,800
one uh

186
00:07:01,110 --> 00:06:59,039
critical component so they needed to go

187
00:07:02,230 --> 00:07:01,120
through flight safety review review

188
00:07:04,550 --> 00:07:02,240

again and they're going to be flying

189

00:07:07,589 --> 00:07:04,560

with mission seven so we are go for

190

00:07:09,749 --> 00:07:07,599

launch we are incredibly excited and we

191

00:07:12,390 --> 00:07:09,759

are very um proud to be part of the

192

00:07:14,550 --> 00:07:12,400

space community dr goldstein we're so

193

00:07:15,990 --> 00:07:14,560

excited that that the teams were able to

194

00:07:17,350 --> 00:07:16,000

jump into action and get these

195

00:07:18,469 --> 00:07:17,360

experiments put back together to be

196

00:07:20,790 --> 00:07:18,479

reflown

197

00:07:22,070 --> 00:07:20,800

i know we just have one minute left you

198

00:07:23,430 --> 00:07:22,080

kind of spoke to it but i guess i'm just

199

00:07:25,270 --> 00:07:23,440

kind of curious what is the sentiments

200

00:07:27,430 --> 00:07:25,280

of the students now

201
00:07:30,070 --> 00:07:27,440
um i think

202
00:07:32,150 --> 00:07:30,080
there's a higher level of euphoria now

203
00:07:35,110 --> 00:07:32,160
than there was before

204
00:07:38,309 --> 00:07:35,120
because we you know we met the challenge

205
00:07:41,270 --> 00:07:38,319
and came through and i think um this is

206
00:07:43,830 --> 00:07:41,280
really an incredibly powerful lesson

207
00:07:46,230 --> 00:07:43,840
that um you know research is not

208
00:07:49,270 --> 00:07:46,240
supposed to be easy human exploration is

209
00:07:50,309 --> 00:07:49,280
not supposed to be easy it's hard

210
00:07:52,629 --> 00:07:50,319
so what

211
00:07:54,710 --> 00:07:52,639
failure happens and we just got to punch

212
00:07:55,589 --> 00:07:54,720
through it and that's what we all did

213
00:07:58,790 --> 00:07:55,599

so we