
PAO

1
00:00:04,950 --> 00:00:03,030
hi welcome to the international space

2
00:00:07,590 --> 00:00:04,960
station flight control room as promised

3
00:00:10,150 --> 00:00:07,600
we have a guest with us here on the pao

4
00:00:12,150 --> 00:00:10,160
console today paul abel who is the lead

5
00:00:13,350 --> 00:00:12,160
scientist for planetary small bodies and

6
00:00:15,669 --> 00:00:13,360
he is going to tell us a little bit

7
00:00:17,670 --> 00:00:15,679
about subjects i think it's of interest

8
00:00:19,990 --> 00:00:17,680
to a lot of people the meteor that hit

9
00:00:21,429 --> 00:00:20,000
the ground in russia on friday thanks so

10
00:00:22,630 --> 00:00:21,439
much for coming paul thank you very much

11
00:00:24,870 --> 00:00:22,640
for having me

12
00:00:26,710 --> 00:00:24,880
well okay so tell us what exactly

13
00:00:29,910 --> 00:00:26,720

happened on friday let's start there

14
00:00:31,910 --> 00:00:29,920
okay so friday morning about 9 20 in the

15
00:00:34,310 --> 00:00:31,920
morning rush the time

16
00:00:36,310 --> 00:00:34,320
we had an object that came in and it

17
00:00:37,830 --> 00:00:36,320
exploded in the upper atmosphere over

18
00:00:39,270 --> 00:00:37,840
chapelensk

19
00:00:42,069 --> 00:00:39,280
russia it's a town in the southern

20
00:00:43,110 --> 00:00:42,079
murals in russia okay and it was a

21
00:00:44,950 --> 00:00:43,120
meteor

22
00:00:46,630 --> 00:00:44,960
yeah it actually was a small asteroid or

23
00:00:48,709 --> 00:00:46,640
a big meteor either one

24
00:00:51,110 --> 00:00:48,719
it's the the asteroid was about 15

25
00:00:53,189 --> 00:00:51,120
meters in diameter came in very fast

26
00:00:54,950 --> 00:00:53,199
about 18 kilometers per second and we

27
00:00:57,270 --> 00:00:54,960
think exploded at an altitude of about

28
00:00:58,869 --> 00:00:57,280
20 kilometers

29
00:01:00,549 --> 00:00:58,879
it exploded before it hit the ground it

30
00:01:01,830 --> 00:01:00,559
didn't actually hit the ground i guess

31
00:01:04,390 --> 00:01:01,840
yeah that's right so this was an air

32
00:01:05,990 --> 00:01:04,400
burst um meteorites hit the ground this

33
00:01:08,870 --> 00:01:06,000
actually object didn't hit the ground

34
00:01:10,950 --> 00:01:08,880
intact it actually burst or exploded

35
00:01:12,390 --> 00:01:10,960
about 20 kilometers up and fragments

36
00:01:14,230 --> 00:01:12,400
actually fell to the ground so right now

37
00:01:16,310 --> 00:01:14,240
what the russians are doing are actually

38
00:01:17,830 --> 00:01:16,320

trying to recover those fragments

39
00:01:20,310 --> 00:01:17,840
do you know anything at this point about

40
00:01:22,390 --> 00:01:20,320
what the meteor was made of or where it

41
00:01:24,070 --> 00:01:22,400
was coming from anything like that yeah

42
00:01:26,789 --> 00:01:24,080
actually we think the the meteor or the

43
00:01:29,830 --> 00:01:26,799
asteroid was made of rock so we think a

44
00:01:31,270 --> 00:01:29,840
15 meter diameter rocky asteroid the

45
00:01:33,030 --> 00:01:31,280
reason we think that is because it had

46
00:01:34,310 --> 00:01:33,040
actually burst at altitude if it was a

47
00:01:36,069 --> 00:01:34,320
solid iron

48
00:01:38,390 --> 00:01:36,079
it may have made it all the way to the

49
00:01:40,149 --> 00:01:38,400
ground before exploding in the air we

50
00:01:42,469 --> 00:01:40,159
also have some fragments initial reports

51
00:01:45,350 --> 00:01:42,479
from the russians suggest it may be a

52
00:01:46,630 --> 00:01:45,360
rocky material what causes it to explode

53
00:01:47,749 --> 00:01:46,640
in the air rather than go all the way to

54
00:01:50,069 --> 00:01:47,759
the ground

55
00:01:51,749 --> 00:01:50,079
so rocky asteroids are a little bit

56
00:01:53,510 --> 00:01:51,759
weaker than the solid iron if you think

57
00:01:56,389 --> 00:01:53,520
of battleship armor it's very very tough

58
00:01:58,310 --> 00:01:56,399
very strong rock is not nearly as strong

59
00:01:59,990 --> 00:01:58,320
and moving so fast it gets to a certain

60
00:02:01,270 --> 00:02:00,000
point in the atmosphere where the

61
00:02:03,030 --> 00:02:01,280
density of the atmosphere the lower

62
00:02:04,870 --> 00:02:03,040
atmosphere causes the asteroid actually

63
00:02:06,630 --> 00:02:04,880

to explode it can't punch its way

64
00:02:09,669 --> 00:02:06,640
through and that's why they had the air

65
00:02:11,110 --> 00:02:09,679
burst okay and i guess it's unusual

66
00:02:13,030 --> 00:02:11,120
fairly unusual for one to make its way

67
00:02:14,390 --> 00:02:13,040
through our atmosphere at all right yeah

68
00:02:16,390 --> 00:02:14,400
usually the ones that have to make it

69
00:02:19,430 --> 00:02:16,400
through the atmosphere are in intact at

70
00:02:21,510 --> 00:02:19,440
hyper velocity are much much bigger

71
00:02:23,030 --> 00:02:21,520
you think about the dinosaur impact 65

72
00:02:24,550 --> 00:02:23,040
million years ago that was a much much

73
00:02:26,470 --> 00:02:24,560
bigger asteroid that was about a 10

74
00:02:28,150 --> 00:02:26,480
kilometer diameter asteroid and that

75
00:02:30,470 --> 00:02:28,160
made an impact crater all the way to the

76
00:02:32,309 --> 00:02:30,480
ground in mexico this one was much

77
00:02:34,550 --> 00:02:32,319
smaller like i said 15 meters in

78
00:02:36,150 --> 00:02:34,560
diameter and it exploded at altitude

79
00:02:37,670 --> 00:02:36,160
some piece of it actually made it to the

80
00:02:39,270 --> 00:02:37,680
ground but they just fall they don't

81
00:02:41,110 --> 00:02:39,280
come in at high speed

82
00:02:42,390 --> 00:02:41,120
okay and how often would you say that

83
00:02:44,550 --> 00:02:42,400
that happens

84
00:02:47,430 --> 00:02:44,560
so we get hit by material all the time

85
00:02:50,070 --> 00:02:47,440
the earth sweeps up about 80 to 100 tons

86
00:02:51,509 --> 00:02:50,080
of meteor meteorites meteor material so

87
00:02:53,110 --> 00:02:51,519
there's a lot of stuff falling on us but

88
00:02:55,509 --> 00:02:53,120

it's usually very small and we don't

89
00:02:57,190 --> 00:02:55,519
notice it our atmosphere protects us

90
00:02:58,470 --> 00:02:57,200
so that smaller size stuff we don't

91
00:03:00,309 --> 00:02:58,480
really worry about

92
00:03:02,070 --> 00:03:00,319
something like this size

93
00:03:03,750 --> 00:03:02,080
and a little bit bigger happens maybe

94
00:03:06,470 --> 00:03:03,760
once every hundred years the last time

95
00:03:09,910 --> 00:03:06,480
we had an event of this magnitude was in

96
00:03:11,990 --> 00:03:09,920
1908 over tunguska siberia and russia as

97
00:03:13,430 --> 00:03:12,000
well but that was a much bigger object

98
00:03:15,910 --> 00:03:13,440
it was about a

99
00:03:18,309 --> 00:03:15,920
50 meter object and that exploded again

100
00:03:19,670 --> 00:03:18,319
at altitude but had much more energy

101
00:03:21,190 --> 00:03:19,680
associated with it

102
00:03:22,710 --> 00:03:21,200
okay so they're

103
00:03:25,430 --> 00:03:22,720
reasonably rare we don't have to worry

104
00:03:26,949 --> 00:03:25,440
about one happening every day um the two

105
00:03:28,949 --> 00:03:26,959
that you mentioned both were over russia

106
00:03:31,589 --> 00:03:28,959
could it happen anywhere yeah these

107
00:03:33,589 --> 00:03:31,599
these objects come come in all the time

108
00:03:36,390 --> 00:03:33,599
we have basketball-sized things hitting

109
00:03:37,910 --> 00:03:36,400
the earth probably about once a month

110
00:03:39,589 --> 00:03:37,920
the reason why these things happen in

111
00:03:41,270 --> 00:03:39,599
russia is russia is just a big landmass

112
00:03:43,270 --> 00:03:41,280
it's just a coincidence that the last

113
00:03:44,949 --> 00:03:43,280

big one happened in siberia this one

114
00:03:46,470 --> 00:03:44,959
happened in the southern urals russia is

115
00:03:48,229 --> 00:03:46,480
just a very large land mass there's

116
00:03:49,830 --> 00:03:48,239
nothing unique about russia

117
00:03:51,430 --> 00:03:49,840
these things don't have an agenda

118
00:03:53,030 --> 00:03:51,440
against russia it's just

119
00:03:54,390 --> 00:03:53,040
la russia is a very large landmass and

120
00:03:56,149 --> 00:03:54,400
these things happen and fall all over

121
00:03:57,910 --> 00:03:56,159
the world in fact we have meteorites in

122
00:03:59,750 --> 00:03:57,920
antarctica we have a team that goes down

123
00:04:01,270 --> 00:03:59,760
there every year and recover meteorites

124
00:04:03,110 --> 00:04:01,280
from antarctica so this type of material

125
00:04:04,949 --> 00:04:03,120
they fall all over the earth and i know

126
00:04:06,710 --> 00:04:04,959
y'all keep track of a lot of what's

127
00:04:08,630 --> 00:04:06,720
orbiting in space in part to make sure

128
00:04:10,789 --> 00:04:08,640
that the space station is not going to

129
00:04:12,070 --> 00:04:10,799
come across any of its paths right yeah

130
00:04:13,429 --> 00:04:12,080
that's correct so there's another

131
00:04:15,350 --> 00:04:13,439
department so

132
00:04:16,949 --> 00:04:15,360
i am associated with a near-earth object

133
00:04:18,789 --> 00:04:16,959
program so natural

134
00:04:20,870 --> 00:04:18,799
asteroids and meteorites and things and

135
00:04:22,790 --> 00:04:20,880
there's another program office that's

136
00:04:24,950 --> 00:04:22,800
concerning itself with orbital debris

137
00:04:26,230 --> 00:04:24,960
and we track the orbital debris we make

138
00:04:28,390 --> 00:04:26,240

sure the station and any other

139
00:04:30,310 --> 00:04:28,400
satellites are safe and if if need be we

140
00:04:32,469 --> 00:04:30,320
can maneuver out of the way okay and

141
00:04:34,870 --> 00:04:32,479
orbital debris is man-made generally

142
00:04:36,710 --> 00:04:34,880
yeah it's man-made space junk it's bits

143
00:04:38,790 --> 00:04:36,720
of satellites rocket bodies things like

144
00:04:41,030 --> 00:04:38,800
that that are no longer in use and still

145
00:04:42,629 --> 00:04:41,040
flying around the orbit of earth and so

146
00:04:44,550 --> 00:04:42,639
a lot of times when we hear the space

147
00:04:46,870 --> 00:04:44,560
station has to move to avoid it's

148
00:04:48,710 --> 00:04:46,880
usually something it's usually orbital

149
00:04:49,990 --> 00:04:48,720
debris right it's usually man-made

150
00:04:52,790 --> 00:04:50,000
that's correct it's usually orbital

151
00:04:54,230 --> 00:04:52,800
debris yeah okay um now do we keep track

152
00:04:56,230 --> 00:04:54,240
of things like meteorites and stay out

153
00:04:58,790 --> 00:04:56,240
of their way as well so yes just like we

154
00:05:00,550 --> 00:04:58,800
keep track of orbital debris we keep

155
00:05:02,629 --> 00:05:00,560
track of these asteroids

156
00:05:03,990 --> 00:05:02,639
we do have a survey program ground-based

157
00:05:06,230 --> 00:05:04,000
survey program

158
00:05:07,909 --> 00:05:06,240
that keeps track of as much of these

159
00:05:10,629 --> 00:05:07,919
asteroids as we can

160
00:05:13,189 --> 00:05:10,639
right now we have about 9 600 near-earth

161
00:05:15,990 --> 00:05:13,199
objects being tracked and cataloged 9

162
00:05:17,830 --> 00:05:16,000
600. 9 600 yeah there's actually there's

163
00:05:20,230 --> 00:05:17,840

a lot more out there this is what we

164
00:05:21,430 --> 00:05:20,240
know right now in our in our current

165
00:05:23,350 --> 00:05:21,440
catalog

166
00:05:25,909 --> 00:05:23,360
the biggest is about 30 kilometers the

167
00:05:28,310 --> 00:05:25,919
smallest is a few meters across

168
00:05:30,390 --> 00:05:28,320
just so you know um you know the big

169
00:05:32,710 --> 00:05:30,400
ones uh like the 30 kilometer on station

170
00:05:34,230 --> 00:05:32,720
there's no danger from those guys right

171
00:05:37,029 --> 00:05:34,240
so the thing that we're working on right

172
00:05:39,749 --> 00:05:37,039
now is concentrating on finding all the

173
00:05:42,469 --> 00:05:39,759
one kilometer diameter sized objects and

174
00:05:44,230 --> 00:05:42,479
up one kilometer that's still pretty big

175
00:05:46,310 --> 00:05:44,240
yeah it's really big and the reason why

176
00:05:48,310 --> 00:05:46,320
we concentrate on those is we want to

177
00:05:50,629 --> 00:05:48,320
make sure that the earth is safe the one

178
00:05:52,390 --> 00:05:50,639
kilometer and up the bigger guys are the

179
00:05:54,550 --> 00:05:52,400
ones that can give us a bad day a really

180
00:05:56,150 --> 00:05:54,560
bad day sort of like global devastation

181
00:05:57,430 --> 00:05:56,160
so we concentrate on those first and

182
00:05:59,909 --> 00:05:57,440
we're actually doing a really good job

183
00:06:01,350 --> 00:05:59,919
on those guys we've got about 95

184
00:06:02,870 --> 00:06:01,360
of those guys cataloged we know where

185
00:06:04,150 --> 00:06:02,880
they are they're not in dangerous orbits

186
00:06:05,830 --> 00:06:04,160
and there's no threat to the earth we

187
00:06:07,590 --> 00:06:05,840
still got a little bit of work to do we

188
00:06:08,469 --> 00:06:07,600

get about another five percent uh to

189
00:06:10,469 --> 00:06:08,479
find

190
00:06:11,990 --> 00:06:10,479
and then we have to start working on the

191
00:06:13,510 --> 00:06:12,000
smaller ones and this is where we we

192
00:06:14,870 --> 00:06:13,520
need a little bit more effort and work

193
00:06:16,870 --> 00:06:14,880
and we're working on that very hard

194
00:06:19,110 --> 00:06:16,880
right now how do you how do you find

195
00:06:21,189 --> 00:06:19,120
them to begin with big ones are small

196
00:06:22,950 --> 00:06:21,199
really good questions so one of the best

197
00:06:23,670 --> 00:06:22,960
ways to do it is through telescopes

198
00:06:25,029 --> 00:06:23,680
right

199
00:06:25,990 --> 00:06:25,039
these asteroids

200
00:06:27,270 --> 00:06:26,000
reflect

201
00:06:29,029 --> 00:06:27,280
sunlight off their surface they don't

202
00:06:31,189 --> 00:06:29,039
give light off they look like stars

203
00:06:32,870 --> 00:06:31,199
except they move very quickly so we use

204
00:06:34,870 --> 00:06:32,880
ground-based telescopes looking in

205
00:06:36,950 --> 00:06:34,880
optical wavelengths just visible light

206
00:06:39,590 --> 00:06:36,960
and we try and scan the sky and we pick

207
00:06:41,029 --> 00:06:39,600
them up and catalog them and track their

208
00:06:43,029 --> 00:06:41,039
orbits that way

209
00:06:44,070 --> 00:06:43,039
can you do that with just any telescope

210
00:06:45,670 --> 00:06:44,080
or does that have to be a pretty

211
00:06:47,590 --> 00:06:45,680
powerful one

212
00:06:49,749 --> 00:06:47,600
it has to be a little bit sophisticated

213
00:06:52,790 --> 00:06:49,759

we we have some big telescopes we have

214
00:06:54,629 --> 00:06:52,800
meter meter sky size class telescopes

215
00:06:56,469 --> 00:06:54,639
we also have one space based asset that

216
00:06:57,510 --> 00:06:56,479
has been helping us too called neowise

217
00:06:59,029 --> 00:06:57,520
that

218
00:07:00,710 --> 00:06:59,039
currently is offline right now but we're

219
00:07:02,150 --> 00:07:00,720
hoping to bring it back

220
00:07:03,909 --> 00:07:02,160
it's been it's been doing some great

221
00:07:05,589 --> 00:07:03,919
stuff for us but the telescopes that are

222
00:07:07,029 --> 00:07:05,599
typically used aren't really really big

223
00:07:08,870 --> 00:07:07,039
they're not um like the eight meter or

224
00:07:10,950 --> 00:07:08,880
ten meter class but they're a few meters

225
00:07:13,270 --> 00:07:10,960
a few meters across it's mainly more the

226
00:07:15,670 --> 00:07:13,280
software and the people behind them uh

227
00:07:16,790 --> 00:07:15,680
that do the job and we also have i

228
00:07:18,870 --> 00:07:16,800
should point out some very good

229
00:07:22,070 --> 00:07:18,880
professional level amateurs they don't

230
00:07:23,430 --> 00:07:22,080
get paid like i do working for nasa but

231
00:07:25,350 --> 00:07:23,440
they're very very good and they actually

232
00:07:26,629 --> 00:07:25,360
help us out a lot tracking and keeping

233
00:07:28,469 --> 00:07:26,639
track of where these guys are well

234
00:07:30,150 --> 00:07:28,479
that's interesting a pretty big network

235
00:07:32,230 --> 00:07:30,160
you said i wouldn't say it's a real big

236
00:07:34,230 --> 00:07:32,240
network but it's a sizable network it's

237
00:07:35,589 --> 00:07:34,240
an international cooperative network we

238
00:07:37,350 --> 00:07:35,599

have telescopes in the northern

239
00:07:39,189 --> 00:07:37,360
hemisphere in the southern hemisphere

240
00:07:41,670 --> 00:07:39,199
all over the world and helping us to

241
00:07:43,110 --> 00:07:41,680
keep track of these objects that's great

242
00:07:44,629 --> 00:07:43,120
so i know there was some confusion

243
00:07:45,909 --> 00:07:44,639
though on friday about one of these

244
00:07:50,550 --> 00:07:45,919
larger objects that y'all had been

245
00:07:52,230 --> 00:07:50,560
tracking i think a da-14 yes 2012 da14

246
00:07:54,150 --> 00:07:52,240
this was an object that was about 50

247
00:07:56,629 --> 00:07:54,160
meters across and

248
00:07:58,070 --> 00:07:56,639
we discovered it um a year ago and

249
00:07:59,909 --> 00:07:58,080
actually was a one of these professional

250
00:08:01,510 --> 00:07:59,919
amateur groups that i mentioned earlier

251
00:08:04,629 --> 00:08:01,520
that actually discovered this particular

252
00:08:06,230 --> 00:08:04,639
object wow and um yeah they they uh did

253
00:08:07,589 --> 00:08:06,240
a great job and we were able to track it

254
00:08:09,990 --> 00:08:07,599
and we knew that it was going to make a

255
00:08:12,070 --> 00:08:10,000
very close approach uh to the planet so

256
00:08:14,070 --> 00:08:12,080
we were all set up watching for that the

257
00:08:16,710 --> 00:08:14,080
russian event that happened was a

258
00:08:18,150 --> 00:08:16,720
complete coincidence it was in no way

259
00:08:21,510 --> 00:08:18,160
related to

260
00:08:22,629 --> 00:08:21,520
da14 2012 da14 the orbits are completely

261
00:08:24,629 --> 00:08:22,639
different

262
00:08:27,830 --> 00:08:24,639
the orbit of the russian event was an

263
00:08:31,110 --> 00:08:27,840

east-west uh entry and the orbit of da

264
00:08:32,790 --> 00:08:31,120
14 was north sorry south to north so no

265
00:08:34,709 --> 00:08:32,800
way related okay it's completely

266
00:08:36,469 --> 00:08:34,719
separate just happened to take place on

267
00:08:38,709 --> 00:08:36,479
the same day exactly pretty big

268
00:08:42,790 --> 00:08:38,719
coincidence a remarkable coincidence yes

269
00:08:44,230 --> 00:08:42,800
okay um but now so the one in russia if

270
00:08:46,070 --> 00:08:44,240
that had

271
00:08:48,710 --> 00:08:46,080
been over the ocean or something like

272
00:08:50,070 --> 00:08:48,720
that would we have known about it

273
00:08:51,829 --> 00:08:50,080
yeah we would have known about it um i

274
00:08:53,670 --> 00:08:51,839
don't think we would have as good video

275
00:08:55,430 --> 00:08:53,680
and one we had remarkable videos and

276
00:08:57,030 --> 00:08:55,440
we're really anxious to look at that

277
00:08:58,389 --> 00:08:57,040
data

278
00:09:00,870 --> 00:08:58,399
basically in russia they had all these

279
00:09:03,030 --> 00:09:00,880
dash cams and a lot of security camera

280
00:09:04,710 --> 00:09:03,040
footage so it happened over a major city

281
00:09:06,310 --> 00:09:04,720
uh population center so we got lots of

282
00:09:08,389 --> 00:09:06,320
good footage if it happened over the

283
00:09:10,470 --> 00:09:08,399
ocean you wouldn't have the video but we

284
00:09:11,990 --> 00:09:10,480
would be able to know about it we have

285
00:09:14,630 --> 00:09:12,000
satellites in orbit

286
00:09:17,110 --> 00:09:14,640
that look for these type of explosions

287
00:09:19,590 --> 00:09:17,120
we also have infrared infrasound

288
00:09:21,750 --> 00:09:19,600

stations these are stations set up

289
00:09:23,269 --> 00:09:21,760
to monitor big explosions basically

290
00:09:25,670 --> 00:09:23,279
nuclear explosions sort of part of the

291
00:09:28,070 --> 00:09:25,680
nuclear test ban treaty and they monitor

292
00:09:29,910 --> 00:09:28,080
and listen for explosions and so they

293
00:09:31,509 --> 00:09:29,920
would have picked up this event even if

294
00:09:32,710 --> 00:09:31,519
it had been over the open ocean so it's

295
00:09:33,590 --> 00:09:32,720
not happening every day and we just

296
00:09:36,070 --> 00:09:33,600
don't know about it because it's not

297
00:09:37,509 --> 00:09:36,080
over city exactly yeah we even know that

298
00:09:39,430 --> 00:09:37,519
it's not happening every day all right

299
00:09:41,990 --> 00:09:39,440
um well what what's next what do you do

300
00:09:43,990 --> 00:09:42,000
at this point to learn how to learn more

301
00:09:45,829 --> 00:09:44,000
or go on from here so one of the things

302
00:09:47,430 --> 00:09:45,839
we've got to do is obviously we'd like

303
00:09:49,190 --> 00:09:47,440
to recover as many fragments and pieces

304
00:09:51,430 --> 00:09:49,200
as we can there's supposedly a very

305
00:09:53,190 --> 00:09:51,440
large fragment that fell in a lake uh

306
00:09:54,550 --> 00:09:53,200
punched this way through the ice so we

307
00:09:56,070 --> 00:09:54,560
were in the process of working with our

308
00:09:58,070 --> 00:09:56,080
russian colleagues to try and recover

309
00:09:59,590 --> 00:09:58,080
that we'd also get like to get an idea

310
00:10:01,590 --> 00:09:59,600
of the composition of the object find

311
00:10:03,269 --> 00:10:01,600
out exactly what was made of and then do

312
00:10:04,710 --> 00:10:03,279
some more analysis and sort of fine-tune

313
00:10:06,550 --> 00:10:04,720

the the mass

314
00:10:10,069 --> 00:10:06,560
and the size of the object and like i

315
00:10:12,630 --> 00:10:10,079
said it's between 15 and maybe 17 meters

316
00:10:16,389 --> 00:10:12,640
in diameter estimated mass is anywhere

317
00:10:18,949 --> 00:10:16,399
from 64 100 to 7 700 metric tons so it

318
00:10:20,870 --> 00:10:18,959
was a sizable object sounds like what

319
00:10:22,630 --> 00:10:20,880
can you learn from the fragments well

320
00:10:25,110 --> 00:10:22,640
from the fragments we can learn um what

321
00:10:27,750 --> 00:10:25,120
the original asteroid this is a piece of

322
00:10:29,350 --> 00:10:27,760
a bigger asteroid so learn about where

323
00:10:31,670 --> 00:10:29,360
it came from

324
00:10:33,350 --> 00:10:31,680
back out its orbit from the trajectory

325
00:10:35,509 --> 00:10:33,360
we have a preliminary orbit so we know

326
00:10:37,990 --> 00:10:35,519
that this was a a near-earth asteroid

327
00:10:40,389 --> 00:10:38,000
obviously it came and crossed our or

328
00:10:41,750 --> 00:10:40,399
orbit and hit the earth

329
00:10:43,829 --> 00:10:41,760
we want to know where it came from how

330
00:10:45,829 --> 00:10:43,839
long it's been in space we can get an

331
00:10:47,509 --> 00:10:45,839
idea by some of the fragments we can

332
00:10:49,110 --> 00:10:47,519
find out how how long it's been in space

333
00:10:50,870 --> 00:10:49,120
and when it was liberated from its

334
00:10:52,710 --> 00:10:50,880
parent body that's very interesting from

335
00:10:55,269 --> 00:10:52,720
an orbital dynamic standpoint because it

336
00:10:56,870 --> 00:10:55,279
tells us how fast things come from the

337
00:10:58,710 --> 00:10:56,880
main asteroid belt which is located

338
00:11:00,230 --> 00:10:58,720

between mars and jupiter and how fast

339
00:11:02,069 --> 00:11:00,240
things get to earth so it's another test

340
00:11:04,870 --> 00:11:02,079
of that we'd also like to learn about

341
00:11:06,470 --> 00:11:04,880
the composition because that tells us

342
00:11:08,550 --> 00:11:06,480
a little bit about its internal

343
00:11:10,870 --> 00:11:08,560
structure its strength so in future

344
00:11:12,550 --> 00:11:10,880
events we have an idea of how far these

345
00:11:14,949 --> 00:11:12,560
things can penetrate into our atmosphere

346
00:11:17,030 --> 00:11:14,959
and how how big a size range we have to

347
00:11:19,110 --> 00:11:17,040
be worried about before we have to take

348
00:11:21,269 --> 00:11:19,120
mitigation steps to prevent damage

349
00:11:23,110 --> 00:11:21,279
wow so lots to learn from that and we do

350
00:11:25,430 --> 00:11:23,120
that kind of work here at js johnson

351
00:11:27,269 --> 00:11:25,440
space center right yeah we do we we have

352
00:11:28,949 --> 00:11:27,279
astro materials research and expiration

353
00:11:29,750 --> 00:11:28,959
science directed which i am a part of

354
00:11:34,230 --> 00:11:29,760
and

355
00:11:35,670 --> 00:11:34,240
that type of information from the

356
00:11:37,350 --> 00:11:35,680
samples that we bring back here in our

357
00:11:38,870 --> 00:11:37,360
laboratories do you think you will get

358
00:11:40,870 --> 00:11:38,880
some samples from this to analyze the

359
00:11:42,790 --> 00:11:40,880
goal is to get a sample at least some

360
00:11:44,389 --> 00:11:42,800
samples from this event bring it back to

361
00:11:46,069 --> 00:11:44,399
johnson and find out all we can about

362
00:11:47,110 --> 00:11:46,079
the about the object okay well maybe

363
00:11:48,150 --> 00:11:47,120

we'll have to check back in with you

364
00:11:49,829 --> 00:11:48,160
then after you've learned a little bit

365
00:11:51,829 --> 00:11:49,839
more certainly thanks so much for

366
00:11:53,910 --> 00:11:51,839
talking with us again this was paul abel

367
00:11:55,509 --> 00:11:53,920
the lead a small body