



1
00:00:02,950 --> 00:00:01,670
happy birthday

2
00:00:04,710 --> 00:00:02,960
hey uh

3
00:00:06,389 --> 00:00:04,720
it's not actually my birthday uh though

4
00:00:07,909 --> 00:00:06,399
happy birthday to the 10 people who are

5
00:00:10,549 --> 00:00:07,919
watching this whose birthday it actually

6
00:00:12,230 --> 00:00:10,559
is i bought this balloon this big

7
00:00:13,749 --> 00:00:12,240
party balloon it's the biggest one that

8
00:00:15,829 --> 00:00:13,759
they had well at least the only size

9
00:00:18,470 --> 00:00:15,839
they had actually to illustrate some

10
00:00:20,470 --> 00:00:18,480
interesting properties of mylar balloons

11
00:00:21,750 --> 00:00:20,480
viewed with thermal cameras and the

12
00:00:23,750 --> 00:00:21,760
properties are is that when you're

13
00:00:27,029 --> 00:00:23,760

looking up at a mylar balloon it's going

14

00:00:29,589 --> 00:00:27,039

to look hot if you're looking down at a

15

00:00:31,669 --> 00:00:29,599

mylar balloon it's going to look cold

16

00:00:35,030 --> 00:00:31,679

and the reason this came up is from this

17

00:00:36,790 --> 00:00:35,040

this video here the uh rubber duck ufo

18

00:00:38,630 --> 00:00:36,800

video and there's the suggestion this

19

00:00:41,030 --> 00:00:38,640

might be a bunch of balloons can have an

20

00:00:43,030 --> 00:00:41,040

irregular shaped bunch of balloons

21

00:00:44,470 --> 00:00:43,040

uh it could be something else as well

22

00:00:46,150 --> 00:00:44,480

but people are saying

23

00:00:49,110 --> 00:00:46,160

that they think it isn't a bunch of

24

00:00:51,350 --> 00:00:49,120

balloons because it looks so very cold

25

00:00:53,750 --> 00:00:51,360

uh it's very bright white and we're in

26
00:00:55,270 --> 00:00:53,760
black hot mode in this thermal camera so

27
00:00:57,430 --> 00:00:55,280
people are saying that you know why is

28
00:00:58,950 --> 00:00:57,440
this so incredibly cold

29
00:01:01,590 --> 00:00:58,960
and the reason i think is you know what

30
00:01:04,549 --> 00:01:01,600
i pointed out earlier when you look down

31
00:01:06,789 --> 00:01:04,559
on a mylar balloon from above then it is

32
00:01:07,910 --> 00:01:06,799
going to appear cold and why does it do

33
00:01:11,270 --> 00:01:07,920
that it does that because it's

34
00:01:13,670 --> 00:01:11,280
reflective and the sky is very very cold

35
00:01:15,510 --> 00:01:13,680
and so it reflects the sky

36
00:01:17,830 --> 00:01:15,520
and

37
00:01:19,429 --> 00:01:17,840
other people have said that it reflects

38
00:01:21,990 --> 00:01:19,439

other things as well so you'd expect to

39

00:01:23,590 --> 00:01:22,000

see a mixture of hot and cold but the

40

00:01:26,070 --> 00:01:23,600

problem is that we're looking at a very

41

00:01:28,390 --> 00:01:26,080

low resolution video here and we're

42

00:01:30,069 --> 00:01:28,400

looking down on this this perhaps bunch

43

00:01:31,990 --> 00:01:30,079

of balloons perhaps a drone or something

44

00:01:34,310 --> 00:01:32,000

else from a steep angle so the

45

00:01:35,910 --> 00:01:34,320

reflection we're seeing uh is you know

46

00:01:37,510 --> 00:01:35,920

we're not actually seeing

47

00:01:39,270 --> 00:01:37,520

uh very much and the things that are

48

00:01:41,510 --> 00:01:39,280

reflecting around the sides

49

00:01:43,830 --> 00:01:41,520

are reflections of the ground which will

50

00:01:45,590 --> 00:01:43,840

blend in with the ground but this is

51
00:01:47,910 --> 00:01:45,600
just me talking perhaps i should do some

52
00:01:50,069 --> 00:01:47,920
kind of experiment to do this so i got

53
00:01:53,670 --> 00:01:50,079
this balloon got my little thermal

54
00:01:56,550 --> 00:01:53,680
camera my little flair one camera

55
00:02:00,389 --> 00:01:56,560
and i went out and did an experiment

56
00:02:02,389 --> 00:02:00,399
this is in uh black hot mode and we can

57
00:02:04,310 --> 00:02:02,399
see that we're looking down on it here

58
00:02:07,350 --> 00:02:04,320
and it's reflecting the sky

59
00:02:08,790 --> 00:02:07,360
and the sky appears to be to be white to

60
00:02:10,790 --> 00:02:08,800
be cold

61
00:02:13,270 --> 00:02:10,800
now if we get down below the balloon and

62
00:02:16,390 --> 00:02:13,280
we look up at the balloon against the

63
00:02:18,550 --> 00:02:16,400

sky we see that the balloon appears very

64

00:02:19,670 --> 00:02:18,560

dark so the balloon when you're looking

65

00:02:23,190 --> 00:02:19,680

up at it

66

00:02:25,510 --> 00:02:23,200

appears to be black hot which is hot and

67

00:02:27,510 --> 00:02:25,520

it shows here 54 degrees and you'll

68

00:02:29,190 --> 00:02:27,520

notice if i move around and look at

69

00:02:31,750 --> 00:02:29,200

other areas of the sky

70

00:02:33,509 --> 00:02:31,760

minus 27 degrees it's looking at this

71

00:02:35,830 --> 00:02:33,519

blue sky over here which you think of as

72

00:02:38,150 --> 00:02:35,840

being nice and warm but it's actually 27

73

00:02:39,830 --> 00:02:38,160

degrees in terms of the radiation coming

74

00:02:40,949 --> 00:02:39,840

off it that isn't actually the real

75

00:02:43,030 --> 00:02:40,959

temperature because there's nothing up

76

00:02:45,509 --> 00:02:43,040

there except for gas you know minus

77

00:02:47,670 --> 00:02:45,519

minus 40 degrees minus 46 degrees so

78

00:02:50,070 --> 00:02:47,680

obviously anything you look at against

79

00:02:52,229 --> 00:02:50,080

the sky even ice actually it's going to

80

00:02:54,470 --> 00:02:52,239

appear as hot

81

00:02:55,509 --> 00:02:54,480

it appears black hot against the white

82

00:02:58,869 --> 00:02:55,519

sky

83

00:03:00,390 --> 00:02:58,879

so why in the um the rubber duck video

84

00:03:01,670 --> 00:03:00,400

are we just seeing white you know we're

85

00:03:03,430 --> 00:03:01,680

looking down

86

00:03:05,190 --> 00:03:03,440

at this and you saw earlier when i was

87

00:03:08,630 --> 00:03:05,200

looking down at this balloon

88

00:03:10,470 --> 00:03:08,640

uh we just we saw this kind of white

89

00:03:12,309 --> 00:03:10,480

area at the top we see dark as well well

90

00:03:13,910 --> 00:03:12,319

the reason is we're looking at it down

91

00:03:16,869 --> 00:03:13,920

at it from quite a

92

00:03:19,430 --> 00:03:16,879

a high altitude and from a steep angle

93

00:03:20,949 --> 00:03:19,440

and i tried to simulate that as best as

94

00:03:23,430 --> 00:03:20,959

i could with what i have available by

95

00:03:24,789 --> 00:03:23,440

going up on my balcony and looking down

96

00:03:26,789 --> 00:03:24,799

so here's the balloon there's the

97

00:03:27,830 --> 00:03:26,799

balloon down here and here's what it

98

00:03:32,470 --> 00:03:27,840

looks like

99

00:03:34,630 --> 00:03:32,480

can't see anything else all we're seeing

100

00:03:36,630 --> 00:03:34,640

is white i can play this here

101
00:03:38,869 --> 00:03:36,640
and you see the balloon bobbing around

102
00:03:40,229 --> 00:03:38,879
we don't see anything really other than

103
00:03:42,869 --> 00:03:40,239
the white blob you know when it's

104
00:03:43,990 --> 00:03:42,879
adjusted we see just that white blob and

105
00:03:46,149 --> 00:03:44,000
here i'm measuring the temperature it's

106
00:03:47,990 --> 00:03:46,159
about 60 degrees i did it this morning

107
00:03:49,430 --> 00:03:48,000
when we go on to the balloon it goes

108
00:03:51,350 --> 00:03:49,440
down to a much lower you know below

109
00:03:53,190 --> 00:03:51,360
freezing temperature which obviously it

110
00:03:54,470 --> 00:03:53,200
isn't this balloon was actually warmer

111
00:03:56,949 --> 00:03:54,480
the environment than the environment

112
00:03:58,949 --> 00:03:56,959
because it's been indoors the whole time

113
00:04:00,470 --> 00:03:58,959

so it's actually it should actually show

114

00:04:02,229 --> 00:04:00,480

a warmer if it was showing but because

115

00:04:04,710 --> 00:04:02,239

it's reflecting the sky

116

00:04:06,070 --> 00:04:04,720

it just shows up as a white blob and

117

00:04:08,710 --> 00:04:06,080

that's why this

118

00:04:09,990 --> 00:04:08,720

uh balloon possible bunch of balloons

119

00:04:11,830 --> 00:04:10,000

over here

120

00:04:13,830 --> 00:04:11,840

would show up just as a bunch of white

121

00:04:16,229 --> 00:04:13,840

blobs and they were blending together

122

00:04:17,990 --> 00:04:16,239

and they would just show up as bright

123

00:04:20,150 --> 00:04:18,000

white it's not even super bright white

124

00:04:22,310 --> 00:04:20,160

you see this white here is the same as

125

00:04:24,469 --> 00:04:22,320

this white here it's uh you know it's

126

00:04:26,469 --> 00:04:24,479

the same white here and here it's not

127

00:04:29,909 --> 00:04:26,479

even particularly cold it's just showing

128

00:04:32,150 --> 00:04:29,919

up as cold on the thermal video some

129

00:04:32,950 --> 00:04:32,160

people like dave falcia have tried to

130

00:04:35,030 --> 00:04:32,960

show

131

00:04:37,189 --> 00:04:35,040

that it couldn't be a mylar balloon by

132

00:04:38,550 --> 00:04:37,199

showing these videos over my lab alone

133

00:04:40,070 --> 00:04:38,560

and they show that it's seen as black

134

00:04:42,550 --> 00:04:40,080

and white and you can see everything

135

00:04:44,469 --> 00:04:42,560

clearly uh and then they show it shows

136

00:04:46,629 --> 00:04:44,479

it up against the sky let's see i think

137

00:04:48,310 --> 00:04:46,639

this is and this is in black hot mode so

138

00:04:50,310 --> 00:04:48,320

it appears as hot

139

00:04:51,990 --> 00:04:50,320

and he's saying that you know this this

140

00:04:53,350 --> 00:04:52,000

shows that it wouldn't appear

141

00:04:55,189 --> 00:04:53,360

on the video like that but of course

142

00:04:56,870 --> 00:04:55,199

here he's looking up at the balloon so

143

00:04:58,550 --> 00:04:56,880

it's going to appear as hot what he

144

00:04:59,670 --> 00:04:58,560

should have done is look down at the

145

00:05:01,909 --> 00:04:59,680

balloon he should have got up on the

146

00:05:04,230 --> 00:05:01,919

roof of the building and filmed it

147

00:05:06,150 --> 00:05:04,240

looking down at it the same way that i

148

00:05:07,270 --> 00:05:06,160

did here

149

00:05:09,749 --> 00:05:07,280

so you've got to make sure you're doing

150

00:05:12,150 --> 00:05:09,759

the right type of experiment if you're

151

00:05:13,430 --> 00:05:12,160

trying to compare like with like

152

00:05:15,110 --> 00:05:13,440

it's

153

00:05:16,629 --> 00:05:15,120

all very well just pointing a camera at

154

00:05:18,230 --> 00:05:16,639

a balloon but if you're pointing at a

155

00:05:20,870 --> 00:05:18,240

camera at a balloon in a very different

156

00:05:22,790 --> 00:05:20,880

set of circumstances is not going to

157

00:05:24,950 --> 00:05:22,800

give you the same result

158

00:05:25,990 --> 00:05:24,960

here i'm looking down at the balloon and

159

00:05:28,950 --> 00:05:26,000

we see

160

00:05:30,390 --> 00:05:28,960

it's very much just a white blob and

161

00:05:34,150 --> 00:05:30,400

that's what we see

162

00:05:37,749 --> 00:05:34,160

in the ufo video so it's possible

163

00:05:39,670 --> 00:05:37,759

that these are actually balloons

164

00:05:40,710 --> 00:05:39,680

just reflecting the cold of the night

165

00:05:42,550 --> 00:05:40,720

sky

166

00:05:43,990 --> 00:05:42,560

and i say reflecting the cold of the

167

00:05:47,510 --> 00:05:44,000

night sky because this is actually a

168

00:05:50,310 --> 00:05:47,520

night this is at 0 900 hours of zulu

169

00:05:52,070 --> 00:05:50,320

time which is gmt so you convert that to

170

00:05:55,430 --> 00:05:52,080

arizona time that's i think i believe

171

00:05:56,710 --> 00:05:55,440

two in the morning uh in arizona time uh

172

00:05:59,110 --> 00:05:56,720

so it's in the middle of the night it's

173

00:06:00,950 --> 00:05:59,120

dark it's reflecting uh the the night

174

00:06:03,270 --> 00:06:00,960

sky which i think is even colder than

175

00:06:06,710 --> 00:06:03,280

the daylight sky and we saw earlier that

176

00:06:08,230 --> 00:06:06,720

the daylight sky shows as -50 degrees so

177

00:06:10,309 --> 00:06:08,240

this is going to be reflecting something

178

00:06:12,950 --> 00:06:10,319

that's very very cold all you're going

179

00:06:14,150 --> 00:06:12,960

to see is that cold any reflections

180

00:06:16,309 --> 00:06:14,160

around the edge are just going to be

181

00:06:17,590 --> 00:06:16,319

reflections of things that are similar

182

00:06:19,110 --> 00:06:17,600

color to the background so you're not

183

00:06:21,510 --> 00:06:19,120

even going to see them

184

00:06:23,830 --> 00:06:21,520

so mylar balloons viewed from above will

185

00:06:25,990 --> 00:06:23,840

appear as cold view from below will

186

00:06:28,230 --> 00:06:26,000

appear as hot if you're going to do a