



1  
00:00:04,849 --> 00:00:02,929  
the last flight of the US Space Shuttle

2  
00:00:07,309 --> 00:00:04,859  
is a return visit to the International

3  
00:00:11,089 --> 00:00:07,319  
Space Station for each of the four

4  
00:00:13,669 --> 00:00:11,099  
astronauts on board Atlantis sts-135 is

5  
00:00:16,760 --> 00:00:13,679  
the third station mission for retired US

6  
00:00:19,040 --> 00:00:16,770  
Navy captain Chris Ferguson I was born

7  
00:00:20,929 --> 00:00:19,050  
raised and got to spend you know all of

8  
00:00:22,759 --> 00:00:20,939  
my grade school in high school years in

9  
00:00:25,429 --> 00:00:22,769  
one place which is which was really nice

10  
00:00:28,070 --> 00:00:25,439  
we had a close-knit community in

11  
00:00:30,500 --> 00:00:28,080  
Northeast Philadelphia Ferguson admits

12  
00:00:33,200 --> 00:00:30,510  
being interested in rockets as a kid but

13  
00:00:35,479 --> 00:00:33,210

not necessarily in being an astronaut it

14

00:00:39,229 --> 00:00:35,489

made me want to understand things that

15

00:00:40,819 --> 00:00:39,239

are larger than life and I think that's

16

00:00:43,119 --> 00:00:40,829

why I wanted to go fly for the Navy and

17

00:00:44,750 --> 00:00:43,129

land a plane on an aircraft carrier

18

00:00:46,610 --> 00:00:44,760

after high school

19

00:00:48,709 --> 00:00:46,620

Ferguson went downtown to Drexel

20

00:00:50,540 --> 00:00:48,719

University for his Bachelor of Science

21

00:00:52,220 --> 00:00:50,550

and mechanical engineering while earning

22

00:00:54,439 --> 00:00:52,230

his commission through the Navy ROTC

23

00:00:57,590 --> 00:00:54,449

program at the University of

24

00:00:59,900 --> 00:00:57,600

Pennsylvania he flew the f-14 Tomcat on

25

00:01:02,029 --> 00:00:59,910

deployment aboard the USS Forrestal and

26

00:01:04,399 --> 00:01:02,039

attended the Navy's top gun fighter

27

00:01:06,350 --> 00:01:04,409

weapons school earned a master's in

28

00:01:09,230 --> 00:01:06,360

aeronautical engineering at the Naval

29

00:01:11,620 --> 00:01:09,240

Postgraduate School served as an f-14

30

00:01:13,580 --> 00:01:11,630

weapons separation project officer and

31

00:01:15,950 --> 00:01:13,590

completed a deployment to the western

32

00:01:17,990 --> 00:01:15,960

Pacific and Persian Gulf aboard the

33

00:01:20,960 --> 00:01:18,000

Nimitz before being selected for the

34

00:01:22,910 --> 00:01:20,970

astronaut program in 1998 and getting

35

00:01:26,120 --> 00:01:22,920

his chance to follow in the footsteps of

36

00:01:27,800 --> 00:01:26,130

the great explorers of the past we have

37

00:01:29,240 --> 00:01:27,810

a home up there and we're destined to be

38

00:01:31,190 --> 00:01:29,250

up there and we're destined to go beyond

39

00:01:33,950 --> 00:01:31,200

low-earth orbit perhaps set up a colony

40

00:01:36,140 --> 00:01:33,960

on the limit and go on to Mars Ferguson

41

00:01:38,840 --> 00:01:36,150

was the pilot on the 2006 shuttle

42

00:01:40,630 --> 00:01:38,850

mission that delivered the p3 p4 truss

43

00:01:44,060 --> 00:01:40,640

to the International Space Station and

44

00:01:45,950 --> 00:01:44,070

commander of a 2008 supply flight that

45

00:01:49,100 --> 00:01:45,960

delivered one of his current crewmates

46

00:01:51,200 --> 00:01:49,110

for her long-duration mission this is

47

00:01:53,179 --> 00:01:51,210

the third trip to orbit for dr. sandy

48

00:01:57,609 --> 00:01:53,189

Magnus who was born and raised in

49

00:02:00,139 --> 00:01:57,619

Belleville Illinois medium sized town a

50

00:02:02,060 --> 00:02:00,149

lot of family living in the area it was

51  
00:02:05,209 --> 00:02:02,070  
really quite a nice place to grow up

52  
00:02:08,809 --> 00:02:05,219  
very solid well grounded community lots

53  
00:02:10,430 --> 00:02:08,819  
of very nice people and I enjoyed it you

54  
00:02:11,990 --> 00:02:10,440  
know we had st. Louis nearby if you want

55  
00:02:13,730 --> 00:02:12,000  
to do big-city stuff but we were yet a

56  
00:02:16,550 --> 00:02:13,740  
smaller town so we didn't have a lot of

57  
00:02:19,850 --> 00:02:16,560  
city issues and it was a good place to

58  
00:02:21,920 --> 00:02:19,860  
grow up as for her interest in becoming

59  
00:02:24,110 --> 00:02:21,930  
an astronaut she doesn't really know

60  
00:02:26,420 --> 00:02:24,120  
where it came from it's something that

61  
00:02:29,180 --> 00:02:26,430  
caught ahold of me when I was in middle

62  
00:02:30,740 --> 00:02:29,190  
school later or not and I've always

63  
00:02:32,630 --> 00:02:30,750

liked science and technology in math

64

00:02:34,940 --> 00:02:32,640

it's always been fun to learn how the

65

00:02:36,710 --> 00:02:34,950

world works and to see new things and

66

00:02:39,620 --> 00:02:36,720

learn new things and there was something

67

00:02:41,440 --> 00:02:39,630

about flying in space that just grabbed

68

00:02:44,090 --> 00:02:41,450

a hold of me and didn't let go

69

00:02:45,950 --> 00:02:44,100

Magnus got her degree in physics at the

70

00:02:47,630 --> 00:02:45,960

University of Missouri Rolla but

71

00:02:49,520 --> 00:02:47,640

discovered engineering while she was

72

00:02:51,530 --> 00:02:49,530

there she finished a master's in

73

00:02:53,210 --> 00:02:51,540

electrical engineering at Rolla while

74

00:02:55,970 --> 00:02:53,220

she worked for McDonnell Douglas on

75

00:02:58,370 --> 00:02:55,980

airplane design and materials until she

76  
00:02:59,990 --> 00:02:58,380  
left for Georgia Tech to get a PhD from

77  
00:03:02,090 --> 00:03:00,000  
the school of material science and

78  
00:03:05,090 --> 00:03:02,100  
engineering she was selected for the

79  
00:03:07,010 --> 00:03:05,100  
astronaut program in 1996 ready for

80  
00:03:09,170 --> 00:03:07,020  
another new chapter in her quest to

81  
00:03:12,440 --> 00:03:09,180  
learn new things or finding interesting

82  
00:03:14,450 --> 00:03:12,450  
things about the virulence of some

83  
00:03:15,920 --> 00:03:14,460  
diseases or finding interesting things

84  
00:03:17,480 --> 00:03:15,930  
about how materials operate or find

85  
00:03:19,880 --> 00:03:17,490  
interesting things about just fluid

86  
00:03:22,700 --> 00:03:19,890  
fluid dynamics and all these little

87  
00:03:25,100 --> 00:03:22,710  
pieces of information can be used to

88  
00:03:26,900 --> 00:03:25,110

here on the ground to create things that

89

00:03:28,930 --> 00:03:26,910

can help people or technology that can

90

00:03:31,340 --> 00:03:28,940

they can do new things

91

00:03:34,190 --> 00:03:31,350

Magnus operated the space stations

92

00:03:36,140 --> 00:03:34,200

robotic during the 2002 shuttle mission

93

00:03:38,960 --> 00:03:36,150

that delivered the s-1 trust of the

94

00:03:41,150 --> 00:03:38,970

space station and returned in late 2008

95

00:03:43,120 --> 00:03:41,160

to start a four and a half month tour of

96

00:03:48,320 --> 00:03:43,130

duty as a flight engineer on expedition

97

00:03:50,720 --> 00:03:48,330

18 STS 135 is also the third space

98

00:03:53,480 --> 00:03:50,730

flight for retired Air Force colonel Rex

99

00:03:55,550 --> 00:03:53,490

Walheim of Northern California born in

100

00:03:58,730 --> 00:03:55,560

Redwood City and raised in San Carlos

101  
00:04:00,590 --> 00:03:58,740  
it's a town of about 30,000 people south

102  
00:04:03,290 --> 00:04:00,600  
of San Francisco it's a great place to

103  
00:04:05,960 --> 00:04:03,300  
grow up pretty normal middle America you

104  
00:04:10,100 --> 00:04:05,970  
know playing sports Little League you

105  
00:04:11,930 --> 00:04:10,110  
know football and I had a great support

106  
00:04:14,690 --> 00:04:11,940  
structure a wonderful mother and father

107  
00:04:18,229 --> 00:04:14,700  
that really really took good care of me

108  
00:04:20,720 --> 00:04:18,239  
and made sure I was I was going down the

109  
00:04:22,760 --> 00:04:20,730  
right path for school and everything his

110  
00:04:25,370 --> 00:04:22,770  
interest in the space program grew out

111  
00:04:26,670 --> 00:04:25,380  
of a love of flying and he got that from

112  
00:04:29,969 --> 00:04:26,680  
his dad

113  
00:04:32,159 --> 00:04:29,979

my father was a b-17 pilot during the

114

00:04:34,200 --> 00:04:32,169

World War 2 era so he was a pilot and he

115

00:04:35,850 --> 00:04:34,210

loved flying and so he's take us to air

116

00:04:37,740 --> 00:04:35,860

shows and I think there's something

117

00:04:38,700 --> 00:04:37,750

about flying that sometimes runs in the

118

00:04:41,550 --> 00:04:38,710

blood and so that's something that's

119

00:04:43,050 --> 00:04:41,560

passed on from my dad to me with a

120

00:04:46,320 --> 00:04:43,060

bachelor's in mechanical engineering

121

00:04:48,120 --> 00:04:46,330

from UC Berkeley the ROTC student headed

122

00:04:50,999 --> 00:04:48,130

straight for Air Force pilot training

123

00:04:53,129 --> 00:04:51,009

but a diagnosis of a heart murmur ended

124

00:04:55,980 --> 00:04:53,139

that ambition and he set his sights on

125

00:04:57,330 --> 00:04:55,990

becoming a flight test engineer after an

126  
00:04:59,850 --> 00:04:57,340  
assignment as a missile warning

127  
00:05:01,320 --> 00:04:59,860  
operations crew commander Walheim was

128  
00:05:03,659 --> 00:05:01,330  
transferred to the Johnson Space Center

129  
00:05:05,909 --> 00:05:03,669  
in Houston for a tour as a mechanical

130  
00:05:08,010 --> 00:05:05,919  
systems flight controller he also earned

131  
00:05:10,770 --> 00:05:08,020  
a master's in industrial engineering at

132  
00:05:12,689 --> 00:05:10,780  
the University of Houston and then on to

133  
00:05:14,939 --> 00:05:12,699  
a management job at Air Force Space

134  
00:05:16,260 --> 00:05:14,949  
Command headquarters when he was

135  
00:05:19,200 --> 00:05:16,270  
accepted for the flight test engineer

136  
00:05:21,480 --> 00:05:19,210  
course a test pilot school doctors told

137  
00:05:23,070 --> 00:05:21,490  
him he did not have a heart murmur so

138  
00:05:26,040 --> 00:05:23,080

his goal of becoming an astronaut

139

00:05:28,080 --> 00:05:26,050

re-emerged Walheim served as a flight

140

00:05:30,779 --> 00:05:28,090

test engineer and in management jobs

141

00:05:33,060 --> 00:05:30,789

with the f-16 combined task force at

142

00:05:35,070 --> 00:05:33,070

Edwards Air Force Base and then as an

143

00:05:37,500 --> 00:05:35,080

Air Force test pilot school instructor

144

00:05:40,200 --> 00:05:37,510

before being picked as an astronaut in

145

00:05:44,070 --> 00:05:40,210

1996 and getting the chance to make a

146

00:05:45,600 --> 00:05:44,080

lifelong dream come true it's important

147

00:05:47,219 --> 00:05:45,610

to keep pushing your boundaries just

148

00:05:48,960 --> 00:05:47,229

like the pioneers in the old days push

149

00:05:50,700 --> 00:05:48,970

the boundaries and went farther west and

150

00:05:52,050 --> 00:05:50,710

we're learning about our earth we're

151  
00:05:54,149 --> 00:05:52,060  
learning about how the human body adapts

152  
00:05:56,339 --> 00:05:54,159  
to space and and we're learning all

153  
00:05:58,290 --> 00:05:56,349  
sorts of ways physical activities and

154  
00:06:00,899 --> 00:05:58,300  
biological processes behave in space

155  
00:06:03,300 --> 00:06:00,909  
that are different Walheim did two

156  
00:06:05,249 --> 00:06:03,310  
spacewalks on the 2002 shuttle mission

157  
00:06:07,080 --> 00:06:05,259  
that installed the center section of the

158  
00:06:10,560 --> 00:06:07,090  
station's integrated truss structure and

159  
00:06:13,310 --> 00:06:10,570  
three more EVs on the 2008 flight that

160  
00:06:16,080 --> 00:06:13,320  
delivered the Columbus laboratory module

161  
00:06:19,560 --> 00:06:16,090  
Marine Colonel Doug Hurley is making his

162  
00:06:21,510 --> 00:06:19,570  
second spaceflight on STS 135 he was

163  
00:06:24,240 --> 00:06:21,520

born in the small upstate New York town

164

00:06:27,060 --> 00:06:24,250

of Endicott and grew up next door in a

165

00:06:28,920 --> 00:06:27,070

pelican it was just a wonderful place to

166

00:06:31,110 --> 00:06:28,930

grow up it was a very small town it was

167

00:06:35,670 --> 00:06:31,120

fairly rural I had a lot of close

168

00:06:37,230 --> 00:06:35,680

friends played sports downhill ski did

169

00:06:38,459 --> 00:06:37,240

all the things that I think you know

170

00:06:40,770 --> 00:06:38,469

most folks from that part of the country

171

00:06:42,600 --> 00:06:40,780

do and and really enjoyed it

172

00:06:45,030 --> 00:06:42,610

he remembers being interested in

173

00:06:47,580 --> 00:06:45,040

spaceflight but never set himself a goal

174

00:06:48,930 --> 00:06:47,590

of becoming an astronaut I think it was

175

00:06:50,879 --> 00:06:48,940

just a natural progression of things

176  
00:06:53,850 --> 00:06:50,889  
being interested in engineering being

177  
00:06:56,640 --> 00:06:53,860  
interested in in aviation in space and

178  
00:06:58,200 --> 00:06:56,650  
it just kind of led me down a path into

179  
00:07:00,210 --> 00:06:58,210  
college in the military and then in the

180  
00:07:03,060 --> 00:07:00,220  
Marine Corps flying fighters and then

181  
00:07:04,640 --> 00:07:03,070  
ultimately as a test pilot and then to

182  
00:07:07,610 --> 00:07:04,650  
be lucky enough to get to come here

183  
00:07:10,260 --> 00:07:07,620  
early went to Tulane on a Navy ROTC

184  
00:07:11,580 --> 00:07:10,270  
scholarship graduating with a bachelor's

185  
00:07:13,380 --> 00:07:11,590  
in civil engineering

186  
00:07:15,480 --> 00:07:13,390  
he took his commission in the Marine

187  
00:07:17,400 --> 00:07:15,490  
Corp completed the basic school and

188  
00:07:19,740 --> 00:07:17,410

flight school and made three deployments

189

00:07:22,050 --> 00:07:19,750

to the western Pacific in an f-18

190

00:07:23,490 --> 00:07:22,060

squadron when his commanding officers

191

00:07:26,159 --> 00:07:23,500

encouraged him to do so

192

00:07:27,659 --> 00:07:26,169

Hurley applied to and was accepted at

193

00:07:30,630 --> 00:07:27,669

the Navy test pilot school

194

00:07:32,580 --> 00:07:30,640

he served in an f-18 tes Quadron for

195

00:07:35,159 --> 00:07:32,590

more than two years and became the first

196

00:07:36,930 --> 00:07:35,169

Marine to fly the f-18 Super Hornet

197

00:07:40,020 --> 00:07:36,940

before being picked to become an

198

00:07:42,270 --> 00:07:40,030

astronaut in 2000 Hurley was the pilot

199

00:07:44,400 --> 00:07:42,280

on a 2009 shuttle flight that delivered

200

00:07:45,719 --> 00:07:44,410

components of the Japanese section of

201  
00:07:48,240 --> 00:07:45,729  
the International Space Station

202  
00:07:50,520 --> 00:07:48,250  
and he's eager for the start of the next

203  
00:07:52,890 --> 00:07:50,530  
era of human spaceflight that begins

204  
00:07:55,110 --> 00:07:52,900  
after the final wheel stop of the space

205  
00:07:57,060 --> 00:07:55,120  
shuttle program let's explore the moon

206  
00:08:01,890 --> 00:07:57,070  
let's explore an asteroid let's explore

207  
00:08:04,020 --> 00:08:01,900  
Mars to me that's that is the part of

208  
00:08:06,060 --> 00:08:04,030  
human spaceflight that that really is

209  
00:08:08,070 --> 00:08:06,070  
exciting and just to see what's over

210  
00:08:10,500 --> 00:08:08,080  
that next bend and around that next