



MARSHALL  
REMEMBERS APOLLO

1  
00:00:19,189 --> 00:00:16,760

[Music]

2  
00:00:21,439 --> 00:00:19,199

I'm from Plainville Georgia and I went

3  
00:00:23,210 --> 00:00:21,449

to berry college and I've got a degree

4  
00:00:25,580 --> 00:00:23,220

in physics they're one of the first two

5  
00:00:29,569 --> 00:00:25,590

women to get a physics degree at school

6  
00:00:33,470 --> 00:00:29,579

my roommate and I we we tried a lot of

7  
00:00:37,040 --> 00:00:33,480

different majors and we went to the soda

8  
00:00:40,070 --> 00:00:37,050

shop there on campus then we decided

9  
00:00:43,369 --> 00:00:40,080

well let's just see who comes in let's

10  
00:00:46,340 --> 00:00:43,379

watch the men and we did and we decided

11  
00:00:49,850 --> 00:00:46,350

hey the best-looking men are in physics

12  
00:00:52,100 --> 00:00:49,860

that's what we're going to major in it

13  
00:00:55,100 --> 00:00:52,110

as it turned out we married

14

00:00:57,560 --> 00:00:55,110

it's married wonderful people were

15

00:01:00,410 --> 00:00:57,570

gravitating towards physics because the

16

00:01:02,390 --> 00:01:00,420

Sputnik had launched a good bit earlier

17

00:01:04,670 --> 00:01:02,400

you know and seemed like the natural

18

00:01:08,780 --> 00:01:04,680

thing to do to get into something that

19

00:01:12,499 --> 00:01:08,790

you could help the country and I applied

20

00:01:14,990 --> 00:01:12,509

for a fellowship to the University of

21

00:01:18,020 --> 00:01:15,000

Alabama mainly because my boyfriend was

22

00:01:20,630 --> 00:01:18,030

going there and I did get the fellowship

23

00:01:23,750 --> 00:01:20,640

so I was in my first year of graduate

24

00:01:25,880 --> 00:01:23,760

school there and a friend was attending

25

00:01:27,380 --> 00:01:25,890

school there and she says let's go up to

26

00:01:29,570 --> 00:01:27,390

Huntsville they're hiring a lot of

27

00:01:32,330 --> 00:01:29,580

people of course at that point in time I

28

00:01:36,290 --> 00:01:32,340

was tired of not having any money so we

29

00:01:43,410 --> 00:01:36,300

came up and we were hired so that's how

30

00:01:49,560 --> 00:01:46,980

of course the group that hired was

31

00:01:51,870 --> 00:01:49,570

located out on the parkways so we met

32

00:01:53,460 --> 00:01:51,880

with them first and they said well what

33

00:01:55,680 --> 00:01:53,470

are your interests and I said well I'm

34

00:01:59,340 --> 00:01:55,690

interested in what goes on in the

35

00:02:01,260 --> 00:01:59,350

laboratory so they gave me an interview

36

00:02:03,210 --> 00:02:01,270

into the materials and processes

37

00:02:06,990 --> 00:02:03,220

laboratory and of course at that point

38

00:02:09,389 --> 00:02:07,000

in time you came in all dressed up with

39

00:02:12,930 --> 00:02:09,399

gloves owned and that kind of thing and

40

00:02:15,030 --> 00:02:12,940

visited the people and I got an offer

41

00:02:16,860 --> 00:02:15,040

right off and of course you worked with

42

00:02:20,550 --> 00:02:16,870

someone you know you weren't out on your

43

00:02:26,010 --> 00:02:20,560

own at least initially but when you had

44

00:02:28,080 --> 00:02:26,020

a problem there were so many experts not

45

00:02:30,930 --> 00:02:28,090

only in the materials and processes

46

00:02:33,780 --> 00:02:30,940

laboratory but in other areas at the

47

00:02:36,600 --> 00:02:33,790

centre in structures in avionics and

48

00:02:39,300 --> 00:02:36,610

they would say well go ask so-and-so

49

00:02:41,130 --> 00:02:39,310

about that problem and it was just

50

00:02:44,010 --> 00:02:41,140

wonderful to have all these people that

51  
00:02:46,350 --> 00:02:44,020  
you could talk to and I know one of the

52  
00:02:48,600 --> 00:02:46,360  
first things that I was asked to do we

53  
00:02:51,600 --> 00:02:48,610  
were looking at the design of some slip

54  
00:02:54,030 --> 00:02:51,610  
rings and I had never made an

55  
00:02:59,940 --> 00:02:54,040  
engineering drawing and I much less put

56  
00:03:01,560 --> 00:02:59,950  
a tolerance on it and so I sketched up

57  
00:03:05,970 --> 00:03:01,570  
something we have plenty of machine

58  
00:03:07,890 --> 00:03:05,980  
shops around and gave them the drawing

59  
00:03:10,800 --> 00:03:07,900  
or sent the drawing to them and I got a

60  
00:03:13,410 --> 00:03:10,810  
call to come over and see these folks

61  
00:03:15,630 --> 00:03:13,420  
and here was the head of the machine

62  
00:03:20,280 --> 00:03:15,640  
shop about three or four technicians

63  
00:03:23,610 --> 00:03:20,290

standing around him and I said are you

64

00:03:28,290 --> 00:03:23,620

sure you want those tolerance hun I said

65

00:03:31,770 --> 00:03:28,300

yes but they talked me out of it I mean

66

00:03:36,630 --> 00:03:31,780

a six millions was a little bit much on

67

00:03:38,550 --> 00:03:36,640

a slippery tiredness but that taught me

68

00:03:40,289 --> 00:03:38,560

a little lesson hey let other people

69

00:03:43,410 --> 00:03:40,299

look at your drawing before you submit

70

00:03:48,600 --> 00:03:43,420

it to be made oh they were so nice to me

71

00:03:51,600 --> 00:03:48,610

in I never felt like I wasn't liked in

72

00:03:53,880 --> 00:03:51,610

the workforce or was a discriminated

73

00:03:55,740 --> 00:03:53,890

against or anything like that they were

74

00:03:57,330 --> 00:03:55,750

very helpful and

75

00:04:02,759 --> 00:03:57,340

I thought it was just a great place to

76

00:04:07,979 --> 00:04:04,589

I guess I never thought about it as

77

00:04:11,430 --> 00:04:07,989

mentor I just tried to do the best I

78

00:04:14,880 --> 00:04:11,440

could in in you know I might have a

79

00:04:15,809 --> 00:04:14,890

project assigned and I would go give my

80

00:04:18,449 --> 00:04:15,819

report

81

00:04:21,000 --> 00:04:18,459

you know both verbally and written to my

82

00:04:23,360 --> 00:04:21,010

supervisor but it wasn't like somebody

83

00:04:30,070 --> 00:04:23,370

standing around to help you all the time

84

00:04:34,629 --> 00:04:32,290

the group that I worked in was called

85

00:04:36,430 --> 00:04:34,639

lubrication and surface physics and of

86

00:04:39,730 --> 00:04:36,440

course at that point in time there were

87

00:04:42,969 --> 00:04:39,740

a lot of mechanisms rubbing and sliding

88

00:04:45,969 --> 00:04:42,979

mechanisms on spacecraft and you needed

89

00:04:48,999 --> 00:04:45,979

to know how to you know reduce the

90

00:04:51,219 --> 00:04:49,009

friction on those surfaces and make sure

91

00:04:54,100 --> 00:04:51,229

it operated and of course you could use

92

00:04:56,680 --> 00:04:54,110

greases or oils or anything like that so

93

00:05:00,310 --> 00:04:56,690

we develop new lubricants dry films

94

00:05:03,219 --> 00:05:00,320

using molybdenum disulfide which you

95

00:05:04,930 --> 00:05:03,229

know did rely on having oxygen to give

96

00:05:11,290 --> 00:05:04,940

it its lubricating properties like

97

00:05:13,719 --> 00:05:11,300

graphite this so we developed those we

98

00:05:17,110 --> 00:05:13,729

had some initials that we use for these

99

00:05:19,330 --> 00:05:17,120

lubricants MLF which really stood for

100

00:05:21,010 --> 00:05:19,340

mighty low friction but we didn't tell

101  
00:05:23,469 --> 00:05:21,020  
anybody that's what it is suited for and

102  
00:05:25,749 --> 00:05:23,479  
then we would give it a name and it

103  
00:05:28,920 --> 00:05:25,759  
depending on whether we really liked

104  
00:05:31,870 --> 00:05:28,930  
that person or if it had a high

105  
00:05:35,320 --> 00:05:31,880  
probability working we gave it a

106  
00:05:38,409 --> 00:05:35,330  
person's name that we liked we were

107  
00:05:40,570 --> 00:05:38,419  
pretty much in the trenches you know we

108  
00:05:42,850 --> 00:05:40,580  
could only really see what we were doing

109  
00:05:45,760 --> 00:05:42,860  
in the laboratory but there were lots of

110  
00:05:48,670 --> 00:05:45,770  
things going on with very busy time well

111  
00:05:52,149 --> 00:05:48,680  
there were a few that came in the lab

112  
00:05:54,790 --> 00:05:52,159  
and of course dr. von Braun walked

113  
00:05:56,939 --> 00:05:54,800

through a few times since they said the

114

00:05:59,740 --> 00:05:56,949

door wanted to know what you were doing

115

00:06:02,320 --> 00:05:59,750

so I think I experienced that a couple

116

00:06:05,939 --> 00:06:02,330

of times plus we had a lot of visitors

117

00:06:08,950 --> 00:06:05,949

from the outside that came in to see

118

00:06:10,719 --> 00:06:08,960

what we were doing like we had dr.

119

00:06:14,050 --> 00:06:10,729

Christian Barnard's you know the South

120

00:06:17,770 --> 00:06:14,060

African heart doctor that came in and

121

00:06:20,920 --> 00:06:17,780

James Webb came in had his children with

122

00:06:23,740 --> 00:06:20,930

him and we got to tour them around and

123

00:06:26,020 --> 00:06:23,750

one of the things I got to which I

124

00:06:29,110 --> 00:06:26,030

thought was funny at the time was when

125

00:06:32,320 --> 00:06:29,120

Art Carney was making a movie in town

126

00:06:34,149 --> 00:06:32,330

and I was asked to show him through the

127

00:06:36,219 --> 00:06:34,159

Space and Rocket Center what the only

128

00:06:38,830 --> 00:06:36,229

thing I'd ever seen him do was play

129

00:06:42,279 --> 00:06:38,840

Norton with Jackie Gleason you know and

130

00:06:43,300 --> 00:06:42,289

I kept thinking he's gonna jump into

131

00:06:46,870 --> 00:06:43,310

that

132

00:06:50,620 --> 00:06:46,880

for son but no he's very serious guy and

133

00:06:53,740 --> 00:06:50,630

I enjoyed it it's been a lot of time

134

00:06:59,680 --> 00:06:53,750

with him he's asked a lot of interesting

135

00:07:06,460 --> 00:07:03,160

I only went to the Cape once watched one

136

00:07:09,340 --> 00:07:06,470

launched and that was Apollo 8 I think

137

00:07:13,500 --> 00:07:09,350

the way it came about was I was going to

138

00:07:16,660 --> 00:07:13,510

Alabama Missouri football game at

139

00:07:19,540 --> 00:07:16,670

Jacksonville and so I went on down to

140

00:07:22,570 --> 00:07:19,550

see the launch you know we're just all

141

00:07:28,700 --> 00:07:22,580

you you know you you just sit there and

142

00:07:36,249 --> 00:07:33,140

it was that NASA was such a capable

143

00:07:39,650 --> 00:07:36,259

organization we could do anything in

144

00:07:43,010 --> 00:07:39,660

large spacecraft doing things had never

145

00:07:47,659 --> 00:07:43,020

been done before to me it stands it's

146

00:07:51,260 --> 00:07:47,669

the big icon that we look at and should

147

00:07:59,729 --> 00:07:51,270

keep that in mind when we do these tough

148

00:08:06,209 --> 00:08:04,259

Huntsville was on the brink of becoming

149

00:08:08,849 --> 00:08:06,219

a big city

150

00:08:10,739 --> 00:08:08,859

there weren't any places to live I was

151

00:08:16,289 --> 00:08:10,749

fortunate had a friend that lived here

152

00:08:18,389 --> 00:08:16,299

so I stayed with her until we could find

153

00:08:21,809 --> 00:08:18,399

an apartment and it was actually down

154

00:08:26,009 --> 00:08:21,819

tents one of the lawyers offices now and

155

00:08:29,489 --> 00:08:26,019

we drew straws who got what room well I

156

00:08:32,429 --> 00:08:29,499

got the hall which was okay with me it

157

00:08:36,059 --> 00:08:32,439

was easy to just walk around and do what

158

00:08:43,740 --> 00:08:36,069

you wanted to in a small town but you

159

00:08:49,200 --> 00:08:47,160

it was almost like we were isolated from

160

00:08:51,420 --> 00:08:49,210

that kind of thing and it may be the

161

00:08:53,340 --> 00:08:51,430

fact that we were out on the Arsenal and

162

00:08:56,400 --> 00:08:53,350

you know and separate from other

163

00:08:57,660 --> 00:08:56,410

organizations so you didn't see a lot of

164

00:09:00,300 --> 00:08:57,670

that at all

165

00:09:05,820 --> 00:09:00,310

actually I think I was always out there

166

00:09:08,460 --> 00:09:05,830

on my own doing what it took and so he

167

00:09:11,910 --> 00:09:08,470

wasn't looking left or right and seeing

168

00:09:16,050 --> 00:09:11,920

these poor women waiting for their turn

169

00:09:21,370 --> 00:09:16,060

they weren't there so I just did what I

170

00:09:29,380 --> 00:09:26,500

well I was involved in the last mission

171

00:09:30,850 --> 00:09:29,390

in terms of having a fluids experiment

172

00:09:33,010 --> 00:09:30,860

we were going to see how the fluids

173

00:09:35,800 --> 00:09:33,020

reacted in that low gravity environment

174

00:09:37,450 --> 00:09:35,810

and to look at you know effective

175

00:09:39,850 --> 00:09:37,460

surfactants on them and that kind of

176

00:09:43,030 --> 00:09:39,860

thing when the shield came off our

177

00:09:46,270 --> 00:09:43,040

laboratory being materials and processes

178

00:09:48,430 --> 00:09:46,280

we developed the umbrella and of course

179

00:09:51,490 --> 00:09:48,440

they did away with one astronomy

180

00:09:53,560 --> 00:09:51,500

experiments so we could use that port to

181

00:09:56,290 --> 00:09:53,570

put the umbrella out but we developed

182

00:10:01,630 --> 00:09:56,300

the coating and and that was a

183

00:10:02,380 --> 00:10:01,640

round-the-clock activity and fortunately

184

00:10:05,080 --> 00:10:02,390

it worked

185

00:10:07,510 --> 00:10:05,090

you had to subject it to the

186

00:10:13,540 --> 00:10:07,520

environments of space you simulated

187

00:10:16,050 --> 00:10:13,550

environments like the Sun you know are

188

00:10:21,790 --> 00:10:16,060

the optical properties of the material

189

00:10:25,110 --> 00:10:21,800

enough to main to be maintained and it

190

00:10:27,700 --> 00:10:25,120

doesn't out gas it's resistant to the

191

00:10:31,510 --> 00:10:27,710

ultraviolet that kind of thing will it

192

00:10:33,730 --> 00:10:31,520

last a long time so those were the kind

193

00:10:39,620 --> 00:10:33,740

of tests results that we had to

194

00:10:44,420 --> 00:10:42,260

Carolyn Greiner and Mary Helen Johnston

195

00:10:46,340 --> 00:10:44,430

and I work fairly close together

196

00:10:49,430 --> 00:10:46,350

although long different things we

197

00:10:53,120 --> 00:10:49,440

decided we had put enough experiments

198

00:10:59,060 --> 00:10:53,130

together that we could actually you know

199

00:11:01,430 --> 00:10:59,070

try to operate them and we in a semi

200

00:11:03,410 --> 00:11:01,440

closed environment so to speak it got a

201

00:11:06,320 --> 00:11:03,420

lot of publicity and we had our own

202

00:11:09,500 --> 00:11:06,330

experiments which we tried out and

203

00:11:12,290 --> 00:11:09,510

operate that and we had some technicians

204

00:11:14,330 --> 00:11:12,300

that we call along to help us if we

205

00:11:17,060 --> 00:11:14,340

needed it but it was very interesting we

206

00:11:19,670 --> 00:11:17,070

got a heck of a lot of publicity out of

207

00:11:23,500 --> 00:11:19,680

that for the center then we got involved

208

00:11:29,510 --> 00:11:23,510

in diving in the tank prepared for

209

00:11:32,440 --> 00:11:29,520

possible missions I think it was you

210

00:11:36,380 --> 00:11:32,450

know being self-sufficient in that small

211

00:11:39,740 --> 00:11:36,390

environment and being prepared to do

212

00:11:42,110 --> 00:11:39,750

these things and to you know I think

213

00:11:44,180 --> 00:11:42,120

there was a follow-on group of people

214

00:11:48,080 --> 00:11:44,190

that were chosen to do the same thing

215

00:11:51,020 --> 00:11:48,090

and we did a good bit of talking to them

216

00:11:53,450 --> 00:11:51,030

and what they needed to know it was fun

217

00:11:57,710 --> 00:11:53,460

and we you know we had a lot of

218

00:12:00,410 --> 00:11:57,720

interviews with various media I mean in

219

00:12:03,080 --> 00:12:00,420

a sense it felt a little artificial you

220

00:12:05,660 --> 00:12:03,090

know you're doing this you know hey this

221

00:12:07,820 --> 00:12:05,670

is gonna be over in a week or so keep

222

00:12:14,080 --> 00:12:07,830

doing what you're doing because this is

223

00:12:23,880 --> 00:12:19,540

well I had experiments on Space Lab and

224

00:12:26,830 --> 00:12:23,890

I had a number of experiments that flew

225

00:12:29,440 --> 00:12:26,840

enjoyed those I'm really enjoyed working

226

00:12:31,330 --> 00:12:29,450

with a science it's such a clever group

227

00:12:33,940 --> 00:12:31,340

of people for the engineers are clever

228

00:12:36,420 --> 00:12:33,950

also it just seemed like everybody was

229

00:12:40,030 --> 00:12:36,430

so smart and good there's so many things

230

00:12:42,790 --> 00:12:40,040

when you're in charge of engineers you

231

00:12:46,090 --> 00:12:42,800

pretty much work with them you know it's

232

00:12:48,760 --> 00:12:46,100

sort of a lead role in a sense it's a

233

00:12:50,140 --> 00:12:48,770

scientist you just enable them because

234

00:12:52,600 --> 00:12:50,150

you're certainly not going to be out

235

00:12:57,130 --> 00:12:52,610

there telling them what to do in their

236

00:13:00,090 --> 00:12:57,140

sense and so every time you change a job

237

00:13:02,770 --> 00:13:00,100

you have to reinvent yourself to

238

00:13:08,440 --> 00:13:02,780

accommodate your job and you just have

239

00:13:15,610 --> 00:13:11,860

to me it's going out there and doing

240

00:13:19,389 --> 00:13:15,620

your best and don't let anybody stop you

241

00:13:22,960 --> 00:13:19,399

I mean hey just go through them you know

242

00:13:26,500 --> 00:13:22,970

don't don't stop you do what you have to

243

00:13:29,410 --> 00:13:26,510

do and you know you don't have to make