



**EPISODE SEVEN:
BACK TO GRAVITY**

1
00:00:03,737 --> 00:00:05,705
>> SO THIS IS EMILE.

2
00:00:05,705 --> 00:00:07,340
HE, UH, IS ALMOST

3
00:00:07,340 --> 00:00:08,708
EIGHT MONTHS OLD NOW,

4
00:00:08,708 --> 00:00:11,845
AND HE WAS PRESENT FOR A LOT

5
00:00:11,845 --> 00:00:13,380
OF THE TESTING THAT WE DID.

6
00:00:13,380 --> 00:00:13,947
HE WAS ALSO PRESENT

7
00:00:13,947 --> 00:00:16,549
FOR THE LAUNCH IN UTERO.

8
00:00:16,549 --> 00:00:18,518
SO OVER THE COURSE OF THE--

9
00:00:18,518 --> 00:00:21,254
OUR FIRST ISS PROJECT,

10
00:00:21,254 --> 00:00:23,056
WE MADE AN ENTIRE NEW HUMAN.

11
00:00:23,056 --> 00:00:25,458
ALONG-ALONG WITH ALL

12
00:00:25,458 --> 00:00:27,827
THE OTHER TESTING THAT WE DID.

13
00:00:27,827 --> 00:00:29,896

THIS, UM, FLIGHT SUIT

14

00:00:29,896 --> 00:00:30,764

THAT HE'S WEARING WAS

15

00:00:30,764 --> 00:00:32,499

FROM HIS AUNTIE PARASTOO

16

00:00:32,499 --> 00:00:34,067

THAT WE GOT, UM,

17

00:00:34,067 --> 00:00:34,667

WHEN WE WERE DOWN

18

00:00:34,667 --> 00:00:35,301

AT CAPE CANAVERAL

19

00:00:35,301 --> 00:00:37,971

FOR THE LAUNCH IN DECEMBER.

20

00:00:37,971 --> 00:00:39,005

THAT'S MY FAVORITE FACE

21

00:00:39,005 --> 00:00:40,673

HE MAKES RIGHT NOW.

22

00:00:40,673 --> 00:00:41,241

SINCE HE DOESN'T HAVE

23

00:00:41,241 --> 00:00:42,041

ANY TOP TEETH.

24

00:00:42,041 --> 00:00:43,376

[LAUGHING]

25

00:00:58,258 --> 00:00:58,825

SO WE WERE RUNNING

26
00:00:58,825 --> 00:00:59,592
CONCURRENT EXPERIMENTS

27
00:00:59,592 --> 00:01:01,728
ON EARTH AND ON STATION.

28
00:01:01,728 --> 00:01:03,096
SO NANORACKS HAD GELS

29
00:01:03,096 --> 00:01:04,097
AT THEIR FACILITY

30
00:01:04,097 --> 00:01:05,198
AND THEY WERE GETTING

31
00:01:05,198 --> 00:01:07,066
THE DATA FROM THE EXPERIMENTS

32
00:01:07,066 --> 00:01:08,301
RUNNING ON STATION.

33
00:01:08,301 --> 00:01:08,968
AND SO WE WERE LOOKING

34
00:01:08,968 --> 00:01:10,370
AT HOW THE GELS FORMED,

35
00:01:10,370 --> 00:01:11,271
THEIR STRUCTURE,

36
00:01:11,271 --> 00:01:13,039
AND ALSO HOW THE DRUG-RELEASE

37
00:01:13,039 --> 00:01:14,174
PROFILE WAS CHANGING,

38
00:01:14,174 --> 00:01:14,974

GIVEN THOSE TWO

39

00:01:14,974 --> 00:01:16,376
DIFFERENT ENVIRONMENTS.

40

00:01:16,376 --> 00:01:17,243
>> NANORACKS BROUGHT

41

00:01:17,243 --> 00:01:18,778
THE PLATES BACK TO US,

42

00:01:18,778 --> 00:01:20,113
AND WE ALL, UH, MADE SURE

43

00:01:20,113 --> 00:01:20,980
THAT WE WERE HERE,

44

00:01:20,980 --> 00:01:22,949
AND WE, UM, OPENED

45

00:01:22,949 --> 00:01:25,118
THE-THE PLATES ALL TOGETHER

46

00:01:25,118 --> 00:01:26,519
AND WE HAD THE SAME TYPE

47

00:01:26,519 --> 00:01:27,420
OF EXCITEMENT THAT WE HAD

48

00:01:27,420 --> 00:01:29,656
AT, UH, KENNEDY SPACE CENTER.

49

00:01:29,656 --> 00:01:30,623
>> IT WAS ALREADY EXCITING,

50

00:01:30,623 --> 00:01:31,324
BECAUSE SPACE NEVER

51

00:01:31,324 --> 00:01:32,025

LOSES ITS COOL,

52

00:01:32,025 --> 00:01:32,826

AND SO WE HAD THESE PLATES,

53

00:01:32,826 --> 00:01:33,493

WE'RE LIKE, "OH, MY GOD,

54

00:01:33,493 --> 00:01:34,127

THESE ARE WHAT

55

00:01:34,127 --> 00:01:35,195

THE ASTRONAUTS TOUCHED."

56

00:01:35,195 --> 00:01:36,529

AND SO WE OPENED THEM--

57

00:01:36,529 --> 00:01:37,197

AND THEY'VE BEEN

58

00:01:37,197 --> 00:01:38,498

TO SPACE AND BACK,

59

00:01:38,498 --> 00:01:39,732

AND NOW THEY'RE IN OUR LAB.

60

00:01:39,732 --> 00:01:40,667

>> WE COULD JUST AT LEAST

61

00:01:40,667 --> 00:01:41,901

LOOK AT THEM AND SEE, LIKE,

62

00:01:41,901 --> 00:01:43,636

HOW THE INTEGRITY IS DIFFERENT

63

00:01:43,636 --> 00:01:45,138

IF THE STRUCTURAL, UH,

64

00:01:45,138 --> 00:01:46,573
CHANGES ARE SOMETHING

65

00:01:46,573 --> 00:01:47,307
THAT YOU CAN OBSERVE

66

00:01:47,307 --> 00:01:48,808
JUST BY LOOKING AT THE GEL.

67

00:01:48,808 --> 00:01:50,143
>> AND, WHEN WE LOOKED

68

00:01:50,143 --> 00:01:51,478
AT THE DATA THAT WE GOT FROM,

69

00:01:51,478 --> 00:01:53,613
UM, THE EQUIPMENT ON STATION

70

00:01:53,613 --> 00:01:55,381
AND EQUIPMENT FROM NANORACKS,

71

00:01:55,381 --> 00:01:56,382
WE COULD SEE THAT THERE WERE

72

00:01:56,382 --> 00:01:57,717
DIFFERENCES IN THE DRUG

73

00:01:57,717 --> 00:01:59,052
RELEASE PROFILES FROM THOSE

74

00:01:59,052 --> 00:02:00,119
GELS THAT WERE HAPPENING

75

00:02:00,119 --> 00:02:01,154
AT THE SAME TIME.

76
00:02:01,154 --> 00:02:02,555
>> WE ACTUALLY OBSERVED SOME,

77
00:02:02,555 --> 00:02:04,657
UH, INTERESTING CHANGES

78
00:02:04,657 --> 00:02:05,825
THAT WE HOPED THAT

79
00:02:05,825 --> 00:02:07,126
WE WOULD BE ABLE TO PROVE,

80
00:02:07,126 --> 00:02:08,361
UH, DOING ACTUAL

81
00:02:08,361 --> 00:02:09,929
STRUCTURAL TESTS

82
00:02:09,929 --> 00:02:11,798
AND THE MORE IN-DEPTH STUDIES.

83
00:02:11,798 --> 00:02:12,932
BUT JUST BY OBSERVATION

84
00:02:12,932 --> 00:02:14,601
SEEMED LIKE THERE

85
00:02:14,601 --> 00:02:17,003
MIGHT BE SOME CHANGES.

86
00:02:17,003 --> 00:02:17,804
>> WHILE THE THRILL

87
00:02:17,804 --> 00:02:18,571
OF THE ROCKET LAUNCH

88
00:02:18,571 --> 00:02:19,639

MAY BE OVER,

89

00:02:19,639 --> 00:02:21,174

ELAINE AND PARASTOO STILL HAVE

90

00:02:21,174 --> 00:02:22,675

ONE OF THE MOST EXCITING PARTS

91

00:02:22,675 --> 00:02:24,110

OF THEIR JOURNEY AHEAD,

92

00:02:24,110 --> 00:02:26,312

PUBLISHING THEIR RESULTS.

93

00:02:26,312 --> 00:02:27,413

THIS INFORMATION COULD HELP

94

00:02:27,413 --> 00:02:28,615

INFORM FUTURE RESEARCH

95

00:02:28,615 --> 00:02:30,884

ON EARTH AND IN SPACE.

96

00:02:30,884 --> 00:02:32,919

>> WHAT WE'RE WORKING ON NOW

97

00:02:32,919 --> 00:02:34,888

IS COMPILING ON THAT DATA

98

00:02:34,888 --> 00:02:35,722

AND TELLING

99

00:02:35,722 --> 00:02:37,156

A GOOD STORY AROUND IT,

100

00:02:37,156 --> 00:02:38,725

SO THAT IT'S SOMETHING

101
00:02:38,725 --> 00:02:40,226
THAT WE CAN OF COURSE PUBLISH

102
00:02:40,226 --> 00:02:41,494
AND GIVE BACK TO THE PUBLIC,

103
00:02:41,494 --> 00:02:42,161
'CAUSE WE'VE GOT

104
00:02:42,161 --> 00:02:42,929
SOME REALLY INTERESTING DATA

105
00:02:42,929 --> 00:02:44,163
FROM THESE EXPERIMENTS

106
00:02:44,163 --> 00:02:45,665
THAT WERE AGAIN SUPER SIMPLE,

107
00:02:45,665 --> 00:02:48,334
BUT THE STORY MIGHT TELL US--

108
00:02:48,334 --> 00:02:49,435
CAN REALLY INFORM

109
00:02:49,435 --> 00:02:51,337
MATERIAL SCIENCE AS A WHOLE.

110
00:02:55,942 --> 00:02:56,576
>> YOU DEFINITELY FEEL

111
00:02:56,576 --> 00:02:58,845
A HUGE RESPONSIBILITY PERFORMING

112
00:02:58,845 --> 00:03:00,413
THIS RESEARCH FOR OTHERS,

113
00:03:00,413 --> 00:03:01,514

BECAUSE YOU KNOW HOW MANY YEARS

114

00:03:01,514 --> 00:03:02,148

THEY'VE BEEN WORKING

115

00:03:02,148 --> 00:03:03,182

ON THE GROUND,

116

00:03:03,182 --> 00:03:03,816

AND WE OFTEN LIKE

117

00:03:03,816 --> 00:03:05,018

TO KNOW THE RESULTS.

118

00:03:05,018 --> 00:03:06,519

SO PERSONALLY, I STAYED IN TOUCH

119

00:03:06,519 --> 00:03:07,687

WITH A LOT OF THE SCIENTISTS,

120

00:03:07,687 --> 00:03:08,521

AND THAT GIVES US

121

00:03:08,521 --> 00:03:09,923

A LOT OF GOOD FEEDBACK.

122

00:03:09,923 --> 00:03:11,157

AND IT GIVES US

123

00:03:11,157 --> 00:03:12,392

SOME CLOSURE, TOO,

124

00:03:12,392 --> 00:03:13,960

TO KNOW HOW IMPORTANT

125

00:03:13,960 --> 00:03:15,128

THE SCIENCE THAT WE WERE DOING

126

00:03:15,128 --> 00:03:16,796

UP THERE REALLY WAS.

127

00:03:16,796 --> 00:03:17,497

>> I THINK RACHEL

128

00:03:17,497 --> 00:03:18,531

HAS SOMETHING FOR YOU GUYS.

129

00:03:18,531 --> 00:03:21,100

>> YEAH.

130

00:03:21,100 --> 00:03:22,035

[GASPS]

131

00:03:22,035 --> 00:03:22,869

>> IS THIS FOR REAL?

132

00:03:22,869 --> 00:03:26,472

>> OH, MY GOSH!

133

00:03:26,472 --> 00:03:27,874

HI, SERENA.

134

00:03:27,874 --> 00:03:30,877

>> OH, MY GOSH.

135

00:03:30,877 --> 00:03:31,377

>> WHEN THEY TOLD ME

136

00:03:31,377 --> 00:03:32,011

THEY WERE DOING THIS,

137

00:03:32,011 --> 00:03:32,645

THEY SAID THEY'D MAYBE LIKE

138

00:03:32,645 --> 00:03:33,980

TO TRY AND SET UP A--

139

00:03:33,980 --> 00:03:35,014
AT LEAST A FACETIME CALL

140

00:03:35,014 --> 00:03:36,549
OR SOMETHING AND, UH,

141

00:03:36,549 --> 00:03:38,017
I WAS LIKE, "YEAH, ABSOLUTELY!

142

00:03:38,017 --> 00:03:39,218
THIS IS GREAT."

143

00:03:39,218 --> 00:03:41,020
>> THIS IS A FANTASTIC SURPRISE.

144

00:03:41,020 --> 00:03:41,955
>> WHERE ARE YOU GUYS LOCATED?

145

00:03:41,955 --> 00:03:44,090
>> SO, WE'RE IN OUR LABORATORY

146

00:03:44,090 --> 00:03:45,625
IN RICHMOND, VIRGINIA.

147

00:03:45,625 --> 00:03:47,260
SO OUR OTHER, UH, FULL-TIME

148

00:03:47,260 --> 00:03:48,227
EMPLOYEES ARE ALSO WOMEN.

149

00:03:48,227 --> 00:03:49,028
SO WE'RE AN ENTIRELY

150

00:03:49,028 --> 00:03:51,197
WOMEN-RUN COMPANY.

151
00:03:51,197 --> 00:03:52,432
>> FANTASTIC!

152
00:03:52,432 --> 00:03:53,566
>> IT JUST TURNED OUT THAT WAY,

153
00:03:53,566 --> 00:03:54,601
BUT IT'S BEEN WONDERFUL,

154
00:03:54,601 --> 00:03:56,402
BECAUSE WE'RE ALL, UH,

155
00:03:56,402 --> 00:03:57,804
WOMEN ENGINEERS.

156
00:03:57,804 --> 00:04:01,741
[OVERLAPPED CHATTER]

157
00:04:01,741 --> 00:04:03,209
>> THIS IS GREAT.

158
00:04:03,209 --> 00:04:03,810
>> WE JUST WANTED TO SHOW YOU

159
00:04:03,810 --> 00:04:05,244
THE PLATE THAT YOU'D

160
00:04:05,244 --> 00:04:06,713
HANDLED IN SPACE.

161
00:04:06,713 --> 00:04:07,580
>> REALLY?

162
00:04:07,580 --> 00:04:08,548
>> WE STILL HAVE IT.

163
00:04:08,548 --> 00:04:09,082

>> WE STILL HAVE

164

00:04:09,082 --> 00:04:09,816
ALL YOUR SAMPLES.

165

00:04:09,816 --> 00:04:11,084
>> HOW COOL.

166

00:04:11,084 --> 00:04:12,619
OH, THAT'S SO COOL! MAN!

167

00:04:12,619 --> 00:04:13,319
SEE, IT'S EVEN NEAT

168

00:04:13,319 --> 00:04:14,153
WHEN WE GET TO SEE THE SCIENCE

169

00:04:14,153 --> 00:04:15,722
BACK DOWN IN YOUR HANDS, TOO.

170

00:04:15,722 --> 00:04:17,624
SO, SOMETIMES IT DOES GO

171

00:04:17,624 --> 00:04:18,524
LITERALLY IN A BLACK BOX

172

00:04:18,524 --> 00:04:19,425
WHEN WE'RE UP HERE,

173

00:04:19,425 --> 00:04:20,727
AND WE HOPE EVERYTHING GETS DOWN

174

00:04:20,727 --> 00:04:22,595
SAFELY BUT THANKS FOR LETTING ME,

175

00:04:22,595 --> 00:04:23,730
UH, INVADE YOUR SPACE

176

00:04:23,730 --> 00:04:24,564

A LITTLE BIT TODAY

177

00:04:24,564 --> 00:04:25,798

AND, UH, GOOD LUCK

178

00:04:25,798 --> 00:04:27,333

WITH EVERYTHING YOU GUYS DO

179

00:04:27,333 --> 00:04:28,701

SCIENTIFICALLY, PERSONALLY,

180

00:04:28,701 --> 00:04:30,203

PROFESSIONALLY IN THE FUTURE.

181

00:04:30,203 --> 00:04:31,070

>> ALL RIGHT, THANK YOU

182

00:04:31,070 --> 00:04:31,938

SO MUCH, SERENA.

183

00:04:31,938 --> 00:04:32,872

>> COOL, ALL RIGHT.

184

00:04:32,872 --> 00:04:33,840

>> IT'S GOOD TALKING WITH YOU!

185

00:04:33,840 --> 00:04:34,741

>> VERY NICE TO MEET YOU.

186

00:04:34,741 --> 00:04:35,642

>> AND HAPPY HALLOWEEN.

187

00:04:35,642 --> 00:04:37,577

>> HAPPY HALLOWEEN!

188

00:04:39,445 --> 00:04:40,480

>> YEAH, IT'S HARD, UH,

189

00:04:40,480 --> 00:04:41,481
TO BEAT THIS.

190

00:04:41,481 --> 00:04:42,448
>> OH, I DON'T THINK--

191

00:04:42,448 --> 00:04:43,716
I'M TRYING TO THINK OF ANYTHING

192

00:04:43,716 --> 00:04:44,517
THAT WOULD BE BETTER

193

00:04:44,517 --> 00:04:45,251
THAN WATCHING

194

00:04:45,251 --> 00:04:47,687
MY OWN LAUNCH OF RESEARCH

195

00:04:47,687 --> 00:04:49,088
TO THE SPACE STATION.

196

00:04:49,088 --> 00:04:50,857
>> I ACTUALLY HAVE, LIKE,

197

00:04:50,857 --> 00:04:52,425
MY BACKGROUND OF MY CELL PHONE

198

00:04:52,425 --> 00:04:54,260
IS ACTUALLY THE PICTURE OF US

199

00:04:54,260 --> 00:04:55,662
SENDING THE PRODUCT

200

00:04:55,662 --> 00:04:57,030
TO SPACE STATION.

201
00:04:57,030 --> 00:04:57,830
DEFINITELY A LOT OF PEOPLE

202
00:04:57,830 --> 00:04:59,532
ARE SURPRISED THAT YOUNG,

203
00:04:59,532 --> 00:05:02,101
UH, FEMALES IN STEM

204
00:05:02,101 --> 00:05:03,336
HAVE, YOU KNOW,

205
00:05:03,336 --> 00:05:05,204
THIS TYPE OF EXPERIENCES

206
00:05:05,204 --> 00:05:07,040
AND HAVE CONTRIBUTED THIS MUCH.

207
00:05:07,040 --> 00:05:09,409
AND I STILL LOOK AT THE SKY,

208
00:05:09,409 --> 00:05:11,144
AND I REALLY THINK EVERYTHING

209
00:05:11,144 --> 00:05:13,212
IS SO FAR AWAY AND LIKE, UH,

210
00:05:13,212 --> 00:05:14,180
LOOK AT THE STARS

211
00:05:14,180 --> 00:05:15,281
AND EVERYTHING LOOKS LIKE--

212
00:05:15,281 --> 00:05:17,050
THAT NOTHING IS ACHIEVABLE.

213
00:05:17,050 --> 00:05:19,118

BUT THEN JUST BEING A PART

214

00:05:19,118 --> 00:05:21,187
OF THIS, UH, WHOLE EXPERIENCE,

215

00:05:21,187 --> 00:05:23,623
IT JUST IS A DREAM COME TRUE.

216

00:05:26,325 --> 00:05:27,260
>> ELAINE AND PARASTOO

217

00:05:27,260 --> 00:05:28,294
NOW JOIN THE THOUSANDS

218

00:05:28,294 --> 00:05:29,629
OF SCIENTISTS WHO'VE

219

00:05:29,629 --> 00:05:30,830
PERFORMED RESEARCH ABOARD

220

00:05:30,830 --> 00:05:32,699
THE INTERNATIONAL SPACE STATION,

221

00:05:32,699 --> 00:05:34,100
MAKING THE MOST OF WHAT

222

00:05:34,100 --> 00:05:36,335
MICROGRAVITY HAS TO TEACH US.

223

00:05:36,335 --> 00:05:38,004
THIS DEDICATED GROUP IS

224

00:05:38,004 --> 00:05:38,871
BRINGING WHAT THEY LEARN

225

00:05:38,871 --> 00:05:39,839
BACK TO EARTH,

226

00:05:39,839 --> 00:05:41,107

HELPING IMPROVE LIVES

227

00:05:41,107 --> 00:05:43,676

AND ADVANCE EXPLORATION.

228

00:05:43,676 --> 00:05:45,445

>> WHAT SPACE STATION GIVES US

229

00:05:45,445 --> 00:05:46,646

IS A DIFFERENT SORT

230

00:05:46,646 --> 00:05:47,747

OF LABORATORY.

231

00:05:47,747 --> 00:05:48,815

AND WHAT'S REALLY

232

00:05:48,815 --> 00:05:49,782

MEANINGFUL TO ME

233

00:05:49,782 --> 00:05:51,017

IS TO BE ABLE TO COME BACK DOWN

234

00:05:51,017 --> 00:05:52,552

AND TALK WITH MY PATIENTS

235

00:05:52,552 --> 00:05:53,786

AND LET THEM KNOW ABOUT SOME

236

00:05:53,786 --> 00:05:55,188

OF THE DISCOVERIES WE'VE MADE.

237

00:05:55,188 --> 00:05:56,289

THIS MEANS A LOT TO ME

238

00:05:56,289 --> 00:05:57,690

AS A CLINICIAN.

239

00:05:57,690 --> 00:05:59,459
AND SO IT WAS REALLY NEAT

240

00:05:59,459 --> 00:06:00,226
TO BE ABLE TO PERFORM

241

00:06:00,226 --> 00:06:01,794
THAT SORT OF SCIENCE ON STATION.

242

00:06:03,629 --> 00:06:04,464
>> THE ENERGY THAT EVERYONE HAS

243

00:06:04,464 --> 00:06:05,898
WHO IS INVOLVED

244

00:06:05,898 --> 00:06:06,632
IN SPACE RESEARCH

245

00:06:06,632 --> 00:06:08,167
IS EXTREMELY CONTAGIOUS.

246

00:06:08,167 --> 00:06:08,801
AND SO YOU JUST GET

247

00:06:08,801 --> 00:06:09,602
HYPED UP ABOUT IT

248

00:06:09,602 --> 00:06:10,403
BECAUSE EVERYONE ELSE

249

00:06:10,403 --> 00:06:11,938
IS SO EXCITED ABOUT IT.

250

00:06:11,938 --> 00:06:13,106
YES, THE TIMELINE'S ARE LONG,

251
00:06:13,106 --> 00:06:15,007
BUT EVERYONE IS SO POSITIVE

252
00:06:15,007 --> 00:06:16,042
AND CERTAIN THAT THEY'RE

253
00:06:16,042 --> 00:06:17,477
DOING A GOOD THING

254
00:06:17,477 --> 00:06:19,078
AND THAT THE MONEY IS WELL-SPENT

255
00:06:19,078 --> 00:06:21,414
AND THAT IS WHAT DRIVES PEOPLE

256
00:06:21,414 --> 00:06:22,148
TO KEEP DOING

257
00:06:22,148 --> 00:06:23,282
THIS SORT OF RESEARCH.

258
00:06:28,654 --> 00:06:30,189
>> MICROGRAVITY STILL HAS

259
00:06:30,189 --> 00:06:31,824
MORE INSIGHTS TO REVEAL,

260
00:06:31,824 --> 00:06:33,226
AND THIS LABORATORY

261
00:06:33,226 --> 00:06:34,327
LIKE NO OTHER

262
00:06:34,327 --> 00:06:36,028
WILL CONTINUE TO UNCOVER THEM

263
00:06:36,028 --> 00:06:39,265

ONE EXPERIMENT AT A TIME.