

Jon Spooner: [00:01](#) Hello and welcome to Live from The Space Shed, a podcast all about space and science hosted by me, Jon Spooner and me

Mini Jon: [00:10](#) You mean me

Jon Spooner: [00:12](#) Sorry. Yeah, I mean you

Mini Jon: [00:13](#) Mini Jon!

Jon Spooner: [00:14](#) Mini Jon! Long story short, a few years ago, I accidentally set up my own space agency based out the shed at the bottom of my garden. Turns out if you go around telling people you're the Director of Human Space Flight Operations for the Unlimited Space Agency wearing an orange space suit, more people than you might think want to play along. And now the British astronaut, Tim Peake is our patron and he took me with him to space.

Mini Jon: [00:37](#) He took *me* with him to space.

Jon Spooner: [00:39](#) Yeah. Yeah. Alright. He took you with him to space. So Mini Jon became UNSA's first astronauts.

Mini Jon: [00:45](#) Woohoo!

Jon Spooner: [00:47](#) Since then we've been touring in UNSA's mobile headquarters, The Space Shed to festivals like Latitude and Blue Dot, telling stories, talking to some super cool space and science people, and we've recorded our chats so you can find out about their amazing work as well.

Mini Jon: [01:03](#) Jon?

Jon Spooner: [01:08](#) Yes, Mini Jon?

Mini Jon: [01:09](#) What is your favourite planet?

Jon Spooner: [01:10](#) My favourite planet is ours - Earth. I like it here. The trees, the oceans, the mountains, the animals, the humans. Most of the humans. What's yours?

Mini Jon: [01:22](#) I reeeeeeeally like Mars.

Jon Spooner: [01:24](#) Oh well that's great because this week's guest in Live from The Space Shed is our friend Abbie Hatty - the space engineer building the European Space Agency's, ExoMars rover that's launching to Mars in 2020.

Mini Jon: [01:36](#) Abbie is cool!

Jon Spooner: [01:36](#) She is SUPER cool. Do you remember when she visited us in the Faraway Forest at Latitude Festival?

Mini Jon: [01:43](#) I do, Jon

Jon Spooner: [01:43](#) Yeah, we had a few 'technical problems' with the Shed. So, we're starting this episode a little further into the conversation than normal.

Mini Jon: [01:52](#) Onwards and upwards!

Jon Spooner: [01:52](#) Onwards and upwards, indeed!

Mini Jon: [01:53](#) Let's go!

Jon Spooner: [01:53](#) Let's go! Enjoy this episode of Live from The Space Shed.

Abbie Hutty: [02:10](#) Hi! [cheers]

Jon Spooner: [02:10](#) Abbie!

Abbie Hutty: [02:16](#) Woohoo!

Jon Spooner: [02:16](#) Abbie, you're one of my favourite people to have in the Shed, so I'm sorry that, that all went uh, that way. Why don't you tell us, you're a space engineer?

Abbie Hutty: [02:21](#) Yes.

Jon Spooner: [02:22](#) What the space engineers do, Abbie?

Abbie Hutty: [02:24](#) All sorts of things. So, at the moment I work on a project called ExoMars, which is the first European Mars rover mission. So I've spent six years working on that so far, which makes me feel ancient. Um, but uh, starting off doing the design of the actual structure of the rover, so the body, the like the chassis of the rover, and now the structure is all designed, we finished all of that design. So I am in charge of making sure that all of the different bits of the rover come together, get tested, get integrated and built up to make the full rover

Jon Spooner: [02:56](#) That's pretty cool, right? Show of hands, who thinks Abbie has got a cool job? Building an actual Mars rover. When's it going?

Abbie Hutty: [03:03](#) So it's due to launch in summer 2020.

Jon Spooner: [03:06](#) Summer 2020, which is only like two years away, two years today, say today.

Abbie Hatty: [03:10](#) It is.

Jon Spooner: [03:10](#) Yeah it's two years today it's going to launch, more successfully than we did this morning, I hope.

Abbie Hatty: [03:14](#) Hopefully, yes.

Jon Spooner: [03:15](#) Yeah. Why is it going there? I mean we've got two rovers up there already, right?

Abbie Hatty: [03:19](#) Uh, we've got more than that, but some of them don't work anymore.

Jon Spooner: [03:23](#) Ah. How many rovers are there?

Abbie Hatty: [03:25](#) So there are four up there at the moment, in various states of falling apart. Some of them are pretty old now. And ours will be the first European one. So all of the ones that are there so far have been built by NASA, the American Space Agency.

Jon Spooner: [03:37](#) So 2020. Actual Mars rover that you are building. You've been the lead engineer on it. You're making sure it gets assembled. All the- that it doesn't fail on the way.

Abbie Hatty: [03:45](#) Yep.

Jon Spooner: [03:45](#) How many in your team? How many people working with you?

Abbie Hatty: [03:48](#) Uh, so working for me about 25, but there's about 170 working at Airbus on the whole of the rover, and there's probably about a thousand worldwide working on it.

Jon Spooner: [03:57](#) So a thousand people that are collaborating together across the world. That's so, that's so cool. And I'm just thinking- anyone here that you think Abbie's got a cool job, but anyone maybe at the front here, some of the smaller people, would you- anyone fancy maybe in the future trying to build a rover that goes to another planet? You definitely did. Yeah. Excellent. Okay. And I'm guessing you're a bit- like six? Maybe four? Yeah. If these guys are six and four, how are they going to get involved with building stuff that goes to, how did you do it?

Abbie Hatty: [04:22](#) Just keep building stuff. Keep making stuff. Any stuff. Lego stuff. Marble runs stuff. I love making marble runs. I was an absolute

ace at marble runs when I was a kid. Toilet rolls and kitchen roll tubes in my house were not safe. Really just staying creative, staying curious and maybe doing some sums and science and stuff along the way.

- Jon Spooner: [04:42](#) [Laughs] Maybe fit in the sums
- Abbie Hutton: [04:44](#) Yeah
- Jon Spooner: [04:44](#) But this is something we've heard a weekend from all of the guys that have been in the Shed. They say, it's the curiosity.
- Abbie Hutton: [04:48](#) Yeah, being curious, making things and just keeping that kind of connection with how to build things and how to make things work.
- Jon Spooner: [04:54](#) Cool. This rover, like you say, there's four up there. Two of them don't work. Two of them are still-
- Abbie Hutton: [04:59](#) One of them might not still work. We haven't heard from it in a month.
- Jon Spooner: [05:01](#) Oh, was that since the storm? That's really sad. So we've only got one working rover up there at the moment.
- Abbie Hutton: [05:05](#) Potentially.
- Jon Spooner: [05:06](#) Just as well we're sending another one. Um, but what's special? There's something very special about your rover.
- Abbie Hutton: [05:10](#) So our rover will be the first rover that's actually looking for life on Mars. All of the others have been looking for things like, they say looking for the conditions to support life, and that basically means if we send humans there, can they carry on living? Is there water there? Is there oxygen there? Things like that, but actually we want to answer a very different question, which is, is there separate Mars life still on Mars? So we need to answer that question before we send humans there because as soon as we send humans there, humans are really dirty, covered in like bugs and bacteria and stuff like that. As soon as we send humans, we won't be able to work out if anything that we find on Mars, has actually just been brought across from Earth. So we need to make sure that we know for certain what- and it's are we alone in the universe? It's one of humankind's earliest questions.

Jon Spooner: [05:57](#) I think that's a, it's a good question. Because how much, how much is it costing to build this rover?

Abbie Hutty: [06:00](#) So there's two different missions. One is already gone, so we're probably only a half of this or something, but it was 1.6 billion euros for the whole two missions.

Jon Spooner: [06:08](#) 1.6 billion, but worth it if we find out the answer to the question, are we alone in the universe?

Abbie Hutty: [06:14](#) I think so.

Jon Spooner: [06:14](#) That sounds like small beans to me. And how are you going to answer this question?

Abbie Hutty: [06:19](#) Well, the big thing that we've got that nobody's ever taken to Mars before, is we've got a dirty great drill on the front of our rover so it can actually drill down further under the ground than I am tall. So two meters under the ground is where we're going to look for life, and we know that the environment at the surface of Mars is so hostile, is so radiated from space and stuff like that, that nothing could survive there but under the surface, deep down under the soil, that's where things could be still protected enough to still be alive.

Jon Spooner: [06:49](#) You've got some pretty good hunches about that. You're, I think you're quite confident aren't you?

Abbie Hutty: [06:52](#) I really hope that we find something there. I really do.

Jon Spooner: [06:55](#) What would we find? What's the most likely, what's the thing you're expecting to find?

Abbie Hutty: [06:59](#) Um...

Jon Spooner: [07:00](#) Green alien-

Abbie Hutty: [07:00](#) Slugs-

Jon Spooner: [07:00](#) form-

Abbie Hutty: [07:02](#) Snails, uh squirrels-

Jon Spooner: [07:04](#) Lizards

Abbie Hutty: [07:04](#) None of that. None of that.

Jon Spooner: [07:05](#) -with Theresa May masks, skins.

Abbie Hutty: [07:08](#) Really, we think that if there was big life on Mars, if they were actually, you know, things scuttling around on the surface, you would have seen them all. We would've seen evidence of them from the rovers that have been there so far. So what we expect to find is much more like bacteria, bugs, fungi, things like that. Little tiny single cell, very basic organisms like that.

Jon Spooner: [07:28](#) And the reason that you're confident about that, I think, is because we already know, we have evidence and we're pretty certain that there was at some stage water on Mars.

Abbie Hutty: [07:35](#) Yep. We know that there was water on Mars and it used to flow. And one of the really interesting things that I think is a good supporting theory for life is that there's methane on Mars. Now on Earth, we only get methane created either by volcanoes or by lifeforms. And we know for a fact that there aren't any active volcanoes on Mars because we'd be able to see them. So that means that if there's methane on Mars and it's still being produced today, we can tell that it's still being produced cause it was only lasts about four, 500 years on Mars. It'll get broken down in the atmosphere. So we know that there must be a source of methane on Mars and that could be a life source.

Jon Spooner: [08:14](#) So that's pretty cool. I think that's cool. Sending rovers to discover life out there. This is your opportunity to ask a person who is building objects that go to other planets. If you've got any questions, now is your opportunity to ask them. Who's got a question for Abbie? I'm going to go with the smaller person first.

Audience: [08:32](#) How much money do the singular Mars rovers cost? Does one cost more than the other?

Jon Spooner: [08:38](#) Oh like, which is the most expensive Mars rover? Which is the Ferrari?

Abbie Hutty: [08:43](#) Oh. I don't know for certain, but I would imagine that Curiosity, which is the really big, most recent NASA rover is the most expensive one so far, just because it's a lot bigger than all of the others. And it's got a big nuclear generator on the back, which are, they're pretty expensive.

Jon Spooner: [08:58](#) Hopefully everyone knows this, but it posts pictures quite often of itself and of the Mars landscape.

Abbie Hutty: [09:03](#) Yep. It's on Twitter, you can follow it.

Jon Spooner: [09:05](#) So if you, if you didn't know that, you can literally, almost daily look at a picture of Mars from Earth, which I think is cool. Show of hands, who knew that? A handful of you - it's going to blow your minds. You can see other planets. It's great. Good question. We now know, Curiosity. Slightly larger person here

Audience: [09:25](#) Hello. Uh, so you said about lifeforms being bacteria or things like that, but surely they're going to be totally and utterly different, not even bacteria or else?

Abbie Hutty: [09:38](#) That's one of the really interesting things, is it's that by definition it would be alien life, so we wouldn't know what it would look like. So we've just got to go with what we would recognise as being life here on Earth and hope that it's similar enough what we find that we'll be able to work out that it's life there, but yeah, it could be something completely different.

Jon Spooner: [09:58](#) What do you hope it's going to be?

Audience: [09:59](#) I think it blurs the boundaries between what is life, and what we consider not to be life. Like rocks and things.

Jon Spooner: [10:07](#) [Laughs] Something rocky-

Abbie Hutty: [10:09](#) That would be amazing!

Jon Spooner: [10:09](#) -and squidgy and with eyes.

Audience: [10:11](#) I don't know, no eyes.

Jon Spooner: [10:13](#) No eyes. No eyes.

Abbie Hutty: [10:15](#) Little scuttling rock things.

Audience: [10:17](#) Scuttling rocks but also that live on a different type of scale. Like maybe they live for a billion years.

Jon Spooner: [10:25](#) Cool

Audience: [10:25](#) Or maybe live for half a second. Warping our ideas of time.

Jon Spooner: [10:30](#) How? How long have you been here?

Audience: [10:31](#) [Laughter] 3 seconds

Jon Spooner: [10:40](#) [Laughs] Good one. I met someone yesterday, uh Ziggy who's here. He was telling me that there's some strange opinions around. I like that one. Scuttling rocks. That's a, that's a good thing, but Ziggy was telling me that our cosmic creators are going to be here in October for the event. They're going to be here to take us away from this planet into a new realm. So you should find Ziggy, I think you two would get on. [Laughter] Thank you. Who's- hello again, you've got another question. What's your question for Abbie?

Audience: [11:07](#) What's your favourite planet?

Jon Spooner: [11:07](#) What is your favourite planet?

Abbie Hutty: [11:09](#) Obviously Mars, otherwise I wouldn't be sending a Mars rover to it.

Jon Spooner: [11:11](#) Why is Mars your favourite?

Abbie Hutty: [11:15](#) Mars is in what we call the Goldilocks zone, so it's not too hot and it's not too cold, so it's the kind of place that life could live if it was going to live in our solar system, and it's a bit like Earth. Actually, if you look at some of the pictures from Mars of the surface, it looks just like deserts or kind of mountain landscapes on Earth, you could really believe that it's being on Earth. So it's familiar enough that you can imagine yourself there. Whereas some of these gas planets that don't actually have a solid core and stuff like that, it's just too far fetched that you can't really picture how you'd explore it, how you'd live there.

Jon Spooner: [11:50](#) Stupid gas planets. Do you, do you have a least favourite?

Abbie Hutty: [11:55](#) Ooh. Um, I, I'm not keen on Venus.

Jon Spooner: [11:58](#) No, me neither. I agree. What's your favourite planet? Mars as well. Was it Mars before you met Abbie? Oh, it was, okay.

Abbie Hutty: [12:07](#) Awesome.

Jon Spooner: [12:07](#) Yeah. Gentleman in the front row. He's going to talk about cosmic creators. I can sense it.

Audience: [12:12](#) Hi Abbie. Um, I just wanted to ask, why two meters? Why not ten meters? Why not 30 cm?

Jon Spooner: [12:18](#) Good question. Why two meters?

Abbie Hutty: [12:20](#) Um, so if you want to get technical, radiation is shielded on an exponential scale by the depth of material that is covering it. So two meters, I worked this out once and I can't remember, but it's something like 99.999% of all of the shielding that the whole of Mars would give you is given by two meters. So if it can't survive at two meters, chances are it can't survive on Mars.

Jon Spooner: [12:44](#) That is an excellent, excellent answer. That's a good one, right? Now you know. Thanks Abbie. Who else got a question for Abbie? Yes.

Audience: [12:56](#) What do you have to study at university to become a space scientist?

Abbie Hutty: [12:56](#) Ooh

Jon Spooner: [12:56](#) What do you have to study at university to become a space scientist? Nice.

Abbie Hutty: [13:00](#) There are actually lots of different things that you could study at university and become a space scientist, or a space engineer. So the most common ones, I did mechanical engineering. Um, you can do aerospace engineering, there's quite a few people that studied physics or people that studied maths. But also to work in the space industry, we need all kinds of different skills and all kinds of different people. So we have lawyers, so they studied law, and we have business analysts and they study business probably, and all kinds of other people like that. So most of us are engineers, some of us are physicists, but there's all kinds of different things as well.

Jon Spooner: [13:34](#) This has really come through, we were talking, we had Kevin Fong in yesterday and he was saying, just really emphasising, that you can do any job. His favourite space people are the guys, he was talking about the lock, the door on the space shuttles. So they literally have a key on a fob and they go and they lock the door and then they go and stand away from the, and it goes to space and they say that a little bit of me goes into space every time I do it. So that's not really a space scientist, I guess, but you still get to work in space. Also because you've asked the question, you're the first girl that's asked this question. You said there's a thousand people working on your ExoMars-

Abbie Hutty: [14:06](#) On the rover around the world.

Jon Spooner: [14:07](#) Yeah, how many of those are women?

Abbie Hutty: [14:10](#) Ooh, I don't actually know because I've only met the people, the 160 people at Airbus that work on it. In the UK 11% of engineers are women. So it's not huge. It's getting much better. So the amount of people studying engineering at university is more like 15-20% depending on the university. So it's kind of improving, but it's got a long way to go.

Jon Spooner: [14:33](#) Study hard. Join Abbie on this mission. We need more people like you. But by the time, although by the time you're older to go to university, I'm really optimistic about getting over the whole gender thing. Right? Cause gender's just a construct, it's just an idea. And by that stage you won't, it, it won't matter. We'll all just be-

Abbie Hutty: [14:49](#) It doesn't matter now. But there's just a lot of people that I think parents and grandparents, teachers and careers advisors that just don't understand what engineering means and what you can do with engineering and that you can do these really cool cutting edge things like building spaceships. If you study engineering, they're all like, oh no, it's fixing washing machines, isn't it?

Jon Spooner: [15:07](#) And it all starts with a marble run

Abbie Hutty: [15:08](#) And then it just turns people off the idea of becoming an engineer.

Jon Spooner: [15:12](#) Cool.

Abbie Hutty: [15:13](#) And it opens so many doors.

Jon Spooner: [15:14](#) What'd you think you going to study? Yeah. Have a good think about it. Don't know. You shouldn't know. You're only like eight. Why, what a ridiculous question to ask.

Abbie Hutty: [15:22](#) Don't tell her that the sky's the limit, there are footprints on the moon.

Jon Spooner: [15:26](#) [Laughs] Um, no. Gentleman at the back.

Audience: [15:32](#) Hello. What I wondered is, is there any evidence of the so called building blocks of life?

Abbie Hutty: [15:32](#) Yes, yes, yes, and yes.

Jon Spooner: [15:37](#) Heeeey! Do need to say any more than that?

Abbie Hutty: [15:41](#) Uh, probably not.

Jon Spooner: [15:42](#) No.

Abbie Hutty: [15:42](#) I love the fact that there is lightning on Mars. I think that's pretty cool.

Jon Spooner: [15:45](#) We've got pictures of that? I'd like to see a lightning storm on Mars.

Abbie Hutty: [15:48](#) I don't know if we've got pictures of it like from a rover, but we can definitely see it from the sky. But there are things like dust devils and things like that, just because of the heating up of different layers of the atmosphere. And that means that you get these dust storms and then you get these static discharges. So it's maybe not lightning in quite the same way that it is here on Earth, but you still get these kind of lightning arcs that come down.

Jon Spooner: [16:10](#) Still looks awesome.

Abbie Hutty: [16:11](#) Yeah.

Jon Spooner: [16:11](#) Yeah. Girl in the front with the hat. Hi.

Audience: [16:18](#) What made you want to do this job?

Jon Spooner: [16:18](#) What made you want to do this job, Abbie?

Abbie Hutty: [16:20](#) Oh, um, so I had no idea that there was any kind of space industry in the UK when I was at school. Um, so I got right up to doing my GCSEs really before I had any idea what I wanted to do with my life. Um, at one point I was just going to open a teddy bear factory. I thought that was probably the, uh, the safest bet. Um, I like teddy bears. Why not? But then while I was seeing, my GCSEs, I was really lucky that just at that time there was in the news a lot of stories about Beagle 2, which is actually a British built probe to go to Mars. It wasn't a rover, it wasn't going to drive around. It was just going to go down onto the surface and do some experiments. But I kept seeing these news articles about it and people saying that British engineers are making this probe to go to Mars. And I thought, wow, if British engineers are making something that is going to another planet, then perhaps engineering is a good thing for this British girl to study.

Jon Spooner: [17:11](#) Was it at that moment that you went that it was, oh, it's space I want to do?

Abbie Hutty: [17:15](#) Well, yeah, I'd never really been that into space before. I'd never kind of looked through a telescope or done all of those other things that a lot of kids are excited about from a young age, just because I kind of thought it was unattainable. It wasn't something that I could do here. And then I found out that it was, and it kind of opened this door in my mind of like, wow, this, this is cool and I could actually do this.

Jon Spooner: [17:34](#) That's brilliant. And also that's now what you're doing as well. It's sort of going, yeah, I am building a spaceship. Come and help me build a spaceship.

Abbie Hutty: [17:40](#) Absolutely. So this is why I love going out and talking to families and kids and saying look this is actually something you really can do and it's a hugely growing industry. There's loads of people that we're going to need in the next few years. And it really is something that you can aspire to.

Jon Spooner: [17:52](#) And at a time when it is more difficult to get work and jobs and particularly if you're in the performing arts, I mean cuts or- but space industry, should have gone into space.

Abbie Hutty: [18:02](#) Well yeah, it's, it's growing and it's growing all the way through the recession and it's predicted to continue growing. So it's a great industry to be joining.

Jon Spooner: [18:09](#) Cool. One more question. Two more questions then, because you're very keen but we're going to be coming from here first.

Audience: [18:15](#) My daughter wants to be a space engineer, just like you

Abbie Hutty: [18:20](#) Perfect.

Audience: [18:20](#) She's doing here A Levels.

Abbie Hutty: [18:22](#) Yup.

Audience: [18:24](#) What did you get to get into university?

Jon Spooner: [18:27](#) Reveal what grades did you get at a level Abbie? That's tough dude. I'm glad you didn't ask me.

Abbie Hutty: [18:36](#) So, I did, the only real subjects that were essential to study an engineering degree are physics and maths. So I did physics and

maths, and then I did design technology just cause I like making things, and I did French because why not? And I actually got A's in all of those.

- Audience: [18:49](#) [claps]
- Jon Spooner: [18:50](#) Yes. Well done. I'm not, yeah, I'm glad. I'm really glad that question didn't come to me, four As. [laughter] Um, yeah. Well done. One more question at the back there.
- Audience: [19:06](#) What do you say to flat earthers and people who don't believe we landed on the moon?
- Jon Spooner: [19:07](#) What do you say to the flat earthers and people that don't believe we landed on the moon?
- Abbie Hutty: [19:13](#) Um, it's a struggle to have an extended conversation [laughter] with those kinds of people. I did sit next to a guy once at a wedding whose response to 'what do you do? I'm a space engineer' was, oh really? I don't believe in that. And I just-
- Jon Spooner: [19:29](#) [Laughs] He didn't believe in what part of it?
- Abbie Hutty: [19:32](#) What part... what... [mumbles] Yeah. It's a complicated one. I mean, it's- my favourite thing about flat earthers is, um, Elon Musk tweeting the flat earth society and saying, if there's a flat earth society, why isn't there a flat Mars society? And the flat earth society replied, not even joking, because Mars has been observed to be round. [Laughter]
- Jon Spooner: [19:55](#) Because we can see it from the flat earth.
- Abbie Hutty: [19:57](#) Yeah. It's just like, but if Mars is round then what makes you say-
- Jon Spooner: [20:03](#) So there's basically nothing to say to them.
- Abbie Hutty: [20:05](#) No, no. Sorry.
- Jon Spooner: [20:06](#) Anyone here believe that the earth is flat? You do. You don't. Anyone here believe that the moon landings were faked? Oh, we're doing well today. Ziggy? Kevin Fong again was saying yesterday that, because it's difficult to believe that these things are successful because how risky is it, this mission that you're sending to Mars, what are the like, what the chances of it getting there?

Abbie Hutty: [20:30](#) Well, if you look historically and we are getting a bit better, but um, we've sent over 50 missions to Mars now. Missions that have had some kind of scientific connection with Mars, whether they're taking pictures of it or they're landing on the surface or whatever. And of those only just over 50% have been successful.

Jon Spooner: [20:49](#) So it's 50/50.

Abbie Hutty: [20:50](#) Yeah.

Jon Spooner: [20:51](#) So it is difficult. And it is, that's why I think it's difficult for people to believe sometimes, the idea of landing on the moon although-

Abbie Hutty: [20:56](#) It seems so far fetched.

Jon Spooner: [20:58](#) Yeah. Yeah.

Abbie Hutty: [20:59](#) It is so complicated. How could you possibly get all of those things right at the same time for one mission.

Jon Spooner: [21:04](#) And what's, cause this is like you say, this is years and years of your and thousands of other people's lives, work, research going into it. Can you, do you ever think about how it would feel if it didn't?

Abbie Hutty: [21:16](#) You can't.

Jon Spooner: [21:17](#) No?

Abbie Hutty: [21:17](#) You just can't go there, psychologically. You have to keep going. I mean there was some people, because Beagle 2 the mission that inspired me in the first place wasn't actually a success, ,and there's a lot of people that work where I work, who did work on Beagle 2 and it's still this kind of dagger in their hearts. So, um, in some ways a lot of them are trying to kind of get over that and get closure for that by working on ExoMars and hoping that that one does work.

Jon Spooner: [21:42](#) And it's also this persistence thing, right? You've got to keep trying. You've got to keep going.

Abbie Hutty: [21:45](#) Absolutely. Nothing works first time, right? You wouldn't do anything amazing if you gave up the first time it didn't work. You've got to keep trying.

Jon Spooner: [21:53](#) Like today when we tried to open the shed, which you would think would be a simple thing, but no, uh, we really got that- Abbie you're not going to be running away are you?

Abbie Hutty: [22:02](#) Nope.

Jon Spooner: [22:02](#) You're here for the day. Uh, what are you excited about seeing?

Abbie Hutty: [22:04](#) The Killers later.

Jon Spooner: [22:05](#) Killers this evening. Got up, beautiful day for the rest of the day. Loads of stuff to do here. We're going to be back at two o'clock where I tell you the story of How I Hacked My Way Into Space. We've got Jen Gupta in at four o'clock.

Abbie Hutty: [22:16](#) She's awesome.

Jon Spooner: [22:16](#) Yep, but before then, Abbie's not running away, so if you didn't get to ask a question that you wanted to then do come and see her down here outside the Shed. Thank you for bearing with us through the technical things a little bit earlier. Would you please give a massive Faraway Forest round of applause to Abbie Hutty!

Audience: [22:31](#) [claps]

Mini Jon: [22:37](#) I want to go to Mars!

Jon Spooner: [22:37](#) You want to go to Mars? Well, I suppose now that you've been to the International Space Station, I guess we do need a new mission for you.

Mini Jon: [22:45](#) Mars! Mars! Mars!

Jon Spooner: [22:45](#) I really don't think-

Mini Jon: [22:49](#) I could go with Abbie's rover

Jon Spooner: [22:49](#) What great idea, MJ! But I'm not sure that there would be room for you to fly there with Abbie's rover.

Mini Jon: [22:55](#) I'm only small.

Jon Spooner: [22:55](#) You are only small. Well I guess we could ask.

Mini Jon: [22:59](#) Mars! Mars! Mars!

Jon Spooner: [23:00](#) Okay. Okay. I mean maybe Abbie will listen to this and think your idea is a good one.

Mini Jon: [23:05](#) Yeah!

Jon Spooner: [23:05](#) Fingers crossed!

Jon Spooner: [23:08](#) Thanks for listening to this episode. If you enjoyed it, please subscribe to Live from The Space Shed on Apple Podcasts, Spotify, Google Play or wherever you get your podcasts. You can follow us on Twitter and on Instagram at @untheatre that's <u-n-theatre> and you can find full details and social links at our website thespaceshed.com

Jon Spooner: [23:29](#) Live from The Space Shed is an Unlimited Theatre production with Season 1 brought to you in association with the Science & Technologies Facilities Council, the Cockcroft Institute, The Space and Arts Council England. With special thanks to Dr Rob Appleby of Manchester University. Our theme music is 'Go!' by Public Service Broadcasting used with their extremely kind permission. Our sound engineer and editor is Andy Wood with additional sound design by Elena Pena. The show is produced by Jon Spooner and Alice Massey, with support from our friends at Storythings. Live from The Space Shed is an Unlimited Theatre production on behalf of the Unlimited Space Agency. See you for more

Mini Jon: [23:59](#) Live from The Space Shed!

Jon Spooner: [23:59](#) Live from The Space Shed soon!