Reaching for the Stars

TARIQ AL OLAIMY: We all have the power to build a better world and shape the future into one that is cleaner, safer, healthier and equitable for us all. But we can't do that alone.

I'm Tariq Al Olaimy, and this is "People and Planet".

A podcast from Expo 2020 Dubai's Programme for People and Planet, where changemakers from all over the world breakdown what it will take to create a sustainable future for our planet.

[INTRO STING]

TARIQ AL OLAIMY: Today we're speaking to DR. Maggie Aderin-Pocock MBE... that's her official title - but when I asked her to introduce herself... this is what she said.

DR. MAGGIE ADRIN: Um so my name is Maggie Aderin Pocock. I'm a space scientist and a science communicator, and I love all things about space

TARIQ AL OLAIMY: DR. Maggie is also the presenter of BBC's The Sky at Night,

BBC The Sky at Night - The Brightest Star [HD]

TARIQ AL OLAIMY: a show that explores the fascinating world of space and a stronomy, something she has been passionate about ever since she was a child.

During Space Week at Expo 2020 Dubai this October, she hosted "The People's Mission", an event which brought astronauts, space scientists and astronomers together to inspire people from all generations to keep reaching for the stars.

ARCHIVE

DR. MAGGIE ADRIN: Salamu Aleykom. Uh, good morning, everybody. And, um, it's wonderful to be here and uh welcome to expo 2020. And this is the people's mission. Our citizens in space exploration. I must have been just saying that gives me a real buzz. I'm so excited to be here.

Now I will be your guide on this journey through space and time. Uh, my name is DR.. Maggie Aderin Pocock. Now I think one of the important things is that this is a journey to be made by all the peoples of the world. And so I think it's a celebration and a joy that we make it together

So the title of this talk is reaching for the stars, but it's also about the power of a crazy DR.eam because all my life, um, I have had a number of crazy DR.eams and I want to tell you a bit about them.

Back to the interview with Dr. Maggie Adrin:

TARIQ AL OLAIMY: Now back in her home in London, we got a chance to speak to her about her experience at the expo, the wonders of the cosmos... and the vital role space exploration plays.

TARIQ AL OLAIMY: In mutuality DR.. Maggie, It's such an honor, and a pleasure a be able to speak to you today for your time, your breath. Um, we really, really appreciate it.

So let's get started...

You're based in London and you grew up in London in the seventies and you're born a year before the moon landing. So I want to get a sense of, what was that environment like and really how did it shape you, and inspire you towards space exploration.

DR. MAGGIE ADRIN: As you said I was born sort of 1968 and 1969, the moon landings happened.

So I was too young to remember the moon landings, but they played a vital role in my life. So growing up, I heard about sort of other trips to the moon and I was excited about them. And also um growing up in the UK in sort of um a late sixties, early seventies, it was quite interesting. Cause when I went to school, I felt I didn't

really belong because at school I was sort of, um, the color of my skin quite prominent.

And so kids were coming up to me and say, oh yeah. what are you doing here? Yo, why don't you go back home? I was like, I live around the corner. So, um, but also at home, when I was meeting my cousins, um they were all sort of bought in Nigeria and I was born here and I'll say, you don't speak Nigeria and you are not Nigerian.

So I felt I didn't really fit into any world, but what I loved about spaces, when you look at the globe from space, you don't see the barriers. You don't see, oh, yes, you're from Nigeria or you're from England. It's just one globe. And I loved that. So space was an attraction in that way. And also, uh, I must confess, I used to love watching Star Trek and sort of, um, with, uh, Captain Kirk and especially Nichelle Nichols.

Oh, you tell him you horror seeing her as a black woman, as a key part of the team and an international team, people from everywhere exploring space together, that really sort of made me excited about space. 7:29

TARIQ AL OLAIMY: Beautiful. And who are your, your non-fictional idols as well? I'd be curious to learn.

DR. MAGGIE ADRIN: Yes, so I have a number of sort of role models in my life. Uh, firstly, my parents, um, although my parents split up when I was four years old and both had a strong influence on me, my mom is a sort of a strong, powerful woman, a very independent woman. And I think I got that. Some of that from her. Uh, but my father was the one who encouraged me to sort of reach for the stars.

Um as I was growing up, I was facing various challenges, um, through education and things like that. And my father was always the one encouraging me say, okay, this might take you longer, but you can still do it. Uh, but then going sort of further a field, hearing about people like sort of Yuri Gagarin, uh, the first person to travel into space.

He had a special place in my heart, especially later because I found out that his birthday and my birthday, uh, were both born on the 9th of March. So to me that was sort of a, a bit of symmetry happening. And, it was sort of in later years I heard more about Neil Armstrong and uh, growing up, I thought he was the right stuff, you know?

Um, so ex-military and sort of going into space, but he was a simple engineer. And I think the reason why he was the first person to land on the moon was because he

was very calm in a crisis. So it's these sort of people, but as I've grown up, I've seen more female role models like Mae Jemison, the first black woman in space.

I met her a few years ago and she was fantastic and she came and gave me a hug. I will remember that moment forever. So I've, I think I've been very lucky to have some fantastic role models out there.

ARCHIVE

DR. MAGGIE ADRIN: So as I moved around a lot um they just assumed, but I was a bit dumb. And so I was put at the back of the class, you know, with the safety scissors and the glue to keep her out of the way. And, um, so there I stayed. So I had these crazy ideas about you reaching for the stars, getting out there into space, you're traveling the universe.

And yet there I was at the back of the class. Now, one of the things I realized is that it's science that gets people out there into space, science, engineering technology. And so I um used to pay slightly more attention to the science class. And I remember sitting in a lesson one day and the teacher asked a question and the question was this.

If one liter of water weighs one kilogram, what does one cubic centimeter of water weigh? Now I start there. Now, one of the things about dyslexics is I can't spell for tophi. You might even have spot some spelling mistakes on my slides, but one of the things about dyslexics, uh, we are very logical. And I sat there thinking, okay, Um, sort of at one cubic centimeter is a thousandth of a liter.

A thousands of the kilogram is one gram. So one cubic centimeter she'd weigh one gram. So I remember putting my hand dock here. I got this one and I ended up looking around the classroom and no one else had their hand up. So I sort of put my hand down, but then the teacher looked at me and I thought, come on, you grab the opportunity, see where it takes you. So i put my hand back up and said Miss, is it one gram? And at that moment, sorry, but it really was as if heavenly angels started to, singing. Little maggie at the back of the class got this question right. If I can do that, what else can i do? Sorry, I I'll quit on the evil laughter. But it was a sudden an opportunity..

And so that sort of transformed my education. I started paying more attention to science classes as my science race started coming up, my other grades going up as well, that it was hard work

Back to the interview with Dr. Maggie Adrin:

TARIQ AL OLAIMY: You know, just going back to what you mentioned on that challenging environment at school, you'd mentioned at expert 2020, that you have this super power of dyslexia. I'm just wondering, like adding on onto those layers of. Being, uh, you know, in that kind of challenging environment, how did that positively affect you? And what ways did you really harness that superpower for, for good and towards your life's calling ?

DR. MAGGIE ADRIN: So it's quite interesting because with dyslexia, I used to say I suffer from dyslexia because when I was a child, I didn't know I had dyslexia, but all I knew is that I found reading and writing quite hard. And of course, when you're first in school, it's all about reading and writing.

So as I realized I had dyslexia, I saw it as a detriment, but, um, as I grew older, I realized sort of, it's like the ying and the yang. There were some benefits I get out of dyslexia and sort of communication is one of them. And, um, sort of, um, a good 3D spatial. Lots of dyslexics go to architecture.

And also I think just growing up with dyslexia, you learn how to tackle problems in a different way. So for instance, if I'm writing something and they get to a word and I can't spell, I can't spell it. And the spelling checker doesn't recognize what I'm trying to say. You come up with a different word.

And I think for dyslexics, that's the way we are sort of built in. We have that sort of resilience built in because we're always sort of tripping over ourselves. And so I think just by having dyslexia, it's given me the ability to sort of you come across a problem. They get, okay, I can't go that way.

Let's find another way round. But I think the communication, I, Before I realized I actually had dyslexia, I started moving my career towards communication because I felt I was better at communication than sort of the written word. Although I do write books, which is a bit scary.

TARIQ AL OLAIMY: And on you're continuing to write your story. And I'd be interested to know, you know, going back to between the, the embraces and hugs between idols and really being able to fit in many worlds within one world. And, and really finding that sense of wonder within space and science at a young age. Is there like a moment where you knew this was going to be your life's calling like this is what was really calling toward you as this pathway, to the future. That was that was really inviting you in to enter the space of wonder and exploration

DR. MAGGIE ADRIN: So it's quite interesting. Cause I think, um, some people, some people have a sort of seminal moment, I think.

Yes. But for me, I can't remember a time when I didn't want to go into space, which sounds very strange, especially when I was at school, so to get the back of the class. When people ask me what I want you to do. And I said, oh yeah, I want to be a space scientist. Sometimes people will say, oh, Maggie that's. I don't think you're going to do that.

You know, I asked you what your, if you want to go into a space, that's going to be really tough. Why don't you do something else? So for many years, I didn't tell anybody. I want you to go into space or I want to be a space scientist, and it's not until I sort of was able to get through, um, the obstacle course.

That was my schooling and sort of come out the other end. I started saying, oh yes, I really love space. And I'd love to do something in space. So the calling, I think, has been there from like, from the beginning. And I think in that way, I'm quite lucky because by having such a big and so epic DR.eam, it means that, um, I have sort of a, um, overcome those hurdles and sort of found ways round.

And sometimes I've fallen flat in the mud after utter failure and it's been sort of horrible, but I think the thing that's picked me up again is thinking, oh, well, you know, there's that golden DR.eam of getting into space. And so if I can focus on that, then I can sort of go, I can overcome this failure and keep on going.

So I think I'm quite lucky in that way from having that I like to call it the desire to aspire, but that got me when I was a very young age. And so it's helped me through some of the more difficult times.

TARIQ AL OLAIMY: Beautiful. And you're someone who speaks to a lot of young people today. You plant the seed, I'm sure of, uh, of that desire to aspire as well. And what, what would your advice usually be to young people who you see maybe are navigating that obstacle course that, you know, maybe are not fully communicative of, you know, those wild DR.eams. Uh, what is your advice really to table to counter, uh, maybe their colleagues, their classmates who are, or maybe not giving the space for them to shine? Uh, what would you say to them?

DR. MAGGIE ADRIN: So, um, um, the title of the talks I usually give to young people is reach for the stars no matter what your stars may be. So I think, what I like to

encourage people to do. Is think big and think crazy because I think the bigger, the DR.eam and the crazier, the DR.eam for more DR.ive, you have to reach it.

And there will always be naysayers. The number of people in my life that said, oh, that's not going to happen. I think by having the big DR.eam, it means you can overcome it. And also it means you can, I may never get into space, um uh It's still my DR.eam, and I'm still hoping to get there. I may never get into space by, by having that big DR.eam, it has DR.iven me.

So I do want the kids to have a desire to aspire and to know that um they have so much potential. Uh uh if I could go back to myself and tell myself, you, just offer a few words. I say, Maggie, yeah, the world is your, is your creation. You create the world you want. and the career you want. So believe in yourself, because I think so often we sort of listen to the negative voices and sometimes the negative voices inside.

And I have that too, you know, imposter synDR.ome, like, should I really be here? But I think it's overcoming that. And having the big DR.eam really helps that.

TARIQ AL OLAIMY: And you are someone who did create that world yourself when you're a young age. And I'd love to maybe invite you to tell us about your love story with telescope.

DR. MAGGIE ADRIN: Yes. And so, yes. Uh, my love story of telescopes begins when I was quite young. I used to watch a program called the sky at night, um, which was hosted by a chap called Patrick Moore.

And he had to have sort of a monocle and he was very British and, and this program is it's the longest running science program in the world. And I'm very honored now that I host the program. But, as a child, I used to listen to him and he'd say, what was in the night sky. And I'd always sort of go out and I was living in London and I'd go out and I'd sort of look, and it was often cloudy and there's lots of light pollution, but I thought if I could get a telescope, then I could get closer to the stars and see what's out there.

And I bought my first house escape when I was probably about 13 and we didn't have much money. Um, we were living in sort of what we call a cancel flat in England, which is sort of a, um, sort of assisted accommodation, uh, because we didn't have much money and uh I bought this telescope and it was, wasn't very good at all.

It's suffered from something called chromatic aberration, which means as the light goes through the telescope, it gets split into different colors. So I was really disappointed because this was all I could afford. But then I saw, in a magazine, a telescope making class, and this was sort of mind boggling.

You can make a telescope?! And so I sort of went along to the class and I remember someone knocking on the door and coming in and everybody else in the room was male. And I think the average age was about 50 and there was me sort of 14 years old. But it's funny. I came in and they sort of, they were very welcoming and we had in common was we wanted to get a better understanding of the universe by making our own instrumentation.

So I used to go to the class, which I think was on a Tuesday night at a local school. And they showed us how we could sort of take two pieces of glass and you put an abrasive powder in between them. And then you put one piece of glass on top of the other and you start sort of a grinding away. And what happens is the glass underneath becomes sort of a dome shape.

And the glass above sort of becomes like a cave concave. And if you keep on doing that, you end up with a spherical surface. But for a telescope, what you actually want is a parabolic surface, because a parabola is a shape that brings light from a distance to a nice sharp focus. And so, um, I used to work on it and then sort of measure it at the telescope making class.

And, uh, I, I used to sort of sit in front of the TV, watching Star Trek and making my own telescope. And eventually I was able to actually make it, uh, my telescope. I made a little housing for it, and I was able to sort of point up at the night sky and I'm a lunatic. I love the moon. And so to be able to see the craters of the moon with a telescope that I'd made with my own hands was almost magic, but that led me to actually work on bigger telescopes later.

So it's been a uh wonderful trajectory for me from making my own little telescope. So working on some of the largest telescopes in the world.

TARIQ AL OLAIMY: And in between you graduated with a PhD in mechanical engineering from Imperial college, London, you moved on to work for the ministry of defense on projects, ranging from missile warning systems to landmine detection. How did you kind of come full circle back to that first love of telescopes and end up working the Gemini observatory?

DR. MAGGIE ADRIN: when I finished university, I sort of, um, I was writing up my PhD and I needed a job. Uh, but there weren't many jobs going around in fact, uh, many companies where I'm sort of cutting people at the time.

So it was a bit frustrating. Finally, you know, I, DR.. Maggie, ready to go out into the world, but there was no jobs available, but I applied to the ministry of defense and, um, cause I've been doing optical instrumentation through my telescope and through other things. And also my PhD was also uh measuring engine oils in very, very tiny contacts.
So maybe a million of the width of a hair looking at what happens to engine oils in these conditions. Um, I was able to get a job,, working on an optical system, looking at sort of, uh missiles going down a track. As a missile warning system for pilots. So I did that for a while, but then I got involved in landmine detection because landmines are a devastating problem across the world.
So I was doing all of that and it was very rewarding work, but my heart was lying out in the stars. And so I applied for a few jobs or one job was at the Palmer in tenor reef on a telescope there. And they were looking for someone who did electronics.

And unfortunately I don't, I'm not very good at electronics, so that didn't work, but eventually I was able to get a job at university college, London, I'm sort of building an instrument to go on a big telescope and it was just sort of mesmerizing for me because I was going to be working on the Gemini telescope, one of the largest telescopes in the world.

And so I was able to make the transition from the ministry of defense, sort of working on landmine detection to ground-based telescopes making instrumentation for that. So, it was a challenging project. We were building, uh, an instrument that actually sat on the tele scape and as sort of measured Starlight and gave us an understanding of what was happening in the heart of stars.

It made my heart sing to do it because it was me getting close to my crazy DR.eam of reaching the stars.

TARIQ AL OLAIMY: can you give us a sense of perspective? How big are these telescopes in London?

DR. MAGGIE ADRIN: Yes. So many people, if you buy a telescope to sort of, uh, look, uh, do astronomy or even binoculars, they're generally made out of a lenses, but when you're talking about 8.1 meters, and one of the things that Isaac Newton came up with is going to have what we call it, a reflecting telescope.

So rather than the light passing through a lens, what you do is you have a reflecting surface, and this is very useful because if you have an 8.1 meter lens, the quality of the glass has got to be amazingly good. And it's hard to get a glass, which doesn't have sort of a continuities or impurities.

But if you have a mirror, you just reflect off the surface. And so the glass doesn't have to be of that good quality. And so this is why, we have these huge telescope mirrors. Going into the telescope dome. It is amazing because it is like a temple to science because you've got the eight meter telescope in the center, and then you've got this huge doom that sits around it.

And then as the sun sets and we get ready to do the observing, they open up the telescope and the Dome's been air conditioned all day to keep the temperatures of cool. And then they open up the dome. Sometimes the purple sky as the sun sets and the star start to appear in the sky. And uh I've actually been actually standing on the telescope as it moves around to take its first observation.

And it's just a thrill, cause it's like a roller coaster ride because this is eight meters of telescopes swinging round to look at the first star of the night. And it's just sort of, if anyone gets an opportunity to go to one of these large telescopes, take it because it is amazing. It's an amazing feat of engineering too.

So to be there was just magical!

TARIQ AL OLAIMY: And in that temple of science and in that pair of observing the stars, what did you learn from your work and the Gemini observatory? Both. Within yourself and really linking to what you share to your challenges growing up, um, how you flourished, uh, but also really what did you learn from the science of that work?

DR. MAGGIE ADRIN: Yes. So, um, in terms of, actually my work, um, I was the project manager. I'm making an instrument called BH Ross, which stands for bench mounted high resolution optical spectrograph, which is a bit of a mouthful. But what BH was doing was it was taking the light gathered by the telescope.

That light was fed via an optic, um, an optical fiber, uh, to BH Ross. And then we took that light and sort of stretched it into its rainbow colors. And then we could analyze the light by doing this, um, this rainbow, the spectra, you can see little absorption bands and these bands indicate what chemical reactions are happening in the heart of the star.

So, again, it is getting me closer to my crazy DR.eam of understanding the stars.

And sometimes we were looking at old stars and seeing how they evolve. With a telescope, a telescope is like a time machine because it takes a finite time for light, to have a form, the star to reach the telescope. And to me, the magic is if you look through a telescope that light has traveled billions of kilometers to go into your eye and with a telescope, oh, the instruments we were building that light is traveling billions of miles, billions of kilometers to get to our instrument.

But because it takes us finite amount of time for the light to travel from the star to the instrument. We are effectively looking back in time if, we should never look directly at the sun, but it takes a light from the sun about four and a half minutes to reach us. So as we see the sun, we're seeing it as it was four and a half minutes ago, or with light, sometimes we're looking at a light there's travel for thousands of years.

But also the project itself was quite challenging, I was the project manager managing a team of about 17 people it was nice because it was a team which was quite diverse. So we had sort of software engineers, we had electrical engineers, we had optical, sort of a designers. We had mechanical designers to support the optics. So we were all working together and sometimes, um, funding was tight. And I remember, um, sometimes I'd use my credit card to buy instrumentation or to buy the things we needed just to keep the project going. So again, I think it was that resilience coming in, but, you know, um, we, it was trying to keep the project going no matter what.

So towards the end, I was juggling more and more things. But it made me understand the instrument more so as a project manager and then sort of as a systems engineer.

So it was sort of a certain amount of resilience to keep the project going. And then we eventually delivered it to, um, sort of a telescope in Chile. And I was there in the basement putting the instrument together. And I used to see it as my, sort of my baby, because I, um, I'd worked on this instrument for about four years before we delivered it to Chile.

So it was something very close to my heart. And the first night where we actually got sort of Starlight going through the instrument and we actually got some results, it was the culmination of sort of four years work coming together. (26:12)

DR. MAGGIE ADRIN: And what was it like working in that isolation there in the remote Chilean mountains?

DR. MAGGIE ADRIN: Oh, it's funny because it, it was beautiful. I was there on my own, and so I actually had a little house on the mountain. And, um, it was sort of a bit of a way down from the telescope. And so everyday I would sort of DR.ive up to the telescope and work on the telescope and then sometimes into the night, because at first I was working during the day sort of putting the instrument together, but then as the instrument was coming together, then we start working at night.

So actually gathering the star, light it and testing out the instrument. But I'm sort of. Stay up on the mountains, whatever 24/7, but on a Saturday morning, I would go down the mountain and pick up supplies. And Chile is a fantastic country and everybody was very warm and welcoming. And um, so I'd go down and gather supplies and then DR.ive back up to the mountain.

So, um, the local town was La Serena which was by the sea and that would often be sort of cloudy and covered. So you couldn't see very much, but as you DR.ove up the mountain, the skies would become clearer and clearer.

But sometimes I would sort of sit out on my balcony. I'd make some food and just look at the stars and toast the moon, maybe because the moon was my companion up there. So it all sounds a bit crazy, but it was beautiful.

TARIQ AL OLAIMY: Uh, Lunatic in the, in the best sense of the word is you mentioned

Incredible. And I just want to go back to something you shared, which I find incredible that you have to cover many of these costs yourself and really take, uh, not just two or three steps forward yourself, really a hunDR.ed and beyond. And you know, you're going back to saying that there weren't that many black female scientists and role models, you know, growing up and who are doing this work on the buyers that really there to attention to the space

Do you find that that's still something that's common for female scientists, you know, entering to the field, especially for black female scientists? Uh, could you speak a bit more to how your just perceptions of that space, even the challenges that still exist, um, or what you see are maybe breakthroughs in the sector.

DR. MAGGIE ADRIN: So I think there are definitely still challenges in that sector of people, uh, for women, for people from ethnic minorities as well
So there were still barriers, unfortunately, I think here in the UK and in other parts of the world, uh, it's still sort of, uh, the space industry is still very male dominated and

it's quite interesting because um I was speaking, I do, public speaking, sort of encouraging, uh, sort of encouraging girls to go into science, encouraging everybody to go into science, but showing that girls that there's a place for them there too.

Uh, but also speaking to sort of people who are already in the field and sort of progressing in the field. And sometimes when you sort of speak to people, sometimes the barriers are external and people say, oh no, you can't do that. Or, oh, you're a girl. Yeah. What do you know about science? So these sorts of stereotypes, and I think that's the challenge to break those stereotypes.

And I think in terms of that, um as scientists, we can go out and speak to people, but also I think it's a societal change you still have. Um, you still have, when my daughter who's 11 now was growing up, I'd go to a toy shop and they'd have boys toys, which were engineering and putting things together and cars, and then the big girls toys, which was sort of the, the nurturing the dolls and things like that.

And so right from the start, we almost have this divide. And so it's trying to break those barriers down. So I think these are societal changes that we need. Also, we need sort of more role models to show, you know, if I can do it so can you, but also sometimes the barriers are internal, we are as a woman or as a black woman, who should I be going into this field?

Can I, can I succeed? So it's breaking down barriers, internal, external, the imposter synDR.ome and things like that, which we all suffer from, so I heard someone describe it as the sticky floor. And so it's trying to tackle it on both levels and throughout society. So it's a big challenge to take on, but unfortunately we've come a long way, but we're not there yet.

I saw a horrible statistic the other day that showed women working in the space industry. And it showed that there's a huge pay gap for many women working in the space industry and the pay gap gets worse. The higher you go up. So it's trying to sort of tackle these problems and sort of um make things um just more balanced and different people are, get excited by different things.

So, young boys wanting to go into nursing girls wanting to go into engineering. It's not trying to show you that all of these things are for everyone. It depends on what makes your heart sing. Not to it shouldn't depend on the color of your skin or what gender you are. So we have a way to go, but we have come a long way.

So I'm heartened, but there's still work to do . 31:21

TARIQ AL OLAIMY: Absolutely. And you mentioned the importance of the BBC's the sky at night show for you and you know, and that lens, how important was that moment? Culturally, personally, and also sort of socially for, for aspiring young female scientists, uh, in the country, when you are a top to host the show, um, and you are invited, uh, to detect that mantle.

DR. MAGGIE ADRIN: Yes so for me it was very interesting. So um Patrick Moore who has done the program I think the program started in, I think it was 1957. It was just before Sputnik went up and it was only meant to last for sort of a couple of weeks.

But Patrick Moore, I did the program for 57 years. So he was the longest running science presenter, but longest running TV presenter in the world when he passed away, there was talk. Should we continue with the program? Cause it was very much Patrick Moore's program. And so, um, it sort of, there was talk backs on possibly stopping the program.

And, but there was an opportunity there. And I must say I did express an interest in sort of our hosting is, cause this is the program that sort of helped me get a better understanding of the night sky. So the idea of trying to do that for other people encourage more people to come on board and understand what's happening out there.

There seems like a wonderful opportunity for a science communicator. So I did say I'd love to do the program. And when I actually got offered the job, I was sort of uh, uh, later I couldn't believe it, but there was some talk in the press that the BBC were just being politically correct. But you know, who is this woman?

You know, they're only giving it to her because you know, she's black and female. And, uh, at the time I was fairly well established as a science communicator. So I'd been going out and speaking to school kids, I've done sort of lots of news programs. And, and so the idea that I was just getting it because I was black and female was fairly disappointing.

But it's quite interesting because when I started doing the program, I think a few people say, well, we're not sure about this. This is, yeah, this is a change. Uh, but uh, I've been doing it for seven years now. And people come up to me in the street and say, oh, we love what you do on the sky. And I thank you so much.

We really enjoy it. And I think this is the fear, really people fear change because it is a sort of, one was a leap into the unknown. And when people are used to something, when things change that they don't know what it's going to be like. And

I find that with project management or people see me. Hey, she's the project manager, what's she going to be like?

So it was an interesting transition, as I say, I've been doing it for seven years now, so I think I'm well established in the role, but, um, uh, it was quite terrifying for me too, because he had a presenter who'd been doing it for 57 years. And then I sort of come along and say, hello, so it was terrifying, but fantastic at the same time.

TARIQ AL OLAIMY: So just on that front as well, why is it so important to be a science communicator? Why is it important for you that science is accessible on maybe also to invite you to explain what is really the mission behind your organization? Uh, science, innovation.

DR. MAGGIE ADRIN: Yes. So I truly believe that science plays a major role in all our lives. And I think, um, through the COVID pandemic, we've seen how that really plays out the fact I'm speaking to you, sort of a, um, sort of across the world, that sort of technology at work.

The looking for the vaccines, I'm sort of, that is top technology at work at science at work. And, it's quite interesting because when I go out to speak to kids to encourage them into science, I don't, I don't think it'd be scary if all the kids became scientists. So that's not the goal, but I think the goal is for everybody to be aware of science, because science is too important just to be left to the scientists.

There are ethical questions to be asked, moral dilemmas, how we use science is so important. And so I like to explore that with kids. So even if they don't want to be scientists, just having an awareness of science, I think is critical for everyone. And so that was my goal with science innovation limited, or the company I set up.

Um, I, I realized that I was sort of working as a space scientist, which seemed like a really cool title, your whole I'm a space scientist. But what I was realizing is that I couldn't recruit people to work in space science. As a space scientist not only are we making a real difference to the world. We're also sort of understanding the universe, but also, um, changing people's lives and making it, uh, uh, having an impact.

So what I want to do is go and encourage people and actually consider this as a job. One of the things that I've found is when I go and speak to school kids, and I say, I did a degree in physics.

I say, well, you did a degree in physics. We thought you'd be a physics teacher because they don't make that link between physics and doing other things out

there. They see physicists, there's maybe going to work in academia. They see physicists as going to work as teachers, but as a physicist, people go and work in the city.

They go and work in medicine, they go and work in so many different areas, but they can't see that clear, clear career path. So what I want you to do was use my career as an example of the many different things I've done and show that getting a degree in physics can lead to so many, many different paths.

And so that's what I try and do with my company. Try and I see as a, a three, um, a three-pronged sort of approach. Firstly, I want to talk about sort of as a role models are very interesting because when someone first suggested I was a role model, I got a bit freaked out because I don't see myself as a role model but I think I was wrong because to be a low model, you don't have to be perfect.

You just have to have something you're excited about. And for me sharing my knowledge of science with other people in a way that people can understand is that's what makes me excited. And so, we need more role models and it's nice to show sort of female role models, role models from ethnic minorities to show that science is for everyone.

At the EXPO that's one of the things I was, I was trying to explore. If you look back in time everybody has looked up at the stars across the world, every culture. And so there is our heritage and in the UAE, um, you've got the hope probe going around Mars at the moment, and it's setting up sort of a biodomes in the desert to simulate us over a Martian colony.

And in the future, you're hoping to have a colony on Mars. So it is, the aspiration, I think all countries. And so it's showing that heritage EA space is for everybody. And so it's role models and then its relevance. Because again, it's all over. If I do physics, where do I go? So it's showing that, you know, with physics, you can go anywhere and with other sciences too.

But I think the final thing is that sense of wonder. And the fact we're finding planets out there going around to other stars, which may in the future be potential homes for humanity. It's that sort of, uh, um, the way we're doing things and understanding things with our big telescopes. That sense of wonder, I think really works too.

So I like to talk about role models. I like to talk about sort of the relevance of science in our lives, but I'd like to show that wonder, cause science is doing amazing things!

TARIQ AL OLAIMY: Beautiful. And to walk deeper into that wonder, uh, you run these tours of the universe for students on I'd love for you to let us know. What do students experience, what do they take away from these trips on what are your hopes for, for that future generation that are going through these tours?

DR. MAGGIE ADRIN: I like to show, uh, all place in the universe is amazing. We live on a planet, the third rock from the sun as it's described, but we've got a sort of, um, um, seven other planets in our solar system. So I like to talk about just listing some of those planets.

so there's a debate going on in the UK at the moment as to whether we should be spending all our money on sort of looking at climate change and perhaps you curb the spending on space. But I would argue that by looking at the other planets in our solar system, for instance, we can get a better understanding of our own planet.

If you look at the planet, Mars, for instance, Mars used to have liquid water running over the surface. And we have various theories for why the atmosphere of Mars changed significantly. So by looking at other planets, we can get a better understanding of our own Venus. Venus is the hottest planet in our solar system, even though it's not the planet closest to the sun, because a Venus has, uh, an atmosphere, which I think is 96% carbon dioxide.

So it was looking at the impacts of that. And so we only have a small amount of carbon dioxide in our atmosphere, but it's increasing. So by looking at the planets and space, looking at our own planet, we get a better understanding. So it's showing sort of the relevance of that, and actually going soft as a tore through the solar system and then out, beyond to get an understanding of our place in the universe.

And I do love going out beyond. Because all local star is the sun and but um all the stars we see in the night sky. Uh, sun's like our sun. And so if we travel out beyond our solar system and start visiting other stars, what we're discovering now is planets going around these stars and planets. So it's sort of a, a very different from the planets in our own solar system.

But at the same time, we're finding earth like planets. And we even have the ability now to, in some cases, look at the atmospheres of these exoplanets as we call them. And we find water vapor in some of these atmospheres. So we're also looking for signs of life out there. So it's really just put sort of the place in the universe in perspective, there are 300 billion stars in our galaxy and each one, a sun like our sun, but in the whole of the universe, there are about 200 billion galaxies.

So we just say we're insignificant in the, in the universe is it is a bit of a misrepresentation, but at the same time, um, our small planet that we sit on is part of something that's truly amazing. And as we look further and further out, we discover more and more of what's out there. And one day we might start making the footsteps to go out there and explore further, um, uh, physically rather than sending probes.

So I think it's an exciting time. And I, I love to share that with as many people as possible, 44:01

TARIQ AL OLAIMY: Incredible. And of course your travels and your exploration led you to Dubai, in expo 2020, and to visit the constellation of pavilions that are out there in the world and at the expo. And of course, to your point of that link between climate and space, the first week at the expo was around climate and biodiversity and that followed with space week.

TARIQ AL OLAIMY: And I wonder what inspired you at the expo? Actually? What did you learn from your experience?

DR. MAGGIE ADRIN: Unfortunately, my visit to the expo was far too short because there's so much to see and take in. And I loved sort of the different sort of zones those on mobility, sustainability opportunity. I loved exploring that, but what I loved, what I truly loved is it's going back to my star Trek, my star Trek days, it's the countries of the world coming together to explore, to debate, to work out how we can change things, how it can make things better, but better for everyone.

And it was lovely. That space uh uh was a uh themed week in that exploration. But my my daughter and husband came out to the expo with me and we were going round to the different countries and getting our passports stamped. And it's like, which country was that? I don't know where you're, what do they do? And sort going into the pavilion thinking, oh, wow.

And I'm Nigerian and my husband is British. And so of course, we went to the UK pavilion and we went to the Nigerian pavilion. So my daughter could get sort of a culture, culture blast from both, but so was just exploring and having all that laid out there. But I do love the power of countries coming together.

So the expo just seemed immensely powerful, bringing those countries together and having sort of serious debates and sort of people meeting up and getting together because to me for change to happen, that's what we need. And so the expo is a fantastic example of that. Bringing people together. 46:15

TARIQ AL OLAIMY: Incredible on that. The expo you spoke about the importance of collaborative science. And to ask you how can everyday citizens collaborate with scientists to advance space exploration?

DR. MAGGIE ADRIN: Yes. So one of the exciting things at the moment is, we're building bigger probes. We're getting bigger telescopes and we're sort of getting more and more data, but there's, um, uh, a space probe called Gaia and it's doing a survey of over a billion stars in our galaxy and it's producing a sort of a petabyte of data.

So the problem is with all this data, sometimes we don't have the capacity to process it all and we can use AI and machine learning, but there's some things that machines just can't do, but humans can. And so my colleague on the sky at night is actually doing a project called Zuniverse. Where they're getting sort of data.

They're getting all sorts of different types of data, archeological data, and they're getting members of the general public to actually help process the data. And as a result, sort of general members of the public, who've got some time on their hands and the computer can actually help process the data and help with the knowledge of humanity.

And I think that's so exciting that everybody is a scientist. One of the things I love about astronomy is much of the big science today is the large HaDR.on Collider, or it's sort of, you know, maybe building a space probe, but with astronomy everybody can get outside on a clear night and look up. So astronomy is the science for everyone, and now we can get that data and people can actually use the professional data that we get and process that and perhaps get their name on a paper.
So, yes, I think that's important science isn't just for the scientists. Science is something that every person can participate in and help sort of with human knowledge. So I find these projects so exciting.

ARCHIVE

DR. MAGGIE ADRIN: And so um yes um. This is a celebration. And we'll be celebrating space throughout the day. Now, one of the things that I'm interested in is something called Archeo astronomy. So it's a sort of a smushed between sort of archeology and astronomy, but it's looking back through time and seeing how the different cultures across the world. have been fascinated by space. And I think that's one of the things that unites us in an amazing way.

If you look back in time, every culture across the world has looked up out there and wondered what's out there. So it's a uniting force between us. It's also quite interesting because it's sort of over, it's just something that brings us together in so many different. Now, this is just a part of a timeline, um, and it's the UNESCO astronomy timeline, and it shows across the different continents, what monuments were being built to celebrate astronomy.

And as I say, look across the world, everybody has looked up

Back to the interview with Dr. Maggie Adrin:

TARIQ AL OLAIMY: That is incredibly exciting and it speaks to the excitement of the human spirit, uh, for space throughout the ages. And you mentioned archeological data, and of course at the expo, you spoke a little bit to the field of Archeoastronomy. Now, can you tell us what that is? And maybe what are some specific cultural moments throughout history that have happened that relate to space that particularly stand out to you?

DR. MAGGIE ADRIN: gosh. So, so there's so many, so, um, Archeoastronomy is like a, sort of the archeology of astronomy and it's looking sometimes at it's call it: who knew what, when. Growing up in the UK, I think I often got the impression that astronomy was sort of just put together by your Greek guys. You're wearing togas in Greece looking up at the sky, but of course, astronomy is so much wider than that.

Um, in the Arabic world, um, Astrolabes, uh, these are beautiful instruments and they are so beautifully ornate and they are used to sort of look at sunrise, sunset, look at how the stars are traversing across the sky. So there they're works of art, but they're also works of science as well. So then if you go to a sort of India, they have, um, amazing in some where called Jodhpur, they have an observatory, but it's an observatory that was built before we actually started using telescopes for astronomy. And so you can see all these instruments, which are looking at how stars cross against the sky and by measuring them accurately, they could do star maps and sort of get a better understanding of our place in the universe.

Um If you look at sort of south America, sort of a temples, huge temples built. And, um, it's funny. They had a good understanding that, you know, the earth was round and they actually sort of built a base in, in, um, I think Ecuador because they knew it was close to the equator. But if you look at some of their monuments, they have 360 steps going up because they knew there were about 365 days in the year, so they actually saw.

Uh Built the astronomy into their structures. Uh,uh Africa, there's a uh stone circle, which has, I think it's at that 7,000, maybe 9,000 years old is enough to applier. And then the new Namibian desert. And this is one of the oldest stone circles in the, uh, in the world and it's on African soil. So if we look across the world, everybody has looked up.

Everybody has wandered in Australia of the aboriginals, came up with sort of a, um, creation stories, looking up at the night sky and working out, you know, how the whole world was created, how the universe was created. So everybody has looked up and I love to tap into that to show that astronomy is for everyone, but at the same time, we need to collaborate today, but also we need to collaborate tomorrow.

I have a fear. The DR.ive for space is a big one. The space industry is booming across the world, but it's booming more in some places than others. And I don't want some countries to be left behind. And I think the United Nations is working on this to make sure that everybody has that foothold in space.

So there are, there's sort of the haves and the have nots again, but everybody has sort of the opportunity to utilize space for the good of all humanity. So it's an interesting time, but yes, I'll archeoastronomy just shows that we all have roots out there. We all have that desire to understand what's going on.

TARIQ AL OLAIMY: Fantastic. And of course there's new countries also entering into this space, uh, excuse the pun. Um, so of course you mentioned UAEs hope Mars mission, you know, when you see missions like that, what gives you hope? Uh, when you see new countries, uh, new programs really wanting to invest in space, uh, really also not to serve just for outward exploration, but really to understand our place in universe better and also to serve, uh, for really ensuring a flourishing earth?

DR. MAGGIE ADRIN: I guess it does give me hope. It hope in so many different ways. I think the, both of the space era, I have this idea that there's been three eras of space and the first area of space I call confrontation because first of all, it was to try and get missiles across the world, um, without sort of having to engage.

So it came out of confrontation after the second world war, and then there was sort of a cold war and it was sort of the, um, the space race with sort of a USSR and America sort of trying to, um, get the first sin space and try and get people to the moon. So there was lots of confrontation, but now I think we're in an era of collaboration where people are working together and you get formation of the

European space agency, the Japanese space agency, working with NASA, working with the European space agency.

People pooling resources to get a better understanding of how we can utilize space, but the third area is commercialization, but I think the fact that we are collaborating is so important. Because and that's what makes the world a better place. Space has a way of uniting people. I always like to say for space, you don't see the barriers.

And so I think it is, it does bring me hope. And also one of the things is in the past, it was sort of the usual suspects. There were only a few people, so it was the USSR, it was the Americans, it was only a few big players, but now more and more people are seeing space as the way of the future.

And so you have sort of the amazing program in the UAE. You have the ISRO, the Indian space agency, JAXA the Japanese space agency. So it's not just one or two countries. Now. It is more of a global effort and more of a global collaboration. So I'm very much heartened on that. My parents are from Nigeria and a few years ago, I went back to Nigeria and I was looking at their space program.

So more and more countries are getting on board and I'd like to see the space train, but it's collaboration I think that really works and brings us together just as the expo does. It brings us together. I think space is now, hopefully bringing people together too 58:38

TARIQ AL OLAIMY: do you think that would ever lead to us being able to have a chance to live on Mars on would you want to actually be one of those living on those outer colonies in space?

DR. MAGGIE ADRIN: It's quite interesting because of this television program. I don't know if you've ever seen it, but it's called big brother. And it was about sort of people living in a house and they get evicted. Well, actually it's quite a few years ago, about 10 years ago, I made a little television program called big brother in space.

It was sort of 10 people going to Mars. And the two people who won the program came back home, but everybody else lived out in the rest of their days on mars. Because we've tried to find ways of sort of using, uh, the Martian soil to grow crops and things like that. And in the program, I nominate myself for eviction.

So I spent the rest of my days on my house. Now I have to add, you know, this must have been 12 years ago because it was before my daughter was born. And

that's one thing that tethers me to earth. Um Now, if we're going tomorrow, I want her to come with me and be able to come back. But, um, the idea of living on a moon base, just, ah, uh, it's a DR.eam of mine and actually a physical DR.eam.

I DR.eamt of living on a moon base and seeing the glorious beauty of earth in front of me. So it's something I would love to do, but, I want my daughter to get a bit older, so as you can possibly come with me, and I think as the aspiration for many, many people across the world and I, yes, I would love to live on one of those colonies and yes, when I'm a little older, maybe retire to Mars and spend my final days living out on the martian and surface 1:04:01

TARIQ AL OLAIMY: Please send me up to that retirement plan as well. Um,

DR. MAGGIE ADRIN: You're coming too! Perfect! We need broadcast is the tale of the experience

TARIQ AL OLAIMY: I don't know if I'd go for the big brother experiment. I think I'd have a calmer, a calmer experience, maybe a different game show.

Um, brilliant. And you know, you spoke about your daughter and I wonder what is a message that you have maybe for parents, for chilDR.en who are either interested themselves to get into this space, um, or a parent that is interested in supporting their chilDR.en to do so. What advice would you give?

DR. MAGGIE ADRIN: It's quite interesting for me because I travel around the world and I often take my husband and daughter with me and, uh, people have to say, oh, do you want your daughter to be a scientist? And I say Not really. I just want her to find something that makes her heart sing for me. It was space and astronomy and all that.

I want her to find her thing that makes her excited. And so uh I think with, um, w uh, as a parent, what I want to do is nurture my daughter's natural talent. Like one of the challenges is finding out what that natural talent is. So exposing them to lots of different things, and they can experience stuff, but if there is someone who is that way inclined, who is as stars in their eyes, and then I think it's sort of to encourage them, but not necessarily in social sciences, many people think to work in the space industry, you need to be a scientist. You need to be an engineer, but of course, space is an industry. So we have lawyers, we have PR, we have sort of broadcast. We have journalism, we have so many different things that space. sort of embraces. So I think virtually anything that anyone is doing. Could lead to a career in space.

And so if they, that desire for space, um, then sort of encourage them in anything they're doing, but show them that there's a path that they can actually utilize it to a further the space industry. Because I meet many, um, sort of people who come and say, oh, well, I'd love to do a work in the space industry, but you know, I'm not very good at science or I can't do maths that doesn't matter.

The space industry embraces everybody. And I think it's getting more and more important, uh, for the future. So we need sort of the next generation of sort of space practitioners coming through. So yes, if they're that way inclined, I think there's definitely a role for them out there

TARIQ AL OLAIMY: Okay, thank you so much for making our hearts sing. And I'm sure this conversation has planted the seed for that expiration for so many who are listening to this. Thank you so much, DR.. McGee for your, your time, your breath, your inspiration, um, for how beautifully you communicate.

DR. MAGGIE ADRIN: Oh, thank you so much. Thank you for your amazing questions. I, I talk a lot, but uh thank you. Thank you for the opportunity

Is there anything that particularly stood out for you, whether it's through the expo, something that's kind of burning or exciting you for the next kind of couple of months that you'd like to touch upon?

I'd say is if you get the opportunity to go to the expo, do you go because it just, oh, just walking under the structures, visiting the pavilions, and at night, I love the dome and with the sort of, uh, the different animations, there's something there for everyone. And so it is a glorious experience. And I was so glad that I took my, um I had to get my daughter special permission to leave school for a day to come.

And it was so worth it. So yes, I would recommend it to everyone. And I just love the idea behind the expo, bringing people of the world together. You can't get better than that. If you ask me.

[OUTRO STING]

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