

Transcript – Jessica Meir, class of 1999

Narrator: Astronaut Jessica Meir

Interviewer: Amanda Knox, Pembroke Center Assistant Archivist

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Amanda Knox: Good afternoon. My name is Amanda Knox. I am the Assistant Archivist at the Pembroke Center for Teaching and Research on Research – Teaching and Research on Women – at Brown University. It is 2:30pm Eastern Standard Time, 1:30pm Central Time, on Tuesday, October 27, 2020, and I am here with another Brown University alumna who I invite to introduce herself now.

Jessica Meir: Hello, my name is Jessica Meir. I am currently a NASA astronaut. Previously, and I guess still, a scientist. And I was a graduate of Brown University in the class of 1999, my Bachelor of Arts in biology.

AK: Well, thank you so much for joining me today, Dr. Meir. I'm excited to learn about your, your time at Brown and everything you've done since Brown. If you're comfortable, I wonder if you wouldn't mind starting even before Brown and sharing with me a little bit about your family background, where you grew up, what your [1:00] parents did if you're comfortable sharing that, things like that?

JM: Sure. I grew up in a small town in northern Maine called Caribou, Maine. And my parents are actually both from other countries. So I'm a first generation American, my mother's from Sweden, and my dad was originally born in Baghdad, but moved to what was then Palestine and then became Israel in the early 1930s. So he was actually one of the very first volunteers for the first Israeli army, and fought in the war of independence in 1948. They moved to the US after, well, my parents were actually married in Sweden, and my oldest two sisters were born there. And then in the early 70s, they moved to the US and I, the, I was born in Caribou, Maine, and my brother and sister before me also born in Maine. So we grew up there and I spent all of my 18 years before going to Brown in Caribou and I was really fascinated by biology. That was my

favorite subject, I had this curiosity about [2:00] the world around me, the natural world, particularly the plants and the animals. And perhaps that was because I grew up in this remote town, lots of forest around, my mom being Swedish. Swedes often have an innate connection and a close connection to nature. So whatever it was, a combination of those things, I loved biology, it was my favorite subject. And from the time I was five, I started saying I wanted to be an astronaut as well. So again, maybe that connection with the world around me, really incredible stars and sky up there in northern Maine, very little light pollution. So something about, I think those, a combination of all of those things led to this interest in science and exploration. And I think, eventually toward this path of my current job.

AK: And how did you hear about Brown and what drew you to Brown?

JM: So also, I should mention, I'm the youngest of five kids. So I think that also had something to do with my trajectory and always looking at my [3:00] three older sisters and my older brother and wanting to emulate them and do everything that they did. And so they were very diverse in their interests and activities, ranging from sports, to music to academics, and for me, I thought, well, okay, I have to do all of it. They, she does this, and she does this, and he does that, but I want to do everything at once. And that was just kind of the environment that I grew up in. And that was really fostered and encouraged by my parents and my siblings and, and everyone around.

AK: Do you have any siblings, did any of your siblings go to Brown?

JM: Right, so the next part, no, they didn't actually. So interestingly, since my parents, you know, were both from other countries and hadn't, didn't know a lot about all the different academic institutions in the US, I really didn't either. You know, Caribou was a very small town and most people that do go on to college ended up staying within the state of Maine. And I found out about Brown actually from one of my father's coworkers at the hospital. My father was a surgeon and one of the other doctors at the hospital had gone to Brown [4:00] and they must have in conversation just been talking about the, about the time when I was getting ready to go to school and my father's colleague recommended Brown and said, "You know, she should really

check this out. I,” you know, she talked about her experiences there. And so it really was kind of just luck. I, I wasn’t really one of those students. So I found it so interesting when I got to Brown and there were all these kids who had gone to these prep schools and had known about Brown from the time they were kids and they were prepping their whole lives to be there, whether at Brown or some other institution. And for me, you know, that certainly wasn’t part of it. We just didn’t have that kind of exposure where I grew up. So I think it was really just a lot of luck involved. And looking back on it, I feel so fortunate that, that my father had that interaction and encouraged it and I did apply to Brown because I can’t imagine having gone anywhere else. It was such a, really an ideal setting for the types of things that I wanted to do and I still have so many lasting friendships and experiences and memories [5:00] from my time at Brown that I wouldn’t have ever done it any differently.

AK: Do you have any memories of the first time you stepped on campus as a student?

JM: I do have a few of those specific memories, you know, the things that you, that get stuck in your mind and one of those was just when my mom dropped me off. You know, we were drive, we drove down from me and, and we had the car packed of all the different things and she’s helping me unload everything. And I remember coming into my freshman dorm room in Wayland, South Wayland, and my roommate was already there. And her father was inside helping her arrange everything. And it was just this really distinct memory of meeting him and meeting her. And interestingly, actually, I just saw her a few weeks ago, she’s still my best friend. So my randomly paired first-year roommate is still to this day my closest person. So really great story. And we saw some of our other Brown girlfriends as well that were in this really close knit circle at Brown. So it’s so [6:00] nice to still see everybody and connect like that.

And I have a lot of other memories too, you know, specific examples of just those everyday moments when you’re walking across campus. And especially in the fall when the leaves are changing, and just hanging out in the different, in the grass and the different quads and using it for a study space or just using it to kind of hang out with your friends. So many nice memories of walking around that whole campus. Like, I think that’s one of the things we’re so fortunate to have, such a great campus where you can have that kind of really that lifestyle, that

on campus lifestyle, and all the little, little different neighborhoods in College Hill. So a lot of different memories like that along the way.

AK: Similarly, do you have any kind of specific kind of snapshot, high point and low point memories of times that were really great, or maybe especially challenging, while you were at Brown?

JM: Well, I certainly put a lot of pressure on myself while I was there in terms of my grades and academics and I studied a lot. I probably spent too much time [7:00] in the SciLi and in the Rock studying, but it certainly paid off. And there were, there were challenges along the way, though. I remember one example, after a genetics exam that I took where, you know, I was really upset with myself for making this mistake. And, and I actually remember that, leaving the building and coming out into the quad and, and being so upset about it and talking about it again with that best friend, you know, so just a strange moment. But those are the things sometimes that stick in your memory.

And I had some amazing experiences, too, that were really formative to my current career here. Some of my earliest experiences, first of all, with scientific research in general, and then also space related research, were right there at Brown. I worked, the summer before my senior year, I had a grant from the Rhode Island Space Grant so I worked there in a lab at Miriam Hospital with an investigator, Herman Vandenberg, who was on faculty at Brown, but also had a lab at Miriam. And he had been doing space related research [8:00] for a very long time, actually had several experiments on the Space Shuttle and then was doing some work with the Space Station as well. A lot of it related to his work with these things called BAMs, bio artificial muscles, which we made in the lab and used for various target therapeutic strategies and those kinds of systems. So I actually worked in that lab that summer before senior year, and had my whole scientific project which led to my honors thesis at Brown, where I was evaluating a cell culture unit that was a prototype for one that was going to be used on the International Space Station actually. So where my, my home of seven months where I just returned from, even way back then in the late 90s, I was working on one of the prototype cell culture systems. And also in the lab, there were some people, one of the other investigators, he was an MD PhD student at Brown at the time, Peter Lee, he was one of the senior people in the lab and would help me with

a lot of the things that we were doing. He was the one [9:00] that actually told me about the International Space University, which I went on to do a Master's after Brown. And he really filled in a lot of this, you know, told me so much about other opportunities at NASA. And that also came full circle in such a great story just on the Space Station during my mission. Peter Lee was actually one of the investigators on an experiment that flew on the Space Station that I was the operator for so I was in the life sciences glove box and we were processing these engineered heart tissue samples. So they were basically stem cell derived, tissue engineered, mini little cardiac units, so miniature hearts, and they were very interested in looking at the effects of spaceflight on the muscle development, on the contractility of the muscle. And this was a really important step because we've done a lot of experiments now looking at the cardiovascular system in general, but not at the particular, the tissue specific level. So this was a really interesting experiment where we had these little engineered heart tissue samples [10:00] in their little habitat and throughout the mission we would fix the samples, we would change the media to keep them alive, and then we would fix the samples at different time points so we could see the onset of any changes with the effect of microgravity in the spaceflight environment, and then send some of those samples home. So that was just such a cool full circle story, where I was working on this experiment where Peter Lee was one of the coinvestigators and the two of us had worked together at Brown in the lab on some of the first scientific experiments that I ever performed in my lab and in my life. And I just thought that was such a cool story. It's such a great Brown connection for both of us.

AK: It definitely sounds like a Brown story. So this is a couple of questions ahead, but as you're making these decisions, to do this kind of research at Brown and go on to the International Space University, were they all with the intention, were you thinking, "I'm going to do this because one day I'm going to be an astronaut," or did you just think maybe astronaut would come up as an opportunity along the way? [11:00]

JM: A little bit of both. You know, really, throughout my whole life. And definitely through all the four years at Brown, everybody knew that I wanted to be an astronaut. You know, people called me Space Girl and it was just kind of this natural connection that everybody knew about. At the same time, I knew that it was such a small chance of that happening. So it certainly wasn't

something that I counted on, but it was something that I just wanted to keep in my life no matter what the outcome was, because it was just such a genuine interest and passion. At the same time, you know, biology was my favorite subject from the time I was young and that's what I majored in at Brown. And you know, some people think that's not really the most natural of connections if you want to be an astronaut, maybe being an engineer or a military pilot. But for me, it was all about pursuing the things that I was passionate about. And even though, yeah, it certainly is more rare for the life sciences to become an astronaut, now, our office is so diverse, that all types of scientific backgrounds are represented. We have medical doctors, other types of scientists, so that diversity, I think, is really key in our success [12:00] in the astronaut office now in accomplishing missions safely and successfully and really making them more enjoyable when you have this diverse set of people, not only from their backgrounds, but just really in their skill sets and experiences as well. Of course, I think that's really the best solution for having an effective team, a happy team, and a really, really successful one.

So I was really pursuing both interests in parallel, by my, my career in biology and also immersing myself in any space related activities that I could. And a few more of those came up along the way while I was at Brown. In one of the summers in between, I think it was between freshman and sophomore year, I participated in the Space Life Sciences Training Program, which was a program that the NASA Kennedy Space Center offered. And it was very specific to life sciences so it seemed perfectly suited to me. It was all paid for, I applied for it, and it's a paid program where you're living and working in the labs for really an extensive, like a six week period, [13:00] in Florida in the space biology labs. And it was such a cool experience for me because you know, still, as an undergraduate, I was there working at NASA, getting lectures from astronauts at the time, but from different investigators, from all the different disciplines at NASA and being exposed to all of that I think really helped me realize that maybe this was realistic that I could be involved in space life sciences, or NASA, or spaceflight, or maybe even being an astronaut in some way. So I continued to do those projects, had another opportunity at Brown. NASA had a program called The Reduced Gravity Student Flight Opportunities, which unfortunately recently was put to an end, but it took advantage of NASA's spacecraft called the KC 135, or the Vomit Comet. It was a KC, KC 135. At one time, there have been other planes as well like the DC 9, but basically this aircraft flies in a pattern of parabolas, which allows you to accomplish brief [14:00] bouts of microgravity, so 30 to 35 seconds of microgravity, after you're

at kind of the peak of the parabola, basically, the pilot shuts off the engine. Now you're in freefall back to Earth, which is essentially what microgravity is, everything is falling at the same rate, and so you experience those 30 to 35 seconds of weightlessness. And at Brown, we designed an experiment, Peter Lee was part of that team too, we had some other advisors on it, and there were some other undergraduate students and I that designed an experiment, submitted it to NASA, and we were one of the teams that was selected to come to NASA, come here to Houston right where I am today, and perform that experiment on what we call affectionately, The Vomit Comet, since it does induce sickness in some people. But we were very fortunate to have that opportunity to perform our experiment. And that was, I'll never forget that the first time that I came here to the, to Houston, to the NASA Johnson Space Center, such an unforgettable experience and such a valuable opportunity to give to, [15:00] to undergraduates in terms of designing an experiment and the scientific method and actually carrying an experiment out all the way through its conception toward something like, like being in the field, in this case, being on the airplane as the operator. So all of those things just kind of kept me on this path of pursuing both. And, you know, again, not really thinking, "I know I'm going to become an astronaut," because we all know, realistically, it's such a small chance of it happening, but I certainly was going to give it my best and then still incorporate all the other things like biological research that I was interested in.

AK: On a personal note, I know that you're deeply connected to your Jewish heritage and I was wondering if you were able to incorporate that into your undergraduate life at Brown?

JM: Yeah, that's something for me, you know, it's more of a cultural thing for me in terms of the history of my father's family, as I mentioned, my father's family are still in Israel, pretty much the majority of them, and that cultural connection [16:00] and the history and the customs and the traditions, all of that was definitely a part of my life at Brown. And, you know, so I think I, that was more an individual level with friends and with family members. But you know, of course, Brown has a great, foster's that community as well with Hillel. And I know, my, actually, again, Jacqueline Mason, that that first year roommate, she and I went did go to some events at Hillel our first year at Brown. So really nice to just be in that environment. You know, actually, where I grew up, we were really the only Jewish family, we didn't even have a synagogue in our

town, we went to the neighboring town which is where I had my Bat Mitzvah. So it was really nice to be in this community, in this environment where there was such diversity represented, and there were more people, you know, to have things in common than compared to the small town where I grew up. So I really appreciated that.

AK: I'm jumping quite a bit ahead in time here now, to talk more about space. [17:00] I, in doing my research, I learned that the application process for becoming an astronaut is ultimately like a two year long process. Would you mind sharing with me a little bit, if you can, your experience with your application process to becoming an astronaut?

JM: Sure. Since it was always the goal, you know, when I became realistically competitive and able to submit an application I did. And part of that actually, the first one I submitted was, even before I was realistically competitive, I didn't have an advanced degree yet. And that's not actually a requirement to become an astronaut, but it's a little bit more realistic, especially if you're coming from the sciences. So right now, you do have to have a bachelor's degree in a hard science, any STEM fields, so hard science, technology, engineering, math, and three years of experience. And now you also need to have a master's. At the time that I first applied, even when I was selected, that wasn't a requirement, though, it was certainly kind of realistic given the applicants. So I started applying when I first could and the first one I applied [18:00] back around 2004, but really wasn't very realistically competitive then. In 2009, that was when I was becoming competitive. I was just finishing my graduate degree at Scripps Institution Oceanography, about to receive my PhD, I had all the basic requirements. And so I put in another application. What happens is you submit your application usually, in most years, it's been on July 1, which I feel like was a stroke of fate, because July 1 is also my birthday. So I submitted my application that year. And then a few months go by, and that's the time where NASA is looking at these applications, and you know, these days, they're receiving thousands and thousands. For my class in 2013 there were over 6,000 qualified candidates. The class after, more like 18,000, so more and more people are applying and more work for the interview and selection committees here. So those committees will go through and narrow down the applicant pool to about 450 people. And then they'll ask those people [19:00] for their references, they'll check their references, and then they'll also ask them to get a class three physical, that's an FAA



class three physical. And you've already, so the way you have submitted your application is through the USA Jobs website. So just like any other federal position, if you're a civilian, you go through USA Jobs. Otherwise, if you're in a different branch of the military, you'll go through the different branches handle it differently before they present their candidates to NASA. So I did my USA Jobs application, and then they'll check those references, as I said. After they do that, for the 450 individuals, they narrow it down further to about 100, 120 individuals, and they bring those people to NASA for an in person interview that lasts usually just two days in that first round. You come down with a group of other people, you have the in person interview with the board, and then other activities like medical tests, some psychological tests, different types of team activities that they'll observe, and that kind of thing. [20:00] After that, the selection committee meets again and refines that pool of 120 down to usually 40 to 50 astronauts that come back for the final round. So the final round of interviews, that lasts a full week here at NASA in Houston, and again, you have another interview, you have more group activities, more medical tests, more psychological screening, that kind of stuff. And then they choose the class from that.

So when I applied in 2009, I made it all the way to that final round. And it was really cool to be back here since I had worked here for three years as a scientist before going to graduate school. So it was great to be back in Houston and see everybody. And you know, I thought, "Well, this is a great experience, chances are that I'm not going to get selected because it's such a small number, but you know, we'll see what happens." The interview went well, and I didn't have any personal regrets. You know, it wasn't one of those things where you thought, "Oh, if only I'd done this or said this," you're kicking yourself for the way you said or did something. So I felt very, you know, confident that I'd done the best that I could [21:00] and that was, that's really all you can do. So I remember where I was, I was still in San Diego, since it was before I finished and defended my thesis at Scripps. And I received the call, the dreaded call. And it was the Astronaut Sunny Williams calling and I knew her from my time there. And she said, "Well, you know, Jessica, you did a great job, we really want you to apply and encourage you to apply again, but you're not in the class this time." And of course, that's a great disappointment. It's also a bit realistic, because you know it's such a small chance of it happening. But you know, once you get that far and think, "Wait, maybe this could actually happen," and it's something you dreamed about for so long, it's still a big disappointment. So I remember, you know, kind of

dealing with that. But I felt very fortunate that I had found another career that was very fulfilling and made me content in the way that I had thought, you know, being an astronaut would. And that's something that I thought a lot about, because all growing up, you know, people would look at me and say, "You're so lucky, [22:00] you have this one dream and one passion. You know exactly what you want to do. I wish I had that." And I thought, "Yeah, you know, I can see why you think of it that way." But the grass is always greener, right? I kind of thought, "Well, what if it doesn't happen? The chances are that it's not going to happen, and will I ever actually be content and satisfied if it doesn't?" So in the back of my mind, I was a little bit worried about that. So I felt so incredibly fortunate to have found this other career, working as a comparative physiologist, and studying the physiology of animals in extreme environments, deep diving penguins and seals, going to places like the Antarctic, studying high altitude birds later. As a, as a physiologist, being in the field and working with these animals, it was very fulfilling for me, I had this career in academia, and I thought, "Well, alright, maybe I'll be better off. Maybe this is meant to be. And I'm so lucky I have this other career now. So I'm going to go on with my life."

So I did, and I went on to do a postdoctoral research project in Vancouver, and I was studying [23:00] this time high altitude animals and that was equally as fascinating. And I had kind of thought, "Well, the time has probably passed for me to become an astronaut." You know, we're only doing selections about every four years now. I knew in the previous class, they had picked a young female life scientist, and I thought, "You know, even if I apply again, like, it's probably just not going to work out in timing." And so I was still in Vancouver, when I found out that another selection was happening for a 2013 class, and you know, the application process was a year or so before that, and I thought to myself, "Maybe I don't need to apply." You know, going through that, like you said, it's a very lengthy process. It certainly takes a mental toll, a psychological toll on that process. And I thought, you know, "I have this career now that I find so fulfilling and rewarding, maybe this is the right decision." And I knew just like anything, there are pros and cons to a job so maybe this is a better life for me, maybe I just won't apply. But I was kind of, you know, I think that I was just kind of fooling [24:00] myself, or maybe trying to take the easy way out of going through that disappointment and that struggle again. But then I thought, "Okay, this is stupid, I need to at least apply. I need to know if it could happen." So I did put my application in and when I came down for the interviews and made it to the final round again, you know, kind of just like that definition of sanity, right, you expect that which

you've already experienced. So everything went well, I felt confident about my interview. Again, I felt good about it. But I knew the chances were small, and I was probably just going to get the same call I did last time. And you know, maybe it was because I had that different perspective or had that experience already, but this time, you know, if you don't try then you won't succeed. And so it's certainly the case here. I didn't expect it. And then when I got the call this time, it was completely different. And it was on a job offer for me and this dream come true. So it was a really interesting process, I think to go through, psychologically through that whole process of you know, trying before and being able to understand [25:00] that you need to put yourself out there and take a risk or you won't get the reward in the end. And it's just a perfect example of that kind of perseverance that it takes to really accomplish and fulfill your dreams.

AK: Can you tell me about the moment that you got the good call?

JM: Yeah, so at that point, I had just wrapped up my postdoc in Vancouver, and I had a job, I'd been recruited to work in Boston. So it was actually the first time that I was back in New England since I had graduated from Brown. So it was kind of nice, I'd made a full circle of the US, I'd left Brown gone briefly over to Europe, to France, then Houston, San Diego, Vancouver, and now back to Boston. So I kind of completed the circle. And I was working in a position, an assistant professor position through Harvard Medical School and Mass General Hospital. And I was still doing the same kind of comparative physiology research, still working with the animals in extreme environments. And I was sitting at my desk in my lab in the, [26:00] in MGH, and I knew that the calls were going out, because you kind of know, the timeframe. And I still, you know, knew some people that worked at NASA. So I knew it was happening. My cell phone was sitting there on my desk, and it started ringing with this Houston number, and you recognize the area code, and I thought, "Alright, this is it." And you kind of know, you have a little bit of a clue based on who's calling you what the answer is going to be. So when the head of the selection committee calls you, they're responsible for calling all the yeses and the other people on the committee are the ones that call the nos. So this time, it was the head of the selection committee, Janet Kavandi, who called me and so I had the first clue. But I thought, "Well, you know, maybe something's different." And she said, "Well, Jessica, I guess the second time's a charm." And I thought, "Well, I guess that can only mean one thing." But I was shocked because

I just wasn't expecting that result. And I remember being very eloquent, saying something like, "Really?" That's all I could muster at that moment. And she said, "Yes, we'd love to have you join us here [27:00] in Houston, would you like to come and join the Astronaut Corps?" And it was just this huge moment of incredulity, really, it's just difficult to process that that dream, you know, that I'd had since I was five years old, could have actually come true, and that it becomes even harder. You know, I think everybody remembers that moment where they were just because it's so intense, that feeling of emotions and what's happening. And then they make it much more difficult because they say, "Okay, well, you can't tell anyone yet because we want to make sure that we notify everybody, and we know exactly who's going to be in the class before we have a public announcement about it. So you got to keep this to yourself for a few weeks until that happens." And it's really difficult, you know, they understand that you'll probably in confidence, tell your significant other or one person, you know, maybe a family member and, and so I did that, of course, but it's so hard to keep this secret. But that's just the way it is. But that was, yeah, that was where I was from I call.

AK: Wow, that's, I have goosebumps for you right now. [28:00] So, again, I know I'm jumping a big time span here, but you're told that you're going to space and you go to space do you have – And I'm using all of the words here, obviously, you go to space – What is your first memory of entering the International Space Station?

JM: Yeah, good question. That, that whole ride, I mean, everything's happening. And it almost feels a little bit surreal when you're launching. And part of the whole launch process. It's just like being in the simulator. And I'd spent almost, you know, a good majority of the year and a half, two years before the spaceflight living and working in Russia, learning how to fly this Russian spacecraft. And that was such a cool experience, I served as the copilot on the mission. So I had a lot of training there, in working with the commander and doing that, learning how to be a test pilot, learning how to be an operator of the spacecraft, and doing that in Russian. [29:00] Such an extraordinary part of the process and something I wouldn't trade for anything. That experience and that time, from a professional level, but even just from a personal and cultural level, so incredible, such a cool experience. And then getting to the space station, you know, that's something in the post-flight video that the team put together for us. And I've been

fortunate enough to see that footage now several times and it helps me remember exactly what it felt like. And I had the biggest grin on my face, the biggest smile that I've ever seen. And it was really interesting because I spoke about that moment with several people on the ground and people from really vast, a vast range of individuals, and everybody used the same word choice. I found it really interesting because everybody said, "It was just pure joy. You can just see the pure joy on your face." And I thought that was an interesting choice of words because it's not really a word that people use that often. People usually use other similar words to describe you know, that feeling of happiness [30:00] or smiling and, and just everyone used the exact same words, "pure joy." And I thought that was just really interesting to see how so many different people interpreted that. But that was absolutely what I felt. This joy, this incredulity that I was actually there. And I think part of that is just the act of floating, floating all the time gives you the sense of levity, and it turns people more into their five year old selves and you're more playful and everything is just more fun. And that just lasts, it doesn't go away. And for me, that smile, you know, probably was the biggest when I first got there, but it lasted throughout that entire seven month period. And at the end of it, I actually would have rather stayed longer than come back. For me, it wasn't, it wasn't quite enough time up there. But there is good video and photographs of that moment, which is really nice for me to help me remember that. And it will actually even be in 3D virtual reality and an immersive experience. During our mission we had the ISS Experience [31:00] Project, the first episode of that was actually just released recently on the Oculus platform. So a company called Felix and Paul, a video production company in Montreal, they put together this experience, and it is absolutely incredible. You use the Oculus headset, and it is a 3D, 360 degree virtual reality presence on the space station. So we filmed all of these different parts of our mission, including my arrival on the space station, different experiments we're doing, repairs. And the next step is they'll actually have the camera outside to record a spacewalk. So, really cool. And I can tell you having been there myself, I watched the first episode just last week, and I felt like I was back there, you really are in, you feel like you're on the space station. You can look around in every direction and for us that have lived up there, you feel like you're back home, you just feel like, "Okay, now I'm going to walk into my bedroom and float over here and float here." It's really extraordinary. So for me, it just is such a powerful [32:00] tool to be able to better share the experience that we're so lucky to have with everybody back on the ground.

AK: And of course, on October 18, 2019, you were a member of the first all-woman spacewalk along with Christina Koch. What, I'm sure you had quite a bit going on in that moment, but did you have a moment, were you able to take a moment to think about how you were feeling physically and emotionally as you kind of made history in that way?

JM: Yeah, of course, I've talked about that moment a lot. And it's interesting, as I've reflected on it, it's been kind of a multifaceted blend of emotions and feelings throughout the process. When I first arrived in space, and I was only there a couple weeks before we had this spacewalk. So I was still learning the ropes. You know, I was the new guy on board, learning how to do our daily activities like brush our teeth, and eat and sleep and go to the bathroom. You know, all these things. When you arrive in space, you're like a newborn [33:00] up there and have to learn, relearn kind of all those basic functions. And then I had to get ready for the spacewalk. And spacewalks are the riskiest thing that we do. And they're definitely the most challenging thing both mentally and physically. So I needed to put 100% of my focus and concentration on making sure I was ready to do the job, use all my tools, do the job successfully, and to keep both myself and Christina safe. That's really what we need is to focus 100% on that. And that's what I did, particularly since this was my first spacewalk, you know, it was the first time that you're really getting used to doing all of this without gravity. On top of that it was also a contingency spacewalk. The spacewalk which we thought we were going to perform, the one that we were really more prepared and trained for, was just to upgrade the batteries on the space station. So replacing the old batteries with the newer lithium ion batteries. And that was something that we did in our second two spacewalks. But the first one, we actually had an unplanned, an unforeseen event where we had a failure of another component [34:00] of the power channel, what's called the battery charge discharge unit. So we instead needed to remove and replace that in order for the whole power channel to be up and running again. So we only had about 48 hours to prepare for what we needed to do to execute that. So just really a way of saying I had, was 100% focused on the task at hand. So at the time, I didn't actually even let myself think about the added elements, the first time, the first all-female, all-women spacewalk, the historical significance, I really wasn't thinking about that because I just needed to do my job and get the job done. But I think that after the fact, I've had a lot more time to reflect on what that meant, not only to Christina and to myself, but really to the world. And to be honest, I was really overwhelmed by

the, the level of enthusiasm and support and how much attention people paid to it. I wasn't expecting that because you know, normally not that many people tune in to watch a spacewalk. It's not very exciting actually. It's very pretty slow moving [35:00] if you aren't intimately connected to it, and I just didn't expect people to care that much, or to really tune in to what NASA was doing, because, you know, for better or worse, the space station has been up there a long time now. And though, of course, it's still incredibly exciting what we're doing, people have a lot of different information to go through, they can only put their attention on so many things at once and I just didn't necessarily think it was going to be on us. But what, for whatever reason, whatever blend it was, maybe it was the timing of everything else that was happening on the Earth that time, but people were so excited and so inspired. And that, in turn really meant so much to us and inspired us. First of all, so great for NASA, for everything that we're doing, for people understanding more about basic science and technology, what's happening in the NASA program. But for us, you know, I still don't look at it as a personal achievement, I truly did see it as me going out the door that day and doing my job. And it could have been anyone else, could have been any other woman in our office, it could have been a man that day [36:00] doing the same job. But looking back on it and understanding the importance of it. I think the biggest, the utmost of importance is for those generations of women and other minorities, that were the ones really pushing the boundaries, breaking those glass ceilings in decades past when we weren't as well represented. Certainly, we still do have a lot of work to do in making sure that we have equity of all kinds represented here in the US in the workplace, in all the things that we do, as well as in the rest of the world. But we've certainly made a lot of headway in the last few decades and that's because of these pioneers. They were the ones pushing those boundaries when we didn't always have a seat at the table. Christina and I, when we joined NASA, we were part of the 2013 class, the first class that had 50% female 50% male ratio. So for us, it was normal, you know, we were all held to the same standard had the same training protocol, we all had the same skill set and expectations. But that wasn't always the case. You know, we know that, that is certain [37:00]. We still have room to grow and progress to be, to be made. But I think in looking at this achievement in this historical milestone, I hope that it's those generations that came before us that are truly the ones to revel in it, to enjoy it, and to be proud of that moment because it's their work that got us there, you know, those early generations at Pembroke, for example, that

were the pioneers and the forerunners that were allowing us to be as more equally represented where we are now.

AK: And I know, on a much smaller, intimate scale, again, you brought a lot of things with you into space. Do you want to share any of those with us?

JM: Absolutely, I did want to share a few special ones. And you know, we are actually allowed a small amount of items that we can bring as personal items. So things that are important to you, maybe some photographs, maybe some personal mementos, maybe you fly somebody's wedding rings, or small items that you want to give as gifts to people that were there [38:00] and part of the mission with you. And, you know, I did that really as a way of giving back because I don't look at this as just my mission. This is everybody's mission, I am the lucky one that gets to be up there, but it's not, it's only enabled because of the taxpayer money that gets us and pays our salaries here at NASA, all of the people from the time that I was a kid that encouraged and mentored me, my family, my friends, my teachers, everybody that helped shape this path. And so I tried to fly some things that were important to me to represent some of those milestones in my life and Brown University, of course, was one of those so I flew a few items. First of all, I flew a patch. So these items will eventually make their way back to Brown in some form. So we'll see, so that they can be enjoyed by the generations to come at Brown. There's a patch here, there's this pennant that I flew. I've got photographs of all of these as well of these things floating in the cupola with the Earth in the background, so pretty good images that I can share with you. [39:00] Then Brown University did actually send me this as an official item, this official flag will certainly make its way back to Brown. And then one of my good, one of my close girlfriends that I mentioned earlier, she flew this, this Brown bear up so he was up there with me as well. So Brown was fairly well represented during my mission for sure. And I just hope that that's something that people can connect with and get excited about and help share and enjoy the mission.

AK: Absolutely. Again, just to take a moment to think about some highs and lows. Maybe not including your spacewalk, but it can be if you'd like it to. Did you have any exceptionally



wonderful times or exceptionally challenging times while you were in the International Space Station?

JM: Yeah, absolutely. I think some of the best times are, funnily enough when I think back on that some of the my fondest memories of that space mission were kind of just the downtime when you have a moment to actually [40:00] process and accept and realize where you are. So I would say the instances where I had a little bit of downtime to float in the cupola, to look back at the Earth, and just to take a moment to appreciate that perspective of realizing where you are, separate, 250 miles above the Earth, and everyone you know, everything you've experienced is down there. What that means significantly, it changes you as a person. It does shift that perspective of, you know, I think for me in a few different ways, one was, I've always been an advocate of the environment and making sure we're doing our best to preserve this planet for generations to come and combat climate change. But it resonated even more loudly when I could see the planet from above with my own eyes, and you see this thin tenuous band of an atmosphere and how fragile and special it is, you can even see the grading, the grades of blue. So it's not just one continuous blue line, you can actually see it fade out as the air gets thinner and thinner with altitude [41:00] and how, how, how special that is before you reach this void and blackness of space. And the other thing it really keys in is how interconnected everything is. You see all of the landmasses and all of the oceans, and you don't have any of these manmade geopolitical boundaries that we've imposed upon ourselves. And you just realize that we are really one human and you appreciate that fact. It's actually difficult to not feel that. You realize that we are one, one human and it's one of those perspective things, which I think is so easy on Earth to get caught up with trivial matters or the minutiae of what's in front of you at that moment, that seems to just be an innate character of, of humans, to have that and to remember that sometimes it's better to take that step back and appreciate the big picture and realize what's truly important. Doing that, seeing that from space really helps you do that. So I hope that's something that I can really [42:00] carry with me through the rest of my life and hopefully help impart on others. But just those moments, kind of floating, or even moments that I had with my crew member, one of my crew members, Drew Morgan, he was up there for the entire seven months. So he had arrived before me and then we came down together. And we had a lot of really special moments, especially in the last few months, because things were a little bit more

calm, there were only three of us instead of six of us and we weren't as busy with all of the really dynamic events like the spacewalks and the intensity, that it was a little bit of a less intense pace, just compared to the schedule we've had when we had this crew of six. So some of my favorite moments were just the two of us floating on a Saturday morning, when we're drinking our coffee and catching up with the news and just kind of enjoying floating around.

Some of the more challenging moments, you know, probably in that earlier period, when we had this really intense dynamic pace. And it's something that the difference with being in space than being here on Earth in your normal workplace, you can, well perhaps a little bit different now [43:00] since most people are working from home, but normally you have more separation between your workplace and your home. You know, you can go home, at the end of the day, get away from your colleagues, have a different environment, a different atmosphere to relax in. And that's one of the challenges of living and working in space is that you never go home at the end of the day. So not only that, you're also always kind of primed, you're never really completely relaxed and completely with time off because at any moment you could have some kind of emergency situation that you need to be ready to respond to. You know, you're in this high pressure environment where if you had any problem on the Space Station, a meteorite impact, a depressurization, a fire, all these things that, you know, can be harmful on the ground, but have a new meaning when you're in a pressurized environment where you need these life support systems to survive, you have to be ready for that at any moment. So I think those kind of just the everyday challenges because of the type of environment you're dealing with where you don't really get that full decompression time, [44:00] that can sometimes make things frustrating and a little bit challenging and in different way.

AK: You've been back on Earth now for about six months. Does, now that you've been, you've had the experience of being in space does anything else that could happen on Earth feel very dull and boring?

JM: Maybe not anything. But I think, like I was talking about, given that perspective change, I hope that is something that I can carry with me moving forward to maintain that perspective and hopefully not get too wrapped up in the in the small trivial details, but you know, I find myself doing that already, just that really is just human nature. But there are still so many exciting things

on Earth. And I think one of those things for me that I couldn't access in space, it's a bit ironic and that you have this bird's eye view of the entire planet and all of the most breathtaking ecosystems, and climate zones, and the glaciers, and the rain forests, and the rivers, and the oceans, but you can't actually enjoy any of it. [45:00] You can't feel the breeze on your face, you can't smell that fresh mountain air or the trees, or plunge into the water in the ocean. So it's kind of ironic that you have that extraordinary view, but you can't appreciate it. So that's one of the things that I still find incredibly exciting on Earth. And stimulated by some of the views that I had, there are other places on Earth that I want to explore that I hadn't even thought about. Things that you see, the different textures and colors of all of the different desert areas and sand dunes, I had no idea that the sand dunes all around the world were so varied in their shapes and forms and colors. Seeing all of that and seeing the climate and the textures and the gradients of colors in Africa and in the Middle East. Really just extraordinary, some of these things that I really, makes me want to explore more places from the ground. So I've actually spent a lot of my months off, I'm back to work now, but I had a little bit of downtime where I could re immerse in nature and at least you know, those, those things are COVID friendly as well. So I spent some good [46:00] time hiking and camping in the Rockies with my sister, I spent some time in Lake Country in Wisconsin doing lake activities, and then in Southern California, with my brother and his family in the ocean, doing the kind of more beach oriented activities, and then road tripping back through some of my some of the special places that I'd seen. The Navajo Nation and Moab area, this really painted red, and it's so brilliant, stands out so much from space. And I remember thinking, "Man, where is that? I have to go there, it's so extraordinary." So I road tripped through there and did some hiking and camping in Moab this summer as well. So it's really been cool to experience those points of view this time from the ground and to take advantage and re-immerses myself in nature.

AK: That's wonderful. I never even thought of it that way. So I know I jumped around quite a bit here and left out big chunks of your life and we're coming up on time so I'd like to leave some open space, if there's anything else you would like [47:00] to share with us about space, Earth, anything you've done that you were really hoping that I would capture in this oral history with you today.

JM: You know, I think we hit on a lot of the high points, you know, I just, I guess I would reflect a little bit more on my time spent at Brown. And I just appreciate so much the environment that Brown encourages and fosters, you know, that kind of creativity and input that you can have into your own curriculum really, that freedom where you can have a little bit more independence shaping your education and taking advantage of all of the different things that are out there. And like we talked about earlier, having that very diverse community where there's so many different little niche markets that you can take advantage of, and that you can immerse yourself in and experience. I think it really helps me become a better, a more well-rounded individual and be able to understand more of what's out there and appreciate it. So I think it's really wonderful that you guys are doing this project and have [48:00] all these historical accounts. I would be so interested to start listening to some of them throughout time and see the different points of view and how those perspectives have really shifted over time. I'm sure it's extraordinary.

AK: Well, just for our listeners, I would like to mention that you've been in many interviews over the years. Most of them, to my knowledge can be found on YouTube and NASA's website. So for all of the questions I didn't get to ask it's because many of them have already been answered elsewhere. So Astronaut Meir, thank you so much for your time. It has been an absolute honor to talk to you today.

JM: All right. Thank you very much, Amanda. I'm really privileged and feel quite proud to be a part of this oral history. Hello to everybody at Brown and goodbye now. Thank you

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