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Speaker 2:

You're listening to Further Together, the ORAU podcast. Join Michael Holtz and his guests for conversations about all things ORAU. They'll talk about ORAU story history, our impact on an ever-changing world, our innovative, scientific and technical solutions for our customers, and our commitment to the communities where we do business. Welcome to Further Together, the ORAU podcast.

Michael Holtz:

Welcome to Further Together, the ORAU podcast. As ever, it's me your host, Michael Holtz from the Communications and Marketing Department at ORAU, and I am in a run of interviews with folks who are NASA postdoctoral fellows. ORAU manages the postdoctoral fellowship program for NASA, and I get the opportunity to talk to some of the fellows about the research that they're doing and how they got to where they are. And this episode is no exception. Today I am talking to Jordan Bretzfelder. Jordan, welcome to Further Together. I'm so glad to have you.

Jordan Bretzfelder:

Thanks for having me.

Michael Holtz:

So Jordan, tell me where you are in your fellowship and a little bit about your research focus.

Jordan Bretzfelder:

Yeah, I started here at Marshall Space Flight Center in August, so it's been about three-and-a-half months, almost four. We're just about to go out for our first field expedition for this project, and we're going out to Death Valley National Park with this instrument we have here called the NAC, which is a backpack-mounted LIDAR system.

And we're taking LIDAR system out to the field to a Mars analog site that I identified as part of my thesis research. And we're going to be doing some geomorphology using that LIDAR system and kind of assessing the uses of this LIDAR system for future planetary missions on rovers.

Michael Holtz:

Very cool. So for those of us who are not scientists, what is a LIDAR system? First of all.

Jordan Bretzfelder:

A LIDAR, it's a laser-ranging device, and so with the LIDAR you can create a really high-definition 3D map of an area. So in this case, what we're using it for is to create a really accurate 3D model of the dunes and the LIDAR we're using gets us a really high-resolution image. So even for very small features, we can see them really clearly and we can see how they change over time by taking repeated scans of the same area.

Michael Holtz:

Gotcha. And since you said you're going to, what is a Mars analog, I'm assuming that this is in preparation for the Artemis mission, right?

Jordan Bretzfelder:

Yeah, so there's a lot of interest in getting a LIDAR system on the Moon, both for Rover navigation and potentially to help astronauts get around areas where they can't see Because the LIDAR creates its own light pulses. So even in permanently shadowed regions, which they're interested in exploring, you could use the LIDAR to be able to see your surroundings without any light. And especially in the polar regions of the Moon, the lighting is very odd and unusual and difficult to use. So something that creates light itself can give you a really good idea of what you're looking at, even if you can't see that well.

Michael Holtz:

That sounds really, really cool and very way advanced and sort of almost... I don't want to say science fiction because it's happening, but sort of has that science fiction of I can see around corners and see in the dark and those sorts of things. It sounds really exciting and really important for the upcoming missions that NASA has planned.

Jordan Bretzfelder:

They've done a lot of testing with both robotic assets or little rovers and actual astronauts going out in the field and using this in a demo. And so now in addition to further exploring its technological capabilities, we're trying to show all the science you can do with it too in addition. So it's like an engineering navigation instrument and you can do cool science with it while you're at it.

Michael Holtz:

That's really awesome. Jordan, what was your trajectory? How did you get to the NASA postdoctoral fellowship program?

Jordan Bretzfelder:

How far would you like me to go back?

Michael Holtz:

Well, okay, so let me start with this question. When did you first become interested in science?

Jordan Bretzfelder:

So my dad works at the Smithsonian Museums in D.C., which is where I'm from. And so I have always been interested, but it didn't even occur to me that that was an unusual thing to be interested in. I just thought the museums were cool and they had cool dinosaurs and rockets on display. And so I guess just because I was exposed to it, I thought it was neat.

So that's been an ongoing thing. And then as I got older, I knew I wanted to do science. I originally was going to probably go to medical school, but I've always been really interested in space. So I picked to do physics for undergrad and I was doing pre-med while doing the physics track. And then along that path, I both shadowed medical doctors and did a couple of internships in planetary science after I found out what that was, because that came much later and realized that what I actually found interesting about science is being able to learn new things, discover new things, explore new areas. And so I sort of pivoted to focus on the planetary science aspect of things. And so I went to graduate school for geology at UCLA, and really it was planetary science I was doing, but they just now approved the major of planetary science. It's brand new. So at the time you go for geology and here I am.

Michael Holtz:

Excellent. So how did you then get to NASA? Was it networking? Was it I have an idea? All of the above?

Jordan Bretzfelder:

Yeah, I think planetary science is a growing field, but it is fairly small. And so it seems like the way a lot of people end up where they end up is because they knew somebody who knew somebody who thought they had a good idea. And with the way the NPP program is structured, I was connected to my supervisor here and his listing on the NPP site was about the instrument and accepting research proposals to use the instrument that he already had. And because I had just been working on this Mars analog site, I was like, well, this would be a great thing to apply it to, and the rest sort of came from there.

Michael Holtz:

That's amazing. Is there an aspect of science that you find particularly empowering?

Jordan Bretzfelder:

I think for geology in particular, one thing that was kind of exciting for me and made me feel like I could get involved in it, even though it was pretty late in the game when I came to it, is that with physics and math, there's generally a correct answer. And so with something like geology where you are interpreting the rocks, obviously there is still a range of correct interpretations, but with something like Mars where we're all using these orbital images and the Rover data, you can make interpretations and justify them. And as long as you can reasonably justify it, you can still contribute even if somebody else might've at first looked at it differently. So I think it's really unique to be able to rather than 15 pages of math solutions to try and demonstrate something like you can describe and show people what you're looking at, and then they can come to their own conclusions too.

Michael Holtz:

Awesome. Is there an example of a significant obstacle that you've had to overcome to get to where you are?

Jordan Bretzfelder:

Well, it's kind of twofold. So I am mixed race. I'm black and my dad's Jewish. And my name though is a typically male name. And because my last name is my dad's, a lot of times people will contact me via email or I'll reach out to them via email and they're expecting not me.

Michael Holtz:

Mr. Bretzfelder.

Jordan Bretzfelder:

Exactly. And somebody who looks very different to how I look are... Et cetera, a different background. And the first couple of times it's funny, and then the rest of the time you kind of start to wonder, am I only here because you thought I was Mr. Bretzfelder? Did I only make it this far because you didn't know? So that's kind of one version of things. The other version was that I was in grad school when COVID happened, and so all of the networking and field and lab opportunities that we'd had planned either got delayed or just didn't get to happen or were done over a Zoom type thing. So it was not exactly what it was supposed to be in my head, but we made it work and still got to do the field work just delayed. And lab work, same thing. But could have been worse.

Michael Holtz:

Right? Absolutely. Still got time in some way, shape or form. Right? I know that science, particularly at NASA, is a collaborative sport. I mean, you don't really do anything in a vacuum. Talk about, and I know you're young and you're early, I should say, in your fellowship, what does collaboration look like in the research that you're doing and the project that you're working on?

Jordan Bretzfelder:

So for this particular project, because there's a field component and because there's a 45 pound backpack that somebody has to wear and walk around, logistically it would be very difficult to do it alone. From a safety perspective, you cannot go out to that remote area of Death Valley by yourself safely. From a physical capacity standpoint, it is very difficult to walk over 150 foot dunes with a 45 pound weight trying to drag you back down.

Michael Holtz:

50 degrees, and yeah.

Jordan Bretzfelder:

Exactly. It's right there in the name, but there's all that, the things that you actually simply cannot do without the help of somebody else. But then there's also the guidance. I came from a not particularly software heavy background, and the instrument requires a lot of software to output usable data. And so the group of engineers here at Marshall who were on the project from the beginning have been invaluable in helping me get caught up and understanding what needs to continue to be done to get this to work. And it's great to work with people who come from engineering because scientists can say they want all this data, but the engineers can tell you what you can and can't get.

Michael Holtz:

Right. So you mentioned that your dad is part of the Smithsonian. How is he feeling about you being part of NASA?

Jordan Bretzfelder:

I think he's really excited. I know he brings it up to people I think as often as he reasonably can. My younger brother is at a science magnet school too, and so I think he tries to encourage my brother to seeing what I've done, can give other people ideas of how to get where they want to go, because if you're coming from outside of science, it's hard to figure out how to get into science. And even if you work at a museum, if you're in the tech office or the press office, you didn't do the science track. And he really likes sending me articles or being like, "Hey, I heard this thing. Can you explain it to me?"

Michael Holtz:

Nice. Really nice. Well, so along those lines, if there's a young up and coming scientist who wants to follow in Jordan's footsteps, what do you say to that person?

Jordan Bretzfelder:

I would say that it might not always be the most fun, but it is definitely worth it. And seeing that you'll have to spend eight or nine years in school seems really daunting. And a lot of people don't explain well that grad school for STEM is different from other grad programs where it's not as much of a financial burden because you often get a stipend and they cover your tuition. So sometimes it doesn't seem attainable for a lot of logistics reasons that actually can be resolved. And so I would encourage everybody to talk to somebody who's doing what you want to do and see what they had to do to get there, so that you actually know what it'll take and you're not holding yourself back just because there's a lack of information.

Michael Holtz:

Awesome. Last question for you, Jordan. What brings you joy?

Jordan Bretzfelder:

Right now, given the time of year, I would say skiing.

Michael Holtz:

Oh, cool.

Jordan Bretzfelder:

But I really truly, the places we get to go to do the kind of analog work that I've been doing, it's really incredible. And access to places like the bottom of Meteor Crater that otherwise nobody gets to go down to, it really feels like a true privilege to get to go to those places and work there. And that's your job. So I'm really happy to be doing what I'm doing now.

Michael Holtz:

Awesome. It sounds like great work. And Jordan, I hope at some point you'll come back and tell us more about what you've learned and how the LIDAR system works and all that cool stuff. I'd love to learn more about all of that.

Jordan Bretzfelder:

Thanks. I'd love to.

Michael Holtz:

Great. Thank you so much for being here. I appreciate it.

Jordan Bretzfelder:

Thanks for having me.

Speaker 3:

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