

Interviews of the Margaret MacVicar Memorial AMITA Oral History Project, MC 356
Massachusetts Institute of Technology, Institute Archives and Special Collections

Megan Brewster – class of 2011

Interviewed by Dou Dou, class of 2017

July 16, 2015

Margaret MacVicar Memorial AMITA Oral History Project

This interview with Dr. Megan Brewster (Ph.D. Materials Science and Engineering, class of 2011) by MIT undergraduate Dou Dou (S.B. Mechanical Engineering, class of 2017) was conducted on July 16, 2015 in Lafayette Square, next to the Eisenhower Executive Office Building in Washington, D.C. At the time of the interview, Dr. Brewster was the Senior Policy Advisor for Advanced Manufacturing at the White House Office of Science and Technology Policy and a Fellow of the Oak Ridge Institute for Science and Education.

DOU: To start with, we would like to know you and, I guess, start with your early life-- about your childhood and where you were born, what your family's like and your parents.

BREWSTER: Of course. I was born and raised in a suburb of Seattle. The town is now called Sammamish. At the time I was born, it was Redmond, which is where Microsoft is from.

My neighborhood was between suburban and rural, but it was only a half hour drive from Seattle. So when I was growing up, there was this interesting dichotomy between that lifestyle and weekend bus trips into the city that I would take with my friends.

I grew up in a house with my mom and my dad, and then my younger brother was born when I was six. And I lived in that house my entire childhood until I moved away to college.

DOU: I see.

BREWSTER: So until then, it was the only home I'd ever known.

DOU: Right. [LAUGHS]

BREWSTER: My parents were very supportive of my studies. They encouraged me to work as hard as I wanted to.

DOU: I see.

BREWSTER: So they didn't push me--

DOU: Yeah.

BREWSTER: --I pushed myself. But they always gave me opportunities. So when I was in elementary school, there was a pull-out program where once a week you could go to another school and you would be joined by students from a variety of schools in the district. And you would learn about all kinds of interesting things. The stock market, genetic engineering. I mean, second graders learning about--

DOU: How old were you?

BREWSTER: This was second grade through sixth grade I did this. And my parents found out about this program. They signed me up to take the test to enroll. They were very supportive of that.

When I was in high school, I wanted to take an advanced math class. I had been placed into the normal math class, and I wanted to take the advanced math class. They supported me in enrolling in a local community college so that I could take the normal math class over the summer, and that the next year I could enter the advanced math class.

They were really supportive whenever I started doing science and engineering and math activities. My father had this amazing woodworking shop. He loved to do things with his hands, and those doors would open wide for me for my various school projects. We built all kinds of things together. We built a little mini roller coaster. One of my projects for when we were learning about architecture was to build a mockup model of a house for a mouse. My dad helped me with that. It was just a really great bonding time with my dad.

DOU: What does he do?

BREWSTER: He studied mechanical engineering, and he basically does aerospace engineering. And my mom is an accountant. They're both retired now.

DOU: So you had the family environment there for science, engineering--

BREWSTER: Who knows where I would've gone if my parents hadn't been so enthusiastic. I mean they were enthusiastic about everything I did. They loved all my writing; any sort of English or literature, they were supportive. But they were really supportive with STEM activities. And I think that had a huge influence.

There's one particular moment I remember fondly from my childhood. It was show and tell in elementary school. And a lot of the kids would bring in their dog or their latest toy or something like that. My dad convinced

me that it would be funny to bring a science experiment. It was cornstarch mixed with water, so it makes a non-Newtonian fluid. When you add energy, it freezes up. We had this cookie sheet with this mixture on it, and then I encouraged everyone to lean in close and look and then I smacked it with my hand. And of course, it didn't splatter, but it was a surprising discovery for my classmates. My classmates did not think it was as funny as I did.

DOU: [LAUGHS] They were scared?

BREWSTER: Yeah. My parents and I were like teammates, and we were scheming together. And it was really fun.

DOU: OK. So would you say that series of events – building with your dad and all these things – sort of led you to the path of science and engineering afterward?

BREWSTER: In some ways, I think it definitely set the foundation. They really just provided the opportunities for me, and then I stepped into that space.

DOU: Yeah.

BREWSTER: Who knows what I would have done if those opportunities had not been there. Would I have made them for myself? I mean I was so young, I didn't know any better. Having that level of guidance with a very light touch, very light touch, so that at every step of the way, I felt that I was the one making the decision. But they presented me with the opportunity.

So-- I think what made me want to go into science and engineering, and eventually materials science, was when I was in high school, I worked at a bike shop. We did bike sales and we did bike maintenance. And I was always really fascinated by the difference in the materials that the bike frames were made out. Why would you make a bike out of steel versus aluminum versus titanium? And at that time, carbon fiber was new and exotic.

DOU: I have no idea what my bike is made of. [LAUGHS]

BREWSTER: Yeah. Why would you care? Why would someone pay so much more money for carbon fiber bike? And so I started to ask these questions about the materials and that drew me in.

When I went into college and was choosing what to major in, I envisioned a framework for my decision. I felt very strong in my writing capabilities, but I also felt very strong in my science capabilities. And I felt like that was the first big decision point. Do I want to do liberal arts or do I want to do science, in a very generic hierarchy. I chose science, because I felt like there was so much opportunity there, especially for a woman. And then within science, I thought, "Well, it's not just science that I like, it's the application of science to solve real problems," which is how I think of engineering. So that's what made me go into engineering.

And then of all the engineering disciplines, I thought, which discipline will help me keep as many doors open as possible? Because I didn't know what I wanted to do when I grew up. And I thought, well, engineers build things out of stuff. If I'm an expert in the stuff, then I can go anywhere. And so that's why I went into materials science.

DOU: So you do have a systematic thought behind it.

BREWSTER: For better or for worse, I really like to preview all of my options before I make a decision.

DOU: Me, too.

BREWSTER: Yeah. It made more sense when I was younger and growing up, but now that I get older I'm realizing that you'll have windows of opportunity that you also have to-- and you can't optimize that--

DOU: Exactly.

BREWSTER: --which drives me crazy every day.

DOU: I'm curious: do your parents still do the same for your brother? Six years apart?

BREWSTER: Yeah, my brother also. My father and him would scheme and build things together. Yeah, they're very supportive, although my brother and I are so different. With that said, he is a mechanical engineer, so maybe not! Different paths to the same end point, perhaps.

DOU: And your father is a mechanical engineer.

BREWSTER: Exactly. It kind of runs in the family.

DOU: Awesome, yeah. This can be awesome. But, for example, my parents are doctors. Both of them are doctors.

BREWSTER: Medical doctors, cool.

DOU: Yeah. Well, at the time, I guess, in China, they didn't really think so much about-- At the time, the thinking was, "Doctors are respectable and good income, so they're good for the family."

BREWSTER: Yeah.

DOU: But they just said, "Yeah, so we'll be doctors." And then it became a lifetime career. But, interestingly, my parents never supported me to become a doctor.

BREWSTER: Interesting.

DOU: Times have changed, and the reputation of doctors is not as before--

BREWSTER: Interesting.

DOU: --not as respectable. And they are doctors, they know how tiring it is.

BREWSTER: Yeah.

DOU: It's a complete different situation in China than the States. So--

BREWSTER: That is so interesting, though.

DOU: Yeah. At the point when I needed to decide what I wanted to for college, I said, "OK, I don't want to be a doctor." But I don't know how much of that is because when I grew up, they sort of-- convinced me not go with this idea.

BREWSTER: Yeah, parents have a really strong hand in influencing their childrens' career paths.

DOU: So we can move on, to later on, when you go to college. So, we know that you went to undergrad at the University of Washington.

BREWSTER: Right.

DOU: And then you went for a Ph.D. at MIT. So let's start with undergrad, I guess, a little bit briefly about it. You started majoring in materials science.

BREWSTER: Exactly.

DOU: And then went on to do the same major at MIT.

BREWSTER: Exactly.

DOU: So do you see any difference in the same major between the two schools?

BREWSTER: Yeah. There are huge differences in the cultures of the two schools, with the caveat that undergrad and graduate lifestyles are naturally very different. It's like comparing apples and oranges. But the way that I conducted my studies at MIT is very different than the way I conduct my studies at U-Dub [University of Washington]. When I was at U-Dub I mostly flew solo in terms of doing homework. Whereas at MIT, I couldn't survive on my own. I had to have study groups. And it was a relief to me that not only did the professors support study groups, they encouraged study groups. Which was great.

DOU: Was that the case at U-Dub?

BREWSTER: It depended on the class. But there wasn't this same culture, exactly, at the undergrad level. At the undergrad level, I could do it on my own, and so I did do it on my own. I think that's a key distinction. There probably were study groups that I could have participated in. But because I could do it on my own, it was just easier and faster, so I just did it on my own.

With that said, U-Dub has an amazing community of its own that's so unique. It's in Seattle and the student body is four times larger than at MIT. There [were] 40,000 students when I went to school there. It's a huge school. Every kind of person was there. Every lifestyle. And I loved that. Coming from a smaller town, I loved that diversity of thought and of lifestyle. I really reveled in that.

And when I was at U-Dub I was in the honors program. Which was a nice way to shrink the size of the school, in terms of my experience. So instead of having my 101-level classes in these 600-person lecture halls, I had 30- or 40-student classes with the best professors of the department. It felt like a curated undergraduate experience.

DOU: How did that work? How did they select the people to be in the honors program? Did you have to apply?

BREWSTER: Yeah. So you would apply for U-Dub, and then you also had to submit a separate honors application.

DOU: Whatever you feel comfortable with.

BREWSTER: Yeah. When was I applying for colleges, U-Dub was the school in my backyard. Once I was accepted into the honors program, that's when U-Dub became a school that I was pro-actively interested in. At that time, I had been convinced that I should go to a liberal arts college. And there was no way I could afford it. But once I got into the honors program I felt like, well, U-Dub's a huge school, but being in the honors program is really going to shrink the size and it might feel closer to the experience I might get from a liberal arts campus.

DOU: Sometimes-- I'm also really interested in how people's decision of school changes a lot from what they set out--

BREWSTER: Exactly.

DOU: --try for and where they ended up. A complete thought is changed in the middle.

BREWSTER: Yeah, exactly. In my case I knew I wanted to be close to home. So I was really only applying to schools in the Pacific Northwest region. But I genuinely thought I wanted to go to a liberal arts school. And at that age, and at my current age, I feel like I do not understand what \$40,000 a year looks like. I don't get it. And so personally, for me, I'm really glad I went to U-Dub, in part because it was very, very cost effective relative to the other options I was considering.

DOU: So for the liberal arts school, and then you eventually took materials science and engineering. How did that transition happen? Was it because you got into the honors program?

BREWSTER: Oh, I think at the time that I was choosing a college, I was still trying to make that initial decision between writing and liberal arts and science. And I felt like I could do both of those at any of the schools I chose. I hadn't quite gotten to the point where I had really selected engineering. Once I got to that point, after I had spent a couple of years at the University of Washington, I was very glad that I made the decision I did,

because I needed easy access to labs and the graduate students and their research.

DOU: Did you have to decide your major when you--

BREWSTER: No. When you start you can be undeclared for-- I think you can do up to your second year as undeclared. And then, for engineering many of those programs are oversubscribed, and so you need to apply for them. So based off your prereq scores, you apply for that college, the College of Engineering. And then that will be your second two years.

DOU: So you were undeclared in the beginning.

BREWSTER: I was undeclared in the beginning. Yeah. Even though I was pretty sure I knew where I wanted to go I stayed undeclared as long as I could because I didn't want to close any doors.

DOU: Yeah, definitely. OK, awesome. If you would summarize your experience at U-Dub as an undergrad, what would you say about that four years?

BREWSTER: I would say it was eye opening. The exposure to so many different people, so many different avenues of study. And--

DOU: Kind of a bigger world.

BREWSTER: Yes! Such a big world. U-Dub is a beautiful campus, and Seattle is a beautiful city, so it was just amazing to be able to call that my home for four years. And during those four years I transitioned significantly, in terms of who I was as a person, how I saw myself, how I conduct my work. That all happened at U-Dub. So it holds a very special place in my heart, for that reason. I did a lot of growing and experimenting during those four years.

DOU: I feel like I'm doing that right now.

BREWSTER: Exactly! That's what undergrad is for.

DOU: I know, I love it.

BREWSTER: That's awesome.

DOU: So then I guess the natural question would be what made you transition from U-Dub to MIT? How did MIT catch your eye? Who encouraged you or discouraged you?

BREWSTER: Because at that point in my life, the people I-- when I was in high school I think I knew one girl that went to MIT. But otherwise, people generally went to school nearby. So I would've never seen myself going to a school like MIT when I was in high school.

But when I was an undergrad, because I was in science, I was doing these summer internship programs – the NSF REUs [National Science Foundation Research Experiences for Undergraduates]. The summer before my senior year, I applied to REUs around the country. I think I applied to six REUs. I was rejected from all of them, except for the one to MIT. And the one to MIT targeted students from schools that were underrepresented at MIT. And so that was my opportunity. That's how I got my foot in the door.

And I remember the day before the internship started, I flew in Saturday night and we were starting Monday morning. So I woke up on Sunday morning and was like, "This is it. I am in Cambridge." And I walked onto campus and the first thing I stumbled across was Killian Court. And I sat there and my mind was blown over the course of the next two hours, in which I just sat there and took it all in just in complete awe and shock. Would have *never* in my wildest dreams thought that I would end up there.

And I spent my summer there and I loved it. And I met grad students that were happy!

DOU: Hopefully not the only time! [LAUGHS]

BREWSTER: I know, right? People were going to happy hours and doing things outside of work. And I loved that. And that was what convinced me to go to graduate school, because up until that point I wasn't really sold on the whole idea of going to graduate school. But it was my experience at MIT that ... this looks like fun, actually.

DOU: Not everyone was grumpy. [LAUGHS]

BREWSTER: Right, exactly. So I got home at the end of the summer, and I applied to a handful of graduate schools. And it was a tough choice. I was very excited about a lot of different opportunities. But at the end of the day, MIT was a known quantity. I knew I loved it. My department gave me a lot of flexibility, because we were not required to declare which professor we would do our Ph.D. with. Whereas, the other schools did require that.

I wasn't ready to sign a contract with someone I didn't even know. I wanted to arrive and be on campus for a little bit, have a chance to meet the professors. Because the visiting weekends for graduate school are so short. You'll meet with many professors, and it's hard to keep everything straight. So I really appreciated the opportunity to arrive, get my feet under me, explore, and make a concerted decision on who I wanted to work with.

DOU: And you found that actually helpful?

BREWSTER: Yeah. I definitely spent my first semester talking to different professors, talking to other graduate students, touring their labs, reading their papers. Just exploring. And in the end I chose the lab that I ended up in because of a hunch. My advisor started at MIT as a professor at the same time I started as a graduate student, so she was brand new.

And another professor, the professor I had done my summer research with, suggested, "Have you looked at this new professor? I think she's going to be doing some really interesting work, you should go talk to her." So I met with her, and I felt a bond.

DOU: I see, yeah. That's always important.

BREWSTER: And honestly, that's how I chose my lab. I just wanted a professor that I felt like I had a connection with. And so that's how I chose it.

DOU: My I ask who's the professor--

BREWSTER: Yeah, It's Silviya Gradečak [Associate Professor, Materials Science and Engineering]. She focuses on semiconductor nanotechnology. I really enjoyed my time in her group. And she was growing as a professor, the lab was growing, I was the third student to join. And she gave me a lot of room to grow as an individual as well, which is very important, because she recognized that I had interests outside of the lab.

DOU: Right. Sometimes professors-- it's not that easy for them to recognize that.

BREWSTER: Exactly. Exactly. Some professors, I think, might have been a little less sympathetic to my extracurriculars. [LAUGHTER] Silviya was very understanding, and that meant a lot to me.

DOU: That's great. Do you still keep in contact with her?

BREWSTER: Yes, for example I let her know when I make a career transition. I shoot her an e-mail and say you know, "Hi, Silvija, guess what I'm doing next. Thank you for everything. I wouldn't be here if it weren't for you." And I think that's important when you make those career transitions.
[LAUGHTER] I've reached back to say thank you.

DOU: And then she knows where you are.

BREWSTER: Exactly.

DOU: Maybe we'll come back to the lab and all the research stuff later, but the most interesting part of what you did, for me, was all the extracurriculars.

BREWSTER: Yeah.

DOU: And you had quite a bunch of them. And on one of your resumes it said that, most notable is Undergrad Women at MIT.

BREWSTER: Graduate--

DOU: Graduate Women, sorry. Graduate Women at MIT [GWAMIT]. You were the co-founder and executive and all that, so tell me more about what the group does exactly, and what your duties, responsibilities, were.

BREWSTER: Yeah, GWAMIT is one of my proudest achievements. It's an amazing group. It's by students, for students.

DOU: [LAUGHTER]

BREWSTER: The goal is to lift up the graduate women through a variety of mechanisms. And with that comes the whole community. We really focus on the personal growth and professional development of graduate women. And the point of the organization was to be kind of an umbrella, a one-stop shop. There were so many programs and sources of support already in existence, and they were underutilized. They were underutilized not because they weren't doing great work, and not because they weren't needed-- Just purely that people didn't know about them.

The goal of our organization at the beginning was purely to collect all of these disparate resources and house them in one central repository. There were three of us that started the group: Kay Furman [SB Materials Science and Engineering 2007] and Jean Yang [Electrical Engineering and Computer Science 2010] and I. Kay was shopping around this idea. She

had done her undergrad at MIT, and then had just started graduate school as joint between Harvard and MIT. Inevitably someone said to her, "You know, have you talked to Brewster?," because I had apparently developed a reputation for myself for being a strong advocate of women at MIT.

And when Kay came to me, at first I said, "But there's already so many resources." And she convinced me that that is true, but those resources would be better utilized if we had one central organization. And I agreed with her, so I said, "OK, I will help. I'm in. Count me in." And together the three of us grew this group very quickly. The momentum this group had was amazing. We within a year had, like, a \$20,000, \$30,000 operating budget.

DOU: Where did the budget come from – from MIT?

BREWSTER: Yeah, so we would go around to the different departments and the different Deans, and show them our plan and ask them for support. And so my role in the group was fundraising, and bringing my network that I had built through experiences with other student groups, but I had never started a student group, and that's a totally different experience. So I already had these working relationships with these various MIT leaders, but never in a way where we were starting a new group.

I would ask them for their support, not just financially, but also in a mentorship, like, "This is the direction we're thinking of taking the group, what do you think? Do you have thoughts of ways that we should grow?" So it became this two-way conversation. It was really nice.

DOU: What year-- Into which year at MIT--

BREWSTER: GWAMIT started in 2009, my third year.

DOU: What was the status of the group at the end, when you left MIT? How much--

BREWSTER: --had we grown? I mean, we went from nothing to having a group that had a \$30,000 per year operating budget. We had over 700 members. We had representation in nearly every college and department. We were an award-winning group. I mean, it just went to show what a great idea Kay had. It really was needed.

DOU: MIT really welcomed it.

BREWSTER: Exactly. And we had an operating structure. I mean, we had really built something that we felt would last. It wasn't a flash in the pan. We had annual events. We marketed them as, this is the first annual event, implying that there would be a second annual event and a fifth annual event. It was really inspiring to see how quickly that group grew. It was just a testament to how much that service was needed.

DOU: So what were some of your most important lessons?

BREWSTER: I think having people who really want it helped pull the momentum. Oh, another thing that we did, going back to how we grew the group-- We went from this student group to a group that had become a subcommittee of the Graduate Student Council so that we could have an even more strongly unified graduate student voice.

DOU: Have the administrators support it.

BREWSTER: Exactly. And you know, it's this delicate balance between shepherding your vision and morphing it into spaces where others see opportunities, because you don't want to grow in a way that's unauthentic. But you also need to grow. You have to push yourself. And that was a challenge.

You know, we had a lot of internal debates about whether or not to join the Graduate Student Council. We sought a lot of mentorship on that decision. It was a big decision for our group.

DOU: Right. I mean for any growth-- An organization has to make a lot of debatable decisions.

BREWSTER: Exactly. And I think one of the reasons why-- There were many things that made this group successful, but one of them was the idea that it's by students, for students. That's something that the MIT community gets: people bootstrapping because they are motivated to make their community stronger. That's something that really resonates with MIT. If it was top-down, like [if] the administration started this group, it would have never gotten the same traction. So I think that that was also an important part of it.

DOU: That's great, yeah. And you mentioned-- At some point you said that you got this reputation of focusing on or advocating for women--

BREWSTER: Yeah, which is so funny, because by then I had shifted my extracurricular focus from women in science to science policy. To some degree I was starting to rebrand myself. And so people would say, "Oh, but you know

you're a strong advocate for women." And I'd say, "Yes, but now I'm focusing on science policy." But the opportunity was just too great, and I realized I can do both.

DOU: That's good, right? It means what you've done was [appreciated]. But what sparked your initial interest in women in science particularly?

BREWSTER: That's a good question. I think the change for me was-- The moment for me was when I transitioned from high school to college; science classes in high school to science classes in college. In high school, the majority of my classmates were women in the sciences, really strong, driven women – and lots of them.

When I got to undergrad, it was strong, driven, passionate women, but they were a much smaller portion of population. It was a stark difference. I went from an atmosphere that was 70% women, 30% men, to an atmosphere that was the inverse – 30% women. And I just kind of looked around and was like where did all the ladies go? Where did everyone go? It was like night and day.

And I think that that's when I started to realize that there was something wrong.

DOU: Do you have a theory now?

BREWSTER: I don't know. I don't have a theory. But one thing is for sure: I think that science and engineering are perceived as difficult majors, and they are, but that doesn't mean that anyone should avoid it. Maybe you should take on that challenge.

DOU: I will say if you want to do something like this, nothing that's easy-- If you want to do--

BREWSTER: Right, exactly. If it's worth doing, it's not going to be easy.

DOU: I was wondering if you notice any difference – even in the labs and in your classes at MIT. Is there any difference – dynamics – going on?

BREWSTER: Honestly, I never noticed a difference. My friends tended to be guys anyway, so it wasn't something that was unusual for me or strange to be surrounded by men. As an undergrad and at MIT, I never really noticed any gender differences. Having a female advisor was-- I really appreciated that, and I respected that, because I knew that that was a rarity. But it never felt, I never felt different because of my gender.

DOU: I guess in terms of numbers, you know, in your labs, was there a big difference?

BREWSTER: Yeah, there was a big difference. The numbers of women were small.

DOU: I see.

BREWSTER: So I became aware that there were problems associated with these differences, with this lack of women. The numbers got smaller every year. Every stop along the way, there was a smaller and smaller percentage of women. And I definitely noticed it. I wasn't treated any differently, but I noticed it.

DOU: It's just kind of a reality. And I guess so you talked to a lot of professors in the beginning, right?

BREWSTER: Yeah.

DOU: And you also noticed probably it's a big difference.

BREWSTER: Exactly. Yes. There were mostly male professors. Yeah. At one point during my Ph.D., I did a summer of research abroad. And the lab I worked in there was run by a professor who was also female, and I remember just feeling really lucky to have these two amazing female professors guiding me. I felt very lucky.

DOU: One thing that I noticed on your resume; you were a TA for Professor Sadoway [Donald Sadoway, John F. Elliott Professor of Materials Chemistry]. I'm also a TA, but that's kind of like a different program. Normally undergrads don't TA, but I was in ESG – Experimental Study Group.

BREWSTER: Oh, interesting!

DOU: It's not exactly like an honors program, because it doesn't take people based on their grades, but you do apply and enroll, and it's a very, very small size classes. So I took all of my undergrad 101 stuff in classes of 15 people.

BREWSTER: Oh, wow.

DOU: It was great, because that's how my classes were at my high school. I went to a boarding school. I've always had 15 people in my class, so it's kind of a continuation. And all of our professors were different than the

mainstream. And they're always there in their office. We have this kind of tight area, so you can literally walk into the professors' offices at any point. We call them on a first-name basis.

A really good part of this program is we can come back as TAs when [we] become upperclassmen. So I was a sophomore this year, and I TA'd Physics 1 and Physics 2, because I took them my freshman year and I had really good grades, so my teacher invited me back to TA. But I want to know: what is it like to TA for a bigger class as a graduate student?

BREWSTER: The class I TA'ed for is 3.091. It's an intro to chemistry through the Materials Science Department, and at that time it was taught by Don Sadoway, who was legendary for his showmanship in his lectures. If you haven't had a chance to watch his lectures, you really should. It's really-- it's pretty funny. So I would go to class with the 500 undergrads in 10-250, and then twice a week we would have smaller recitation groups. And so my recitation group was on the order of 20 to 25 students. It was their first semester at MIT, and it was my first semester at MIT. That was not lost on me that we were learning together. And I was just as scared, if not more scared than they were to be at MIT.

And the first thing I did in our first recitation, I told them, "Look, we are in this together. We need a team name." So we decided on our team name; it was Army of Darkness.

We went through the material together. And what I taught during recitation was based purely on what they asked. I didn't teach them anything unless they wanted to know it. So I was there as a resource. And if they didn't want to talk about 3.091 material, then we would talk about whatever they wanted to talk about.

But there was one thing that I tried hard to help them understand, because it was something that meant a lot to me in my growth as an undergraduate, which was this decoupling of your self-worth from your test scores and understanding that, if you fail an exam, it has nothing to do with your value as a person.

So I spent a lot of time articulating that to them. And I think that they appreciated it. They would ask to talk about it. I was happy to hear that it resonated with them. It was good for everybody to talk about that stuff.

DOU: But it's their first semester at MIT and all that.

BREWSTER: Exactly.

DOU: It can be a big shock when they see their scores.

BREWSTER: Exactly. MIT is not a "participation trophy" kind of school. It was a shock for everyone. And I derived a lot of satisfaction just from helping them understand that they were valuable regardless of how their performance in 3.091 was.

DOU: And you TA'ed for a semester.

BREWSTER: Just that one semester. And then I started my research.

DOU: I always wonder what TAs-- We always see them at the lecture, with the professor and everyone else. What do you do, actually?

BREWSTER: Honestly? I was learning the material right along with you guys. Because some of it I had learned but never in that format, never in that framing. Some of it was new to me, as well. And it was my first experience teaching like that. I didn't want to mess up.

DOU: Of course. Well, that's actually really good to know. Because when we had the graduate TAs, sometimes people complain about TAs in the big classes, because they are graduate students. And they don't necessarily know the frame material. It feels like they're knowledge gap is a little bit different.

BREWSTER: Exactly.

DOU: So they might not completely understand the questions from the undergrads and what they were going through.

BREWSTER: Yeah. I went to every single lecture. Because, like I said, maybe it was a review of the material, but in a very different framing, or it was new material. And I wanted to make sure that I was the best TA I could be for them.

They deserve nothing less. I bring my A game. I expect them to bring their A game. It's only fair.

DOU: It's a cycle. It popped up to me, because I'm also a TA. I don't have recitations, but I hold office hours regularly. And the end of the year, I hold a final review section. I can relate a lot to the personal growth part, because I'm kind of talking to my students. I like talking to them about what majors should they consider. It's fine. We fail this test, it's OK.

BREWSTER: It's OK.

DOU: I did the same thing. I'm still a TA now.

BREWSTER: It's important for them to see a diversity of life experience. I don't know how the other TAs ran their recitations. But I mean, for a 500-person class, there were a lot of recitation sections. And my recitation was always full. Almost every student always came to class.

And I always told them, you guys don't have to come to recitation. Recitation is not required. This is not a part of your grade. But they always came. And I would like to think it was because we were a team. It might have also been because, occasionally, I made them brownies.

DOU: That always works.

BREWSTER: It didn't hurt, I'll tell you that much. It did not hurt.

DOU: Undergrads-- I feel like MIT has a huge amount of pressure, somehow.

BREWSTER: It's huge.

DOU: Yeah. One, there's the transition from high school.

BREWSTER: It's a huge transition.

DOU: And then, also, it's extremely competitive to get in, so everyone I guess expects themselves to be the top and realize they aren't.

BREWSTER: Exactly.

DOU: Were there any specific mentors besides your professors, any other mentors that helped you?

BREWSTER: I had too many mentors to count. My theory of mentorship is that I will seek them out. I will seek out mentors for small questions. The formal mentoring programs, where you're officially connected with someone, and she's supposed to be your mentor for everything – that's never worked for me.

Like I said, there are so many to count. Here are just a couple that come to mind from the MIT community. My first mentor at MIT was a professor in my department, Krystyn Van Vliet [Michael and Sonja Koerner

Professor of Materials Science and Engineering]. She was one of the professors that took students in my summer REU.

Then when I came for graduate school, Krystyn remembered me, she recognized me, she remembered my name. And I cannot tell you how meaningful it was to walk in to MIT for the first time and be terrified, of where I was and the journey I was about to embark on, and to have this woman who remembered me.

My advisor was a huge mentor for me. I mean, not just scientific, but also a life mentor. Her perspective on career and work-life balance was so interesting and informative to me.

Another person that was really influential was Bill Bonvillian [then-Director of MIT's Washington office]. He was one of the mentors for the Science Policy Initiative, one of my student groups. And he has this amazing network and is always suggesting people to go talk to.

DOU: That's great.

BREWSTER: Whenever I have a career fork in the road, Bill is one of the first people I call.

Another person that is just a wealth of information and cheer is Mary Rowe [Adjunct Professor of Negotiation and Conflict Management; an MIT ombudsperson reporting to the president of MIT 1973-2014]. She was the ombudsperson for a very, very long time.

I interacted with her through GWAMIT; the Ombuds Office is a very important resource that we would showcase. By showcasing her office I began to realize just how useful those services are. And I still call her. Occasionally, things come up, and I call her for advice. She's amazing.

DOU: Well, I learned a lot. After I go back for my senior year, I'll start using her.

BREWSTER: And then the other source of mentorship was my upper-classmates. Having someone who is senior to you, but only so senior that the environment that they went through is similar to the environment that you are going through now –the lessons they learned are directly transferable. That was very valuable. So I kept a very close eye on where my classmates went after school, because I was very curious. They ended up in some of the most amazing places. And it was so fun to talk to them about, "How did you make this decision? I didn't know you were

interested in that. When did you decide to go into X or Y?" So those people are very valuable mentors as well.

DOU: I'm pretty sure you'll probably be a mentor for later classes.

BREWSTER: Yeah, I hope so.

DOU: I love it--

BREWSTER: I hope so. Because I know that when I have to make decisions that I foresee affecting my future, in terms of my career and my lifestyle, I spend a lot of time gathering input, talking to people about how they made similar decisions, asking if they have words of wisdom for me in how I make my decisions. I spend probably too much time gathering input.

For better or for worse, this is how I operate. And so I just hope I can give back. Because I've spent – and I will spend – plenty of time asking for advice from everyone that I've ever met. I consider everyone I've ever met as mentors to me.

DOU: This is not just practical, but also a very good view on relationships, that you respect the people who have walked the past.

BREWSTER: Exactly. I also think it's really important, when you find someone who tells you the honest truth behind their decision and does not make it seem like their entire career was some linear, obvious choice – when you talk to someone who is willing to share with you – "Well, I decided to go there because I wanted to be close to my family. And then I went here, because I don't know, it sounded cool."

Because that is real life. That is what it actually looks like. And having someone that's willing to peel back the curtain and share the real choices, the real information that they made their decisions with, is so valuable. Because after a while, you have this kind of glossy narrative that you tell. And sometimes, you're just scratching the surface, because there is a lot of richness to those decisions.

DOU: So let's talk about your decisions after MIT. I guess, first, just briefly, what happened, and then we'll go more into detail of how it happened.

BREWSTER: So when I graduated from MIT, I knew that I wanted to go into science policy. I knew that I wanted to come to D.C. But I felt that it would be

more valuable for me to first have industry experience, because I never had industry experience. I had only done academic research.

So I went to GE Global Research. And I spent a couple of years there. But I just really wanted to come to D.C. So at a certain point, after a couple of years, I said--

DOU: "This is good enough."

BREWSTER: Yeah, "Let's do this. Let's go to D.C., what I've always wanted to do."

DOU: And your interest in science policy was from your experience at MIT?

BREWSTER: Exactly. From the Science Policy Initiative, a student group that I was involved in. [That] was where I first learned about it. And I was drawn to science policy. When you think about the research that we do-- Who pays for that research? In many cases, it's the government. Why would the government care? Why should taxpayers be paying for me to do my Ph.D.? How does that make sense? What is the value proposition?

So those are the sorts of questions that I started asking. And it really just drew me in. I also was very excited to look at science, as a field, from a much higher vantage point – see how it all comes together, and learn about who sets the science agenda for our country. I wanted to zoom way out.

DOU: Yeah. I can imagine it's very easy to kind of get lost where science is, like in the one--

BREWSTER: Exactly.

DOU: --a very specialized field.

BREWSTER: You drill down, and you're working on just one or two or maybe three very specific questions for years. And it was such a change of pace to just look at it from such a high view.

DOU: So you went to the industry.

BREWSTER: Yeah.

DOU: And then what happened next?

BREWSTER: I was at GE, but it was just not where I wanted to be. So after a couple of years, I applied for the fellowship that I always knew I wanted to do. It was a Congressional Fellowship, funded by my professional societies – the Materials Research Society and the Minerals, Metals, and Materials Society – and administered by the American Association for the Advancement of Science. So I came to D.C., and I spent a year in Congress on the Senate Committee for Energy and Natural Resources. And after that year, after my fellowship was up, I decided to do another fellowship, this time in the executive branch. I wanted to see that side of policy as well.

I started at the Department of Energy in the Advanced Manufacturing Office. Then the Office of Science and Technology Policy [OSTP] at the White House asked if I would do advanced manufacturing across the entire federal government, so DOE allowed me to rotate over to OSTP. And so that's where I am now.

DOU: What's the rotation like? So you were still in the fellowship--

BREWSTER: Exactly. I'm basically on loan from DoE to the White House. And in fact, that is very common. The majority of people that work at the White House are on loan from another agency, strangely enough. So everyone's on rotation or on detail.

DOU: That kind of goes back to what you said last time about the people rotate when the administration changes, it changes a lot.

BREWSTER: Exactly.

DOU: So it might be easier to work out that way.

BREWSTER: Yeah, exactly. Exactly.

DOU: So looking at the work that you're doing now, is it the same or different than what you expected to do in the policy world?

BREWSTER: It's very different than what I expected. I had thought that, if people in government knew more about science, then they would make more scientifically informed decisions. And now that I am here, I realize that there is a lot that goes into making decisions that involve the scientific enterprise, both in government and in business. It's not just the science. It's also the state of the economy, the current events of the world. There are many things that play a role in how decisions are made.

Now that I am here, I realize just how critical it is for scientists to be involved in the policy-making conversation, whether it is sharing their science that informs policy, or advocating for science funding, or articulating the importance of the scientific enterprise. Now that I am here, I realize, to the full degree, just how important this is.

DOU: So in summary, it's much more complicated, this whole practice.

BREWSTER: It's much more complicated than I ever thought. Ideally, when you're in the lab, you think, well, if you have a technology that works, then you're good to go. But there's so much more to it. You need the business case. You need customer appeal. You need market dynamics. There is so much that goes into the momentum of a technology beyond its scientific merit.

DOU: So going back to your initial participation, interest, involvement in women in science, so now that you're actually in the workforce – especially the policy world is kind of unique in the workforce, as well – do you still see any concerns with the role of women in the environment that you're now working in? Now as a woman in science in D.C., as opposed to when you were at school, and women in science at MIT?

BREWSTER: I think one thing that I've realized is that we're worried about the lack of women in science. But there is a lack of women at the top levels in every field. Even fields that are dominated by women, if you look at the highest level, the C-suite level, it is men.

DOU: That is actually very to the point.

BREWSTER: Yeah. I figured that there were fewer women in science. I thought that that was specific to science. And now I'm realizing that that is the case in every field. There are a lot of women that I work with here, probably more women than men, which is a big transition for me and has really changed my work style and how I get work done.

But if you look at our political representation: predominantly men. So again, the highest levels.

DOU: The political field has always been perceived as like the men's.

BREWSTER: Exactly.

DOU: And it's just very recently we've seen some women in leadership coming up. That's a really good point, now that you pointed it out. But you did

say that at your office or at your current workplace, there are more women.

BREWSTER: Yeah, there are more women.

DOU: But do you see that kind of as a coincidence, with this (Obama) administration, maybe? Or it's always been a trend at this office?

BREWSTER: That's a fair question. I don't know. I don't know if it's always been like that. I'm not sure.

DOU: How much MIT do you see at your current workplace?

BREWSTER: There are a lot of MIT alums in D.C.

DOU: In the policy world, or more like--

BREWSTER: Yeah, a lot. There are so many people from MIT here. And I think it just goes to show that MIT instills this very strong curiosity and desire to make the world a better place, and to believe that you actually can; that that is something you can actually do, which is so powerful.

Because every day, I get to come to work, and I think, "What can I do to make the world a better place?" My boss has a thought experiment that he encourages people to do to kind of wrap their head around the sort of work that we do. And the thought experiment goes like this: If you had 15 minutes with the president, what would you talk about? The president can pick up the phone, and he can call anyone. Or he can write a directive asking a federal agency to do something. What would you tell him should be done?

The other of his thought experiments is to imagine you could write a press release and whatever you wrote became true. What would you write? And if you are not working on that topic, why not? It is mind-boggling just how much good work we can do.

So I think it's really strongly linked with MIT's culture to always be thinking about how to make the world a better place and what you can do as an individual or as a team. And I think the natural place to go with that level of passion is D.C.

DOU: Because, believe it or not, the policy does make a very big difference.

BREWSTER: It makes a huge difference. I mean, the government is what we make of it. If people don't show up to make the government a better place, the government will languish. It's what we make of it.

BREWSTER: Exactly.

DOU: Even not exactly in the politics world-- I'm not a U.S. citizen, so there's no way I could work for U.S. agency. But the reason I chose to work for the World Bank was because I have a really strong interest in international development. I was working on the Open Transport initiative in the East Asia Pacific Region, researching ways to use open source platforms and standardized transport data to help governments better plan their public transportation system. And I've done some ground projects, field projects in my freshman year. I've participated in two projects, one in Myanmar and one in Western China.

One was a sustainable waste program in Myanmar, and then another education project in Western China. But I have, I guess, a lot of experience just directly dealing with people and organizing trips and directly involved in the development work.

But doing that made me realize there's this really huge influence of how supportive the local government was. What was their motivation to do any of this? It's not particularly profitable. At a much higher level, a lot of projects were supported by the banks and governments from other countries. And so at the government level, at the multilateral development bank level, what are they thinking and what's their motivation? The reason I chose the World Bank is it gives me that perspective.

BREWSTER: Yeah, that's so valuable.

DOU: So now, going back to doing grad projects, I have that perspective in mind. So either just practically, first, number one, you look for funding. You know what they're looking for. And you know what their priorities are. And then, just also to maximize or optimize the way that you can get support.

The projects that I did in Western China and Myanmar, in both of them the local government played a huge role. The Myanmar project turned out a lot better than we expected, because we had a scout trip and then we established a connection with local people. And then we actually went to the mayor's house and had tea with him.

BREWSTER: That's so awesome.

DOU: A lot of it comes down to who was supporting you at the ground.

BREWSTER: That's awesome. What an amazing experience.

DOU: I'd like to know what you have planned for the future. And also, looking back to your experience at MIT, do you want to say anything to current students?

BREWSTER: In terms of future career plans, I have no idea. And I think that anyone who tells you that they know what they want to do is probably lying. And I am the kind of person who always had a five-year plan.

Right now, I'm not sure what I might do next year. Part of that is the nature of D.C. In D.C., if you've been at a job for two years, that can be a long time. In the rest of the world, it's not. So part of this kind of flying-by-the-seat-of-my-pants is a little bit of D.C.

But it's also just life catching up with me. Life moves so fast. And it's finally catching up with me.

At some point, your timeline is not just yours. If you have your family or a partner, there are a lot of things that influence the path your life will take. And planning it out is useful, but it can be futile. Because unexpected things can happen.

DOU: But do you still expect to work in the policy realm?

BREWSTER: I hope to continue. I hope to continue working on the science at a strategic level. I do not see myself going back to bench research, because I don't think that that's where my strengths are. I think that my strengths are in communicating my science and the importance of the scientific enterprise and thinking strategically about how to move technology forward.

I think that one of the values of being an MIT alum is it gives me very strong credibility that I may or may not deserve. People will give you credibility and space. And it is your job to step into this space that they give you. They afford you so much space, you need to step into it. It's easier said than done; I'm still learning how to do that.

The other thing about MIT is the network. Every single person you went to school with – your year, the years above you, the years below you –

keep an eye on where those people go. Because guaranteed, they will all be doing something extremely fascinating.

All of your professors, every mentor you ever had, they will always be a part of your network. And utilize them, because everybody wants to help. Everybody wants to give back. It never hurts to call and reach out to somebody and reconnect with them.

Another thing that MIT helped me become more comfortable with is captured by a quote I heard from a friend at MIT. "If your dreams don't scare you, they're not big enough." I'm not sure if I would have understood that, fully, without my time at MIT. Because just stepping onto that campus was like the most terrifying dream I had ever had. But I did it. And I was successful. So I really began to understand how important it is to dream big and actually step into those dreams – actually execute – and to know a little bit of fear is healthy. It's OK. Now, when I have really big dreams and they scare me, I can think back and say, "I've done things that have scared me before. And this new experience will be scary. And that's OK. That's part of it. I can do it again." And then you step into it and you move forward.

You realize your full bandwidth, your full potential, your full capacity. You realize that you are capable of biting off much bigger chunks than you thought you could.

DOU: I completely agree. Just looking back to how I got here from China and how, at some point, I decided, oh, I just want to try applying to U.S. boarding schools. Why not? And it worked out. I didn't ask the agency's help, like normal people should do. But I decided, "OK, I'm going to apply by myself and see if I get in. If I get in, I'll go. But if I don't, I'll stay here." For some reason, of all the schools I applied to, I got into this one school. And it was one of the best options. It didn't even give me a hard time choosing. Opportunities present themselves. This is the school you should go to. So I went to the school, and had an amazing three years there.

BREWSTER: This was your high school?

DOU: High school, yeah.

BREWSTER: Where were you?

DOU: I was in Connecticut. It's called the Hotchkiss School. It's a boarding school. And the boarding school world is also very different from the

public school world. But then definitely a very big part of what I want to do for international development, now, came from all of my travel and experiences, with the opportunities provided by my high school. If I were back home, I would still do a really good job academically, but I would have never had any of those traveling opportunities.

BREWSTER: That's amazing.

DOU: It was like really interesting to see how life just sort of takes you in a much bigger way than you--

BREWSTER: Exactly, I completely agree. What an amazing story. What an awesome experience.

DOU: Thank you. Yeah, I mean, a lot of it, even when I think about it, there's not that much of like me in it. When things present themselves, you just go with it. And it works out very well. To avoid the reluctance and fear just going through something different and something new, like that probably was the part of me that helped. But other than that, life works out.

BREWSTER: That's so awesome. Yeah, it's true. Because you might not believe it always, but it's true.

DOU: When good things happen, just take it.

BREWSTER: Exactly.

DOU: Thank you so much! I think we got through everything!

BREWSTER: This was awesome – thank you! This was such a fun experience.