

**NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT  
EDITED ORAL HISTORY TRANSCRIPT**

JEANETTE J. EPPS  
INTERVIEWED BY JENNIFER ROSS-NAZZAL  
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ROSS-NAZZAL: Today is February 16th, 2012. This interview with Dr. Jeanette Epps is being conducted in Houston, Texas, for the NASA Johnson Space Center Oral History Project. The interviewer is Jennifer Ross-Nazzal, assisted by Sandra Johnson. Thanks again for taking time out of your schedule today to meet with us.

EPPS: Oh, no problem.

ROSS-NAZZAL: Certainly appreciate it.

EPPS: It's my pleasure.

ROSS-NAZZAL: I thought we'd start today by having you give us a broad overview of your education and work experience before coming to work here at NASA.

EPPS: Educationwise I went to undergraduate in Syracuse [New York] at Le Moyne College and while there I earned a bachelor's degree in physics. I only spent four years there, but I originally planned to spend five years. I was going to do a three-two program where you spend three years at Le Moyne and then you go off to an engineering school for two years, but I decided to finish

the four years off in physics and then go on to graduate school. I'd rather have spent that fifth year in a graduate program doing aerospace than continuing physics.

After four years of undergrad I ended up at University of Maryland in College Park, and I entered the aerospace program there. Originally I wanted to go into the space program there, but there were a lot of people in the space program at the time. So I ended up talking with the department chair at the time, who happened to be Dr. Inderjit Chopra. He was the head of the rotorcraft group there as well, and he was doing a lot of work with smart materials for helicopters. He convinced me that it was a good idea to stay there in the rotorcraft group and do research with smart materials.

So instead of going into the space group I ended up in the rotorcraft group. That was pretty interesting. I ended up spending seven and a half years there for a master's and a PhD. It was pretty interesting. I did a lot of work. For my master's I actually worked on composite blades. I did a thesis on composite swept-tip rotor blades, did a lot of work on that, wrote a paper, and went to conference, and then finished that. Then for graduate school I had multiple topics. I finally ended up doing a lot of work with these materials called shape-memory alloys and how to apply those to reduce vibrations in the hub of a helicopter. So it was pretty interesting work while there.

After graduate school, just to broaden my horizons as a scientist, I wanted to get away from my adviser and to be independent and become a real scientist. Graduate school is one of the best places to be, but it is a protected environment—to me it was. I was offered a job at Ford Motor Company in the scientific research lab there to continue work with smart materials. It was a way to continue working with the same materials but applying it to a different mechanical object I should say. Rather than a helicopter, it was a car now. So I did that for two and a half

years. While working there, I was recruited to go work at the CIA [Central Intelligence Agency], and I worked at the CIA for seven and a half years. I worked in the directorate of intelligence while there.

I was an analyst for about three and a half years or so. While there I did technical analysis for foreign weapon systems. That was very interesting. You do a little bit of reverse-engineering to try to build a picture of what happened, of how things may work based on the data that you have so you're a reverse engineer. Then beyond that I moved over to the Directorate of Science and Technology. While there I was a project engineer and also a technical operations officer, where you develop operations to collect different signatures or to collect different pieces of intelligence that the US government has an interest in.

At the agency that was where I really thought that I could become a scientist and a little bit more operational, if that makes sense. I was able to volunteer to go to Iraq for four months. So I spent four months in Iraq during November 2003 through February 2004. I spent time there helping to try to figure out what happened to the WMD [weapons of mass destruction] and worked with the David Kay group. After that I got to travel quite a bit all over the world to different places for proliferation issues and export control issues.

Once I went over to the Directorate of Science and Technology it was still a lot of the same. I only spent about a little over a year doing that. That was interesting, but after being a scientist and working in a lab and being able to work with your hands and do a lot of the work, it was interesting being the project engineer who just managed other scientists to do it. I was a little jealous. I couldn't jump in and do anything. Although I liked the projects, some very good black projects that we worked on, very good work, but I wanted to get more into the operational side and collect the information that we need. Almost as a research scientist wants to get the

data to prove something or even disprove something. So being on the technical operations side you can get involved in that sense. It was a very interesting career that I had that eventually culminated into getting selected for the astronaut program.

ROSS-NAZZAL: You had a very unique experience before you came to NASA.

EPPS: I did. A lot of people are saying, “Well, how did you end up applying to the astronaut program?” One of the funniest things is that I was so—well, it’s not funny in a ha-ha way—and this is what I always tell people, is that I think every kid wants to be an astronaut. My older brother was in college at the time. My twin sister and I, we were doing really well in school. We had to be about nine, he’s in college, he comes home, and he’s looking at our grades from the last couple years. He’s like, “Well, you can go to school. You can go into aerospace engineering; you may even become an astronaut.” I thought, “Okay, I can become a scientist, I can become an aerospace engineer. Astronaut? Oh, that would be so cool. But nah, I don’t know if I’d ever get selected for that.” So it’s one of those things.

As I was growing up my brothers and sisters said, “Well, you always said you wanted to work for NASA, didn’t you?” Even now they say that to me and I’m like, “Well, that was my dream.” Even though I never thought it was something that I could do, you build your life to do those things. Even though, you know, I probably will never be one of those people who can apply, and should apply and just go for it. So I built my life to be, “Okay, if I can’t be an astronaut I will be a great scientist,” because I wasn’t that operational in that sense. I figured that I’d become a great scientist and then maybe maybe maybe in the future I’ll be able to apply, if I

establish myself well enough. As a child I thought that becoming an astronaut was the coolest thing but one of the most impossible.

Because I was nine years old [and] my parents weren't engineers or anything like that, I said, "Well, I got a lot of work." My sister and I, we loved science, anything to do with science. She ended up going the chemistry biology route, and I ended up going the engineering route. So growing up we loved all of this stuff. We loved space, anything to do with space. We loved just about anything that was related to science.

ROSS-NAZZAL: Did you follow the Shuttle program when you were a kid?

EPPS: Well, the funny thing is we followed NASA, and we did follow the Shuttle program. Like for example when Mae [C.] Jemison was selected that was a huge deal. Of course we followed that. I remember the picture of her on the cover of *Jet* magazine, and that was legendary, and that was one of the landmark things in my mind. Gosh. I was still in high school, looking at that. I was just wowified, just absolutely wow. But we had the *Challenger* [STS-51L] happen.

For some reason the *Challenger* issue, that resonated more with me. I don't know why. I remember we had a break from school, and we were home and watching the Shuttle launch. Minutes later you see this whole event unfold, and it's so unreal. That really stuck with me, but it never deterred me from wanting to be part of that. Not once. It just made me realize that going to space is cool, but you got a lot of preparation that you need to do in order to get there. I think that made me want to work a little bit more, work a little harder, just to make sure. If you ever get there, you're going to make sure everything's correct, and right, and that you've looked at all the details.

Mae Jemison—I can't think of another woman growing up, other than my mother—who stood out in my mind as much, because it was amazing that she was selected and she was able to do this at the time. It was unheard of. I think her selection gave a lot of girls like me just the thought, it could come true. Holy cow, it happened for her, so maybe it can happen for me. With the *Challenger* issue you got to work hard, and you never know what will happen. Role models are definitely very important. I do know that just seeing that picture of Mae Jemison on the cover of *Jet* magazine made me think, “Wow, I can't believe she made it; that's just amazing, if she can do this then maybe I can do this as well.” I was definitely older; I think I was in high school when I saw that, my senior year in high school or something like that.

It was memorable just seeing that picture. It was those two events that stand out in my mind, that *Jet* magazine and then the *Challenger* issue, that framed the way I thought about things after that.

ROSS-NAZZAL: Tell me how you prepared to become a scientist through elementary school and high school.

EPPS: My twin sister and I, we were very fortunate in that we had people who—I don't know what they saw in us or what was going on—but they propelled us in that direction. Janet and I, we did a lot of stuff in math and science growing up. Especially in middle school and different things, we had people who moved us and geared us in that direction. It's interesting because people always told us that's what we would be. I think words are very important for kids. I don't remember ever thinking I would do anything else. Not one time, because people always said, “Well, you're going to become some kind of scientist or something like that because you're

so good at math and you do this and you do that.” Janet and I, we were very blessed in that we had people who encouraged us, who helped us, and propelled us in that direction. We were the youngest of seven. So going to college, my mom was like, “Well, you’re going to have to take out a lot of loans maybe. Maybe try to go for scholarships.”

While in high school we really had a lot of people come out of the woodwork to help us get scholarships. My mom wanted us to stay local and go to Le Moyne, not Syracuse [University]. She wanted us to go to Le Moyne College for some reason. Janet and I went there and interviewed, and lo and behold we both received the Le Moyne College Urban League scholarship. So we didn’t pay to go to undergrad.

ROSS-NAZZAL: Wonderful.

EPPS: Yes. We had great role models, and just great people in our lives who directed us in that direction. Corcoran High School was a great high school to go to. A lot of the instructors there and the teachers there, the principal—Thomas Kenah at the time—they really helped us in that sense. A friend, Hillary Hunter, she was the president of our senior class, and I was her vice president. My mom or dad, neither of them went to college. She said, “Well, you have to do these things; you can do this.” We had a lot of people who helped us get through and reach our goals. So it definitely wasn’t alone.

There were people at Le Moyne. I’ll never forget Professor [James F.] Welter—he’s passed away—and Evelyn Monsay, two of the instructors there. They were really great in just understanding. I worked undergrad, and we commuted in half the time. We were definitely helped in a good way. As long as we were producing and doing our work as we were supposed

to, there were always people there to help. Even beyond that once I got into graduate school, Dr. Chopra, he was a huge role model. Even to this day I now think of him as a father. He's one of those fathers looking at you, making sure you do well. You don't want to disappoint him.

In graduate school Dr. Chopra really looked out [for me]. As long as you were doing your work and you were doing the things you needed to do, spending the time in the work and getting it done, he was there to help and make sure you didn't have to worry about getting a fellowship for the next year. We went to conferences. We wrote papers to establish ourselves. So Dr. Chopra was really really critical and in the loop on everything. Janet and I both had great advisers that did that for us. She was in the molecular cell biology group, and Dr. [Soichi] Tanda, her adviser, did the same thing for her and moved her through as well. As long as we were doing the work and producing the things that we were supposed to, we never had any problems. We were truly blessed. We got through, and just a lot of people there who encouraged us and helped us along the way.

ROSS-NAZZAL: Yes, it's amazing how much encouragement helps.

EPPS: It really does. One thing I always tell people, the words you use are the things that kids remember. Looking back now, I don't remember ever thinking that I would do anything other than become a scientist or work for NASA, become a scientist-engineer, do something like that. Growing up I always said to Janet and my mom, "Well, I want to work for NASA at some point." Janet constantly reminds me of that to this day. "You always said that; you always said that." I never thought I would do anything [else]. People confirmed that. They kept saying that. I didn't have anyone who said, "You are not." It's funny. When I did run into one or two people

who would say that I'm like, "Well, that's contrary to what I had always been told, so you can't be right." So I do make sure that I tell [people]—especially when I see parents telling their kids, "Oh, you're a bad boy, or you're this, or you're that," words are very important. You're programming your child to be that thing that you're telling them. So words are very important.

It is interesting, because Janet and I, I remember being as young as six, my older sister would tell us these things. She would come home with her homework and she would have us sit with her, because she had to watch us. She had to babysit, and she would teach us how to do her homework. She was surprised that we could do it, but she's teaching us how to do this. So we were learning. She even said, "Who knows what you'll do as you get older?" They always said, "Well, you're intelligent enough to do this. You're smart enough to do this. You can do it. You can do it. You can do it. You're this. You're that."

It is very important to have that encouragement and use the right words. I think words are very important.

ROSS-NAZZAL: Now I understand according to your biosheet that you were a NASA fellow when you were in graduate school for a number of years.

EPPS: I was. It's funny, because my mother said, "Well, you always said you were going to work for NASA." I said, "Yes, but I'm working at Ford." She said, "Well, you got the NASA fellowship." I said, "Yes, that's true." So I thought I was resigned. Okay, I had the NASA fellowship. Dr. Chopra was very critical in getting that. I had a project that I was working on and he thought that one of the research scientists out at Ames [Research Center, Moffett Field, California] would be interested and would sponsor me for the fellowship. His name was Khanh

Nguyen. He was out at NASA Ames for a long time. I think he subsequently left, but it was because of him and working with Dr. Chopra. They supported me for three years on that fellowship. It was very nice because they sponsored travel out to NASA Ames, and I could present my project and talk to Khanh and get advice. It was a very good three years. I think it was at the tail end of the PhD phase of me being at University of Maryland.

ROSS-NAZZAL: Did you get a chance to work at Ames as a fellow?

EPPS: No. The NASA fellowship is a GSRP. Graduate Student Research Program I think is what it was called. You would get a NASA fellowship through the program. So I never got a chance to work out at NASA Ames. I worked with one of the research scientists, but never out there. Instead of going to a NASA Center after graduate school I ended up going out to Ford. Dr. Chopra, I don't know if he was happy about that, but it was a good thing to do, [in] hindsight.

ROSS-NAZZAL: Well, I'm sure he's pretty proud of you now.

EPPS: Yes. It's a good way to pay back a great adviser, is to do well.

ROSS-NAZZAL: Tell me how you found out that NASA was selecting a new group of astronauts in 2009.

EPPS: I had always followed the program because I knew people were applying, and I knew so many people were interested, but I would never utter the words. To me it was like if you said, "I'm going to apply and I'm going to do this, I'm going to do that," and then you don't get selected, it's like ah. This time Leland [D.] Melvin actually called me. He said, "NASA is looking for new astronauts." I had always said to him, "I don't know if I can do that. I think maybe it's not for me. I need to work on this, and I need to do this."

I had done a lot of traveling for the agency. I never thought I was operational enough. I don't know if that makes any sense. I said, "Well, I don't know; I don't know." Then I thought about it. I was 38 at the time. I said, "Well, if I don't apply now I'll never be able to apply again." That was the wakeup call. I said, "Well, if I don't do it now I'll never do it. I just need to at least apply once and see what happens. They probably won't select me, but at least I will say I did it; I applied. Oh well." The thought of it being the last chance that I could ever do this was huge in my mind. So I said, "Okay, I have to do it." I always told Leland, "I don't think I can do this. I don't know if they would [select me]."

Not being selected, it's disappointing. I've seen people who put their name in and they don't get selected. It's very disappointing. I look at them. "Wow, if that person didn't get in, and I go ahead and apply, I'm not sure if they would even consider me for an interview." I knew people who got an interview. They went through. They had great resumes. They had done great things, and they weren't selected. It is very disappointing. So I said, "Well, it's my last chance. Who know what'll happen?"

ROSS-NAZZAL: Tell me about that whole process as it unfolded. I understand you actually participated in two interviews, which is unusual.

EPPS: Yes. It's nerve-racking too. So you get the first call and you're on cloud nine. Just to be called for an interview is amazing. You go through the first process where you do a basic workout with some of the astronauts like Peggy [A.] Whitson and Suni [Sunita L.] Williams.

ROSS-NAZZAL: Really? Cool.

EPPS: Just to see how well your physical fitness is. So you're, "Okay, that's interesting." Then beyond that you do a basic interview, a roundtable. You're sitting in one spot, and then it's a U-shaped table. All the rest are astronauts and other people who are interviewing you. It's rapid-fire questions, so you can't plan what you're going to say. There's no way to plan what you're going to say. It's rapid-fire. You're just answering. I don't know if they do that so that you can't have a canned speech that you're going to give them. It was nerve-racking, but after I came out of there I said, "Oh." You really don't remember what you said.

ROSS-NAZZAL: It's a good thing you don't mull it over anymore.

EPPS: Exactly. So in fact I had the interview right after I worked out with Peggy Whitson and those guys. We'd just come from the locker rooms, and I had to get in there. It was good because my energy is already up, adrenaline is going, and just sit down and just do it. It was nerve-racking. You've got so many people watching you, so many senior astronauts, and people that you've only seen their names. You're like "Wow, this is pretty intense." Very cool, but very intense as well. Duane [L.] Ross is always sitting to your left, and he's a calming factor.

So that first interview was quite interesting. They did a little bit of anthropometrics to measure your body to see. I think at the time I wasn't sure if that was to see how you fit into the Soyuz, your body shape and different things, to see how you would fit in there.

Then the waiting period between interviews was the next step. So you do that interview and then out of 120 people who were interviewed the first time they whittled it down to 40. That waiting period between interviews was also nerve-racking. It was quite nerve-racking because you don't realize how much you really want this until you come down. You're in the middle of it, and you meet some of the people, and you talk to them. I remember talking to John [L.] Phillips. He's telling me about Kazakhstan. I'm like "Wow!" It's like being in a daze and walking through a dream that you've had. So get back home, and you're thinking, "Wow, I really want this." I'm just praying that they call me back. One of the nicest feelings is when they call you back and you're like, "Wow, I'm one of the 40." That is a very nice feeling, I have to say. The second round of interviews is mainly the medical aspect, which is a very thorough physical exam.

Even though it's a stressful time in the sense that you're excited and nervous and you go through the medical part, everything usually works out. I ended up having gallstones. I was also told that having gallstones is a disqualifier but not having a gallbladder is not. So if I didn't have a gallbladder, it was, "No, you're not disqualified," but having gallstones is. In other words get rid of the gallbladder. I didn't realize that I had gallstones, but I had always had this slight pain in that area. I actually decided to go ahead and have my gallbladder removed after that to get rid of the stones and all that. So I had my gallbladder removed, which worked out to my advantage in fact. During the process I found out I had gallstones. Subsequently about a month and a half

later I had it removed. The second interview process we did have to go through another roundtable interview where you're the only person. So that was another interesting aspect.

Being here again in Houston just confirmed, "Oh wow, I didn't understand how much I really wanted this." You get back, and it's a waiting process. You're on pins and needles. Everyone's sending e-mails. I'm trying to focus on work and go off and do other things and not think about it. It was a tough process waiting, very tough process.

ROSS-NAZZAL: Tell me about that phone call that you finally received. Who ended up calling you?

EPPS: It was Peggy Whitson. I'm not ashamed to say that when she said, "We think you would be a great addition," tears just started coming down my eye. I'm totally not ashamed about that. It was June 23rd at 11:00. I can't remember the [exact] time. I think it was either the 22nd or the 23rd. But I remember it was June 20 something. It was early afternoon. I remember sitting in my car. I had just come out from work and had to call. In fact my mother was in the hospital at the time. I had to call her. So I came out and picked up my phone and saw that. I'd just got in the car and the phone rang. Picked it up, and lo and behold it was Peggy. So it was quite exhilarating. Having everything come together all at once is an overwhelming feeling, emotional, and it's life-changing because you know that at that moment your whole life is going to change. You've got to be on your A game. This is a serious task. It's a worthy task. So it was amazing.

ROSS-NAZZAL: What did your family think when you told them?

EPPS: Well, what's funny is that my mom, she subsequently passed away, but when I told her she was the one who always said she doesn't like me doing all these dangerous things, she doesn't think I should do this, she doesn't think I should do that. But when she heard this she said, "Wow, that's the best thing that's ever happened to you!" So I said, "Wow!" Everyone was just elated. I got so many calls. I didn't know what to do with it. It was just like wow. I didn't know what to say. I didn't know what to do either. It is life-changing. It is one of the best things that could happen to you, because it is just huge amounts of, I think, responsibility. You're in the public eye. You got to take on this huge task to perform. It's amazing, because I guess I do think about it as you're still working for the government, and you are privileged to be able to do this and go to space and do the science and do those things. It's a huge privilege and responsibility.

I think at the time I said, "I'm ready for it." You get in the middle of it, and you're like "Wow, you really have to be responsible." It is a privilege; it's a true privilege. I think I realize that more and more each day, because I love doing a lot of the things that we do especially going out to the NBL [Neutral Buoyancy Lab]. It's a really tough task to get into the suit, perform for six hours. But how many people get to do that? How many people would love to do that, on top of it? It's nice to have friends that come out. I had a friend who came out last time I got in the pool. She said, "Man, I just wanted to grab some scuba gear and get in there with you." It's like I know. It is very cool. It's a privilege to be able to do it. It's overwhelming, but it's good, very good.

ROSS-NAZZAL: Tell me about coming into the agency in 2009. The Shuttle is closing out and Constellation has been canceled. What was your reception by the rest of the astronaut corps?

EPPS: It's interesting, because when we came in, we were off and running. They put us into classes. So I thought the reception from the office was pretty nice. After that we immediately were jetted off to—we first went to Brunswick, Maine, to survival training. After that a handful of us went off to Pensacola [Florida] for six weeks. Then we were traveling in between to visit sites. We were doing a lot of geology. Then we had our own classes. So it was fast and furious, the first two years, to get all the training in. It was very fast and furious.

Because the Shuttle was ending I think a lot of minds were directed towards that. It's funny because when the Shuttle program ended, it hits you like a rock. You're like "Wow, they actually did stop flying the Shuttle." It was sad to see the Shuttle era end, but it is also hopeful because there's a lot of cool things on the horizon. The interesting part is that a lot of people actually thought NASA shut down after that. I had a lot of people send me e-mails to ask about, "What are you going to do now?" I said, "Well, I was never meant to fly in the Shuttle. I actually get to do something that is—I would love to fly in the Shuttle—as cool, which is to fly in the Soyuz." If there's a future vehicle, who knows what will happen? Maybe I'll get to fly in one of the future vehicles. But for now it's like the Mir Shuttle program. When the Mir was there, we only had the Russians. So to me it's a huge opportunity.

We came in, and our mandate was that we had to know Russian. So we had to start taking Russian. We had to pass the oral proficiency interview exam, which is totally separate from NASA. So we had to be validated that we can speak at, it wasn't a very high level, but we had to learn Russian to that level before we could graduate. I think that's so cool that we have to

learn Russian. So after that, we have to learn Russian, we have to learn a lot about the Soyuz. We're learning a lot about the Russian system, and the US working together also. I guess I have this different mindset. It's not necessarily different. But coming from the agency, which is an international agency, and working with other countries in this capacity to me is a much better capacity that I would want to work with another country. The CIA has a whole different aspect of how they work with other countries. I like the idea of working cooperatively and doing things like that. So the idea of working well with another country, to go to their country and do different things, that appealed to me a lot in the sense that we're working well together. So learning Russian I think is one of the coolest things we get to do. And actually having time spliced out to do that is part of your job. You can't beat that.

We learned Russian. We learned about the Soyuz. We have to be able to do an EVA [extravehicular activity]. So that was the task. I said, "Okay, if I'm going to focus, my main focus is going to be on the EVA, and how to do that." Partly because I wouldn't want to be on Station, something goes wrong, and not be able to go out of the hatch. I want to be prepared for just about anything that can go wrong, and even things that we don't know about. Being able to do an EVA and do it well. It may not be perfect, but do it well, that's very important to me. If anything goes wrong you got to be there. It may even be something where you save the Station. Who knows? If you're on Station, you have to be the one to go out there. So recognizing the dangers and the joys of doing that I think should be in the forefront of people's mind. I think for people coming on subsequent to us, I think having them understand that look, you have to be able to do an EVA. Something goes wrong, you have to be trained well enough to go out the hatch. Doesn't have to be a perfect EVA. but you have to know what you're getting into and understand what you're doing. Everybody in the office understands that. I think before coming

on board I always thought one of the coolest things was the spacewalk and how you do that. I think being in the pool and in the suit gave me a whole different perspective. That's one of my favorite things to do, for sure. I think because it's such a challenge to do. But it's doable. That's the nice part. It's doable.

ROSS-NAZZAL: You fit in the suit. That's been one of the—I guess arguments about whether or not women fit in the suit, and they can't do EVAs.

EPPS: Well, I'm 5' 8". I'm not extremely thin. I'm a size eight. So I'm a 5' 8" size eight kind of person. So I really actually don't fit in the suit. I have a lot of padding in certain cases. A lot of it has to do with being neutrally buoyant. If you're neutrally buoyant, being able to work in the suit can be streamlined. If you have air pockets in there, you're not so neutrally buoyant. So you have that air pocket making you floaty. You may have other things that may [affect you], like if you have a leak in the suit it may make you heavy. Then translating in the pool becomes difficult. But those are a lot of pool issues.

One thing I did notice is that people try to say that it's a male-female thing. I'm not so sure about that, because I'm not the thinnest person. I know that my Japanese colleagues, the three gentlemen that came in with me, one of the guys, he's very thin, he's very narrow. I've got at least hips, and I don't fit in the suit. I know he doesn't either, but he does really well in the suit. I'm like, "Well, why am I having so many difficulties?" I've learned how the suit works a lot better.

Sometimes I think for some women it may be arm reach that may be an issue, because one thing you do in the suit is you have to reach for certain things and you may or may not be

able to reach into certain places because of the arm length. There may be little things that you have to tweak and do. There were men who I'm taller than who were able to do the EVAs, and they did really well. So that's why I don't want to give way to say, "Hey, it's a male-female thing," just yet. Because I'm convinced, not that if my Japanese colleagues can do it I can do it, it's just that I see how they work in the suit. I'm like "Okay, I should be able to do some of that." Strengthwise, I do a lot of weight lifting. When I look at those guys, we're about the same height, I think one of my JAXA [Japan Aerospace Exploration Agency] colleagues, he's probably about three inches taller than me. For the most part we all fall in this 5'11", 5'8" range. You can adjust the boot length to fit the height. The width is where you have the problem, because you have these air pockets moving around. So I'm convinced that as a woman I know I can do this. I don't have any doubt, especially looking at those guys.

I'm like, "Okay, they know how to work the suit, and that's what it is." I've learned. I'm getting better at working the suit to my advantage so that it doesn't wear me out. We're in the suit for six hours. That's a long time to have 300 pounds on, and then 300 pounds that take on—even though it's waterproof, it still takes on a little water. So it becomes a little heavier. Plus we have a lot of great divers in the pool who help us so they try to make it so that it's more spacelike. They will help you on things that are a one-G issue. So for the most part we should be able to work the suit as well as any guy.

So I'm convinced that we can do it. I'm convinced.

ROSS-NAZZAL: I understand you're also training to be an ISS [International Space Station] CapCom [Capsule Communicator].

EPPS: Yes. The CapCom is the person who talks directly with the crew, and they take all the input from the flight director, and the flight director has taken all the input from the flight controllers. Whittled it down to what the crew needs to know and has said to CapCom, “Tell the crew this.” So we’re the interface with the crew. That way the crew has one voice, and we’re all in agreement as to what they should say. I haven’t gone into the mission control yet, but we’re doing a lot of the simulations where everything breaks.

ROSS-NAZZAL: I’ve heard about those.

EPPS: Oh yes. I’ve done several of them. They’re very good for training, because you learn a lot more about the systems in a lot greater detail than we do in class. As a CapCom you never know the systems as well as the flight controllers. It’s their job to know those systems inside and out, but as a CapCom you hear what they’re doing. You learn a lot more about the system. It could be the WHC [Waste and Hygiene Compartment], or the toilet. It could be the toilet on board. It could be the portable water dispenser. It could be just a lot of the systems on board that we’ll get to know better. So I think the office’s objective in having us do CapCom before we go to space is so that we can understand what’s happening on the ground as a crew member. When you become a crew member, you can understand the issues that the CapCom are having, and how they’re working out questions that we have for them, if we’re on Station. Just to understand how the whole process works.

Having better situational awareness of what’s going on, so you don’t get frustrated, you don’t say, “Well, they never answered my question.” So it does help understanding, giving you a good perspective of what’s going on.

ROSS-NAZZAL: You also work with the ISS Integration Branch.

EPPS: I do. The nice thing about working in that branch is that it's not as I guess work-intensive, in the sense that we have several really good engineers that work the different topics. They follow everything, because in the middle of working in these different groups we still have training to do. Like I'm starting advanced EVA skills. So even though we're in these groups and we're working, it's hard to follow everything day to day. The nice thing is that we work closely with the engineers to try to go through different procedures for different payloads. Vet out the procedures that would be done on Station. So I work mainly with the struc and mech [structures and mechanical] guys. So the Integration Branch is great because you learn a lot about the systems as well. The whole objective in getting us into these CapCom and Integration Branch is so that we'll know the Station very well before we even go there.

That has helped out tremendously. Understanding what systems break all the time, and why they break and how to fix them so that we don't have those issues in the future, it really helps just the situational awareness of the Station and what to expect when you go there. So it's very nice, very nice.

ROSS-NAZZAL: Sounds like a great place for an engineer, like yourself.

EPPS: It is. It is. I notice that here I'm constantly in the learn mode, which is different than any job I've had. Working different topics. You're learning, but you almost feel like a student most of the time. Which is very different, and I like it a lot, don't get me wrong, just very different.

ROSS-NAZZAL: Tell me about working on NEEMO [NASA Extreme Environment Mission Operations]. I understand you were a CapCom for one of those expeditions.

EPPS: NEEMO to me was one of those things. I said, “This sounds like one of the best analogues to space.” How do you simulate going to space, with some of the difficulties? You can’t come home immediately; you’re in a place with a small confined environment with a group of people. You’re friends, but these aren’t your family members. You have to basically perform tasks and do different things. So to me I thought NEEMO, even apart from the National Outdoor Leadership classes that we do, the NOLS classes, I thought NEEMO was one of the best analogues to space. I was mainly curious about it. I ended up getting the opportunity to be a CapCom and getting a bird’s-eye view of what goes on at NEEMO.

I think just being there for that week did confirm that it is one of the best analogues to space. So the fact that they ask CB, the Astronaut Office, to send astronauts to be crew members—I really like that idea. Being a CapCom, it was interesting because I actually got to participate in some of the simulations that they were doing, like the medical situations. Even the time delay, that was very interesting. The time delay was an eye-opener to how frustrating that could be. If you’re going out to Mars, and it takes 30 seconds for a message to get there, and then 30 seconds for it to come back, it can be very frustrating. I think from that I realized that if you’re going to Mars or someplace like that you’re going to pretty much for the most part be autonomous. You have to do things a little differently, I think.

To me I still think that NEEMO is one of the best analogues to space. There's other things that we do as far as spaceflight training and readiness, but NEEMO to me was one of the best analogues.

Being stuck out in the middle of the Canyonlands [National Park, Utah] with NOLS, that was interesting for ten days. It is not like space in the sense that we're out in the middle of a wilderness as far as NOLS goes. We're out in the middle of a wilderness. The thing that is like going to space is that you're on this expedition, you're with a group of people, you've got tasks to perform. You have limited supplies. You have what you have. There's a lot of good analogies, but NEEMO to me was one of the best, because you can't just come out of the habitat and come up. You have to wait. You have to decompress. You have to do this, and you have to do that. It's not immediate evacuation if anything goes wrong. If there's a medical emergency you have to take care of your crewmate there and get them stable. You really have to work as if you were on Station. You can't just come back home immediately.

It's interesting, because they couldn't just come back home. It was very good training, very good training. Just a realization of okay, if you go to doing long-duration missions or if you're doing a Mars expedition, you're going to be on your own. You really have to train up. I think after seeing that I realized that the field medical training was going to be very important to me, because if anything happens you really have to be able to take care of yourself. If anything happens to your crewmate you got to be able to take care of them. It's an eye-opener.

ROSS-NAZZAL: Tell me, if you would, how race perhaps has impacted your career here at NASA, if at all.

EPPS: When I read that question I thought I'm not sure how it's impacted. I think partly because I'm one of those people. I'm very focused on work and getting things done. I haven't had any incidents or anything like that. I don't think it's played a role. I think I've been required to do the same tasks as my colleagues. I can't say that I've been singled out for this or for that because of it. You know what I mean? Right now I don't have an inkling that it has impacted my role here at JSC. So I can't answer that well right now, which is good. I think it's a good thing.

ROSS-NAZZAL: What about gender? Do you think that's played any role in your career here?

EPPS: I don't think gender has played a role. When I was talking about the EVA suit and people say, "Well, the woman this and that," I'm convinced, maybe it's just because I'm stubborn, I don't think that being male or female makes a difference. I don't think being a female even has played a role. I think a lot of us, especially in the corps, we want to perform just like our male counterparts. Whatever they can do we need to perform well too because we're going to be a member of that crew, and we want to be a productive member of the crew. So we have to be able to perform as they do. I do know that there's a difference in muscle, difference in things like that. I'm not saying that we're the same as men, but we should be able to perform as well as any of the guys who we would end up going to space with. So I don't think gender has really impacted [me].

Maybe I'm not focused on it either. It's not that I don't notice those things. I think I have this tendency to focus on the tasks that I need to do in order to get to the next level. I want to be one of those people who can perform just as well at the highest level that we need for a crew to go to space. I think everyone has that mindset. "Well, being a female shouldn't matter."

I think early on when Shannon [W.] Lucid and those guys came on it may have played a great role. I think it's leveled out a little, well a lot, because I don't notice it. You know what I mean? I don't notice it at all, but I'm not looking for it either.

ROSS-NAZZAL: Is there anybody who you would single out as someone who has mentored you since you came to work here at JSC?

EPPS: Oh yes. I've had the opportunity to talk to a lot of great people. Clay [Clayton C.] Anderson, I ended up spending a lot of time talking with him. More than I ever expected. One thing I like about Clay is that he's got the greatest intentions. He's flown three times. He's got a lot of good advice as well. He does try to mentor and give me good advice and make sure I don't do anything to get myself into trouble. It's interesting. I never expected to find that Clay Anderson would be my mentor.

Sandy [Sandra H.] Magnus has helped me out tremendously too. She was extremely busy with [STS]-135 though so I didn't want to hound her for information while she was doing it. The first couple times I was in a suit, it was a weird environment. She said, "Oh, well, you need to do another suit fit check and see. We need to check that again." She actually took the time out, came over with me, went through the suit, and said, "Oh, no, no. You got to change your gloves. You got to fix this, you got to fix that." She helped me out tremendously. Sandy, she's definitely an angel in my book. She helped me out tremendously. I'm thinking about the people that I spent the most time talking with. Clay Anderson and Sandy are probably the two that I've spent the most time [with]. Well, they've given me the best advice.

I've talked with Cady [Catherine] Coleman. She's a sweetheart too. I've talked with several other people as well. I got a lot of information from Sandy as well as Clay. So it's interesting. I thought Clay was so busy. He's so gregarious and doing all these things. He takes the time out and chats with me and tells me a lot of good things. So it's interesting. I would have never expected that. He's been great. Between he and Sandy I think I've learned quite a bit. Quite a bit.

ROSS-NAZZAL: I understand that you also like to mentor. You like to work with young children and kids who are interested in science and technology. What do you think sparked that? How have you been able to, as an astronaut, inspire some of those kids?

EPPS: Well, I think what sparked that was the fact that when I was growing up I had so many people who—I didn't do anything—they just reached out and helped me. I think I just want to pay it forward. I don't know if that makes sense. I look back, and I see how many people were in the loop and just trying to propel me forward. I think it's important to reach back and say, "Hey, look, if I can do this, you can do this. You got to put the time in to do it." Just encourage kids. I realize growing up that words were very important. I don't remember anyone telling me that I wasn't going to be a scientist. If there were one or two naysayers, I had more data to confirm that they were not telling the truth. I think wanting to encourage kids and tell them that you can do this and you're capable. Put the time in.

Try to give them advice on how to do it, because a lot of people think that things just come instantly and if you don't get it instantly then you move on to the next thing. I'm like, "No, you got to put time into it, and really put yourself into it." Once you find what you're

passionate about, if this is something you really want to do, put the time into it, and get it done. Here's how you can get it done. So I think having so many people who helped me inspires me to want to give back.

It was nice also when I went to work for Ford. There were several people who were training students to become better at taking the SAT [Scholastic Aptitude Test, a standardized admissions test for college]. That was quite impressive, other people wanting to help kids to do this. I joined the Ben Carson Scholars. That was a volunteer organization that tried to help kids in Detroit [Michigan] take the SATs, learn how to take it, and teach them how to do much better at it. That was very very rewarding, I think. Just having students who want [to improve]. Parents wanted to be involved as well and see that go forward. But even beyond that, when I got back to DC there were a lot of people who were volunteering to help students. I think one thing I wanted to do was try to teach them to do something more very technical and just become analytically minded. Even if you don't use it in the future, you go on to put together some business or something like that, your mindset is such that you can do just about anything, if you put your mind to it. You understand the time you have to put into it, especially if you go to school for engineering. You understand that it's not just going to be a couple minutes here, and I'm done studying. So to put something big together it takes time and understanding that and putting the time and effort towards it.

Giving something back is huge for me, especially in the sense that I had so many people helping me. How can I not do that? It's rewarding too to see a lot of kids. There's this young man who approached me while I was doing a PR [public relations] in Atlanta [Georgia] at one of the Space Farm PRs. He said, "Well, how do you do this? How do you do it?" I said, "Well, are you putting the time in?" He said, "Well, how much time do I need to put in?" I said, "Well,

however much time you need to get it done.” It was interesting to see his face change. It’s like “Oh, well, I got to put time in.” Yes, you got to put the time and effort in. You don’t poof and automatically know how to do this. Putting the time and effort in. He was a very nice young man. He was so grateful at the end of that conversation. I thought putting time in is key. I think he just wanted someone to talk to. Kids in general, just [to] have someone encourage them to do, “Just go ahead and do it,” and put the time and do in I think is very important, just someone to encourage them sometimes.

It’s interesting. I had my twin sister and my mother. They always said, “Well, you can do, do, do.” I realize that not every kid has that. Sometimes they’re doing something totally different than what their parents did. They may not have someone to say, “Well, if this is what you want to do, go for it, and do good things.”

ROSS-NAZZAL: You mentioned that cover in 1992 of Mae Jemison and really how that was such an important or significant event for you. What do you think about being a hero now for kids?

EPPS: That’s unreal to me, when I think about that, because in fact I was in college at the time. Gosh. When I looked at that picture of her on the magazine, the image is just emblazoned. To think that that person could be me, I can’t even fathom that. It’s funny, and I’m sitting here reaching for words. I’m like trying to picture that. My sister and I, we always felt like we were just doing what we [were supposed to]; this is what we’re supposed to be doing. We never felt like we were something out of the ordinary. We’re just regular people doing what we’re supposed to do. People like Mae on the cover, well, they’re different. We never felt like we were anything but ordinary. We were just ordinary people doing what we’re supposed to do. I

guess having that mindset and thinking that way, to think that that would be me is like, “Well, I don’t know about that.” You know what I mean? I don’t know. That’s hard to answer right now for some reason, because even now I haven’t wrapped my mind around that.

Doing PRs is still new for me and nerve-racking, because I’m like, “What do people want to hear from me? Do they really want to hear what I have to say to this entire huge crowd.” I can understand kids, can understand that fully. Even now it’s quite overwhelming to have people approach me at different events and want to talk to me because I’m in the astronaut program. I guess when I see people do that I really want to give them the information they want. I’m just here doing my job is how I see it. I’m here at the behest of the taxpayer. We are privileged to be able to go to space and do these things. So to think of myself as one of those people on the covers is still hard for me to wrap my mind around that. Very difficult. I don’t know why. So trying to envision that, I still can’t see it yet. But maybe one day.

ROSS-NAZZAL: Well, it’s going to happen, you know that. I think the only other question I had was if you would talk a little bit about working with the government and working in private industry. How did that differ? Then you worked for the CIA and now for NASA, two very different agencies.

EPPS: Working for a private company is very different than working for the government because cost and things like that are very different for a private company. They’re all about profit, because this is someone’s company. Working for the government, you don’t really make a profit. It’s taxpayer dollars and different things. So two different mindsets. Then for a company like Ford where manufacturing is so huge, I really loved working there after coming out of

graduate school, because I was able to see how a project was done from end to end. How it's designed and then how it's manufactured and then how it's marketed. So understanding that whole process of the manufacturing of a car and how much it takes to get one car to roll off the line, turn the key, and have it work. That was a very good mindset for me.

When I started doing research on how to reduce vibrations into the suspension, to give you a better ride, I had to understand that the actuators that I was developing, they couldn't cost \$100 each or \$200 because they were going to design these for millions of cars. So you can't put a piece on there that's going to cost that much. So how do you make it as good but a lot cheaper? How do you manufacture an actuator like this for millions of cars? Thinking of design for manufacturing was what I think Ford taught me, which I thought was huge at the time, and I still think is pretty big.

Then going over to the agency. Doing the research there, even though some of it was reverse research, and just doing research in general, it was very different because money wasn't as big of an issue. We weren't building millions of things. We were building only a few. So working at the agency, the big thing that I got there was learning how to think in an operational mindset of how you would—like you have these guys who go out in the field, and they just do stuff. Like even a fighter pilot, they're very operationally minded. As a scientist, I like more details. I take time. I do this. Operators just go out, and they—I can't describe why they're very good at what they do and how they do it, because I like a lot more detail. So trying to balance that. That's one reason why I volunteered to go over to Iraq and I volunteered for different things. Just to get that scientist side and think about things from an operator's perspective as well.

I learned a lot working at the agency as well. Coming to NASA, NASA is a very different government agency in the sense that I'm constantly impressed with Johnson Space Center to see how people work in order to get the astronauts to space, get them there safely and back home safely. All the time and effort that they put into designing things, fixing things, even down to fixing the procedures. So Johnson is just very impressive. Then going over to Kennedy Space Center [Florida] and NASA Glenn [Research Center, Cleveland, Ohio] and seeing all the research that's done. That is still like the general research that I've seen. So it's still a government agency, has a government feel to it. But it's very different than working for the CIA.

The CIA is a government agency. Their whole thing is to collect foreign data. I don't know how to put that in a better way. So you work very differently. You don't really tell people about what you do. You don't give them any details or anything like that. It's nice to come out from under that classified environment, very classified. Everything is classified. It's nice to work in a lot more open environment. It's not stressful when you're working in it, but once you stop working in it, you realize wow, we were working, we couldn't tell people what we do, and there was a lot of aspects that we couldn't talk about, even though we were doing some cool stuff. You can't really talk about it at all. It's nice not to have to worry about that. It's very nice. That classified umbrella was different, very different so I do like working without it, needless to say. Plus, people can know everything about what you're doing, which is nice, especially when you want to share with students. You want them to know why it's a great place to work.

Like at the agency, I thought it was a great place to work, and if you were a student you could come in as an intern or something like that. It's a great place to work. But you couldn't

really tell them everything, why it's so great. At NASA you can tell them everything about why it's great to work here. So all three companies are very different, but I think the nice thing for me is that it created a more complete picture of design for manufacturing and building things, to going to the agency, becoming a little bit more operational and designing things for operational matters. So when you design things for an operator how much do you need on there? I'm still struggling with that even now. If you design something for an operator, what should it look like? How many buttons should it have? How fast? What information do they need? So the agency really taught me that. Then coming to NASA and putting all that together and doing it for myself actually. Understanding how things are designed for manufacturing, what kind of payload can you put on the Station, designing it well for the manufacturing, and designing it for the Station, understanding all the different things that go into that.

Then even beyond that, as an operator now. I guess I didn't realize astronauts are operators. We're operators in the loop. We go to Station. We work closely with ground. Ground says, "Do this." We got to do that. We have procedures. We have different things like that. So working as an operator now is very interesting. Because I did research for so many years, it's an interesting change. It doesn't automatically happen overnight, but I'm getting there, which is nice.

ROSS-NAZZAL: It's a new step.

EPPS: It is. It is. So it's another level.

ROSS-NAZZAL: Are there any challenges that you think you've encountered since you've come to work for the agency?

EPPS: Challenges as far as personal?

ROSS-NAZZAL: Personal challenges or work on the program.

EPPS: It's interesting, because I think for me the biggest challenge was that when I came here my mother had passed away. I think the start of everything was so difficult because of that. So having to go through that and work through it for so many months it seems. It's a challenge trying to get your work done and not focus on that. I think things may have started out a little interesting, but time heals all wounds. As time goes by you come back to your normal self and you start doing things as you normally would. So things become normal, which is nice. So I think that was probably, for me, that was the biggest challenge I think I've had since being selected. I thought it would be oh, it's just a couple months, I'll be back to normal. It takes a little longer than just a couple months. Realizing that is half the battle. Everything's normal now. You know what I mean? I don't know if that makes sense. But things begin to normalize and you feel like yourself and you can do things as you normally would. So it's worked out pretty well.

ROSS-NAZZAL: Sounds like family is very important.

EPPS: Yes. It's interesting. My twin sister and I, we're the youngest of seven. It's really bizarre because we were clustered together growing up. As my brothers and sisters left the house it became just—my parents had separated and divorced subsequently. So as everyone moved out of the house it became really my twin sister and my mom and me. It was like the three of us clustered together.

My brothers and sisters always helped and encouraged us. So yes, family is very important. Yes it's huge. I think with most people in the corps, they may not say it like I do. I'm like, "Oh, I'm wishy-washy." Family is very important to everyone in the corps, because your family really do—especially the guys who are married with kids—they really sacrifice a lot to put in the time and effort to get things done.

ROSS-NAZZAL: Well, is there anything else that you would like to talk about today? I think we pretty much covered the questions that I had typed up as we talked. But I wasn't sure if there was something else. We're right at that time.

EPPS: No, that was pretty much it.

ROSS-NAZZAL: Well, I really thank you for coming in today. I know that your schedule is very hectic.

EPPS: Well, this was a good day to do this. Thank you. I hope it went well.

ROSS-NAZZAL: It's great.

[End of interview]