# NASA DISCOVERY 30TH ANNIVERSARY ORAL HISTORY PROJECT
# EDITED ORAL HISTORY TRANSCRIPT

DONYA DOUGLAS-BRADSHAW
INTERVIEWED BY SANDRA JOHNSON
GREENBELT, MARYLAND – AUGUST 30, 2023

JOHNSON: Today is August 30th, 2023. This interview with Donya Douglas-Bradshaw is being conducted for the Discovery 30th Anniversary Oral History Project. The interviewer is Sandra Johnson, and Ms. Douglas-Bradshaw is at Goddard Space Flight Center in Maryland and talking to me today over Microsoft Teams.

To begin, let's talk about your background and your education and how you first got interested in NASA and what brought you to NASA.

DOUGLAS-BRADSHAW: Yes. I knew I wanted to work for NASA since the age of 10. My dad loved learning and space and would always give me books. I was always good at math and science, and I just knew I wanted to work for NASA.

At first, I thought I wanted to be an astronaut, until I realized you couldn't poke your head out of the window and breathe, and so I decided that I didn't want to be an astronaut. But I was good in math and science, and so did well in school, and went off to college, and at one point in my college career I was at the University of Maryland Eastern Shore. They gave summer internships to the two highest students at Wallops Flight Facility [Virginia], so I got an internship at Wallops in '91, and I've been working for Goddard and NASA ever since.

JOHNSON: That's quite a long time, and that's great that you were able to do that. I read that you were also a co-op.

DOUGLAS-BRADSHAW: I did. Once that internship ended, they converted me to a co-op and I transferred up here to University of Maryland, College Park.

JOHNSON: You said you were interested in math and science, so what type of degree did you work on with NASA in mind? What did you think you were going to be doing with NASA?

DOUGLAS-BRADSHAW: I ended up getting a mechanical degree. I just knew that I wanted to work on spacecraft that flew in space. I don't know that I necessarily fully appreciated the different types of engineers that work at NASA. I just was always fascinated by science and the discoveries and just knew I wanted to work here.

When I was at Wallops, I got to work on aircraft experiments, which were fascinating, taking measurements. Then when I came up here and started co-oping, I actually worked with the thermal group and I got to sit on console and talk to astronauts as part of Hitchhiker payloads for the Shuttle[1]. As a young engineer that was quite impressionable; it made an impression on me to be that close and to understand the phenomena around space and even aerospace and flight and physics and the dynamics. When you stop and think about it it's just amazing what we're able to do because of science and physics and math.

JOHNSON: When you were in school in engineering, in the '80s, '90s, it was just starting to open up for women. Did you feel like you were encouraged to do that? Or was that something that

[1] The Hitchhiker program was created in 1984 to provide quick-reaction, low-cost opportunities for small payload customers on the Space Shuttle.

was a little more difficult because you were a female? I know women engineers that we've talked to have had some different experiences going through school.

DOUGLAS-BRADSHAW: It was particularly challenging. My first college that I went to was actually Rutgers University in New Brunswick [New Jersey]. I had a scholarship when I graduated. I grew up on the Eastern Shore, Salisbury [Maryland]. I remember sitting in my chemistry class in one of those big auditoriums, and my professor saying, "Look to the left, look to the right. One of you won't be here."

So no, not encouraging at all. For me it was particularly challenging because I grew up on the Eastern Shore. It was slow, it was quiet, it was the country. Being in New Jersey it was a different environment. I didn't know anyone. It was quite a cultural shift for me, and I struggled that first year.

Fortunately there were people that were a little more outgoing that befriended me. In particular one of my friends who was an engineer as well. That helped me. But for my career in college it was very different, because I got married young, had kids young, and so when I was finishing up at College Park, I was a wife and a mother.

At one point I was pregnant with my son Christopher and I remember that my professors didn't seem to think that I had it in me. The worst best thing you can do with me is to give me the impression that you don't think I can do it. I remember making the dean's list that semester because the disbelief motivated me. But yes, it was not a very supportive environment. I think being an African American woman, being married, it was challenging to get through college for sure.

JOHNSON: When you first got that internship and that co-op at NASA, did you feel like that was a more open environment? That people were more accepting? Or were you still seeing some of those expectations?

DOUGLAS-BRADSHAW: I had the fortune of working with a group that was very supportive. I came into the engineering lab, very hands-on. It was a very diverse group of people. I was quite young, and I'll tell you I was very intentional when I came. I had already purposed in my mind that as a young African American woman I had to show up a particular way. I would dress a certain way. I would carry myself in a certain way. I held people accountable for what they said and how they acted, so if things were said that were not necessarily appropriate, I would challenge them.

I got a reputation very early on that Donya is someone that is going to challenge the status quo, and maybe some of the dynamics. Throughout my career I didn't have some of the challenges and issues that my other women friends had.

JOHNSON: That's good that you had that attitude, that probably helped with your success, I'm sure.

DOUGLAS-BRADSHAW: I definitely believe that.

JOHNSON: Let's talk about some of those early positions. You said you were working with thermal systems. Briefly talk about some of those early positions and how you felt they prepared you to work on the Lucy mission.

DOUGLAS-BRADSHAW: When I came in in the lab, it was R&D, so research and development. You come in and a lot of hands-on work. We were working on technologies that were enabling technologies, thermal technologies that could operate in a microgravity environment with high reliability.

I recall one situation in particular. I had the opportunity to work with Dr. Jentung Ku who was a PI [principal investigator], world-renowned, in two-phase systems. I came in and I always had the attitude—one of my mantras, one of my beliefs is never say no. I never say no to opportunities. I noticed that he would write a lot of papers because it was R&D, and he couldn't use the word processor, whatever the application was, and I was recently out of college, I could use it. He made a deal with me. He said, "If you edit my papers, I'll make you a secondary author." So I essentially was his secretary, so I did that. I think that that attitude and just that experience jump-started my career. Because by editing his paper, I'm learning, and ingesting, and then there are opportunities for me to be a PI on technology development, so I got published and went to conferences and I was building my career.

Then I progressed into more advanced positions because as I said I never said no. People would see me and then say, "Hey, I think you would be great at this." It was always a stretch opportunity and I would always say yes. I would say yes, and. Yes, I'll do it, but I need a coach, I need a mentor, I need training.

Every single job that I've had has been a job that someone has said, "Hey, I think you would be great at that, have you thought about that?" That has allowed me to expand my toolbox. Every single job that I've had has been foundational to that next job that I've gotten.

JOHNSON: Let's talk about that then. You were working with the ICESat-2 [Ice, Cloud and land Elevation Satellite], the ATLAS [Advanced Topographic Laser Altimeter System] instrument as a project manager. You were starting to get that experience as far as being a project manager. Then the opportunity to work as the deputy project manager for Lucy came up.

DOUGLAS-BRADSHAW: Yes.

JOHNSON: Let's talk about that transition.

DOUGLAS-BRADSHAW: Okay. Let me just say so I did R&D and then I moved into spacecraft and instrument thermal system design. Then I went into systems engineering. I was actually on ATLAS as a systems engineer, and then the project manager got promoted and they asked me if I would be the project manager, and a six-month job turned into two and a half years, because there was a failure in TVAC [thermal vacuum].

But prior to that I had been in line management too. I've seen every aspect of it. After ATLAS as the instrument project manager for a $500 million instrument, largest instrument built in-house at Goddard, a laser altimeter, I was working a proposal as the deputy project manager, and the Lucy deputy project manager was retiring, So it was suggested that I apply for that role. Now I hadn't done a planetary project, and I hadn't been a deputy on a mission. I applied and the project manager selected me. Then eight months later he retired, and I became the project manager.

JOHNSON: Was that Mike [Michael] Donnelly that selected you?

DOUGLAS-BRADSHAW: Yes.

JOHNSON: What do you think he saw in you, since you hadn't worked on a mission before that, that made him want to bring you on to the Lucy mission?

DOUGLAS-BRADSHAW: I actually asked him that question because, not only hadn't I done a mission before, he didn't know me. He didn't know me until he had interviewed me. I became aware of some other people that had interviewed that I thought were better qualified for that role, and so I asked him what made me. He said that what he saw in me was I was capable, he had confidence in my abilities, and he wanted to, my words, invest in the Center. He saw me as being an asset to the Center. I would be a project manager, and that would be a value to the Center, and he wanted to make that investment.

JOHNSON: Did you know any of the team members on Lucy before that?

DOUGLAS-BRADSHAW: I only knew one. I knew the project systems engineer. I knew that this team was a very close-knit team. I knew that a lot of them had worked together before on a previous mission, because I had done my research. But I did not know the team.

JOHNSON: Had you followed any of what the Discovery missions were doing, or that program was doing, and the idea of it being PI-led missions, and how they were the cost capped, short turnaround, that sort of thing?

DOUGLAS-BRADSHAW: Yes. I was familiar with the Discovery Program because as someone that did R&D early in my career, I had worked proposals before. At the time that I interviewed for the Lucy job I was on a New Frontiers proposal. I was familiar with the Discovery Program.

JOHNSON: When was that? When did you come in as the deputy project manager?

DOUGLAS-BRADSHAW: I came in as the deputy project manager October 31st, 2018.

JOHNSON: Halloween, that's a good day.

DOUGLAS-BRADSHAW: It was the day after their confirmation.

JOHNSON: Looking at that project and doing your background on it and then of course since working on it, why do you think Lucy was chosen? Talk to me about what you think sets that mission apart and why Lucy matters.

DOUGLAS-BRADSHAW: Oh, wow, that's a great question. I think absolutely the project was selected because of all of the work, number one, it's compelling science, when you think about it. I have to tell you there's a personal connection with Lucy. But the fact that you have a mission that was named after the Ethiopian fossil that was discovered by Donald Johanson and his team in 1974, and the fact that for me the excitement is around rewriting our science books and what we understand about the genesis and creation of our universe, that Lucy is going to

survey these asteroids that are believed to be fossils of our universe. I'm an amateur genealogist. My husband and I have been tracing our family tree since 2008. I've found documentation that shows that I can trace my ancestry back to Ethiopia. For me it felt like I was destined to be part of this mission.

JOHNSON: Definitely sounds like it. That's great. I understand that.

Talk about what you were doing as the deputy project manager for Lucy. And, like you said, eight months later you became the project manager. Let's talk about what you were doing in both positions early on. Also, with a mission that's going to be long, does that project manager position continue?

DOUGLAS-BRADSHAW: As the deputy project manager Mike had three deputies. He had me, he had a deputy project manager for resources, so all the budget and schedule, the financial arm of it, and there was a deputy project manager for the payload or the instruments. He was intentional in the way he organized his deputies because as you said it's a PI-led mission. Dr. Hal [Harold F.] Levison is the PI out of SwRI, Southwest Research Institute.

One of his deputies was from SwRI. John [P. Andrews] had oversight for the three scientific instruments. Basically the deputies are down and in. We're responsible for the day-to-day management, oversight. You could consider me deputy for technical, working really closely with the technical team, with the systems team, with the spacecraft.

Donnelly, Mike, a lot of the up and out reporting, so interfacing with the stakeholders. In the time that I was on as the deputy, I really spent my time trying to learn, because as you said it was a PI-led mission. I'd not been a project manager for a PI-led mission before. There's a

nuance and a dance between a PI-led—they're the top of the org chart—and the project manager. Those relationships are extremely important.

But I also am intentional around just observing. I come in and I'm quiet in the beginning. It's funny because people who don't know me think I'm quiet, and I'm far from quiet. But I'm observing because I don't want to disrupt things for the sake of disrupting.

I wanted to learn the team. I wanted to learn dynamics. I wanted to learn the way they do business and rules of engagement. I spent a lot of time trying to understand the science, understand the different partners, understand expectations from stakeholders, from Headquarters, from the program office.

There was a lot of drinking from the fire hose. Trying to understand. Also recognizing that Donnelly had already said he was going to retire in seven or eight months.

JOHNSON: As that deputy project manager, maybe talk about the team you said you were observing, and you were watching how things worked. Let's talk about that team that was put together. I've talked to Dr. Levison and a couple other people that were on Lucy on the science side. It's always interesting to see how these teams come together because every mission is a little different. You've got a little different mix of personalities. Talk about your impressions of the team members and the communication style and how things kept moving with so many people from SwRI, Lockheed Martin, Arizona State [University, ASU].

DOUGLAS-BRADSHAW: Yes. A very distributed team. The spacecraft was in Colorado. We had an instrument at Goddard. We had an instrument at APL [Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland] and an instrument at ASU. The project office at

Goddard, project systems at Goddard, project safety and mission assurance at Goddard. It was clear how set an environment of literally one team, badgeless, and that's the way they operated. It was, as I came to see during COVID, operating like a family.

The team worked hard. We celebrated successes together. There was an intention of traveling to have those face-to-face [meetings] because we were in the midst of an anomaly, distributed team. Very inclusive.

I remember having a conversation with Vince [Elliot]. On some projects the project leadership may hold the financials very close. That team was very open about sharing the books and information so that everyone knew the state of the project. You truly felt like everyone had an equal vested stake in the success of that project, because it was full transparency.

Communications seamless. There were your standard meetings and your standard reporting and things of that nature. But there wasn't stovepiping or people being excluded from discussions. It was an open book. I think by them setting that environment then everyone mirrored that back. We knew where the challenges were. People communicated challenges quickly. Everyone understood to give people time to work it, but people kept you informed.

JOHNSON: Once you became the project manager, how did your job change at that point?

DOUGLAS-BRADSHAW: Since you said share anecdotes, I want to share this with you. There's two things that happened. I was asked about whether or not I was interested in being the project manager, and my initial response to my leadership was no, I don't think I'll be ready in seven months. I was probably asked this maybe three or four months before Donnelly was going to retire. I said, "No, I don't think I'll be ready."

This individual said to me, and I'm thankful he said it, "Here's the difference between men and women. I've studied, I've seen training. Here's my observation difference between men and women. Women want to make sure that they have the training and they have everything lined up and they want to feel comfortable before they jump in. Men just jump in and they'll figure it out on the fly."

When he said that to me, I was struck. I thought about it and I remember going home and having a conversation with my husband and saying to him, "I don't know. I've not been here long enough. It's just different. A lot of visibility. Headquarters." I'd done that before but it was just different. He looked at me and he said, "You say that every time but you do it, and you do great." I'm like, "No, but this one is different. I've only been on the project four months."

But I told him about that conversation and I was bothered. Because I was like, "Huh." I thought about it, and that's true about women. I went back and then I had a second conversation with my deputy Vince. I called him up and I said, "Vince, I don't know. I'm being asked if I am interested in this job. I said, "I don't know." Vince said to me that day, and I never forgot it, he says, "Donya, I've watched you." I didn't know him before this. He said, "I've watched you over the last four months or whatever. You're amazing. You're more than capable. I promise you that if you say yes, I will do everything I can to ensure you're successful."

JOHNSON: Wow, that's a lot of confidence.

DOUGLAS-BRADSHAW: In that moment I said, "Vince, I appreciate the grace. I appreciate the support." Needless to say, I called them back up and said yes, I'd be interested in doing it. Had a one-on-one with Hal. What do you think? Whatever. Everyone was supportive. Certainly I

spent the next three months like okay, I've got to understand this. Then Donnelly retired and I took over.

JOHNSON: I'm sure there was a big learning curve when you were preparing to take over. But talk about those first few months in that position and what was going on. Because you weren't in that position very long before COVID hit.

DOUGLAS-BRADSHAW: Yes. I'll tell you. It was nowhere as hard or concerning as I thought. I'll tell you why. Because Lucy had an exceptional team. I never presented myself as all-knowing. I relied on the experts to give me the information that I need in order to guide the team and make decisions. I was never concerned or afraid or reluctant to make decisions. I relied on the folks that were around me who were the experts.

JOHNSON: In that position and part of being in a management team, sometimes you have to prepare for the unexpected to happen. Let's talk about that. How do you balance the schedule that you have, any kind of technical risks that you have, and then you throw in something like COVID and a complete shutdown of the centers; how do you plan for something like that? Or were there any plans in place in case of some type of stop like that?

DOUGLAS-BRADSHAW: No. Before March there wasn't any anticipation of a work stoppage. We had had technical challenges and hardware delays because of those challenges, both on the spacecraft and with the instruments. I'm a big contingency planner. I'm someone that does what-if scenarios. I try to anticipate the worst reasonable outcome. We were doing the planning.

As a matter of fact, Vince and I, on March 10th—because it was such a profound and impactful time—we're sitting in my office and we were saying to ourselves, "Isn't it amazing how we've had all these technical challenges and we've been able to weather them and still be on track to meet our LRD [Launch Readiness Date]?" I literally stood up and I wrote on the whiteboard.

Vince said, "Why do you think that is?"

I looked at him and I said, "Vince," and I wrote on the whiteboard, "we are family." Because there was truly this get in, roll your sleeves up. Everyone, the grace, the empathy, the support, the filling in the gaps. This team operated like that. That was March 10th. By March 24th we were at a shutdown. In a matter of 14 days we went from hey, we've survived to wow, what are we going to do.

We went into contingency planning. First thing I did, Hal and I had a conversation and I told Hal, "Trust me. If you trust me, I'll keep the team safe and we'll get to launch." Then we worked, the leadership team, to figure out how to do that. I set up a framework, and then I asked the teams, "Tell me what you need in order to be able to deliver." We had sufficient funding to be able to bring on a separate team. We planned for two separate teams. I told my systems team, "I need you to go and look at how to accommodate late delivery." They started looking at it from the technical standpoint.

We immediately started contingency planning. Because we contingency planned, when those situations arose, we were ready for them. We could keep marching.

JOHNSON: Was it L'Ralph? I think that instrument had some problems because of delivery or because of the timing.

DOUGLAS-BRADSHAW: Yes. They were shut down for seven weeks, yes.

JOHNSON: How do you continue on a schedule? I'd read that you had people working shifts like you said through the week with an extra team. But then you had to do COVID protocol as far as only so many people in a lab or in an area. Masks, everything had to be provided. People that could work from home were working from home. Talk about some of the things that you came up with. Even Microsoft Teams and FaceTime. How did people communicate? Because when you're building instruments, you have to be there. Or when you're looking at things and testing things you need to be there. Talk about that technology and how you all worked around that.

DOUGLAS-BRADSHAW: Sure. We implemented a strategy that we enveloped by calling FAST. Lockheed Martin came up with that acronym. Feasible ATLO [Assembly, Test, and Launch Operations] shortened timeline. That basically compressed the schedule. Because we did have schedule impacts and there was loss in efficiency.

As part of that COVID framework that I established with the project I didn't require people to travel. The people who traveled wanted to travel. I traveled. I spent 171 nights in a hotel that year because I thought it was important for me to travel. Because if my folks were going to be on-site, I was going to be on-site working with them. But we did use GoPro, so that people could do inspections remotely in the clean room, and FaceTime on iPads so that people could see, for people who weren't comfortable traveling.

We used Teams extensively. It didn't have all of the capability and bells and whistles that it has now. But remember, we were already a distributed team. I think the important thing to remember, and I've said this, is Lockheed Martin never shut down. That's where the

spacecraft was. When COVID hit we were five months from the start of ATLO. Spacecraft I&T [integration and testing]. I think that if we had the spacecraft built at a NASA center that had shut down, it might have been more of an impact. Lockheed Martin didn't shut down. They did allow people who weren't critical and on-site to work from home. But they for the most part were able to maintain that schedule, and we actually started ATLO a week early.

But we used all the things for the other team members because we had nine partner institutions, so that they could participate remotely. They could monitor what we call over the shoulder. Someone positioned a camera over a computer so that people could monitor the telemetry remotely and they wouldn't have to travel. Less efficient certainly, but we were able to do it. Because we had healthy reserves I could invest money in a second team, in these capabilities, in providing PPE [personal protective equipment], in all of these things, we had the funding to do it.

JOHNSON: Having that funding and the ability to do that, was that something that you had to have approved to spend those funds?

DOUGLAS-BRADSHAW: No. Because it was in our reserves. The team before and since I had been on had done such an exceptional job with schedule performance, because time is money, that we had healthy reserves. We could expend funds to pay for those risk mitigations.

JOHNSON: That's great. You talked about "we are family." I know a lot of people during COVID, it was difficult, because people were being affected by it. They may get ill themselves, have family members that are ill, have family members at home that they didn't want to infect,

that had health problems. But at the same time this team needed to continue that focus that you were talking about, that everybody was rolling up their sleeves, getting things done. How do you keep the morale high and a team focused during this global emergency and still make your launch date the way you did?

DOUGLAS-BRADSHAW: There's a couple things. You're right. There were team members that were having to teach their kids, that had their parents with them. For me it was challenging because if you recall there was the social unrest with George Floyd[2].

JOHNSON: Yes.

DOUGLAS-BRADSHAW: I have three African American sons. I need to show up as the project manager, but the minute I got off the meeting I'm worried. One of the things that I did is I set up expectations and norms. I had a Teams meeting with everyone, and the first thing I said is take care of yourself. Put yourself first. We will figure it out. Take time off. It's okay.

I asked people to establish buddies. I had a buddy at home because my husband worked for NASA, so I could talk to him. People paired up. I would call and check in on people.

We missed being together so much because we couldn't be on-site that we, here at Goddard, would get together outside. We were missing that human interaction. We would socially distance but we would meet up at a restaurant. Just to be able to see each other and have that camaraderie.

[2] George Floyd was an African American man who was murdered by white police officers in Minneapolis, Minnesota, during an arrest on May 25, 2020. After his murder, protests against police brutality, excessive force, and racism broke out across the U.S. and the world that summer.

When I say that we acted like family, there was that care and understanding and checking in and genuinely wanting to make sure that people were okay and giving them grace to not be okay, and to be comfortable not traveling. There was never any pressure for people to be on-site or travel. We made it work for the people that were willing to. We created means for people to be able to participate remotely.

I think one of the important reasons why we were successful is because I think that Lucy team had relationship equity going into this. This team had worked together. Some of them had worked together for five, four years. They had built that, and I think that's what got us through.

JOHNSON: You were talking about you told people to take care of themselves. Did you follow your own advice?

DOUGLAS-BRADSHAW: It was hard to follow my advice because as the lead you have to show up. What I will say is the one thing that touched me was that the deputy—there were people on the team that reached out to me just checking in and saying, "Hey, I see what's going on. How are you doing?" I didn't have to take care of myself all the time, because there were people that extended that same care to me. I really appreciated that.

JOHNSON: Yes. It's an amazing year that people lived through with everything that was going on.

DOUGLAS-BRADSHAW: I want to talk about the team spirit and things. We took FAST and it became like this mantra. It was something that everyone rallied around. We got masks that had things on it. We put it in our PowerPoint presentations so that it would be a reminder.

Did anyone tell you the story about the pineapple?

JOHNSON: No.

DOUGLAS-BRADSHAW: Once we had finished with ATLO with the spacecraft and we'd gotten through it—and by the way we never had to shut down because of a team getting sick. We never had anyone get COVID and the team have to shut down. We actually compressed nine and a half months of work if you laid that schedule out into seven months. We had family and friends day, and people were feeling a little more comfortable and people traveled out to Lockheed Martin for family and friends day. We had the whole ceremony around installing the plaque which had all these famous quotes from famous people.

I'm in a conference room and I'm getting ready to go to make my speech, and I'm walking out and Vince looks at me and he goes, "Hey, Donya, will you take a challenge?"

I turn around and look at him. Now I always said I was indebted to Vince, so whatever he asked me I was going to do. I turn and look at him and I say, "Okay, Vince, what do you got?"

He goes, "I need you to work pineapple into your talk." He asked Liz, the project support, for a word to work into my talk, and Liz throws out pineapple. I'm two minutes from walking over there, so I'm walking over there and I'm thinking. As I'm writing this message about Lucy strong and blah blah blah how am I going to work pineapple in my speech? I'm

googling on my phone. What is a pineapple? I write this speech and the first thing, I write, "Did you know a pineapple…"

Hal comes over my shoulder as I'm typing it on this teleprompter. He sees pineapple. He goes, "Pineapple?"

I said, "Oh, don't worry, it's going to work." He walks away.

It turns out that it takes 200 flowers to form a pineapple. That's an example of teamwork. It takes two to three years for a pineapple to grow. That's an example of perseverance. Then you can use pineapples for anything. That's an example of versatility, which is what this team had showed. I worked that into my speech.

I go back over to the conference room, and when I walk in everyone starts screaming and we're high-fiving each other. You would have thought—from that point through launch and through the solar array the pineapple became a symbol to us. When we were down there and tired, we would look at each other and say, "Be like a pineapple."

JOHNSON: That's wonderful. That's a great story. I hadn't heard that one.

DOUGLAS-BRADSHAW: When we launched, I gave my leadership team a pineapple something.

JOHNSON: There were a lot of other things going on during that time too. Like the ground readiness testing. Is there anything you want to talk about as far as how the testing went? Again during COVID, how adaptive was that testing process? It requires real-time problem solving when you're testing things, making sure all those connections work. How do you do that in the pandemic environment?

DOUGLAS-BRADSHAW: I think we had critical mass on-site at Lockheed to support a lot of the testing at that point. Because of the technologies and the tools that we put in place, it allowed people to participate remotely.

It lengthened the time that it took to complete them. There was a lot of learning in that process. But fundamentally we were still able to identify, number one run through the testing, which is intended to prepare you for ops and launch. It allowed us to uncover things that we needed to, and it prepared us for the dynamics as we were headed to Florida [Kennedy Space Center], which was a different work environment.

JOHNSON: Talk about the difference in the work environment once Lucy went to Florida. I think that was in July 2021 that it was taken to the Astrotech clean room. Talk about that.

DOUGLAS-BRADSHAW: Yes. There was a lot of conversation and some angst because remember, we were in the middle of COVID. Florida, they weren't wearing masks. Initially we hadn't planned as part of our baseline to continue the two teams. We planned that through ATLO. But as we got closer to shipping to Florida, we made a decision that that was a risk mitigation strategy that we wanted to continue with. That placed more burden on more people, because then you had to have—and the way Lockheed does it, their folks move down there. I ended up going down there to stay too. Now you have two groups of people that they had to send down. But it was important for us to do that because of where we were with COVID and because of the way the environment was in Florida.

It made people have to stay on the project longer. Some folks were feeling like hey, I got through this whole campaign of I&T with the spacecraft, now I can breathe and go back to normalcy, with their families, and take some time off.

It was well, we're going to continue this. People had to move their families down there with them. We had just spent from August through June working that very intense period through ATLO. Then we duplicated it for a much smaller team but the same handoff for ground operations leading up through launch.

JOHNSON: Must have been stressful, especially for people that had to disrupt their whole family and take them with them.

DOUGLAS-BRADSHAW: It was particularly distressful for the leadership because think about it. Although you can have multiple teams, you only have one project manager. You only have one project systems engineer. You only have one CSO [Chief Safety and Mission Assurance Officer]. They're the technical authority. The burden and the stress on them was twofold.

JOHNSON: In September of '21 there was a threat of a government shutdown. Was that something that was in your mind at that point? What happens if the government shuts down and we're so close, we have this window we have to launch through?

DOUGLAS-BRADSHAW: Yes. I've been through the potential of government shutdowns on projects multiple times. You're always preparing for it. You're always preparing your rationale to ask for an exception. You're reading what's going on and whether or not you need to start

working that earnestly. I didn't have any real concern that it would impact our ability to launch because I felt like the Agency would be supportive and we could put together a justification.

JOHNSON: Okay. It just seems like it was one thing after another.

DOUGLAS-BRADSHAW: It was. It very much was one thing after another. There was challenges with GOES [Geostationary Operational Environmental Satellite] and there was some issues with the rocket. By far there was challenges leading up and beyond launch.

JOHNSON: Through all that you were still able to keep that family together?

DOUGLAS-BRADSHAW: Yes.

JOHNSON: That's amazing. A good group of people.

DOUGLAS-BRADSHAW: They're great. We were all tired.

JOHNSON: Yes. I can imagine. You mentioned the plaque and putting the plaque on and that ceremony. There were other things, the outreach and public education efforts. Were you involved in any of those? You had to speak at the one with the plaque, but how involved were you with things like the time capsule or reaching out to kids with Lucy in Space, the patch, and different things that they were doing?

DOUGLAS-BRADSHAW: I was mostly involved in the media campaign as the PM. We were intentional with identifying and giving people opportunities on the project to engage in those. I didn't do a lot of the outreach like I said because I did the media, but folks on the team did.

JOHNSON: Talk about dealing with the media. How often did you have to do that, and are there any experiences that come to mind or anything you'd like to share?

DOUGLAS-BRADSHAW: Leading up to launch there's this whole schedule of interviews and things that you do. It's well coordinated. You do dry runs and dress rehearsals and things of that nature. We take media training, those who are going to be talking to the media. We take media training, which is extremely helpful. The week of launch is really hectic. But I wouldn't do it any other way because there are a lot of appearances, there are a lot of interviews.

For me it was particularly special because my hometown got wind of it. Various news outlets interviewed me. I got a front-page article in a newspaper; small town girl makes it big. That was particularly exciting. It was exciting because I had people that I didn't even know reach out to me on Facebook and say how proud they were to be from Salisbury and how proud they were of me being from Salisbury. That was very impactful.

JOHNSON: I imagine too being a woman, being an African American woman, that you are a role model. Especially if you're in the public eye like that, that people would respond.

DOUGLAS-BRADSHAW: Yes. People view you as a role model for sure.

JOHNSON: That's wonderful. Let's talk about launch and when that day finally came. Like I said, it was amazing to me after everything the mission had been through that you were able to get off in the first time possible to launch. Talk about where you were and watching that launch and counting down to that launch and that whole day.

DOUGLAS-BRADSHAW: The day before, we were quite excited, but those of us who were going to be on console—well, most of us probably. I went back to my room and slept during the day because we had to be on console, I think, at 11:00 p.m. that night for a 5:34 a.m. launch.

I get up, it's dark outside, and we go and we're on console and we're doing all the checks and everything. My family had flown down. My husband, my sister, my great-niece, and my sons had flown down, and some friends. It was pretty exciting. They're getting ready to get the bus out.

You're on console and you're doing your checks and you're looking through all your documentation. You've done the dry runs and everything. It feels surreal as you're sitting there. For me, my family could see me on the screen. They got to see me in that control room. For me, being able to give my okay to go to launch as the project manager, there's no feeling like that.

Then just before launch we were able to run outside and actually see the launch. But you could feel the rumble once that engine got turned on. I could feel the walls and the windows shaking from the power of that rocket. To go outside and be able to see that launch, 5:34 in the morning. It was dark. It was beautiful. To know all your hard work has got you there. When you said, "We're going to launch on time," and you did it.

JOHNSON: I watched the video. It was pretty impressive. That cloud cover with the rocket lighting up the clouds. It was a good beginning for a mission that promises so much.

DOUGLAS-BRADSHAW: Yes.

JOHNSON: Did you have time after that to celebrate with your family?

DOUGLAS-BRADSHAW: We go back, and there's checkout, and you're waiting for Sun acquisition. We found out that the solar array didn't deploy fully. So no. We didn't really get to celebrate the way we would have. I remember heading back to the hotel and taking a nap and being woken up and having to have conference calls with stakeholders. So no, we never really fully got to celebrate.

JOHNSON: Let's talk about the solar arrays and when you learned of that and maybe those first steps in those first minutes, hours, and how quickly things happened, and that whole process.

DOUGLAS-BRADSHAW: There's telemetry that you get that shows that the command was sent. My recollection is we saw that the commands were sent, because everyone was waiting for the solar arrays to deploy. KSC [Kennedy Space Center] folks were waiting for the separation of the spacecraft from the rocket. We were waiting for Sun acquisition and the solar arrays to deploy.

The command was sent, and at that point it looked like the solar arrays had deployed. The technical folks were still on console. I said, "Okay, I'm going to head to my hotel." I'm thinking everything's nominal.

The project systems engineer said, "There's a couple of temperature sensors that look odd."

I said, "Okay, let me know." Not really thinking. I can't remember if I went straight back to the hotel or what. I think I was going to go to the hotel and I think Hal and Cathy [Olkin] and I got together and we were waiting. Folks were trying to look at the data. I said, "Okay, give me a call if anything happens." Go back to my hotel to take a nap.

Then my phone rings and my husband wakes me up and I think it's only an hour or so or two later. Then it's like oh, we don't think the solar array latched. Then from there it was just long days trying to figure out what had transpired.

JOHNSON: Was there an anomaly or contingency team, a response team to deal with that? Or was that already set up that in case something happened with the solar arrays?

DOUGLAS-BRADSHAW: You have an interim response team. Every mission has an interim response team in case there's a mishap. But when you have an anomaly on orbit, it is led by your systems engineering team, that investigation.

All of the technical people that were needed for those discussions were at launch, so immediately those teams got together. We immediately went into the mode of okay, let's figure out what's going on. The solar array provider was already doing testing in the spacecraft. We just kicked back into our normal mode of how do you deal with an anomaly. You try to figure out a strategy to get to the root cause.

First of all, we made sure the spacecraft was safe. That goes without saying. We made sure the spacecraft was safe. The spacecraft was safe. Then you try to figure it out. Then it

becomes the media campaign. For me it was the down and in with the technical people but it was also the up and out with the stakeholders and the communication around that and what was going on.

JOHNSON: Talk about that team that was working on it. Was it across Goddard and Lockheed Martin and across the team?

DOUGLAS-BRADSHAW: Yes, Lockheed Martin, Northrop Grumman who was the solar array provider, Hal as the PI institution. Yes. Your Goddard team, your Lockheed, your SwRI, your Northrop.

JOHNSON: They actually got the solar panel almost latched over a period of time. I know it was explained to me that the worry was mostly not that it wouldn't work because you were getting power. It was what would happen if it started oscillating or shaking. But it has to go forward. Was the decision made that the percentage is good enough, we're just going to go forward and hope for the best? Or was there ever a thought that this isn't going to work? Talk about some of those decisions that were made around that problem.

DOUGLAS-BRADSHAW: Sure. The solar array investigation lasted well into June. Just to give you a sense. You talked about earlier when does the PM role end. Usually the development project manager hands over to the operations manager at PLAR, postlaunch acceptance review. Project systems hands over to that team too and mission assurance hands over to that team.

Because we were in the middle of an anomaly, the decision was made that we would stay in place and work concurrently with the Phase E team.

Rich [Richard D.] Burns is the Phase E project manager. We formed an anomaly response team, the ART, that had the people from the development team and the people from the mission ops side of it. Every decision I consciously as the project manager, every decision that was made I polled the mission ops, the Phase E project manager too. He was actively engaged. Throughout that we immediately once we determined that it was safe—and Northrop Grumman was very quickly able to put together a test bed and had reasonable confidence on what had happened with the solar array. Because of that, there were a series of investigative tests that were performed on the spacecraft and the solar array to try to characterize the performance on orbit with what we were seeing in the test bed.

But all of those decisions require concurrence from project management, systems engineering, PI. And we had to go downtown and brief Headquarters before we perturbed the spacecraft, so there was meetings with Headquarters, Thomas Zurbuchen, Lori [S.] Glaze, to report out to them what the plan was. There was a lot of communication and engagement throughout those six months.

We evaluated whether we should use as is, fly as is, in the current state, and leave it alone and not do anything. What's the risk of doing damage if we perturb it? Versus the risk of trying to deploy it further to get it latched. We laid out a very comprehensive risk assessment analysis and ground testing in order to evaluate the feasibility of use it as is versus the feasibility of trying to latch it.

Over the next six months based on that investigation and that root cause analysis, we made multiple attempts to try to bring the lanyard in and to latch it, and in the end got

comfortable with how close it was, and based on the analysis that flying it as is presented acceptable risk.

JOHNSON: You stayed through all of that time period before you left as project manager.

DOUGLAS-BRADSHAW: Yes, I was doing two jobs. I was serving as the Lucy project manager and I had taken a job as a deputy within the Engineering Directorate. A number of us, the project systems engineer, that leadership team that was going to transition off, was doing two jobs at that point.

JOHNSON: It must have been a very packed time for you.

DOUGLAS-BRADSHAW: It was.

JOHNSON: Looking back at the Lucy mission, are there any lessons learned as far as your position or anything you observed during the Lucy mission that you'd like to share?

DOUGLAS-BRADSHAW: Yes. I actually give a talk and there are some takeaways that I share with folks. I say FAST, the feasible and faster, came at a price. We pushed hard for 10 and a half months under very taxing circumstances. As time progressed the team brittleness became apparent. I remember hearing stakeholders say to other projects during COVID, "Why can't you do what Lucy did?" Even outside of COVID when people get into trouble. Why can't you do what Lucy did?

I personally think it was lightning in a bottle. I think it was just the combinations of the team, the dynamic, the planetary launch window, the culture that Hal had established that allowed us to do that. I don't know that that's easily replicated. Nor do I think it should be expected that it could be easily replicated. I definitely saw team brittleness throughout that. That was something that I talked a lot to Center leadership about. That was definitely a concern.

I said Lucy was successful in navigating COVID and launching on time for a number of reasons. We balanced time, cost, and performance with risk as a discriminator. We were willing to make decisions with less information than ideally you would be comfortable with. We were always focused on schedule. Schedule was king. We used risk to influence and evaluate and dictate which path we took. People have to be comfortable with ambiguity and being able to make risk assessments with limited information.

Risk management was continuous. We developed mitigation strategies with off-ramps. I am someone that does contingency planning. I will always ask, "What is my risk exposure?" That is my first question. Tell me what's the worst reasonable thing that could happen. Every decision took into account the potential schedule impact. Every single intention. My engineers considered schedule. Often your engineers only think about technical. My engineers considered schedule too. Which was extremely helpful and important in those conversations.

We had healthy cost reserves which we used to buy surge support and time. We were single-minded in our vision to get to launch and have a successful mission. We really were. Decisions were made collectively meaning all tradespace was put on the table. Everything. Subsystem, spacecraft, instrument, whatever. All of it was considered.

We maintain a people first mission always mindset. I cared about my people, Hal, everyone. We cared about the people but we were intent on getting to launch. We look beyond

the obvious in each other, in our tools, in our ideals. We worked hard and we played harder together. We celebrated successes. We went out together. Hal rented a house in Florida. We did family style dinners. We went over and helped his wife cook. We would show up early and we'd prepare meals together and we'd eat together. Truly. We held each other accountable. We embodied the characteristics of family, openness, grace, appreciation, interest in each other and our lives. We took care of each other. We stepped in to help each other filling in the gaps as needed.

It was important for the leadership team, and by that, I mean the PI, the PM, the deputy PMs, the project scientists, the deputy PIs, to show that we were in the arena too. So we traveled, we put ourselves at risk, to be present and on-site with our team.

I said this before. The PI and the PM before me established a familial inclusive teaming partnering culture from the beginning of the project. One badge, one team, one tribe.

JOHNSON: That's a great list. I appreciate you sharing that. One of the questions I was going to ask, but I think you've already pretty much answered it, is what you consider the ingredients for success for a project manager. It sounds like that list covers a lot of that.

DOUGLAS-BRADSHAW: You have the talent. Everyone that works at NASA. We're here because people are smart. It's those intrinsic characteristics.

JOHNSON: Right. What do you think it takes as far as a PI to make a successful mission?

DOUGLAS-BRADSHAW: I think it takes their passion because that's what inspires people. Especially when it's tough. Hal did a great job. Steve [Steven W.] Squyres on CAESAR [Comet Astrobiology Exploration Sample Return] did a great job of telling people why they were important, why you matter to this mission. I see that and I emulate that now. As a project manager going in and connecting with people. Especially when times are tough and there's a challenge. Just going in and telling them why they matter, why they're important. But I also think in my opinion the best PIs and the teams are the ones that understand the role of the systems engineer and the project manager. That they get the three legs of the stool and how they play together. That they then don't ask for unreasonable things and have unreasonable expectations because they get it.

JOHNSON: One of the things that I'd read is a quote from you. You were talking about your favorite quote, to whom much is given much is required.

DOUGLAS-BRADSHAW: Yes.

JOHNSON: I just wanted to talk about that for a few minutes and why that quote means something to you, and maybe about the work you do at Goddard, and you've worked with the Women's Advisory Committee to give back, and where that came from. Where did that desire to do that come from?

DOUGLAS-BRADSHAW: Growing up I realized that I was a little different in my family, in my immediate community. That I was blessed with talents and capabilities. When I had children

my son Christopher has Down syndrome. I've always been a strong outspoken advocate for the underrepresented whether it was women at work, whether it was—I served on the PTAs and everything and county level boards for school and advocating. That's something that has been extremely important to me because I feel like I have skills that perhaps other people don't have, and I believe it's important for the strong to take care of the weak.

The way it manifests itself is being an advocate, being outspoken, making sure that things are equitable. Whether it's at work, or in my kids' school, or in community. That's where it comes from. I feel like I have a gift that's been given to me and so I am duty bound to give back and do for others who may not have.

JOHNSON: How has that worked into these women's groups through NASA? How do you make sure that not only women you may mentor but people on your teams when you're working, how do you make sure that they have a voice if they feel like they don't have that voice or they can't speak up?

DOUGLAS-BRADSHAW: I think it's the climate that you set. It's the expectations that you set. It's what you emulate. And it's how you hold people accountable. I'm not shy about going and having a conversation with people, the offender or whatever. But I also have conversations with people, whether it's women or it's a young man or whatever, and check in with them and say, "Hey, what's going on? You look like you wanted to say something but you were hesitant."

Often what I hear, because it's hard—I started when I was young—it's hard to walk into a room with people who have far more experience, have personalities that are different, and sit

down and plant your feet and be comfortable speaking up and saying something confidently. I've been there. So I see it and I create a space where people can be comfortable doing that.

Then I am always willing to work with them one-on-one to suggest, "Hey, how about this? Talk to this person." From a policy standpoint, I call things out. I speak. I challenge. If I see it, I'm not letting it go. I don't care who you are.

JOHNSON: Have you had pushback from that? Because some men can do that and they think wow, they're strong and confident. But sometimes a woman does that and they don't get the same reaction.

DOUGLAS-BRADSHAW: I don't care. I don't care what they think. If you talk to anyone, they will tell you that Donya is outspoken. I'll give you a recent example. I'm on CCRS[3] [Capture, Containment and Retrieval System] as the project manager. ERO[4] [Earth Return Orbiter] is our partner in their spacecraft. A few weeks ago I had a meeting with them. I'm on the call with them and it's all men. I'm on the call with them early one morning. I'm in California, it's five o'clock in the morning, and I made a statement to them that we were going to go down a particular path, and apparently, they didn't agree with it. Someone on the call says, "Oh, let me see your schedule."

I said to them, "I won't tell you how to design your spacecraft if you don't try to tell me how to manage my project." They were shocked and eventually apologetic. But no. I don't tolerate that.

[3] The Capture, Containment and Retrieval System (CCRS) is a payload that is a part of the joint Mars Sample Return mission between NASA and the European Space Agency. CCRS is made up of a Capture and Containment Module and Earth Return Module which picks up orbiting samples to bring them back to Earth.
[4] The Earth Return Orbiter would be the first interplanetary spacecraft to capture an object in orbit around another planet and make a full round trip to Mars and back to Earth.

JOHNSON: That's great. I appreciate that. What would you tell a woman that wants to achieve a leadership position at NASA? You mentioned the different way women think. They want all the information first to feel confident. What do you tell women that want to achieve what you've achieved?

DOUGLAS-BRADSHAW: Avail yourself of opportunities. Just make sure that you have the support that you need. I tell anyone, I tell young engineers, "Protect your reputation. Know that everyone is watching you." Like I said, I've gotten positions because people have watched me and said, "Hey, I think you would be great at it."

Be mindful how you show up. You can't discount that. Job decisions are made behind closed doors. Even when I hire people and there's a panel, there's a phone call that says, "Hey, do you know this person? What do you think?" The things that you don't get out of an interview. The networking piece is extremely important. The relationship piece is extremely important. You want your name to be in those closed-door conversations.

JOHNSON: That's good advice. Looking back at the Lucy mission and your role in that, is there anything that you're most proud of? You've talked about a lot of different things that worked really well. But anything that really stands out as what you're most proud of?

DOUGLAS-BRADSHAW: I'm most proud that when COVID hit and we were considering whether or not we should stand down for a year and go to the backup launch, when I reached out to various folks in leadership and I said, "Hey, I just want to check in and see how you feel," and

every single one of them said, "No, we can do this." That's what I'm most proud of. In that moment of uncertainty when we didn't know what the future would bring, there was no doubt in anyone's mind. That's what I'm most proud of.

JOHNSON: It's amazing. It is. Are there any mentors that you consider true mentors to you and your career at NASA?

DOUGLAS-BRADSHAW: Yes. I'm someone that has had a lot of mentors because I watch people and if there's some aspect that I like or appreciate or I think I can learn, I will approach them and ask them if they would be willing to be my mentor. But there are particular people that I think had a profound effect on my career. Ted [Theodore] Michalek who was a thermal engineer that had been around a long time that mentored me in my first leadership role, that was willing to sit in the background and whisper in my ear and let me be up front, that told me that I could do it.

Dewayne Washington works at Headquarters and he's in PAO [Public Affairs Office] and I don't know that anyone would call him a traditional mentor. But I don't know what happened. There was something that he saw in me and he, very early on in my career, spotlighted me, which gave me a platform that I don't know that I would have had.

Then there's Cynthia Simmons, who actually worked for me on a project who is now our [Goddard] Deputy Center Director. A woman that is brilliant. She is probably not only a mentor but she is definitely a sounding board. So those three people for sure.

JOHNSON: That's great, it's always great to have those people that have your back, that's for sure. Is there anything that we haven't talked about as far as Lucy is concerned that you wanted

to share? Any other anecdotes or stories? I know we're getting ready, in November hopefully there'll be that first encounter. That should be exciting.

DOUGLAS-BRADSHAW: I just appreciated that even though Lucy was a PI-led mission, Hal as a PI, the way he partnered with the project manager, he respected and allowed the project manager to have autonomy. That is a relationship that I don't think you always have between PIs and PMs.

JOHNSON: Like you said it was like lightning in a bottle as far as the success. I think that's a great way of putting it. Everything was in place and with the right people to encounter those problems.

DOUGLAS-BRADSHAW: Yes.

JOHNSON: I appreciate it. If there's nothing else then I'm going to go ahead and stop the recorder.

[End of interview]