

NASA DISCOVERY 30TH ANNIVERSARY ORAL HISTORY PROJECT

EDITED ORAL HISTORY TRANSCRIPT

FAITH VILAS
INTERVIEWED BY SANDRA JOHNSON
SEABROOK, TEXAS – MARCH 21, 2022

JOHNSON: Today is March 21st, 2022. This interview with Dr. Faith Vilas is being conducted for the Discovery 30th Anniversary Oral History Project. The interviewer is Sandra Johnson. Dr. Vilas is in Seabrook, Texas, and talking to me today over Microsoft Teams. I appreciate you taking the time to talk to me today.

I want to start today by asking you to briefly describe your background, your education, and your interest in planetary astronomy. Maybe where that interest came from and what led you eventually to work for NASA.

VILAS: That's fairly long at this point. Okay. You asked for it. When I was in second grade someone gave me a copy of *The Golden Book of Astronomy*. I opened it up and I said, "Woo-hoo. I really want to work in this field. I want to work in," what was then a nascent space program. That dates me. "I want to be part of this and the whole thing so I'm going to be an astronomer." That was second grade through applying for college, I was going to be an astronomer. I did things in astronomy in high school, all that sort of thing. I went to Wellesley College [Massachusetts] to major in astronomy because they had one kick-ass professor I just loved, and I met her when I was just being driven around to schools to look at, Sally Hill. I said, "This is it. It's got one of the best undergraduate astronomy programs in the country in my opinion," then and now.

I went to Wellesley. But at that point I would say astronomy itself wasn't totally catching my interest since I started to take some geology courses and we were beginning to have our spacecraft take a look—Mariner 4 had gone by Mars. I was beginning to see these surface attributes of these objects and I was beginning to think “Whoa, I think I'm interested in planets.”

That got me interested in planets. It turned out that with a cross-registration program between Wellesley and MIT [Massachusetts Institute of Technology, Cambridge], I could take courses with people who did planetary sciences, so I did that as well as finish of course the major in astronomy at Wellesley. Graduated from Wellesley with a degree in astronomy, but immediately went to work and then to be a graduate student with a professor at MIT. I got a master's degree in the end at MIT, and I decided to take some time off.

First side of that is I loved planetary sciences, that's where I belonged, and I knew at that point. I just knew if I'm staying in this field, that's where I belong. I liked instrumentation and this man was good at instrumentation as well for telescopes. I was being groomed as somebody who worked with instruments, telescopes, made observations, an observer in planetary sciences, where of course it was also expanding in the direction of unmanned satellites all over the place, or space probes.

I spent two years at MIT getting a master's degree. Part of that was because my professor said to me, “What do you want to work on?”

I said, “Mars”.

He said, “How about Mercury?”

I said, “Why Mercury?”

He said, “Well, I will send someone down to South America a few times next year to observe Mercury to do a thesis.”

I said, "I'm so there, it's all Mercury."

I went down to South America, to Cerro Tololo [Inter-American Observatory, Chile], which was the national observatory down there at the time, and did my observations for my master's thesis there. I fell in love with Chile. I walked around the astronomers and bugged them, "Please please, I'd really like to come down here to work. I could be a research assistant, I could work your computers, you name it." Eventually, to my total surprise, I literally talked the director into hiring me as a research assistant. They were thinking of going that way. I stepped off the track of getting my PhD, went to Chile, was there for a couple years. It was both amazing and terrifying and everything else you can imagine. I was trying to think of how to say whatever. But at the end of the two years I knew I wanted to go back to get the PhD. I turned down a really good offer, and I know I did. I had a hard decision to make between the job in Chile or a PhD offered from somebody. I thought if I don't go live in the foreign country now, I probably never will have that chance again. I think that's still true now.

So I did. At the end of the time I was working I took off and backpacked around South America for a while. Then I got back to the States and I did my first round with JSC [Johnson Space Center, Houston Texas]. I was looking for a job, period, while I would sit down and start applying to grad schools to go back again. Lockheed Electronics was the name of the contractor in Building 31, which is of course the Moon rocks and things like that building, and planetary sciences building. Lockheed hired me to work for someone, and I worked for them for about a year, and I quit. I had gotten into grad school by that time, I'd applied for graduate school.

I spent about two or three months off surviving a little bit, and then the spring semester of that year I started graduate school again at the University of Arizona [Tucson]. I was there for probably five some odd years before I defended. I didn't ever expect to be there that long, but

part of it was I just had to get back into being a student again, I'd been out working for so long then. It didn't seem wrong to me to come home and turn on the TV and watch the news and do something else and not have to study, and I had to relearn how to study, and even make it better than I had before.

I finished my PhD, and it was with a man who was part of the team that was developing a detector, the CCD [Charge Coupled Device] detector, for Wide Field/Planetary Camera, the first one, for Hubble [Space Telescope]. This is all in the early '80s at this point. I got my hands on the CCD before most of the rest of the world did, and that was pretty cool. I wanted to learn about instrumentation, I was thinking electronics. He got me doing more of the optics. Part of my thesis is the design of a coronagraph that he wanted to use. He was using coronagraphs. He wanted an updated one that he could take to South America and back and around. That was part of my PhD thesis. It helped to get my thesis, but what it really did was give him and a colleague a chance to use a really good detection system with telescopes, and they produced the first image of a circumstellar disk around another star in 1984. So I could walk in onto calendars and see this up on astronomers' thing and say, "And I designed the instrument that took that." But because I had always—it's not a secret—I had always wanted to be an astronaut, I wanted to get back to JSC.

I had bought a town house and rented it out. My department was disgusted to know that they had a grad student who had a town house rented out. But oh, well. I wanted to go back to JSC. I applied for a postdoctoral program, a National Academies' National Research Council postdoc. I went back, and this is where all that instrument plays in nicely. I'd also done a lot of graduate work in systems engineering and image processing, which was close to brand-new at the time. They were looking for a person to use astronomical techniques to identify orbital

debris, debris in low-Earth orbit, geosync or GEO [geosynchronous orbit] transfer orbits. I guess they had to submit three names, and I was one of the possible names. I think I was number three, and something happened where numbers one and two could not join the crowd, so they offered me the job. So eight months after I went there, I became a civil servant, and that was 1985. That's really how I got into it and how I got to JSC. I was one of the very few professional acting astronomers, somebody who did astronomy. It was great.

Then other things happened that still tie me to this area, like I married my husband, who was also in this area. But we did play commuter marriage a couple times in the process over time, including the time I was at [NASA] Headquarters [Washington, DC] with Discovery. But I was only there about a year.

JOHNSON: Were there very many women doing what you were doing? You said you were one of the few, but in that area were there other women working too?

VILAS: You mean like at Building 31 or in general?

JOHNSON: In the general field that you were working. You said you were one of the few astronomers at the time.

VILAS: JSC, I was one of the few astronomers. There were no other women astronomers there at the time. There had been a few, a very few women, I think. One or two, three, something like that, civil servant women. I knew some when I was there for that one year years before. Both were gone by the time I got back. There were others that were postdocs. They hadn't hired

many others; there was one other woman I can remember who was a civil servant, she'd been with NASA for a long time. There were women when I went there the first time, which was fall of '77 to fall of '78. There were a lot of women in the curation facilities, and they did work on the curation side. Actually there's a lot of reason to fully respect that because they came up with some really good ideas. But otherwise no, I don't think so. At that point I was the third woman that had been hired on to be support to someone. There were a couple of others. One was gone, the other one was still there.

When I came back and became a civil servant, there were a couple of other postdocs but for the most part it was me. That changed of course. They brought other women and hired women in during the time that I was there. But that was sort of new then.

JOHNSON: Yes, it was during that time when they were trying to add more women, but it wasn't quite there yet. When Discovery was first proposed in mid '90s, and when it started, it was a different competition model. It was actually something a little bit different than NASA had done before. We'd always done these big programs, cost a lot of money, took a lot of time. This was started, and it was going to be PI-led [principal investigator] as opposed to the way they had done it before. How aware were you of what was going on? In your job, were you aware of what they were planning? Talk about how people talked about that program and the differences it was going to make for exploration.

VILAS: At some level I was kind of out of the loop. I don't think that necessarily what I heard was what everybody heard. But let me backtrack slightly. Because this gives some background for Discovery. In 1986 I applied to a program that was not space science-related, but it was do

you have aeronautics type programs, do you have an experiment you'd like to do. And I did, I was tasked with designing experiments that would quantify debris, size distribution with altitude, things like that, so we knew what we had in the way of a threat, to feed into the model of the orbital debris. I was working orbital debris.

I applied to this one program and got all the money I requested, which was \$150,000 I guess, and in the '80s was just a lot of money to do a Phase A study of this project that I proposed which would have telescopes onboard the Shuttle. Different means of operating them and different ways of quantifying what we get in the visible and the thermal infrared. Then come up with size distribution, all sorts of things, down from Space Station altitudes, from sizes of about 1 millimeter, to whatever was sitting around our geosync locations, which are big objects. Then to try to determine if there was a way to provide sufficient warning for very small particles that might be coming around the next time and hit the Station.

The answer is really no for if they're small enough. But I got that money. I brought that in. Because I was confused, I didn't know any better, about the fiscal year and this and that and everything else. Never mind that they had told me, they awarded me the money in—I'll make it up—January, and then I had a year from that. I thought that I had January and I had to have it in by October. I pushed everybody and we went through and came back in October and said, "We really want to do this. Here's my presentation." I went up to Headquarters and gave the presentation. The guy said, "Okay, you need to write up a Phase B plan, a Phase B thing," so I did that.

That went ahead through two external Phase B contracts that were probably larger than what each individual Discovery project necessarily would be. It was a major effort that went absolutely nowhere, as many things do at NASA in the end. When I was at the point when they

were going to say either cut metal, downgrade, or get rid of it, I think management above me had changed a little bit. I heard that my Division Chief had said, "Get rid of it." For no reason, since I was getting awards for doing it all on time, and I had a project manager and I had a whole slew of stuff. It was probably more, frankly, than what people did in Discovery at the time in order to apply or to do their downselection.

That ended five years later, thereabouts, six years, '92, '93. At that point Discovery was coming up. People were talking about it a little bit. Maybe they were going to make the [Near Earth Asteroid Rendezvous, NEAR] Shoemaker the first Discovery mission. But they also called a meeting where they had all sorts of people applying for different projects to see. I submitted one as PI and I had a lot of people who were backing me up on it. I submitted it, but it got shunted to geology when it should have been shunted to atmospheres.

But it got shunted to geology and of course geology said no. I wanted a telescope in Earth orbit looking at particularly things close to the Sun, because the elongation angle between Sun and some of the inner planets and some other things that we were very interested in like errant asteroids, you can't look at that with any of the rest of the telescopes that we have, or had at the time.

That sort of got turned down and they said, "Well, you can go back and take a look at this particular project." But I lost interest for a lot of reasons that are not necessarily germane to this. I just said, "Okay, I've had it with orbital debris." I felt I got no backing for practical purposes from my branch. It was the division and the directorate and the then Center Director, all of whom wanted me to keep going. I don't think my branch chief, I didn't understand why. I finally went in to him and said, "Why are you not paying attention to this? You should be really pleased." He said, "I don't know." I thought that was most interesting.

Left to my imagination, I will guess, and I always will guess, that I was a female and I was not part of his—even though he'd hired me and he was very nice. Actually I'm still in touch with him. I was a female and they were very upset when their funding came in for the orbital debris studies and then my funding came in for the flight experiment, and it was equal to theirs, total. I had \$1.98 million one year. Oh well. Anyway, nobody's ever done it since. Every once in a while, I hear somebody say, "Oh, that's a great idea, we're going to go up and send something to look for orbital debris in space." I'm going, "Yeah yeah yeah." I've given almost all that stuff to somebody else.

But the point was I had a lot of experience in what goes into a spacecraft experiment design and flying something on the Shuttle, even though it's a Shuttle and not a deep space probe, it certainly would be complex enough. They had it manifested. It was manifested once for—it was either primary or prime secondary payload. Then it was dropped off basically from the manifest. But it would have been a pretty nice deal. I would have liked to have done it.

Nonetheless, there I was. At that point I'd written into my contract when I was hired that I wanted to continue to do a little bit of work in planetary sciences. When Discovery was coming on board, what I was hearing was they were going to convert the Shoemaker, make it the first Discovery mission. They hadn't done that when it launched. They did not want civil servants to be scientists on the missions. I have a feeling that was not ultimately true. That was what I heard. That may have been something that went through. Somebody might have said it and somebody might have let it go. I don't know. Might have changed as they were establishing the parameters for this.

But since people were not letting civil servants be scientists on Discovery, I didn't apply to do anything on Disco things. I did think I might like to. I had a good background that I could

go push for a Disco program if I wanted to. For the first round, they had a meeting. I was saying this earlier. I wasn't chosen. Then they had another meeting a couple years later when they were picking people to be the scientists to support the Shoemaker. I think it was the Shoemaker. NEAR. Yes. At least three people came in to me and said, "Dear God, if you'd only put in an application to be on the spectroscopic team, we would have made you the head of it." Three people from disparate sources. I said, "Well, shit."

Instead Joe [Joseph] Veverka became head of both that team and the imaging team on that Discovery Program, because he was the one person with lots of experience. The other people who were on that were newbies. I thought I was a relative newbie, but I was a lot more nuanced I guess, or I knew what I was doing more than a lot of the other people did as far as the spacecraft went.

I was not involved with NEAR. I wanted to propose something for Discovery at some point, but there's a whole mechanism around this that I don't quite totally understand. I will add that around that time, '92, I developed the problem that I have now with MS [multiple sclerosis]. So I knew that I had an issue. But it was very minor, and it's remained very minor. I'm incredibly lucky.

The other part of that was that I did sort of morph into doing more and more planetary science. Planetary astronomy is not as welcome in that building. I couldn't get postdocs if they were deciding on them, because they wanted people to go into labs. They have tons and tons of people who do that. They had about one or two people who went observing to do astronomy. Getting a postdoc or something wasn't going to happen.

I did manage to put in grants and get enough to support my planetary science and hire somebody finally. I'd had interns from intern programs and things like that. It came to be 1999

I think, somewhere there, 1999, 2000, and I was asked to chair—it was for Europa—chair one of the panels that was looking at Europa missions at that time. I don't think those missions went anywhere at that time. I think it's more now.

I remember pretty much exactly when it was. I chaired this one panel to give advice back to Headquarters, and there was some comments like, "If we do this then we'd like to see this done. But if you don't do this because of this then we'd like to see this done sort of thing." So I called in the guy who was running the whole panel who was Jay [T.] Bergstralh. I'm sure you've run into the name. I said, "Sit down, let me tell you what it is we're doing. Here's what we're doing, this, this, this. If we do this, then I want this." I don't remember what they were, but he just sat there going, "Yes, okay, thank you."

Then a couple months later maybe at most, I got a call from Jay Bergstralh saying, "Would you be interested in coming up here to be Discovery Acting Program Scientist, on a shift?" Because he was going to give up the job after he had started with it and stayed with it up until that point. He was going to take on being Acting Director of the Planetary Sciences Division, or at least Deputy Director when they got a new hired person in. So he couldn't do the one.

I said, "You bet." Because I had been always wanting to do some managerial work, and nobody at JSC was letting me do anything. If I applied for something it wasn't going anywhere, at all, at all. It just was not, for some reason. Things have changed one step since then. They have women who have been managers and all that since then. Eileen Stansbery if you know her, I think really broke that through there. But my approach to it was this is for the birds. I'm applying for other jobs. We'll see what happens. But I wasn't quite there yet. I was still thinking I could do something, and I thought I could go up to Headquarters, run Discovery, fly

back every weekend, do commuter marriage, and maybe if I do a good job, they'll consider me for other jobs. I used to think that you got jobs somewhat on merit. I don't think that anymore. Sorry. It's just my—this is where I've got some strong opinions here. But I'm not going to probably tell them all.

JOHNSON: It's understandable.

VILAS: Jay said, "Oh, that just sounds great." That went on fine until I guess I was doing that for a bit, and I flew up there and did a Disco lessons learned thing for that year. Jay was up there too, but he introduced me and said, "This is the person that's taking it over." One of the men that was there was one of the men that had been involved with supporting my flight experiment work. He was going, "Oh, this is great. We're so pleased we have you here, this is great." Then I didn't know if there was any other way I was supposed to do this.

But the woman who was the Business Manager for Space Sciences—and she is not there now—she led a campaign about we can't have her come up here. We can't have her coming up here because we can't afford her. We don't have a lot of money. I said, "Well, I can do it all from Houston." Just come up periodically, which seemed like a reasonable solution to me.

Including we have buildings at JSC, or we did, I'm sure you still do, that are locked and sort of apportioned to people who are doing reviews of something and they want privacy. That's what we had used when we had competition going for the flight experiments. I said, "I can go sit over there if I need to do something for Disco if I can't go up to Headquarters. I could keep things locked in there. That's not impossible."

The prevailing attitude was—God help me. I’m still amazed at them—that if somebody ran Discovery out of JSC, everybody in the community would be afraid that JSC was trying to steal Discovery. This is what I was told. They couldn’t let me do that. Sorry. But I did get the other offer. I went back up to do a couple things. That might be when they told me that. I was just in town visiting. I couldn’t do Discovery, and that would have been the summer. I’d been doing it for five or six months and working at some level with Wayne Richie, the person I spoke about, who was a terrific person. They wouldn’t let me do it. They couldn’t have me doing that—this is what they told me up there—because they’d be afraid that JSC would be trying to take it over. I’m looking at it thinking this is so small potatoes compared to what JSC handles. You guys don’t know. They said they would be happy to appoint someone here at Headquarters. They had a person in mind of course. I could do all the work but he had to sign all the papers.

I hope you understand this is not what I was angling for. If I’m doing the work, damn it, I’m getting the credit or the blame. I said, “Oh. Really.” They expected me to say, “Yes, that’s great.” I said, “Let me think about it.” I thought about it one night and went in the next morning and said to Guenter Riegler, the person who was telling me this. I went to Guenter and I said to him, I’d worked on my wording all night, “If it’s that important to have the work done out of Washington, I really think that you need a person in Washington to handle Discovery, so I’m going to step away from it and I’ll let you handle it.” I think he was surprised. I think he expected me to say, “Yes, of course I’ll do this.” I said no.

I remember among other things he said, “Well, you’re going to have to tell Jay.”

I said, “I already did tell Jay.” I told Jay when I came in. I went in, I said, “I’m sorry but I’m having to step away from this.” He was not a happy camper about that but that’s okay. Then I went to Guenter and told him that. Then I stepped away. I stepped away in a big way. I

was so mad at them for this that I wouldn't give them any advice about anything that had gone on. Here's all my paperwork. Enjoy.

The person they put in charge, this is just history, I don't have anything good or bad to say about it, obviously everything progressed so it was okay, was Paul [Hertz] who's in charge of astrophysics now. He conducted the first round of the proposals that had come in. I did the science check on first proposals. I knew what had come in. Then I was removed from it and I couldn't talk, literally could not talk about it to anybody. There's nobody I could talk to about it. So I didn't. In fact one of my associates came in the office and said, "Faith, I have to look at your copies of Icarus if you don't mind, for something I can't tell you about." I said, "Fine, they're right over there." I waited and they came up with the final listing.

Then I'd sort of kept talking to Jay and Tom [Thomas H.] Morgan. Jay suggested I look into other ways of getting up there if I wanted to keep doing it, because he still was interested in my doing it. They'd been delayed anyway, there was something that was stalling. Paul didn't really want to do it. I can understand. So I applied for what was then known as the PDP or Professional Development Program. It was a program that you could go up and you spent a year both in professional development classes but they paid your way up and they paid your hotel and they paid your per diem and they paid a little extra for whatever you were going to run into. You kept your job and then you went back. It was supposed to give people a kick start into management. I really felt like I didn't exactly need in my opinion a kick start into management, but it was one way to get up there. Fortunately I looked at it as you can always learn something. It was actually a pretty damn good program; I enjoyed it a lot. I think very highly of some of the people that I went there with at the time. But JSC didn't participate in it very much, because it was a Headquarters program, and George [W.S.] Abbey was the big controlling factor at the

time. Now we're pushing in '99, 2000 time. I think he might have been Center Director at the time. They just hated this program here. Just hated it. They didn't encourage people to go from JSC. They gave one slot to JSC, when other Centers had more, just as a pro forma, and expected nobody to apply for it.

I applied for it, figuring well, okay, but I wrote my best application. Just before it was time to assess the proposal, suddenly JSC got a little more interested in getting people up there in it. There was some competition for it, and I won it. I was pleased with that.

Then I was headed up to Headquarters. Because the Discovery selection had been slowed down or delayed for some reason, I don't know what, at this point I don't remember, but I remember that they hadn't announced anything yet, or they had announced their downselection batch but they had not gone through the rest of it, and I had sat about half of the panel that made the decision to go for the downselection batch, but I wasn't allowed to follow it.

I did go back up to Headquarters, and I went up in August of 2001. That's momentarily where I'll stop and let you ask. What else do you want to know, anything in there?

JOHNSON: Let's talk about when you went back to Headquarters. You were talking about the downselect. Which selection was that?

VILAS: That's the downselect and there were three missions that were downselected. In order of memory, God, I'm drawing a blank on the damn missions. Kepler and Dawn and INSIDE Interior Structure and Internal Dynamical Evolution of Jupiter (INSIDE Jupiter)].¹

¹ The three selected proposals were announced in January 2021.

JOHNSON: Early ones, okay, yes.

VILAS: One, two, three, those were the ones that were up for potential selection. When I went back, they said to me, “It’s either going to be one or two missions. We don’t know how many yet, but we need to start doing all this work on the downselection side.” That was the TMCO [Technical, Cost, Management, and Other Factors] processing of the whole thing.

Once I figured I was going up I started working on it again from home, and then took it over. Paul ceremoniously said, “Here.” I said, “Thank you.” I went up in August of 2001. That was underway. Almost immediately we flew to Colorado. I went to see all the rest of the people who were doing the TMCO thing at Langley [Research Center, Hampton, Virginia]. Wayne was in charge of that. Then we did two site visits that were both in Colorado. That was a good thing.

They were at the same place, they were at Ball [Aerospace], I guess. Then came back. We had one more site visit scheduled for September 12th. I hope you see where I’m leading. September 12th it was supposed to be at Dulles. I’ve forgotten. I’ll remember the name of the company sooner or later too, but it was near Dulles. September 10th and September 11th people were coming in town. I think I had 20 people on my staff coming in to assess the whole thing. There were like 40 people coming in on the Dawn team, and I knew a lot of them. It was all going to be at this one location. September 11th hit. Surprise. We all know what September 11th, 2001, was [terrorist attack on the World Trade Center, New York City, and the Pentagon, Washington, DC].

It was pretty stunning, because it suddenly dawned on me, I have people internationally flying in from Dawn, and I have people who were coming in from other locations to Dulles. I just wish they’d stay home. But they’re either stuck somewhere or they’re stuck here. The first

day, I won't go into my whole story. But I ended up going in late to the Center because I had to talk to the office at the apartment complex I was in. That apartment complex that I was in was the closest one to the Pentagon. Closest apartment complex.

When I walked over to Pentagon City to jump on the Metro to go in, which is like three stops away, nothing had happened. Clearly nothing had happened. I would have known if something had happened. I was actually watching the *Today* show, the famous Katie Couric statements I didn't see because I turned it off. Went down, talked to the people in the office, signed the paperwork that I had to. Went out, walked into the metro station, and I know that we got into the Pentagon [Metro station], somebody came running on board and was just like very agitated but I couldn't quite figure out what was going on. It [the Metro train] went on.

By the time I walked into the building the two guards that they had at Headquarters at the time, screening log, your briefcase, they were saying something about two planes having collided. I was thinking of Tenerife years ago [1977, Los Rodeos Airport runway collision], I just went, "Damn, we've had a midair." I went up to the floor that I was on and the secretary for us came up and said, "Do you know what's going on?"

I said, "I never know what's going on."

She said, "Two planes have crashed into the twin towers at the World Trade Center."

I said, "We're under attack." That was it.

Not only that, but by then I'd just missed, or I was underneath the ground or something when the Pentagon was hit. Because I was that close in my apartment. There are a couple things I did. First, I tried to get hold of my husband. I couldn't get through for a long time. [Interstate] 395 was backed up like crazy. I was just looking at it out my window. Why bother going home yet? This is not worth it. My family is not here. Nothing's going to happen to me here.

They're not going to bomb NASA Headquarters. If they're going to go after NASA they'll go after something like the VAB [Vehicle Assembly Building, Kennedy Space Center, Florida], something really noticeable. But they're not going to bomb NASA Headquarters.

But I ended up staying there for hours, like three or four hours or more. Because I didn't have any other place to go. I then decided to try, because somebody called me, another woman working in the office called me and said, "I got through but I went back through on the Blue Line and some different direction." Because of course everything between the Pentagon was closed off. So I got on and did this long ride around and got home. Then a friend of mine was on the Dawn team that I'd known since we were in grad school, came over to my apartment, had gone up to the roof, and he was taking pictures of the flames. I won't go into a lot more on it. But during the time that I was in there, I talked to Wayne. I said, "What the F do we do?" Because we were talking about what we do. Because it's not clear. The timed submission of questions to the team and the time that they are scheduled to defend, blah blah blah, are very heavily controlled and scripted. Nobody gets an extra advantage. That's the whole point of that. You can't even have a sniff of an advantage.

What we decided was that they'd sent us all of their material in advance. We were going to hang on to the material until we saw them, whenever we rescheduled. Then we were going to have a person sitting there looking over the material. Anything new they handed to us we were going to look and see if there were any differences. They stuck to that. They stuck to it very well. It was the Dawn team that we had to look at. They did not change any material. They did not change anything. They went with what they were going to have the next day. That was the way we proposed and did, I think, maintain integrity in the process. That was important to everybody, to all of us.

Of course the shit hit the proverbial fan, and then I managed to talk NASA HQ Space Science Directorate all into doing reviews of stuff at the last minute really for Disco. Three teams had to come talk to us, and then I had to have HQ make a decision. I managed to shoehorn in. I remember the three teams talked to us; it was fine. Then they were going to talk about it and they kicked me out so I couldn't hear. Darn it. I would like to have heard the discussion.

By this time Colleen Hartman was Division Chief. She was fine. Jay Bergstralh was her Deputy. I can remember Colleen looked at me and said, "I'm sorry, Faith, you can't stay in here." Rats. The next day I got shoehorned. For 45 minutes they were to make a decision. The meeting lasted an hour and a half. I went, "Heh heh heh." But they did make their decision. At that point it had to be approved. It was approved up and above and by December they were ready to release the information. But we had to send letters to first of all the loser. They were going to pick two. The loser was INSIDE Jupiter. And the two winners, which were number 9, Dawn, number 10, Kepler. That literally just turned on a dime. It turned on one small aspect that was caught that they had to fix because the whole selection process had been delayed. There was close to nothing in the way of anything that was bad on these proposals. That always amazed me. But that's true.

Then we debriefed everybody at different times. But the first thing I got to do was after I waited a certain amount of time, when they couldn't tell, the PI for Dawn, Chris [Christopher] Russell, we sent him a letter. We gave him enough time that he probably could have gotten it. I think I talked to him and I said, "I want to tell Mark," my friend that had been in DC. I said, "Give me a half an hour, I get to tell Mark."

He said, "Okay, if you don't I will in about an hour."

I said, "Okay." I called Mark up, I woke him up, because he was in Arizona, and I actually got his wife and she said, "He's asleep." I said, "Wake him up."

She said, "He did this, this, this last night."

I said, "I don't care. Wake him up."

She said, "Faith, wake him?"

"Yes." Woke him up and told him. It was funny, it was great.

Then that's Christmastime roughly by then. The site visit had actually taken place in October. We did our debriefs in January. Then started the work on both Dawn and Kepler. Kepler eventually got switched over to the astronomical sciences world. That's kind of where I was. In that program I got to switch out things. I ran one of the programs as Program Scientist for a selection and process and development. It was the NEAR Data Analysis Program that was intended to morph into, and did, the Discovery Data Analysis Program. I lined that up. Then went on my way. I spent four months working for the IG's Office [Inspector General], which was really really interesting, a lot of fun, as the rest of the part of the PDP, because I also had to do all the PDP things for that course. They insisted that I did another rotation somewhere, and it turned out I just did it at IG. I liked IG, I had something to offer them, and that was a good thing. At the end of that time period I went back to Houston.

JOHNSON: Those data analysis programs that you set up, what did that entail? Because I think it was for Dawn and for NEAR, both?

VILAS: It was the first one, NDAP, NEAR Data Analysis Program. Because it was kind of done or close to done. They were setting it up for the data analysis program. The person that set it up

originally was Tom Morgan. Probably it's worth talking to Tom as well. I was looking for something else to do and they kept saying, "We don't want to burden you."

I'm going, "I'm bored to tears. For heaven's sake give me something to do."

They said, "Well, how about NEAR DAP?"

I said, "Okay." The selection was done. So I set up that selection. Then tried to set it up for an increase in money per year. But switching it from just being NEAR DAP to Discovery DAP. Which would be programs for Discovery. It wasn't a major major thing. It was a major thing, but it wasn't, if you understand.

That was the end of my dealings with Disco. But when I went back to JSC the then Acting Director [Roy S. Estess] whose name I do not recall at all, and I probably wouldn't if you named it to me, talked to me. I told him what my philosophy had been, which—this is very true. My philosophy was that one of the things the United States does really well is its space program, and I will be damned if I let anybody who's bombing things slow me down or stop me from doing something that that's my part of it, and I'm going to get it through. Then yes, yes, that's my reason. I'm going, "Well, okay." I was encouraged to apply or to put my name into—a couple people were very excited about well, we really need somebody to do X, and you've just come back with a whole bunch of experience from Headquarters, maybe you can be a branch chief, division chief, whatever. That suddenly just, bam, changed. I was talking to people and they were happy that I was coming back and I had all this experience and had loved it. Then all of a sudden it was just boom, cut off. Nobody ever spoke to me about why, except another woman who was in the PDP. She had come from Langley. Her husband got a job offer in Houston, so she wanted to transfer down to JSC. She talked to the head of personnel, and she said, "I want to talk to you."

I said, “Okay, what’s up?” She said that this guy had been talking to her and he said he doesn’t understand this. People go off to Headquarters and they think they can come back and do things and they can come back and take positions, and that’s not necessarily going to happen. He went on about that with her and first suggested she go be a contractor, and she said no. But she ended up getting a job as a civil servant.

But she said she was sitting there and she knew what my situation was, and she said, “I can really see this. This is clear.” They felt it was directed at me, that everything was saying, “You went to Headquarters, George Abbey doesn’t like Headquarters, George Abbey doesn’t like the PDP, George Abbey doesn’t like this. You are not going to be considered for anything.” That’s what personnel told her. People defining it because I had come back in a little bit earlier and pushed on trying to get a job. So I was out.

At that point that was 2002. I started looking for other jobs. I did look at Headquarters actually but it didn’t quite work for a lot of reasons. I applied and was interviewed for a handful of other jobs and eventually got a job, which I started in 2005, so that’s when I quit NASA, as the director of an observatory, one of the largest observatories in the world. I went off to do that. The Multiple Mirror Telescope is what it used to be but it’s just one telescope now, the MMT Observatory in Tucson. Played commuter marriage for five years. But I wanted the chance to be able to use this. I now realized that NASA was not the slightest bit open to anybody. Obviously, I wasn’t something that they wanted. Okay, see you. That was the end of me and NASA.

Five years of the MMT. Came back, I was working for a soft money company and went up on a rotation to the NSF [National Science Foundation], which I took at the time sort of because it was going to pay me some money. I ended up loving it. I loved my time at

Headquarters, let me be honest, it was pretty fabulous. Even with everything that went on that year. Maybe that made it even more interesting.

But the NSF I just really really liked. It was a whole different ball game than I expected and I really liked it. So I was there for a good three years and I applied for a job to go back and then said, “No, really.” I was being considered. It would have been a really good job, head of astronomical sciences. I was one of the finalists. I just finally said for a couple personal reasons, “Here, no more.” I’d done commuter marriage eight years, nine years, or something at various times in our marriage, and I just didn’t want to go away. I’m too old I guess at this point, in a funny way. Why ask for trouble?

JOHNSON: Exactly. Let’s go back to the Headquarters time. I know you were in that downselect and you weren’t there that long, but were you ever involved in the next announcement of opportunity? Or even for the 2000? Did you have any involvement in those?

VILAS: I didn’t. That was really done by Jay. That would have been in the year 2000 that he was doing that. That was done by the time I arrived. I just inherited that.

JOHNSON: I’ve talked to other people about the organization and how Discovery did the selections and the teams with the principal investigator and the program manager and that sort of thing for these missions that were being proposed. Was there anything you’d like to share when you were looking at these, when it was Kepler and Dawn, and you were making these site visits? Was part of what you were looking at how that team was formed and how they worked together as far as the cohesiveness of the team or the understanding of what was happening? I know a

couple people have mentioned that there were certain things in a principal investigator that are better, that you look for, because they have to do a lot of things, and then you have the manager that has to do certain things. Even the engineering people that are going to be involved in actually building the spacecraft. Talk about that relationship between those different team members and what you were looking for when you went to those visits.

VILAS: That's going to be interesting. Because all that basically at some level had been decided already. They weren't swapping people in and out at that point. Now they look for people—I'm going to say this—now they look for people that have experience with missions because there have been so many missions and you can get that with planetary sciences. Then, when it was just starting, it was sort of nascent and getting up there, it was either people who had experience on missions in general or they had leadership experience in general. Things like people who were involved with different instruments on Galileo or Voyager, something like that. Magellan, whatever. I think that probably was taken into account. But that may have been taken into account for the scientists because the scientists were going to approach the science. That sounds ridiculous, but the science is taken care of during the first selection process. The science was frozen by the time it got to me. This is the science, we have selected the science, we're now looking at everything else.

Looking at the value of the scientists to the mission as scientists was done, really, or basically. Looking at the value of the PI must have also been taken care of by then. When I think about who the PIs were of these missions, they were just—forgive me—old white men. But that's what they were at the time, which is where most of them were. But they all probably

had experience with spacecraft one way or the other. They'd all been scientists on spacecraft teams or that sort of thing. In all the three cases that was fine.

I think we couldn't really know how well they worked together. We looked to see who had the attributes, the sorts of things, because they were spelled out, to contribute to the mission, and whether the mission would be successful or not. But I don't think that anything that I was doing turned on any of the people, the scientists. They turned on aspects of the technical side that would not necessarily function well or could be risky. It was a matter of assuming how much risk you had or didn't have, at least from my point of view, whether they were proposing something properly, which fundamentally they were.

The downside for the Jupiter project really was that because of the delay they were going to have to launch the Jupiter project, and then it was going to take more power than they could have with just gas powered or something spacecraft to get to Jupiter. They were going to have to use a solid rocket in the middle of it. They did not want to have to do that. It was up there in orbit, or wherever it was, and they were going to have to fire it from there. As an aside, although I don't think it happened when we didn't pick Jupiter, but that's what happened to one of the missions, CONTOUR [Comet Nucleus Tour], when it failed, was because of the rocket at the time. That had not happened when we made our selection.

I think that was maybe one of the biggest technical issues we could have defined. I honestly don't remember. Again, you're picking on a thin dime at that point. These people know what they're doing setting up missions. I got the impression in all cases that people were willing to work for them then. We'd look at what they offered and make some suggestions, but for the most part they were I think pretty well designed.

I remember one time one guy had given a lot of financial questions for the financial side of Dawn. The guy who was in charge of all that with Dawn just came in. He brought in a whole box of stuff that just had totally been forgotten. Just put it in front of the guy that went down in our site visit. Here it is, go through it, go through it to your heart's content. The guy was just happy as a damn clam. That probably doesn't answer your question, but I'm not really sure I can. My problem is of course I have the chunk between setting up the board and my arrival was unknown to me. That's Paul. Paul knows that or somebody else knows that. Wayne might know more about that then. But even then, that was a scientific panel. TMCO didn't do much. In the first review of all the proposals TMCO did a sort of cursory review. But it's the second review where TMCO really went to town. It was the technical side of things they reviewed.

I can remember in staff meetings at Langley. Then going to hear the discussions at the sites in the site visits. Seemed to me that everybody got along pretty well. I didn't have a sense of them not. I might have been very naive, I don't know.

JOHNSON: I was reading about your involvement with LRO [Lunar Reconnaissance Orbiter], and then LCROSS [Lunar Crater Observation and Sensing Satellite] at the MMT. Do you want to talk about that?

VILAS: Sure. That was simply I was at the MMT. I was also encouraged to do different things. I probably had been their primary planetary scientist astronomer that they ever had there, and certainly as director. But I saw that they were advertising for people to take a look at the impact on the south pole of the Moon. That has nothing to do with my LRO involvement later. But LCROSS, separately, I'd applied for a proposal to do two nights' worth of observing. As

director I got 20 nights a year as my discretionary time, so I could do whatever I wanted with that. I took that 2 nights of that 20 nights and said I could allocate it to this program.

The reason I did that was I wanted the first night for everybody to be there to set things up to go, and the second night for the observations. One of the reasons I really wanted to do it is because we had really good adaptive optics, both natural adaptive optics on stars, and also laser guide star adaptive optics. I watched how they just pulled things into really really cool view, and I thought it's going to be hard with the Moon because the Moon is moving at a different rate of course in sidereal rate. We could go there, however. What we decided, we tried on the Moon itself, but that was just not going to work to do that. What we did in the end was—although it was a lot better with the Moon doing it—we picked a star that was very near the Moon, got it into focus, and our plan was to get that into focus, then move to where the impact was supposed to take place, so we could see. We wanted to see. We had visual and infrared sensors on this.

I applied for time, I applied for grant money. I got the grant money. That's what I did. The first night was totally wiped out with weather. It was no big deal but just gone. The second night was totally clear, and this event was going to happen in the morning. We were just looking at this beautiful clear sky. We were sitting there just following around next to the Moon. Beautiful clear sky. Then it came to the last minute when we were going to try to do the observation, and there was something wrong. We couldn't get it to come into focus somewhere else. I was just watching it tick down. We had 25 minutes, 20 minutes. I think at 20 minutes or 25 minutes I said, "We have 5 minutes more." We're all sitting there ready to go but we can't do it unless we get this thing moved over to where it's supposed to be. We were hoping it was in focus. Extra focus, that was the whole point. We couldn't manage to pull that one off.

I said, “We’ve got 5 more minutes to do that. If we don’t have it in focus by then, we just go to the base of the Moon. I’m not going to worry about it because I will be damned if I don’t have an observation. But if we can get it possibly that’d be great.” Sure enough, somebody managed to get it into focus. We said, “Whew.” It was truly like a NASA thing, because we had to move it, and they were moving it quickly to the location. We’re all standing up. Boom. People were talking things. We were on it within less than a minute before the event.

One of the astronomers looked at me and said, “I can’t go through that kind of stress again.” I said, “Welcome to NASA.” But there was not much that was observed anywhere. Unfortunately we ended up having really good observations of nothing. But I really wanted to try that because I had the telescope there to do it. I could direct it to that, so I did.

But that was about it. We celebrated that we’d at least taken the data. But even when we looked at the data there was nothing there. We stored the data. The data are permanently at PDS. But that was that.

I wasn’t heavily involved with LCROSS and how it was decided upon and made. I just heard about it and said, “I want to do this, looking for the proposals, I’ll put in for the money.” And got it. We got some publicity. Some of it was bad publicity, and I have to say I absolutely have no idea of where this came from. But somebody printed a picture of the MMT. You could see this like puff-of-smoke-like thing or puff of whatever out of the bottom part of the Moon, saying the MMT had observed this.

Then somebody talked to me in general and said, “The MMT.”

I said, “We didn’t get anything.”

They said, “This came out of U of A publicity.” Which they were following it literally full-time. Maybe they just got some weird puff of something somewhere. But that was either

huge, and then other people would have seen it, or it was nothing at all, which is what I think it was, a glitch or somebody screwed around with it somehow. In any case they sent it out. We notified them that we had seen nothing, but they sent that out apparently. I got slammed. MMT got slammed on a couple people who write columns for astronomy and planetary science, for denying that they had seen something or lying through their teeth and trying to say that they'd seen something or not. I said, "I don't know where it even came from."

As far as I knew that night, we had told people, the U of A press, that we saw nothing. It was like what the hell is this. When I saw it, it was like a year or two later, I was like, "Holy shit, I haven't seen anything like that." We never did. I never said anything about it. We got at least some bad publicity out of it, which is not what I was hoping for. I was hoping for at least neutral. Look, you see your telescope is participating well. Oh, well. No, I didn't see anything to help us, I'm afraid. We didn't see anything.

I remember one guy called me up from another telescope, "Well, I didn't see shit, did you see anything?"

I went, "No, we didn't either."

JOHNSON: Why anyone would do that, that's interesting.

VILAS: I don't know. But I can see why they did it if they saw the image. How the image got out or who made that image I have no idea. I'd love to know. From this day on I'd love to know. I think it was an accident. Nobody, none of my staff that worked on this were like, "What's all this?" Oh, well. We had a bunch of people up at the telescope. Just people standing

by working on it, punching everything through and getting it. It was great. I remember the one guy saying, “I can’t go through this sort of stress.”

I said, “Welcome to NASA.”

JOHNSON: You said your LRO work later. Is it the LAMP [Lyman Alpha Mapping Project]?

VILAS: LAMP.

JOHNSON: Want to go ahead and talk about that?

VILAS: Yes. I’m now on the LAMP team. I was brought on to do some particular type of work. I started it when I was at NSF. I’ve been their quiet person who hasn’t finished a whole hell of a lot yet. But they don’t pay me much of anything and I don’t draw money for it. I will probably leap into it in very short order. I’m a spectroscopist at heart with surface compositions and surface attributes of planets. Some of my earlier work dealt with working to find water on the Moon, or evidence of water’s actions on the Moon. I did do one paper on that before there was all this quote, unquote discovered in 2009. That’s a paper that either people believe or people completely ignore. Both have good reasons. I have not been able to duplicate that yet, because the data taken in that spectral range by subsequent spacecraft I either haven’t had access to or they’re just not good enough, there are problems with them. So I’m not sure that my discovery makes sense or not.

But it put me saying there was potentially water on the Moon at a higher, closer to the equator, lower latitudes, numberwise. That was one of the big complaints. They said, “Oh, who

knows, couldn't see anything that high up." The answer was yes, they did see something that high up. But I only had one image which I could use. It was a Galileo image. I couldn't duplicate the effort to be able to show people that yes, it's repeatable.

I don't disagree with the arguments against it too. But I really like the solution. I was just thrilled. I was thrilled when they found the water. I was like, "Woo-hoo." But LAMP is Lyman alpha, it's UV [ultraviolet imaging spectrograph instrument]. I've started working a lot more in the UV with a collaborator, Amanda [R.] Hendrix. She was on that team, she pulled me into it. That's how I've gotten involved with that. I'm still fascinated with the idea of what has happened to the water at what latitude on the Moon. That's basically what I'm looking at.

Secretly I'm trying to see if I can duplicate my result. If I can find a real—I found some data that just said no. It just isn't there. Or we don't think this thing is there. Then I found out from somebody else that that data set was potentially erroneous. I said, "Okay. But I can't prove that." Although I'm willing to admit that maybe it isn't there. There are a lot of things that were consistent with what I was finding. The same types of areas on craters, things like that, that might have led to it being a for real find.

But the function of science is ever evolving. Science is not static. Science evolves. It's one of the fun parts about science actually. But people keep thinking science has to be exactly the same all the time. It's not true. Of course it really evolves. That's why it's like the most adult guessing game than everything else that you can possibly get involved with. It's neat, it's fun.

The person who wanted to be the astronaut, yes, I would love to have been an astronaut. I was obviously not going to make it. I got bounced in the mid '80s for a medical reason. That

was the end of my trying at least. But I've been engaged with being a scientist. That has been a lot of fun. I'm surprised that it was. But sort of gotten there that way.

JOHNSON: Some of the work you did early on when you were at MIT was with Mercury. Later on you were a participating scientist on the MESSENGER [Mercury Surface, Space Environment, Geochemistry and Ranging] mission.

VILAS: Yes.

JOHNSON: You want to talk about that?

VILAS: Back to my story earlier, where my advisor, I said, "I want to work on Mars," and he said, "I'll send someone to work on Mercury if they want to go down to South America for a couple times next year." I said, "Okay, Mercury, it's all Mercury." I went off and observed Mercury at the time. The data taken then I also reanalyzed as a grad student later for fun. Because I wanted to. They predicted no spectrally detectable iron oxides on Mercury, which is totally not what people expected. They expected just like the Moon, they were expecting it to look pretty much like the Moon. Because there's a lot of Mercury that does in physical craters, things like that. There's a lot that is different as well.

The results of my work in the end, and I took some more spectra of Mercury as a postdoc, I don't see any oxides. I think these are all because it's hard to observe this planet from the Earth, and you're looking through a lot of atmosphere if you're getting down closer to the Sun, which is what you have to do to get Mercury, at least then, when the Sun is below the horizon

and Mercury is above it a little bit. It's far enough away, it's got enough elongation. It's a tricky observation to make.

I said I didn't think there was any. I thought it might be space weathering or something else. Of course Mercury should be a template for that because it's so close to the Sun. I applied to MESSENGER basically to test that, because I had a whole different result from what other people were thinking that they should get. The answer in the end is I was right. There is no spectrally detectable stuff like that on the surface of Mercury, and there's no absolute reason you have to come up with for why that's the case, but that's what it was. The elemental experiments on MESSENGER showed that. To be a participating scientist you have to apply and propose, and there's a whole selection process. For whatever reason, I actually was thinking about it, I was way far behind other people on the selection process, and I remember writing this. I was at the MMT at the time, so I was in Tucson. I was getting up like 3:00 in the morning and writing on this and going into work and seeing what I had to do and then writing on this on the side. They all said, "We got to leave her alone, she's finishing something."

It turned out to be a really good proposal I think in the end. Three weeks before that I had no idea. I was sort of scrapping what I had started to work on and going through this. It was a good thing to get on it. I did have some results. I worked on some other things that other people did too. Mostly I did come up with some spectral features on the hollows, which are those anomalous bright spots you see on Mercury that you don't see on the Moon. They're probably youngish and they imply all sorts of good things about sulfur and things like that.

I did my thing. But we were on MESSENGER for quite some time. One thing that I really liked that I did, totally unrelated, is I hired a postdoc who had finished her degree with, worked on—it's all magnetohydrodynamics type stuff. She'd done Faraday rotation [physical

magneto-optical phenomenon]. She'd done solar stuff but she'd also done a lot of planetary stuff.

I hired her and she looked at it and she said, "If we just leave the two radios on that MESSENGER has, when it's getting close to the Sun and it's in this particular location, and we get ground-based, which used them as signals. We're not looking at the data that they're sending back, just the signal, and ground-based radar can look at it, then we can determine a great deal about the Faraday rotation properties." We worked through getting that going, and got data from Green Bank [Telescope, West Virginia]. It was amazing, it was fabulous. She got more data from another thing, the STEREOs [Solar Terrestrial Relations Observatories]. She managed to work with STEREO A and STEREO B. But we ended up with three or four papers out of that as well. That was interesting because the people at JPL [Jet Propulsion Laboratory, Pasadena, California] who are in charge of the radar didn't want to let her do anything. She'd gone through UCLA [University of California, Los Angeles], so she knew them and I guess they hadn't always gotten along. Not that it was horrible.

But one guy clearly was trying to just deep-six this whole project. I just said, "Okay, let's go on to Green Bank, let's do this." Then she got turned down and I said, "Let's go back to DD time, director's discretionary time." She said, "Okay." We did, and we got it, and we got beautiful observations. Just beautiful observations. She has a whole bunch of new stuff to come up with.

I guess the way people do on these missions, they draw people in, and they have them working on things, or they contribute to it. I contributed to a lot of other things that other people were doing related to photometry. A little bit on the spectroscopy side. Spectroscopy results were held up for quite some time to get to our data warehouse. There were a handful of us who

finally went to the Program Scientist at Headquarters and said, “We can’t do anything if we don’t have the spectroscopy. We’re not being offered any of it.” That supposedly was going to change, but then they went through a lot of questions about that as well.

I just went and started looking at the photometry. That was kind of neat. It was very neat.

JOHNSON: Why was it being held up?

VILAS: Just not given to us. We were on the team but the people who were doing the work on that instrument, they were trying to make sure they got everything right, I guess. They were extended in multiple directions too. I don’t think they intended to cripple us. I don’t think it was on purpose. I think it was just something that they started finding there were problems involved. There were a couple of issues with MESSENGER which people have worked around, but where its exposure to the Sun was so much that once or twice it had issues with the data. The extreme heat thing. That was potentially an issue too.

But the spectroscopic data we just didn’t get our hands on it, weren’t allowed to have it for some reason. That was odd. For those of us who were hired to do our spectroscopy, included to do our spectroscopy, that was it.

JOHNSON: I imagine on these missions there’s so many moving parts too as far as people doing different things and different research. When I was looking at your background I noticed, I don’t know if you actually got a master’s in systems industrial engineering or you did the coursework toward it.

VILAS: No. I did coursework toward it and I didn't finish it. I really liked systems engineering. I was thinking it was sort of a nascent thing to get involved with. I thought this could really really help. Looking at my credentials and getting me in the astronaut corps maybe. Besides which I liked it.

I was taking classes in that as well. If I'm going to be really honest about it, the reason I didn't finish that master's is because the MS hit. I didn't know what it was, frankly. I thought I was somehow terrified or nervous or something, that all of a sudden, I was having problems with feeling things in my hands and my feet. I was dragging one foot one evening. Then it all went away after I said, "I got to back off. I'm just doing too much stuff here."

Did that, and of course as MS does, it all went away. I said, "Well, that must have been what that problem was." It wasn't until 10 years later when I said, "No, there really is something more here." But the worst of it really hit in grad school and I really thought it was my nerves. At that point I said, "Okay." I had a four-point average in the systems classes. But I just thought, "I came here to get my PhD. Let's get the PhD. Let's be done."

JOHNSON: I thought it was an interesting side to what you were doing. I was wondering if that helped at all when you were working on these projects with Discovery and then also other ones that you worked on. Has that helped knowing that other side of it?

VILAS: Yes. I think it really helped with the flight experiment years ago. I think it also helped a lot with Discovery. But probably what helped the most with Discovery was just that I was a jack-of-all-trades and a master of Mercury, maybe, and asteroids. But I was jack-of-all-trades, I

knew something about systems engineering, something about image processing, telescope stuff, what you need to do, the latest and greatest detectors, all that at the time. And I guess I could look at things and see the nuances. I think that Bergstrahl wanted me in the job because I sat there telling him that one time after the Europa meeting, “This is how we do this and this and how we built that program to do this but this doesn’t work if you don’t do this.” He just sat there, “Uh-huh uh-huh uh-huh.” I think that that had to do with why.

Because one person had said they were looking for somebody to do planetary astronomy at Headquarters, that Tom Morgan was stepping away from that. I thought that would be kind of cool but I did not ever anticipate the call saying, “Would you consider Discovery?” I think that had a lot to do with that.

It probably had a lot to do with my handling the flight experiment DCWS [Debris Collision Warning Sensor], because I could look at their plans, I could look at their structure, I could look at things, I could see. A lot of systems is what’s working well where. Without going through all the stuff related to that, it allowed me to take a different eye to it if you will. I like that. I like that a lot.

JOHNSON: I noticed also in your background that you were chair of the AAS [American Astronomical Society] Division of Planetary Science for a while. Part of what you did was help establish the Carl Sagan Medal [for Excellence in Public Communication in Planetary Science]. I know the importance of communicating in the science field. Is that something that you’ve always felt passionate about? I know he was such a proponent and he did it so well.

VILAS: He did it so well and he was part of our field. The DPS, Division for Planetary Sciences, of the AAS was probably the largest professional society in that field in the world. I don't know if it still is, but it was then. For me to be chair of it was a big thing. It's an elected position. I was really pleased that I wound up being elected. Sagan died shortly after I stepped into the job. He died within a month or two, couple months, two or three months. We decided we were going to do something because he was one of the founders of the DPS as well. When we established the medal, I was chair, so I worked all that out to establish the medal.

We didn't award it for a year. I was pushing, I wanted to award it the following year. Then it just became apparent that it was too much to try to get it all in line and get applications for it and the word out there for nominations, so we held off and did it a year later. At the time the guy who was chair kindly let me hang the first medal because I always wanted to hang a medal on somebody. I thought that would be so great. So I got to hang a medal on someone. I thought that was wonderful. But it was probably one of the first statements within our profession that communication with the outside world was an important thing, was a good thing.

It's been a variety of people who've gotten the award since then. Most people present talks or have some sort of a media thing. One or two are artists. The first guy who got it was an artist and then another guy a few years ago was an artist as well as giving a talk or two, and the one guy writes books and things too. The first guy who got it deserved it completely. Bill [William K.] Hartmann. But it was fun to see who has gotten the award.

We gave the award to one person who really, he and with the help of his wife who was pretty smart as well, had really worked to get educational materials manufactured and taken them and spread them round, including in Spanish, including in English; he was in Arizona. They went down to Mexico. This is well before we started having the terms EPO [Education and

Public Outreach] or before Headquarters started demanding that everybody have something that's an educational aspect to their missions and well before they did any of that. The answer that most people gave me at the time was they were happy to see him get the award; they did not want it to become an education award necessarily, just not be always toward that. But they also understood this is the man who did all of this long before the term EPO became part of our world. He started a whole bunch of stuff and he's continued it and it was pretty good, and we gave it to him one year. That was the second or third award given. Larry [A.] Lebofsky. But I'm not sure where it was, but it was fairly early on [2000].

But most of the awards have gone to people who do something publicly, they started TV shows or webcasts or something, or they have art or they have a variety of things. Somehow, they've taken their work out to the public and had contact with the public. Of course Sagan was a master at that, an absolute master at that.

I did put my foot down the first year they were doing that and they said, "Well, why don't we give it to this person?" who was in biology or something. I said, "No, I think it should go to somebody who's a planetary scientist. That's what we're trying to honor here." It didn't have to be a member of the DPS. Most of the people were, I think, but at least a planetary scientist. That's who we're trying to honor here. It seems to work. A couple years ago, they've done it twice now I believe, given two medals in one year. Most recently it was for a guy who his wife is in the U.S. Foreign Service, so they get detailed all over the world. But he is an astronomer, planetary scientist, a good practicing planetary scientist, and he has taken tons of stuff to the public in India, in Sri Lanka. He's just done a lot of work on doing that. It's very impressive. I think the State Department even honored him for it. That was tied with a woman who came up with essentially planetary science on tap. You go to your local beer hall, get a beer or two, and

listen to a lecture on popular astronomy. It's great, you can do it anywhere. Another woman got it for what's called trick or treat with telescopes. She started a deal where if you've got a telescope, set it up, and when the kids are coming around trick-or-treating you go, "Look at Saturn, wow," and try to get people engaged with thinking about this sort of thing. She also has written books and things like that. She's also a practicing scientist. It honors that.

I am not one of those people. I'm just not. Other people are much better at this than I am.

JOHNSON: Going along with that, mentoring is important in your field too. Have you been involved with that, mentoring the next generation of scientists?

VILAS: Through specific activities yes. When I was at JSC I had summer interns. We had a joint summer internship program between JSC and the Lunar and Planetary Institute. I got some summer interns from that, and I got a couple other people come in who just bugged me and said they wanted to work, they wanted to work, when they were in college, would I have a job. I hired them as well, and I've tried to mentor just about anybody who's come through my office, if they want it. If they're not responding to it, I understand too. But I've tried to work with everybody that has come through. I think that I've done a fairly good job actually.

One woman I was just talking to at the Lunar and Planetary Conference that took place a couple weeks ago and we got together one night and just sat in my house, we were drinking little itty-bitty bottles of wine, we drank a couple, but she was one of my interns before, and she's now a scientist at Applied Physics Lab [Johns Hopkins University, Laurel, Maryland], as is her husband. She basically said the fact that I accepted her for this when nobody was predicting that

she would do well, and one of her things was that she wanted to show people I can do well with this, and now everything in her life through doing graduate work, getting a PhD, meeting her husband, three kids, full job, stemmed from that one decision. I said, “That’s nothing though, that’s really just a side decision, it’s not anything else.” But she’s doing really really well.

I have another former student who right now has her own consulting firm or lobbying firm in Washington. She did a degree in physics in the end but also then did work at I think it’s GW [George Washington University, Washington, DC] where she got her master’s in public policy emphasizing space policy. She’s been there ever since then. I’ve kept in touch with her a lot too.

There are a couple people I’ve lost touch with as well. But one of the women who worked on the lunar stuff, I contacted her after things had started happening in 2009. I said, “Hey, you still have those data?” She said, “Oh yes, let me send them to you.”

The woman that I hired as the postdoc had been a student at Texas A&M [University, College Station] who said to me basically she’d just heard about me. She just out of the blue sent me a message and introduced herself and said that she was looking for a summer job. She had been an EMT [Emergency Medical Technician] and I had been a paramedic, so I thought why not, I think I have the money to do this, so I set it up. She was great. She still is great. I can still do lots of work with her.

I think I’ve done pretty well. One of my postdocs, he is now in charge of a lot of the asteroid work for NASA. Another postdoc is at JSC. They’re both at JSC. That surprised me, they got hired ultimately to stay at JSC, which I think was pretty amazing. The woman had gone away and taught but the man had stayed with jobs and finally got hired in as a full civil servant. She’s worked with orbital debris, but she’s now working with CLPS [Commercial Lunar Payload

Services], the landing thing, the small missions that are going to the Moon. She has maintained her research as well, which is pretty impressive. It's gone pretty well.

But I'm not formally—well, one of my coworkers came in the office and started telling me about a woman who was near the end of her junior year or something or senior year, thereabouts. Maybe it was beginning of her senior. Anyway, she was at La Porte High [School, LaPorte, Texas] and she needed an internship type thing. I was saying, “Well, there are all sorts of people here who do this and this and this.” He said something else, and I still was passing it off.

Finally he looked at me and said, “Faith, I want you to be her,”

I'm going, “God, I was trying to avoid it.” But she was very smart. She was the valedictorian of La Porte School that year. She came and worked for me free, but it was part of the program. She did really well. I hired her for part of the summer for sure before she went off to college. I took her to a conference, and had her present results, and all those sorts of things. I do know about her, where she is now, and keep in touch with her too.

But people will do their thing anyway. Most I've really done I think, as part of mentoring, is to help people find ways to do things. Also, I don't much care if somebody doesn't like me anymore in the field. Who cares? But for the younger people, they need sometimes somebody to go in and say, “This is the way this is. This is a good thing, or this is a bad thing. Or in my opinion it's a bad thing or in my opinion it's a good thing.” I've tried to do that a couple times for people, but people make decisions. I know my professors where I got my PhD thought I should be going off to JPL, and when I didn't, I think they were surprised. But as one guy said to me, “You've educated me in this. You can go off and do these things at different places.”

I said, “Okay.” Not formally, sometimes individuals as part of programs, I try to give as much as they are willing to accept.

JOHNSON: Thank you for talking to me. I don’t want to keep you too long because I know you have a drive.

[End of interview]