INTERNATIONAL SPACE STATION PROGRAM
ORAL HISTORY PROJECT
EDITED ORAL HISTORY TRANSCRIPT

JULIE A. ROBINSON
INTERVIEWED BY SANDRA JOHNSON
HOUSTON, TEXAS – JULY 29, 2015

JOHNSON: Today is July 29, 2015. This oral history session is being conducted with Julie Robinson in Houston, Texas, as part of the International Space Station Program Oral History Project. The interviewer is Sandra Johnson, assisted by Rebecca Wright. Dr. Robinson is the Chief Scientist for the International Space Station Office at JSC [Johnson Space Center], and overseeing the transition of the laboratory from the assembly period to full utilization of the Station with hundreds of active science investigations. I want to thank you for joining us today and giving us your time.

You began your career as a contractor in the Image Science Laboratory, and later joined the Office of the ISS Program Scientists in 2004, and you were named Deputy ISS Program Scientist in 2006, and then Chief Program Scientist in 2007. Let's talk about that evolution and what brought you to JSC, or to NASA, and then your evolution of becoming a civil servant and moving into this position.

ROBINSON: Well, originally I had moved to Houston as an assistant research professor at the University of Houston. I started collaborating with what was the Earth Sciences Branch at the time, collaborating with a number of both contractor and civil servant scientists there, because they were preparing astronaut training in earth sciences for [ISS] Phase One, for [Shuttle-]Mir, or they were conducting training for Mir and preparing their first set of training for the astronauts

that would go to ISS, and they did not have any biologists or ecologists on the staff.

They had meteorologists and geologists with legacy back to Apollo, but they didn't have biologists, and they recognized that one of the most important things that astronauts were going to observe and need to understand were the effects of global change on the environment, seasonal changes that they would observe in a long-duration mission, which is something Shuttle astronauts had never observed before. So Shuttle astronauts had primarily been trained on geography and geology and meteorology, which made sense for a two-week mission. But they realized that they needed to be able to talk about seasons, about glacial melting, how to interpret shows, volcanic events, droughts, all of those things that you could see in a six-month period, and they didn't have any biologists on board.

I started collaborating with them to develop those training materials and was given a job offer by Lockheed-Martin to be part of the contractor support for that group. That was how I came in. I spent seven years in the group, coming in as one of the scientific peers that was covering my discipline. During my time in the office, one of the things that changed is we switched from film cameras to digital cameras. And a digital camera, even though we think of it as a camera, it's also a digital sensor that has quantitative data about what it's observed. It's really a three-band, multi-spectral instrument, from a remote sensing perspective. That was background that I had in doing mapping, both from aerial photography as well as from remotely sensed data from satellites.

So I had the opportunity to kind of develop the first playbooks on how you would take data from the cameras and use it as data rather than as happy snaps, we used to call it. Some people say, "Oh, the astronauts are just taking happy snaps." At the time, remote sensing was still pretty coarse resolution, so you couldn't see very much, and astronauts, early in the Space

Station, were able to develop hand-held techniques where they were getting 6-meter resolution on the ground, so you could really see a lot of information there. They were also able to develop techniques for looking at city lights at night that were better than any satellite. And so I used my background in the satellite remote sensing work to kind of find those cases where there was astronaut photography that really could be digital data, and where that was filling gaps and things that the satellites did not offer. That wound up being the focus of a lot of my time, is bringing that photography in and finding out the places where satellites couldn't do the work.

Also, we went digital with the archive. We went through and had all of the old films scanned, and digitized, and corrected and uploaded, and we constructed what is now the database of [Gateway to] Astronaut Photography of Earth, distributed that, and made it available to the whole world. All the cataloguing data, we went back and pulled all the Apollo and Skylab data, got that digitized, so that the archive of astronaut photography would be complete. And that's really important for global change studies, because you could look at a city like Dallas, Texas—I actually published a paper on this—and see how it had changed from basically Skylab to today, and it's just extraordinary. So a lot of those old Skylab images predate any satellite remote sensing data, or there was a little bit of Landsat data, some of that's been lost. So it becomes a really powerful historical record as well.

As part of that time, I also, sort of by accident I wound up publishing the first peer-reviewed publication that came from the International Space Station, and it was about the spatial resolution that the astronauts were getting in their digital photography.

JOHNSON: That's interesting. You began from that position, like you said, with Lockheed-Martin, and then you moved to working for NASA in 2004 as a program scientist. How did that come about?

ROBINSON: Right, I was doing astronaut training in a lot of these different disciplines, and several colleagues from around the Center had asked if they could sit in on the training to learn from them, and one of them was a colleague, Jennifer Radigan, who had just begun serving—and also Steve [Stephen N.] Frick, who was an astronaut. I had worked with Steve a lot on post-*Columbia* [STS-107] image analysis. After the *Columbia* accident, we did a big project to analyze all the amateur photography of the breakup of *Columbia*, once again taking photography but making it into digital data and getting quantitative information out of it. I had worked with Steve, who had been the astronaut assigned to support that group during the post-*Columbia* era, and so then he came to some of my classes.

His wife, Jennifer Radigan, had been up at [NASA] Headquarters [Washington, DC] doing a rotation, and she was going to going to come back here as the deputy for the newly named—and they called it program scientist at the time, which was Don [Donald A.] Thomas. Jennifer had been to some of my courses for the astronauts, and she said, "Wow, she's a great speaker. She can really communicate about science." She and Don contacted me, and they said, "We're going to be hiring some people for the office. We'd really like you to consider coming on, apply to this position that we're going to have open, you might be just perfect for coming on, and you've got a lot of disciplines under your belt"—because I've got chemistry and biology background, and remote sensing, so I can talk across a lot of different disciplines.

They said, "You might like coming over to the program for a year and see how everything works, and that will give you a lot to take back to another job in the future." Of course it was an opportunity to become a civil servant, and scientists don't have a lot of those, because scientists have really very few opportunities to come into JSC as co-ops. So most scientists around here, they're going to spend a decade or more as a contractor, and there are no opportunities to come in, so it was a great opportunity. I applied for it and I was selected.

JOHNSON: And that was the year that President [George W.] Bush announced his Vision for Space Exploration.

ROBINSON: That's right.

JOHNSON: And then the following year, ISS was designated as a National Lab, in 2005.

ROBINSON: Yes. Right. In fact, I remember at my job interview, one of the questions was, "What do you think about the vision for space exploration, and is it a good thing or a bad thing for research on ISS?" Which has been a controversy for a long time, looking at that pull and push between exploration-related research, which is definitely in NASA's mission, and then all the other research which can benefit scientific knowledge and health on Earth and all those things but isn't about exploration. When the vision for space exploration came out in '04, that was really the beginning—well, it really wasn't the beginning, it was actually echoing some things that had been going on before that, one thing called REMAP [Research Maximization and Prioritization Task Force], but it was the beginning of a massive pruning of the research portfolio

for the Space Station, and we're still living with the ramifications of that and all of the different political things that have happened, including naming ISS a National Laboratory, then selecting CASIS [Center for the Advancement of Science in Space] to manage it, and sort of as the Agency struggles with how do we do both of these good things that come from space when our Agency budgets are so limited?

JOHNSON: Talk about that designation as a National Lab and how that came about and, I guess, what was the purpose of that designation and what did it mean to the ISS Program, having that? And it is just the U.S. segment, not the Russian segment, right?

ROBINSON: What it is, it's the U.S. resources, so it's not so much real estate as the ability to do the research. For example, if a National Lab user wants to use an ESA [European Space Agency] facility, we'd just negotiate for that for them, and then it becomes a U.S. resource that they can have available. We do have National Lab users that take advantage of Russian resources, and we barter that to help them out. But, U.S. law could not designate the Russian segment as a U.S. National Laboratory, so that's what the hair-splitting is on that.

Heading up to 2004, post-*Columbia*, after *Columbia* happened and everybody realized we have to retire the Shuttle, so we're going to finish building the Space Station and then the Shuttle will retire, and then the next thing is, we've got to find budget to build the next vehicle. Where's that budget going to come from? At that point in time there was an organization at Headquarters called the Office of Biological and Physical Research, OBPR. It was AA-level [Associate Administrator] it was what we would call Mission Directorate today. It was Code U, I think it was.

That organization had its own AA, who was Mary [E.] Kicza, it had about an $800 million a year budget, and the idea had been that you would have literally hundreds to thousands of PIs [Principal Investigators] doing research in their labs on the ground, and they would discover all kinds of things, and you would pick the pinnacle of that. It was like a pyramid structure where you'd have hundreds to thousands of PIs working on the ground, and you would pick the best of the best, and they would fly to the Space Station and you'd have this small set of flight experiments. And that's how the $800 million a year budget was set up. And it was divided into space biology, human research, physical sciences, and space product development, which was kind of commercialization but they didn't call it that at that time. Each of those orgs [organizations] had an allocation on ISS, like 25 percent—there was 10 percent held out for space operations, and then of that other 90 percent, it was 25 percent to space biology, 25 percent to human research, 25 percent to space product development, and 25 percent to physical sciences.

And they had not been able to fly anything, because assembly had taken so much longer than expected. That organization probably peaked 5 to 10 years earlier than it should have because they ramped it up budget-wise and started selecting all the ground PIs based on the original ISS development schedule, which we never met. So that organization had been spending $800 million a year for 10 years and had done just very, very little research; some human research, just tiny bits getting done. We were typically having maybe 30 experiments every six months; most of them were human research and a few other little bits here and there. Very little up mass, seven hours a week of crew time going to research back in that phase.

They were spending a lot of money and ISS wasn't assembled yet. We still had a long way to go. And they were the obvious place to go get the money, and a lot of what they were

doing was fundamental, commercialization, it wasn't all focused on exploration. That had been seen, and in about 2003, Mary had led a restructuring they called REMAP, where they went and looked at every single experiment to see if it was relevant to exploration or not. That had led to a lot of classifying of experiments that had been selected by peer review, and that was before I came in.

There hadn't been a lot of action on that, when Mary decided to reorganize into the product lines that I just told you about. Then when it became apparent that the budgets were going to be diverted to Constellation [Program], as Constellation was being formed, Mary wound up leaving as AA, they wound up kind of deconstructing that office, and then eventually they moved them into ESMD, the Exploration Systems Mission Directorate, as a small sub-organization, basically a division within Exploration Systems Mission Directorate that was going to be led by Carl [E.] Walz.

In that time frame, the leadership at Headquarters, they went and cancelled hundreds of PI grants, so there were hundreds and hundreds of PI's all around the country who got cancellation letters in the middle of their grants. They had postdocs and grad students working on things, and all the money was drawn back and they got cancellations. There was a huge outcry in the community. I meet people today that are still mad about that. As far as I know, it's unprecedented. I don't know of any other government agency that's ever completely withdrawn something. The only other case I know of is, there have been some laws about stem cell research that have led NIH [National Institutes of Health] to cancel bodies of work, but those were highly politically debated, they weren't just because NIH wanted to move the budget somewhere else.

There are a lot of people in the scientific community that lost faith in NASA. They were already frustrated because it had taken so long for them to fly, because they came in with

scientists' unrealistic expectations of us following a schedule, which has never happened in the history of human spaceflight. But they didn't know that, and they built plans. You can't have a grad student in four years do their Ph.D. on a spaceflight experiment while the Space Station is being built, but people tried to do that and failed, and were really frustrated with NASA. It was, I would say, a pretty big low point in the history of ISS from a research perspective.

All of that was happening right at the end of fiscal year 2004, I believe. Also at that time Don Thomas, who was the Chief Scientist at the time, he was reporting directly to Mary Kicza, and the equivalent of the Program Science Office today was housed in SA [Human Health and Performance Directorate], it was kept separate from the program to be independent. So the Chief Scientist was supposed to kind of be here nagging at the program manager but not in the program manager's org, and it was partly a clean up the program, because clearly something's wrong in the program, it's not assembled, we're not getting any research done. And the program was very driven by the fact that they're going to bleed money left and right if they don't get assembly done, so you've got to get assembly done and it just doesn't matter. If you don't get assembly done, everything will fail, so getting a little research on the side is not important in that assembly phase.

I think right at the end of that fiscal year, as all of those reorganizations took place, they decided to dissolve OBPR and move it into ESMD, move the remaining staff into ESMD in this division under Carl Walz, and I think we got a notice two weeks before the end of the fiscal year that the Chief Scientist position was going to be eliminated altogether, and the office was going to be dissolved, all that money from Headquarters was gone. And Don flew up to Washington and met with Bill [William H.] Gerstenmaier and said, "They're canceling all the research, they're saying they're not going to need ISS, they don't want a Chief Scientist anymore, they

don't want a Program Scientist anymore. I think you need a Program Scientist, and I'd like to still be that, but you're going to have to pick us up."

The other people in the office were looking for other jobs. I actually couldn't, because the way they hire civil servants at NASA, they put them on term, and until you're converted term to perm [permanent], which I think takes place after three years, you can't apply for other civil service positions. So I would have actually been terminated and had to leave the Agency, even. And I think in some ways that was maybe why Don was motivated, because he was on detail from the Crew Office and he could've just gone back to the Crew Office. And the other people who weren't term, the other people in the office weren't in that term situation, they all found other jobs and were gone immediately.

So Bill said, "Yes, I want this office." He handed it off to [Michael] Suffredini without a lot of input from Mike, who's become a dear colleague over the years, and Mike was mad as hell about it. He got stuck with Don and I, and he cut our contractor budget way down. We only brought with us two contractors, and we moved into OA [International Space Station Program] from SA. It was basically four of us that moved over.

Mike had told other colleagues that he was just very unhappy about it. He was so focused on assembly, and he had to be at that point in time. Every time somebody mentioned research, it was just an irritant to his prime objective, which he had to get done. So I would say it was a really important strategic decision that Gerst made, and Mike was in the weeds worrying about the budgets day by day, so he didn't see the value of it then. He certainly sees the value now, and that's the place he stayed in, but at that time that was the challenge.

JOHNSON: How did the four of you coming in, how did you start growing this science program, and how did that change? Over the last 10 years obviously it's changed quite a bit, but how did you start working on that early on to get everyone to accept the fact that you were there and that you needed to stay?

ROBINSON: When I first came to the office before it came over, one of our most important jobs was setting the priorities on different things. In accordance with REMAP and the Vision for Space Exploration, all those allocations I talked about were dissolved, and instead everything was reranked—for the tiny bits of up mass and the tiny bits of crew time we had, everything was reranked by its relevance for exploration. So that was the main thing that we were doing before the office was eliminated. When we came over here, we kept doing that. And honestly, the office still does it today. We're trying to balance, only now we have a different set of direction for balancing, but early on the balancing was all just about exploration relevance, and then meeting international commitments a little bit. As we came over, we continued that prioritization.

Don continued in the office for a period of time, and that was when I got promoted to be his deputy. The other thing that we were doing then was developing this database of all the research that had been done and all the results, and something that would allow us to track, over time, all the accomplishments and things that had been done, and something that would allow us to produce documents that said all the things we were doing and why we were doing them. What, why are you doing this or that? Because an experiment has a name like AutoReg, and nobody knows what it means or why they should care. Trying to start to develop those products

and trying to start adding a culture of caring about science in this operational organization that was totally focused on assembly.

So starting small wasn't a bad thing, because research was starting really small again. And as Don's deputy, I had the chance to work with him, and we started shaping those interfaces with the Payloads Office. Payloads Office culture at the time was completely focused on building facilities, and so it was very much an engineering organization, nothing like it is today. At first, Dan [Daniel W.] Hartman was leading it, when I came in, and then, let's see, I think Kathy [Kathleen C.] Laurini was deputy for a while, and then Ven Feng was deputy for a while, and then Dan went over to OB [Vehicle Office], and that was when Rod [Rodney] Jones came in. So early in the time with Rod Jones, that was when Don and I were working to define what things we would do, how we would insert scientific information into decisions that were being made mostly by engineers.

For example, most of our lead increment scientists were not scientists. Even though they're supposed to be advising the ops [operations] team, most of them had engineering backgrounds. If an organization doing the research says, "Well, our samples are expiring in two weeks and we just figured that out," an engineering organization typically looks at the requirements document and says, "Well, you didn't say we'd have to operate it by this date, so sorry." But scientifically you might want to explain to them why it is, why the knowledge changed, what the impacts are going to be. And especially as we were trying to squeeze little bits of research out of the corners around assembly, we did a lot of work understanding all the experiments and being able to explain to people, and that was about the time Kenny [Kenneth] Todd moved into his current role as [Operations Integration] Manager, ops lead, and trying to help them understand if doing something a little bit differently could give somebody a science

experiment, we should do that, and help them start thinking about science requirements. And it was really challenging, because culturally it was really an uphill battle.

But now we were embedded in the Payloads Office, which gave us the opportunity to sit in on all the meetings and have all the feedback. We would set priorities, then we could also help with the priority trades at a much more sophisticated operational level. So we started doing that, and then Don decided he was going to leave the Agency. He left, and I wound up acting for almost a year and a half, because nobody knew what to do with me. They were afraid if they cancelled the position, with the community as estranged as they were, that would cause an uproar or cause an investigation, or something like that. Why would you not have a Chief Scientist of this vehicle if its purpose was supposed to be doing science? So nobody wanted to cancel it, but nobody really wanted anyone bothering them either. The engineering org that was ISS just wanted to focus on assembly and keep going.

When Rod Jones first came in and he asked Suffredini what to do, because Don Thomas left, and then here I am, I'm the only one doing it, I'm leading this piece of thing, and I'm value added, and I'm working with everybody great, so nobody wants to get rid of me, but nobody really wants that role either, and he asked Suffredini what to do—so I'm told, I wasn't in the conversation—but what he had relayed to me is, Suffredini said, "Well, let's just keep her doing it, but just make sure she never bothers me."

Rod told me, "Well, you can keep acting," and at that point I was moved down a level, too; instead of reporting to Don, Don was treated as a peer of Dan Hartman. He started working for an AA, then he'd moved down and been put on OA staff, and I was working for him, then when I became acting, I was left under Rod Jones. So we had basically, in a year, it had been pushed down three or four levels of authority and of seniority in the organization.

What's kind of ironic is, I just got an SL [Senior Level] last year, having been Chief Scientist for, what, seven, eight years now. So it's sort of back up.

JOHNSON: I was going to say, it's changed a lot.

ROBINSON: It's changed a lot over that time. But what really, I think, changed for me is, I started seeing opportunities—because the budgets had been so reduced at Headquarters, I started seeing opportunities where we could fit things in. Like we could fly some animals. We had two extra powered locker slots that were not needed for assembly, so let's do some animal experiments. I started working with my colleagues at Headquarters and saying, "Hey, we could do this, if you would select some science for this." And so we started being able to carve out some extra science in the ESMD budgets, working with Carl Walz and all of his staff, finding these different opportunities to get extra science and get something started so that we could prove the value. Because the problem was, we'd made all these claims and we'd spent all this money, and we hadn't actually done very much at all. So we really needed to be in a better position to show the value of things.

And then at the same time that all of that happened, Mark Uhran came over to be Gerst's Division Director for ISS, and eventually I think they promoted him to assistant or associate AA, whatever they call it. He had been working behind the scenes. He had been the former head of space product development in OBPR, and so he'd been working behind the scenes. He had lots of political contacts on the Hill and so forth, lots of credibility with them, and he'd been working behind the scenes with some staff members of Kay Bailey Hutchison and others, and this idea of

ISS as a National Laboratory came forward. That was kind of happening in parallel to me becoming the deputy and acting as Chief Scientist.

So that concept was, here's a solution to the fact that the Agency is never going to spend $800 million a year on research again, on low Earth orbit research. That solution is, if this laboratory is so great, let's get the private sector and other government agencies to cover it, and surely they'll come flocking in because it's such a great laboratory that we've built. Then we'll just carve off this piece for NASA research, for NASA's exploration-focused research. That was codified when ISS was declared a National Laboratory. That was a really long answer, wasn't it?

JOHNSON: Well, no, it was great. It was wonderful, and there's a lot of background there, but we've been going about 30 minutes and I don't want to keep you.

ROBINSON: You can have 10 more if you want, we're fine.

JOHNSON: Okay. Well, part of what you said got you the job in the first place is because you were a great teacher and a great speaker, and that seems to be a big part of your job now, from what I've read, is that you're like the cheerleader for science, as far as ISS is concerned. So maybe if you want to talk about that for just a minute, and when it became a National Lab, and then you started going out and maybe talking to other groups, and how did you kind of tailor your message for different groups, and did it include recruiting those researchers to come to ISS?

ROBINSON: One really exciting thing that was in the authorization act of 2005 was a request that NASA start doing National Lab Pathfinders. So it actually said ISS becomes a National Lab when assembly is complete, but you, NASA, go do some Pathfinders, think about how you would manage this thing, and start working with other government agencies, start working with the private sector, and see what you can get on board. And so Mark Uhran took on that leadership level. He's not a scientist by training, he has a lot of background in technology primarily. Super-smart guy; he was absorbing the science really fast. And he used me a little bit as his kind of scientist on the wing.

I got the opportunity to go with him as he was working with NIH, as we started pursuing the Pathfinder projects there, where they selected four different experiments to go to ISS, four or five, and working with USDA [U.S. Department of Agriculture]. Then as we started having more meetings that were designed to attract and give visibility to new users, then I started getting visibility in the national community, talking to the national academies about the facilities and what was happening with the research, because there wasn't anyone at Headquarters anymore that really could speak to those things.

I do think the communication skills emerged as being really important, both for communicating with new users, also for communicating with our stakeholders as they were struggling with how does ISS fit in the nation and in the federal budget. And then for communicating with the public. If you see the triangle up on the board there, that's always up there, because that's our mission of the office. We'll say our goal is science strategy, but it has, at the top of that triangle is science communications for new users, accomplishments for stakeholders and accomplishments for the public. Then the foundation of it are two things, the international collaboration and the national research, where I work as an independent advisor and

set the priorities and do those things for our internal things. That's how it's evolved today and how we look at it today.

And it always actually was defined as that. When I just updated my position description for the SL position in February, there are still paragraphs in there that were in Don Thomas's original position description. So the Space Station has changed dramatically, and it's openness to the role of my office and a Chief Scientist has changed dramatically, and the size of the office has grown with the Space Station. But the function is actually remarkably stable, in spite of all of that, which is kind of funny, that the vision people had in wanting it there has actually held.

JOHNSON: And that's part of your job, as you said, communication is so important in so many things, but especially when you're trying to make people understand where the money's going. I don't know how much more time—I don't want to get into too much. I was going to talk about some of those relationships, as far as CASIS, how that evolved, but I think it's going to take more than five minutes.

ROBINSON: CASIS we should probably do at another session.

JOHNSON: We can probably save that for the next time. If you had to describe your job to somebody and what you do, is there anything else that we haven't talked about just in the last few minutes, how you would describe your position? Maybe someone that wasn't even involved with NASA, and you had to tell them, this is what I do. Or if you had to give a talk to somebody that wasn't involved.

ROBINSON: If I meet someone on the airplane, I'm going to give them the one-sentence version of what I do. They don't want to hear the triangle thing I just told you, right? Which is what I think I really do. But what I usually tell them is, I am the person that's representing all the scientists in this huge engineering org, both to keep the scientists from going a little nuts and doing things they shouldn't do, but also to make sure the program understands and serves them.

JOHNSON: And you also deal with science representatives from all the international partners too, don't you?

ROBINSON: Right, right. I have a counterpart, and that's—one thing I'm really proud of that I've done was creating the Program Science Forum of all my counterparts, which didn't exist before in that way. That's something we might want to talk about in the future too.

JOHNSON: I actually have that on my list. So I think for today, so we don't keep you running too fast down the freeway, we can stop for today. But we appreciate it, thank you.

ROBINSON: Oh, you're welcome.

[End of interview]