

Blueshift - March 1, 2010

First Light, Last Paycheck

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Maggie: Hi, I'm Maggie Masetti and welcome to our March 1, 2010 episode of Blueshift, the podcast from NASA's Goddard Space Flight Center.

There are few fields in which completing your job successfully also means that you no longer have one. Such is the case sometimes here at NASA where projects come and go. It's the nature of working on spacecraft and instruments that can have short lifespans. The passage of a few years can mean that it's time to start looking for something else to transition to.

However, the Hubble Space Telescope has been one of the longest running satellite programs and some people have spent their entire careers working on it. Not only that, but it was a mission that often called for specialized skills, which may or may not translate to the world outside of Hubble. The last mission to service it was completed (successfully) just last May, and the end of an era is clearly in sight.

To find out what happens when a major project winds down, we talked to a few Goddard people who were involved in different aspects of Hubble, from support science, to systems engineering, to working with the astronaut's tools, to actually managing the spacewalks for last year's Servicing Mission 4, or as it's known at NASA, SM4.

Mark Jarosz has been involved with Hubble for a number of years. He started out during Servicing missions 3A and 3B as the carrier manager, that is, managing how the new hardware and instruments were carried up to space and the old returned to earth. He left the project after that but was brought back on for SM4 in a different, very vital role.

Mark: I was the Hubble EVA manager, and EVA being for Extra Vehicular Activity, basically was responsible for working with the astronaut crew at Johnson and the trainers at Johnson to familiarize the astronauts with the repair mission and the tasks that they would have to perform during an EVA.

That was across the board. Every time the astronaut had to do a spacewalk, any activity he had to do, we worked with Johnson to put together the choreography and the ...uh develop the tools and procedures to do that.

There was some question of what you would go do afterwards because Goddard is not really a... working with the astronauts/training them with the astronauts other than Hubble. I did have a concern for the Lockheed team that worked for me, as well as the crew aids and tools group, which was developing the tools for the astronauts. So that was kinda a couple of unique jobs on Hubble that there wasn't actually a niche at Goddard for that to fill.

Maggie: Justin Cassidy and Jackie Johnson were two of the people that worked on the astronaut's tools. Justin has worked on every servicing mission except the first one and he played a very important role during Servicing Mission 4.

Justin: I was the lead system engineer for the CATS. The CATS are the Crew Aids and Tools, basically the tools that the astronauts use to make a servicing mission happen for Hubble.

Maggie: Jackie Johnson worked on Hubble for 14 years. For SM4, he was the lead EVA liason for the EVA group to the carriers group.

Jackie: Our group was responsible for basically packaging up and hauling up all of the tools and equipment and instruments that the astronauts used to service Hubble. The tool guys would provide us with the tools and we'd find a way to package it, put it in a box, and carry it up there. Keep it warm, keep it safe, until the astronauts were ready to use it.

Maggie: Since Jackie and Justin appeared to have very specialized jobs, we wondered about concerns for job prospects post-SM4.

Jackie: I think anybody who worked in the EVA world, the extravehicular activities, may have had that concern. Because if you were really entrenched in EVA, well there's not a whole lot of other EVA work, with the exception of space station now. And if you're not somehow tied to space station, you're not going to have a whole lot else to do.

Justin: Maybe it was not talked about. Everyone was extremely focused on our servicing mission. It was the absolutely the most challenging mission, the most jam packed, but in the end, the most rewarding project to work on. I'm sure other people were very, you know, in the back of their mind, concerned about what am I doing next, but there was such focus to make the mission happen that there was not a lot of talk about what's your next move going on.

Maggie: Kevin Boyce spent around 20 months as the systems engineer for the repair of the Advanced Camera for Surveys or ACS. Though he was a relative newcomer to the project, Kevin was no less affected as the project neared completion.

Kevin: There were, yeah, there were a lot of people who I don't think knew where they were going to end up next. For many people it had been 15, 20, 25 years that they had been doing that kind of thing. And yeah, it was going to be, at the very least, a big change to a whole different culture with whatever they were going to do next.

It was a little bittersweet sometimes, knowing that you're done, but it was, as the guy who hired me as a systems engineer called it, the last ride out of Dodge.

Maggie: Eliot Malumuth has worked supporting a number of Hubble related instruments, including the Wide Field Camera 3. He was able to transition from one Hubble-related project to another. But post Servicing Mission 4, he was faced with trying to figure out what was next.

Eliot: I was very worried. From what I was hearing, I knew that work for WFC3 would extend a little bit beyond launch...but, you know, it kept looking like it was 3 months or maybe it was 6 months, or maybe it was part time... and so I was, I was definitely worried about it. You know, my supervisor was committed to try to find some other work here for me, but even though he said he was working on it and things, I was worried 'cause all the things seemed little and not something that would make up a full-time job for maybe more than a year.

Maggie: Job uncertainties aside, for most, the launch of STS-125 was the culmination of years of hard work. For some, the work was just beginning!

Kevin: It was great going down for the launch. I got to go down for the final walkdown in the shuttle. So the shuttle on the pad with a big clean room up against it with the bay doors open. And I got to go up there and look at it and see the big box, inside of which was another box, inside of which was the stuff I made and look at it and say "oh yes, everything looks fine to me". I had a moment there when I was looking at it and thinking, "Wait a minute, this isn't a simulator, this is the real thing! This stuff is going to be up in space and John Grunsfeld and Drew Feustal

are going to be out there putting together the things that I've built and putting them on the Hubble!" And that was an energizing moment.

Justin: I had a great week. We have what we call our systems walkdown, where a core group of our systems engineers go down there and we get to inspect the cargo bay, then make sure all of our equipment is packed in and look at the launch vehicle before they actually shut the cargo bay doors. So, that was one day. The next day they started to shut the doors and I got to see the doors closed. I had never seen that before, and I thought that was really fantastic.

Jackie: The knowledge that you've got friends, in this case you know, the astronauts who were on board, we'd worked directly with them for so long. Knowing that they were onboard, it always gives you that little bit of a lump in your throat when you see it go up. It's always exciting watching something that you've spent so many years working on, and then to see it go up and to see it actually unfold - it's extremely exciting.

Mark: Watching Hubble launch... it was extremely exciting. A lot of work, hard work, went into preparing for it. However, having launched spacecraft - usually at that point, my job is done. And being the EVA manager with Hubble, you watch the shuttle launch, and you know, you watch it for those couple minutes and it's like, oh, this is fantastic. And then reality sets in that, wait a minute, I got to get on a plane and head to Houston, because this job isn't over. You got another, you know, 12, 13 days mission in front of you with 5 very difficult EVAs. So my excitement didn't really come until the end of the 5th EVA day, when they got everything done on the telescope and we got a thumbs up that not only did we complete 100% of our objectives, but we completed about 110% and that everything was working. So that night is when I had my celebration.

Eliot: Thrilling and nerve-wracking. There were things that happened which could have kept Wide Field Camera 3 from going into the telescope! Until the astronauts push the telescope overboard and return home and everything is working, there's still a little bit of worry about it. The real pay off is that some amazing science is being done and a lot of it has to do with how good the detectors are, and in particular the IR detectors. That's a lot of what I worked on with the testing of the detectors and pushing the technology to make them better and better, and they got to the point where they can now do this amazing science, so that's really gratifying.

Maggie: In the end, thanks to the hard work of the Hubble team, the tricky repair of Hubble's instruments was successful. The science results show that the immediate future of Hubble is no longer in question. But what happened to Mark, Justin, Jackie, Kevin, and Eliot? Did their Hubble skills translate to something else at NASA? Were they able to move on to something new, or did Hubble's first light essentially signal their last paychecks?

Kevin was lucky and had a job waiting for him with a group he'd worked with before.

Kevin: Well, right now, I'm working on ASTRO-H, which is a Japanese mission. It's an X-ray astronomy satellite. ASTRO-H is going to launch in 2014. It's a more normal length program compared to what I did on Hubble, which was 3 years of work crammed into a year and a half.

Maggie: Mark Jarosz has changed projects every few years, so in a way, this was just one more transition.

Mark: I don't know where everyone has gone on Hubble. I know some people have retired. Some people have left to go do other things. Project manager, Frank Ceppolina, he's been trying to develop and keep that

servicing capability alive, and doing some studies for mission on space station. Those people are still working in that area. Not so much EVA, but development of tools and robotic capability for maybe the possibility of servicing Hubble again in the future robotically, or some technical capabilities on space station. For me, I had done a bunch of other programs here at Goddard along the lines of spacecraft, so I wasn't exactly worried that I could have a problem transitioning back into the mainstream of what Goddard does.

Maggie: Justin Cassidy and his engineers were ready for new challenges.

Justin: We are engineers, so engineers do engineering stuff. So we kind of have to reinvent ourselves. All of us were really at the top of our game. I mean, we had been studying for years what to do, we created unique tools. To go through the development, the testing, manifesting, getting the tool up in orbit, watching the crew member over his shoulder do the work. Extremely rewarding. And it's like, the high is the high, because it all worked out in the end. What we're doing after the mission, we've been going around showing our tools to other folks. We've had a lot of visitors here at Goddard. So we have a great technology, great engineering base here to show what we can do. Kind of promoting ourselves for future work. We've been servicing Hubble, and now we're just going to shift gears and figure out, how can we service other satellites that are up in space.

Maggie: Jackie Johnson, who works with Justin, also had to transition from working on spacewalks.

Jackie: I'm working with a smaller core group, from the Hubble group. We're working on, going back to station, but not in an EVA capacity. It's more robotics demonstration capacity, showing what we can do robotically to refuel a geosynchronous satellite.

Maggie: Eliot Malumuth managed to pull together enough tasks for a full-time job, including some residual work on Hubble.

Eliot: Right now, I'm still a little bit on the Wide Field Camera 3 detector testing. 'Cause there are still some properties of the detectors that we can test in the lab, aren't so easily tested in orbit. My primary task now is with the optics group for the ISIM, which is the Integrated Science Instrument Module of the James Webb Space Telescope, which is a big project here...

Maggie: In the end, working where we do can be, as Kevin said, bittersweet. The satisfaction of accomplishment is often followed by the question of "what's next". And after seeing the level of dedication that went into making this Hubble Servicing Mission successful, perhaps the bigger question is, can what's next match what's done and gone?

Jackie: I think the bigger thing for me is, looking back, how anything top what we did on Hubble SM4? It was just a phenomenal, exciting mission. It was great. Honestly, I think it's true probably for most people, you know, going on to whatever that next thing is. It's kind of hard to reach the same level of excitement as what we experienced.

Maggie: And with that thought from Jackie Johnson, we'll leave you for now. But be sure to check out our website, we have some photos of actual space hardware from Hubble that Justin Cassidy showed us when we interviewed him. We also have a few video clips. Our website is [universe.nasa.gov/blueshift](http://universe.nasa.gov/blueshift). We also love chatting with listeners on twitter - you can find us there as @NASABlueshift. We'll see you in a couple weeks with a new podcast. This is Maggie Masetti bringing the universe closer to you, with Blueshift.

