

Blueshift - September 30, 2009

[intro music]

Sara Mitchell: Welcome to the September 30th, 2009 episode of Blueshift, brought to you from NASA's Goddard Space Flight Center. Earlier this year, the world watched as astronauts made one more servicing mission to the Hubble Space Telescope. On a series of space walks, they repaired and replaced Hubble's hardware, making it as good as new. Or really, even better than new.

One of the astronauts aboard this historic mission was Dr. John Grunsfeld. And he's not only an astronaut, he's also an astrophysicist. So here at Blueshift, we were interested in talking to him about this dual role.

I was fortunate to speak with Dr. Grunsfeld on the phone earlier this month and we talked about Hubble, astrophysics, and more.

Sara: To the public, the Hubble Space Telescope is a national treasure and it's a camera to them that just takes these beautiful pictures. But what does the Hubble mean to you as both an astronaut and an astrophysicist?

John Grunsfeld: Well the Hubble is probably the most productive scientific instrument ever created by people. And it's given us the ability to answer such fundamental questions about how the Universe began, the evolution of the Universe, our neighborhood in the solar system. So many fundamental questions that people have asked just from looking up at the skies. And that appeals to the biggest, broadest audience possible, basically thinking humans, that it really has become an icon for science. And at the same time, in my lifetime, it's really allowed astronomers to overturn and kind of learn about the Universe for the first time, that it really is just a phenomenal star in our Universe of scientific instruments.

Sara: Have you used the Hubble for any of your research?

John: I've been in collaborations in gamma-ray burst research that has used Hubble. And this fall we're hoping, if everything works out, to actually use the new Wide Field Camera 3 to observe the Moon. And I'm very excited about that. We're going to point Hubble at the crater Tycho and Hubble is uniquely suited because of its ultraviolet capability. Being above the atmosphere, the ultraviolet light doesn't get through the atmosphere, which is a good thing for us, but a bad thing for astronomy. And so Hubble has got the best instruments, with this new Wide Field Camera, to study the Moon, which is something I've always been fascinated with.

Sara: Your work in manned space flight has almost certainly been part of NASA's most prominent and visible work. But you're also, your background is really in something that's one of the least visible fields, which would be astrophysics. So what's the value of astrophysics. Why should we do it? Why do you do it?

John: Well, astrophysics is really about answering fundamental questions that we all ask. You know, from birth on, when we really start thinking, you know, we want to know where did we come from, how did we get here? And these are deep questions that humans ask. Who knows, maybe that is the deciding line between what we consider conscious, intelligent beings and not, is whether they can question their existence. And when we do question our existence, one of the ways to try

and understand that is through astronomy and astrophysics. Because astronomy and astrophysics answers the questions of how did the Universe come to be the way it looks? How did the chemical elements form? How did planetary systems form? How did the Earth form? These are very, very fundamental questions that enquiring minds want to know. Astrophysics provides many of those answers. It's just amazing to me that we live in such a rich time in astrophysics. We have the tools, not just Hubble, but a whole fleet of astronomy and astrophysics satellites and tools to be able to answer these very fundamental questions that span from the whole size of the Universe down to what may be the actual structure of space time.

Sara: So, what's next for you?

John: Oh, good question. There are lots of opportunities out there. I'm very interested in, now that we've got Hubble for the very first time in the best shape of its life. Its got five working scientific instruments, all of which are corrected for the spherical aberration in the mirror. So in a sense, Hubble is just beginning its mission of discovery. And so I'm very interested in seeing what kind of science comes out of Hubble and hopefully to participate in it.

Sara: The last thing I wanted to ask you about, we actually did a story earlier this year, while you guys were up there, about the other telescopes that were on board the mission that both you and Mike Massimino brought. So you brought along a 200 year old telescope made by Jesse Ramsden.

John: Yup.

Sara: What was your connection to that telescope?

John: My connection is really to the Adler Planetarium in Chicago. And that's where I went to my first astronomy course when I was in high school. And my grandfather was the architect of the Adler Planetarium back in 1930. It was the first planetarium in the western hemisphere. And so my family kind of got me there and then once I was there I was hooked on astronomy. And they have a rather in depth collection of antique and historical astronomical instruments. Not just telescopes, but astrolabes and other things. And so that telescope is a new addition to their collection. And it's been not only used for astronomical purposes on Earth, but of course in Earth's orbit. And then we have one of the replicas, as you know, of Galileo's telescope, one of the three replicas that was made with all of the period materials and by the same techniques that Galileo used to optimize that for astronomy, if you can call it optimized. Massimino and I actually looked through it and Galileo was a very patient observer. That's about what I can say.

Sara: I really appreciate having a little bit of your time.

John: Oh, my pleasure.

Sara: Here at Blueshift, we're interested in those fundamental questions - how the Universe began, what's out there, and how we fit into the big picture. And we look forward to seeing more impressive discoveries from Hubble for years to come. As a bonus, we also asked Dr. Grunsfeld about his screensaver. Here's what he had to say.

John: Right now it's a picture of the Earth limb and then, the bottom of the screen is the Earth limb, and the top three quarters of the screen is black, punctuated by about a one inch long Hubble Space Telescope. And it's a picture that I took when we were leaving Hubble on STS-109.

Sara: You can find that image, and more information from this episode, on our website at universe.nasa.gov/Blueshift. You can also follow us on Twitter @NASABlueshift, where we tweet about news, updates, contests, and more.

We'll be back in mid-October with another behind-the-scenes look at the world of NASA astrophysics. Until then, this is Sara Mitchell, bringing the Universe closer to you with Blueshift.

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