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# Scoping for Knowledge

Growing up in Salina, Kansas, **STEVE HAWLEY**'s interest in science began at a very young age with a curiosity about his grandfather's physics books. "I didn't really understand it all and I recall asking him, 'What do you learn in physics?' He said, 'You learn how to think.' I thought that was pretty fascinating," says Hawley.

He liked astronomy because he thought it was interesting how astronomers could figure things out just by looking. Unlike physicists, chemists or biologists, astronomers can't do the usual experiments. "They just looked at things in clever ways and tried to make sense out of what they saw. That process seemed very attractive to me," he says.

From the beginning he was interested in the space program and astronauts, reading lots of science fiction and even making spaceships out of cardboard boxes while in grade school.

He earned his bachelor's degree in physics and astronomy from the University of Kansas in Lawrence. In 1978 NASA was looking for the first class of shuttle astronauts at the same time Hawley was getting his Ph.D. in astronomy and astrophysics from the University of California. He immediately applied. "I didn't think I would be selected but I didn't want to go through life wondering if I could have had I only applied," recalls Dr. Hawley.

As a scientist astronaut Dr. Hawley flew five shuttle missions, three of which dealt with telescopes in space. Best known is the launch of the Space Shuttle Discovery with the Hubble Space Telescope (HST) aboard on April 24, 1990. Hawley was the one who deployed the HST 380 miles above the Earth's surface where it has taken hundreds of thousands of pictures over the last 20 years. The Hubble was the first of four NASA space-borne observatories, known as the Great Observatories, each of which views at different wavelengths (visible, gamma, X-rays and infrared.)



*Photo Credit: NASA*

As he was about to deploy it, Hawley's mind raced with thoughts about how many people had devoted so much time to the HST and its potential to change our understanding of the universe. "The first thought put a lot of pressure on us to do the mission successfully, and the second thought was really exciting for me as an astronomer," he says.

To Hawley, one of the most amazing Hubble discoveries has been that the expansion of the universe is actually speeding up. "No one I know expected that. It was a real shock and showed that we know basically nothing about most of what makes up the universe," he says. "Also amazing is the ability of HST to take a picture of a planet around another star. We now know that there are more than 400 planets discovered around other stars. We haven't got photos of more than a couple but 20 years ago we didn't know there were planets around other stars at all."

Dr. Hawley retired from NASA in 2008 to come back to Kansas where he teaches physics and astronomy at the University of Kansas. One of his goals is to serve as an example to Kansas youth.

"I've heard lots of students say they really like certain science and engineering disciplines, but then they don't like or don't think they can do the math, so they give up. I tell them that science is fun and being able to do science and math enables you to do some really exciting things when you grow up. I can't say that I really enjoyed calculus, but it's one of the tools you need to be able to do science," he says.

"Doing science is fun. Being an astronaut was fun. If you work hard to develop the skills, the payoff can really be worth it. Lots of worthwhile things are hard to do. You just need to believe the reward is worth the hard work," says Dr. Hawley.