A place among the stars

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DURHAM — For internationally recognized astronomer Dr. Terry Forbes, it all began in his home state of Indiana at age 8 with a telescope won from a cereal box.

Forbes, professor emeritus at the University of New Hampshire’s Institute for the Study of Earth, Oceans and Space, recently received the prestigious 2016 George Ellery Hale Prize from the solar physics division of the American Astronomy Society. The award is given annually to an astronomer who has provided outstanding contributions to the field of solar astronomy.

When asked if he had always wanted to go into this line of academia, Forbes remembered...
thinking, as a child he would grow up and be either a singer or an astronomer. In junior high school his voice began to change, dashing his dreams of being a singer. Nearly at the same time, he discovered the science fiction section of the school library, and fell in love. The rest, as Forbes said, is tortured history.

He went on to earn his bachelor of science in physics at Purdue University in 1968. Despite push back from his undergraduate institution, Forbes was determined to study astronomy at the University of Colorado.

"Back then, Purdue specialized in solid-state physics. I remember my undergraduate advisor said 'you want to do what?' That's a ridiculous idea, you realize if you go into (astronomy) you will never get a job," Forbes said while laughing. "Eventually, they let me go."

In 1971, Forbes’ Ph.D. plans were interrupted when he was drafted into the Army. He was fortunate enough not to be deployed to Vietnam. Instead, he spent his two years of service at the atmospheric sciences lab at Fort Monmouth in New Jersey.

"One of my scientific papers was published while I was there, so that turned out better than I could have hoped," Forbes said.

After returning to Colorado, he was able to finish his doctorate in astrophysics in 1978. After receiving his Ph.D., he conducted research at the Los Alamos National Laboratory before taking a position as a research fellow in the Applied Mathematics Department at the University of St. Andrews in Scotland. His research has been supported by the National Science Foundation and NASA, and he also received research grants from France and the United Kingdom.

Forbes found his way to UNH after considering several other competitive offers from an institution in California, the Marshall Space Flight Center in Alabama and Boston College.

"I came (to UNH) because I knew the fellow who was to be my boss – Joseph Hollweg – and knew he was a nice guy. So the people were more important in that decision than the money involved," Forbes said.

Forbes began working at UNH's EOS Institute as a research scientist in 1984. He was promoted to associate research professor, serving from 1986 to 1990. From there, he was promoted to research professor until 2012, when he officially became professor emeritus.

These various research positions ultimately culminated in the George Ellery Hale Prize. The American Astronomy Society noted Forbes was recognized for his contributions to the theory of magnetic reconnection, his physics models of solar flares and coronal mass ejections, and for his work mentoring students and other scientists in solar physics.

Forbes said he has been working on these theories for the majority of his nearly 40-year career. In that time, he has become a leading international expert on magnetic reconnection theory, which is used to explain the behavior of solar flares and coronal mass ejections.

Forbes’ magnetic reconnection theory can also help predict the occurrence of solar eruptions. Space scientists have used this data to protect their satellites and other space assets from the harmful effects of these events.

In his research at St. Andrews, Forbes pushed the idea that the source of a solar flare or coronal mass ejection was a magnetic instability in the solar atmosphere, or corona, of the sun. He argued it was all one big motion, that the magnetic field and the solar plasma were moving upward, causing these large eruptions. His theories were met with overwhelming criticism and adversity. At the time, Forbes estimated only 10 percent of the scientific world agreed with him.

Most astronomers believed these solar eruptions were occurring below the visible surface of the sun, and what was happening in the atmosphere was just the aftermath.

"When you're doing research like that you can make a decision about what you're going to support, what you think is important, and you can push that forward," Forbes said.
Despite the initial challenges his theories faced, the scientific community gradually came to realize the eruptions were indeed caused by magnetic instabilities in the atmosphere.

“It’s the nature of that instability that we still argue about. It’s a process,” Forbes said.

Though Forbes work seems to be far from complete, he was thankful to have received this year’s Hale Prize. Forbes is the first from the UNH community to have received this specific award.

“I really feel grateful to all the people who have put in the work to nominate me for the award,” he said. “I see it as a wonderful gift from my colleagues.”

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