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Regional

Mather explains the known and unknown universe

How the universe began – and, of course, how it will end – has been a subject of debate between scientists and theologians for many years. It has occupied the attention of average people and has found its way into political debate. And it was the topic of the presentation by John Mather, the 2006 Nobel Prize winner in physics when he spoke at Southern Illinois University Edwardsville.

“To start with there wasn’t necessarily a beginning and there won’t necessarily be an end. I just wanted people to come to the lecture,” said Mather. “We know the universe is expanding and gradually getting cooler and producing stars and galaxies and planets.” He said that our understanding of the evolution of the universe has been so enriched by recent discoveries that even the term “big bang” is wrong.

“It’s just the popular name,” he said. “We should call it the expanding universe.” Mather, a Virginia native, is currently a senior astrophysicist in the observational cosmology laboratory at NASA’s Goddard Space Flight Center. He came to SIUE as this year’s Shaw Lecturer and as a part of the Arts and Issues series.

The universe as we know it today, he explained, is about 14 billion years old. And our solar system represents only a small part of it.

“And our particular human part is a very tiny fraction of that,” he said. “The fossils say that people that look like us have been here for a couple hundred thousand years, which is microscopic on the scale of the Earth.” One of the most striking facts about the universe that Mather pointed out is that it is not only expanding, but also its expansion is accelerating.

“We got quite a big surprise in 1998 when we discovered that the universe is accelerating, but we definitely have not explained it,” he said. “There is no law of nature that says it should be so that we know of. So it is just an observational fact right now.” A theory that has been floating around among some astrophysicists is that there may be even



Dr. John Mather delivering his talk during his recent visit to SIUE.

more universes besides ours out there. But are there any facts supporting such a hypothesis?

“If you mean knowledge in the sense of observational knowledge, it is completely impossible to know about those others,” Mather said. “Our definition of the word universe means everything that is. And our ability to see in terms of telescopes and tools just depends on what nature has given us to see, so we have only seen a very small amount of what we think is there. So as far as

I know, there is no logical possibility of ever measuring anything about these other universes that might exist. It doesn’t mean it’s not happening, we just can’t find out.”

Despite the fame and status that comes from his work, Mather said that he likes to talk to ordinary people about the wonders of the universe. He even participates in the USA Science and Engineering festival’s “Lunch with a Laureate” program, where middle and high school students get to engage with

a Nobel Prize winner over a brown bag lunch. Mather said that he found winning the Nobel to be a life-changing experience, but that he was initially surprised when he received the phone call from Stockholm.

“I thought, ‘Well that’s lovely, but probably the finger will not be pointed at us anytime soon.’ So I decided to not think about it. Then the year that we got the phone call several people told me that they thought it was my year,” he said. “I thought, ‘they aren’t supposed

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to know. It’s supposed to be secret, but I’ll at least pay attention.’

“So the day before the day they were supposed to announce it I looked up on the Internet to see if today was the day. And when the phone rang I thought, ‘That is it,’ so it wasn’t a total surprise,” he said. Mather received the Nobel Prize with George Smoot for his work measuring the background radiation of the universe, which has helped scientists to understand with a great deal of precision the energy that was produced when the universe started to expand. Mather said that the experience of going to Stockholm and receiving the award was incredible.

“It’s really an over-the-top kind of experience and you know your life is never going to be the same afterwards,” he said. “The minute I put the phone down after I got the call from Stockholm it immediately rang again, and I realized it was never going to stop ringing. I hadn’t had breakfast and was still in my pajamas. I had to just take the phone off the hook and start my day.” Within an hour reporters with cameras were at his door.

“Within a very short period of time I was doing a press conference with cameras all pointing at me and I thought, ‘oh what a world it is to be famous.’ Finally, I flew to Stockholm and off the plane I was greeted like royalty. The people meet you right off the plane, you don’t have to go through security,” he said. “I was shown to a small room where I could wait for my bag to come out, and they feed you chocolate candy that are exactly the same size and shape as Nobel Prize medals.”

Aldemaro Romero Jr. is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, “Segue,” can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College_Arts_Sciences@siue.edu.

Photo by Howard Ash/SIUE