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Lisa Randall teaches a physics class at Harvard. Randall speaks today at 11 a.m. in Graham Chapel.

Physicist reveals extra dimension mysteries

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The human eye may see in 3-D, but Lisa Randall, today's Assembly Series speaker, will encourage her audience to expand their minds and envision a universe with extra dimensions.

Randall, a professor of physics at Harvard University, recently wrote "Warped Passages: Unraveling the Mysteries of the Universe's Hidden Dimensions," a book on string theory and the dimensions of the universe.

"String Theory is a hot topic in theoretical physics today. She has made a name for herself and so she seemed to be the natural choice," said Michael Friedlander, professor of physics, explaining why Randall is this year's William C. Ferguson Science Lecturer.

"It's also very important that she's written a popular book," said Mark Alford, assistant professor of physics. "She's interested in reaching out to a wide audience and explaining string theory, getting people interested in it, even people who aren't necessarily scientific experts."

String theory is the attempt to find a unified description of quantum mechanics and gravity, said Alford. Many people are familiar with gravity, a concept Einstein tackled in his special theory of relativity, but quantum mechanics may evoke puzzled looks from non-physicists.

In a nutshell, "quantum mechanics is the theory that's required to explain the behavior of particles at very small distance scales, like the atom," said Alford. "It's been tested deeply and experimentally."

"Quantum mechanics is sort of the framework for all of physics as far as we can tell," he continued.

Yet Alford said that physicists are having trouble fitting in gravity within the quantum mechanical framework.

Randall addresses the complexity of these theories in her book, and will speak about understanding extra dimensions in her lecture today from 11-12 p.m. in Graham Chapel.

"I like solving problems and understanding how the world works," said Randall. "People should have the opportunity to understand physics. Particles tell us things about the world we would never know otherwise."

Her book builds off the history of physics of relativity, quantum mechanics, particle physics and string theory and why they might all tie together. While Randall admitted that her core subject is "obviously a hard subject," she said she enjoys making physics relatable to a lay audience.

Randall and Raman Sundrum of Johns Hopkins University co-published an influential paper in 1999 on extra special dimensions. Her theory may be further explored next year when the Large Hadron Collider in Geneva, Switzerland plans to generate enough energy to send particles to or through another dimension. The experiment may even create black holes on a microscopic level.

Both Friedlander and Alford applauded Randall for serving as a role model to women who want to enter the field of physics.

"It's good to see women in the senior ranks who are doing first rate work which is recognized," said Friedlander.

Alford agreed. "Women in science sometimes feel that they don't get as many role models as they'd like to have," he said. Randall's research can stand on its own, Alford said, but the fact that she's a woman at the forefront of the physics profession is "a bonus."

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