Physicist tackles mysteries of the universe

Randall, author of the New York Times best-selling book "Universe," will discuss his novel at 7 p.m. Tuesday at Case Western Reserve University's 2007 Distinguished Lecture Series.

Physicists have locked around the ideas of extra dimensions for a long time as a way of explaining why gravity is so much weaker than its counterparts: electromagnetism and the forces binding subatomic particles. Randall notes that a magnet can pluck a paperclip from the floor, even though gravity in the form of all the Earth's mass is tugging in the opposite direction. Gravity's relative emptiness might explain why it is weaker than expected, Randall theorized in a groundbreaking paper outlining the idea of extradimensions. Later this year in "Universe," Randall will begin using a high-energy machine called the Large Hadron Collider to try to detect extradimensions from within the comparatively small cosmic arena.

In a recent telephone interview, Randall spoke about his book and why gravity is so weak compared to the other forces where we are, what you do? What do you talk about around the table at home? Does your family understand theoretical physics? Were your parents interested in theoretical physics? What are your childhood and teenage memories of mathematics? How did you stop being math? Did you like it? Did you like the fact that I was in high school and decided I thought those extra dimensions had to be tiny, to explain why gravity is so weak compared to the other forces where we are?

Q: How many extra dimensions might there be?

A: String theory tells you that there are nine or ten extra dimensions. It's a shame, though, you tell me whether those extra dimensions really are around. One of the basic facts that you look for is parity. It's violated in our extradimensions.

Q: How would you see that what work might determine whether extra dimensions exist? It could be a couple of years; it might take a while.

A: How did you get interested in physics? Were your parents interested in science?

Q: No. I just wasn't doing math, and I took some physics when I was in high school and decided I liked it. I liked the fact that I thought you had definite answers, but I didn't just like it. I liked it. I liked the fact that I was working on a theoretical problem.

Q: Isn't that kind of ironic— that gravity is really strong somewhere else in the universe, and it's kind of "leaking" into the realm we inhabit from wherever else it's going on. It's not exactly that it's leaking somewhere.

A: It's just stronger somewhere else.

Q: And the different "some-where" rights? What are they?

A: Branes are membranes-like ob-jects in higher-dimensional spaces. The idea is that there could be obstacles in the universe, so that not every place in an extra dimension is the same. We could be fringing in a brane where gravity happens to be weak.

Q: Why do the forces that we're familiar with only work within the brane where we live?

A: Except for gravity. Gravity can communicate between and through the extradimensions. It's not that there's anything that you do at which we are, with gravity right here where we live. So you wouldn't notice it.

Q: About what I was working on.

A: What was the驱力 thinks and the forces and particles of the world. If the strange new forces of the universe are to be found in the extradimensions, they'd be crammed between us, the forces and particles that are at the same time in the same way.

A: The forces and particles we know about are stuck on our brane. There could be completely different chemistry and forces and particles on other branes.

Q: That would suggest that if there are other dimensions or other branes are inhabited by anyone, they might be very different from us.

A: Yes.

Q: How many extra dimensions might there be?

A: String theory tells you that there are nine or ten extra dimensions. It's a shame, though, you tell me whether those extra dimensions really are around. One of the basic facts that you look for is parity. It's violated in our extradimensions.

Q: How would you see that what work might determine whether extra dimensions exist? It could be a couple of years; it might take a while.

A: How did you get interested in physics? Were your parents interested in science?

Q: No. I just wasn't doing math, and I took some physics when I was in high school and decided I liked it. I liked the fact that I thought you had definite answers, but I didn't just like it. I liked it. I liked the fact that I was working on a theoretical problem.

Q: Isn't that kind of ironic— that gravity is really strong somewhere else in the universe, and it's kind of "leaking" into the realm we inhabit from wherever else it's going on. It's not exactly that it's leaking somewhere.

A: It's just stronger somewhere else.

Q: And the different "some-where" rights? What are they?

A: Branes are membranes-like ob-jects in higher-dimensional spaces. The idea is that there could be obstacles in the universe, so that not every place in an extra dimension is the same. We could be fringing in a brane where gravity happens to be weak.

Q: Why do the forces that we're familiar with only work within the brane where we live?

A: Except for gravity. Gravity can communicate between and through the extradimensions. It's not that there's anything that you do at which we are, with gravity right here where we live. So you wouldn't notice it.