

Physicist tackles mysteries of the universe

'Extra dimensions' theorist visits here

JOHN MANGELS
Plain Dealer Science Writer



Randall

Randall, author of the New York Times notable book "Warped Passages: Unraveling the Mysteries of the Universe's Hidden Dimensions," will discuss her research Tuesday as Case Western Reserve University's 2007 Distinguished Lecturer.

Physicists have kicked around the idea 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 wimpiness might make sense if it was filtered through more than just our three dimensions, like sunlight dimmed by its passage through multiple curtains.

Until recently, many physicists thought those extra dimensions had to be tiny, to explain why they've gone undetected. In 1999, Randall co-wrote a groundbreaking paper outlining the case for infinitely large extra dimensions. Later this year in Geneva, Switzerland, researchers will begin using a high-energy machine called the Large Hadron Collider to try to detect extra-dimensional particles.

In a recent telephone interview, Randall spoke about her work in cutting-edge physics.

Q: Your book is written for a lay audience, but the topic is complex. Why did you want the public to learn about extra dimensions?

A: The point was in part that people who wanted to know what's going on in physics can have access to it. Given that we're asking for funding for colliders, people should have the opportunity to understand it at a more deep level than you would get from a typical newspaper article.

Q: The mystery is why is gravity so weak compared to the other natural forces of electromagnetism and nuclear attraction.

A: In essence, it could be that gravity is really strong somewhere else in an extra dimension and very weak where we are. It sort of tails off in our direction.

Q: So gravity is kind of "leaking" into the realm we inhabit from some other dimension?

A: It's not exactly that it's leaking. It's just that it's everywhere but it's not equally distributed. It's just stronger somewhere else.

Q: And the different "somewheres" are branes, right? What are those?

A: Branes are membrane-like objects in higher-dimensional space. The idea is that space could be punctuated by these branes, so that not every place in an extra dimension is the same. We could be living in a brane where gravity happens to be weak.

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

A: Except for gravity. Gravity can communicate between and among branes.

Q: In a way, we're fortunate that gravity is as weak as it is. If we experienced its full power, whatever that is, would we be able to exist?

A: Well, if gravity was as strong as the other forces where we are, we'd be in big trouble.

Q: Would you expect that on different branes, in different dimensions, the forces and particles of the world we know would operate 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 these 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 10 total. But we really don't know.

Q: To date, the work in extra dimensions has been theoretical. Is there a way to physically test whether these things exist?

A: Yes. One of the basic tests is that you look for particles that travel in the extra dimensions.

Q: How soon would you expect that work might determine

If you go

What: Lisa Randall, a Harvard University physicist and author, speaks about the possibility of extra dimensions as Case Western Reserve University's 2007 Distinguished Lecturer.

When: 5:30 p.m. Tuesday.

Where: Severance Hall, 11001 Euclid Ave., Cleveland.

Cost: Free, although registration is encouraged. Go to Case.edu/events/dls/register.html or call 216-368-2417 for information.

cleveland.com/science

Listen to more of Lisa Randall's interview

whether extra dimensions exist?

A: It could be a couple of years; it could be 10.

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

A: No. I just liked 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. It wasn't just opinions.

Q: Isn't that kind of ironic — that you like definite answers but are in the most abstract field of all: theoretical physics?

A: I know. It's very funny.

Q: Does your family understand what you do? What do you talk about around the table at Thanksgiving?

A: I don't talk about my research that much. One of the fun things about writing the book was finally being able to talk to people about what I was working on.

To reach this Plain Dealer reporter: jmangels@plained.com, 216-999-4842

Monday~Week 12

HERE IS TODAY'S BINGO NUMBER

THE PLAIN DEALER

BINGO

N 36

Easter Bunny Headquarters...

Malley's

CHOCOLATES

216-226-8300
malleys.com

Driver dies inside car submerged in canal

Associated Press

CIRCLEVILLE, OHIO — A man drove his car into a flooded area and died after the vehicle

became submerged in a canal, authorities said.

Marshall Cottrill Jr., 33, of Frankfort, was driving south on Canal Road about 2 a.m. Saturday and went past two signs warning motorists that the road was closed because of high water,

according to the Pickaway County sheriff's office.

The force of the water pulled Cottrill's car into a canal that parallels the Scioto River, a few miles southwest of the city, authorities said. He was unable to escape.

Nominate a special nurse for our **Best of the Best** awards in celebration of National Nurses Week.



Help Us Recognize the Area's Outstanding Nurses!

Now you can share your story of how a nurse's compassion touched your life. Tell us how a nurse helped you or your family. What are your fondest memories of a nurse? What experience highlighted their exceptional skills? The winners will be chosen as the "Best of the Best" by a panel of health care experts. Then, on Wednesday, May 9th, The Plain Dealer and cleveland.com will publish the winning stories in our special "Best of the Best" section during National Nurses Week. So, be sure to nominate your favorite nurse for the "Best of the Best" award. It's the perfect way to express your appreciation for their extra effort.

How To Enter:

1. Nominations must be neatly printed or typed (double spaced) on a single 8" x 11" page. Please include your name, address, and day or evening phone numbers. Also include the hospital, institution or agency where the nurse is employed.
2. The Plain Dealer reserves the right to edit nominations.
3. Entries must be received by 5:00 PM, March 30, 2007.
4. One entry per person. Plain Dealer employees and their immediate families are ineligible. Entries become the property of The Plain Dealer and will not be returned.
5. Mail entries to: Best of the Best, Attn.: Pam Wagner, The Plain Dealer, 1801 Superior Ave. Cleveland, Ohio 44114. Email entries to pwagner@plained.com.

Or enter online at www.cleveland.com/jobs

THE PLAIN DEALER
MISS A DAY. MISS A LOT.



Hurry, entry deadline March 30th!

Do you have Gout?

PAIN, SWELLING, TENDERNESS IN YOUR JOINTS?

Our physicians are conducting a research study to see if an investigational drug can lower uric acid levels in the body (high uric acid can cause gout). If you have a history of gout or are currently experiencing gout symptoms, you may qualify to participate. As a study participant, you will receive all study related care at no charge, including physical exams, lab services and study medication. To learn how you can join over 2,000 other study participants, call our office today or log on to www.gouttrial.com.

HEALTH RESEARCH ASSOCIATES, LLC
216.381.9490

Cerebral Palsy ALERT!

If you have a child with Cerebral Palsy, developmental delays or physical disabilities due to complications of labor and delivery, your child may be entitled to compensation.

Contact:
NOVAK, ROBENALT & PAVLIK, L.L.P.
950 Skylight Office Tower, Tower City Center
Cleveland, Ohio 44113
216-781-8700
OR TOLL FREE 1-877-851-8736
www.nrplaw.com

Buy One Get One FREE with Coupon

Discount Drug Mart Brand
Ibuprofen Pain Reliever/Fever Reducer

24 Coated Caplets
Store Coupon expires 03/25/07

THE PLAIN DEALER
Coupon Value \$1.99