

The Oberlin Review

Sunday, January 5th, 2014

ESTABLISHED 1874

Off the Cuff: Dr. Lisa Randall

by [WILL PASSANNANTE](#)

APRIL 7, 2013

Dr. Lisa Randall is a theoretical physicist, the Frank B. Baird, Jr., Professor of Science at Harvard University and the first female theoretical physicist to gain tenure there, as well as at MIT. Business Insider calls her "one of the most highly-cited thinkers in theoretical physics," and TIME magazine included her in its 2007 list of the world's 100 most influential people. She spoke at Oberlin on Tuesday night in Finney Chapel as part of the Convocation series.

In your presentation, you said that you wrote a “physics opera.” Can you talk a little more about that?

I actually wrote the libretto and sort of helped design the story. I worked pretty closely with the composer [Héctor Parra] and also actually with the set designer, Matthew Ritchie. Héctor and I communicated. We had a concept of what we'd like it to be. I wrote some stuff; he said you have to make it this way for my music, use shorter phrases.” [He] said, “It’s an opera, they should talk to each other more.” I did more expository writing, so it was a nice back-and-forth process. In the end I think it had more physics than I would have done, but that was in part because he really wanted it for his music.

What were you each looking to accomplish with the opera?

I think we each had slightly different goals in doing this, ... but I think Héctor was trying to explore both musically what you can do and really used it as a way to expand these things. I was interested in telling the story through music and visual images and Matthew was interested in also doing that, I guess, at some level.

You stated that most mass in the universe is, contrary to what is often reported, not from the Higgs mechanism. Why do you think it is often reported in this way?

Because I just think people don’t understand. Because that’s what they’re told, [that] the Higgs boson is associated with mass. ... I mean, I went out of my way to explain it. It’s a little complicated. But I think it’s just simple to say the Higgs boson gives mass and it sounds simple, but it’s not actually the way it works.

[About the Review](#)
[Advertise with us](#)
[Content Submission](#)
[Online Policy](#)
[Contact](#)

ADVERTISING

I'm going to start with a two-part question. First, what is supersymmetry?

Well, supersymmetry is actually an extension of the symmetries of space and time the symmetries that say things look the same in every direction or at any time, into the quantum regime. The actual physical consequence is that for every particle we know about there's a partner particle that would have the same charge and mass.

So then, part two: what would the consequences for supersymmetry be if the Large Hadron Collider fails to detect supersymmetric particles?

It would mean it's probably not relevant to the hierarchy problem of particle physics ... that I talked about in the talk today. The problem of why masses are what they are. Right now, ... the question isn't just whether supersymmetry exists, but whether supersymmetry exists and is broken at a scale that is relevant to the physics being explored at the Large Hadron Collider. So if it's not there, it probably is not by itself an explanation for why masses are what they are.

You mentioned this at the end of the talk, but could you go into some more specifics about the experimental evidence that we could find, for example, for the Randall-Sundrum model? (Question from *The Synapse*.)

It really is these particles called Kaluza-Klein particles — particles that have momentum from the extra dimensions. Which particular particles you would find depend on the details of how it's implemented. It also has consequences potentially for how particles acquire their masses — sorry, what masses actually come about, so what mass relations you'd have, but that'll be harder to test. Really the best test is just these Kaluza-Klein particles.

[Comments \(0\)](#)



[Share](#)

[NEWS](#) | [OPINIONS](#) | [ARTS](#) | [SPORTS](#)

[ABOUT US](#) | [ADVERTISING](#) | [CONTENT SUBMISSION](#) | [ONLINE POLICY](#) | [CONTACT](#)

© COPYRIGHT OBERLIN REVIEW 1996 – 2014.

ALL RIGHTS RESERVED.