

Interview: Sarah Baxter meets Lisa Randall

A woman of unworldly ability

When I told a scientifically minded friend that I was going to meet Lisa Randall, the distinguished theoretical physicist and cosmologist, he exclaimed: "She's like a sexier Jodie Foster!" He is not the first person to have noticed the similarities.

Randall herself goes on to tell me students of hers often make the same comparison. "Is Contact based on you?" they'll ask, referring to the film in which Foster plays a clever and pretty young astronomer who thinks she can hear aliens.

"Er, no," she responds, "but it's very flattering. And I actually know the person it is based on."

I can see why Randall, a Harvard professor, is described that way. She has the same piercing blue eyes, shoulder-length blonde hair and slender physique as the Hollywood star. And they are virtually the same age: both born in 1962 (Randall turned 43 yesterday).

You could say they exist in different dimensions or that they are evidence of supersymmetry. But that would be to treat far too lightly Randall's signature theory that the world has many more dimensions to it than three; and that we just can't see as yet beyond the up-down, left-right and forward-backward movements we learnt as a baby when we crawled and climbed out of our cot.

If Foster really were to exist in a different dimension, the point is we wouldn't know she was there. In what has been called the best scientific idea for the past decade, Randall writes: "Although we can't see them or feel them, additional dimensions of space are a logical possibility."

Enticingly, she adds that the stuff of science fiction: "parallel universes, warped geometry and three-dimensional sinkholes . . . are genuine scientific scenarios that could arise in a multi-dimensional world". No wonder her ideas are reaching an expanding mass: the general public.

In the tangible world that we think we know, Randall is the real deal rather than an actress playing the role of a super-brainy scientist. As Larry Summers, her boss at Harvard, recently affirmed — in a politically incorrect comment about innate differences between men and women that nearly cost him his job — there aren't that many to go around.

It is also why a penitent Summers went on to appoint Randall to Harvard's taskforce on the recruitment of women science professors. "I was surprised he made those remarks. He's pretty sorry about them," she says as diplomatically as she can muster. "Personally I've always found he's very respectful of me as a scientist."

Randall was in Britain last week, where she wowed audiences at the Royal Institution in London and the Cheltenham Science Festival while publicising her book *Warped Passages*, just published by Penguin. She is beginning to attain the guru status among experts and lay enthusiasts reserved for Stephen Hawking, legendary author of *A Brief History of Time*.

Hawking literally and metaphorically made space for the newcomer by saving her a seat next to him at a Cambridge dinner.

"Ah, yes, that was embarrassing," she laughs. "I arrived an hour late because I'd slipped away to have a beer with someone in a pub."

Randall lives alone in a pretty, clapboard house covered with rambling roses in the "other Cambridge" in Massachusetts, home of Ivy League Harvard, where I caught up with her the day after she returned home.

She tells me she has a boyfriend who does mathematical modelling for a financial company.

"Ah, good," I say, "so he understands your work," but she looks doubtful. Although she has been praised by reviewers for making difficult concepts approachable, she says: "It's easy to simplify so much that you're not really talking about the science. I just don't believe in doing that."

Little remains of the shy girl from the unfashionable borough of Queens, New York, who was once told by a physics tutor: "If you're going to do this, you are going to have to start talking to people more."

Randall's mother, a primary schoolteacher, gave up work to raise her and her two sisters while her father was a sales rep with a bit of an engineering background who almost made it as a professional baseball player.

Frankly, Randall's origins sound rather ordinary. "I was the first person in my family to get a PhD," she says with understandable pride. But then she goes on to reveal that her younger sister is a professor of computer sciences in Georgia — "she sort of followed in my footsteps".

What is more, her older sister has learning difficulties that have never been properly diagnosed, and works in McDonald's. "She has a boyfriend and she's happy," Randall says simply.

My curiosity is aroused. What sort of learning difficulties? I ask. I have an "aha" moment when she replies that her older sister has symptoms very like Asperger's, a mild form of autism that is often associated with exceptional intelligence.

"She has the most amazing memory," she says. "When she was young she memorised the Latin names for every medical speciality."

I find, however, that Randall is not interested in drawing easy conclusions about the proximity of genius to simple-mindedness. "What we have in common in our family is that we're all fairly obsessive. Beyond that, I hesitate to . . ." her voice trails off. "We're incredibly different."

I get even shorter shrift when I raise the theory of the "male" versus the "female" brain. Some experts on autism believe people with Asperger's — of whatever sex — are more likely to have a "male" brain and that this helps to explain, *pace* Summers, men's alleged gift for science.

"How many people really understand this issue?" she says, pulling a face. "And why are they so interested in latching on to these differences?"

Randall decided sexism would not hold her back when a seemingly progressive careers adviser visited her class at school and said boys and girls could do any job they wanted. "Boys can even be nurses," he added enthusiastically. "They can be head nurses!"

As a girl, Randall enjoyed mathematical puzzles and games. "I was looking for certainty. What I liked was that there were definite, nice, neat answers."

In science there were always more questions than answers, but Randall feels the same impulse is propelling her towards solving challenges. With a trendy flourish, she cites lyrics by musicians from Bjork and Suzanne Vega to Eminem at the opening of every chapter of her book.

The most telling quote is by Talking Heads: "And you may ask yourself: Am I right . . . Am I wrong?"

"That's what makes it fun," she says. "Very often research is about finding the small glitch or inconsistency that is at the root of the really big issues."

For now, her research is theoretical. "Ultimately we will want to do experiments, but you have to start somewhere. Some of the theories, not all of them, will be tested in a few years."

She is particularly excited about the prospect of smashing particles together to create energy at the Large Hadron Collider in Switzerland.

One of the conundrums that fascinates her is why gravity is so weak that even the tiniest magnet can defy the Earth's pull.

She is hoping that gravitons, the particles that transmit gravitational force, will be revealed to have heavy particles co-existing alongside them in a hidden dimension.

Why does it matter? "When I first went into physics I would have thought this was a silly topic," she admits.

"I thought, who cares if you can't measure it and it has no impact on our world." She says her boyfriend jokes: "It's too soon to invest in property in extra dimensions."

Yet Einstein, she points out, had little idea about the practical uses of the general theory of relativity but it now forms a key component of GPS (global positioning satellite) technology.

There is, in any case, something beautiful and appealing about her research. Randall's hidden dimensions can be infinitesimally large or small in size, rolled and compressed like a hosepipe or warped like a distorting mirror at a funfair. A new universe — several, in fact — could fit alongside our own.

In a wonderful analogy, she imagines a heavenbrane (a dimension held within a membrane) with the bored righteous stuck on it, unable to gamble and smoke.

In another dimension the jailbrane hosts all the world's unsavoury characters. The two are forever separated from each other.

Could God exist in one of these dimensions? I ask. The question doesn't really interest her. "I don't see any reason why God is more likely to be there than anywhere else," she replies.

What about life? To Randall, that is a more exciting prospect. "If it's there, it is likely to be based on a fundamentally different chemistry. It really extends your imagination. It's not just a question of little green men with antennae."

I begin to imagine her wandering through the world — even the living room we are sitting in — like an ancient seer, able to glimpse things we mortals cannot guess at. In the background I can almost hear the tinkling music of the spheres.

Perhaps you have some kind of sixth sense, I suggest.

She laughs indignantly and brings me back to earth. "Are you saying I see dead people?"

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