

September 23, 2008, 6:37 AM

Lisa Randall

Theoretical physicist, 46 · Cambridge, Massachusetts

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$$ds^2 = e^{-kr} (dx^2 + dy^2 + dz^2 - c^2 dt^2) + dr^2$$

LISA RANDALL'S WARPED model of the universe (expressed mathematically, above) could irreversibly change the way we understand the cosmos. And in an era when much of theoretical physics is so abstract as to be unprovable, it represents a new age in which testing will become as important as postulating.

According to her model, which Randall developed with Johns Hopkins physicist Raman Sundrum, the reason gravity on Earth appears to be so weak compared with the other natural forces is that our

universe is actually warped by a hidden fifth dimension; any gravity we get could just be leftovers from the imperceptible dimension next door.

When the Large Hadron Collider in Europe begins collecting data later this year, one of the things it will be looking for is gravitons, theoretical particles of gravity. If as protons are slammed together in the collider a graviton were to appear and then instantaneously disappear, it would be a strong indication that Randall is correct.

If that happens, it will not only go a long way toward solving one of physics' biggest mysteries--why gravity appears to be relatively weak--but prove a much-needed boon to string theorists, whose models depend upon heretofore unproven hidden extra dimensions. It would also offer the first hard data to support the even wilder possibility that our four-dimensional universe is just one of an infinite number of universes, all floating freely in space.

Yet even if she's wrong, Randall's impact and influence will help drive physics for many years to come. Her emphasis on not just developing mind-bending scenarios but finding ways to make them testable will set the stage for how the study of physics will be conducted in the future.

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