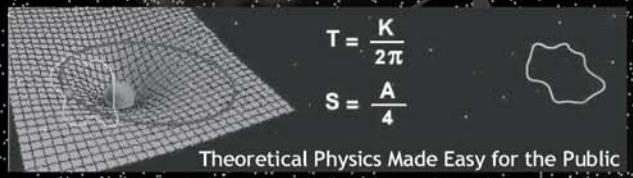
Theoretical Physics
made easy
for
the public



Theoretical Physics Made Easy for the Public

Venue Information

Address:

38 Cameron Gallery

38 Cameron Avenue

Cambridge, MA 02140

www.38cameron.com

Date: Saturday, September 15th 2007

Time: 1:00 PM – 4:30 PM

818 - 935 - 0466

Free to the Public

General Seating

Space is limited. Please register early.

Contact: events@multiversaljourneys.org

Speakers subject to substitution

Abstracts

Is time travel possible?

Einstein's General Relativity tells us that space and time together form a 4-dimensional spacetime that is curved by the presence of matter and energy. If we could produce the proper state of matter and energy, the spacetime could curve enough to permit travel into the past. But ordinary forms of matter are not sufficient. Instead we would need exotic material with negative energy density. The possibility of time travel depends on whether quantum mechanics can provide us with the proper negative-energy-density state. The lecture will present the state of the art in designing a time machine or proving that it is impossible to do so, and the related issues of wormholes and faster-than-light travel. Time-travel ideas related to quantum mechanical correlations and tunneling of a signal through a barrier will be briefly discussed.

Einstein's Biggest Blunder? A Cosmic Mystery Story

In 1915 Einstein completed his greatest triumph, the General Theory of Relativity. This remarkable theory laid the basis not just for our understanding of the motion of objects within the Universe, but the motion of the universe itself! Yet, in 1916, it looked as if Einstein's theory did not properly account for observations of the universe on large scales. To resolve this problem, he added an additional term to his equations, the so-called "Cosmological Constant". Within a decade however, observations indicated that such a term was not necessary to obtain agreement with observations, and Einstein called this addition his "biggest blunder".

Over the past decade, new observations have led to a revolution in cosmology. The standard model of cosmology built up over a 20 year period up until the early 1990's is now dead. Its replacement may be far more bizarre. In particular, new data from a wide variety of independent cosmological and astrophysical observations, combine together to strongly suggest most of the energy density of the universe today may be contained in empty space! Remarkably, this is exactly what one would expect if Einstein's Cosmological Constant really exists! If it does, its origin is the biggest mystery in physics. The discussion will end by briefly describing possible implications for our understanding of nature, for physics, and for life, of this astounding new result.

General Relativity, Going Strong at 92:

Time Travel and Dark Energy

Saturday

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This is a Non-Profit Event and is supported by grant RFP1-06-30 from the Foundational Questions Institute (fqxi.org)

Organized by

Multiversal Journeys

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