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***<http://www.mvjs.org>***

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# Corporate Background

Founded in 2006 to advance research & communications in the field of Theoretical Physics & Cosmology.

Multiversal Journeys is a 501(c) (3) non-profit organization. Our non-profit educational status is also approved by the state of California under section 23701d.

# Our Mission

*To advance research and raise public awareness  
& interest in Theoretical Physics and Cosmology*



# Sources of Funding

## 1. Grants – Private Foundations

FQXi (Foundational Questions in Physics & Cosmology Institute): <http://fqxi.org/grants/>

## 2. Grants – US Government

NSF (National Science Foundations)  
Dept. of Education

## 3. Corporate Donations

*Donations to Multiversal Journeys are deductible to the maximum extent permitted by the laws*

# Charter

Research in leading edge concepts in Theoretical Physics & Cosmology.

Educating the public in the latest discoveries in Theoretical Physics and Cosmology in a non-technical language.

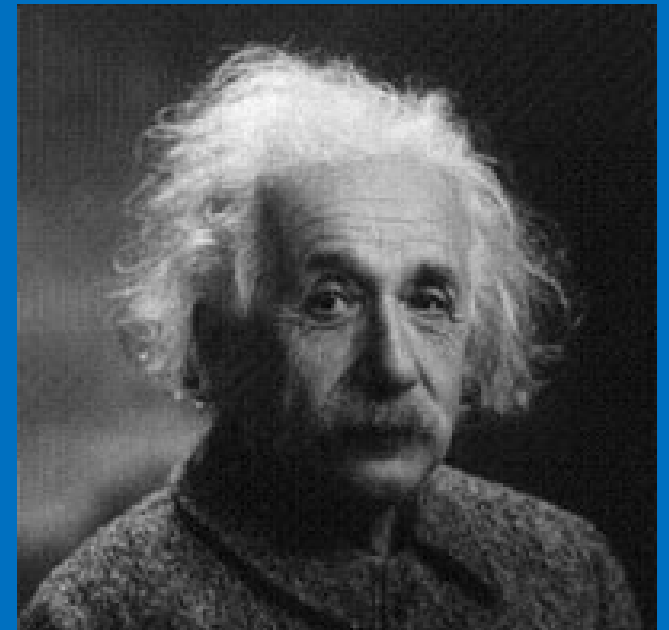
Lecture Series

Panel Discussions

Book Series

Educational DVDs

Production of Documentaries/Films

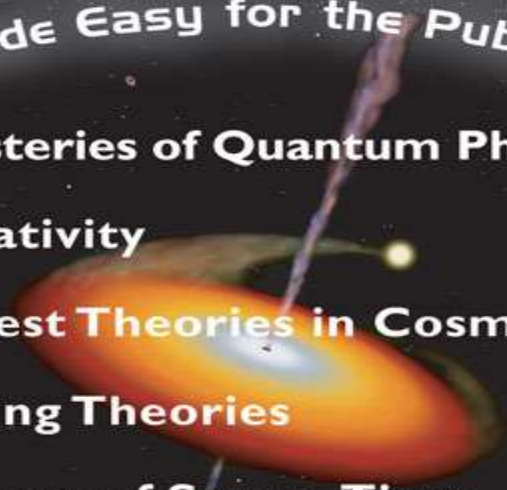



# Scope

**Multiversal Journeys**  
Presents

**"Theoretical Physics  
Made Easy for the Public"**

- **Mysteries of Quantum Physics**
- **Relativity**
- **Latest Theories in Cosmology**
- **String Theories**
- **Nature of Space-Time**
- **Theory of Everything**
- **Time Travel**



  
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[www.multiversaljourneys.org](http://www.multiversaljourneys.org)

# Advisory Boards

## Scientific Advisory Board

- Professor Fred Adams - University of Michigan, Ann Arbor
- Professor Yasunori Nomura - University of California, Berkeley; Director of Berkeley Center for Theroetical Physics
- Professor John Terning – UC Davis

## Book Series Advisory Board

- Prof. Thomas Buchert - University Claude Bernard in Lyon, France
- Prof. Lawrence M. Krauss, Arizona State University, Tempe, AZ
- Prof. Mark Trodden, University of Pennsylvania, Philadelphia, PA



# Conferences - UC Berkeley, CA

## Clarifying Theoretical Physics & Cosmology Misconceptions Lawrence Hall of Science



### CLARIFYING THEORETICAL PHYSICS *and* COSMOLOGY MISCONCEPTIONS For SF Bay Area JOURNALISTS & the PUBLIC

**Topics:** Misconceptions about Quantum Physics,  
Multiverse Cosmology, Particles Physics, and Space-Time

**Speakers:** Professor Yasunori Nomura,  
Professor William Poirier, and Professor John Terning



**Date:** Thursday, July 9th, 2015

**Time:** 1:30 PM – 5:00 PM

**Lawrence Hall of Science  
University of California Berkeley**

**FREE TO THE PUBLIC**

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

For more information about  
the conference  
Please visit  
[www.mvjs.org](http://www.mvjs.org)

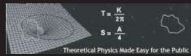
  
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# Conferences - Notebaert Nature Museum; Chicago, IL

## A Symposium on the Future of the Universe The Chicago Academy of Sciences

Theoretical Physics  
made easy  
for  
the public



### VENUE INFORMATION

Address:

**The Notebaert Nature Museum**  
2430 N. Cannon Drive  
Chicago, IL 60614

**Date: Saturday, October 20<sup>th</sup> 2007**  
**Time: 10:00 am – 1:30 pm**

773-775-5100  
**Free to the Public**  
General Seating

**Space is limited. Please register early.**  
**Contact: [events@multiversaljourneys.org](mailto:events@multiversaljourneys.org)**

Speakers subject to substitution

### ABSTRACTS

#### INTO THE DARK

##### The Future History of the Universe

This talk outlines the long term fate of the cosmos. We consider the evolution of planets, stars, galaxies, and the universe itself over time scales that greatly exceed the current age of the universe. This discussion starts with new stellar evolution calculations that follow the development of the low mass (M type) stars that dominate the stellar IMF. We then determine the final mass distribution of stellar remnants – the neutron stars, white dwarfs, and brown dwarfs remaining at the end of stellar evolution. After several trillion years, the supply of interstellar gas grows depleted, yet star formation continues at a highly attenuated rate through brown dwarf collisions. This process tails off as the galaxy gradually loses its stars by ejecting the majority, and driving a minority toward accretion onto massive black holes. As the galaxy disperses, weakly-interacting dark-matter particles are accreted by white dwarfs, where they subsequently annihilate and keep the old stellar remnants relatively "warm". After accounting for the destruction of the galaxy, we consider the fate of expelled degenerate objects (planets, white dwarfs, and neutron stars) within the assumption that proton decay is a viable process. The evolution and eventual sublimation of these objects is dictated by the decay of their constituent nucleons; this scenario is developed in some detail. After white dwarfs and neutron stars have disappeared, the black holes slowly lose their mass as they emit Hawking radiation. After the largest black holes have evaporated, the universe slowly slides into darkness.

#### OUR MISERABLE FUTURE

Discoveries in cosmology over the past decade have revolutionized our view of the future of the universe and life within it. These new discoveries and their implications for the future of life will be discussed. The focus will be on our own future in the relatively near term (i.e. the next 5 billion years), which will provide challenges for the future of intelligent life in our solar system, and then moving on to the very far future, when it appears the universe we live in may be worst of all universes for the future of life. Even before life itself ends, as it must in such a universe, the quality of life will decrease, as our empirical knowledge of the universe will also decrease. All evidence of the big bang, and of the existence of other galaxies outside our own will disappear on a timeframe that is short compared to the lifetime of the longest lived stars. Astronomers in the future will believe they live in a static universe with only one island galaxy. Remarkably the current epoch seems quite special in the history of the universe for a variety of reasons. Is there any significance to this? Arguments about this are changing the way many scientists view a possible understanding of nature.

Multiversal Journeys Presents

A Symposium on The Future of the Universe

## INTO THE DARK The Future History of the Universe AND OUR MISERABLE FUTURE

**Saturday  
October 20, 2007  
10:00 am to 1:30 pm**

**The Notebaert Nature Museum**  
2430 N. Cannon Drive  
Chicago, IL 60614

**Free to the Public**

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

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[www.MultiversalJourneys.org](http://www.MultiversalJourneys.org)

## A SYMPOSIUM ON THE FUTURE OF THE UNIVERSE

**Our Miserable Future**  
**Professor  
Lawrence  
M. Krauss**

Case Western Reserve University

**INTO THE DARK**  
**The Future History  
of the Universe**  
**Professor  
Fred Adams**

University of Michigan, Ann Arbor

**Date: Saturday, October 20<sup>th</sup>, 2007**  
**Time: 10:00 AM – 1:30PM**

**Admission is FREE**

**The Notebaert Nature Museum**  
2430 N. Cannon Drive, Chicago, IL 60614

773-775-5100

For more information  
about the symposium  
Please visit  
[www.MultiversalJourneys.org](http://www.MultiversalJourneys.org)

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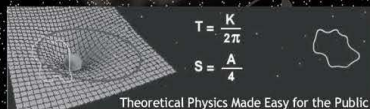
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Foundational Questions  
Institute (fqxi.org)



# Conferences - Cambridge, MA

## General Relativity, Going Strong at 92: Time Travel and Dark Energy

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](http://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](mailto: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  
September 15, 2007  
1:00 p.m. to 4:30 p.m.

**38 Cameron Gallery**

38 Cameron Avenue  
Cambridge, MA 02140  
[www.38cameron.com](http://www.38cameron.com)

**Free to the Public**

This is a Non-Profit Event and is supported by  
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**GENERAL RELATIVITY,  
GOING STRONG AT:  
92  
TIME TRAVEL  
AND  
DARK ENERGY**

**Date: Saturday, September 15th, 2007**

**Time: 1:00 PM – 4:30PM**

**Admission is FREE**

**Professor 38 Cameron Gallery**  
**Ken Olum 38 Cameron Avenue**  
**Cambridge, MA 02140**

**Professor  
Lawrence  
M. Krauss**

Organized by



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For more information  
about the symposium  
Please visit  
[www.MultiversalJourneys.org](http://www.MultiversalJourneys.org)

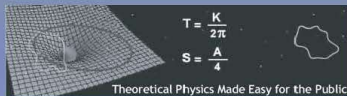
This is a Non-Profit Event  
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Foundational Questions  
Institute ([fqxi.org](http://fqxi.org))



# Conferences - UCLA, Los Angeles, CA

## It's About Time: The Concept of Time, Cosmology and the Latest Theory about Time

Theoretical Physics  
made easy  
for  
the public



### VENUE & TICKET INFORMATION

Address  
Hillel at UCLA  
574 Hilgard Avenue  
Los Angeles, CA 90024

Date: Sunday, July 29th 2007  
Time: 1:00 PM – 4:30 PM

Ticket information:  
<http://www.ticketweb.com>

[www.ticketweb.com](http://www.ticketweb.com)  
**TICKETWEB**

866-468-3399  
Admission: \$5  
General Seating

For more information about the Symposium  
please visit:  
<http://www.MultiversalJourneys.org>

Speakers subject to substitution

### ABSTRACTS

#### The Beginning and End of Time: Life, The Universe, and Nothing

One can consider measuring time by the number of events that occur within some period. In this sense, more happened in the first second in the history of the universe than has occurred in the history of the universe since that moment. The first part of the lecture highlights some of the major milestones in that initial moment, and then moves on to discuss the future. Our current observations suggest we live in the worst of all universes for the long term future of life, and that our knowledge about the state of the universe will continue to decrease with time. In the far future we will be alone in a largely dark and empty universe.

#### Two-Time Physics: The Unified View From Higher Dimensional Space and Time

Evidence has been gathering that the ordinary formulation of physics, in a space-time with three space and one time dimensions, is insufficient to describe our world, just like shadows on walls alone are insufficient to capture the true essence of an object in a three dimensional room. Two-Time Physics reveals that our physical world in 3 + 1 dimensions is like a shadow of a highly symmetric universe in four space and two time dimensions. Amazingly, the best understood fundamental theory in Physics, the Standard Model of Particles and Forces is reproduced, and its "strong CP problem" is solved, as a field theory in 4 + 2 dimensions in the context of Two-Time Physics. This point of view provides new mathematical tools and new insights for understanding our universe. Evidence of the 4 + 2 dimensional world can be found both at the macroscopic and microscopic scales in the form of hidden symmetries and "dualities", and such predictions of Two-Time Physics can be tested through theory and experiment. Two-Time Physics may assist in the quest to unify the Standard Model with Einstein's theory of General Relativity in a single unified theory. The most popular approach to that problem today, superstring theory, and its extension M theory, invoke 10 dimensions of space, but a single dimension of time. The path to success with formulating M theory, which so far eluded theoretical physicists, could well be adopting the more symmetric and higher dimensional Two-Time Physics approach. This would require adding one time dimension plus one space dimension, giving nature 11 space and two time dimensions. The Two-Time Physics version of M theory would have a total of 13 dimensions.

## It's About Time: The Concept of Time, Cosmology and the Latest Theory about Time.

Sunday, July 29 2007  
Hillel Center, UCLA  
574 Hilgard Avenue  
Los Angeles, CA 90024

This is a Non-Profit Event and  
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[www.MultiversalJourneys.org](http://www.MultiversalJourneys.org)

## IT'S ABOUT **TIME**: THE CONCEPT OF **TIME**, COSMOLOGY, AND THE LATEST THEORY ABOUT **TIME**

Date: Sunday, July 29th, 2007

Time: 1:00 PM – 4:30PM

Hillel Center, UCLA  
574 Hilgard Avenue  
Los Angeles, CA 90024

[www.ticketweb.com](http://www.ticketweb.com)  
**TICKETWEB**  
866-468-3399

Professor  
Itzhak Bars

Professor  
Lawrence  
M. Krauss

Admission: \$5  
General Seating  
For more information  
about the symposium  
Please visit

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# Conferences - UC Berkeley, CA

## Extra Dimensions and String Theory: Physics of the Future or Pure Mathematics?

**VENUE & TICKET INFORMATION**



Venue: Lawrence Hall of Science  
University of California at Berkeley  
<http://www.lawrencehallofscience.org>

Date: Saturday, April 7, 2007  
Time: 1:00 to 4:00 pm


Ticket information:  
<http://www.ticketweb.com>  
**TICKETWEB**  
866-468-3399  
Admission: \$5  
General Seating

For more information about the Symposium  
please visit:  
<http://www.MultiversalJourneys.org>

Speakers subject to substitution


**EXTRA DIMENSIONS  
AND STRING THEORY**

Physics of the Future  
or  
Pure Mathematics?



$$T = \frac{K}{2\pi}$$
$$S = \frac{A}{4}$$

Theoretical Physics Made Easy for Public

Saturday, April 7, 2007  
Lawrence Hall of Science  
University of California, Berkeley, CA



This Event is supported by grant RFP1-06-30  
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**Theoretical Physics Made Easy for The Public**

## EXTRA DIMENSIONS & STRING THEORY

### Physics of the Future or Pure Mathematics

Two of the  
**WORLD'S RENOWNED PHYSICISTS**  
will explain **STRING THEORY**  
& **EXTRA DIMENSIONS** in Layman's Terms

Saturday, April 7, 2007  
from 1 to 4 p.m.

Lawrence Hall of Science  
University of California, Berkeley, CA

[www.ticketweb.com](http://www.ticketweb.com)  
**TICKETWEB**  
866-468-3399  
Admission: \$5  
General Seating

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



# Conferences - Skirball Museum, LA, CA

## Space-Time & the Cosmos

### VENUE & TICKET INFORMATION



Venue: Magnin Auditorium  
Skirball Cultural Center  
<http://www.skirball.org>

Date: Saturday, December 17, 2005  
Time: 1:00 to 5:00 pm  
Free Parking

Ticket information:  
<http://www.ticketweb.com>

[www.ticketweb.com](http://www.ticketweb.com)  
**TICKETWEB**

866 - 468 - 3399  
Admission: \$80  
Students: \$60  
General Seating

For more information about the Symposium  
please visit:  
<http://www.MultiversalJourneys.com>  
Speakers subject to substitution.

Theoretical Physics  
Made Easy for Public

### A Symposium on Space-Time & The Cosmos



Saturday, December 17, 2005  
Skirball Cultural Center  
2701 N. Sepulveda Blvd.  
Los Angeles, CA 90049



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[www.MultiversalJourneys.com](http://www.MultiversalJourneys.com)

## Ever Wondered if Other Dimensions or Universes Really Do Exist?

Three of the world's renowned physicists will explain their  
latest findings about the Universe in layman's terms.

## "SPACE - TIME and the COSMOS"

Saturday, December 17, 2005  
Skirball Cultural Center, Los Angeles, CA

For more information please visit

[www.multiversaljourneys.com](http://www.multiversaljourneys.com)

[www.ticketweb.com](http://www.ticketweb.com)

**TICKETWEB**

866.468.3399

Promotion Code  
TimeMachine  
Save 40%

# Conferences - UC Berkeley, CA

## Latest Theories about the Universe & Its Governing Laws

**VENUE & TICKET INFORMATION**



Venue: Lawrence Hall of Science  
University of California at Berkeley  
<http://www.lawrencehallofscience.org>

**Date: Saturday, November 5, 2005**  
**Time: 1:00 to 5:00 pm**

Ticket information:  
<http://www.ticketweb.com>  
**TICKETWEB**  
866 - 468 - 3399  
Admission: \$80

For more information about the Seminar,  
please visit:  
<http://www.MultiversalJourneys.com>

Speakers subject to substitution

**Theoretical Physics Made Easy for Public**

**Latest Theories about  
The UNIVERSE  
&  
ITS GOVERNING LAWS**



$T = \frac{K}{2\pi}$   
 $S = \frac{A}{4}$

Theoretical Physics Made Easy for Public

Saturday, November 5, 2005  
Lawrence Hall of Science  
University of California, Berkeley, CA



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### Ever Wondered if Other Dimensions or Universes Really Do Exist?

Three of the world's famous scientists  
will explain their latest findings about  
the universe in layman's terms

#### "Latest Theories About The Universe"

**Saturday, November 5th**

Lawrence Hall of Science, UC Berkeley

For more information please visit

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**TICKETWEB**  
**866.468.3399**

# Speakers

*Our speakers are some of the world's renowned physicists:*

- Professor Fred Adams - University of Michigan, Ann Arbor
- Professor Anthony Aguirre - University of California, Santa Cruz
- Professor Itzhak Bars - University of Southern California, Los Angeles
- Professor Raphael Bousso - University of California, Berkeley
- Professor Gary T. Horowitz - University of California, Santa Barbara
- Professor Lawrence M. Krauss - Origins Initiative, ASU
- Professor Yasunori Nomura - University of California, Berkeley
- Professor Ken Olum - Tufts University, Medford, MA
- Professor L. William Poirier - Texas Tech University
- Professor John Terning - University of California, Davis

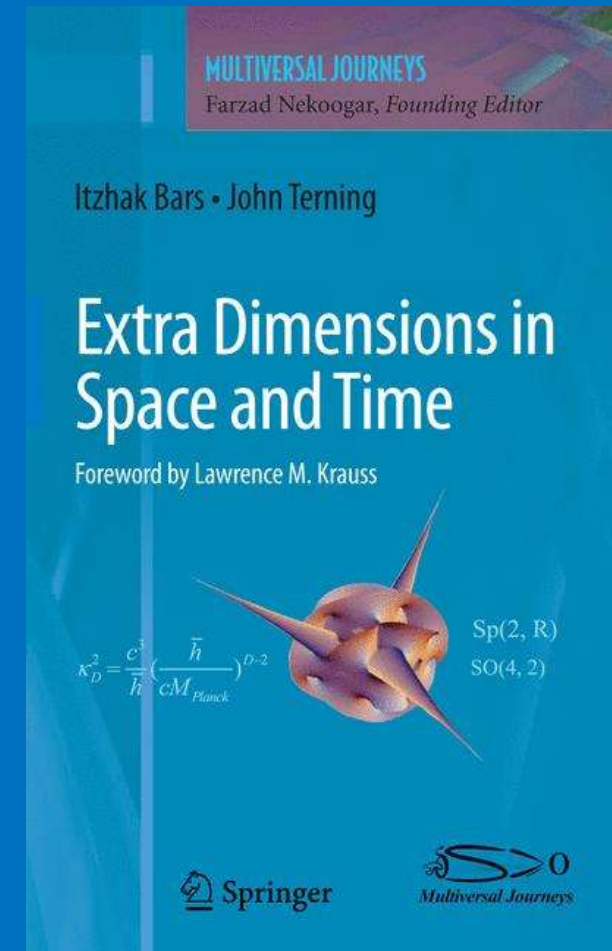


# Book Series

The inspiring books in this series are designed for scientifically literate non-specialists who want to know the latest discoveries in Theoretical Physics and Cosmology in a non-technical language.

Multiversal Journeys-book series are published with Springer (<http://www.springer.com>), a world wide leader in scientific publishing:

<http://www.springer.com/series/7919>



# Book Series

## Topics:

Mysteries of Quantum Mechanics  
Latest theories in Cosmology  
String Theories  
Nature of Space-Time  
Theory of Everything  
Extra Dimensions  
Misconceptions in Theoretical Physics

# Books Published

## Extra Dimensions in Space and Time

Bars, Itzhak; Terning, John;  
Nekoogar, Farzad (Founding Ed.)

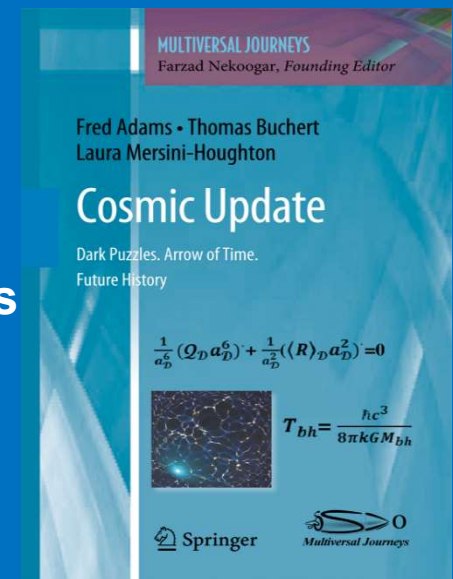
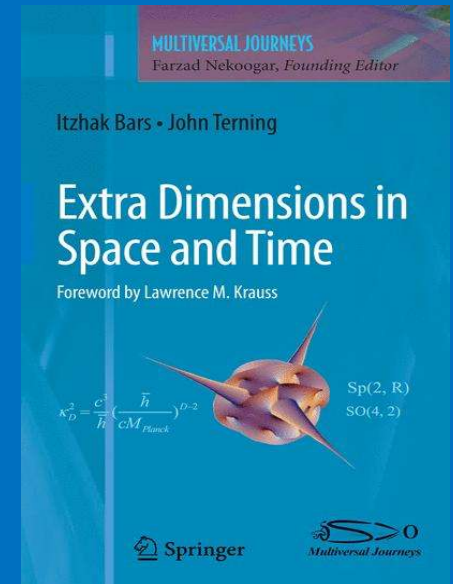
## Cosmic Update

## Dark Puzzles. Arrow of Time. Future History

Adams, Fred; Buchert, Thomas; Mersini-Houghton, Laura;  
Nekoogar, Farzad (Founding Ed.)

**Quantum Physics, Mini Black Holes, and the Multiverse:  
Debunking Common Misconceptions in Theoretical Physics**  
(to be published in 2017)

<http://www.springer.com/series/7919?detailsPage=titles>



# Authors

- Professor Fred Adams - University of Michigan, Ann Arbor
- Professor Itzhak Bars - University of Southern California, Los Angeles
- Professor Thomas Buchert - The University Claude Bernard in Lyon, France
- Professor Laura Mersini-Houghton - UNC-Chapel Hill
- Professor Yasunori Nomura - University of California, Berkeley
- Professor L. William Poirier - Texas Tech University
- Professor John Terning - University of California, Davis

# Production of Documentary Films

Collaborating with top media production companies to develop documentaries about Theoretical Physics & Cosmology topics.

Three short documentaries about Misconceptions in Theoretical Physics on the YouTube:

[Misconceptions about LHC Part-1](#)

[Misconceptions about LHC Part-2](#)

[The Multiverse Part 1: Introduction & Misconceptions](#)

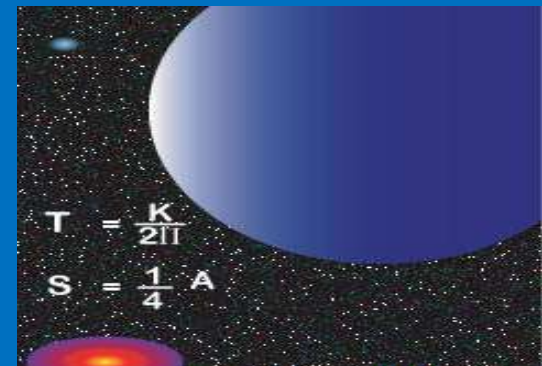


# DVDs Produced

The Beginning and End of Time:  
Life, the Universe, and Nothing  
Prof. Lawrence M. Krauss



The Nature of Space and Time  
Prof. Gary T. Horowitz



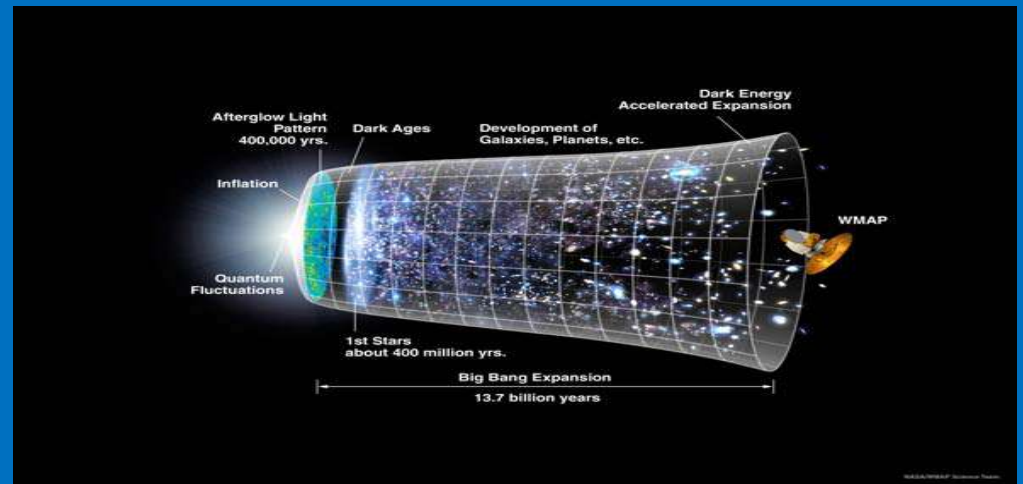
Two-Time Physics: The Unified View from  
Higher Dimensional Space and Time  
Prof. Itzhak Bars



# DVDs Produced (cont'd)

The Future History of the Universe

Prof. Fred C. Adams



Is time travel possible?

Prof. Ken Olum







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***A 501 (c) (3) non-profit organization***

***Thank You***