

# “Buddhism: Higgs Boson and the Search for Cause”

Lewis Lancaster

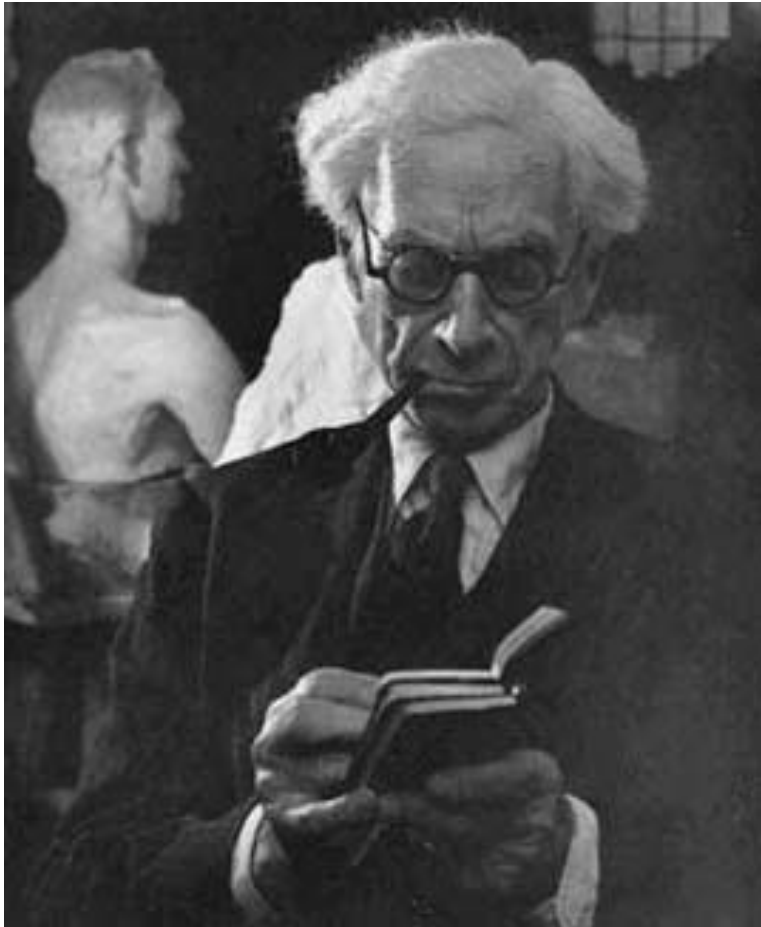
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Hong Kong University

# What is the cause of everything?

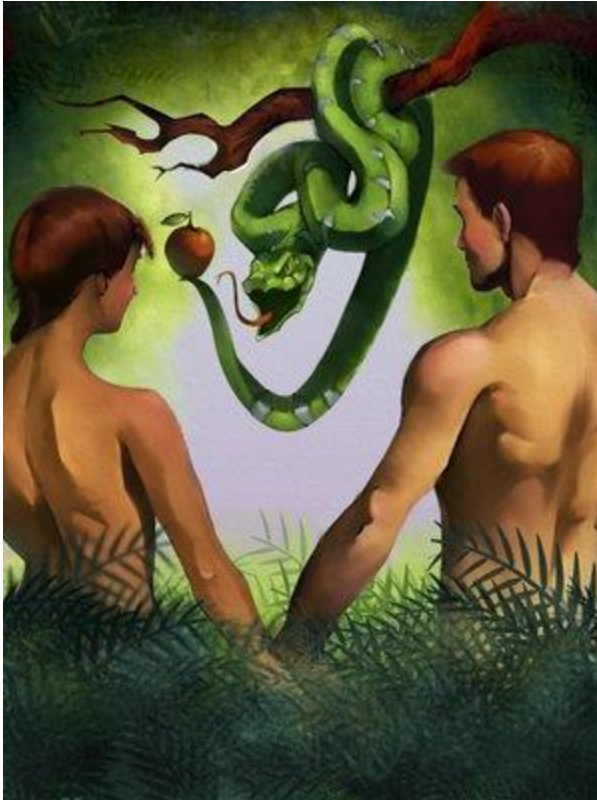
- God?/ Agents?
- Cause and Effect?
- Laws of Nature?

# Bertrand Russell



- “The Law of Causality is a relic of the past, like the monarchy, erroneously supposed to do no harm”

# Causal Description

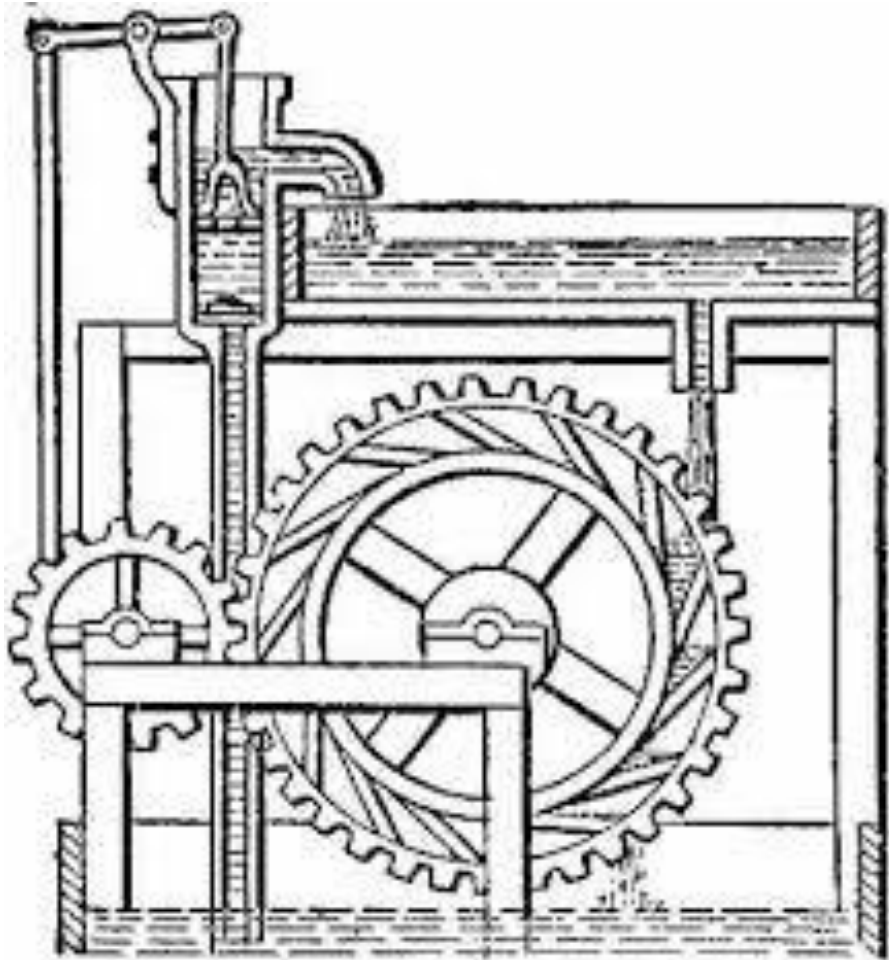


- Universe  
“manufactured” by a  
supernormal power.

# Physics

- Does causality in Physics give us a lead?
- Can we “trust” the Physics solution?
- Can we name the type of cause described in Physics?
- Can it identify a “first cause”?

# Cause and Machine



# Physics

- Our universe



- A tiny dense area expanded
- In the first moments of the expansion energy was beyond our present ability to test

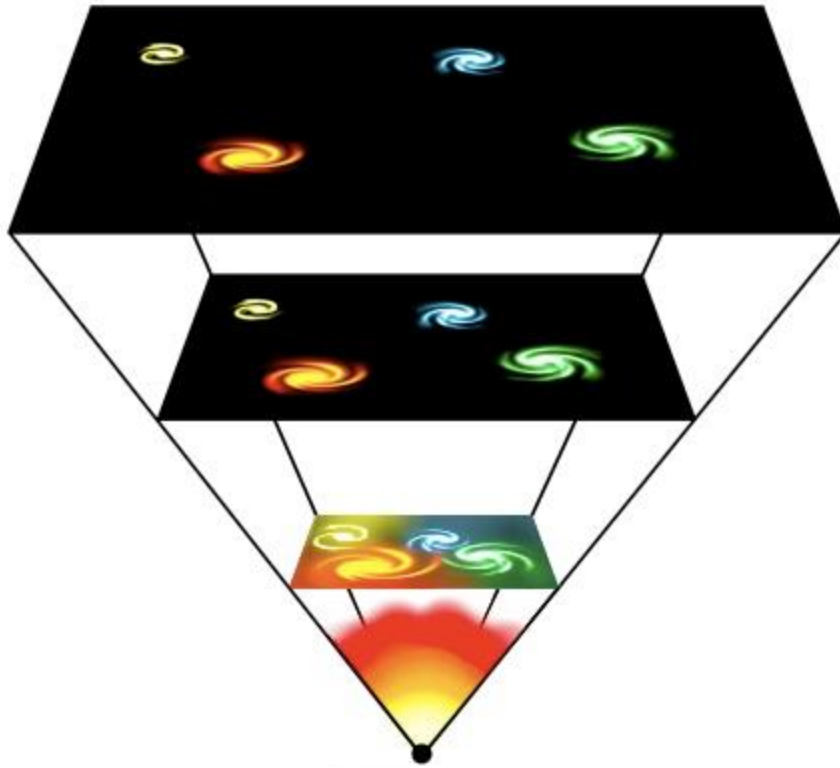
# Symmetry

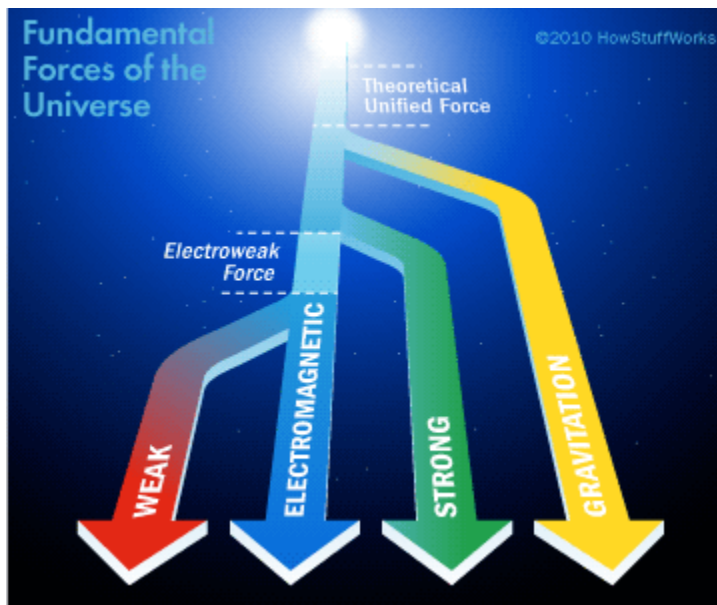


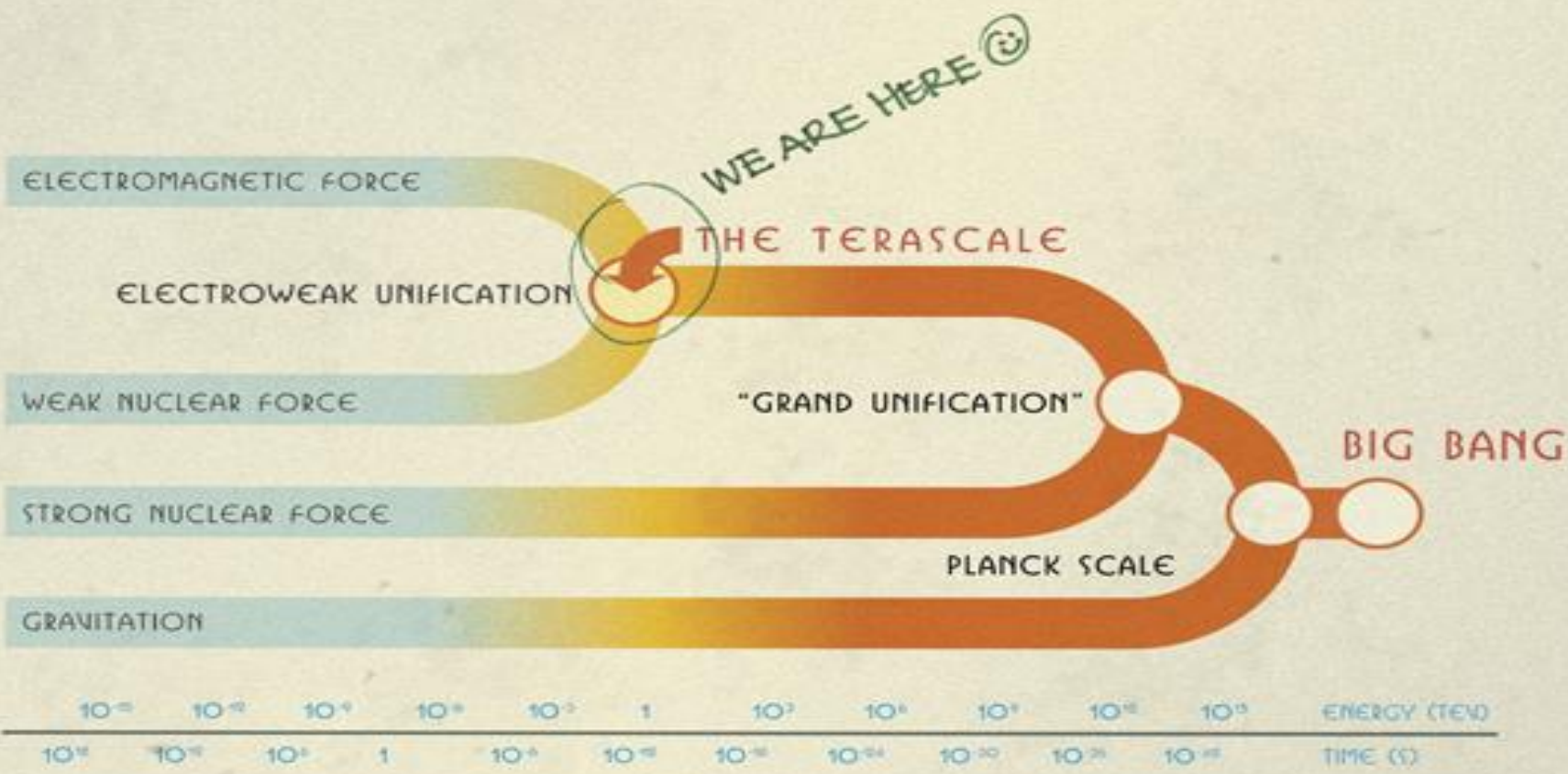


# Inflation

Asymmetry

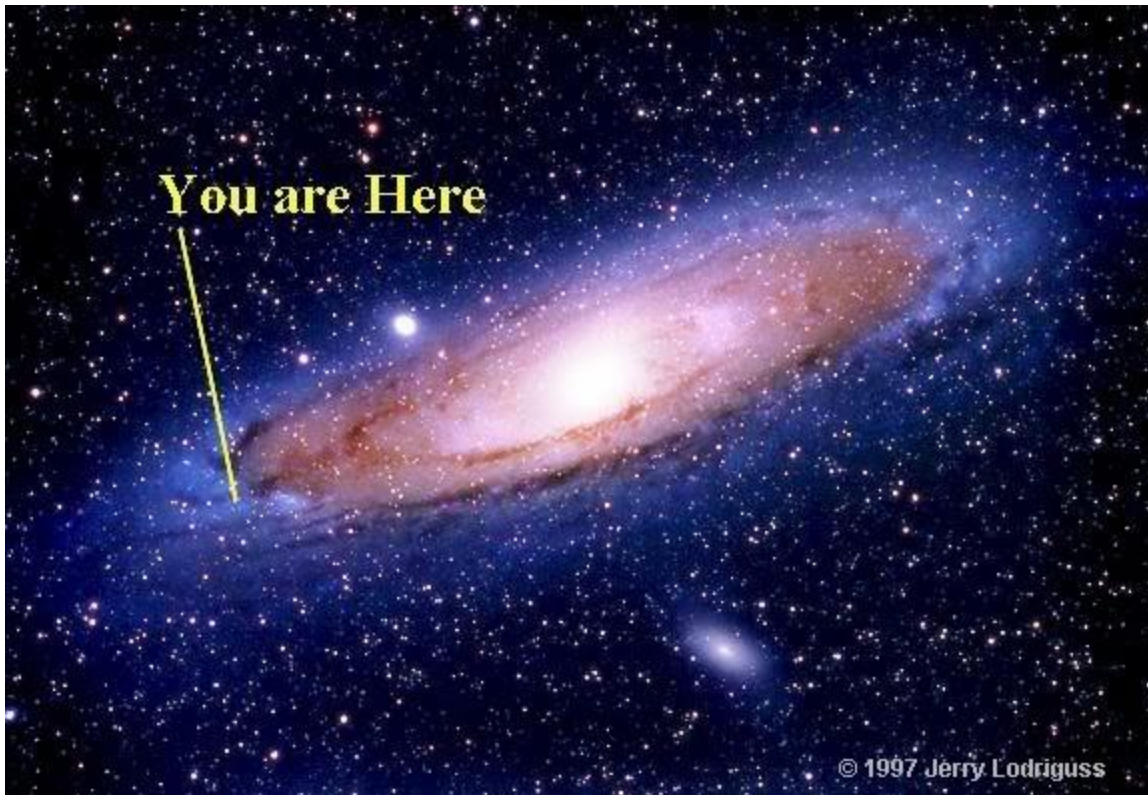






**You are Here**

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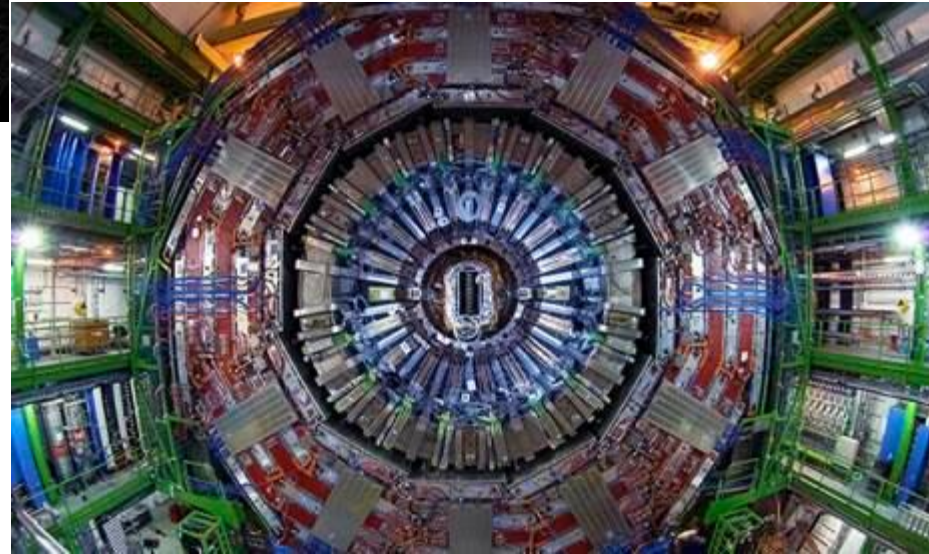
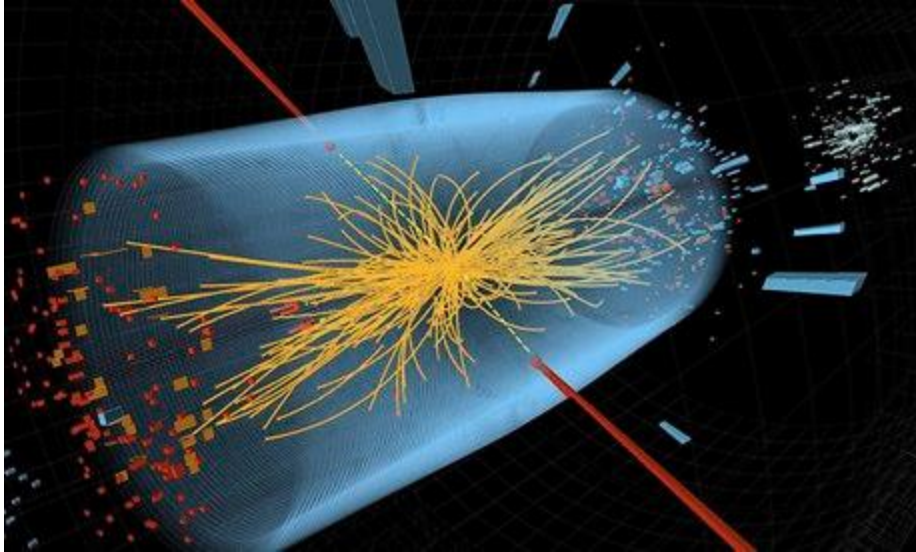


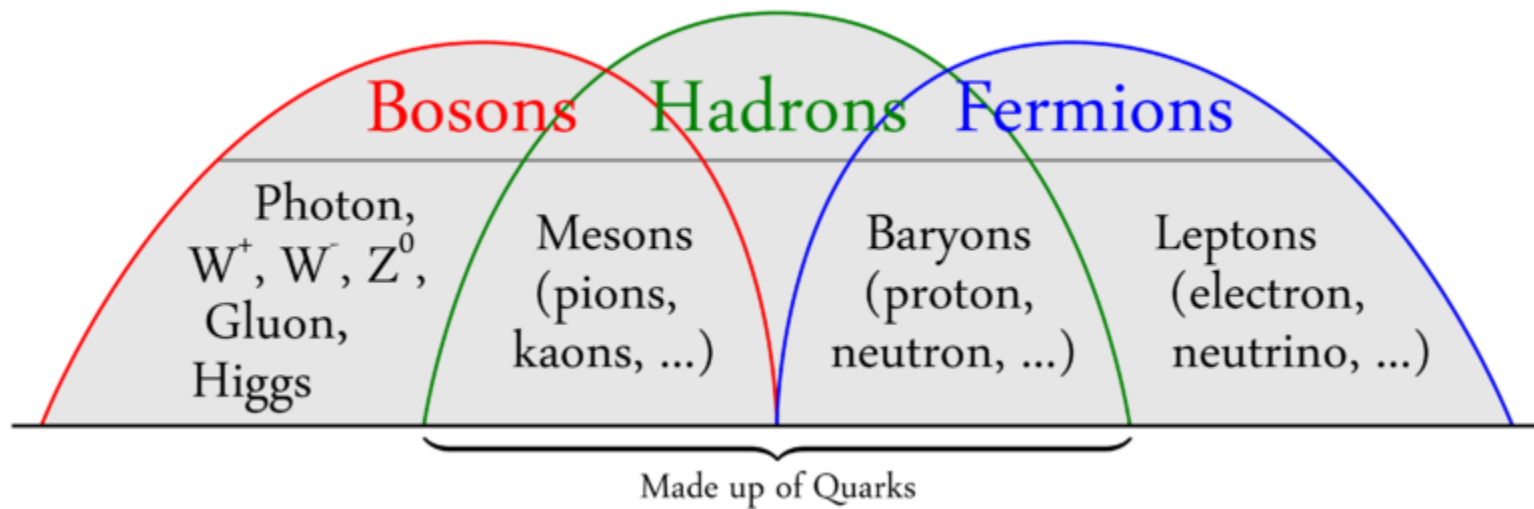
# CERN

- The World Wide Web began as a CERN project called ENQUIRE, initiated by Tim Berners-Lee in 1989 and Robert Cailliau in 1990



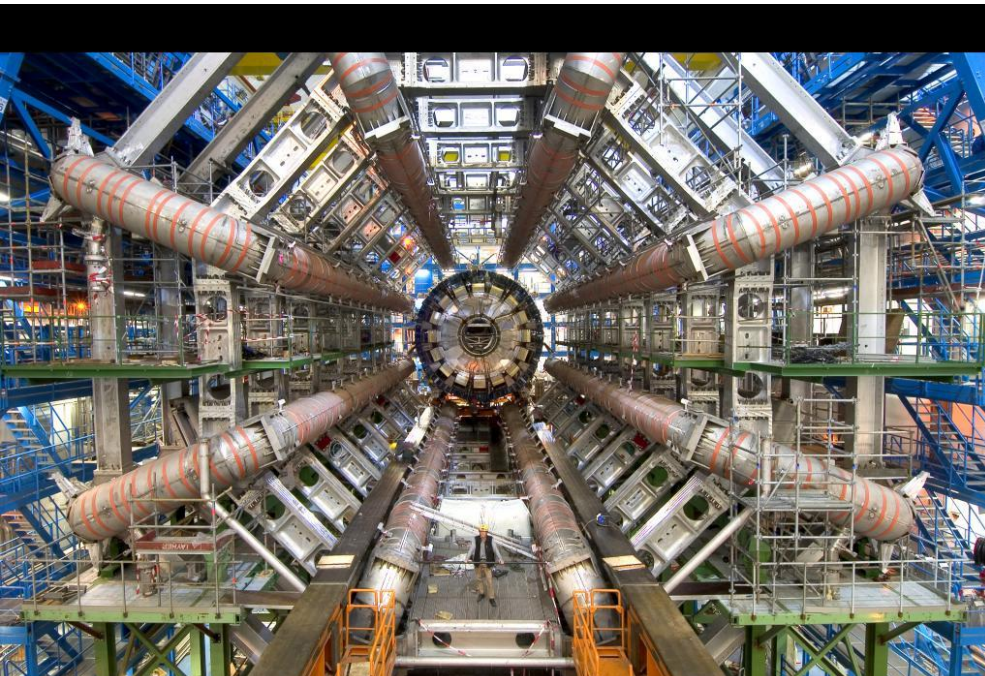






# Higgs Boson

- Field that permeates the universe that give energy to the vacuum
- Recipe for finding:
  - Take two proton beams and counter rotate them
  - Accelerate to near the speed of light
  - Look for a particle with a mass of 126 giga-electron volts





# What's missing/what's found

## Standard Model

- | • Missing                                | • Found               |
|--|-----------------------|
| • Dark Matter particle                   | • Bottom Quark (1977) |
| • Neutrino Oscillations                  | • Top Quark (1995)    |
| • Gravitation                            | • Tau Neutrino (2000) |
| • Accelerating expansion of the universe | • Higgs Boson (2012)  |

# God Particle?

- Professor Higgs



- “I’m an atheist, but I have an uneasy feeling that playing around with names like that could be unnecessarily offensive to people who are religious.”
- one of his papers was rejected for publication because it was ‘of no obvious relevance to physics’.

# Natural Law

- Is the universe  
“orderly”?

# David Hume



- “We may define a cause to be an object, followed by another, and where all the objects similar to the first, are followed by objects similar to the second.”

# Cause of rain



# Cause of Sunrise



# Buddhist Causality

- There is no “first cause” that is not an effect.
-



# Language of mathematics: Algebra

- Galileo



$$a \times a = aa = a^2$$

$$\frac{a^3}{b^3} = \left(\frac{a}{b}\right)^3$$

$$a \times a \times a = aaa = a^3$$

$$a \times b = ab$$

$$\frac{1}{a^3} = \left(\frac{1}{a}\right)^3 = a^{-3}$$

$$a^2 b^2 = (ab)^2$$

$$a^2 a^3 = a^{2+3} = a^5$$

$$(a^2)^3 = a^{2 \times 3} = (a^3)^2 = a^6$$

$$a^4 \div a^3 = a^{4-3} = a$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^0 = 1$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$a^2 - b^2 = (a + b)(a - b)$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$(a - b)^2 = a^2 - 2ab + b^2$$



# Cause



- If A causes B, then, typically, B will not also cause A. Smoking causes lung cancer, but lung cancer does not cause one to smoke.



# Karma

- Past Karma
- Only one of the eight factors of experience.

# Metaphor for Emptiness

- Heat and fire...
- Heat= an essential quality of fire
- Emptiness= an essential quality of phenomena

