

Origin of Mass and Energy

LAW of conservation of mass and energy: $\Delta E + c^2\Delta M = 0$

A Law is the strongest possible science (no exceptions)

Before Einstein's $E=Mc^2$, net energy change, ΔE , and net mass change, ΔM , were both zero (2 separate laws)

Science is tentative: new findings cause revision

Mass can be converted to energy, and vice-versa

(For $\Delta M = -1$ gram, $\Delta E = 90,000$ Gjoules = 2700 MWHrs)

Hiroshima A-bomb converted 6.4 mg of nuclear mass

4,400,000 bombs would convert 1 ounce

All yearly US residential power from a bowling ball's mass

Science has no explanation for the origin of mass/energy

Steven Hawking (6/7/10): "I want to know why the universe exists, why there is something greater than nothing."

Origin of Mass/Energy & Universe's Fine-Tuning

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Topics for This Presentation

Naturalistic scenarios for mass/energy origin

Oscillating Universe

Quantum fluctuation of "vacuum energy"

Multi-verse

Supernatural perspectives on origin

The observed fine-tuning

Naturalistic Origin of Mass/Energy

Naturalism requires "matter from nothing", or "eternal existence" (Infinitely old violates entropy's 2nd LAW)

Entropy: measure of the disorder (randomness) of a system

Equivalent to the unavailability of useful energy

2nd LAW of thermodynamics says entropy always

increases in a closed system (including the Universe's fixed mass/energy)

(known science has never observed a violation of this law)

"All changes are in the direction of increasing entropy, of increasing disorder, of increasing randomness, of running down. Yet the universe was once in a position from which it could run down for trillions of years. How did it get into that position?" Isaac Asimov, "Can Decreasing Entropy Exist in the Universe?," Science Digest, 5/73, p76-77.

Oscillating Universe Scenario

Big bang eventually slows, then recedes to big crunch, repeating infinitely

Scientific problems with scenario

Insufficient mass to overcome escape velocity

Dark matter with no electromagnetic radiation proposed (note: dark matter “explains” more than oscillating Universe)

Exotic non-baryonic mass

68-80% of mass in postulated axions or sparticles

WIMPs (weakly interacting massive particles)

LUX detectors failed to confirm (Oct/2013)

MACHO (Massive And Compact Halo Object)

Quantum Fluctuation of Vacuum Scenario

“Nothing” exploded spontaneously to form Universe

There is no such thing as “nothing” since GTR allows for “empty” space to have “vacuum energy,” which could spontaneously produce (without cause, via quantum tunneling) the mass/energy and the negative gravitational energy of the Universe via spontaneous symmetry breaking.

3×10^{55} g mass of the Universe was spontaneous

Not even an electron-sized equivalent has been detected from a vacuum (Universe is 10^{74} larger)

More Oscillating Universe Problems

Rate of expansion is increasing: What “is driving this apparently anti-gravitational behavior on the part of the Universe, nobody claims to understand why it is happening, or its implications.” Dennis Overbye, “Dark Energy is Still Puzzle to Scientists,” NY Times News Service, 6/4/08

Entropy is not yet maximum (randomness would be maximized after infinite time via 2nd LAW)

Multi-“Universes” with “Strings” Scenario

Building blocks of the universes are strings of vibrating energy in at least 10 unseeable dimensions

Collisions of universes create a new universe

Laws and features are result of collision

Collapse of 10+ made our 3 space + time dimensions

$>10^{500}$ universes needed to make our fine-tuning

“No part of it has been proven, and no one knows how to prove it.” Lee Smolin, *The Trouble with Physics*, 2007

“Without any explanations of nature’s fine-tunings we will be hard pressed to answer the ID critics.” Amanda Gefter, “Is String Theory in Trouble?,” *New Scientist*, 12/17/05

Infinite Universes Problems: “The Grand Design”
Describes how miraculous it is that the laws of physics allow for a Universe that is hospitable for life, in which the Universe has an excess of matter over antimatter and galaxies with stars (& planets) that last billions of years, “explained using “M-theory”
“Besides the absence of any compelling experimental evidence for M-theory, there is another difficulty — its predictions are far from unique. There are 10^{500} different ways to curl up the extra seven dimensions and hide them, and how they curl up determines the fundamental constants and what we four dimensional creatures see as the laws of physics.” [M. Turner, “Hawkings: No miracle in the multiverse,” Nature, 10/7/10, p657-658]

Supernatural Creation Scenario

“Infinite” energy being(s) convert energy to mass or otherwise supernaturally create universe's mass/ energy
Like ALL scenarios, this is outside known science
All are based on scientifically unknowable assumptions
All are philosophical or theological beliefs
It is no more scientific to believe a natural scenario than to believe a supernatural one since known science cannot account for the origin. Each philosophical or theological belief about the origin involves unprovable assumptions that are not verifiable or falsifiable, and would not be bound by known science.

Big Bang of “Current” Universe

Whether from: Infinite expansion/contraction
Spontaneous quantum fluctuation
Production from colliding universes
"Big bang cosmology...rests, however, on many untested, and [in] many cases, untestable assumptions. Indeed, big bang cosmology has become a bandwagon of thought that reflects faith as much as objective truth." (G. Burbidge, Scientific American, 2/92, p. 96)

Biblical Perspective of God’s Creative Word

Science has no explanation for the origin of mass/energy
LAW of conservation of mass and energy: total is constant
Using $E=mc^2$, and 6.4 mg of nuclear mass
1 drop of water equivalent to Hiroshima 10 bombs
“By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible.” Heb 11:3
“All things were created by him and for him.” Col 1:16
God is omnipotent, "easily" converting His power
“The voice of the Lord is powerful” Ps 29:4
“And God said, 'Let there be ...' and there was.” Gen 1
God's creative word in Hiroshima bomb energy equivalents:
520,000
(Universe's 3×10^{55} g requires 3×10^{68} joules)

Fine-Tuned Nature of the Universe

- Physical constants for weak and strong nuclear forces, electromagnetic and gravitational forces, ratios of forces and electron/proton masses, and properties of neutrons are all critical, as are the expansion rate, mass, and density of the universe
- Earth's orbit, tilt, rotation, magnetic field, atmosphere, and composition are life-critical
- Concerning the constants of physics: **“The remarkable fact is that the values of these numbers seem to have been very finely adjusted to make possible the development of life.”** Stephen Hawking, *A Brief History of Time*, 1988

More Fine-Tuning Quotes

- “If we nudge one of these constants just a few percent in one direction, stars burn out within a million years of their formation, and there is no time for evolution. If we nudge it a few percent in the other direction, then no elements heavier than helium form. No carbon, no life. Not even any chemistry. No complexity at all.”** David Deutsch, Interviewed on *The Science Show: The Anthropic Universe*, 2/18/06.
- “The really amazing thing is not that life on Earth is balanced on a knife-edge, but that the entire universe is balanced on a knife-edge, and would be total chaos if any of the natural ‘constants’ were off even slightly... even if you dismiss man as a chance happening, the fact remains that the universe seems unreasonably suited to the existence of life -- almost contrived -- you might say a 'put-up job.'”** Paul Davies, Wiki-Quote, <http://en.wikiquote.org/wiki/Darwinism>

Universe is “fine-tuned” to allow for life

- **“An accuracy of one part in 10^{123} ...the precision needed to set the universe on its course.”** Penrose in *The Emperor's New Mind*, p.344
- **“There is for me powerful evidence that there is something going on behind it all... It seems as though somebody has fine-tuned nature's numbers to make the Universe.... The impression of design is overwhelming.”** Paul Davies, *The Cosmic Blueprint: New Discoveries in Nature's Creative Ability To Order the Universe*, 1988, p203
- **“A common sense interpretation of the facts suggests that a superintellect has monkeyed with the physics”**
[F. Hoyle, “The Universe: Past and Present Reflections,” *Engineering and Science*, 11/81U, p8-12]
- **“He who fashioned and made the earth, He founded it; He did not create it to be empty, but formed it to be inhabited.”** (Is. 45:18)

Another Fine-Tuning Quote

Nima Arkani-Hamed has attempted “to explain why things that appear to be finely, even heroically, tuned actually are not. One possibility, he said, is that our universe is not unique but is only part of a vast ‘landscape’ of universes. If there are huge numbers of universes, perhaps 10 to the 500th power by one estimate, then it is no great stretch to imagine that at least one of them—ours—wound up having extremely small amounts of observed vacuum energy and a weak force that operates on a scale much smaller than expected..” AAAS-4/11/05, “Harvard's Nima Arkani-Hamed Ponders New Universes, Different Dimensions”

The Uniqueness of Earth

A list of probabilities that any planet within the Universe will possess the specific features within the appropriate range to support bacterial life for 90 days or less is based on a study of >650 astronomical/astrophysical research papers. The probability for occurrence of all 501 parameters occurring on one planet is 10^{-311} . Long-term simple life and intelligent life have much lower probabilities. [H. Ross, "RTB Design Compendium (2009)," Part 3]

Nobel laureate Steven Weinberg reflects on "how surprising it is that the laws of nature and the initial conditions of the universe should allow for the existence of beings who could observe it. Life as we know it would be impossible if any one of several physical quantities had slightly different values." Steven Weinberg, "Life in the Quantum Universe,"
Articles: Scient. American

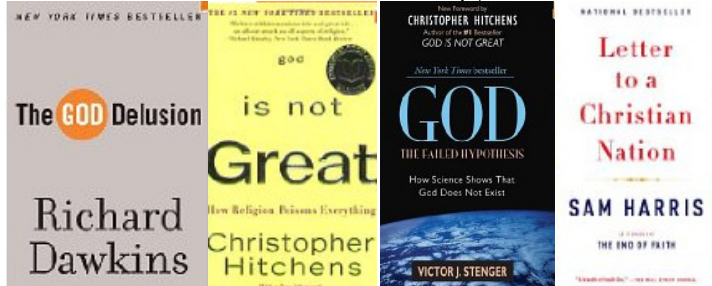
Albert Einstein once remarked that the most incomprehensible thing about the Universe was that it was comprehensible.

"For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; and as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries." Rober Jastrow, God and the Astronomers, p. 3.

Scientific Recapitulation

There is no scientific explanation for mass/energy origin
Fine-tuned nature of Universe is empirically detectable
The Earth is extremely unique in the Universe

Atheistic Scientists' Religious Attacks



Sam Harris: "In Letter to a Christian Nation, I have set out to demolish the intellectual and moral pretensions of Christianity in its most committed forms."

Hitchens frames the argument for a more secular life based on science and reason

Creationism as a mental illness (psychologytoday.com)
"creationism, the theory/superstition that, contrary to massive scientific evidence, the world began exactly as described in the Book of Genesis. Instead of deriving from millions of years of patient evolution, Adam and Eve popped out, fully formed, like characters from a Swiss cuckoo clock... **It's a myth**, but like many myths it serves a psychological purpose which is to provide a storybook sense of simple origins, which allays people's fears. **Those who believe this myth to be the truth are in a state of denial...** two other factors connect creationism with mental illness. The first is psychosis, which is an extension of denial. If psychosis is marked by the discrepancy between one's personal view of the world and the consensual view, creationism holds onto the personal view at all costs, refusing to accept what is abundantly clear... lack of ability for irony. Creationists take the bible story as literally true, unable to recognise that it might be working on those other, mvthic levels."

Be Prepared for Battle

For our struggle is not against flesh and blood, but against the rulers, against the authorities, against the powers of this dark world and against the spiritual forces of evil in the heavenly realms. (Eph 6:12)

The battle is the LORD's (1Sam 17:47)

Therefore I stationed some of the people behind the lowest points of the wall at the exposed places, posting them by families, with their swords, spears and bows. After I looked things over, I stood up and said to the nobles, the officials and the rest of the people, "Don't be afraid of them. Remember the Lord, who is great and awesome, and fight for your families, your sons and your daughters, your wives and your homes... Those who carried materials did their work with one hand and held a weapon in the other" (Neh 4: 13-14,18)

Traditional Literal 6-Day Explanation of Starlight

"Let there be lights in the expanse of the sky... let them serve as signs to mark seasons and days and years."
Gen 1:14 (Day 4)

Universe created "mature," like it is today

God created stars and their light (some believe the speed of light decreased exponentially to today's level)

בְּרֵאשִׁית בָּרָא אֱלֹהִים אֶת הַשָּׁמַיִם וְאֶת הָאָרֶץ
the Earth and the heavens God (Elohim) had created in-beginning

But most don't believe in literal 6-day creation (day-age)

Hebrew has unspecified time after verse 1

"With the Lord a day is like a thousand years, and a thousand years are like a day." 2 Pet 3:8 (Ps 90:4)

Isaac Newton & Johann Kepler
Newton acknowledged as world's greatest scientist

"Gravity explains the motions of the planets, but it cannot explain who set the planets in motion. God governs all things and knows all that is or can be done." "I have a foundational belief in the Bible as the Word of God."--spent more time studying Scripture than on science.

Father of astronomy, Kepler: "I was merely thinking God's thoughts after him."

"He gives wisdom to the wise and knowledge to the discerning." Danl 2:21

"For the Lord gives wisdom, and from his mouth come knowledge and understanding." Pr 2:5-7

Believers: Faraday, Pascal, Kelvin, Maxwell, Boyle, Pasteur



Relativity Literal 6-Day Explanation of "old" Starlight

Time slows with increasing velocity and gravity (proven)

IF "Let there be light" (Gen 1:3) was the "big bang":

High velocity & high gravity would slow time

Several have used Einstein's GTR to calculate:

1st 24 earth hours = 8 billion yrs to external observer

Next 4 billion years = day 2 (of 24 earth hours)

Day 6 would appear externally as 250 million years

First 6 earth days = 15.75 billion external years

Gerald Schroeder (Science of God) calculates 10^{12} expansion of space-time produces 16.43 billion years for the first 6 earth-days of 24 hours

Some Cautions on Dogma

Use caution when basing beliefs on partial understanding
Copernicus was “heretic” for sun-centered solar sys: “O sun, stand still” Josh 10:12 (not “Earth stop rotating”)
Flat-Earthers use “in the four corners of the earth” Rev 20:8
Don't make “my belief” the criterion for salvation
Some: if you don't believe Genesis, throw out Bible, or: a Christian can't believe in evolution
Realize that beliefs based on faith may not be backed by science, but realize that “science” may be false
Critical beliefs are supported by multiple verses
6-day creation in Ex 20:11 & 31:17 (implied 10 times)

Conclusions

There is no scientific explanation for mass/energy origin
Fine-tuned nature of universe is empirically detectable
The Earth is extremely unique in the Universe
The Bible is consistent with known science facts
The Bible IS reliable and can be trusted – “All Scripture is God-breathed and is useful for teaching...” (2 Tim. 3:16).
Christian faith is fact-based, not "blind" or “anti-logic”
“You will know the truth, and the truth will set you free.” (Jn. 8:32)
Our knowledge on any subject is limited – “Now we see but a poor reflection as in a mirror.” (1 Cor 13:12).
Proven reliability increases confidence in predictions
(Heaven, Hell, judgment, salvation, etc. are based on faith).
The world is blind to many truths (Rom. 1:18-32, 1 Cor. 1:18-2:16) – “They exchanged the truth of God for a lie.”

Young Earth/Universe Scientific Evidence

High oil and gas pressure (<10ky)
Magnetic field decay (<10ky) (many reversals during flood)
Helium (radiodecay product) in rocks (<8ky)
Comet tails visible (<<1by)
Receding (4 cm/yr) moon (<1by)
Earth rotation slowing by 2 ms/century
Radiohalos indicate rapid formation of granite
Spiral galaxies are distinguishable
Unfossilized dinosaur bone with DNA & blood cells
Harmful mutations (60 per newborn human) limitation
1-2% fitness decline/generation -- extinction in <10ky

Useful ID References

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