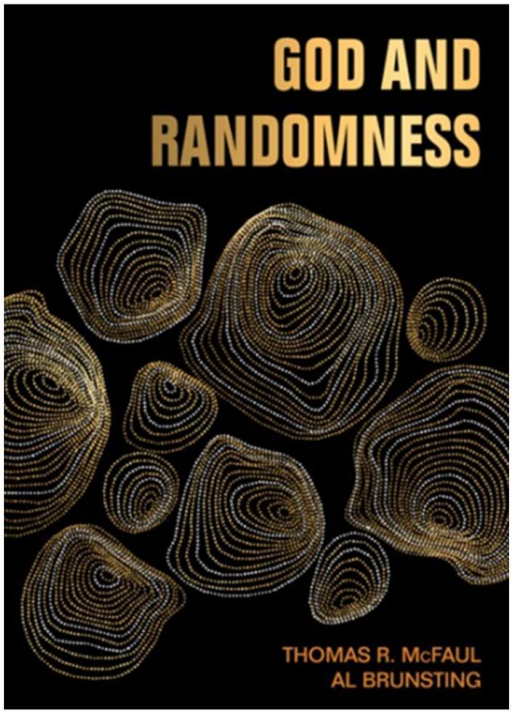


Al Brunsting, Ph.D.-physics (one of the two authors)

Fermilab Society of Philosophy

Feb. 2, 2018, noon – 1:00,

Location: WH4NW

See <https://wipfandstock.com>

Key endorsement (1 of 10):

"In God and Randomness, the authors explore the presence of randomness in processes that encompass everything in the universe, from the world of subatomic particles all the way to the solar system and the galaxies, as well as human life and human history, all the way to the twentieth century, including two world wars, the Great Depression, and jihadi terrorism. Is randomness compatible with human self-awareness and free will? All these issues and many more are examined in depth in God and Randomness, yet using very readable language."

Francisco J. Ayala. Donald Bren Professor of Biological Sciences, U. of California, Irvine. He is the 2001 National Medal of Science Laureate, 2010 Templeton Prize Laureate, and member of the National Academy of Sciences.

Abstract

Assuming a theistic starting point, how can God be influential in human lives and human history in the presence of an overwhelming amount of randomness? We will summarize examples of randomness in the natural world, at size scales from the neutrino to galaxies; in our lives; and in the 20-th Century. A speculative answer to this question will be suggested in the second presentation."

What if you are an atheist or agnostic?

Please listen anyway & participate in the discussion. I hope there are a few “ah ha” moments for you. -- Al

Outline (Feb. 2, 2018):

1. Three Personal Stories. (a) sister, (b) uncle, & (c) brother
2. Micro and Macro Size Scales. Neutrinos to galaxies.
3. The Universe and Solar System. What is so random here?
4. Discussion. Do we see randomness nearly everywhere we look? If you're a theist, how can God influence our lives & human history in the presence of all this randomness?

Outline (Feb. 16, 2018):

1. Conscious, Self-Aware, and mindful Humans
2. 20^{th} Century History, 5 elements
3. Speculative answer to the question. Not here. I want you to return next time.
4. Discussion.

3 Real World Stories

Story #1

Al & Bernace before polio in 1949. These are real people & this story actually happened.

Mom & Dad served God & others. 1st Reformed Church, Grand Haven, Michigan

Explanation of polio

Some of my questions & comments:

- Why wasn't I the one with the dysfunctional right leg?
- Why might 1 virus particle be the cause of such a life-long change?
- Unsatisfying answers: "It's a mystery."
- We want to know how stuff works, underlying cause & effect.

Story #2

Cadet Albert Brunsting graduated April 24, 1942, Gardner Field, Taft, California

Cake story

Born: Oct. 22, 1918
Died: Jan. 3, 1943

My questions & comments:

- Why didn't Uncle Al have the opportunity to live out his life with his beautiful bride?
- Why couldn't Uncle Al & Arlene have children?
- Why was Uncle Al assigned to suicide missions at that time of the war?
- Why did those German fighter pilots spot Uncle Al's B-17?
- Why did WWII occur?

Story #3

Danny, Born Feb. 1, 1955.

Died Dec. 14, 1959.

Cause: Childhood Leukemia.

Of the 100's of pictures of Danny this was Dad’s favorite.

My questions & comments:

- What was the purpose of Danny's childhood death?
- It seems like any benefits have little value compared to the cost.
- Randomness played a key role, especially at the molecular level. So where was God?

Responses?

What are some possible responses to these questions about the personal stories?

Answer 1. God doesn't exist. It's due to pure materialism & the associated randomness. It's a no-brainer.

My comment. This answer opens serious other issues: (a) Why has the life-friendly universe produced self-aware, conscious, curious people? (b) Why are the natural laws so mathematical and not chaotic? (See Multiverse Hypothesis.)

Answer 2. We can never know whether or not God exists.

My comment. Humans are curious about how things work, how nature works. Will this curiosity go unsatisfied? This is a give-up position, similar to "We will never know if there is a Higgs Boson." Are we going to give up?

Answer 3. God exists. We just don't know how She influences our lives or the world around us.

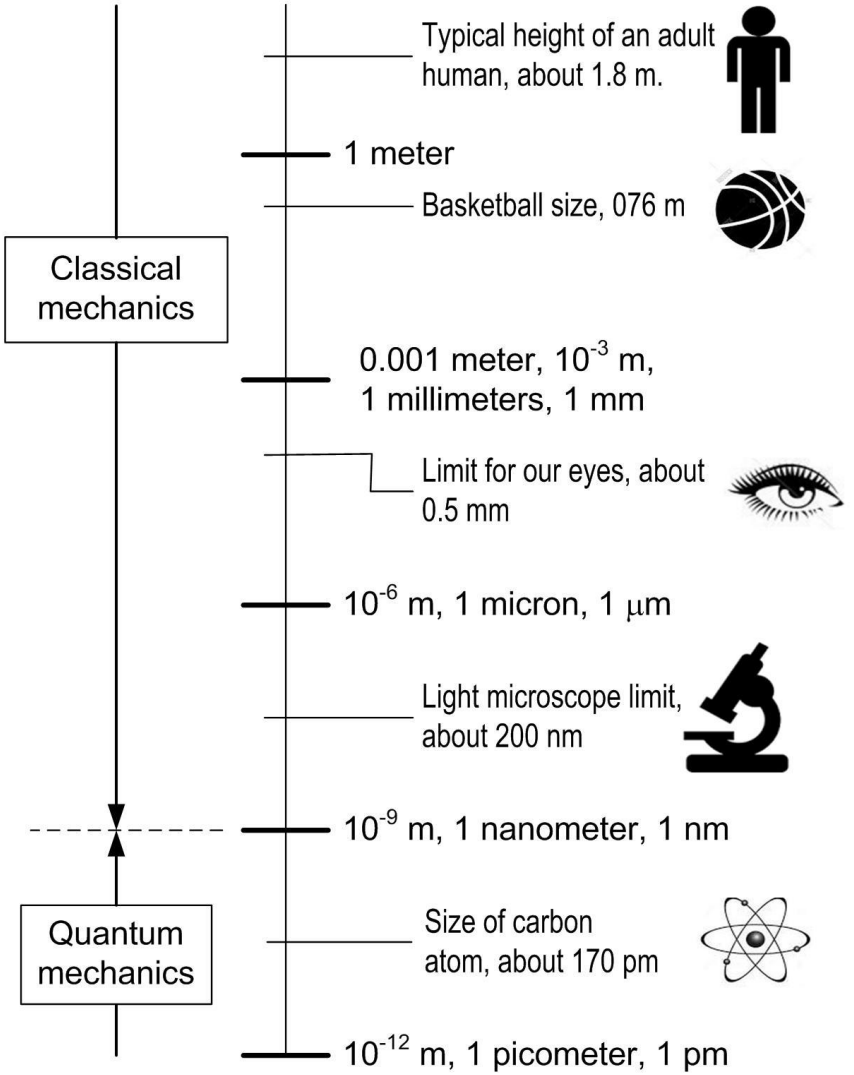
My comment. This is extremely unsatisfying for the case of childhood leukemia, for example. Consider our own subjective, internal, personal experiences. Please refer to my comments for Answer 1. Is this option really the most objectionable? (See theism statement by Francis Collins.)

At what size scale does quantum mechanics become important?

"We know from experiment that quantum theory is valid and essential in order to extend our knowledge from atoms, 10^{-9} m, to atomic nuclei at 10^{-15}m."

-- *Quantum Physics for Poets*, 2011 by Leon M. Lederman & Christopher T. Hill.

QM: "fuzziness, indeterminacy, & probability" -- Ibid



Random Effects at the Macro Level, 3 examples

Plainfield tornado, Aug. 28,'1990

- Wind speeds over 200 mph
- 1500 structures were damaged or destroyed.
- 300 people injured, 29 people killed.

9.1 magnitude earthquake in Indian Ocean, Dec. 26,2004

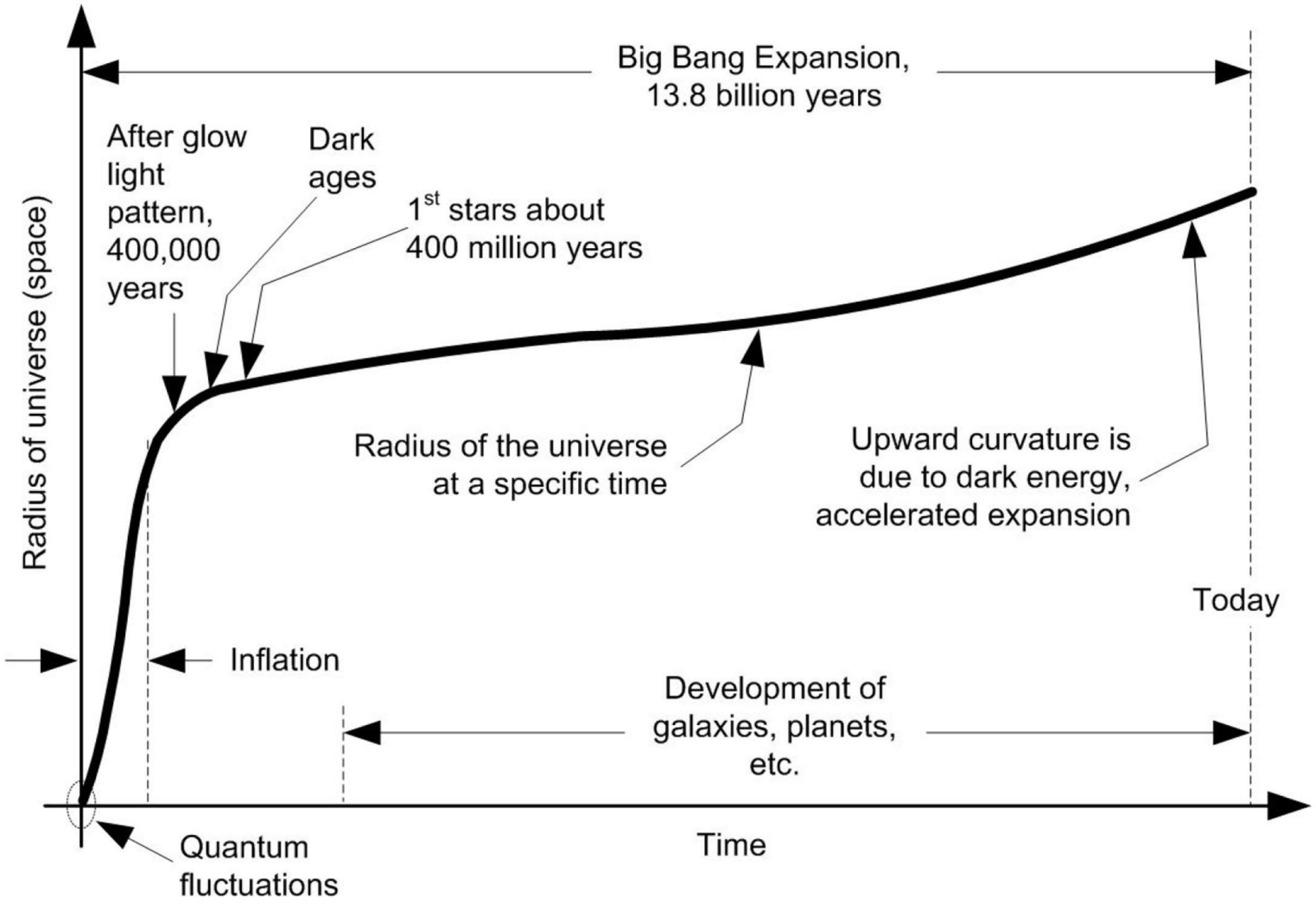
- Large volumes of sea water were suddenly displaced.
- Tsunami resulted.
- 250,000 people were killed.

Italy's Mount Vesuvius erupted on Aug. 24, 79 ADE.

- Pompeii was destroyed & buried.
- Most of the 11,000 population were killed.
- In 2005 I toured this site.

Chaotic, random, unpredictable.

Randomness occurred everywhere along this process.



Summary of Randomness in our Universe Since the Big Bang

	10^9 yrs post Big Bang	What was random?	Effects of randomness	Comments
1	0.0004	Small density differences in mass & energy in the universe	Regions of higher density eventually evolved into galaxies	Evidence comes from cosmic microwave background.
2	0.15 to 0.80	Energies & the directions of individual atoms	Gravitational attraction eventually formed the 1^{st} proto–stars	During the dark ages before nuclear fusion occurred. See Figure 6.
3	0.8	Distribution of heavy elements due to 1st stars that ignited, due to nuclear fusion. The larger stars died in super novae, randomly distributing these elements.	Distribution of heavy elements within galaxies to places where solar systems might form.	Our solar system evolved where heavier elements were located.
4	0.8	Distribution of even heavier elements due to locations of neutron star encounters, which distributed these elements.	Distribution of even heavier elements to other places within galaxies.	Our solar system evolved where these elements were also located. There was an overlap.

Summary of Randomness in our Universe Since the Big Bang, cont.

	10^9 yrs post Big Bang	What was random?	Effects of randomness	Comments
5	9	Energies & directions of individual atoms & molecules that formed our proto–Sun.	Evolutionary path of our Sun's development that led to nuclear fusion.	Energy from our Sun drove most of the evolution of life on Earth.
6	9.5	Energies & directions of individual atoms, molecules, and larger objects that formed our proto–planets, especially Earth.	Evolutionary path of our Earth's development, the platform for life.	Development of our planetary home. One of the main reasons we are here.
7	10	Size, location of development, & time of development of early Earth.	Earth retains its atmosphere.	Originally there was no O_2. Eventually O_2 appears due to photosynthesis, using the early atmosphere.
8	9.0 – 13.8	Energies & directions of large objects, asteroids, & small planet–type objects with Earth.	Possible delivery of water & organic molecules to Earth. Delivery of some heavier elements. Mass extinctions. Stabilizer for Earth's orbiting & rotation, the moon.	All the ingredients for life to start & evolve. Elements necessary to support our modern technologies. Earth's seasons are stabilized. Some life forms go extinct while others thrive in their absence.

Conclusion & discussion

Discussion. Do we see randomness nearly everywhere we look? If you're a theist, how can God influence our lives & human history in the presence of all this randomness? If not, how might that position be defended?

Outline for next time (Feb. 16, 2018):

1. Conscious, Self-Aware, and mindful Humans
2. 20th Century History, 5 elements
3. Speculative answer to the question. Not here. I want you to return next time.
4. Discussion.

Unanswered questions regarding the Multiverse Hypothesis

Email thread to:

Kathryn Jepsen | Editor-in-Chief, Symmetry Magazine
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Kathryn [Nov. 3, 2016],

Here are some of my follow-up questions to the responses from Leonardo Senatore [Cosmologist, article in Symmetry Mag.]:

Since you didn't mention any verifiable evidence for the multiverse hypothesis, I assume there is no verifiable evidence. Is this an accurate assumption?

If my assumption is correct, why is the percentage of acceptance of multiple universes so high (90%)? What percentage of those who accept are theorists?

If there are other universes, why wouldn't we observe some type of lumpiness in our universe associated with external universes affecting energy, field, and/or mass distributions in our universe?

Unanswered questions regarding the Multiverse Hypothesis, cont.

It was announced on Oct. 13, ’16, that the observable universe contains ten times more galaxies than previously thought. Doesn’t this push the boundaries for other universes farther away from us? Consider all possible galaxies in all universes, what percentage of those galaxies are in our universe?

If there are other universes, what is their distribution in all possible locations in space?

How do quantum mechanical fields, currently thought to extend throughout our universe, extend to all other universes through the spaces between those universes?

What is the mass/energy density of those fields throughout our universe, throughout the spaces between universes, and within those other universes? What are the total mass/energies?

Isn’t it true that if you are unconstrained by accepted observational evidence, theories can be developed that lead to shaky conclusions and those theories can be subsequently discarded?

What role do accepted observational evidences play in filtering out (or significantly modifying) proposed theories about multiple universes?

Kindest regards,

-- Al

Statement of theism, Ref: *The Language of God* (2006) by Francis S. Collins, pp. 81-82

Francis S. Collins, M.D., Ph.D. is the current Dir. of Natl. Inst. of Health (NIH). He oversees the work of the largest supporter of biomedical research in the world, spanning the spectrum from basic to clinical research.

Dr. Collins is a physician-geneticist noted for his landmark discoveries of disease genes and his leadership of the international Human Genome Project, which culminated in Apr.'03 with the completion of a finished sequence of the human DNA instruction book. He served as dir. of the Natl. Human Genome Res. Inst. at NIH from '93-'08.

Before coming to NIH, Dr. Collins was a Howard Hughes Medical Institute investigator at the Univ. of Mich. He is an elected member of the Natl. Acad. Med. & Natl. Acad. Sci., was awarded the Presidential Medal of Freedom in Nov. 2007, and received the National Medal of Science in 2009.

If God exists, then He is supernatural.

If He is supernatural, then He is not limited by natural laws.

If He is not limited by natural laws, there is no reason He should be limited by time.

He could know the precise outcome of the formation of the universe even before it started.

Statement of theism, cont.

He could have foreknowledge of a planet near the outer rim of an average spiral galaxy that would have just the right characteristics to allow life.

If He is not limited by time, then He is in the past, the present, and the future.

The consequence of those conclusions would include:

He could exist before the Big Bang and He could exist after the universe fades away, if it ever does.

He could have foreknowledge that that planet would lead to the development of sentient creatures, through the mechanism of evolution by natural selection.

He could even know in advance the thoughts and actions of those creatures, even though they themselves have free will.