

# *Cosmic Beginnings and the Problem of Time*

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# *Who Discovered the Big Bang?*

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- A. Penzias & R. Wilson
- George Gamow
- Albert Einstein
- Al Gore
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# *Big Bang Foundations*

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1. singularity beginning
2. expanding universe
3. cooling cosmos

# *Cosmic Singularity Beginning*

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- Genesis 1:1
- Genesis 2:3
- Genesis 2:4
- Psalm 148:5
- Isaiah 40:26
- Isaiah 42:5
- Isaiah 45:18
- John 1:3
- Colossians 1:15-17
- Hebrews 11:3

# *Stretching the Heavens*

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- Job 9:8
- Isaiah 40:22
- Isaiah 44:24
- Isaiah 48:13
- Jeremiah 10:12
- Zechariah 12:1
- Psalm 104:2
- Isaiah 42:5
- Isaiah 45:12
- Isaiah 51:13
- Jeremiah 51:15

# *Cooling Cosmos*

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- fixed physical laws → constant thermodynamics (energy conserved, ongoing decay)
- continual cosmic expansion → continual cosmic cooling

# *Fixed Physical Laws*

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- Jeremiah 33:25
- Romans 8:18-23
- Genesis 1 & 3
- Genesis 2:5-6
- Ecclesiastes 1:3-15
- Revelation 21:1 - 22:5

# *Temporal Universe*

- Job 14:12, Psalm 102:25-26
- Ecclesiastes 12:2
- Isaiah 34:4, 51:6, 65:17, 66:22
- Jeremiah 33:25
- Matthew 24:35
- Hebrews 1:10-12
- 2 Peter 3:7, 10-13

## Biblical Cosmic Verbs:

perish, discarded, vanish, wear out, be no more, grow dark, dissolved, rolled up, fall like withered leaves, will not be remembered, pass away, disappear, destroyed, depart



# *The Anthropic Principle Inequality ..*

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- 15 billion year minimum to prepare home for humanity
- But, longevity of human civilization <41,000 years

# *The building blocks problem...*

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- getting the right molecules
- getting the right atoms
- getting the right nucleons
- getting the right electrons

# *The heavenly body problem...*

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- getting the right galaxy
- getting the right star
- getting the right Jupiter
- getting the right Earth
- getting the right Moon

# *The Cosmos is Designed for Life*

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1. gravitational force constant
2. strong nuclear force constant
3. weak nuclear force constant
4. electromagnetic force constant
5. electromagnetic to gravitational force ratio
6. number ratio of protons to electrons

## *...designed for life..*

7. ratio of electron to proton mass
8. expansion rate of the universe
9. entropy level of the universe
10. mass density of the universe
11. baryon density of the universe
12. space energy density of cosmos

## *...designed for life..*

13. age of the universe

14. velocity of light

15. initial uniformity of radiation

16. homogeneity of the universe

17. mean distance between galaxies

18. mean distance between stars

## *...designed for life..*

19. average size of galaxy clusters
20. spatial locations of galaxy clusters
21. fine structure constant
22.  $^{12}\text{C}$  to  $^{16}\text{O}$  energy level ratio
23. decay rate of  $^8\text{Be}$
24. ground state energy level for  $^4\text{He}$

## *...designed for life..*

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25. decay rate of the proton
26. neutron to proton mass ratio
27. nucleon to anti-nucleon # ratios
28. polarity of the water molecule
29. epoch for hypernova eruptions
30. number & types of hypernovae



## *...designed for life..*

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31. epoch for supernova eruptions
32. number & types of supernovae
33. epoch for white dwarf binaries
34. white dwarf binary distance & frequency
35. ratio of exotic to ordinary matter
36. number of dimensions in early cosmos

# *...designed for life..*

37. number of dimensions in cosmos now

38. mass of the neutrino

39. exotic mass particles decay rates

40. size of big bang ripples

41. size of relativistic dilation factor

42. uncertainty magnitude in quantum mechanics

# *Nine extinction factors*

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- small population level
- long generation time
- few progeny per adult
- high bio-complexity
- large organism size
- specialized food supply
- small habitat size
- low ecological diversity
- cultural advancement

# *The best possible time and place ...*

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- maximum cosmic window
- best possible observatory
- best possible home
- best possible physics
- most to be conscious of

# *Non-Theist Rebuttals*

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- The Christian God would not make so many useless stars and galaxies.
- We would not be here unless the universe had the attributes we observe.
- For an infinite number of universes an infinite variety of sets of attributes are possible.

# *The Fate of the Universe*

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- Isaiah 34:4
- Isaiah 65:17
- Isaiah 66:2
- Romans 8:21
- 2 Peter 3:7-13
- Revelation 6:14
- Revelation 21:1-5

## *pistis*

... conviction of the truth of anything;  
obedience to established truth;  
acting upon what has been  
established to be true.

# *Purpose of Physical Laws*

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help turn us from sin:

- more sin  $\rightarrow$  more pain

- more sin  $\rightarrow$  more work