

“WHERE FAITH AND SCIENCE MEET (#2): GOD AND THE BIG BANG”

(Psalm 19:1-6)

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**[PROPS NEEDED: (#1) Contact clip & “Mad Scientist” clip;
(#2) Baked cookies & uncooked ingredients & baking paraphernalia]**

[East Cobb U.M.C.; 1-17-10]

–I–

1. **[Traditional Service ONLY:]** Read Text: Psalm 19:1-6 and Pray.
2. **[VIDEO INTRODUCTION BY “MAD SCIENTIST” LUDWIG VON NEBUCHADNEZZAR:**
“Movie Contact Intro (00:00:37-00:03:30) and Ludwig’s “Big, Big Universe” (Time: 5:00)]

A–Well, Ludwig is right! The universe *IS* rather mind-boggling, not only in its sheer size, but also in its mystery and immense beauty.

B–And today, as we continue our series Where Faith And Science Meet, we turn our attention to astronomy and physics – to how the intricacies our amazing universe can actually help us better understand and claim a deep and profound faith in God.

3. Before we begin, though, you need to know that my whole life I’ve always been interested in these subjects – whether it was as a young boy seeing Jupiter and Saturn through the great telescope at Fernbank Science Center in Decatur, or watching sci-fi shows like Star Trek and Space:1999 when I was growing up (well, I still watch them, actually!), or just a few years ago viewing the night sky at the famous Lowell Observatory in Flagstaff, NM.

A–But even with all that interest, and also with the fair amount of reading I’ve done over the last several months preparing for this series, the knowledge I have in these areas is really quite small compared to those who’ve been studying these things all their lives. ¹

B–So while I don’t pretend to be an “expert” in these areas, what I *can* share is a very brief overview of what I, as a *theologian*, consider to be the most important ways that astronomy, physics, and faith can interpret and inform and each other. ²

C–Now, there’s actually a number of such connections in these fields, but today time will only allow us to address two. ³

–II–

4. The first deals with *the origins of our amazing universe*.

A–In 1927, Belgian astro-physicist Georges Lemaître first proposed that nearly 14 billion years ago all reality originated from one single point (called a “singularity”) and then expanded very rapidly, creating space and time, and forming the “stuff” out of which galaxies and stars and planets would eventually come into being.

1–And for a while this was all just theoretical – not taken very seriously, to the point where in 1950 one scientist sarcastically called it the “**Big Bang**” theory.

2–But in 1964, two Bell Laboratory astronomers testing microwave radiation detectors accidentally discovered space radiation left over from this ancient cosmic event, corroborating Lemaître’s theory. ⁴

3–And since that time, “The Big Bang” has continue to be understood by science as the most plausible explanation for the origins of our universe. ⁵

4–In fact, as recent as last November (2009) there was a headline article in USA Today about the massive “*Hadron Collider*” in Switzerland – a huge atom smasher that physicists are now using to study the origins of matter in the first few seconds after “The Big Bang.” ⁶

B–And yet, despite its empirical substantiation, this theory raises a whole host of questions:

1–E.G., If everything began from one singularity, then what came *before* it? How did the singularity come into existence? And what force caused the expansion we call the “Big Bang” to be initiated in the first place? – tough questions for science! ⁷

2–But Dr. Lemaître wasn’t concerned, because he believed these questions merely pointed towards the existence of a divine intelligence of some sort. ⁸

(a) He later wrote that (*on screen:*) “***There are two ways of arriving at the truth [e.g., science & religion]. I decided to follow them both***” (Georges Lemaître).

(b) And so not only did he continue to practice and teach physics, but later went to seminary and became an Roman Catholic priest (...who says reason and faith can’t co-exist within us!?)

5. So let’s talk about another example that connects astronomy, physics and faith – and that is... ***the existence of life in our universe*** (not merely *extraterrestrial* life, but *life period!*).

A–Did you know that science has discovered that the probability of life existing in our universe at all is extremely low... because the confluence of things that had to happen in just the right way, at just the right time, in order for us to even exist is nearly impossible.

1–In physics it’s called the “**Anthropic Principle**” ⁹, and physicist Ian Barbour explains it by saying that “*The possibility of life as we know it depends on the value of a few basic [mathematical] constants, and is remarkably sensitive to them, [such as the universe’s expansion rate, the formation of nuclear elements, and the ratio of particles to antiparticles]. Even a small change in these physical constants would have resulted in an uninhabitable universe.... [So,] the simultaneous occurrence of so many independent features appears wildly improbable.*” ¹⁰

2–In fact, its been estimated that the odds of our universe birthing life like it does is about like the odds of a person in outer space throwing a dart towards the earth, and hitting a bullseye on a dartboard that’s no bigger than the size of an atom – according to science, *that’s* how “miraculous” *any* life in the universe actually is!

B–So, as one cosmologist put it, “*this remarkable fine-tuning of the universe cries out for a philosophical or theological explanation,*”¹¹ and this idea has become the basis for what has come to be known today as the “**theory of Intelligent Design.**”

C–In fact, in his landmark book **Universes**, **John Leslie** goes so far as to say that (*On screen:*) “***The fine tuning [of the universe] is evidence, genuine evidence, of the... fact that God is real.... And it could [even] be tempting to call the ‘fact’ an ‘observed’ one. Observed indirectly, but observed none the less.***”¹²

6. Now, I do need to acknowledge that science *has* proposed *other* explanations for this “fine-tuning,” most of which argue that it’s merely the result of some form of chance.¹³

A–But in the end, I don’t find the “chance” theories satisfactory. Let me demonstrate why...

1–I have here [**POINT TO COOKIES...**] some freshly baked, homemade chocolate chip cookies. Over here [**POINT TO EACH...**], I have the ingredients needed to make them: flour, sugar, vanilla, chips, baking soda, water, etc., along with measuring cups, a bowl to put it all in, and a spoon to mix it. And over in our Fellowship Hall, there’s even an oven to cook it all in.

2–So here’s my question: after setting all these ingredients and mixing paraphernalia on this table, how long would I would have to stand here and wait before “pure chance” caused these things to make themselves into chocolate chip cookies like these others? A year? 10 years? 100? 1000? One *billion*?

B–I think you see my point, exaggerated though it may be: ...these ingredients don’t mix and cook themselves; mere “chance” cannot explain their existence.

1–No. Some *ONE* (some “intelligence”) has to measure it all out in proper amounts, stir it up, space it out on a cookie sheet, and cook it at a certain temperature for a certain time before we get cookies.

2–And if this is true for something as simple and ultimately inconsequential as chocolate chip cookies, then how much more must it be true for the amazing, complex existence of life within our universe?¹⁴

C–Now, I’m a person of faith, but even I don’t possess enough faith to believe that pure chance can explain how the complex values and constants of the universe came into being to enable life – there *had* to be something else behind it.

7. And so this brings us finally (but most importantly) to today's scripture from Psalm 19.
- A—Let's all read it all [again], but as we read, let's do so with an ear to its *theology*, rather than its *science* – listen for the WHO & WHY of our universe, rather than its HOW ¹⁵...
[Congregation Reads IN UNISON... Psalm 19:1-6 (MSG @ 9:30am; NRSV @ 11:00am)]
- 1—You see, in many ways this scripture answers in *theological* terms the questions raised by *scientific* concepts like “The Big Bang” and the “Anthropic Principle.”
- 2—It says that there IS, in fact, a Creator of all things, and that He desires a personal, intimate relationship with every part of His creation, including each of us. ¹⁶
- B—So you see, as we learned last week, *this* is why faith and science need each other – they're complements, not rivals: ...
- 1—...When we want to understand the *mechanics* of our universe, we turn to science;
- 2—... And when we want to understand the ultimate meaning and purpose of it all, we turn to the holy scriptures.
- C—But as people of faith, we believe that in the end, they *both* teach us that “*God and the Big Bang*” are, in fact, one in the same – that God is the infinite, eternal Creator of all things, but one who knows us intimately and loves us extravagantly, as if we are all that there is!
- D—And *that* is awesome!
8. [PRAYER: “*God of heaven and earth, the longer we live and the more we learn, the more we are awed by the beauty and complexity of your creation. With revelation of each new scientific discovery, our wonder grows. You exist in the farthest reaches of the universe where the Hubble telescope cannot yet see. You see the birth of stars and galaxies that we can only imagine. And yet, you know the very hairs on our heads. You alone know if there is life on any other planets, and what you're doing in redemptive grace and mercy towards those who exist elsewhere (if they exist at all). You were here when life first began on this planet, and we believe that you're the one who brought together all the factors that made it possible, and we praise you for that. Thank you for giving us the mental capacity to understand something of your creation. And Lord let all that we learn drive us to our knees in humble awe, adoration and wonder at... (9:30am... the majesty and glory of you, the God of Wonders) (I am...the majesty and glory of your name). In Jesus' name we pray, Amen.*”]
9. [9:30am ONLY - Congregational Response, “*God of Wonders*”]
 [11am ONLY - Adult Choir Response: “*The Majesty and Glory of Your Name,*” (Fettke)]

ENDNOTES:

1. John Polkinghorne argues that this kind of “interdisciplinary work” (e.g., between scientists and theologians) is necessary, even though acknowledging that those articulating these connections cannot hope to have high degrees of knowledge into the subject matter of their counterparts: “*It is scarcely surprising that theologians often do not achieve great sophistication or insight when they turn to science. We scientists who take a serious interest in theology are only too open to the charge of a converse lack of skill and knowledge when we venture into matters theological. [Nevertheless],...interdisciplinary work is both essential (for, in the end, knowledge is one) and risky (for we must all venture to speak on topics of which we are not wholly the master)*” [Polkinghorne, Belief in God in an Age of Science (New Haven: Yale Univ. Press, 1998), p. 83].

2. The goal here is not so much to “prove” the existence of God using astronomy or physics (though I do believe that if we study the universe with an open mind, along the way we’ll conclude that there must be an intelligence behind it all!). Instead, we’ll be discussing several discoveries of astronomy and physics that can help us better understand and claim implications for our religious faith. Stated another way, “*We are not now looking to the physical world for hints of God’s existence but to God’s existence as an aid for understanding why things have developed in the physical world in the manner that they have*” [John Polkinghorne, Belief in God in an Age of Science (New Haven: Yale Univ. Press, 1998), p. 13].

3. There are several other areas/concepts where astronomy, physics and faith seem to meet and dialogue with each other. These include:

Discussions about “**Quantum Physics**,” which deal with the study of things so small that science tells us we must merely take the fact of their existence “on faith,” (much like theology has been saying all along about the existence of “intangibles” like God, faith, love, hope, etc.).

Consider, too, the **Vastness of the Universe** as an example of a connection between astronomy, physics and faith. The sun is the nearest star to us, 93 million miles away. The next closest is Proxima Centauri 25 trillion miles away (4.3 light years). The Andromeda Galaxy is the farthest object that we can see with the naked eye, about 2.2 million light years away. In 2004 scientists discovered a galaxy over 13 billion light years away! The speed of light is about 186,282 miles per second in a vacuum (the Space Shuttle, by comparison, travels at 5 miles/second, and the Apollo rockets that took us to the moon could travel at about 25 miles/second), and a light year is the distance that light travels in a year, approximately 5.9 trillion miles. So, if you wanted to travel to Proxima Centauri, it would take over 4 years traveling at the speed of light [Read Paul E. Stroble, Faith Questions: What About Religion and Science? A Study of Reason and Faith (Nashville, TN: Abingdon Press, 2007), pp. 69-70]. The universe is so vast, and we as humans seem so small and insignificant, and yet the scriptures say that “even the hairs on our head are numbered (Luke 12:7), and the God made us only “a little lower than the angels” (Psalm 8:5).

Finally, science has also often postulated about the **Future of the Universe** (a subject that theology terms “eschatology”). Here, however, science and theology diverge, in that science currently believes that (barring any outside interference), the universe will eventually end cold, dark and lonely as its expansion pushes the galaxies grow far apart from each other, with all stars eventually using up their energy, or will end as its expansion stops, reverses, and collapses upon itself in a reverse “Big Bang.” For example, in 1978 Freeman Dyson set about to determine if life can continue to exist indefinitely in an “open” universe that continues to expand and cool forever, or if it could exist in a “closed” universe that finally collapses upon itself in a cosmic “big crunch.” He concluded that “*we have either the choice of being fried in a closed universe or frozen in an open one*” [Dyson, cited in John Jefferson Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), p.160].

Christian theology, on the other hand, believes that which there will come an end to the physical world as we know it, that end will *not* be “cold, dark and lonely,” but that God Himself will be there to “wipe away every tear from our eyes” and that we will dwell with God forever in heaven (Read Revelation 21). So while the science’s future universe project pessimism and hopelessness, theology’s future projects optimism and hope. As John Davis explains, “*In the face of the pessimism and ultimate hopelessness implied by the inexorable laws of thermodynamics, Christian faith can point modern persons to the resurrection of Jesus Christ in which God has redemptively transcended the forces of disintegration and death and ‘brought life and immortality to light through the gospel’ (2 Timothy 1:10). For Christian faith, the grim prospects of the universe’s heat death are transcended by the omnipotent power of God attested in the resurrection and by the hope of a cosmos that will finally be transformed and liberated from its bondage to decay (Romans 8:21-22; Revelation 21:1)*” (Davis, p. 174).

4. In his explanation of this phenomenon, Lemaître was clear that the original “singularity”, or single point was not “in” space, but instead that space and time itself existed within the singularity. He was also clear that the singularity did not really “explode” (as one would think with a “Big Bang”) but was merely a very, very, very rapid expansion. The astronomer who sarcastically named it “The Big Bang” was Dr. Fred Holye, and the two Bell Laboratory astronomers who made the discovery in 1964 were Arno Penzias and Robert

Wilson. Read more about the development of this theory at Paul E. Stroble, Faith Questions: What About Religion and Science? A Study of Reason and Faith (Nashville, TN: Abingdon Press, 2007), p. 77.

5. Besides the “Big Bang” theory, there *have* been several other scientific cosmologies to explain the origins of the universe. These have included: (a) the “Steady State” theory - expansion density in the universe is “balanced” by the continual creation of new matter; (b) “Oscillating Universe” model - universe eventually collapses in a “big crunch”, leading to another “big bang”, expansion, collapse into a “big crunch,” etc.; (c) “Vacuum Fluctuation” theory (d) “Spontaneous creation” *ex nihilo* (from nothing); (e) Hawking-Hartle proposal - universe is neither created nor destroyed; it merely “is”; (f) Superstring “theory of everything.” Most of these other theories, however, have not been as well-corroborated as “The Big Bang.” For further information about these other theories, read John Jefferson Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), pp. 26-35.

6. Article found in the November 21, 2009 issue of USA Today at www.usatoday.com/tech/science/2009-11-21-big-bang-machine_N.htm?csp=usat.me.

7. These questions begin to sound more and more like questions for philosophy or theology, rather than for science.

8. Noted astrophysicist Robert Jastrow later argued that “*the astronomical evidence [of the Big Bang] leads to a biblical view of the origin of the world*” [Jastrow, cited in Ian G. Barbour, When Science Meets Religion: Enemies, Strangers or Partners (New York: HarperCollins, 2000). p. 41].

9. This concept is described in detail in a 1986 benchmark book The Anthropic Cosmological Principle, by John D. Barrow and Frank Tipler.

10. Ian G. Barbour, When Science Meets Religion: Enemies, Strangers or Partners (New York: HarperCollins, 2000), pp. 57-58). Well known author Stephen Hawking says that “*The laws of science as we know them at present, contain many fundamental numbers, like the size of the electron and the ratio of the masses of the proton and electron... [and] the remarkable fact is that the values of these numbers seem to have been very finely adjusted to make possible the development of life*” [Hawking, cited in Judson Poling, Do Science and the Bible Conflict? (Grand Rapids, MI: Zondervan, 2003), p. 40].

11. John Jefferson Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), p. 133.

12. John Leslie, Universes (Routledge, 1989), p. 198. Other physicists, astronomers, and cosmologists have made similar observations: “*The hypothesis of divine design... not only is consistent with the evidence of cosmic fine-tuning but also adheres with a broad range of other considerations – religious experience, moral awareness, providence and miracle... and is to be preferred as the most plausible explanation of the remarkable fine-tuning of the universe*” [John Jefferson Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), pp. 138-139]; “*From the perspective of faith, it is the God of biblical revelation who ‘breathes fire into the equations’ and brings a possible universe into actual existence through mathematical equations and quantum-mechanical laws that he himself has designed*” (Davis, p. 36).

13. If not the anthropic principle, then what could explain the “fine-tuning”? Science has proposed at least three other options based upon various types of “chance” models: (a) the universe as a “*Brute Fact*” – merely accept the constants as facts without need for further explanation; (b) “*Deeper Physics*” - universal constants can be explained by laws of nature that have yet to be discovered; (c) “*Many-Worlds*” hypothesis – our universe is only one of a great number that exist, and ours just “happens” to be the one with the correct mathematical constants to support life. Each of these explanations are detailed further in John Jefferson

Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), pp. 137-139.

14. The argument here is that even science has recognized that certain variables within our universe are of such a precise nature that mere random chance alone cannot explain either their presence, or the fact that they create and sustain life. This has been acknowledged by many astrophysicists. For example...*“The universe looks as if it is unfolding according to some plan or blueprint... [The laws of physics] look as if they are the product of intelligent designs. I do not see how that can be denied.”* (Paul Davies, The Mind of God: Science and the Search for Ultimate Meaning, p. 215). *“When we take... cosmic history into our reckoning, evolution by itself is not sufficient to account for the fruitfulness of the world... It is a particular kind of universe which alone is capable of producing systems of the complexity sufficient to sustain conscious life.”* [John Polkinghorne, Belief in God in an Age of Science (New Haven: Yale Univ. Press, 1998), pp. 5-6].

And how does the possibility of extra-terrestrial life affect the Christian doctrines of incarnation and redemption? Professor of Systematic Theology and Ethics John Jefferson Davis argues that *“If the atonement can be understood as not being limited by time, it can just as readily be understood as not being limited by space or distance.... The Christology of Colossians 1:15-20 makes it unnecessary to postulate additional incarnations or atonements in order to conceptualize the possible reconciliation of any alienated extraterrestrials elsewhere in the universe. The once-for-all incarnation and death of Christ on the cross has already provided the basis for such a reconciliation”* [Davis, The Frontiers of Science & Faith: Examining Questions from the Big Bang to the End of the Universe (Downers Grove, IL: InterVarsity Press, 2002), p. 156].

15. Interpreting this scripture, one Bible scholar says, *“Psalm 19 is not anti-science, but it does offer a view of the universe as something more than an object to be studied and controlled. To be sure, nature is not divine, but it is incomprehensible apart from God. In some sense, nature ‘knows’ God (vs. 2), and thus it can proclaim God’s sovereignty”* [“The Book of Psalms: Introduction, Commentary, and Reflections”, by J. Clinton McCann, Jr. in The New Interpreter’s Bible, Volume IV (Abingdon Press, 1996), p. 753].

In other words, if we read today’s scripture as an account of *how* the universe was created, we’re going to be disappointed and frustrated trying to “fit it” all into today’s scientific findings. Instead (as we said last week), the Bible is not given to correct our *cosmology* but to correct our *theology*. Remember that in Old Testament times, other ancient cultures actually worshiped nature as gods (e.g., the moon, sun, stars, etc.). So, the creation stories of the Bible were written to argue that nature shouldn’t be worshiped *as* god, but that it was itself created *by* the one and only God of all the universe.

16. Read Psalm 8:1-9, Matthew 10:30, and Luke 12:7.