

Rise & Shine – March 18, 2018

Astronomers Detect Evidence of First Light Ever in Universe

Adapted from The Wired Word.

In the News

Unless you're an astronomer, you probably think of "dawn's early light" primarily as a phrase from our national anthem, "The Star-Spangled Banner." But news late last month, published in the international journal of science *Nature*, gives a different meaning to the term. Astronomers using a radio telescope in western Australia have detected signals of light from the what they believe to be the earliest stars to form in the universe -- that is, the first light *ever* in the universe.

What they "saw" was not light itself, but its "fingerprints" on background radiation by hydrogen that absorbed some of this first light.

"This is the first time we've seen any signal from this early in the universe, aside from the afterglow of the Big Bang," said Judd Bowman, an astronomer at Arizona State University who led the work. (The "Big Bang" is the prevailing cosmological theory about how the universe started and then made the stars and galaxies we have today.)

Many astronomers and physicists theorize that this cosmic dawn, while yielding the first light in the universe, is "early" only in cosmological time. They say the Big Bang occurred 13.8 billion years ago, with the earliest stars, and thus light, not forming until some 180 million years later.

Astronomers involved in this investigation say that light from these early stars would now be so faint that seeing it with Earth-based telescopes is practically impossible. But they had long hoped to be able to detect it indirectly from the way the light shifted the behavior of the hydrogen that was in the space between the stars, and now, they say, they have.

Bowman and his team have been working to detect the signals for 12 years.

To search for the signals, the team used a radio telescope called EDGES (Experiment to Detect the Global Epoch of Reionization Signature), based at the Murchison Radio-astronomy Observatory in Western Australia. The remote location is inside a legislated "radio quiet zone," to keep interference from other human-made devices to a minimum.

While there is still additional work needed to confirm the findings of Bowman's team, the discovery is called a "milestone."

Saleem Zaroubi, a cosmologist at the University of Groningen in the Netherlands, said that the finding seems to be "robust," and added, "It's very exciting stuff. This is a period in the universe's history we know very little about."

Bible verses to guide our discussion:

Genesis 1:1-3

In the beginning when God created the heavens and the earth, the earth was a formless void and darkness covered the face of the deep, while a wind from God swept over the face of the waters. Then God said, "Let there be light"; and there was light. (For context, read 1:1-5.)

In addition to telling that God made light, these verses also say that before that creative act, there was already something there that was "a formless void and darkness." Whatever that was, it was

not ordered but was chaotic. The Hebrew term underlying "formless void and darkness" is *tōhûwabōhû*, which denotes chaos not simply as disorder, but as an active force that challenges the rule of God, undermines life, and works against well-being in the world. But God was and is more powerful than the chaotic dark, and when he said "Let there be light," he was taking the first step in imposing order on chaos.

Questions: What does God's light tell you about the chaos that is still present in the world? Is there an active struggle between light and darkness going on right now? How does this struggle look to you?

Genesis 1:14-16

And God said, "Let there be lights in the dome of the sky to separate the day from the night; and let them be for signs and for seasons and for days and years, and let them be lights in the dome of the sky to give light upon the earth." And it was so. God made the two great lights -- the greater light to rule the day and the lesser light to rule the night -- and the stars. (For context, read 1:14-19.)

Genesis 1:1-3, above, where God made light, was part of the work of the first day of creation. Verses 14-16, here, where God made sun, moon and stars, are from the fourth day of creation. That is to say, in the Genesis account, light was a separate thing, created by God before he created the heavenly bodies, including stars, from which light would eventually emanate.

Questions: What theological construct does that suggest? What, if any, scientific construct does that suggest? How do the two jibe? Does the Genesis account's assertion that light existed before the stars speak to this particular discovery about the gap between the Big Bang and the formation of stars and starlight?

Isaiah 9:2

The people who walked in darkness have seen a great light; those who lived in a land of deep darkness -- on them light has shined. (For context, read 9:1-7.)

The "people" in this verse were the Israelites, oppressed and troubled so much so that they could be metaphorically described as walking "in darkness." But, says Isaiah, God is coming to their aid, like light into their darkness.

Questions: What truths about humankind are assumed in this verse? Does God intend for us to live in both darkness and light, metaphorically speaking? How do we know? When has light suddenly shone in your life? What comfort or guidance did you receive?

John 1:1-5

In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through him, and without him not one thing came into being. What has come into being in him was life, and the life was the light of all people. The light shines in the darkness, and the darkness did not overcome it. (For context, read 1:1-17.)

This is John, the gospel writer, speaking about creation, and he says the Word (whom we learn further on is Jesus), was there with the Father at the time of creation. John also identifies Jesus as "light of all people" that "shines in the darkness."

Questions: Why do you think John decided to begin his gospel with Creation? How is Jesus like light? What truths about Jesus are embedded in these verses? What truths about humankind are assumed in these verses? Who in history or in your life have been light to others?

Additional thoughts for discussion:

- In her book *Learning to Walk in the Dark*, author Barbara Brown Taylor describes darkness as "shorthand for anything that scares me." What scares you? And what kind of light do you need to overcome that kind of darkness?
- In [this article](#), Stephen Hawking talks about what is his current thinking on the "time" before and after the Big Bang. He talks about how we have trouble grasping "time" in this period because it probably did not obey the laws of physics that we currently observe. Similarly, we often have trouble understanding God because we try to constrain him by our human understanding. When have you put limits on God because his ways did not fit your expectations or because you thought that what you hoped for was not possible?

Prayer

Divine Creator, thank you for the light you have sent into the world. Help us to live as good stewards of creation, and followers of your light. In Jesus' name. Amen.