

“...and there was light”

*An artist's conception
of the Big Bang.*

by Richard Fowler

The idea of wanting to take a picture of a black hole comes with a tinge of irony. “I wonder what it looks like?” might be said with the slightest hint of sarcasm. If your mind's eye can't muster it, then you are in luck. In 2019, for the first time in human history, we got a snap of a black hole.¹

Spoiler alert! It's black and looks like a hole! Maybe no surprise there, but for the scientists who waited 20 years to get a glimpse, they noticed something else about the picture. There was a ring of light around the hole, which looked more like an orange glow. This got me thinking.

Eight telescopes positioned around the world were able to build up enough data to create this once-in-a-lifetime image. The light is nothing extraordinary, but I was made more curious when the lead scientist, Prof Heino Falcke, said: “We still have to understand how the light

is generated”.² Apparently, this 40 billion km (three million times the size of the Earth) cosmic vacuum cleaner's gravitational pull even drags light into its abyss. And that's something when you think that light has been around since the Big Bang, the beginning of the universe.

Light was on the scene at the grand opening of the universe, too (sorry, no pictures available). Steven Weinberg, a Nobel laureate in physics, describes this epic event: “At about one-hundredth of a second, the earliest time about which we can speak with any confidence, the temperature of the universe was about a hundred thousand million (10^{11}) degrees centigrade...The universe was filled with light”.³

We may not know why light is generated from black holes, but we do know those packets of energy have been around since the birth of this universe. One suggestion for the source of this light has a descriptive beginning that sounds awfully like

that of Steven Weinberg, except that it was written some three millennia ago.

Maybe you will find it curious that the beginning of the story of the universe by a scientist starts in the same way as the beginning of one of the greatest origin stories, the Bible. This is how the Bible describes the beginning of the universe:

“In the beginning God created the heavens and the earth...And God said: ‘Let there be light’, and there was light”.⁴ Not much difference with how modern science puts it.

NOTES

¹ <https://www.bbc.com/news/science-environment-47873592> .

² <https://www.bbc.co.uk/news/science-environment-47873592> .

³ Steven Weinberg, *The First Three Minutes: A Modern View of the Origin of the Universe*. Basic Books, 1988, p. 5.

⁴ Genesis 1:1, 3.