

Offered Title: OK Google, Let There Be Life!

Yeah, I know, I could have inserted any of the available voice activated assistants such as Siri, Alexa, Cortana...but Google seems to be the universe at this time. Is Google God? No, but to be sure, let's Google it.

Just as Google seems to be ubiquitous in our lives, life might be ubiquitous in our universe. Why not? Is God so narrowly focused as to only germinate Earth, this pale blue dot in a rather ordinary galaxy? That would seem, to me, un-God like. I am confident life is, like us, modifying and maybe messing up many, many other habitable spots in the universe.

OK, I'm confident, so what? Is there an empiric methodology that can support my optimism? Welllll...maybe. Enter the Drake Equation. Maybe you had the luck to be present at the clouded-out Astronomy Night at Tye Preston Memorial Library in Canyon Lake, when Bob Kaiser gave an entertaining and informative presentation of the Drake Equation.

Dr. Frank Drake, an American astrophysicist, was a pioneer in the now famous SETI (Search for Extraterrestrial Intelligence) project. In 1961, for the first SETI meeting, he came up with an equation that he used to dramatize the difficulty and complexity in predicting, much less finding technologically advanced civilizations.

The Drake Equation addresses the question "how many civilizations exist in the Milky Way galaxy?"

The original equation: $N = R_* \times f_p \times n_e \times f_l \times f_i \times f_c \times L$

From left to right: The average **R**ate of star (*) formation x the **f**raction of stars with planets x the **n**umber of planets per star capable of supporting life x the **f**raction of planets with life x the **f**raction of planets developing intelligent civilizations x the **f**raction of civilizations with detectable signal technology x how **L**ong these civilizations release detectable signals.

The weakness of this equation is with multiple assumptions that need to be made to provide numbers for input. In 1961 we had little idea how many stars have planets. We have a better grasp today, planets are commonplace, but currently we cannot say which might be capable of supporting life. Just estimate? That's the challenge, with various estimates plugged in there might be 20 to 100,000,000 civilizations out there capable of radio transmission. No help.

So, where are they? That's what Enrico Fermi, the famous physicist who developed the world's first nuclear reactor asked. Why haven't we picked up a signal, been visited? Go back to my article on The Milky Way, there's just so much space, and distance = time. Even at the speed of light it takes tens, hundreds, thousands of years to travel within our galaxy. Radio signals get weak and distorted. We could have been visited and not even know it!

I'm still optimistic. Sure hope they're friendly.

What's in the Sky?

March 4; Dusk: Venus and Mercury are close and close to the western horizon. Use binoculars.