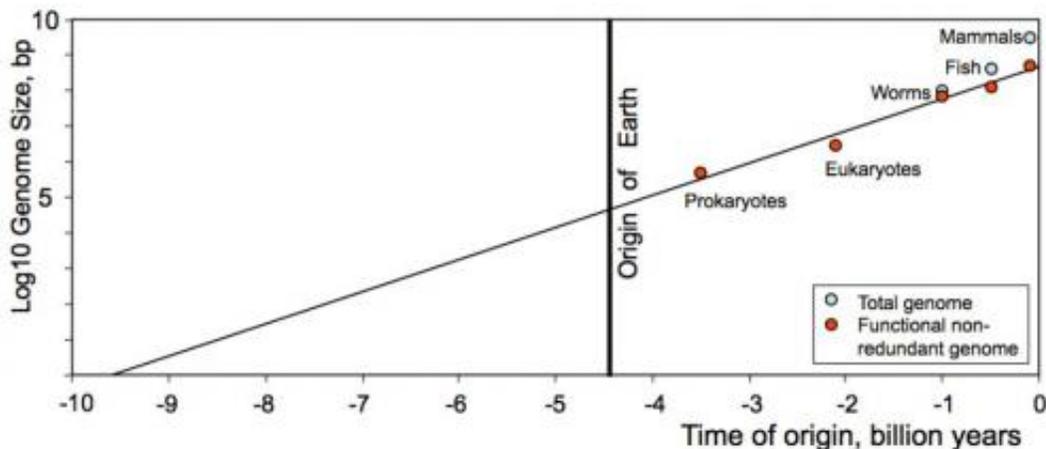


# Researchers use Moore's Law to calculate that life began before Earth existed

April 18 2013, by Bob Yirka



On this semilog plot, the complexity of organisms, as measured by the length of functional non-redundant DNA per genome counted by nucleotide base pairs (bp), increases linearly with time (Sharov, 2012). Time is counted backwards in billions of years before the present (time 0). Credit: arXiv:1304.3381

[physics.gen-ph]

(Phys.org) —Geneticists Richard Gordon of the Gulf Specimen Marine Laboratory in Florida and Alexei Sharov of the National Institute on Aging in Baltimore have proposed, in a paper uploaded to the preprint server *arXiv*, that if the evolution of life follows Moore's Law, then it predates the existence of planet Earth.

Moore's Law, of course, famously suggests that the complexity of

computers grows at a rate of double the transistors per circuit every two years, resulting in [exponential growth](#). Looking at the complexity of computers today and working Moore's Law backwards shows that the first [microchips](#) came about during the 1960s, which is when they were actually invented. In their paper, Gordon and Sharov take the same approach, only they apply it to [biological complexity](#).

The two researchers acknowledge their ideas are more of a "thought exercise" than a theory proposal, but at the same time suggest their calculations ought to be taken seriously. They start with the idea of [genetic complexity](#) doubling every 376 million years—working backwards, they say, means that life first came about almost 10 billion years ago, which of course predates the creation of Earth itself. Most scientists agree the Earth formed just 4.5 billion years ago. Assuming that Moore's Law does apply to biological complexity, this would suggest that life began somewhere other than on Earth and migrated here.

Of course there are other possibilities to explain what happened, as the two acknowledge—life could have evolved following Moore's Law during certain periods but not at others—a [deep freeze](#) could have temporarily halted changes in complexity, for example, or cataclysmic events could have periodically killed off the more advanced biotic life forms. There is also the possibility that the development of life had to reach a certain [stage of development](#) before it began to conform to Moore's Law. Then of course, there is the very real possibility that the beginnings and [evolution of life](#) don't conform to Moore's Law at all.

Gordon and Sharov's paper is likely to set off multiple rounds of discussion regarding not just the origin of life on Earth, but in the galaxy as well. If life truly predates our planet, and it can be proved, what impact might that have on religious thought and what might it mean to those looking for meaning in its very existence?

**More information:** Life Before Earth, arXiv:1304.3381 [physics.gen-ph] [arxiv.org/abs/1304.3381](http://arxiv.org/abs/1304.3381)

## **Abstract**

An extrapolation of the genetic complexity of organisms to earlier times suggests that life began before the Earth was formed. Life may have started from systems with single heritable elements that are functionally equivalent to a nucleotide. The genetic complexity, roughly measured by the number of non-redundant functional nucleotides, is expected to have grown exponentially due to several positive feedback factors: gene cooperation, duplication of genes with their subsequent specialization, and emergence of novel functional niches associated with existing genes. Linear regression of genetic complexity on a log scale extrapolated back to just one base pair suggests the time of the origin of life 9.7 billion years ago. This cosmic time scale for the evolution of life has important consequences: life took ca. 5 billion years to reach the complexity of bacteria; the environments in which life originated and evolved to the prokaryote stage may have been quite different from those envisaged on Earth; there was no intelligent life in our universe prior to the origin of Earth, thus Earth could not have been deliberately seeded with life by intelligent aliens; Earth was seeded by panspermia; experimental replication of the origin of life from scratch may have to emulate many cumulative rare events; and the Drake equation for guesstimating the number of civilizations in the universe is likely wrong, as intelligent life has just begun appearing in our universe. Evolution of advanced organisms has accelerated via development of additional information-processing systems: epigenetic memory, primitive mind, multicellular brain, language, books, computers, and Internet. As a result the doubling time of complexity has reached ca. 20 years. Finally, we discuss the issue of the predicted technological singularity and give a biosemiotics perspective on the increase of complexity.

via [Arxiv blog](#)

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