

# Interstellar Monuments

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By Avi Loeb on August 28, 2021

***B***y now I have reached an age at which my birthdays can be thought of as a countdown to the inescapable end. We live our life without knowing when the end will come. But acknowledging its inevitability encourages us to build monuments of our accomplishments that would outlast us. Of course, our biological DNA could maintain longevity through our children. But we often wish to add meaning to the world we leave behind that goes beyond our genetic code.

[Genesis 3:19](#) states: "By the sweat of your brow you will eat your food until you return to the ground, since from it you were taken; for dust you are and to dust you will return." The only person who escaped this fate is [Clyde Tombaugh](#), the discoverer of Pluto whose partial ashes are making their way out of the Solar system onboard the [New Horizons](#) spacecraft. But these ashes are nothing but burnt-up DNA with no useful information content. It would have been far more scientific for NASA to send an electronic record of his genome, or even [better](#) - frozen [stem cells](#).

The physical making of the rest of us stays on Earth, where we are left with the fundamental question of what to leave behind so that we will be remembered. [Cave dwellers](#) left marks on the walls of their caves. Emperors, kings, wealthy individuals and university officials left statues or portraits that preserve their physical appearance. Architects created buildings. But the best monuments are not physical; rather, they are spiritual in nature. Musicians left behind their compositions of musical notes, scientists their original equations, painters their paintings and writers their stories. These brainchildren live in the space of abstract ideas, not in real space. An idea can last forever as long as there is a brain who knows about it.

Nevertheless, all terrestrial creations will disappear once the Sun will heat up within a billion years and [boil off all oceans on Earth](#). Is there any hope for creating monuments that will outlast this terrestrial endpoint? The best approach might be to follow Tombaugh's ashes into extraterrestrial space.

Our longest-lived monuments could be technological relics. They need not be expired as Tombaugh's ashes but could exhibit active intelligence that outsmarts the natural intelligence of humans, namely they could be represented by equipment with [artificial intelligence \(AI\)](#). Imagine a compact [CubeSat](#) equipped with AI and [3D printing](#) that carries the torch of our goals into the vast extent of the [Milky Way](#) galaxy. Sending such systems to interstellar space after training them to our satisfaction on Earth through machine learning, would resemble the [experience](#) of sending our kids to the world after educating them at home and in school. Each of us could train a unique AI system that reflects their sense of meaning and purpose in life. Instead of painting the wall of a cave that will collapse by

geological activity in a billion years, we can shape the content of our personal AI system that would survive for billions of years in space, as if it were our own technological [avatar](#).

Our technological avatars in space could outlast the Sun and continue on their journey, while replicating damaged parts or making extra copies of themselves with their 3D printers. If we could imagine this as the blueprint for the future of humanity, might it represent the past of a civilization that predated us by a billion years around another star?

To find out the reality we live in, we should search with an underlining modesty for interstellar monuments of those who predated us [in the cosmos](#). So far, all the telescopes we used to survey the sky were *not* sensitive enough to detect a CubeSat-size object by its reflection of sunlight within a distance comparable to the Earth-Sun separation. The forthcoming [Legacy Survey of Space and Time](#) (LSST) with the [Vera C. Rubin observatory](#) could find such monuments. Moreover, if any such object enters the Earth's atmosphere, it might be classified as an [Unidentified Aerial Phenomena](#) (UAP), of the type mentioned in the [report delivered to the US Congress](#) on June 25, 2021.

The recently announced [Galileo Project](#) could potentially discover extraterrestrial monuments as they pass near Earth. Autonomous avatars could have been sent by other beings long ago, so that by now these beings had perished. The discovery of advanced technological artifacts will provide the same sense of awe as the discovery of the prehistoric [cave paintings](#) dating back to [45,500 years ago](#). And finding an accompanying genetic record of the senders onboard with more information content than Tombaugh's ashes, would be even more exciting.

## ABOUT THE AUTHOR



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