



One Earth: New Horizons Message

Continuing the tradition of a message from Earth

<http://oneearthmessage.org/>



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The voyager golden record

The urge to leave our footprints in the sands of time is as grand as the pyramids and as humble as a set of initials carved on a tree. Humanity has made many time capsules, describing ourselves for future audiences.

Some of them have even been included on spacecraft landing on other worlds, from the simplicity of the plaque on Apollo 11 to the complexity of the Planetary Society's Visions of Mars DVD.

But only four physical messages have left the bounds of the solar system to roam forever among the stars. The twin Pioneer and Voyager spacecraft each carried a message artifact on their eternal journey. In fact, after all their power is gone, carrying these artifacts becomes the primary mission of the spacecraft.

The two Pioneers bore the now iconic

plaque carrying etched inscriptions showing two humans, the spacecraft, the solar system, and our galactic location. The two Voyagers each carried the famous Golden Record, a metallic LP containing audio and pictorial information about Earth, including music from many cultures around the world and over two millennia.

In the 40 years since the Voyagers were launched, no other spacecraft was set aloft with a trajectory to leave the solar system until 2006, the New Horizons Mission to Pluto. I watched this launch wondering if the mission would have included an updated Golden Record, perhaps one reflecting the changes in technology since 1977— some kind of a quantum-nano-superconducting Golden Record!

But the mission included no message at all, except for some coins (U.S. state quarters) and other tokens. It also, in a noble gesture, carries some of the ashes of Pluto's discoverer Clyde Tombaugh.

But there is no coherent message designed to be understood by ET.

An opportunity lost?

It seemed a lost opportunity, until I had the idea of making a message on Earth and uploading it to the spacecraft. In 2012 I was designing a logo for the company Made in Space, which was field-testing 3D printers on the International Space Station. Break a wrench in orbit and print out your own replacement wrench from a file sent up from Earth. If we could build a wrench in space, why not a message? Made in Space gave the International Space Station a unit to test in orbit, bearing my logo on its side.

This led me to the idea: Why not make a Voyager Record 2.0 and upload it to the spacecraft's onboard computer?

The most exciting thing about this possibility was that this time the process could be opened up to the entire world. Newly developed crowd-sourcing techniques using the internet would permit a true self-portrait of Earth, made and judged by those Earthlings who cared enough to participate.

In the Golden Record, a few of us had to choose which picture of a mother and child should be sent. Now the whole world could submit their own pictures of mother and child, and let everyone decide which is the best. In fact, the whole world can help decide. Hence the project's name: One Earth Message.

Literally everyone can submit

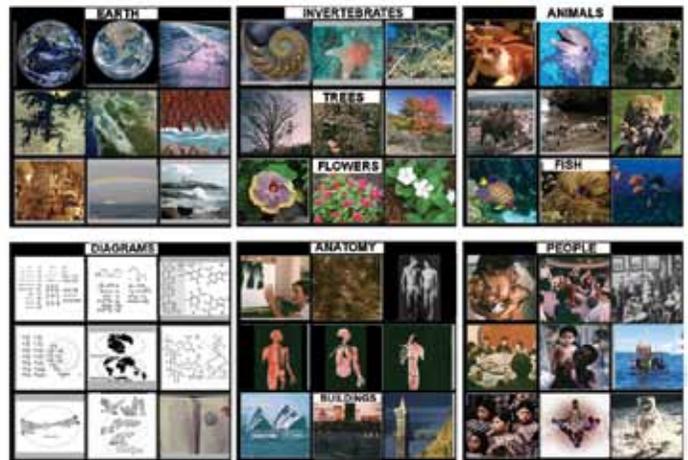
Everyone will be able to submit a few pictures to our submission website at no charge—nobody will be excluded because they cannot pay. People wishing to submit additional photos—or music—will pay a small fee. These fees will be used to support the maintenance and operation of the website during the 18 month selection process. NASA is being asked for no money to support this project. We must support it ourselves.

The devil is in the details, however.

- How do you filter out objectionable material?
- Who decides what is objectionable?
- Who determines if the message is accurate (for example, is the biosphere presented to include worms and microbes as well as puppies and kittens)?
- How long can you maximize the lifetime of the digital message to make it last for an interstellar journey?
- And, most difficult of all, how do you code the contents so an ET, who doesn't know our software conventions, can



Our Advisory Board of over 80 people represents many ages, disciplines, backgrounds. Planetarians may recognize the face of Derrick Pitts of the Fels Planetarium in Philadelphia; Kaoru Kimura, IPS affiliate representative for Japan; SETI scientist Jill Tarter; and the host of the Canadian Broadcasting Corporation's Quirks and Quarks radio program, Bob McDonald. All images provided by author.



Anyone will be able to submit photos in any category and everyone else can express their preferences. A constantly changing mosaic of leading images, available online, will document the evolution of the content.

read it? Can ET be helped to recognize it's a message in the first place?

After many long discussions with engineers, computer scientists, and other experts, I believe we can address and solve all of these problems, beginning with the task of building the submission website. We are working with iScience at the University of Konstanz in Germany, a leading institution in the new field of crowd-sourced science.

New crowd-sourcing techniques have made important discoveries in fields ranging from untangling protein structure to discovering the tomb of Genghis Khan. Such techniques will transform the One Earth Message selection process from a

mere pictures contest into an adaptive process that modifies the selection structure to reflect what people actually want to say, rather than what we think they should say. For example, categories may merge or subdivide, as we see what people really want to tell ETs about.

In 2012 I first approached the New Horizons mission with the idea, and with their support



presented it to NASA. The initial response from both the mission and NASA was informally encouraging, but there has been as yet no formal approval for the project.

Perhaps the main reason was that the earliest a message could be uploaded would be in 2020, after New Horizons had completed its science mission, visiting a Kuiper Belt Object (KBO) in 2019.

Until then, there would be no room in the spacecraft's small 4 Gb memory, all of which would be devoted to recording data from the KBO encounter. Only after all the data are returned to Earth can the One Earth Message be uploaded.

With no pressing need to approve the project, NASA has not yet decided whether to include a digital message on the New Horizons. It's up to us to persuade them.

Why make the message?

I can think of six good reasons to make the One Earth Message:

- All four previous interstellar spacecraft sent out from Earth have carried some sort of greeting to the cosmos, a greeting intended to be understood by ETs. Do we really want to break the chain? What kind of message does that send about us?
- This message may involve many millions of people worldwide in an activity that will bring increased awareness of the New Horizons mission in particular and planetary exploration in general.
- Any international, collaborative activity that encourages people to think of us as one planet and one species is good in itself.
- The Golden Record is a time capsule of Earth in 1977. It no longer represents our planet. As an iconic artifact to inspire the public, an up-to-date self-portrait of Earth will be a powerful reminder of the place of our planet among the many other inhabited worlds that may populate our Milky Way Galaxy.

By self-funding this activity, we avoid political arguments about whether this is a worthwhile expenditure of public money.

Using the onboard computer

Every spacecraft from Earth carries an onboard computer. Many of these spacecraft will remain in orbit or on the surfaces of other worlds for very long periods of time. The OEM will provide a library of crowd-sourced and crowd-selected materials that other space missions can use in their own outreach and public involvement projects.

We anticipate variations of the One Earth Message will find its way onto many spacecraft. Nominated contents that are not chosen for New Horizons may find a ride to space aboard future spacecraft.

In fact, we are already in discussions about sending a modified test version of One Earth Message to the moon aboard a competitor for the Google Lunar X Prize. This would be a proof-of-concept that would demonstrate to NASA that we can actually devise such methods by the new processes we describe. (Stay tuned for details.)

Carl Sagan was my mentor and friend for many years, and among his many other gifts, he was a good politician and understood how to work such an unusual project through the NASA system. His leadership has provided a model for how to proceed in our project.

One of the first things Carl told me when he



invited me to work with him on the Golden Record was that this message was coming from our entire species and must reflect that in the selection and balance of the contents. Hence the greetings in 54 Earth languages, the musical selections from around the world and through millennia, and the photographs of people from all over Planet Earth.

So the One Earth Message is an even more global picture of Earth, because everyone in the world will be allowed to participate in the nomination and selection of picture and audio contents. It will be a self-portrait of Earth in a way that the original Golden Record never could be.

Another lesson is that Carl did not show the Golden Record to NASA, or even discuss its contents, until we had completed the task of making it. Perhaps this made it easier for the various NASA officials to approve, since they could see exactly what we were sending—and,

of course, they will have the final say in what is sent.

The idea of a crowd-sourced global message is a bit vague because nothing like it has been done before. Once we can show NASA the kind of message that results, and the level of support the project generates, we believe it will be easier for them to give us an official approval to upload the message at a time of their choosing.

It's been 5 years since I came up with this idea, and people ask me if I have become discouraged that NASA has not agreed to carry our message yet.

I remind them of the Visions of Mars DVD.

Lou Friedman from The Planetary Society asked me to lead that project in 1992, preparing a CD-ROM for launch on the Russian Mars 94 lander.

My team worked on that for two years in preparation for the launch, only to have it postponed until 1996. It was eventually launched—only to explode and fall into the Atlantic Ocean. All our work was gone in a flash. When a launch fails, there was no Plan B. No second spacecraft.

But Lou was not deterred. He lobbied NASA for years to take the artifact to Mars, finally winning a spot in 2006 on the Phoenix lander, now sitting at high northern Martian

latitudes awaiting discovery by a future generation of human colonists, perhaps a few centuries hence.

They will find an antique DVD containing a message for them—a gift from The Planetary Society of a collection of fiction and art inspired by the Red Planet, the first Martian library. It took 12 years since Lou hired me to lead the creation of this message artifact, but it ended up on Mars after all.

Space exploration is for optimists. It's hard, the odds against you are long, but it is possible to succeed. I have every confidence that we will send a digital gift to the stars, a gift telling some future ET who we were and how we lived on the remote and lonely Planet Earth.

Please spread the word about our One Earth Message Kickstarter project, running now through September 30. Simply go to Kickstarter.com and search for "One Earth Message." ☆