

Planet Ground

Unitarian Universalist Church of Olinda

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Goldilox Sunset © 2021 Sarah Wert

It costs tens of thousands of dollars to send something into space – pound for pound it is the most expensive shipping option.

And yet, years before the current pandemic, the medical officers at NASA, who are in charge of their employee's mental health, understood that, when people are cooped up in a confined space for weeks on end, they can get... a bit edgy, which is not healthy. It can be rather hazardous for astronauts to step out of their housing, so there are limited options for stress relief. One option is exercise, and astronauts on the International Space Station do that regularly.

Another option is music. And even though it can cost tens or even hundreds of thousands of dollars to send instruments into space, NASA understood that sending things like a guitar, a keyboard, bagpipes, or a didgeridoo, was an investment in their employee's health.

For over a decade there has been a guitar on board the International Space Station. And in 2013, Commander Chris Hadfield, a Canadian astronaut, played it as he sang and filmed a reinterpretation of David Bowie's classic song *Space Oddity*. This is the first music video filmed in space. And while the equipment used was quite expensive, they didn't set any budget for special effects. What you see is what they filmed.

In this version of the song, the astronaut makes it back to Earth, landing near the Kazakhstan cosmodrome. And, while Commander Hadfield sings solo, you can see that there are billions of people in the

background, as Earth is visible through the windows of the space station.

When people talk about the first music video to be filmed in space, they sometimes wonder if it's also the most expensive video ever. It probably isn't, since most of the costs for the "set" were already absorbed as costs for other purposes. Even the tens, or hundreds of thousands, of dollars spent on sending up the guitar have been amortized over the years, and paid dividends in maintaining the mental health of several astronauts.

But it does raise the question, why spend all the money to get up there in the first place? It's a question that NASA comes across from time to time. And there are a lot of answers. At the most practical level, the scientific advances from experiments in space have direct use back on Earth – from new products, to new medical techniques, that have been developed over the decades.

There are also indirect benefits just from *taking up the challenge* of sending people up. Simply figuring out the complex problems that come with sending stuff and people into orbit has spurred technological advances of their own, which would not have happened otherwise... or at least, not as quickly. Such jumps in innovation were previously usually seen only in warfare and the development of war machines.

Space exploration is kind of the opposite route to stimulating technological development. Not to mention that nations need to *cooperate* with each other to work on something like an international space station. Canadian Commander Chris Hadfield, got there and back in a Russian Soyuz capsule, and worked with a team from several other countries. Space exploration is like an anti-war recipe.

At a more abstract level, going out inspires awe and excitement for learning about what goes on out there – and what it means for us down here. In the same way that rabbit holes, inspire us to dive deep, and encourage passions when we rise back up from them. Space exploration

is a kind of... space wormhole, that invites us to look up, see what's out there, and come back with new inspiration and passion.

Aside from physically going up into orbit, simply looking up can do that as well. Astronomers are professional looker-uppers – and they do that in a more disciplined and systematic way.

That's how they came across the star TRAPPIST-1 and its system, with planets TRAPPIST-1 *a* through *h*, just 40 light years away. Far enough, that... it's impractical for any of us here, at this time, to realistically get there any time soon. But close enough that we can see it with enough clarity to get a sense of what the place looks like. And even fantasize a bit of what it might be like if we were ever to get closer to it.

Since 2017, we've gotten to know the TRAPPIST-1 system. Orbiting around what is called an ultra-cool red dwarf star, the seven planets are so much like ours... and also very different.

The star TRAPPIST-1 is smaller and cooler than our sun. And its planets orbit so tightly around it that all of them are closer to it than Mercury is to our sun. Their orbits are so fast that a year on the planet TRAPPIST-1 *b* is less than two earth days. In fact, the longest year in the system takes less than 19 days, on TRAPPIST-1 *h*.

And yet, this is the system we know of that has the most planets like ours. Seven terrestrial planets, rocky planets. And out of those seven, three or four are in the habitable “goldilocks” zone.

But it gets complicated. Since the planets orbit so close to their star, it is very likely that they are tidally locked – which is to say, they all have one side always facing the star, in perpetual day, while their other side is in perpetual night. A very different situation than ours – a very alien situation.

And despite this vast difference, it is also speculated that some of the planets in the habitable zone may also have liquid water, and some kind

of atmosphere... all factors that may allow for life. Water and an atmosphere may also allow for some more even distribution of temperature around the planet, even if one side is always day and another is always night. And it's possible that in between – in the perpetual twilight zone between day and night – the conditions may be *just right* for some kind of life to thrive.

Even if there's no life that we recognize on the TRAPPIST-1 system, the planets of the system exhibit a special relationship with each other. The planets' orbits have full integer ratios between them, which allows them to have a certain musical rhythm, but it's also part of what keeps the system running. Without that orbital resonance, it is speculated that the planets would collide with each other and the system would fall apart very quickly. Showing that even at long distances, things are interconnected.

Thinking about the terrestrial planets of TRAPPIST-1... and the possibility – however remote – that they may harbour life, has sometimes led me to the rabbit hole (or wormhole) of thinking, “what would the aliens call their planet?”

One clue might be on how we categorize these planets: terrestrial... which is to say, earth-like. In one of the most fundamental ways, they're like our planet Earth. And we happen to name our planet after... earth – the stuff that we walk on, grow food on, live on – the stuff that makes part of who we are, and which we are a part of. I sometimes wonder if hypothetical aliens might follow a similar naming convention.

If we were to somehow encounter these aliens, and after we figured out the whole translation bit, it turned out that they'd say something like: “We're from planet Ground”. Or maybe their language has the subtlety for them to say “Our world is the planet Land”. And maybe another species would say, “That's funny, our home is the planet Dirt”.

Wouldn't it be interesting if we all used a different word that essentially meant the same thing? If we all called our home planet that stuff that we walked on, grew food on, lived on? The stuff that made part of who they were, and which they felt they belonged to. "We're from the planet Dust," one species would say, "that's where we come from, and to that we shall return."

My friends, we look up at the heavens as they inspire a sense of awe, reminding us that there are impressive and unique worlds out there. We don't know how many – if any – of these worlds can harbour life, or if that life is anything like what we know here. Either way, it's a cause for awe. If we are the only ones in the universe, we can marvel at the uniqueness of our spot in space. And if there are others that we share this space with, we can be grateful that we are not alone in this vast expanse, sharing in the amazement that, against the odds, they are out there – today, we can share in the amazement that, against the odds, *we* are out here.

And looking out upon the heavens, my friends, we are reminded of the many specific, particular, peculiar, circumstances that are needed to support the kind of life that we have come to know – in a place that is *just right*. And of how precious the place where we are is, that allows us to walk on it, grow food in it, and live on it. A place that is part of us, and of which we are a part. The dust that we come from, and to which we shall return.

My friends, may we steward this place that is *just right*, celebrate it, and stay in awe, as we look up to all else that is out there.

So may it be,
In Solidarity and Love,
Amen

Opening Hymn #302 Children of the Human Race

~)| Words: John Andrew Storey, 1935-1997

Music: Thomas Oboe Lee, 1945- , © 1992 Unitarian Universalist Association

SERVETUS

Closing Hymn #1064 Blue Boat Home

~)| Words: Peter Mayer, 1963- , © 2002 Peter Mayer

Music: Roland Hugh Prichard, 1811-1887, adapted by Peter Mayer, 1963 - ,

© 2002 Peter Mayer

~)| keyboard arr. Jason Shelton, 1972 -

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