First comments on NASA draft EIS – NOTE for private use only don't have permission to publish

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Are you certain the mission is safe?
Return to above GEO and return sterilized subsamples immediately
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Asking for a compilation of kookiest comments
Proposal for new spacecraft design

Comment Submitted by Anonymous - test first

Don't bring samples back before testing.

Comment Submitted by Linda Harding - Section off the ISS with protocols to protect Earth

Since ignorance is rampant concerning how extra terrestrial microbes might effect life on Earth; I seriously think that such things should be studied in situ. But since that is at the present time not feasible; it would seem that the next best thing is to have a special section built off of something like the ISS with protocols similar to ones described in the Andromeda Strain, minus the nuclear device.

Comment Submitted by Anonymous - test first

Test the samples!

Comment Submitted by Sharon Brashears - test first

Why do we need Mars samples brought back to Earth with no testing? Protect life here. Please.
I believe the monies spent on this program would be better spent right here on Earth.

Comment Submitted by Frank D. - test first

Please do not bring back untested samples from Mars to Earth. The risk of a germ is too great.
The arrogance of scientists thinking their containment system is unbreakable reminds me of how the Titanic was supposedly unsinkable. The difference is that at least the Titanic had some lifeboats when it sank; the Earth has none.

Comment Submitted by Lori H. - stop mission

Please don't do this! After suffering through the COVID catastrophe, the last thing we need is to bring any kind of bacteria or virus from Mars. And we are constantly reminded of the dangers of invasive species - the Lantern fly is the latest one we are dealing with. Please don't add to our worries of whether anything you or China bring back will be accidentally released. We are all human and fallible.

Comment Submitted by Richard Spotts - stop mission

I appreciate this opportunity to provide comments.

I am extremely concerned that this proposed action could potentially contaminate native life forms on Mars and/or bring back alien virus, bacteria, or other life forms from Mars to Earth.

I understand that there are planetary protection protocols. However, Murphy's Law says that if something horrible could happen, it eventually may indeed occur. History is filled with examples where Acts of God and/or human arrogance caused otherwise unforeseen disasters.

When we think about foolproof containment, waste storage from nuclear power plants is a good example. Our nation still has not found a completely safe location to store this deadly waste for many thousands of years. Even geological formations are subject to change over time, whether through earthquakes, tectonic plate shifts, or water seepage.

Nuclear detonations, meteor strikes, or terrorist attacks could also breach a containment facility.

The Earth is already dealing with increasingly serious problems from invasive or alien species being transported to new locations, and viruses mutating and causing deadly pandemics. We have not been able to solve many of these problems.

What happens if a Mars life form escapes containment and, without evolving in Earth's ecosystems, spreads uncontrollably and devastates Earth's species including us humans? There might be no way to reverse or even mitigate for that devastation.

I support scientific research when it is safe and in the public interest. However, I oppose research when there is no absolute guarantee of safety and when the risks outweigh the potential benefits.

Our search for other life in the universe should not potentially jeopardize all life on Earth. In addition, our limited federal dollars should be much better spent on responding to the mounting climate and extinction crises here on Earth. In most cases, we know how to solve these crises but we have not yet invested properly to pursue those solutions. Our top priority should be saving the life we know and need on Earth.

Thank you very much for your consideration.

Comment Submitted by Evelyn B - test first

The mission to Mars will be a great achievement! Bringing a sample to Earth without testing first could be a mistake...be safe without apologizing for an unforeseen error in judgement which could affect our entire planet. It's just one step at a time.

Comment Submitted by Ralf Senger - need clarity about security measures

While I understand the huge interest of the scientific community to study the samples obtained in Mars, I'm quite concerned about the safety of Earth's environment. What containment measures can be applied to avoid environmental contamination should one of the samples break on impact on the ground? What security measures will be applied to avoid that the samples are retrieved by anyone (i.e., non-authorized persons)? Also, during transportation, what security measures will be applied so that the samples cannot be stolen on the way to the UTTR facility? How can the samples be effectively disposed off after the studies (is heat or pressure effective)?

On a separate aspect, whilst I understand that most of the project is financed by NASA (and ESA), at least the results of the studies should be made publicly available.

Certainly, these are banal concerns and likely to have been listed by many other commenters, however, it must be stressed out, that these are crucial to be addressed in order to have support from the general public.

Comment Submitted by Peter Schorn - asking for a compilation of kookiest comments

Please provide the public with a compilation of the kookiest comments you get. Given the current level of conspiracy theorism and scientific illiteracy on the Internet, I'm sure an open forum on interplanetary travel will produce plenty of amusement to beguile the long winter nights.

Comment Submitted by Ricardo Forde - proposal for new spacecraft design

Before I get started with what I deem necessary.
I would like to thank you for teaching me what not to do .
I've been studying flight and different types of engines not necessarily for space travel but what I've learned is from two historical documentations.

The first is the capsule test of maneuvering thrusters and the second came from the Orion project.

It seems like you've reached the top of your game with the SLS Artemis launch system and yeah it's definitely packs a mountain of thrust and enough to blast blastdoors .

Some would even say that they've seen this many times and in fact , this is true .

I like safe and fast. I know to conquer the vastness of space we need it to be fast .

A hybrid system is what's needed. I don't consider or even think that an 18 minute burn is something to be proud of. I basically laughed when I heard this .

Here are the two major issues aka problems that have you not capable of going beyond LEO in your supersized rocket and fighting gravitational forces.

Here's something that got funded and it's not even feasible or reliable.

Quebec's McGill University with its ground based laser system and hovering satellite to send a pin point burst to an awaiting craft just not the best thing either unless we can pretend that we don't have a discoball already up there as in lots of satellites.

It took me 30 years plus to get to this point of view and believe me I ran into many problems along the way.
Leik Myrabo's Lightcraft was the start but his system setup wasn't feasible either but over time we have improved in this area . I asked him (Leik Myrabo) while he was a professor at the University of New Mexico, can it be mounted ? Btw the government probably heard that because he did tell me that his calls were monitored. So quite a few years later I see my first mounted laser on a Humvee on Top Gear BBC series but that wasn't the end all , they were making a sign to put up in the studio and that's when I heard it.

Sequential firing is my favorite thing because your Rockets just don't have it and it reminds me of turning on the shower at full blast . It's nothing special about it.

Nuclear Rockets are also a waste of time but as you read above I did mention the Orion project because of the bang for a buck campaign it would have used . Can you imagine that if these bomb blasts were sequential, how much faster would it have propelled it in a zero gravity environment ?

Wernher Von Braun probably saw this but the technology wasn't available and in his era he made it a point to the direction we should have taken. He's in a pic with Walt Disney and within his hand is that direction. You all can Google it on images.

A hybrid Spaceplane consists of Jet propulsion, rocket propulsion ,ion thrusters and a hybrid system. It may sound like a lot but we've learned that a little goes a long way.

Ok so here's the breakdown of the hybrid system. It requires 8 disks much bigger than Leik first used . 8 lasers. Shielding provided by ceramics and reflective alloy also the cooling system from the JWST. The disks are mounted on a maglev system that allows for frictionless motion. This is where it gets tricky and also make sense. An airflow system with an active bulkhead. The secondary is the delivery of laser hitting the disks, it has to be protected from the constant bombardment within so like a gun barrel positioned directly to the zero point of the disks . Use your imagination to see

those old muskets with the end that looked like a trumpet hanging on your daddy's wall .

Btw this craft is only 52 meters long and total weight wet would be that of a fuel tanker that the airforce uses. It's got a delta wing design because that alone embodies fast.

My rival and also a helping hand is the Parker Solar Probe because it knows fast . You can also Google that as well .
I even figured out how to get much more from ion thrusters and I also needed 8 of them as well for maneuverability. It won't be the same as many of you have tried . I'm a DJ at heart but definitely know how to volumize the ion thruster solution.

Here's my challenge to you and your engineers. I'll be the dummy with the dunce hat that is willing to challenge anyone who wants to challenge me on my findings and I'll make them a fan . My words are just words but my resolve is H.E.M.P which stands for Human Evolution Making Progress...I'm for forward progression and forward thinking, nothing more and nothing less.

Btw here's the first part of my puzzle and yes i know my grammar really sucks. I can't help that . Rocketships Laser Propelled Light Craft

This isn't science fiction but science facts.
Have fun y'all

Comment Submitted by Robert Walker - Return to above GEO and return sterilized subsamples immediately

NASA's proposed action seems likely to fail legal review, since a BSL-4 facility can't comply with the 2012 European Space Foundation study's limit (Ammann et al, 2012:14ff):

"The release of a single unsterilized particle larger than 0.05 µm is not acceptable under any circumstances".

Their rationale: viable starvation limited ultramicrobacteria can pass through a 0.1 micron filter (Miteva et al, 2005).

This limit is easier to achieve in water under high pressure. One study achieved 100% removal of 0.03 micron polioviruses using carbon nanotubes loaded with silver. (Kim et al, 2016) (Singh et al, 2020:6.3).

However aerosol filters are less effective. Even ULPA level 17 filters remove only 99.999995%. Also those filters are only tested to 0.12 microns (BS, 2009:4). At the ESF's 0.05 microns, an experimental 6-layer charged nanofiber filter for coronaviruses filtered out 88% of ambient aerosol particles (Leung et al, 2020), far from 100% containment.

The ESF also said the chance of release of even a single unsterilized particle at 0.01 microns must be less than 1 in a million, to stop gene transfer agents which readily transfer novel capabilities to unrelated species of archaea overnight in sea water (Maxmen, 2010).

The ESF said both requirements need regular review, as later research might reduce size limits further.

A review board could consider research since 2012 into small synthetic minimal cells (Lachance, 2019), and protocells (Joyce et al, 2018). Also, ideas for simpler "RNA world"• cells without ribosomes or proteins (Benner et al, 2010: 37) could be revisited using new research on ribocells (Kun, A• ., 2021). Panel 4 for the 1999 "Size limits"• workshop calculated that such a primitive free living lifeform could be as small as 0.014 microns in diameter and 0.12 μm in length, if there is an efficient mechanism for packing its RNA (Board et al, 1999: 117).

Biologists have searched for a shadow biosphere of nanobes (Cleland, 2019, pp 213-214) which could co-exist with modern life. They didn't find these nanobes, but they are biologically credible, because such small cells have an advantage in an environment with low nutrient concentrations, as they have a larger surface to volume ratio, and so take up nutrients more efficiently. They would also avoid protozoan grazing (Ghuneim et al, 2018).

If Mars has early life nanobes, even with less sophisticated biology, they might be able to compete in a shadow biosphere on Earth. In a worst case scenario, mirror numbers with the right enzymes (isomerases) would convert normal organics in an ecosystem into mirror organics that only mirror life can use, or rare terrestrial microbes with the ability to metabolize mirror organics.

This size limit review, and the following legal process, may change requirements. They are best completed before we launch the Earth return orbiter, Earth Entry Vehicle, and Mars Ascent Vehicle or build the return facility.

The legal process can also conclude that the required technology doesn't yet exist.

Uhran et al estimate a minimum of 6-7 years to complete the legal process starting from the Environmental Impact Statement date, so that's 2028 at earliest. This can be significantly extended if challenged in the courts. International bodies like the WHO and FAO likely get involved and international treaties triggered (Uhran et al, 2019).

Also, NASA is required to provide preliminary design and engineering details for the Sample Return Facility before they start a build, and with a life-cycle cost over $250 million must also commit to Congress on cost and schedule (NASA, Science Engineering Handbook: section 3.5).

Uhran et al estimate 9 years to build or repurpose the facility. It needs 2 years to train scientists because of many lapses in Apollo sample handling.

So, if the build starts in 2028, the earliest the facility can be ready is 2039.

I propose two solutions.

1. sterilize samples first, e.g. during the return journey with low energy nanoscale X-ray emitters. Any present day life would be recognizable after sterilization,
OR
2. return unsterilized samples to a safe orbit where astrobiologists study them remotely using miniature instruments such as those designed for life detection on Mars. Return sterilized sub-samples to Earth immediately;

My paper recommends airborne dust samples (Jakovsky et al, 2021) and other ways to increase chances of returning viable spores. This makes solution 2 attractive.

2. needs care. A return to the ISS doesn't break the chain of contact with Mars, and COSAPAR say the Moon must be kept free of contamination for future astronauts and tourists (COSPAR, 2011).

My paper solves both issues with a return to the Laplace plane above GEO. This is where ring particles orbit in a ring system, and a stable orbit for any satellite debris.

For details and cites, see my preprint at: https://osf.io/rk2gd (in progress). DOI 10.31219/osf.io/rk2gd

Comment Submitted by Logan Greger - are you certain the mission is safe?

How safe is it to carry out this kind of mission? Many scenarios depict a Martain microscopic lifeform, like an amoeba or virus, infecting and dooming the entire planet to death, with no stopping them as Earth is not adapted to fix this kind of thing. A few years back, my father even suggested that the usual containment of microbes might not work because we don't know how mars microbes could behave. For example, he said keeping them locked in a flask might not work, and that the germs just might phase through the glass. One other concerning thing was they were planning on making a return capsule without a parachute. I know NASA is designing it to be indestructible, but with this kind of risk, it sounds like playing with fire. If the capsule breaks open on return to Earth, and there is a dangerous pathogen inside, it will doom the entire planet. Many scientists also think that these Microbes could stay dormant on harsh surfaces like Mars (as in hibernation) but then reawakened when introduced to a hospitable environment like Earth's. Are you certain that in any way, this mission won't end with the total annihilation of the entire planet, or force us to live in biomes for the rest of time? What about possible human missions to Mars? There's no way to ever contain Mars microbes that are infected into humans or on their spacesuits. Does NASA care about all these scenarios, and should people panic about this? How low or high is this probability, and how can you draw your conclusions?

Comment Submitted by Gabor Bihari - stop mission

There is a certain probability that terrestrial life was not created on Earth, but on Mars, as the conditions on Mars in the early Solar System were more favorable for life than on Earth. If this is the case, the ancient life, that we may find on Mars is a distant relative to our terrestrial biological system. It means, that primitive Martian life forms may infect terrestrial living beings - but not as selectively as earthly pathogens. It could have an enormous impact on human life and life as it is on Earth. Martian bacteria or Archaea might infect a wide range of hosts on Earth, without any resistance, thus causing mass extinction, when accidentally destroying plant and animal life in a parallel manner. So I think, perhaps it is one of the worst ideas in history to bring Martian samples back to Earth in a spacecraft.

Comment Submitted by Anonymous - stop mission

No!

Comment Submitted by Anonymous - Stop mission

Please do not do this.

Comment Submitted by G. Martin - Study in space or not at all

I have been a strong supporter of the space program since the 1960s, including the various Mars missions. That being said, I cannot support the plan to return Mars samples to the surface of the Earth. Any risk of contamination above zero is unacceptable in my view. Although I understand the great efforts that will be undertaken to keep the samples isolated and secure, it is possible that a generation or two from now, those efforts will be viewed as lax, as science, including or understanding of life forms, continues to evolve. For example, a hundred years ago, the survivability of any living organism at deep sea hydrothermal vents would have been scoffed at. In addition, there always is some risk of human error. At a minimum, at least initially, Mars samples should be studied in a space station or lunar station setting under appropriate safeguards or, unfortunately, not at all. Thank you for the opportunity to comment.

Comment Submitted by Patricia D. Don't return until we know it is 100% safe

It does not seem wise to bring back anything from Mars until we know it is completely 100% safe.