

**"Towards an Earth-Moon Economy – Developing Off-Planet Resources"**

# Moon Miners' Manifesto

& The Moon Society Journal

[www.MoonMinersManifesto.com](http://www.MoonMinersManifesto.com)



Space-X tests "grasshopper" – Oct. 2, 2012: a key reusable first stage technology, bringing launch costs down

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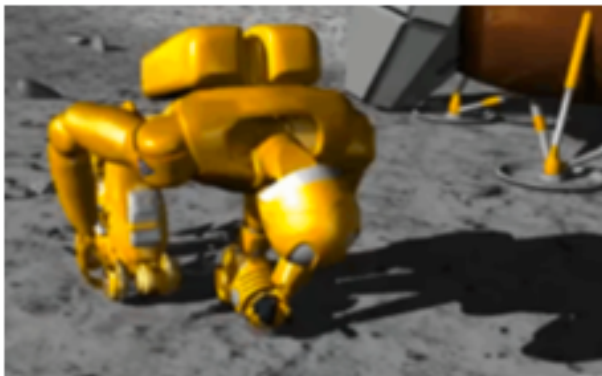
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The first "loop-the-Moon" tours may fly in the next few years. The lucky twosome (plus Russian pilot) will get a marvelous closeup look over the Moon's farside. It will cost them both about \$200 million. But when will you and I get to go? And not just to see the Moon closeup, but to walk around and pick up a moon rock? Telepresence may bring that "experience" to many, even millions, much sooner than most people may expect. This technology is still in its infancy, but commercial and industrial demand is sufficient that we will see great strides in short order. Such tours may not be as good as the real thing, but for you and I, it may still be a super experience. See page 6

For past articles, Visit [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)

## About Moon Miners' Manifesto

- **Moon Miners' Manifesto CLASSICS:** The non-time-sensitive articles and editorials of MMM's first twenty years plus have been re-edited, reillustrated, and republished in 22 PDF format volumes, for free downloading from this location: [http://www.MoonSociety.org/publications/mmm\\_classics/](http://www.MoonSociety.org/publications/mmm_classics/)
  - **MMM Glossary:** new terms, old terms with new meanings:  
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  - **MMM's MISSION:** to encourage "spin-up" entrepreneurial development of the novel technologies needed and promote the economic-environmental rationale of space and lunar settlement.
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Washington, DC 20005 -- Ph: (202) 429-1600 – <http://www.NSS.org>
  - **The Moon Society** seeks to overcome the business, financial, and technological challenges to the establishment of a permanent, self-sustaining human presence on the Moon." – Contact info p. 9.
  - **NSS chapters** and **Other Societies** with a compatible focus are welcome to join the MMM family. For special chapter/group rates, write the Editor, or call (414)-342-0705.
  - **Publication Deadline:** Final draft is prepared ASAP after the 20th of each month. Articles needing to be keyed in or edited are due on the 15th, Sooner is better! – **No compensation is paid to writers.**
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Moon Miners' Manifesto, c/o Peter Kokh,  
1630 N. 32nd Street, Milwaukee, WI 53208-2040
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## In Focus To the Stars – or “Back to the Stars?”

By Peter Kokh

Last month, we published issue #16 of the free PDF file newsletter, **Moon Miners' Manifesto India Quarterly (M3IQ)** – 4 full years under our belt! At the same time, we published the first issue of **To The Stars International Quarterly (TTSIQ)** essentially the same material, rearranged in a different way, and with a title that suggests a connection to the National Space Society, on whose behalf we are doing this to reach international space enthusiasts. NSS' long-running hard copy magazine is titled "Ad Astra" which is Latin for "To the Stars." TTSIQ is also cosponsored by the Moon Society, Space Renaissance Initiative, and hopefully by other organizations as well. But we don't want to talk about that right now, rather about those first three words "To The Stars."

<http://www.moonsociety.org/international/ttsiq/> – <http://www.nss.org/ToTheStars/>

Recently, there is new enthusiasm that advanced physics may find ways to cheat the "Speed of Light Barrier" and NASA is supporting an effort to get people thinking about how a "100-year starship" could be built and flown. To reach the closest star system 4.3 light years away, Alpha Centauri, a binary with a distant third star,

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Proxima Centauri, in 100 years, we would have to maintain an average speed of 23% of the speed of light averaging acceleration and deceleration, meaning a peak velocity of near half the speed of light.

The honor of being the first (or among the first human{s}) to visit another star system will be enormous, but few would go without prior telescopic or robot probe confirmed findings that a human-friendly paradise planet was awaiting our arrival, not some inhospitable planet, too hot or too cold, atmosphere too thin or too thick or un-breathable, no surface water, etc. etc.

Now it is conceivable that we might have learned all this from not yet deployed advanced and highly sophisticated exo-planet hunting space telescopes. Sending probes to all exo-planet systems in “near” stellar space would be both expensive and generation-consuming, however desirable confirmation and elaboration of telescope findings might be. We will simply have to build more powerful, more capable space telescopes equipped to detect signatures of key atmospheric ingredients such as oxygen, nitrogen, methane, and water vapor.

The ability to determine if a world was of the terrestrial “land-sea” type should be the gold standard of telescopic ability. Why would anyone want to sacrifice decades of one’s life traveling through empty space just to find another Venus, or even another Mars? The goal of such a venture should be nothing less than exploring what has been pre-determined to be “another Earth!”

Say that our super-scope found such a candidate. We should be able from its Sun’s spectrum to tell the age of the system. Is the host star old enough that its “other Earth” had time to nurture life to the metazoan stage – multi-cellular plants and animals? Our world developed multi-cellular life only in the past 600 million years, that is, in the last 15% of its lifespan to date! Is that host star considerably younger or older than ours?

If the host sun was old enough, but not too old ... But how can we tell that with only one sample to test, that of our own home planet?

Without a prior visit by a fleet of very capable probes, with all the time delays (very long flight, long report back time, analysis time) sending humans would be a very big gamble. It would seem that despite all the hooplah over the 100-year Starship Project, that a first human venture to a “nearby” star system is quite a bit into the future. Now to be honest, this writer is extremely skeptical that physicists will find a human-survivable way to make an end-run around the speed of light barrier.

There seems to be considerable new optimism that we will find new secret pathways not apparent to us now because our knowledge of physics and cosmology is considerably less complete than we had thought. At the same time, there is recognition that it will be one thing to get a ship to go that fast, quite another to be able to support human life over a number of generations for the duration of the ship.

An alternative, which we put forth many years ago, was to send fertilized human eggs and sperm in suspension, and only “when and if” we were approaching a planet that instruments aboard determined was capable of supporting human life, and not already inhabited by sentient beings, robots would combine sperm and eggs and put them in artificial wombs, and when ready for “birth.” Nanny robots would nourish, and raise, and educate. Sort of like the sowing the seed everywhere, and somewhere it takes root and grows, other places not. No human beings would make the trip, or be brought to term unless circumstances at a distant target star warranted. This avoids all the problems of “Generation Ships” and bypasses most of the problems facing human crews heading out into space without adequate knowledge of where they are heading. It also makes the speed of light irrelevant.

But the point is that we now know that amino acids, the building blocks of life as we know it, pervade the star clouds, and probably the universe. Exploding super suns are the incubators of these building blocks. Life is natural to the universe. Life on Earth may have been sown by the death-struggle output of many suns now gone.

In that light, it would be fitting to replace “To the Stars” with “Back to the Stars!” It would be a pilgrimage! The culmination of the epic of our species and of any intelligent species. But will we really embark on such a quest? Some species will, many will not. Of those that do, not all will succeed. But the universe is so large in both space and time, that we do not doubt that some, maybe many species will succeed.

Nonetheless, the age old dream of exploring, even settling far-flung star systems will not die. It will be there to urge us on, not to the stars, but back to the stars. Our sun is probably just one of a hundred or more that formed in a cluster, like the well-known Pleiades. But after 4.6 billion years, the Sun’s crib-mate stars have long wandered off to considerable distances, very slowly drifting. The Greek name for our sun is Helios, after which Helium is named (this element was first detected in the Sun), so we have suggested the name Heliades for our birth cluster. One strong motive for an effort to seek out and identify and study the Sun’s cribmates is that they are of the same age, and thus their planetary systems have had the same amount of time to evolve and mature. But just as in the Pleiades, our Sun’s siblings will come in many sizes with differing spectra. We’ll want to look at G type stars especially, though some low-F type stars with diminished lifetimes may be worth studying. Read the article “Circling some Yellow-White “F” Spectrum Stars may be a Scattering of “Welcome Matt” Worlds” from MMM # 45, reprinted in the newly published MMM Starbound Theme issue:

[http://www.moonsociety.org/publications/mmm\\_themes/mmmt\\_starbound.pdf](http://www.moonsociety.org/publications/mmm_themes/mmmt_starbound.pdf)

You will find many other interesting and relevant articles in this issue.



in our “Out of Africa” epic, we humans have become thoroughly “Intercontinental.” Becoming “Interplanetary” is the next chapter, but we have yet to establish a permanent presence on the “threshold” between the two, that is, on the Moon which is on the border between Earth-space and Interplanetary-space. But we will get there.

By the time our foothold on the Moon has gotten to the “no turning back now” stage, the next generations of Exoplanet hunters will have found some very, very interesting nearby solar systems. Such findings will feed the imagination of young people and interest in interstellar exploration will grow.

In the meantime, we should know if there are any human-survivable end-runs around the speed of light barrier. If not, maybe that is good, as it may have thwarted visits from any more advanced, colonizing (in the bad sense of the term) nearby intelligent species. (Personally, we believe the universe is swarming with other civilizations but that the average distance in both space and time is so great that encounters are most unlikely, and that is good, as culture-shock could destroy one or both.

Among humans, it is quite clear that the majority in any society is quite content with a slowly advancing status quo. Few ever consider the long term epic path of our species. Thus to rely on political support will get us nowhere, unless the plan is misguidedly linked with short term military strife within our own population. Our civilization may stall in a static inwards downspiral. But somehow, somewhere, some of us will settle for nothing else but seeking out our cosmic destiny, even if it takes many generations, many centuries, many millennia.

Perhaps just the confirmation that we are almost certainly not alone, even if no contact has been made, will be enough for us to understand our own existence in perspective, and to encourage healthy cultural and spiritual growth. Read the article “Skyfields” in that same Starbound theme issue (address above)

We have humbly suggested that the biblical statement “of dust thou art and to dust thou shalt return” be paraphrased “of stardust thou art, and to the Stars thou shalt return.” Well, we may never get there, but more likely we will indeed venture beyond our local vicinity. It is not “getting there” that will transform us, but just the effort to do so will make its mark on human culture and civilization in coming centuries.

“Isn’t life wonderful?!” – Back to the Stars! It is who we are. It is a hidden human instinct. Keep the dream alive! **Below:** The Pleiades star cluster only 150 million years old. **PK**



**Links:**

[http://en.wikipedia.org/wiki/Solar\\_analog](http://en.wikipedia.org/wiki/Solar_analog)  
<http://www.astro.wisc.edu/~dolan/constellations/extra/nearest.html> (26 closest stars)  
<http://www.atlasoftheuniverse.com/12lys.html> (3 dimensional map of our stellar neighborhood)  
<http://100yss.org/> – [http://en.wikipedia.org/wiki/100\\_Year\\_Starship](http://en.wikipedia.org/wiki/100_Year_Starship)  
<http://www.space.com/13135-100-year-starship-symposium-darpa-nasa.html>  
[http://cosmiclog.nbcnews.com/\\_news/2011/11/02/8603075-reality-check-for-starships?lite](http://cosmiclog.nbcnews.com/_news/2011/11/02/8603075-reality-check-for-starships?lite)  
<http://online.wsj.com/article/SB10000872396390444868204578066863905510662.html>  
<http://www.tgdaily.com/space-features/66998-esa-steps-up-search-for-earth-like-planets>

## Why finding an Earth-size planet around Alpha Centauri B is sobering news

By Peter Kokh

**The good news:** Alpha Centauri B, the smaller of pair has a planet slightly bigger than Earth.

**The bad news:** This planet orbits its sun at about a tenth Mercury's distance from our a sun, so close that sun-facing surface must be permanently molten.

We ask why so close? The likeliest reason lies in a "detail" that I had previously ignored. First let's look at the basic "plan" of this system.

Alpha Centauri is really two stars, "A" and "B," not just one. The two circle one another around a common center of mass or barycenter making this a "binary system."

In an article I wrote about Alpha Centauri 21 years ago, I gave the two stars proper names. Why shouldn't the two major stars closest to Earth be given names?

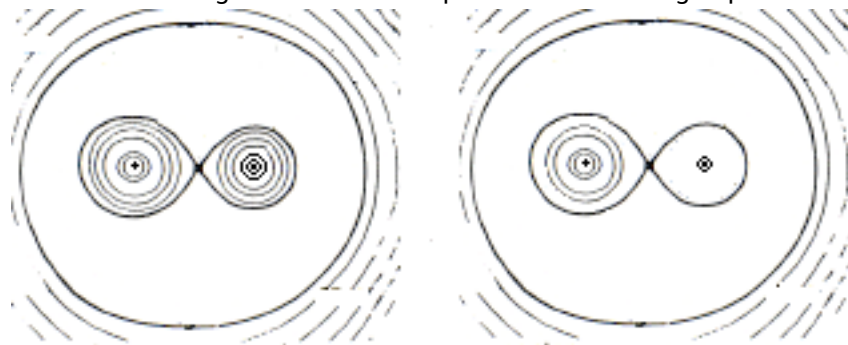
1. Alpha A is **slightly** more massive and brighter than the Sun, and Alpha B, a bit less massive and less bright. If there is even 'some' possibility that either or both have planets, shouldn't these two solar neighbors have names of their own? For the purposes of the discussion that follows, let us call them **Ixion** and **Nephthele** respectively, "**King and Queen of the Centaurs.**"
2. In the case of this double star, "during the pair's 79.91-year orbit about a common center, the distance between them varies from about that between Pluto (40 times Earth's distance) and the Sun to that between Saturn (9 x Earth's distance) and the Sun." [[http://en.wikipedia.org/wiki/Alpha\\_Centauri](http://en.wikipedia.org/wiki/Alpha_Centauri)]

For some time, the common expectation was that orbital dynamics did not allow stable planetary orbits within a binary system. But there are a range of possible binary orbits, and such a generalization is not worth its repeating. First, binary stars can orbit one another very close or at great distances, and anywhere in between. Second, their orbits about a common center of gravity can be anywhere from fairly circular to very eccentric.

Now there are two parts to this situation. On the one hand, it would seem that "inner rocky planets" – such as our Mercury, Venus, Earth, and Mars – would have stable orbits around both Alpha Centauri A and Alpha Centauri B. Likewise, it would seem that there could be some "outer" planets – gas giants and "plutoids" – in stable orbits around A-B's common barycenter, as in the diagram above. But there is a sleeper in the data the repercussions of which I had not previously realized. And that is point 2 listed above, the very eccentric (off-center) orbits of both A and B around their common barycenter.

When the more massive A (Ixion) (1.1 times the Sun's mass) vs. B (Nephthele) (0.9 times the Sun's mass) when their mutual distance is at minimum (9.5 A.U. vs. 40 A.U.) must exert tidal pull on any of B's planets that will increase the eccentricity of those planets orbits, until their maximum distance from B intersects or transcends the current distance of the barycenter between the two stars, and one by one are either flung out into interstellar space, or captured by A (see the bold figure 8 orbit in the graphic above.)

These same tidal forces may force planets fairly close to B to circle ever closer. All the rest of B's original retinue will either have been flung into interstellar space to become "rogue planets" or captured by A.



Left: Original Planets

Right: most of B's planets ejected, outer planet of A also ejected

Could an Earthlike planet in orbit around A stay put? While B's tidal power is less than A's, it is likely to have distorted the positioning of A's original retinue of planets as well, or at least left them in orbits of ever shifting eccentricity and distance from A. This is what I suspect, but I claim no expertise in orbital mechanics.

The upshot would seem to suggest that we would do well to cross binary systems off our list of potential future homes for mankind except for those who circle each other at a much greater distance. Note that Alpha Centauri A and B are also 6.1 billion years old, vs. 4.6 for the Sun. An interesting system, but the "good news that Alpha Centauri B has an Earth size planet" turns out to be "discouraging news" instead.

Hey, we are adults. We can take it. Let's move on!

PK

<http://aether.lbl.gov/www/classes/p139/speed/Alpha-Centauri.html>

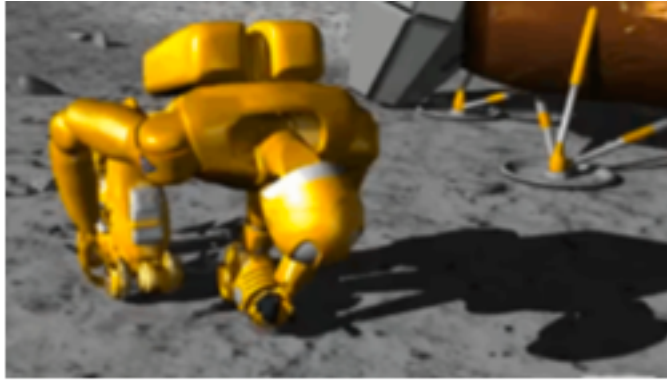
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## Telepresence Tours of the Moon? How Soon?

By Peter Kokh

**Scenario:** It is July 20, 2019, the 50th Anniversary of the Apollo 11 Moon Landing by Armstrong and Aldrin, and NASA is celebrating big style. At all eight NASA centers around the country, new Moon Telepresence Centers will open up. At each center, you can make reservations for use of a Moon Telepresence Booth, by the quarter hour.

Inside the booth, you are helped to get into a telepresence outfit which includes moon-visors, special moon gloves, and and moon-shoes. On the Moon, at the Apollo 11 site or a number of other interesting sites, "avatars" will walk, bend over and pick up rocks, and look at them, or just scan the horizon, as you wish. You will have all the sensations of being there yourself, except that you will still have your Earth-weight (Oh shucks!)



How

soon?

Telepresence equipment is advancing by leaps and bounds, and the six and a half year window may just be enough. Now NASA and a number of commercial firms specializing in robotics are not pushing this technology for you the visitor, but for the sake of science and exploration. For most of the involved parties, the incentive is not public use. But for some, it may be. Indeed some of the breakthroughs needed may be motivated by potential profits from such tele-tourism markets. That's the process of "spin-up" that we had described way back in 1989. Read:

[http://www.moonsociety.org/publications/mmm\\_papers/glass\\_composites\\_paper.htm](http://www.moonsociety.org/publications/mmm_papers/glass_composites_paper.htm)

This development path is just the opposite of "spin-off." Instead of NASA embarking on a crash re-search program at exorbitant cost and then turning over the resultant technology at no cost to commercial enterprises with the taxpayer footing the bill, in "spin-up," a private enterprise, seeking profits, develops the technology, with the consumer paying the bill. As a result, when the technology is needed on the space frontier, it is already "on-the-shelf" and in need of relatively inexpensive adaptation only.

In a recent article in Space Review(online), there just such a possibility is discussed:

"Is there a way for humans to be on a surface of another planet without actually physically being there? Dan Lester argues that, thanks to the increasing capabilities of robotics and related technologies, telepresence can be the next best thing to actually being there, at considerably less cost and risk."

<http://www.thespacereview.com/article/2150/1>

**So what?**

For billions of people who cannot afford a multimillion dollar "loop the Moon" tour, this will be a much less expensive opportunity, not to skim over the Moon's surface at an altitude of 5–100 miles, but to have all the experience and sensation (less the lighter gravity) of walking on the Moon, picking up and feeling a moon rock, and doing a little exploring. Each option will offer different "unforgettable" experiences. This is important because as more and more people take such a telepresence Moon tour, and tell their friends about it, the more public interest in supporting permanent outposts, then tourist centers, on the Moon itself will grow.

The catch is less in developing the "avatars" through which you will see and feel yourself on the Moon, than in sending enough avatars to the Moon to meet telepresence demand, and in their maintenance. The first such experiences will be expensive. But the cost will come down as demand increases.

**What about Mars?**

The reaction time delay for command and response in telepresence on the Moon is of the order of three seconds, the time it takes for command signals to get to the Moon, and perceived command execution at the speed of light. For Mars, the delay will be from a 6 to as much as 40 minutes – it is just not practical.

When will lunar telepresence tours come to a NASA Visitors Center near me? The timeline suggested above seems realistic, especially if commercial firms take the lead in the "spin-up" process described. If it is left up to NASA, it becomes a budget item, which we all know will always be at high-risk for cancellation at any stage of the process. In the meantime, do watch this video: <http://www.youtube.com/watch?v=kFPNcWN7QnM> MMM

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## A low-cost Europa Life Relics Explorer Mission may be Feasible

<http://www.space.com/18217-planetfall-solar-system-photography-interview.html>

### Comment by “Planetfall” Author Michael Benson

**Which future planetary science mission would you most like to see become reality?**

“A: Now there's a nice segue, because I've been advocating that NASA focus its robotic efforts on Europa for years now. But although a mission to Europa would be roughly comparable in cost and complexity to the new Curiosity rover on Mars, or the Cassini mission to Saturn, unfortunately the assumption has taken hold that discovering whether there is life in the European ocean requires not only landing on its surface, but also developing the technologies that could permit the spacecraft to lower an automated submarine capable of melting through what by all accounts is an ice crust that's many miles thick. Needless to say, that's a very fraught proposition, very complex technologically, and far more expensive than Curiosity or Cassini.

“But you know what? That's also totally erroneous. Europa's surface has plenty of faults that, as Galileo Orbiter images from the 1990s reveal, provide plenty of evidence that **water from the ocean below has welled up, and been deposited neatly on either side of the fault before freezing**. Rick Greenberg of the Lunar and Planetary Lab at the University of Arizona has pointed out that all we really need is a lander that can set down at the edge of one of those cracks, directly on top of an area that seems to be comprised of extruded and frozen sub-surface ocean water, and then **collect samples from only a few meters below the surface**.”

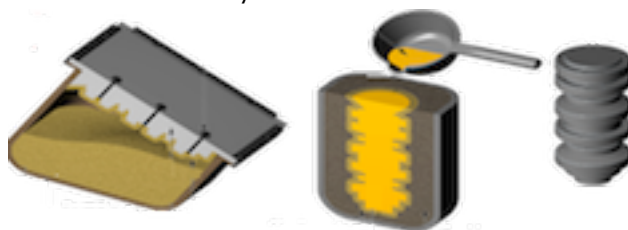
**More on Europa:** Over the years, MMM has featured a number of articles about this fascinating moon of Jupiter.] You can read them in our recently published Solar System Theme Issue at:

[http://www.moonsociety.org/publications/mmm\\_themes/mmm\\_solarsystem.pdf](http://www.moonsociety.org/publications/mmm_themes/mmm_solarsystem.pdf)

MMM

## Casting the “Engineering Metals” on the Moon: Steel, Aluminum, Magnesium, Titanium

By Dave Dietzler



**Steel** can be cast in sand molds because it melts at 1200 to 1500 C and silica (sand) melts at 1700 C. Since solid molds would tend to crack we use sand molds. We do have steel alloying ingredients like chromium, manganese, nickel and cobalt from meteoric fines even abundant silicon...so we can make lots of grades of steel...

Steel is so important that without the carbon from lunar polar ices, we would need to import it and that would be costly. Carbonaceous chondrite asteroids would be the obvious source. It was long believed that Mars' two moonlets Phobos and Deimos were captured asteroids of that composition, but that expectation is now challenged. The cheapest way to ship carbon might be as liquid methane, CH<sub>4</sub>, as we could always use the extra Hydrogen also.

(We would need to co-import liquid ammonia, NH<sub>3</sub>, as well, for of all the key volatiles hydrogen, carbon, and nitrogen, the latter is by far the most scarce on the Moon in proportion to the amount we will need, simply as an atmosphere buffer gas. In other words how many people we can support on the Moon depends on how easily and inexpensively, we can import enough Nitrogen for the “air” we will need.)

**Aluminum** and **Magnesium** can be cast in basaltic molds as they melt at 1250 which is high enough. As the Moon lacks an oxygen-rich atmosphere, magnesium products used outside (in the out-vac) will work well.

**Titanium** will be more difficult to cast. It melts at 1900 C, depending on the alloy...so silica and basalt will melt. We will need yttrium and zirconium oxide sand molds and some kinda binder. ....also Ti is melted with electron beams and cast in a vacuum...at least the vacuum is free....Yt and Zr exist on the Moon but only in like 100 and 300 ppm so they'd have to be imported to cast Ti....also, we lack Ti alloying ingredients like vanadium, tin, etc.

Titanium powder could be used in 3D electron beam printers in the free vacuum to make elaborate intricate parts...Dave Heck (Boeing St. Louis) has done that for a living....instead of casting....but for real big parts we need to cast...

DDz

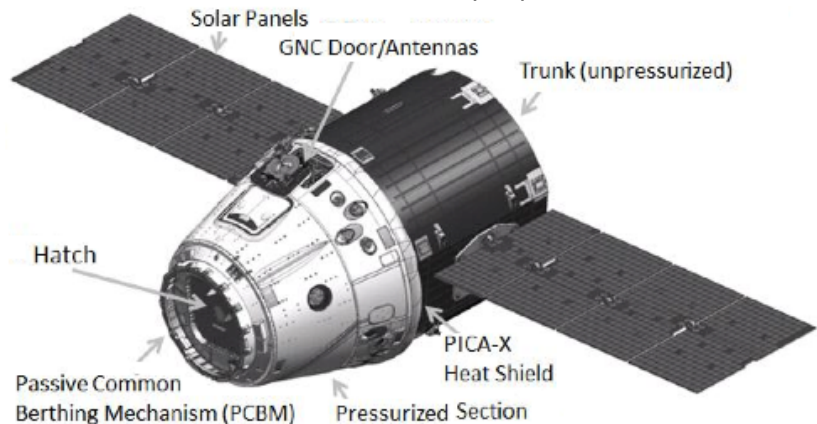
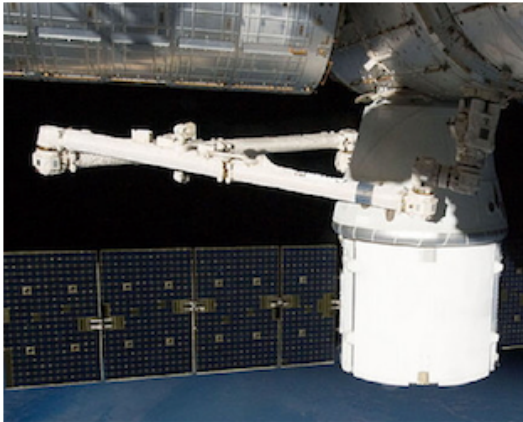
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## NASA/Contractor Throwaway Culture vs. Space-X' Reusability

By Peter Kokh

Launch Date Oct 7; arrival date; departure date, safe landing Oct 28th  
Space-X first returnable cargo vessel to serve ISS (other than the exorbitantly expensive Shuttle)



Having demonstrated in May that it could deliver the Dragon Cargo vessel to ISS safely, with token cargo, and then return back to Earth with an ocean landing, intact and ready for another assignment, this was the first of 12 such missions that Space-X will do according to its contract with NASA.

Now both JAXA's HTV ([http://en.wikipedia.org/wiki/H-II\\_Transfer\\_Vehicle](http://en.wikipedia.org/wiki/H-II_Transfer_Vehicle)) and ESA's ATV ([http://en.wikipedia.org/wiki/Automated\\_Transfer\\_Vehicle](http://en.wikipedia.org/wiki/Automated_Transfer_Vehicle)) can deliver cargo to the Station, but are not designed to return to Earth in one piece to be reused for another mission. All that money thrown down the toilet!

Meanwhile, with the shuttles retired, the only way NASA could return experiments and other items to Earth has been to sneak them in on a Soyuz capsule, with severe limits on size and mass.

Sierra Nevada's Dream Chaser, a mini-shuttle in design, will also be able to return cargo and experiment materials back to Earth.

The "Throwaway Culture" otherwise known as the "path of least resistance effort" has been with rocket science from the gitgo. The original space shuttle plans called for a fly-back booster, but these were scrapped for expediency, and to keep start-up costs low, even if it meant greatly increasing overall program costs. So we got the reusable SRBs, and an External Tank that could have been parked in a high safe orbit for potential reuse, but which was always dumped back into the atmosphere to burn up.

In previous articles, we have called for a radicle culture change in which only fuel is used but once: "If it isn't fuel, it's payload." Well the **Peenemunde Culture which respects only the nose cone payload**, still rules NASA and most of its contractors (Boeing's Dallas Bienhoff is pushing orbital refueling stations.)

In this climate, only the upstart commercial companies, who need to make it better, faster, cheaper in order to compete, can finally purge us of this culture which, rather than opening space, is guaranteeing that we remain planet-bound forever.

### Where does the space-enthusiast community come in?

The NSS Policy Committee would let NASA continue to do its thing. Well, they are right in believing that it is hopeless to try to change NASA Culture. But there is another pathway. We bypass NASA, and try to convince Congress that there is a better, cheaper way to do more in space with less money. **We ask Congress to mandate that NASA open all mission design and build contracts to commercial companies.**

Face it. Money for Space is not ever again going to be as free-flowing as it once was. We have a global economy in crisis (and trying to fix the national economy while ignoring the global situation is stupid) so Congress will be very open to the idea of doing more with less money. And only upstart companies like Space-X are up to the challenge. To be sure, once that becomes clear, you are going to see Boeing and Lockheed-Martin and other traditional space contractors take a hard second look at their internal "culture."

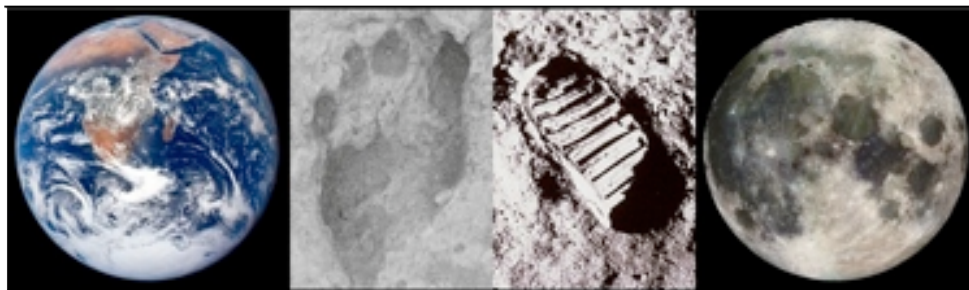
So it has to start with Congress. We space organization representatives need to sing this song in unison. Our opposition is members of Congress who represent entrenched contractors. But these congress critters are significantly outnumbered by those who have no such allegiance.

**We need to get the press on our side first.** As future commercial missions prove out, this message will get out. We can grease the skids for those who won't change.

PK



From Africa  
to the Moon,  
the Human  
Epic, told in  
footprints,  
Continues  
to the Stars!



Our Goal is  
Communities  
on the Moon  
involving  
large scale  
industrializa-  
tion and  
private  
enterprise.

## The Moon Society Journal Section (pages 9–12)

## About the Moon Society

### Objectives of the Moon Society include, but are not limited to:

- **Creation** of a spacefaring civilization, which will establish communities on the Moon involving large-scale industrialization and private enterprise.
- **Promotion** of interest in the exploration, research, development, and habitation of the Moon, through the media of conferences, the press, library and museum exhibits, and other literary and educational means
- **Support** by funding or otherwise, of scholarships, libraries, museums and other means of encouraging the study of the Moon and related technologies
- **Stimulation** of the advancement and development of applications of space and related technologies and encouragement their entrepreneurial development
- **Bringing together** persons from government, industry, educational institutions, the press, and other walks of life for the exchange of information about the Moon
- **Promoting** collaboration between various societies and groups interested in developing and utilizing the Moon.
- **Informing** the public on matters related to the Moon
- **Provision** of suitable recognition and honor to individuals and organizations that have contributed to the advancement of the exploration, research, development, and habitation of the Moon, as well as scientific and technological developments related thereto.

**Our Vision says it all – “Who We Are and What We Do” –** [www.moonsociety.org/spreadtheword/whowhat.html](http://www.moonsociety.org/spreadtheword/whowhat.html)

We envision a future in which the free enterprise human economy has expanded to include settlements on the Moon and elsewhere, contributing products and services that will foster a better life for all humanity on Earth and beyond, inspiring our youth, and fostering hope in an open-ended positive future for humankind.

### Moon Society Mission

Our Mission is to inspire and involve people everywhere, from all walks of life, to create an expanded Earth–Moon economy that will contribute solutions to the major problems that continue to challenge our home world.

### Moon Society Strategy

We seek to address these goals through education, outreach to young people and to people in general, competitions & contests, workshops, ground level research and technology experiments, private entrepreneurial ventures, moonbase simulation exercises, tourist centers, and other means.

**Interested in having input?** Any member may ask to join the Leadership Committee and attend our Management Committee meetings held twice monthly. You may even express opinions. Decisions are often made by consensus, so this input has value. Write [president@moonsociety.org](mailto:president@moonsociety.org)

## A Message from Moon Society President Ken Murphy

Our website update got a major boost this month when new Board member Philip Crume stepped up to head the Website Committee. Under his leadership we will move forward in revamping our website to give it a more Web 2.0 look, as well as to make it more compatible with the many new ways that people access the internet, like with iPads and tablets. If you're interested in joining his team, contact him at [pcrume.moonsociety@gmail.com](mailto:pcrume.moonsociety@gmail.com).

Recently, your president spent an evening at UT Arlington for Astronomy Day. Each year, the UTA Planetarium brings together local astronomy clubs and NSS of North Texas to share space with the public. As part of the program, two half-hour talks on the Moon were given in the auditorium where we attempted to use their digital Moon globe as part of the program. Not entirely successful, but an interesting start.

This is one way that Moon Society members can help build the Moon Society brand – by providing lectures on the Moon in their communities. Members have access to a tremendous Lunar knowledge base through our website, and talks at planetariums, science-fiction cons, and civic events are a great way to circulate that knowledge to a larger audience.

## The Moon Society – Lunar Frontier Settlement – [www.moonsociety.org](http://www.moonsociety.org) p.2

Ken Murphy message continued:

Additionally, these kinds of talks are a great way to introduce people to commercial space ideas, and how our Moon can contribute to a more prosperous cislunar economy.

Coming up next is the SpaceVision 2012 conference themed on "Crossroads – How our Generation will take us to the Space Frontier", where your president will be speaking on a panel about destinations. Sharing the panel will be Jody Davis, from NASA Langley's MSL entry, descent and landing team, Dr. Martin Elvis, a quasar astrophysicist from Harvard, Bruce Mackenzie from the Mars Foundation, and TMS friend Paul Graham from OpenLuna. It should make for an interesting discussion.

On the topic of generations, The Moon Society is going into this conference facing the same challenge faced by many space advocacy organizations – how to bring younger members into the fold. All of the space advocacy groups are struggling with an aging membership, coupled with a general lack of cultivation of space interest in younger generations. Youngsters are always happy to affiliate (look at our Facebook likes: +800 in the last year or so, up some 25%), but not necessarily join "TMS membership is up about 21% in the past year, (including free memberships for the ISDC speakers) which is encouraging, but lags well behind our Facebook membership, which grew by 2%. Another encouraging sign: we have added a new chapter, The Greater Fort Worth Space Society."

So how do we interest younger audiences? They need projects and a chance to shine. The Moon Society is trying to address this on several levels:

- 1) Our science projects, which are looking for team leaders to get things rolling
- 2) Local events, such as Moon Day, which show how space is relevant to the local community.
- 3) Chances to grow, as with our Lunar Observing Certificate
- 4) An excellent example of a local chapter project is to award a small scholarship for the best space project at your next local Science Fair, a great way to encourage students into space topics, by offering cash incentives.

Still, The Moon Society needs to improve its visibility and credibility as a source of Moon-related information. To this end, your president challenged the members of the Leadership team to each have an editorial, article, or blog post published by the end of the year. Your president's article, the **Cislunar Ecosphere** at The Space Review, led to quotes in the conservative Jewish daily 'Makor Rishon' and in the French journal 'Le Monde Diplomatique'. Secretary Peter Kokh and Board member Al Anzaldúa published "**The Triway into Space Declaration**" at The Space Review, which further explored the idea of cislunar infrastructure.

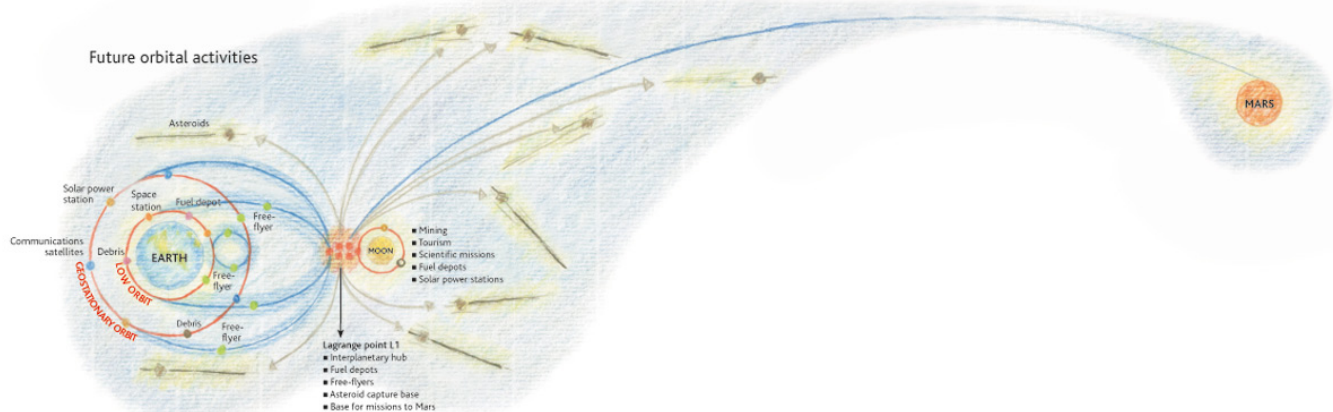
And if you pay attention to the space dialogue, you can see that people are starting to talk more about infrastructure, more about cislunar space, more about Lagrange points, and more about the idea of commercial space providing new opportunities. We can continue to shape the dialogue, but it requires active members.

I therefore challenge all Moon Society members to cultivate one new member by the end of the year. This could be through a gift membership, or by taking the time to encourage the Lunar interests of a youngster. Your Moon Society member started on the path to where he is today because a senior member of a civic organization took the time to ask me to be involved. you can do the same. The future of The Moon Society is in your hands.

**Note:** The French version of the article referred to above in **Le Monde Diplomatique** isn't available yet (<http://www.monde-diplomatique.fr/2012/08/RIVIERE/48044>)

But the English version is: <http://mondediplo.com/2012/08/03space>

The map below has been adapted at: <http://mondediplo.com/maps/space>



Above: <http://mondediplo.com/maps/spacearton6541.jpg>

For past articles, Visit [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)

## Ideas for Chapter Exhibits, Basic Information about the Moon

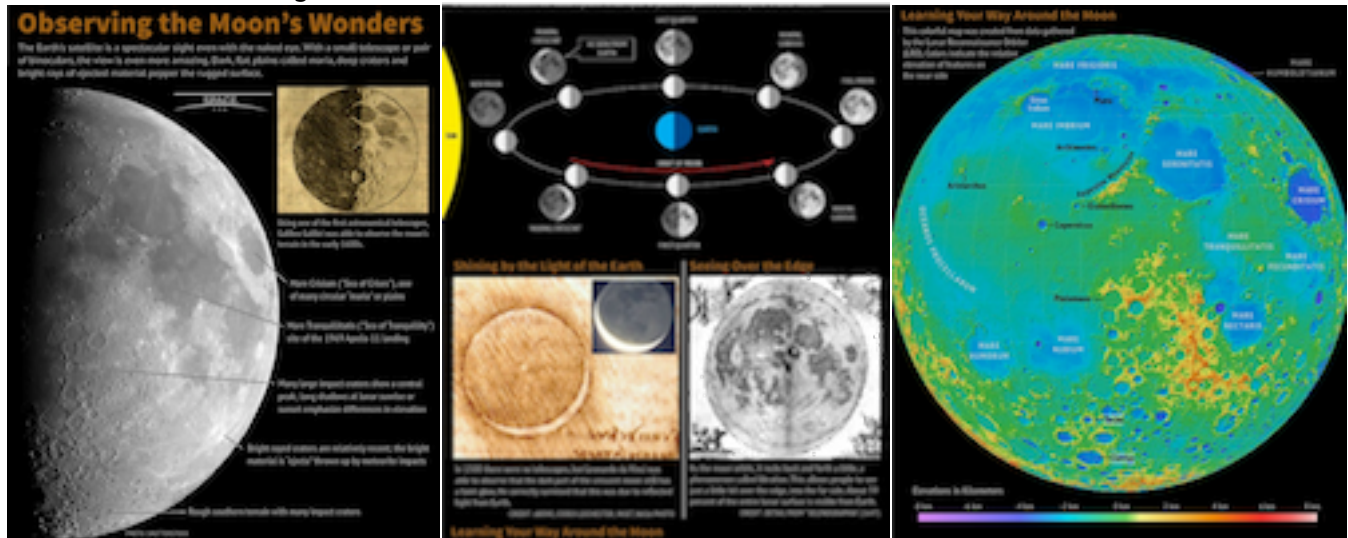
By Peter Kokh

Recently, Space.com published a great addition to their library of “Infographics,” about Observing the Moon.

<http://www.space.com/17702-how-observe-moon-skywatching-infographic.html>

The image of the infographic is 575 pixels wide by 2797 high, a daunting thing to reproduce as an exhibit. I have divided this image into three sections, each of which can be printed on regular 8.5”x11” card stock and placed either in a column or in a row. A 4th page contains the explanatory text in the site above announcing the publication of the infographic. Together, these 4 printouts will make a nice addition to any chapter exhibit.

Below are the three images in reduced scale:



Just mount on a display board and you have a nice addition to your chapter exhibit collection. This would be especially helpful if your chapter wants to try “Sidewalk Astronomy” as an opportunity to stage outreach events without piggybacking on anything other than the Moon’s appearance in a clear evening sky. For information, see last month’s issue, MMM #258, page 10, under the heading “International Observe the Moon Night.”

Check out many more potentially useful Infographics: <http://www.space.com/infographics/>

## Does your chapter want a set of “Gravity Bricks?”

The “Gravity Bricks” produced by the Milwaukee Lunar Reclamation Society (MLRS–NSS) aka Moon Society Milwaukee Outpost, are so unique that all you have to do is put “Gravity Bricks” in your Google Search window and you will find out all about them, even how to make them on your own, a very ambitious project.



3–brick set

with flyer/stand

There is a cheaper “do–it–yourself” alternative for about \$5 in less than an hour: the “Gravity Jugs.” And yes, a Google search will turn the instructions to make them also. Both hands–on exhibits are a favorite with kids and adults alike. And you will be rewarded by seeing the proverbial light bulb shine in their eyes and in their smile as they lift any pair of the three (Earth, Moon, Mars) as they understand instantly the difference in gravity.

MLRS has had a couple of new requests for a set of Gravity Bricks. But after producing over thirty such sets, now scattered about North America, our supply of the 10–hole bricks we need for this project (4 per set) ran out. So we are now committed to buy a fresh supply and are ready to take fresh orders.

It is actually cheaper to make a set than to ship it! The cheapest way to ship is in two “if it fits it ships anywhere” flat rate boxes from the post office. Now for NSS chapters whose members get MMM, and for Moon Society Chapters, we will eat the materials and production costs. That means you only have to send us a Money Order for \$\_\_\_\_\_ to cover shipping. Make the Money Order out to chief elf in charge of production, er me, Peter Kokh. ###

For past articles, Visit [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)



## Chapters & Outposts

### ORGANIZING “OUTPOSTS”

**Bay Area Moon Society, CA Outpost** – South San Francisco Bay – <http://www.moonsociety.org/chapters/bams/>

Contact: Henry Cates – [hcate2@pacbell.net](mailto:hcate2@pacbell.net) Meeting the 1<sup>st</sup> Tuesday of the Month at Henry's home

**Moon Society Nashville Outpost** – Contact: Chuck Schlemm – [cschlemm@comcast.net](mailto:cschlemm@comcast.net)

**Moon Society Knoxville Outpost** – Contact: Jason Tuttle – [tuttlepc@gmail.com](mailto:tuttlepc@gmail.com)

**Moon Society Milwaukee Outpost (MSMO)** – [http://www.moonsociety.org/chapters/milwaukee/msmo\\_aboutus.htm](http://www.moonsociety.org/chapters/milwaukee/msmo_aboutus.htm)

Contact: Peter Kokh [kokhmmm@aol.com](mailto:kokhmmm@aol.com) – [http://www.moonsociety.org/chapters/milwaukee/msmo\\_output.htm](http://www.moonsociety.org/chapters/milwaukee/msmo_output.htm)

### ORGANIZED CHAPTERS

**Moon Society St. Louis Chapter** – <http://www.moonsociety.org/chapters/stlouis/>

Contact: Robert Perry [surfer\\_bob@charter.net](mailto:surfer_bob@charter.net) – Meetings 3rd Wed monthly at Buder Branch Library, 4401 S. Hampton, in the basement conference room – Next meetings – NOV 21 – DEC 19 – JAN 16

**October Report:** The October meeting of the St. Louis Chapter of the Moon Society was cancelled – between bad weather and personal problems. Rufus was the only attendee and not a quorum. Rufus, Bob Perry, and Tom Kullman manned a fan table at Archon 36 October and they had two panels, "Lunar Exports" and "Where's My Flying Car?". Also, Dave Heck forwarded an email from Amy White of the Astronomical Society of Eastern Missouri with a request that we give a presentation at one of their upcoming meetings, telling them about ourselves and some of our interests. Bob has volunteered to do so. January is only a few weeks away and Chris Nobbie and Kathleen O'Neil are organizing Moon Madness Night 2013 and have asked that we participate.

**Moon Society Phoenix Chapter** – [www.msphx.org](http://www.msphx.org) Contact: Mike Mackowski [michael.mackowski@gmail.com](mailto:michael.mackowski@gmail.com)

Meeting 3rd Saturdays monthly at Denny's, 4403 South Rural Road, Tempe Next meetings – NOV 17 – DEC 15 –

**October Meeting Report:** October 20th meeting. Attendees were myself, Art Felsing, and Felix Polz. Four of our regulars responded to email that they would be unable to attend, so the low turnout was expected. We had a discussion about how to proceed with this club. In light of Craig Porter's stepping down, the lack of national Moon Society members, and the limited time I have to devote to this group, the future direction of the group needs serious consideration. Several options were discussed at the meeting, including: dissolution; carry on somehow with limited participation; merge or join forces with other similar clubs in the area.

Granted, this is just the opinions of the three people present, so we encourage input from folks on the email list. We noted that the local National Space Society chapter is facing similar membership challenges (no one came to their previous meeting). They meet every other month, so if you miss one meeting, you don't get together for four months. It is difficult to generate any momentum that way. Perhaps we could combine our meetings (they have been on the same day, the third Saturday, anyway) and alternate meeting locations with them. With groups this small, we ought to consider focussing on what we have in common (promoting space development) rather than worrying about a particular focus area (Moon or Mars or whatever).

I'm open to ideas. Report by Mike Mackowski, acting president.

**Clear Lake NSS/Moon Society Chapter (Houston)** – <http://www.moonsociety.org/chapters/houston/>

Contact: Eric Bowen [eric@streamlinerschedules.com](mailto:eric@streamlinerschedules.com) – Meeting 7 pm in the conference room of the Bay Area Community Center at Clear Lake Park – Even # months: NOV 19 – JAN 21

**Greater Fort Worth Space Chapter** – Contact: Patricia Ferguson [tricia3718@gmail.com](mailto:tricia3718@gmail.com)

Online Meetings: NOV 17 – DEC 15 – JAN 19

## Cooperating with your local SEDS Chapter?

That's easier said than arranged. But we do have three chapters or outposts with a SEDS chapter nearby:

**Moon Society Chapters and Outposts with local SEDS chapters** – <http://seds.org/organization/chapters/>

- Moon Society Phoenix – Arizona State University SEDS, Tempe – <http://sedsasu.wordpress.com/>
- Moon Society St. Louis – St. Louis University SEDS – [http://wiki.seds.org/index.php?title=St.\\_Louis\\_University](http://wiki.seds.org/index.php?title=St._Louis_University)
- Moon Society Milwaukee Outpost – University of Wisconsin–Milwaukee SEDS – [seds.uwm@gmail.com](mailto:seds.uwm@gmail.com)



## GREAT BROWSING LINKS

### SPACE STATIONS + COMMERCIAL SPACE

<http://www.space.com/17846-private-rocket-antares-launch-pad-orbital-sciences.html>

<http://www.space.com/17878-astronauts-year-mission-space-station.html>

<http://www.space.com/17868-spacex-grasshopper-reusable-rocket-test.html>

The Google Lunar X PRIZE at five: can it still be won? – <http://www.thespacereview.com/article/2164/1>

### ASTRONAUTS + SPACE TECHNOLOGY

<http://phys.org/news/2012-10-device-internet-download.html>

<http://www.space.com/17928-supersonic-skydive-earth-atmosphere.html>

<http://www.space.com/17923-supersonic-skydive-space-jump-explained-infographic.html>

<http://www.space.com/18091-tiny-satellites-space-station-launch-photos.html>

<http://www.space.com/18171-space-radiation-tracking-astronaut-danger.html>

Using space internet to control robots – [http://www.esa.int/esaHS/SEMHOZ3S18H\\_iss\\_0.html](http://www.esa.int/esaHS/SEMHOZ3S18H_iss_0.html)

### MOON

<http://www.universetoday.com/97997/the-moons-water-comes-from-the-sun/>

<http://www.space.com/18276-moon-dark-spot-ocean-storms.html>

The need for private iSRU Development – <http://www.thespacereview.com/article/2178/1>

What a Lunar Settlement “Middoors” could be like: google images search for “Devonian Gardens Calgary”

50 nearside features for the amateur lunar explorer to search for with a telescope:

<http://www.nexstarsite.com/NexStar50/nexstar50lunarlist.htm>

### MARS

<http://www.space.com/17815-mars-rover-jet-lag.html>

<http://www.space.com/17842-curiosity-traverse-map-through-sol-43.html>

<http://arstechnica.com/science/2012/10/engine-in-development-could-cut-mars-travel-time-to-three-months/>

<http://www.space.com/18174-mars-water-streals-seasonal-flows.html>

Which Way to Mars? Only realistic way to fund humans to Mars is: <http://www.thespacereview.com/article/2174/1>

### ASTEROIDS

<http://www.space.com/17827-vesta-troughs-asteroid-collision.html>

<http://www.space.com/18246-asteroid-vesta-dawn-revelations.html>

### OTHER PLANETS + MOONS

<http://www.space.com/17829-titan-lakes-boat-talise-mission.html>

### ASTRONOMY + ASTROBIOLOGICS

<http://www.space.com/18089-earth-size-alien-planet-alpha-centauri.html>

<http://www.space.com/18097-alpha-centauri-stars-planet-explained-infographic.html>

<http://www.space.com/15192-sun-siblings-asteroids-earth-life.html>

<http://www.space.com/18246-asteroid-vesta-dawn-revelations.html>

Astrobiology tries to unravel the origins of life – [http://www.esa.int/esaSC/SEM MQCER17H\\_index\\_0.html](http://www.esa.int/esaSC/SEM MQCER17H_index_0.html) (Video)

### HUMOR

<http://jalopnik.com/5949166/how-to-steal-the-space-shuttle-a-step+by+step-guide>

## GREAT SPACE VIDEOS

<http://www.space.com/17818-death-valley-earth-and-gale-crater-mars-what-in-common-video.html>

<http://www.space.com/17904-a-ground-based-telescope-better-than-hubble-video.html>

<http://www.space.com/17898-uranus-and-neptune-the-mysterious-outer-giants-video.html>

<http://www.space.com/17919-life-on-titan-saturns-cold-moon-fascinates-scientists-video.html>

<http://www.space.com/17936-spacex-s-president-details-cargo-mission-to-space-station-video.html>

<http://www.space.com/18071-dark-matter-fossil-of-the-big-bang-found-video.html>

<http://www.space.com/18095-earth-size-planet-orbiting-nearest-star-discovered-video.html>

<http://www.space.com/18190-what-it-s-like-to-ride-russia-s-soyuz-spaceship-video.html>

<http://www.space.com/18245-how-mercury-venus-earth-and-mars-formed-video.html>

<http://www.space.com/18242-curiosity-blasts-laser-at-mars-stonehenge-video.html>

Testing for Mars Life on Tennerife and in Spain (Video) – [http://www.esa.int/esaSC/SEM MQCER17H\\_index\\_0.html](http://www.esa.int/esaSC/SEM MQCER17H_index_0.html)

What a Lunar or Martian Settlement “Middoors” could be like:

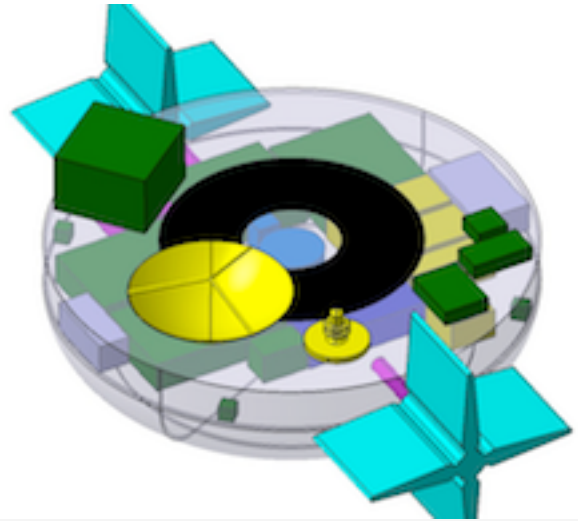
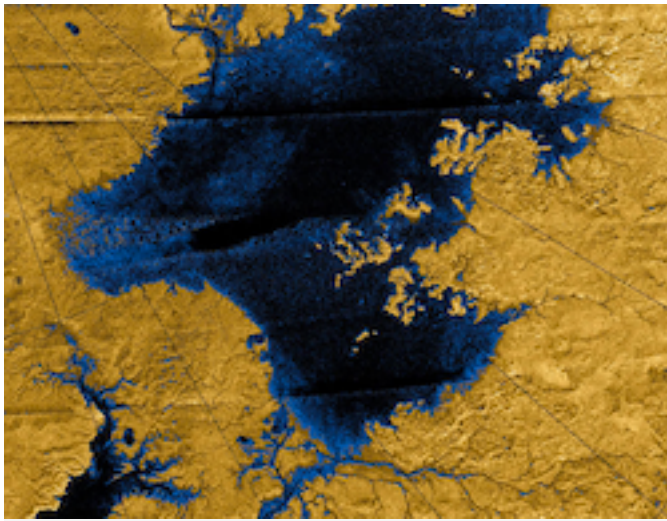
<http://calgary.ctvnews.ca/downtown-oasis-reopens-after-reno-1.856652#>

For past articles, Visit [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)

## MMM PHOTO GALLERY



The Last Shuttle, Endeavor, makes its last landing at LAX, Los Angeles, September 21, 2012



L: Titan's Largest Lake, (larger than our Lake Superior) R: A paddleboat that could explore that Lake

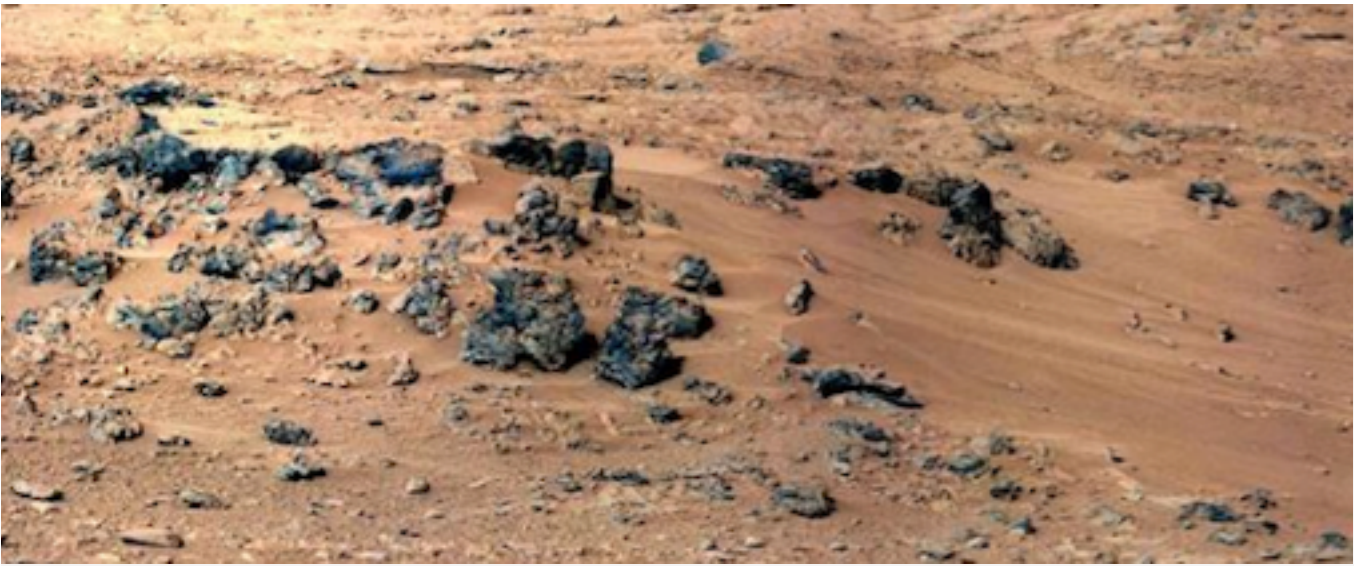
[http://en.wikipedia.org/wiki/Ligeia\\_Mare](http://en.wikipedia.org/wiki/Ligeia_Mare) – <http://www.space.com/17829-titan-lakes-boat-talise-mission.html>



Curiosity snapped this mosaic photo of its own "wheels on the ground"

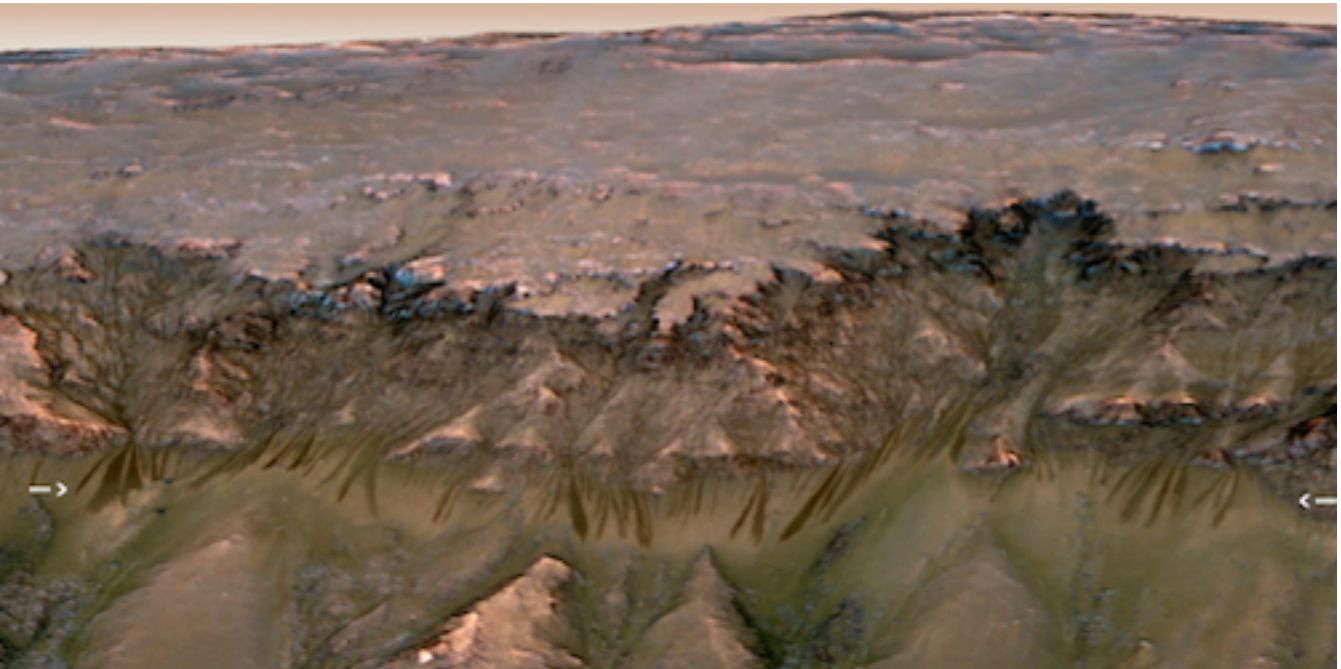
<http://www.space.com/17538-mars-rover-curiosity-self-portrait-wheels.html>



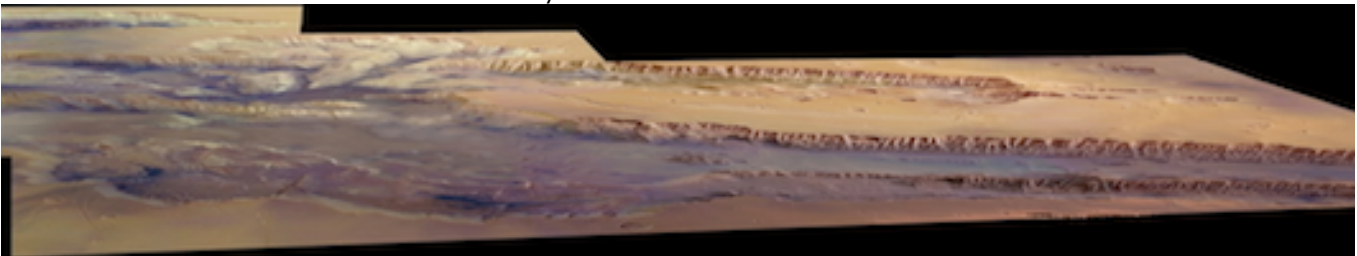


**'Rocknest' From Sol 52 Location – Credit: NASA/JPL-Caltech/MSSS**

This patch of windblown sand and dust downhill from a cluster of dark rocks is the "Rocknest" site, which has been selected as the likely location for first use of the scoop on the arm of NASA's Mars rover Curiosity. This view is a mosaic of images taken by the telephoto right-eye camera of the Mast Camera (Mastcam) during the 52nd Martian day, or sol, of the mission (Sept. 28, 2012), four sols (Martian days) before the rover arrived at Rocknest.



**Mars:** "The melting and subsequent evaporation of frozen salty water could cause the intriguing dark streaks" ( photo vertical dimension reduced 60% ) <http://www.space.com/18174-mars-water-streaks-seasonal-flows.html>  
Photo by Mars Reconnaissance Orbiter



Valles Marineris, Mars, with corrected vertical dimension



## Marshall Mike Moondust and the Sinister Selenian Subterfuge

[MMM Fiction by George von Mond]

**Chapter III** As the Lux Lumen settled into the coast phase back to Lunar guard HQ, Mike stretched in his acceleration couch and reached for his well-worn copy of Herodotus' "The Histories", a particular favorite that was like a travelogue of the ancient Earth.

"And someday," Mike thought to himself, "someone is going to be writing the same thing about the Moon. I wonder if any of my stories will make into whatever book is written about the old days on the Moon?"

It was at this moment that Mike's control panel lit up like 42<sup>nd</sup> Street back before the Dark Skies laws that followed in the wake of the energy crisis in 2022. Reviewing the readings he determined that something had struck his #3 engine, he was leaking propellant, and the craft was slowly tumbling along its trajectory.

Luckily he was in the coast phase. Had the engine been firing when struck the consequences would have been much harder to deal with. His fingers danced over the control boards and he used the OCS thrusters to put the craft back on a normal heading. He remembered that the first person on the Moon, Neil Armstrong, had had his own issues with a tumbling spacecraft. Knowing that one of his heroes had been in almost the same situation helped calm his adrenaline surge and restore a sense of control.

His first priority was to determine the status of the engines. Impacts, even micrometeorite impacts, tended to be messy, and he needed to see what other systems might have been compromised. He quickly grabbed his helmet and headed to the airlock. Outside he barely paused to look down on his beloved Moon. If he wasted too much time she was going to open a big ol' can of lithobraking on him.

Moving to the engines, he quickly saw the damage to #3, now completely unusable, and saw that the #1 engine's systems had also taken some damage that wasn't showing up on the sensors, and using it was a real risk. Which left the #2 engine, which wasn't showing any damage that he could espy. He quickly started moving back to the airlock, not happy with the results of the equations he was running in his head.

Back in the crew cabin he flopped into his acceleration couch and flipped on the Comm channel.

"Lunar Guard Port Control, this is the Lex Lumen. Be advised, I will be coming in extremely hot. You better get Lunar SAR on the line" he said into the mic.

"This is Port Control. We copy Lex Lumen and are notifying emergency services. What's up, Mike?"

"Port Control, I seem to have taken an impact on my #3 engine that has also compromised #1. I will be coming down on #2 alone, and according to my calculations I should have started the firing sequence about, uh, ninety seconds ago. Let's hope this last Merlin engine can take what the factory claims are the tolerances. Adjusting vectors and beginning descent burn on my mark, Mark."

"Copy that Lex Lumen, we see your burn. Our read from your sensors indicates that the #1 can be used to assist. Otherwise that #2 nozzle is going to be fondue by the time you get here."

"Negatory, Port Control. That will likely blow the second I switch it on. I've seen it, the sensors can't be trusted."

"Roger that, Mike, but we don't like what we're calculating as your landing velocity. It looks like you're going to have to take the engine up to 173% of rated capability to land at a survivable speed."

"I was going to go higher, but for a shorter time" he replied.

Mike looked grimly at the readings on his control panel, then out at the rapidly approaching Lunascape outside. The scream of the engine through the body of the spacecraft reached a pitch Mike had never heard before, and he had visions of his nozzle dripping away in gobbets of molten metal.

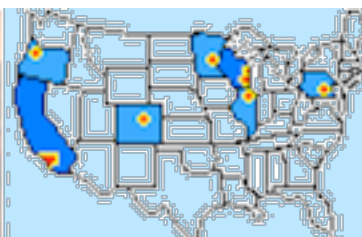
His finger hovered over the control switch for the #1 engine...

**Will Mike use his #1 Merlin?** Or will the malevolent Moon malefactors succeed in covering their tracks?

**Join us next month for the next installment of "Marshall Mike Moondust and the Subtle Selenian Subterfuge".**



## NSS Chapters that share Moon Miners' Manifesto



Space Chapter HUB Website: <http://nsschapters.org/hub/>  
Feature Page: Project Menus Unlimited <http://nsschapters.org/hub/projects.htm>

### WISCONSIN



#### MLRS – Milwaukee Lunar Reclamation Society

PO Box 2101, Milwaukee, WI 53201 – [www.moonsociety.org/chapters/milwaukee/](http://www.moonsociety.org/chapters/milwaukee/)

*Ad Astra per Ardua Nostra = To the Stars through our own hard work!*

#### 2012 LRS OFFICERS & • BOARD Contact Information

PRESIDENT / MMM EDITOR - • Peter Kokh NSS 414-342-0705 - [kokhmmm@aol.com](mailto:kokhmmm@aol.com)

VICE-PRESIDENT Doug Armstrong NSS (414) 273-1126

SECRETARY – • James Schroeter NSS (414) 333-3679 – [James\\_Schroeter@excite.com](mailto:James_Schroeter@excite.com)

TREASURER/Database – • Robert Bialecki (414) 372-9613 – [bobriverwest@yahoo.com](mailto:bobriverwest@yahoo.com)

- ✓ Our 26th Anniversary Holiday Party Saturday, December 8th 1-4 pm will be at our usual meeting place
- ✓ At Mayfair Mall. Garden Suites East lower level, Room G110.
- ✓ Potluck luncheon, and feature Sci-Fi film “Millennium” starting 2pm sharp
- ✓ We expect friends from Chicago, Madison, Green Bay, and Sheboygan Space Society to join us.

### WISCONSIN



#### SSS – Sheboygan Space Society

728 Center St. Kiel, WI 54042-1034 – [www.sheboyganspacesociety.org](http://www.sheboyganspacesociety.org)

c/o Will Foerster 920-894-2376 (h) – [astrowill@charter.net](mailto:astrowill@charter.net)

SSS Sec. Harald Schenk [hschenk@charter.net](mailto:hschenk@charter.net)

DUES: “SSS” c/o B. P. Knier, 22608 County Line Rd, Elkhart Lake WI 53020

Meetings are at The Stoelting House, 309 Indian Hill, Kiel WI 53042 – 3rd Thursday, even # months

NEXT MEETING: Saturday DEC 8 in Milwaukee, at the MLRS annual Holiday/Anniversary Party

### CALIFORNIA



#### SSDS – San Diego Space Society

8690 Aero Drive, Suite 115, #77, San Diego, CA 92123 – <http://sandiegospace.org>

San Diego Space Society collaborates with the following 12 space organizations

AIAA, Dart Rocketry, Mars Society, Moon Society, National Space Society, Project ASTRO

Reuben H. Fleet Science Center, San Diego Air & Space Museum, San Diego Astronomy Association

SEDS: Students for the Exploration and Development of Space, Space Frontier Foundation

Space Tourism Society

CALIFORNIA



**OASIS: Organization for the Advancement of Space Industrialization & Settlement**  
**Greater Los Angeles Chapter of the National Space Society**  
**PO Box 1231, Redondo Beach, CA 90278**

Events Hotline/Answering Machine: 310-364-2290 – Odyssey Ed: Kat Tanaka [odyssey\\_editor@yahoo.com](mailto:odyssey_editor@yahoo.com)  
<http://www.oasis-nss.org/wordpress/> - [oasis@oasis-nss.org](mailto:oasis@oasis-nss.org) – Odyssey Newsletter [www.oasis-nss.org/articles.html](http://www.oasis-nss.org/articles.html)

**Regular Meeting 3 pm 3<sup>rd</sup> SAT monthly – NOV 17 – DEC 15**

**Sat., Nov. 17 OASIS Board Meeting**, Home of Steve Bartlett and Tina Beychok , 7108 East Peabody, Long Beach

**Fri.–Sun., Nov. 23–25 LosCon Science Fiction Convention** LAX Marriott Hotel: OASIS will have a fan table, run programming (incl. Build a Spaceship for the kids), and host a room party, You must have a paid membership.

**Sat., Dec. 8, 3 pm OASIS Board Meeting** Followed by Holiday Party, Home of Bob Gounley and Delfosse

COLORADO



**DSS: Denver Space Society fka Front Range L5**

**1 Cerry Hills Farm Drive, Englewood, CO 80133**

Eric Boethin 303-781-0800 [eric@boethin.com](mailto:eric@boethin.com) – Monthly Meetings 6:00 PM on 1st Thursdays  
Englewood Public Library, Englewood, CO 80110 – 1000 Englewood Parkway, First Floor Civic Center  
NEXT MEETINGS – NOV 1 – DEC 6

ILLINOIS



**CSFL5: Chicago Space Frontier L5 – 610 West 47th Place, Chicago, IL 60609**

MINNESOTA



**MSFS: Minnesota Space Frontier Society – <http://www.mnsfs.org>**  
c/o Dave Buth, 433 South 7th St. #1808, Minneapolis, MN 55415

OREGON



**ORL5 – Oregon L5 Society – <http://www.OregonL5.org>**  
**PO Box 86, Oregon City, OR 97045**

(LBRT – Oregon Moonbase) [moonbase@comcast.net](mailto:moonbase@comcast.net)

**Meetings 3rd Sat. each month at 2 p.m. - Bourne Plaza, 1441 SE 122nd, Portland, downstairs**

**Regular Meeting 3 pm 3<sup>rd</sup> SAT monthly – – NOV 17 – DEC 15**

PENNSYLVANIA



**NSS-PASA: NSS Philadelphia Area Space Alliance – 928 Clinton Street, Philadelphia, PA, 19107**

c/o Earl Bennett, [Earlisat@verizon.net](mailto:Earlisat@verizon.net) - 856/261-8032 (h), 215/698-2600 (w)

<http://pasa01.tripod.com/> - <http://phillypasa.blogspot.com>

**Meeting times and locations:** Our November meeting will be the Cherry Hill Crown Plaza, exact time (Nov 12 or 13) and location in the hotel to be decided by the members on scene. We usually have a dinner meeting at the restaurant in the hotel. Check our, and the Philcon, websites for more. The December meeting has not been decided.

**October meeting notes:** Dennis Pearson brought a guest from Sweden, Oscar, who is an exchange student in the Allentown (Pa.) school district. We also had members of a Philadelphia writers group visit. We explained what we did and the upcoming Philcon event and its heavy emphasis on the joys of writing (including writers workshops).

Dotty and Larry were not present so VP Mitch Gordon got the lead report. He has volunteered for several panels at Philcon, on philosophy and religions and their relationship(s) to man's quest for a physical place in the heavens, and their relations with the sciences. Mitch also had material from the NSS Roadmap to Space Development and our attempts to be part of Space Week here in Philadelphia. The primary mover in the city for this event is the Franklin Institute. But something has happened: we had no notice that the event was happening this year. Both Mitch, and later your correspondent, tried to reach our contact at the Institute without success. However: Mitch and I have both volunteered our groups services as presenters at the Spring (2013) Science Carnival in April 2013.

In better news: Mitch has asked for, and got, permission to set up an outreach table at a SEPTA (public transit) concourse in a center city location. Market East is one of the main cross over points for several types of transport and gets suburban and city residents so Mitch, and Citizen Wallace (he "resides in the city") will have a large, if transient, audience during the time they are allowed to set up. Go, Mitch and Wallace! Hank reported that he had nothing on "at the door" pricing for the Philcon event, and, he asked if we had arranged for an outreach table at this November event. I responded that Dotty and Larry had been working on that.

Dennis Pearson, who is now Chapter Organizer for region Seven (including states from West Virginia to New Jersey) and, I believe I have this correct, some of Region Eight that includes part of New York state, asked about our Space Week activities and to report them to the N.S.S.. As noted above I had to report that we had 'missed the boat' on this. Historically, with a few exceptions, our group has seldom had activities for the public on a number of anniversaries of space exploration. This has included the Apollo Landing ("Landing Day") and Yuri's' Night events. Part of this is due to following the lead of other organizations and what they pay attention to. Some time ago the Franklin Institute stopped doing Apollo events and concentrated on Space Week (a U.N. global Space Exploration celebration) in October (usually). I will send our report to N.S.S. and am mentioning this in such detail so that other groups can see this as a "cautionary tale." Dennis also noted that N.S.S. is considering collecting Chapters dues so that a common pool of money that can then be used to reimburse chapters as needed and to aid in funding chapters projects (Earls' interpretation of why this would be done).

Rich Bowers brought up the Lottery idea again and put forth the idea that Richard Branson, who would have a hotel in orbit in the near (2020?) future, could be asked to encourage a trip to his hotel and the ride to reach it. "Branson's Delight! Come up and see the Universe Sometime." – Earl's slogan. This could work if the hotel is seen to be ready to go and the launchers have been well vetted.

Earl reprised some of the material from Wired on the Maker movement and the use of lithographic and semiconductor techniques to build spacecraft parts (including the use of a new NASCAR repair material and etched silicon). In addition: Earl has attended the Joint North East and Mid-Atlantic VHF Conference which is a specialty group within the Amateur Radio service on techniques to achieve contact on these high frequencies (some even do optical wavelengths) and various activities that promote efficient operation and communications under extreme conditions. I've been following this kind of effort, mostly the electronics side, for many years, and enjoy seeing these people do the work and report on it. They also report on new technology they use that eventually goes into the public pool. I particularly wanted to see the reports on "Software Defined Radio" by Phil Theis, K3TUF, and (for space applications) "Panoramic Polarization-Matching Receivers for JT65" by Joe Taylor, K1JT. Phil did a what's new in very high performance radios and Joe is extending a very weak signal generation and reception technique he has developed. Both developments are relevant to space communications and eventual use in civilian applications. I am working on getting a ham license at this time for a number of reasons, including a question about helping a Mars Society activity a number of years ago, and the recent discovery that my cousin has one and my housemate Michelle's son also "got his ticket"! And to get more involved with people who I like and are doing interesting things.

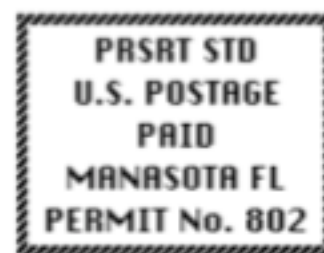
**And** On doing things: one of the Hams had a Makerbot that he was demonstrating at the conference! He was building a part that he needed from a CAD file as we spoke. Cool!

**After meeting note:** Dotty and Larry went to CAPCLAVE in Gaithersburg Maryland and distributed our cards at this laid back event. It is mostly on writing and the business of publishing (and getting published). There was a limited science track. Submitted by Earl Bennett

For past articles, Visit [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)

Moon Miners' MANIFESTO  
Milwaukee Lunar Reclamation Society, Inc.  
PO Box 2102, Milwaukee, WI 53201-2102

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