

“Towards an Earth-Moon Economy – Developing Off-Planet Resources”

# Moon Miners’ Manifesto

& The Moon Society Journal

[www.moonsociety.org/publications/](http://www.moonsociety.org/publications/)



**Inflatable Modules: More Spacious, and cheaper to put in orbit.** The day is coming! A toe in the water: see pages 4-6.

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Carved Basalt Art - with basalt from the Moon as a first export? See p. 3

## About Moon Miners' Manifesto – “*The Moon - it's not Earth, but it's Earth's!*”

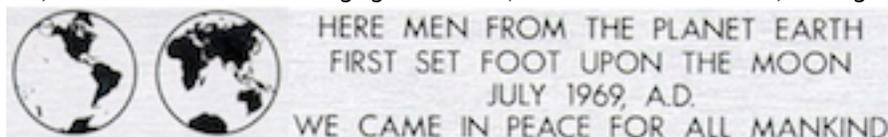
- **MMM's VISION:** “expanding the human economy through off-planet resources”; early heavy reliance on Lunar materials; early use of Mars system and asteroid resources; and permanent settlements supporting this economy.
- **MMM's MISSION:** to encourage “spin-up” entrepreneurial development of the novel technologies needed and promote the economic-environmental rationale of space and lunar settlement.
- **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 23 PDF format volumes, for free downloading from this location: [http://www.MoonSociety.org/publications/mmm\\_classics/](http://www.MoonSociety.org/publications/mmm_classics/)
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**National Space Society** 1155 15th Street NW, Suite 500 Washington, DC 20005 (202) 429-1600 – [www.NSS.org](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.
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- **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.**
- **Submissions by email** to [KokhMMM@aol.com](mailto:KokhMMM@aol.com) – Email message body text or MS Word, Text files, and pdf file attachments or mailed CDs, DVDs, or typed hard copy [short pieces only, less than 1,000 words] to:  
Moon Miners' Manifesto, c/o Peter Kokh, 1630 N. 32nd Street, Milwaukee, WI 53208-2040

## In Focus Protection of Apollo Moon Landing Sites Sparks Controversy

<http://www.space.com/22131-moon-landing-sites-bill-controversy.html>

<http://www.space.com/22123-american-public-parks-on-the-moon.html>

The debate in the US Congress is about whether or not this is a good or bad spending item. We favor setting aside these sites, but as World Preserves, not as American preserves. That, of course, would spark controversy as well. Someday, over the time horizon, the Lunar settlements will form an independent lunar republic. National claims are unwelcome, and have been from the gitgo. This bill, while well intentioned, infringes on that.



Yes, these sites were visited by American astronauts and, yes, the US footed the bill. That changes nothing! The US could pay for site preservation expenses, but should, in the spirit of Apollo 11 set them aside: the plaque left on the Moon reads: “Here men from planet Earth first set foot on the Moon July 1969. **We came in peace for all Mankind.**” Note: the plaque reads “men from planet Earth,” not “Men from the United States of America.” PK

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

## First Export\$ from a Lava Tube Outpost

By Peter Kokh

### Background: early MMM articles on this topic

[http://www.moonsociety.org/publications/mmm\\_classics/mmmc3\\_Jan2005.pdf](http://www.moonsociety.org/publications/mmm_classics/mmmc3_Jan2005.pdf) – pp. 10–11

In MMM #22, February 1989, I wrote an article entitled “**First Exports**” about a 1988 Space Studies Institute Brainstorming Workshop. The Goal: **Identify Profitable Opportunities from robotic missions to the Moon.** The suggestions were:

- **Information from teleoperated rover**
- **An Ambitious Soil Return Mission**
- **Liquid Oxygen Production**
- **Production of glass & iron trinkets**

### Below is the full text of the last suggestion: glass & iron trinkets

“The next mission would be more ambitious and include a 1.5 tonne sample return of lunar material [the sum total of Moon Rocks returned by the six Apollo missions was 841 lbs or .38 metric tonnes] and also a 2nd generation liquid oxygen production plant with the capacity to process small amounts of lunar glass and iron [included in the lunar soil run through the plant] “into high value products for sale on Earth, such as lunar iron ‘coins’ and lunar glass ‘jewelry’.

“The value of such products on a back-home market is highly speculative and depends almost entirely on demand. We hope for a sustainable demand for such coins and jewelry in the \$300–500 per carat range. [By way of comparison, this is over 100 times higher than the going rates for gold or platinum. But a check with a local jeweler gives the current (2/’89) price range for diamonds as \$1800 to \$100,000 per carat depending on quality.]”

There followed, in the same issue, an article of mine by the title “**First Souvenirs: Lessons from Mt. St Helens**” about the considerable amount of entrepreneurial industry and art based on the many inches of Mt. St Helens ash that covered much of Eastern Washington State after the May 18, 1980 eruption, suggesting that moon-dust itself, of whatever site we set down on the Moon, could be turned into objects of significant value on Earth. Our idea was to bring tons of moon dust home and let artists and entrepreneurs experiment. My suggestions were:

- **Moonscapes created with lunar soils** of various shadings in an earthly glass-glass sandwich (wall-art, jewelry box lids, pendants, votive candle glasses etc.)
- **Fine terrestrial glassware** (bridal registry or prestige barware) with etching patterns made with lunar fines.
- **Decorative mirrors, clock faces, and other items** made similarly.
- **Fine earthly china and pottery** in which Moon dust is used as a striking glaze accent. Lamp bases and glass shades, candlestick holders, book ends made similarly.
- **As colored glass fiber combined with earth glass matrix in striking and illustrative glass-glass composite (GLAX\*)** creations from paperweights in 1x4x9cm ‘2001’ monolith style to luxury door knobs and pulls, ‘Moon-pearl’ necklaces and earrings, abacus beads, and prestige desktop name plates.

### What can we do with what is available at/in a first Lava tube site to be explored?

There will be some moon dust infiltrating into lava tubes by way of skylights or rille openings. But even most of the collapse debris itself will be chunks of pure basalt. In the tube proper there will be more chunks of pure basalt that have fallen off the walls and ceiling. Now these chunks will be valuable on Earth, but the market may not be enough to pay for the retrieval mission itself, even if this is an unmanned mission.

### Value added basalt souvenirs

Imagine this scenario: an unmanned lander sets down near the lip of a lavatube skylight and releases an AXEL type rover that then winches itself down into the skylight, setting down on the talus collapse pile. If you are unfamiliar with the AXEL Probe concept, check out our presentation:

<http://www.moonsociety.org/competitions/engineering/SkylightExplorer.pdf> or [SkylightExplorer.ppt](#)

The probes in this presentation are purely scientific explorers. Now let’s imagine a more ambitious followup mission in which the AXEL probe released a machine, which, teleoperated from Earth, **would allow artists on Earth to create sculptures from chunks of basalt, which would then be returned** to the surface by the axel probe as it winched itself back up, and placed in an Earth Return probe. The items could be small, but they would be carved art in lunar basalt. They could be carved on Earth, or on the Moon itself by teleoperated carving/sculpting machines.

To visualize the endless possibilities of carved basalt sculptures, do a **Google or Bing Image Search for “carved basalt”** and/or **“basalt sculptures.”** This art form was very advanced in ancient Egypt. I personally have a carved basalt Scarab (beetle) imported from Egypt, that inspired this article.

A sampling of basalt sculptures (and my scarab) is shown on the bottom of the cover page this issue..

Options: to reach the biggest market, the sculptures should be small to reduce the shipping costs to Earth, but large enough that the purchaser can enjoy and appreciate the detail.

Items tele-sculpted on the Moon and then shipped home would probably be more valuable than items sculpted on Earth from basalt blocks shipped from the Moon as hewn.

Would such artifacts of genuine lunar basalt command a high enough price among the rich to pay for the mission? Maybe, maybe not. But it would be a beachhead start! PK

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

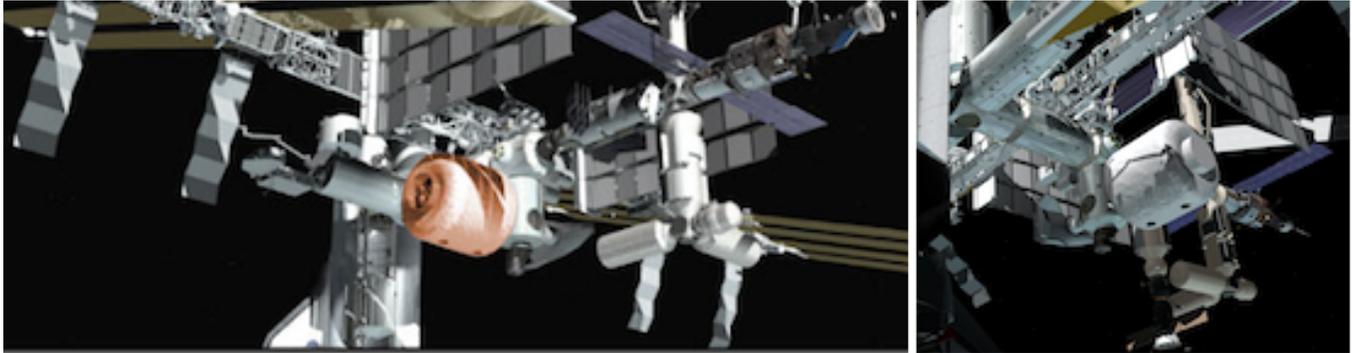
### Inflatable Modules: a timid “toe in the water” for NASA

<http://acuriousguy.blogspot.ca/2013/05/bigelow-aerospace-idea-whose-time-has.html>

By Peter Kokh

Way back in 2001, we were delighted to learn that Robert Bigelow would take over the transhab technology from NASA. NASA had been ordered by Congress to stop work on the project as it was seen by WI Congressman Jim Sensenbrenner (in a face to face meeting with myself at Robert Zubrin’s request) to be a disincentive to Boeing. Zubrin saw TransHab as the ideal lightweight but spacious crew module for the first manned “Mars Direct” mission.

The game plan was to test a functional Transhab prototype attached to the Space Station.



Now, at last, NASA is paying Bigelow \$17.8 million USD for an inflatable unit that is to be connected to the station. “BEAM” (Bigelow Expandable Activity Module) will be delivered to the ISS in an unpressurized SpaceX Dragon spacecraft during the 8th scheduled SpaceX resupply mission (CRS-8). The unit will not be a full-size BA300, nor the mid-size Sundancer, But a module comparable in size to the test modules Genesis 1 and 2, launched into space in July 2006 and June 2007. – [http://en.wikipedia.org/wiki/Bigelow\\_Expandable\\_Activity\\_Module](http://en.wikipedia.org/wiki/Bigelow_Expandable_Activity_Module)

Will it be a “space gym” used for zero-g sports? zero-g dancing? Other uses that expand the range of activities and experimentation that is the main focus of the station? Well, none of the above.

“During its two-year mission, BEAM’s structural integrity, leak rate, radiation levels and temperature will be monitored remotely. How astronauts will use BEAM is still being discussed, but NASA has suggested that the ISS crew would only enter the module several times a year to collect data with the hatch otherwise staying shut.”

A \$17.8 million dollar investment from which we won’t be getting \$17.8 million dollars worth of use. After the planned tests are concluded, why in the whole big universe should we not experiment with “human usages,” before jettisoning it to burn up in the atmosphere?” Hopefully, the astronauts will do so on the hush hush!



Left: Lori Garver and Robert Bigelow in front of proposed test module – Right: Attached to US Tranquility Module



The **BEAM** unit is small at 4 m (13 ft) in length and 3.2 m (10.5 ft.) in diameter – comparable to the Galaxy module. The Genesis modules 1 and 2, launched into space in July 2006 and June 2007, are slightly longer (4.4 m /14.4ft) and narrower (2.54 m/8.3m) with a pressurized volume of 11.5m<sup>3</sup>/406 cu ft.

[http://en.wikipedia.org/wiki/Genesis\\_I](http://en.wikipedia.org/wiki/Genesis_I)      [http://en.wikipedia.org/wiki/Genesis\\_II](http://en.wikipedia.org/wiki/Genesis_II)

#### **Inflatables have three very significant advantages:**

- (1) Their thicker walls made of organic materials, weigh less than a quarter as much per square ft or per square meter as do conventional metal hulls.
- (2) They can be launched uninflated in smaller and lighter cargo holds
- (3) Inflatable hulls are at least as resistant to both radiation and micrometeoroids as metal ones, but high-energy cosmic rays simply pass through without forming secondary x-rays as they do in passing through metal.

#### **Okay, so this will be a beginning, for only \$17.8 million yet! How about for \$178,000?**

Maybe by 2050, they will test the real thing. Yes, we realize that NASA's snail pace is dictated by funding realities. But millions of dollars for a test like this? Give me a break! I'll check back on this in my next life. Look, NASA, the public wants its money worth. Due caution taken to this extreme is not the way to win over Congress or the public. Okay, I know I am not being fair. The proposed BEAM unit is too small to bounce around inside. All the more reason to use at least a Sundancer module. I'd pay the difference, if I had it. And so would the American public. That's precisely the point.

#### **Reason to take heart**

"Beyond its collaborations with NASA, Bigelow Aerospace has greater ambitions. The company is currently building two much larger inflatable modules (with 11,600 cubic feet of space apiece) that will combine to form the world's first private space station, dubbed 'Alpha.' **Station Alpha**, with a **planned launch in 2016**, will be **large enough to house a dozen people**, twice as many as the ISS. Also, Alpha's inflatable modules would be spacious enough to allow up to three people to spacewalk simultaneously compared to the ISS' maximum of two. Contingent on Alpha's success, Bigelow Aerospace intends to build additional stations to meet demand, and has already begun design work on a massive module with 74,000 cubic feet of space."

<http://www.space.com/19291-inflatable-alpha-station-bigelow-aerospace.html>



Surely, Bigelow Aerospace will want to try out a big unit as a space gym intended for space hotels as such a facility would be a prime attraction, in addition to the view in all directions under both day and night conditions. We can expect a lot of experimentation, perhaps years, before specific zero-g dance moves and sports emerge. People want to play under all conditions in all settings. It's part of being human. This will be but the beginning.

Alas, target dates tend to slip, and slip, and slip. In the end, commercial space will dominate. "Socialized" space without competition, has no need to keep on budget or on target or even on focus. The demand for more access at orders of magnitude cheaper rates will keep forcing these changes.

As Space Frontier Foundation founder Rick Tumlinson put it many years ago, in 1988, I believe, "NASA should **open** the door to space, not **be** the door." MMM has been seconding the motion ever since. ##

## Space Gyms & Sport Facilities Beyond Bigelow Inflatables

By Peter Kokh

The BA 330 module may be spacious as habitable modules so far tested in space go, with 330 cubic meters (12,000 cu ft) of internal space. Most configurations illustrated so far have a central core which is most useful for outfitting into floors and rooms. One without a core would provide a lot of space in which to try all sorts of free fall moves, rebounds, and exercises, and experiment with new games from tag to tennis to wrestling, to obstacle courses. Oh yes, not to forget space dancing and synchronized space swimming!

But ILC Dover’s torus module, ideal in gravity conditions, for example as a lunar outpost, could also make an interesting space gym. One could run along on the inside of the outer rim, creating one’s own gravity. And team sports to fit such an environment will require much imagination and experimentation. A space hotel with a torus gym might attract more well-heeled tourists than would a simple BA 330 gym.

Torus gyms could be either non-rotating gravity-free, or rotating, providing a range of gravity levels from asteroidal to lunar to Martian. Even with one-g provided, sports will not be quite the same as on Earth, as the spin would put an “English” twist on everything due to Coriolis forces.



It may take a while before a handful of practical fun sports, and dance moves, begin to emerge, and these will continue to develop for some time over generations.

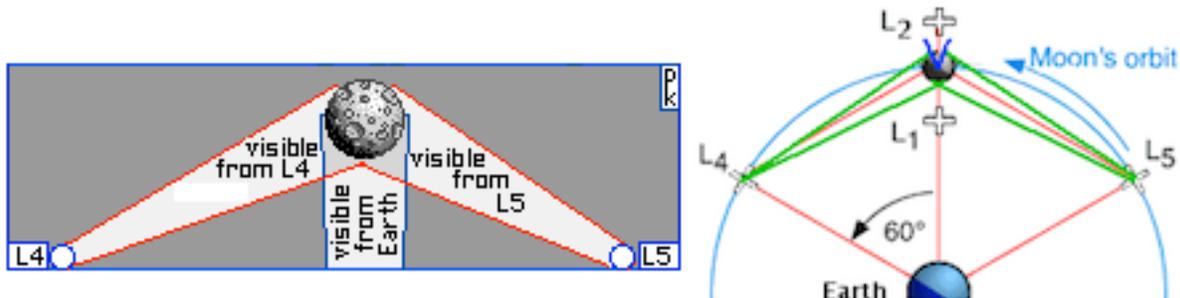
A torus might even be outfitted with changing side walls (non-repeating decor) for future movie sets. Of course, the same can be said of the wheel type space stations. But that is farther off. An inflatable torus will be out there perhaps long before a wheel station. Indeed, what we learn from operating and doing a whole range of things in an inflatable torus will surely affect how we design and engineer “Stanford Torus” type space oases.

## The “Flankscopes” Project: seeing around the Edges of the Moon

By Peter Kokh

It would be a very interesting project, and one bound to be endlessly productive, to send a pair of remotely operated space telescopes to the two gravitationally stable areas flanking the Moon in its orbit where Earth’s and the Moon’s gravities neutralize each other. In those two locations, known as L4 and L5 [see illustration below] these telescopes would keep their station without the need for fuel.

Built to be operated by amateurs and students, these telescopes would see 60° around the Farside of what appears to the Earthbound as the right and left edges, or limbs, of the Moon. This would give observers a chance to chart and explore and familiarize themselves with about 67% of the back side of the Moon forever (otherwise) invisible from Earth.





The “full” Moon as seen from L4 – The “full” Moon as seen from Earth – The “full” Moon as seen from L5

From the L4 Flankscope, one could study Mare Orientalis, arguably the most fascinating multi-ring basin on the Moon; and many other interesting farside features. A bonus would be a much better look at nearside features near the limb, along the Western reaches of Mare Procellarum. From the L5 Flankscope, not only might we see the striking dark lava filled crater Tsiolkovsky and its bright central mountain, but we’d have better views of already familiar objects such as Mare Crisium, Mare Marginis, Mare Smythii, Mare Humboltianum, and Mare Australe.

These two new-New Full Moon portraits could become well-known among students, and among a fraction of the adult populations, worldwide. People would become conscious of the Moon as a whole globe for the first time. Only the 60° wide pie slice of center farside would remain out of view to people on Earth, and actually less than that due to libration effects whereby we can alternately see a few degrees further west towards center farside and then a few degrees further east towards center farside on a monthly rhythm.

#### So what’s new about this?

Of course, we’ve all seen these areas from many angles including straight overhead thanks to lunar orbiters. But now these views will be real time, and especially, when observing features near the advancing or receding terminator, we’ll get serial shots that could be turned into a video of sorts. Has anyone done this?

The two flasksopes could always be aimed at the center of the Moon’s observable disk, 7°+/- 60°W and 7°+/- 60°E, producing a full view very high resolution real time image. An unlimited number of viewers on Earth could, via internet, live-search any part of that image that they wanted to study, and perhaps with better viewing than we have with our best amateur scopes from home – remember these views are not through an unsteady atmosphere, but through vacuum. So even those who wanted to study the nearside, might prefer to tune in to one or both flasksopes.

It gets better: each flankscope platform could also have an a mate telescope turned back on Earth, so that two perspectives of Earth in high resolution were available at all times 24/365 and these two could be studied in detail zooming in on any part of the live image. And that would raise the demand for yet another scope at L3, on the side of Earth opposite to the Moon, trained on just the Earth for triple double-overlapping coverage.

#### The money question: special views of Earth, day and night

Advertisers would pay for all these images to be available on a special channel, and people will pay for a device to “live search” any of these Moon or Earth images. Local TV stations could zoom in on live views of any part of Earth. Is it hoping too much that these two streams of revenue could finance the construction and deployment of both flasksopes? This is a far more ambitious project than that tried two decades ago by a team led by Rensselaer Polytechnic Institute in Troy, New York. It is this piggyback Earthscope feature that might just pay for the whole deal. The market, of course, is not only the media, but universities, airlines, etc. And you can imagine how many will enjoy the nighttime views with the city lights ablaze wherever it is cloudy. Again, zoomable.

So now those of us who would study the Moon through a telescope not only have something we would all die for, but a companion feature that will bring in enough advance money to pay for the project.

“As the Moon turns” (with respect to the Sun!) Of course, libration fudges that a bit, but the areas close to the limb are all but useless anyway, except for edge profile studies of altitudes.

Flasksopes always have perfect visibility (no weather.) When their field of view is “new” and a day before/after new, other observers could use them to study stars, asteroids, comets, and other planets

Should we dust off the Ritchey-Chretien Telescopes design involved in the previous effort? Or should we start fresh? We leave that to the telescope experts. There may well be new designs that could promise more and better features, designs that have evolved more recently. And our Flasksopes would be fixed on target, with a searchable field of view, searchable by an unlimited number of users at any time.

If this idea is judged to have merit and survives peer review, many things need to be determined besides telescope design and operating equipment. There would have to be one or more “control centers.” A university or consortium of universities would be involved.

Students at universities would get equal time with amateurs and vice versa. No problem! As we see it, there could be an unlimited number of users at any time as both flanksopes would be fixed on the center of the lunar field of view, producing a high resolution image of that face of the Moon, searchable by any number of users.

**Closing the mid-farside gap**

A mated telescope in a halo orbit around the L2 position over the Moon’s farside would overlap both the L4 and L5 flanksopes and provide views of all of the Moon’s farside. So the ideal would be 3 telescopes.

**A Partial Precedent**

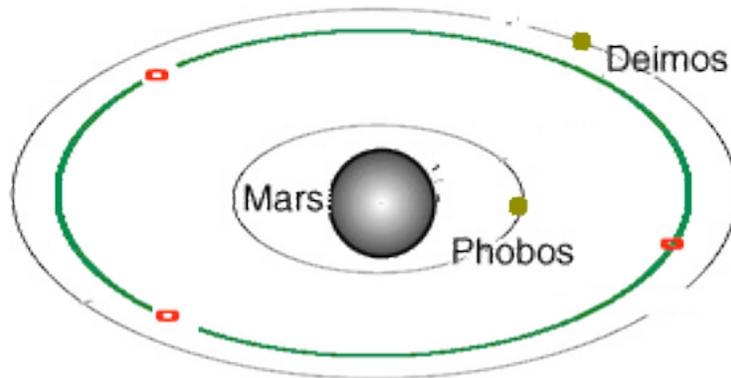
The [Rensselaer Polytechnic](#) Amateur Space Telescope project of the late 1980s and early 1990s (?) aimed to put a telescope in orbit that could be used by students everywhere, not to study the Moon especially, but the stars. The project completed the telescope design but got no further.

Here we do not propose to do the same thing at all. The flanksopes project would put up two identical telescopes, not necessarily similar in design to the Ritchey –Chretien telescopes planned for the Amateur Space Telescope, nor in low Earth orbit, nor to look as the stars. Instead the two telescopes would be placed one in the Earth Moon L4 position, the other in L5, at the same distance from the Moon as is Earth, but from different angles, seeing quite different overlapping views of the Moon.

I confess that I do not know enough about optics to venture a guess on how big such scopes would have to be to do the trick. Clearly our telescopes would be much more powerful, able to produce a high resolution of the entire scope-facing hemisphere of the Moon, differently searchable by each of an unlimited number of users via the internet. It is a more ambitious project with higher expectations and goals.

For all this it will require more money. It is for that purpose that we suggest the potential commercial uses of mated-Earth facing telescopes on each platform, at L4 and L5. The writer is not known for his financial insights and expectations. The suggested financing may be quite unrealistic. But making errors has value if it bothers someone else to the point that he/she comes up with a better way. So we put this proposal before our readers in MMM, in the **MMM India Quarterly #19**, and in the **To The Stars International Quarterly #5**, PK

**POSTSCRIPT sent to Mars:** If this idea survives review and attracts financing, why not follow up with something similar at Mars. Here we would put 3 telescopes in **Mars Synchronous Orbit**, a bit inwards of Deimos orbit. We might want communications satellites at those locations as well. Three “hemispheres” overlapping 60° on each side constantly in view via internet to observers on Earth might lead to more thorough study of Mars’ surface, and a better appreciation of its global assets.



Teleoperated from Earth with clumsy time delays, the effect would be to greatly spread knowledge of Mars among the public. That could lead to more ambitious plans to explore and even someday populate the red planet.

**A word to quick critics:**

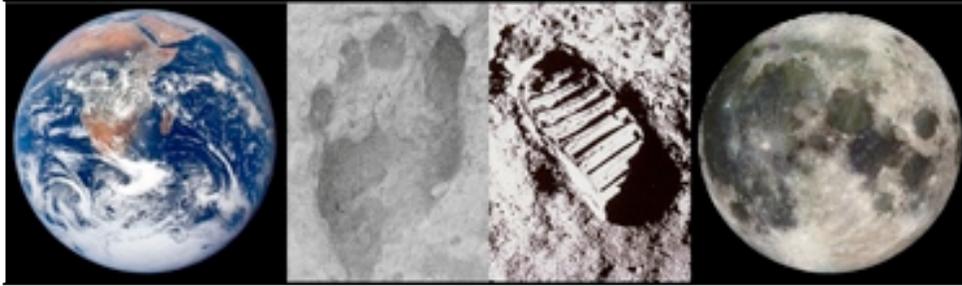
Take a page from “**the PK MMM Playbook**”: If something appears flawed, instead of dismissing it and moving on, **challenge yourself to find a way to “make it work anyway!”** We will happily give you the credit. PK

**“Do not go where the path may lead.  
Go instead where there is no path, and leave a trail.”** – Mongolian proverb

**“Only those who risk going too far can possibly find out how far one can go.”** – T. S. Eliot

**“If it isn’t difficult. it’s probably not worth doing!”**

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)



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

Join us online at our Annual Membership Meeting, Wed. September 11th

From Moon Society President  Ken Murphy

**Annual Membership Meeting, Wednesday, September 11th:**

Everyone is encouraged to make sure your MOO account works, and then join us on **Wednesday, September 11th from 9–11pm Eastern Time** for the Annual Meeting. That's 8–10 pm Central, 7–9 pm Mountain, and 6–8 pm Pacific. Those of you who download the MMM PDF file will get this advisory on time.

Your leadership team will be on hand to take your questions as we work through the Agenda:

- (1) State of the Society
- (2) Membership initiatives
- (3) Publicity and Communications
- (4) Projects
- (5) Website review
- (6) 2014 ISDC Moon track – in Los Angeles, May 14–19, 2014 <http://isdc.nss.org/2014/>

**We want to hear your voice, and what you want from The Moon Society.**

MOO details are at <http://www.asi.org/adb/09/08/04/moo.html>

Practice getting on ahead of time.

For instructions on how to connect on the MOO check this 2011 Report:

[http://www.moonsociety.org/reports/2nd\\_annual\\_meeting.html](http://www.moonsociety.org/reports/2nd_annual_meeting.html)

**LADEE:** September 6th is the scheduled launch on the Minotaur V launch vehicle from the Wallops Flight Facility in Virginia, of the **Lunar Atmosphere & Dust Environment Explorer (LADEE)** mission to the Moon. This will be the first launch to the Moon from Wallops Island.

[http://www.nasa.gov/mission\\_pages/ladee/main/index.html](http://www.nasa.gov/mission_pages/ladee/main/index.html) – <http://science1.nasa.gov/missions/ladee/>  
[www.nasa.gov/centers/wallops/home/index.html](http://www.nasa.gov/centers/wallops/home/index.html) – [http://en.wikipedia.org/wiki/Wallops\\_Flight\\_Facility](http://en.wikipedia.org/wiki/Wallops_Flight_Facility)

NASA is asking for some citizen science help in counting meteorite flashes in the night sky during the course of the mission, and are even offering an iPhone/Android app to help out.

More details can be found at <http://lunarscience.nasa.gov/citizen-science/>

**InOMN: International Observe the Moon Night** is coming up on **Saturday, October 12th**. All members are encouraged to get in touch with their local astronomy clubs to see about arranging an event in your community. This is a great way to network with like-minded individuals, as well as a great chance to spread the message of human development of our Moon. If your community has a “**Sidewalk Astronomy**” group, contact them also.

More details at: <http://observethemoonnight.org/>

Find your local astronomy club at the JPL Night Sky Network: <http://nightsky.jpl.nasa.gov/>

[http://en.wikipedia.org/wiki/Sidewalk\\_astronomy](http://en.wikipedia.org/wiki/Sidewalk_astronomy)

There's been recent news of “**magmatic water**,” on the Moon, and China's Chang'e-3 lander will head to the Moon at the end of the year. Now is an excellent time to get the word out about the importance of the Moon to our future space efforts and even to Earth.

- (1) Write a Letter to the Editor of your local paper.
- (2) Offer to give a talk at your local library.
- (3) Contact your local Rotary/Kiwanis/Lions club to give a presentation.

There are going to be a lot of folks curious about the Moon this Fall.

We can be the ones to tell them what it's all about.

**See you at the annual meeting!** – Ken Murphy, President, The Moon Society

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

## 2013 Moon Society Elections Report

### The following were elected or reelected to 2 year terms:

Vice President: **Paul Banyai** (California)

Treasurer: **Dana Carson** (Maryland)

Secretary: **James Gholston** (Texas)

Directors:

**Philip Crume** (remains Chairman of the Board, Ohio)

**Rose Dieteman** (webmistress, New York)

**Jim Keravala** (California)

### Continuing in Office for one year are:

President: **Ken Murphy** (Texas)

Assistant Treasurer: **Scotty Gammenthaler** (Texas)

Directors: **Ben Nault, Allen Steinberg**

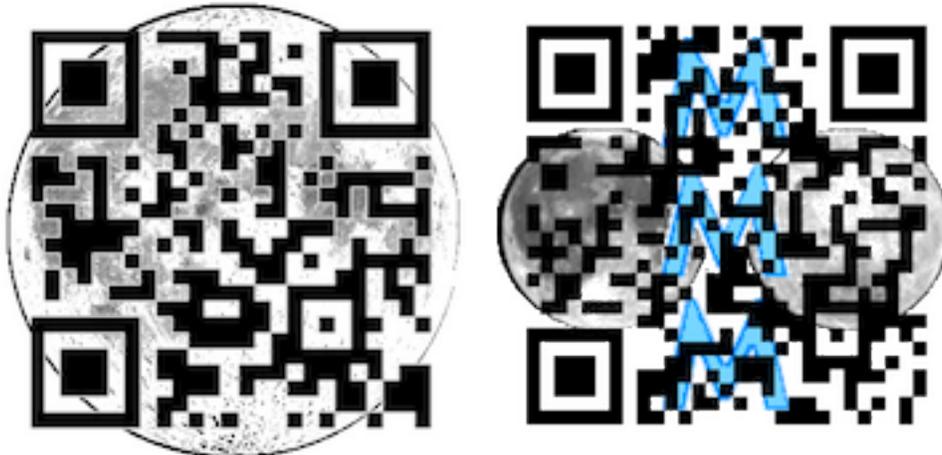
## A QR Code for the Moon Society, and for MMM too

Most likely, all of us have heard of and/or seen QR codes by now, the square box, usually in black and white, that is appearing everywhere – [http://en.wikipedia.org/wiki/QR\\_code](http://en.wikipedia.org/wiki/QR_code)

"QR" code (**Quick Response Code**) is the trademark for a type of matrix (or 2-dimensional) barcode first designed for the automotive industry in Japan; a barcode is an optically machine-readable label attached to an item and that records information related to that item: The information encoded by a QR code may be made up of 4 standardized types ("modes") of data (numeric, alphanumeric, byte/binary, Kanji or, through supported extensions, virtually any type of data."

"A QR code consists of black modules (square dots) arranged in a square grid on a white background, which can be read by an imaging device (such as a camera or smart phone) and processed using Reed–Solomon error correction until the image can be appropriately interpreted; data is then extracted from patterns present in both horizontal and vertical components of the image."

Anyone can make a QR code: <http://www.the-qr-code-generator.com/#/> It's free.



L: TMS "<http://www.moonsociety.org>"

R: MMM <http://www.moonsociety.org/publications/>

I typed in each url and out came the square barcodes, which I then overlaid on a toned down image of the Moon, and another image for MMM. Hold your smart phone up to these images and the Moon Society homepage (and our publications page) will pop up!

We can put these QR codes (with or without background art) on flyers and business cards, and paraphernalia like T-shirts and coffee mugs. The uses are endless. PK

September


 Chapters & Outposts

2013

**ORGANIZING “OUTPOSTS”** (1 or 2 people in search of more members to form a full chapter)**Bay Area Moon Society, CA Outpost – South San Francisco Bay** Contact: Henry Cates [hcate2@pacbell.net](mailto:hcate2@pacbell.net)**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** – Contact: Peter Kokh [kokhmmm@aol.com](mailto:kokhmmm@aol.com)**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 2nd Wed monthly at Buder Branch Library,

4401 S. Hampton, in the basement conference room – Next meetings – SEP 11 – OCT 9 – NOV 13

**August 14th meeting notes:** Present: Rufus Anderson, Bob Perry, Keith Wetzels, Christine Nobbe, Tom Kulhman, Dabne Tolson, Mark Rode, Dave Dietzler, and Jim Merriman.

Christine found, in the library, Buzz Aldrin's book on Mars (Mission to Mars: My Vision for Space Exploration) and after looking through the book recommend it for reading. She liked Aldrin's hand drawn sketches of his ideas. Christine brought rocket shaped cheese crackers to watch during the TV episodes.

We used Rufus's laptop, powered speakers, and projector to watch several videos from Keith's DVD of the "Man in Space" TV series from the early sixties. Jim recalled seeing the series when he was a child. The shows were a bit loose with the physics but that's the nature of drama – they completely ignored the restrictions of "the rocket equation", landing the entire spaceship on the moon with the crew of four, having it start to topple in quicksand regolith, blast off and reland. The background mountains were raw looking – they didn't know that four billion years of meteorite bombardment would erode everything.

Dabne brought the just published September Popular Science magazine with the British proposed single stage to orbit space ship on the cover. In order to get into space seriously we need cheaper access to orbit. There are several governments and quite a few private corporations working on that.

Jim asked how many of us are officially members of either the Moon Society or the National Space Society. He intends to revitalize "The St. Louis Space Frontier" which was the L5/NSS chapter back in the early 80's when we did Space Week, celebrating the anniversary of the moon landing, and had displays at the Air Force open house at Scott Air Base and at the arch with the Veiled Prophet Faire. Bob brought a box he started filling at that time containing several prints, photos, and brochures and spread some of them out on two tables.

We had a brief after-meeting meeting out in the parking lot and Bob promised to email copies of "shuttle launch from above". Surprisingly, putting that title into Google Search led to a website by a company involved with photographing shuttle launches with an eleven inch aperture telescope mounted in the nose of NASA's WB57. Do a Google Images Search &lt;NASA WB57&gt; and a Google Search &lt;NASA WB57 scopestuff&gt; to get a really large JPG. The WB57 was high enough to see black sky and the curvature of the Earth. Weird! – Bob Perry reporting

**NSS/Moon Society Phoenix Chapter** - <http://nssphoenix.wordpress.com/> – c/o Mike Mackowski

Meeting 3rd Saturdays monthly at HSGP Community Center, Mesa, 627 W. Rio Salado Parkway. Due to several factors, including the fact that some of the chapter leadership had conflicts next, and the lack of a program, we are canceling the August 17 meeting. We've had good turnout at recent meetings so the cancellation is disappointing, but I'd rather have no meeting than a disappointing meeting. See you Saturday, SEP 21– Mike Mackowski

**Tucson L5 Space Society** – <http://www.tucsonspacesociety.org/> Now serving Moon Society Members

Contact: Al Anzaldua – Meets monthly, every 2nd Saturday, 6:30 PM

**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: FEB ? – APR ? – Jun ?**Greater Fort Worth Space Chapter** c/o Patricia Ferguson [tricia3718@gmail.com](mailto:tricia3718@gmail.com)

## GREAT BROWSING LINKS

### SPACE STATIONS + COMMERCIAL SPACE

<http://www.space.com/72-iss-module-ru>  
[http://www.esa.int/Our\\_Activities/Human\\_Spaceflight/Human\\_Spaceflight\\_Research/Changing\\_environments](http://www.esa.int/Our_Activities/Human_Spaceflight/Human_Spaceflight_Research/Changing_environments)  
<http://www.space.com/22024-virgin-galactic-spaceshiptwo-suborbital-research.html>  
<http://www.space.com/21957-china-rocket-engine-test-space-station.html>  
<http://www.space.com/22119-3d-printed-rocket-part-test.html>  
<http://www.space.com/22122-next-generation-canadarm-robotic-arm-photos.html>  
<http://www.spacedaily.com/reports/prnewswire-space-news.html> - NASA tests "composite" fuel tank

### MOON

<http://www.space.com/21921-moon-bill-protects-apollo-lunar-landings.html>  
<http://www.space.com/21723-lost-moon-probes-hunt-lro.html>  
[www.space-travel.com/reports/NASA\\_Seeks\\_Information\\_on\\_Commercial\\_Robotic\\_Lunar\\_Lander\\_Capabilities\\_999.html](http://www.space-travel.com/reports/NASA_Seeks_Information_on_Commercial_Robotic_Lunar_Lander_Capabilities_999.html)  
[http://www.space-travel.com/reports/Orbiting\\_astronaut\\_controls\\_robot\\_on\\_Earth\\_testing\\_feasibility\\_of\\_CU\\_Boulder\\_project\\_on\\_far\\_side\\_of\\_the\\_Moon\\_999.html](http://www.space-travel.com/reports/Orbiting_astronaut_controls_robot_on_Earth_testing_feasibility_of_CU_Boulder_project_on_far_side_of_the_Moon_999.html)  
<http://www.cbc.ca/news/technology/story/2013/05/29/technology-moon-express-telescope.html>

### MARS

<http://www.space.com/21984-mars-ocean-ancient-river-delta.html>  
[http://www.marsdaily.com/reports/Mars\\_Water\\_Ice\\_Clouds\\_Are\\_Key\\_to\\_Odd\\_Thermal\\_Rhythm\\_999.html](http://www.marsdaily.com/reports/Mars_Water_Ice_Clouds_Are_Key_to_Odd_Thermal_Rhythm_999.html)  
[http://www.marsdaily.com/reports/Ancient\\_snowfall\\_likely\\_carved\\_Martian\\_valleys\\_999.html](http://www.marsdaily.com/reports/Ancient_snowfall_likely_carved_Martian_valleys_999.html)  
[http://www.marsdaily.com/reports/How\\_Mars\\_atmosphere\\_got\\_so\\_thin\\_New\\_insights\\_from\\_Curiosity\\_999.html](http://www.marsdaily.com/reports/How_Mars_atmosphere_got_so_thin_New_insights_from_Curiosity_999.html)  
<http://phys.org/news/2013-08-odd-martian-crater-impacts-ancient.html>  
<http://www.forbes.com/sites/brucedorminey/2013/05/29/can-mars-be-terraformed-nasas-maven-mission-could-provide-answers/>

### ASTEROIDS

<http://news.sciencemag.org/scienceinsider/2013/07/nasa-warned-to-go-slow-on-astero.html>

### OTHER PLANETS + MOONS

<http://www.space.com/21836-mercury-volcanoes-give-planet-facelift.html>  
[www.spacedaily.com/reports/New\\_insights\\_concerning\\_the\\_early\\_bombardment\\_history\\_on\\_Mercury\\_999.htm](http://www.spacedaily.com/reports/New_insights_concerning_the_early_bombardment_history_on_Mercury_999.htm)  
<http://news.sciencemag.org/sciencenow/2013/07/whats-reallygoing-on-in-lake-vos.html>  
[http://www.spacedaily.com/reports/Tiny\\_Submersible\\_Could\\_Search\\_for\\_Life\\_in\\_Europas\\_Ocean\\_999.html](http://www.spacedaily.com/reports/Tiny_Submersible_Could_Search_for_Life_in_Europas_Ocean_999.html)  
<http://www.space.com/22146-robotic-exploration-europa-incredible-tech.html>  
[http://www.spacedaily.com/reports/Is\\_Europa\\_habitable\\_999.html](http://www.spacedaily.com/reports/Is_Europa_habitable_999.html)  
<http://www.space.com/22034-why-don-t-titan-s-lakes-have-waves-video.html>  
[http://www.spacedaily.com/reports/Mystery\\_of\\_the\\_Missing\\_Waves\\_on\\_Titan\\_999.html](http://www.spacedaily.com/reports/Mystery_of_the_Missing_Waves_on_Titan_999.html)

### ASTRONOMY + ASTROBIOLOGICS

<http://www.space.com/20513-sun-heartbeat-cycles.html>  
<http://weburbanist.com/2012/07/08/watch-out-10-erie-abandoned-observatories/>  
<http://www.space.com/20571-nasa-mit-google-to-examine-life-in-outer-space.html>  
<http://www.space.com/21145-alien-planet-debate-exoplanet-missions.html>  
<http://www.space.com/21293-rocky-alien-planets-surface-composition.html>  
<http://www.space.com/21318-mars-size-exoplanets-brown-dwarfs.html>  
<http://www.space.com/21523-planetary-resources-space-telescope-exoplanets.html>  
<http://www.space.com/21480-extraterrestrial-civilization-heat-seeking-telescope.html>  
<http://www.space.com/21528-alien-intelligence-messages-lone-signal.html> - <http://lonesignal.com>

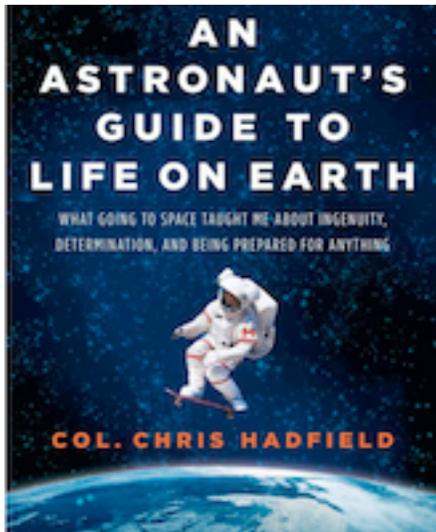
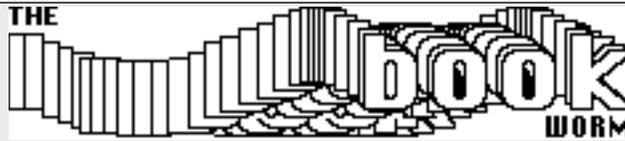
## GREAT SPACE VIDEOS

<http://www.space.com/21531-marks-on-mars-dunes-caused-by-dry-ice-video.html>  
<http://www.space.com/20400-the-search-for-another-earth.html> - "Outstanding!" Do watch!  
<http://www.space.com/18686-phonesat-small-satellites-use-smart-phones-for-brains-video.html>  
 Chris Hadfield on Guitar from ISS [www.youtube.com/watch?v=KaOC9danxNo&feature=youtube\\_gdata\\_player](http://www.youtube.com/watch?v=KaOC9danxNo&feature=youtube_gdata_player)  
 Google Lunar XPrize [https://www.youtube.com/watch?v=fedBWxBTKIs&feature=player\\_embedded](https://www.youtube.com/watch?v=fedBWxBTKIs&feature=player_embedded)  
 Fly through Mars' Hebes Canyon - [www.esa.int/Our\\_Activities/Space\\_Science/Fly\\_through\\_a\\_canyon\\_on\\_Mars](http://www.esa.int/Our_Activities/Space_Science/Fly_through_a_canyon_on_Mars)  
<http://www.space.com/22598-greenland-s-grand-canyon-revealed-by-ice-penetrating-radar-video>

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## NEW SCIENCE-FICTION FILMS

[www.space.com/21224-europa-report-dramatizes-human-mission-to-jupiter-s-moon-video-trailer.html](http://www.space.com/21224-europa-report-dramatizes-human-mission-to-jupiter-s-moon-video-trailer.html) -  
**The Europa Report – Science Fiction Trailer** – in Theaters August 2, 2013  
 A 2nd commentary – <http://www.thespacereview.com/article/2338/1>  
<http://www.space.com/22095-gravity-film-space-photos.html> New Sci-fi film “Gravity” (with Sandra Bullock)  
 involves the International Space Station – in Theaters October 4, 2013



<http://www.space.com/21844-canadian-astronaut-chris-hadfield-book.html>

### An Astronaut's Guide to Life on Earth

Canadian astronaut Chris Hadfield, who in May returned from the International Space Station as a veteran commander and social media star, has landed a two-book deal to share his space experiences.

In "An Astronaut's Guide to Life on Earth," to be published this fall worldwide by Little, Brown and Company and by Random House Canada, Hadfield will take his readers "deep into his years of training and space exploration to show how to make the impossible possible."

Hadfield's "entertaining stories filled with the adrenaline of launch, the mesmerizing wonder of spacewalks, and the measured, calm responses mandated by crises" are used to explain "how conventional wisdom can get in the way of real achievement —

"His own extraordinary education in space has taught him some counterintuitive lessons: don't visualize success, do care what others think, and always sweat the small stuff," the publishers added.

The book, which is subtitled "What Going to Space Taught Me About Ingenuity, Determination, and Being Prepared for Anything," will be published on Oct. 29 as a 320-page hardcover and as an eBook. An audio book version of "An Astronaut's Guide to Life on Earth," read by Hadfield, will also be released by Hachette Audio.

Chris Hadfield made history as the first Canadian to command a space mission serving as the leader of the space station's Expedition 35 crew. His 144-day stay on board the orbiting outpost marked his third journey into space. Hadfield earlier flew on two NASA space shuttles, Atlantis' STS-74 mission in 1995 and Endeavour's STS-100 flight in 2001. During his second mission, Hadfield became the first Canadian to perform a spacewalk, helping to install on the space station the Canadarm2 robotic arm.

It was during his latest expedition however, that Hadfield gained worldwide acclaim for his photos and  educational videos about living in space. Posting to Twitter, YouTube and other social media websites, Hadfield shared his daily experiences from orbit and produced several music videos that quickly went viral.

A singer and guitar player (on Earth, Hadfield is a member of two bands, including the all-astronaut group "Max Q"), Hadfield's on-orbit rendition of David Bowie's song "Space Oddity" received more than 10 million views during its first three days online. ###

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



## Marshall Mike Moondust and the Sinister Selenian Subterfuge

[MMM Fiction by George von Mond]

MISSED PREVIOUS INSTALLMENTS? The whole series is now online, Chapters I-IX (1-9):

<http://www.moonsociety.org/publications/fiction/MMSSS.pdf>

### Chapter X

Standing on the walkway, Mike looked down into the largest cavern he had ever seen on the Moon. On the floor below he could see a large amount of equipment, and around the edges he saw men working to enlarge the chamber. He was stunned. Where had this all come from, and why didn't the Lunar guard know about it?

Glancing about, he looked for a way out. The leadership on the Moon needed to know about this, and fast. The walkway extended to his left and right, curving around the edges of the cavern. Hugging the wall, he moved towards what looked to be the central operations center. Luckily, being coated in regolith dust helped him to blend into the shadows. Still, it was only a matter of time...

"You there!" came a voice from an overhead speaker a few feet in front of him. Glancing up, Mike discerned a camera hidden in the shadows. "State your name and business!"

"Stephen Sinn. I was part of Francis Blair's survey team."

"Why are you here?" the voice barked.

"My rope frayed and separated as I was exploring a deep cleft. Seemingly abandoned, I started exploring and found an entry to this facility."

"Stay where you are!" the voice commanded.

Farther ahead, a door could be heard opening in the wall, and Mike could see several figures as they started moving towards him. Moments later, he was in restraints in a dimly lit office, two heavily armed mercenaries flanking him as he sat in a very uncomfortable chair. A wooden chair, Mike realized. How could such a luxury be so poorly made as to be so uncomfortable? Then it dawned on him - the chair was from Earth, and he was deeply ensnared in some sinister plot.

The pieces started coming together...the missing equipment at Archaea Mines, the mine itself being so remotely located, even the regolith itself. They were seeding the scientific samples they were selling with SWIEs from older regolith excavated from deep underground. There was clearly some larger scheme at work, but what?

"Marshall Mike Moondust, you have been such a pain in my ass," came a strange voice from behind him.

"Who?" asked Mike, looking around to try to spot his interlocutor.

"Give me a break, Marshall," replied a tall figure that moved from behind him and around the table to face him. "You may have been clueless, but you've gotten yourself mixed up in some really nasty business that requires me to kill you before others can find out what we're up to here in BF Luna."

"I..., what?" said a confused looking Mike. "My name is Steven Sinn, and I work for Francis Blair. I have no clue what you're talking about."

The figure sighed. "I'm not sure what it's going to take to get you to drop the bluff, but I guess we'll find out. Gentle men." The figure gestured to the mercenaries, who each took a turn with a rifle butt across Mike's face. He could taste the blood in his mouth, and his tongue tested what seemed to be a loose tooth. He expectorated the contents and addressed the figure.

"I realize that things may be a little primitive way out here In the outback, but I'm pretty sure even you guys should have seen the reports about Marshall Moondust's assassination. The guy's dead. I'm just a guy trying to make a living. Who are you and why are you doing this to me?"

"Please, Marshall. We may be a little primitive out here in the boondocks, but we do have DNA testing capability, and yours is a perfect match. You're going to die Marshall, and in my infinite benevolence I'm giving you the chance to understand why."

"Still don't know what you're talking about," grumbled Mike.

"Whatever. My name is Andrew. Andrew Cantor. And soon I will rule this pathetic rock and use it as my launching point to control the Solar System. For far too long I have seen weak and ineffectual governments pissing away the value provided by their citizenry, leaving humanity far behind where it should be. Petty bureaucrats and petty politicians strangling their nations to control their government enforced fiefdoms. I will change all of that, and lead humanity to the greatness within it!"

"Um, okay...sure," replied Mike. "Fancy yourself another Alexander?"

"No," replied the strange figure. "This is not about empire; it is about humanity being given the opportunity to be far more than it is now. Picture a blossoming of new cultures in the asteroid belt, counteracting the stagnating effects of the homogenizing cultures of Earth. The culture of Earth is sick; as a Loony you know that. I am its cure, and my Moon is the medicine!"

Mike stared incredulous at the obvious madman before him. He had to escape from the heart of the enemy's lair and warn the authorities of the danger to his fellow Selenians. His brain churned through alternatives as he addressed megalomaniacal figure. "So what, do you expect us Selenians to just roll over and be your slaves?"

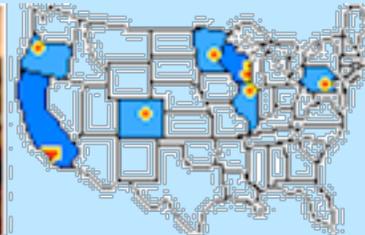
"Why no, Mr. Moondust. I expect you to die!"

Tune in next month as the malevolent plot is unleashed on the Moon!

**MISSED PREVIOUS INSTALLMENTS? The whole series is now online, Chapters I-IX (1-9):**

<http://www.moonsociety.org/publications/fiction/MMSS.pdf>

## 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!*

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• James Schroeter (414) 333-3679 – [james\\_schroeter@yahoo.com](mailto:james_schroeter@yahoo.com)

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

**Meeting place changes for some dates:** On October 12 and November 9 we will meet down the hall in room G150. Thereafter we will be back in our regular meeting room G110.

✓ We will start planning our 27th Anniversary Holiday Party, set for Saturday, December 14th, 1-4 pm

✓ Yuri's Night 2014 is on April 12th coming up. We meet this day in the afternoon 1-4. We can either turn this meeting into a public invited party or plan an evening celebration at a location to be discussed.

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## WISCONSIN



## SSS – Sheboygan Space Society

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

c/o Will Foerster 920–894–1344 (h) [astrowill@frontier.com](mailto:astrowill@frontier.com)

SSS Secretary–Treasurer c/o B.Pat Knier [dcnpatknier@gmail.org](mailto:dcnpatknier@gmail.org)

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 Thurs even # months

NEXT MEETINGS: OCT 17 – DEC 14 (SAT in Milwaukee, 1–4 pm)

## CALIFORNIA



## SSDS – San Diego Space Society

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

## 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 – SEP 21 – OCT 19 – NOV 18 – DEC 21

Sept. 21, 3 pm OASIS Board Meeting, Home of Craig and Karin Ward, 1914 Condon Ave. Redondo Beach, CA

Oct. 19, 3 pm OASIS Board Meeting, Home of Phil Turek, 7611 Alhambra Drive, Huntington Beach, CA 92647

Nov. 16, 3 pm OASIS Board Meeting, Home of Steve Bartlett & Tina Beychok, 7108 East Peabody, Long Beach,

Dec. 14, 3 pm OASIS Board Meeting Home of Bob Gounley and Paula Del Fosse, 1738 La Paz Road Altadena, CA

## 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: SEP 5 – OCT 3 – NOV 7 – DEC 5

## 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 5541

## 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)

Visit Us in **Second Life**” <http://slurl.com/secondlife/National%20Space%20Society/128/151/1261>

**Meetings 3rd Sat. each month at 2 p.m. – Big Dog Coffee, 107 Molalla Avenue, Oregon City, Oregon**

**Regular Meeting 3 pm 3<sup>rd</sup> SAT monthly – SEP 21 – OCT 19 – NOV 18 – DEC 21**

## 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 Location and times:** we meet at the Liberty One Food Court 1–3 p.m. Our next regular meeting will be **September 21**. There may be an event at the Suburban Station Concourse, with Mitch and Wallace doing outreach, around the meeting date. In October we may take part in **Space Week activities at the Franklin Institute**, if invited. This is preliminary. In November we will be part of the **Philcon Science Fiction Convention**. Several of us have received invitations to be on panels again, and, also to contribute ideas for talks.

**August Meeting notes:** We had a good turn out even though Mitch went to the Jersey Shore. However: Rich Bowers went to another meeting of the Northeast Philadelphia Model Group and he brought some of there thoughts on materials to start building a basic **lava tube display**. His report engendered much talk again about this project because the materials where very basic: in the first instance a tube that could be picked up at Home Depot, or other warehouse store (see those used for concrete casting and similar projects) and second, one of the large water bottles used in various locations. In the second case we looked at this as a way to get something quickly and easy to modify. The habitat structure we are considering would be a cylinder on the inside, but, would have a light distribution system that we see in the design of the Bernal Sphere. After a number of ideas where exchanged on this design another possibility was suggested (by Dennis Pearson I believe): the use of plastic playground tubing, that would normally be discarded when worn out by children, that would allow for a cheap/free housing for the internal model display. We might be able to do this but I don't personally have the space for a large display. When trying to design a lava tube building display I had to move toward a nested plumbing tube design with an air pump to tension the "skin" of the building part of the display. The habitat display idea is moving forward due to member enthusiasm and I think we will have something for Spring events if not sooner! I think our activities are justifiable: see the Kalpana design in the Fall Ad Astra.

Larry gave the first report on web activity, pretty steady, and the discussion of setting up a Google Meet-UP site continued. The idea is a good one for the people who would be doing the connecting, but, a site that was "ours," not just some outreach by individual members, would cost about \$100 a year. This was supported by several members, but, I temporized until our treasurer, Mitch, could be present to consider starting a specific, paid for, site under our control. Also: Larry noted that he uses his Tablet, rather than an I-Phone, for some of his social network activity. And Hank Smith pointed out that he has joined several Meet-Up groups to raise our visibility among possible members of our organization.

Dorothy reported on various public events in the Mid Atlantic region museums in the Washington area: Women in Aviation and Space on September 14, at The Smithsonian, Family Day at the Udvar-Hazy Center in Chantilly, Va., with this event showing, and discussing, the contributions to aviation and space exploration of Latin Americans. The Udvar-Hazy location also has Super Science Saturdays every second Saturday of the month through the end of September. See the Smithsonian site for many more events, including astronomy outreach, for more. Then there are ongoing activities for the public at the Goddard Space Flight Center outside of Baltimore. See the website. And the Baltimore Science Center also has a number of ongoing programs including "The Universe Live!" at its' planetarium, and, starting November 2<sup>nd</sup>, "We Are Aliens" and "Life Beyond Earth". When weather permits on Saturdays' there are solar viewing events from 1 to 4 p.m. In connection with Women in Space: Dennis pointed out that this was also the 50<sup>th</sup> anniversary of a women going into space: Valentina Tereshkova was acknowledged at the ISDC in San Diego this spring. Hank Smith brought more material for the Philcon Convention, coming to the Crowne Plaza in Cherry Hill, November 8 to 10. See [philcon.org](http://philcon.org) about the Con, and, call 877-656-3914, or see [psfs.org](http://psfs.org) for details on the PSFS group that is the Cons parent.

Dennis Pearson also attended and contributed to various discussions and pointed out that the former head of the Indian Space Agency, Dr. Abdul Kalam was at the ISDC and was the recipient of the Werner Von Braun Award for his work on that nation's space program and promotion of space based solar power. He gave a short report on the myriad of talks and events at the ISDC with Rick Tumlinson's enthusiasm for space mining, at his presentation, being noted in particular. From the agenda this was a great event to have been at. Dennis confirmed this. Dennis also presented us with our Chapter Charter which is the official acknowledgement of PASA as a chapter in good standing of the National Space Society. We did the required work to maintain that status and continue to do our part in promoting those activities that could lead to an expansive culture that includes the habitation of the solar system by Man (homo sapiens and our offspring). He also pointed out that our habitat display may qualify for funding by NSS and we should apply for support, and, we should consider getting school children in our area involved in some of the student projects that NSS awards (Dennis has volunteered to help with this). Wow! A lot of good activities aimed at a hopeful future.

Lastly, Earl brought a number of publications that are space, or applicable technology to, related. One that was used a lot was a children's book, donated by Dotty and Larry, called "Space Colonies" by Dennis B. Fradin. This book from the 1980s has a number of excellent illustrations of what various constructs might look like to the grown up children. Who would build and live in them? It also illustrates Mass drivers for moving materials in space and sending them up from the Moon. A good talking point publication.

In Wired magazine for August is two movie **reviews of films** our members have seen or will go to: **Europa Report**, which is documentary format is described as being heavy on the sci in science fiction. Having seen it I agree: there are not lots of gunfire and explosions with major stars battling injustice. However: there is a style to the movie that says "we, the directors and film makers, listened to our advisors from NASA and Space-X and other hives of factiness". This is in limited release and should be caught as soon as you know its playing. It was in an "Art House" in Philadelphia.

The other film, with Brad Pitt as the fighter of injustice (and Jodie Foster as guardian of the Elysium habitat) is closer to the Hollywood style many of us dislike, but, it is not an "all good things (read Stanford Torus!) destroyed in the end" film either. The Elysium habitat is home to the 1% in the future and the rest of humanity has to fend for itself and not interfere with the plans of the wealthy. Mitch and Rich Bowers both saw the film and recommend it highly. The write up in Wired is very good as is the plug for thinking long term about what we show and tell the public about: the creator of Elysium, Neill Blomkamp (District 9 director), saw illustrations of the Stanford Torus, as a youngster, in a National Geographic issue that included Syd Meads illustrations of the habitat. Go see it for the visuals; they will be a common reference point that many young people will have seen and can relate to during your outreach activity.

There is much more, from recent small satellite work in The Amsat Journal, to the 2013 ISDC coverage in the Fall Ad Astra (with a number of habitat illustrations including the Kalpana design from India (first published, in 2006, as Kalpana 1) ([nss.org/kalpana](http://nss.org/kalpana) for revised design), and the November issue of Analog for November: "3D Printing and Dancing Bears" by Thomas A. Easton. Professor Easton starts out explaining what is 3D printing in the first place (and references his earlier article from 2008) and goes on to explain some of the steps and processes that make this manufacturing method possible. He sites info. on many present day companies that are involved in development, and, some of the problems being discussed now with the increasing distribution of the technology. It is a brief but very informative. He mentions an early article, from 1992 by Arlan Andrews, in Analog, on this subject, while those of us from the sci-fi and futurist community may remember The "anything machine" described by Arthur C. Clarke in the early 1960s. And from the 1970s the Santa Claus machines for build any part we might need. This is all interesting and fun stuff. Michelle and I have talked about this rather frequently and are planning to go to New York to see the Makerbot store and the Makefaire at the Hall of Science in Queens in September.

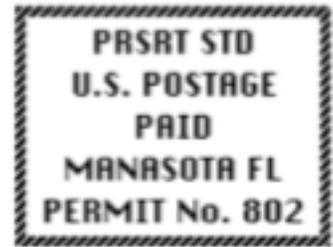
P.S. Michelle and I have been interested in this area of applied technology for some time, including the use in building whatever can be described with appropriate CAD files. but in the last two years these machines have become part of the conversation in the society at large. It is another tool and may be a very useful one to the hab and base builders among us.

On a related note: although we have seen "replicators" on Star Trek since the late \*00s there has not been much more than reference to Trek and hand waving at the Cons we have been to or head about on the East Coast in our region. This, and small cheap satellites, are two areas that I think should break out of the space conference venue into the Cons. I realize that one of the Mars related groups (Four Frontiers Foundation?) had one last year, but, I think that this would be a draw for younger METS (I like this acronym better) enthusiasts.

And finally: Congratulations to the Middle Tennessee Space Society who received The Robert Compton Chapter of The Year Award. There were a number of contenders but Tennessee took it. Onward!– Earl Bennett

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

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