

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

# Moon Miners' Manifesto

& The Moon Society Journal

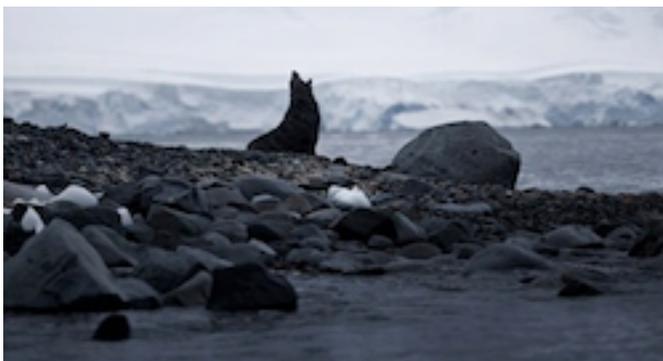
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**Antarctic coast scene:** a much friendlier place than Mars but with nearly the same annual temperature range

## Feature Articles:

2. In Focus: Advocates of Moon and Mars Settlements should work to amend the Antarctic Treaty
3. Antarctic Activities can Blaze the Trail for Pioneers on Moon and Mars
7. Working within the Strictures of the Current Antarctic Treaty



Any proposal to allow **"civilian settlements"** in areas of Antarctica above the Antarctic Circle or continent-wide, under an "amended" Antarctic Treaty, must have strong protections for wildlife as well as for unique ice-free "dry" areas, along with strict mining and resource recovery guidelines protecting the environment. If such an agreement could be reached, it would provide a precedent for human settlement of the Moon and Mars that respects the environment yet finds a place within that framework for a viable human frontier. Only humans can extend life to these worlds.

## About Moon Miners' Manifesto

- **Moon Miners' Manifesto CLASSICS:** The non-time-sensitive articles and editorials of MMM's first twenty years 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:**  
<http://www.moonsociety.org/publications/m3glossary.html>
- **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.
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- **Milwaukee Lunar Reclamation Society** is an independently incorporated nonprofit membership organization engaged in public outreach, freely associated with the National Space Society, insofar as LRS goals include those in NSS vision statement. MLRS serves as the Milwaukee chapter of both **The National Space Society** and **The Moon Society**: – <http://www.moonsociety.org/chapters/milwaukee/>
- **The National Space Society** is a grassroots pro-space member-ship organization, with 10,000 members and 50 chapters, dedicated to the creation of a spacefaring civilization.  
**National Space Society**, 1155 15th Street NW, Suite 500  
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.**
- **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

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### In Focus Why Advocates of Moon and Mars Settlements should work to amend the Antarctic Treaty

"Failure to "responsibly modify" the current Antarctic Regime could very well result in a Treaty ban on "settlement" of the Moon and Mars, allowing scientist-explorers only."

**Antarctic Treaty Precedent** – In 1959, Twelve nations, involved in Antarctic exploration, and with land claims frozen, established a treaty that would allow peaceful collaboration and coordination, signed the original Antarctic treaty. Since then 31 others nations who wish to conduct exploration and scientific research there have now "as-ceeded" to the Treaty which was extended in 1989. It will next be open to review in another thirty years, that is in 2019. That gives us seven years to marshal support for some key changes.

The most significant of recent protocols was signed in Madrid in 1991 therefore being known as the Madrid Protocol, though it's official title is, "**The Protocol on Environmental Protection to the Antarctic Treaty**" which came into force in 1998. Most of the provisions are reasonable. But some of the provisions create a precedent that

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

must be rejected if we are going to open the Lunar and Martian frontiers to resource-using settlement. Article 3 Environmental Principles is fine as it stands and is not the area of concern.

Article 7 states "Any activity relating to mineral resources, other than scientific research, shall be prohibited." In our view, it would be better to rate specific areas of the continent according to environmental risk, and to set standards for mining practices such as to protect the environment. If all mining were bad, we would still be in the stone age.

Article 8 does make distinctions between activities with (a) less than a minor or transitory impact; (b) a minor or transitory impact; or (c) more than a minor or transitory impact. But the overall effect has been chilling.

We certainly do not object to a rigorous review of all mining and commercial activity proposals. But the outright "ban" is counterproductive. In effect, Antarctica is off-limits to settlement, if settlers are to produce any percentage of their needs, specifically, building materials.

Not helpful, the treaty applies to areas poleward of 60° south. If the Antarctic Circle had been the "fence," about a third of the Antarctic coastlands (that portion south of Australia and the Indian Ocean) and much of the Antarctic Peninsula (below South America) would be excluded from this ban.

The principal base of McMurdo Sound and the very unique Dry Valleys lie south of New Zealand. These valleys are environmentally unique in all the world, but even there some scientific research – (these valleys offer the best Mars analog site conditions anywhere) – and even some commercial operations such as "photos and footprints only" tightly-guided tourism – should be allowed.

In our view, the Treaty notwithstanding, humanity has a right to settle and use the resources of both treaty-excluded and treaty-protected areas, under strict safeguards and protocols. The pro-space community sat on its hands when the Treaty was extended last time. We must rise to the challenge in 2019 and that will require a lot of careful and detailed preparation. We offer some suggestions in the article that follows.

1. **First, we consider what we might be able to do within the limits of the present language.**
2. **Then we show how some simple modifications would allow much more without undue harm to this magnificent natural frontier.**

Failure to "responsibly modify" the current Antarctic Regime could very well result in a Treaty ban on "settlement" of the Moon and Mars, allowing scientist-explorers only. PK

## Antarctica Activities can Blaze the trail for Pioneers on Moon and Mars

By Peter Kokh

**It is essential that we demonstrate here on Earth, in Antarctica, that development and settlement can be pursued in a way that respects and preserves nature.**

To do this, we need to set standards, something we have failed to do previously except retroactively, after damage done has become too significant to ignore. In that light, not to set standards in advance would be to disrespect the gift that is Antarctica, and that is the Moon, and that is Mars. Put it this way: to win a broader base of public support, we need to earn the respect and support of the "Environmentalist" community (to which, by the way, we personally are personally proud to belong.)

In his recent article "Are We Ready to Settle the Solar System?" [Moon Miners' Manifesto India Quarterly 14 pp 27-33] Dave Dunlop writes:

### **"Pushing the Boundaries**

Today there are many long term outposts on the continent of Antarctica, clearly the most challenging and "alien environments" on our home planet with the possible exception of the deep ocean. For the moment we have forbid ourselves the "luxury" of creating true settlements in this harsh terrain but have enduring outposts for scientific study and now increasingly tourism. The Antarctic enterprise shared by many nations is the best model of how we our aspire to poke our nose into new space environments. Our global Antarctic Program is The Grand Daddy of Space Settlement Initiatives but it is far from a sustainable settlement largely dependent on in situ resources."

### **Potential Settlement Sites**

There are a few science outposts "out on the ice" in Antarctica: Amundsen-Scott Station at the South Pole, Concordia Station (France-Italy), and Vostok (Russia) for example. The only local resources are ice and wind. Most other stations are on or near ice-free ground at various locations along the coast, or on coastal islands. But these stations have only one purpose: science. They are totally dependent on support from the sponsoring nation(s),

Even McMurdo which has over a thousand residents during the summer and is physically bigger than many a small country town elsewhere, cannot be considered a "settlement." None of its residents is "permanent" - all are there on limited tours of duty - no families, no children. Official visitors only.

### **Raw Material Sources for Settlement and Settlement Basics**

Most Antarctic outposts, McMurdo-Scott among them, are on exposed ice-free ground, where conceivably, some limited use of **local rock and rock debris (including basalt** from neighboring Mt. Erebus volcano) is a potential "resource" given enough experimentation and imagination. Adjacent seas are teeming with "food." The ever-present steady winds blowing seaward off the Antarctic ice cap provide a significant energy-source. Coastal outposts may see occasional driftwood, beached animal carcasses, wood and steel shipwrecks, all sources of materials to creative and resourceful people.

That "mining" necessarily disfigures the landscape and poisons the environment is a blanket assertion and proposals to access materials for local use should be allowed to have a hearing before the Treaty nations in advance of the next scheduled review in 2041. Environmentalists stand to gain from such a process as

**Ways to mine more responsibly and with less negative environmental impact, here in Antarctica, have the potential to transform for the better, how mining is done elsewhere on Earth, as well as to pretest means and methods of responsibly accessing resources on Moon and Mars**

### **The idea of self-supporting settlements in Antarctica**

Any true settlement has to provide for a wide variety of needs of its members. In short that means that

1. **What a settlement cannot produce locally, it must import from elsewhere**, and to do that,
2. **The settlement must produce products that it can trade for what it needs to import.** Some of that trade can be with other Antarctic Settlements, of course, but collectively, Antarctic settlements must export commodities to the outside world to pay for whatever they must collectively import from the outside.

### **Specific products**

Together, this covers a lot: food, clothing, building materials (primary and secondary including furniture and furnishings); power, manufacturing equipment, vehicles; tools: the list is long, but can start small.

Currently, the only places in Antarctica that produce anything exportable are those that engage in fishing in the Antarctic ocean, which is, however, perhaps the most food-rich ocean of all. But most of this fishing is done out of ports in southernmost Chile and Argentina. Some amount of whaling has been supported out of small towns in South Georgia, which is hundreds of miles north of the Antarctic coast.

### **Beyond fishing: some options: wind power; rock products; minerals; fossil fuels**

**Wind:** The Antarctic Coast enjoys the strongest steady winds on Earth, continually blowing coastward of the polar interior. Wind power is being used in Maitri (India's station) and at McMurdo-Scott (US, New Zealand). All that power is used locally. To be exported, wind power would have to be converted into some other power source or actually beamed elsewhere by orbital relay. So, at least near term, wind is a local resource, not an export option.

Nonetheless, this domestic source of power is definitely of significant value. **Most communities around the world are not as energy-independent as Antarctic Settlements could be.** Of course, this is electrical power, and fuels for non-electric vehicles and equipment must still be imported. But a greater reliance on batteries and fuel cells could increase wind-power applications to cover a growing percentage of non-electrical power needs.

**Rock (and gravel):** these are crude building materials, but in light of the fact that there are no trees in Antarctica, that assumes some real importance. The makings for cement would make this rock and gravel resource cover more construction needs: blocks, bricks, slabs, beams etc. are a great start. Basalt on the slopes of Mt. Erebus at McMurdo can be used as cast tiles, bricks, slabs, hewn and carved items, and as industrial fiber.

**Other mineral resources:** Metals, gems, etc.: We have no idea what lies under the ice, but the fact that at one time Antarctica was connected to South America, Africa and other "continents" that formed Gondwanaland, it should be expected that mineral resources in once contiguous areas should be similar. For example, what we find available in the southern Andes of Chile and Argentina, we should expect to find in the mountains of the Antarctic Peninsula. But for clearly practical reasons, we are looking at only exposed, ice-free locations. Except for the exposed nunataks of the TransAntarctic Mountain chain, that means **we are looking at ice-free coastal areas only.**

There are interior ice-free areas, the so called "Dry Valleys" across the Ross Sea from McMurdo Station, but these are so geologically and biologically so special that they deserve to be permanently protected as World Geological Nature Preserves, as they already are, with limited escorted tourist excursions only, except for restricted science camps. There is no better place on Earth than here for a Mars Analog Station, but the logistics would be even more expensive. Off shore oil drilling should remain forbidden as there is no fool-proof way to prevent spills.

**Fossil fuels:** there is coal and oil in Antarctica, from the forests and vegetation this land once sprouted before it wandered south to the pole. Clearly, however, the most stringent environmental procedures would need to be in place to allow these resources to be tapped so that surrounding areas inhabited by wildlife of any kind are not

polluted or spoiled in any way. If tapping these resources was limited to serving local needs, that might minimize potential damage, but at the same time, prevent settlements from trading these reserves for other needs.

### A formula for responsible mining that we should strive for everywhere

Writing about how we should mine on the Moon, in MMM #22, February 1989, "Lessons from Mt. St. Helens" we pointed out that there is nothing that sparks the inventiveness and resourcefulness of artists and craftsmen and entrepreneurs in general as "free material" – in this case the inches of Mt. St Helens ash that covered large areas of the Pacific Northwest after the 1980 explosive eruption of this volcano.

Then, in the next issue, MMM #23, March 1989, our article "Tailings" addressed the issue that the bulk of what is mined is cast aside as "of no economic value" – tailings.

From the MMM Glossary <http://www.moonsociety.org/publications/m3glossary.html>

**Tailings** – what is left after the elements sought in a mining operation are removed. Actually, all other elements remaining are somewhat "enriched" in abundance by that removal. In a mining cascade, the tailings would continue to be further enriched in the elements not yet extracted. When it becomes impractical to mine tailings further, casting them into building materials would productively embody all the energy already spent, and minimize the amount returned to nature, the "throughput." The less the "throughput" of a operation or of an industrial settlement as a whole, the more efficient that operation or settlement can be said to be, and the more minimal its environmental impact or footprint.

**Tailingbrick, tailingcrete** – suggested building products to be produced from tailings.

You can read both articles, on page 11, and pages 17–19 respectively in Moon Miners Manifesto Classics, volume 3: a free download from: [http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)

Tailings-based Antarctic industries could help reduce the gross tonnage of imports from off-continent that will be required to support permanent settlements in Antarctica. And any tailings-based products used on the continent that are attractive enough to find a market elsewhere, will help pay for what must be imported.

It may take some time before Antarctic Settlements can reach and then exceed an economic "breakeven" point. But without the prospect of doing so, true settlement is unlikely. For supporters of Lunar and Martian settlement, the stakes in Antarctica are very high. We choose to ignore what is happening and can happen in Antarctica at our peril. Let's look at some other potential income sources

### Other sources of income for Antarctic Settlements

1. **Tourism:** In 2010–11 34,000 tourists visited Antarctica and the numbers keep growing! While agency tourist guides take care of most of the tourist agenda, they should be required to enlist local civilian guides from any "settlements" they visit. There are currently only two such spots, and we'll get to them below. The idea, however, is to set a precedent. If in time at some of the various national science outposts, true permanent residents are allowed in support roles, this practice could be extended. Through such "subcontracting," a source of local income can be provided. Of course, we favor healthy competition, so at each location a choice of tour guide agencies would be ideal. We can see such an operation at an entry "gateway" to the Dry Valleys area for example. Tourists love souvenirs, of course, so such gateway civilian centers gift shops featuring crude unfinished souvenir rocks, as well as locally produced art objects made from local materials would help. Tourism could thus employ tour guides, transport vehicle operators, translators, artists and craftsmen, and even entertainers. We have to start somewhere! Many a town in America (and elsewhere) thrives largely on tourism.
2. **Fishing:** Grytviken (photo below), on the North coast of the island of South Georgia is the outstanding example. However, this site is well north of the Antarctic coast itself, and for a reason: it is accessible and ice-free for a greater number of days than any site on the Continent, or on immediate off-shore islands. Yet some anchorage for fishing ships and fleets is available there, and with some front money could be developed.



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So the resources necessary for a core of self-sufficiency to be complimented by imports is a difficult goal to reach. Beyond fishing and logistics support for tourist excursions and possibly for nearby science stations, there does not seem much upon which to establish genuine settlements.

### The Obstacles and Challenges are Real but Must be Overcome

Antarctica poses a number of serious logistical problems to any would-be mining or prospecting activities;

- **Antarctica experiences the most extreme cold on the planet. Mars' climactic range is very similar:**
- **Mutual isolation of outposts in Antarctica is a preview** of what it might be like on Moon and Mars. Such isolation is an impediment to internal trade. However, a clustering of inter-trading settlements on the Antarctic Peninsula and its off-shore islands provides an optimal place to start. On Moon and Mars both, some settlements will be very isolated, but for success, a critical collocation of neighboring settlements at some optimal locations will be critical to the development of lunar and/or Martian economies
- **The annual "icing-in" of Antarctica** imposes "no shipping" intervals, at least by sea, if not also by air. This "on your own" test will apply even more strictly on Mars as well, with launch/landing windows more than two years apart. If we can't succeed in Antarctica, it would be foolish to think we could succeed on Mars.
- **These "Antarctic Challenges" make the continent an analog of Moon and Mars as to the difficulty of setting up Lunar and Martian economies.** If we don't accept the challenge of trying out our proposed ways of "working around the obstacles" posed in Antarctica, both natural and artificial (Treaty), how can we be honest in our dreams and convictions of being able to do so in space? Space enthusiasts of all stripes, who ignore Antarctica and choose not to get involved in that continent's future, do so at their own peril.

### Note that there already are two "civilian" settlements in Antarctica

Despite the provisions of the Antarctic Treaty, there are two "settlements" there, **families welcome**, both off-shore, both "grandfathered" - having been established before the present Treaty amendments took effect.

(1) **Villa La Estrellas** (Chilean) (below) is one of the main ports of call of Antarctica cruises.



This town was founded in 1984 at 62°12' S, 58°53' W on King George Islands, one of the South Shetland Islands, above the Antarctic Peninsula. It is integrated with the Chilean Eduardo Frei Base, a scientific (meteorological center) and military (air base) station.

The hamlet has 20 prefabricated modules, 14 are **family residences**. It also has a **bank**, post, hospital (one doctor, one nurse), school (15 students) kindergarten, hostel, gym, store/market, local shop, and a church. The post office is also an attraction for tourists and philately enthusiasts that travel to the town to send postcards and letters with an Antarctic postmark. Built for visitors, the "**Polestar**" dormitory has room for 90 people.

There is an aerodrome providing the settlement and other Antarctica bases with several connections, with some 200 flights each season. This also serves the neighboring Russian Bellingshausen Station founded in 1968 just 200 meters away. Further, the station is also connected by unimproved roads to the nearby stations: Chilean Base Presidente Edyardo Frei Montalva, Chinese Great Wall Station, and Uruguayan Artigas Base.

The Antarctic Peninsula and its off shore islands are by far the most condensed cluster of outposts in Antarctica, mostly above the Antarctic Circle. The Antarctic Peninsula and its nearby islands are considered to have the mildest living conditions in Antarctica. The average temperature around the station in the coldest month (August) is -6.8°C (19.76°F), and +1.1°C (34°F) in February, the warmest month. Russian polar residents have nicknamed the Bellingshausen Station "kurort" or "resort."

(2) **Esperanza** (Spanish: "Hope Base") is an Argentine base located in Hope Bay, Trinity Peninsula, Antarctic Peninsula. Built 32 years before Las Estrellas, **in 1952**, the base houses 55 inhabitants in winter, including 10 **families** and 2 school teachers for a school built in 1977. The site enjoys an arctic tundra climate with one "summer" month when it sometimes gets just above freezing. Esperanza can boast that it is the birthplace of the first person to be born in Antarctica.

Esperanza's 43 buildings offer a combined covered space of 3,744 sq m (40,300 sq ft.) Imported fuel oil is used to produce electricity, but a wind generator was installed in 2008. Research is Esperanza's main product and projects include: Glaciology, Seismology, Oceanography, Coastal Ecology, Biology, Geology and Limnology. However the town's tourist facilities are visited by approximately 1,100 tourists each year!

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**Expanding this list of just two Settlements - a “match made in heaven” proposal**

Picking up and moving your family to Antarctica will appeal to very few people. Yet there will be some, so discouraged by current conditions at home, that might be willing to try something “this new, this far out.

But would there not also be **Eskimo, Inuit, and Samoyed families** in the high Arctic that are willing to re-settle along the Antarctic Coast at a few favorable locations, with some level of promised support? There are no Caribou in the Antarctic, but there are seals and plenty of fish. Might resettled arctic families flourish and prosper? Perhaps not at first. The Arctic and Antarctic are quite different. But I believe that in time, transplanted Arctic peoples could thrive in the Antarctic Peninsula and offshore islands, and maybe elsewhere on the last continent.

An ad hoc conference of the US, Canada, Norway, and Russia, with representatives from the native arctic populations of all of them involved, could pursue this idea. There might be no interest, but that would surprise us. The flame of adventure and pioneering is alive within all peoples. Who else would be as hardy? Corporate partners might be involved, so long as this does not lead to “Company Towns” - a worst possible result. But that is a separate other article for a future issue.

Of course, room must be made for people from other non-arctic populations as well.

PK.

**Working within the Strictures of the Current Antarctic Treaty**

Modifying the Antarctic Treaty Strictures to include a more relaxed zone between 60° South to the Antarctic Circle at 68° 32' would be, to us, the first step towards a “pregnant” solution.] See Map of below.



Note that there are also several ice-free areas above the Antarctic Circle on the Antarctic Coast below Africa and Australia. That said, **this might be a longer term goal. Our first goal** should be to see what we can do to expand the scope of civilian activities, including families, **under the present language** adopted in Madrid in 1998.

**Families, children and other dependents not allowed!**

The place to start would be the US stations, which together involve the largest population in Antarctica, if not the majority. Besides the scientists and other researchers themselves, we have many more support personnel who maintain the various stations, vessels, aircraft and other equipment and systems, freeing scientists and researchers to do what they come to do. The Antarctic Treaty may not specifically forbid “dependents.” But there would seem to be no room for them in the US Station support personnel programs.

**The USAP - “UNITED STATES ARCTIC PROGRAM”**

**Guide to Programs/Funding Opportunities:** [www.usap.gov.usapagov/JobsAndOpporunities/index.cfm?=1](http://www.usap.gov.usapagov/JobsAndOpporunities/index.cfm?=1)

Three corporations are the principal players: **Lockhead-Martin, Gana-A ‘You Service Corporation, and GHG Corporation**, all equal opportunity employers: women and minority groups are encouraged to apply. But this does not include children or other dependents. What we have as a result are “artificial communities of transients.” While at US Armed Forces bases, it is common to have off-base housing for spouses and children, this is not the case at US science stations in Antarctica.

Support personnel are hired for limited tours of duty, and many of the seasonal ones (Antarctic summer) return for repeat tours. For these seasonal people, the perk of having family nearby is not an issue. But what about the smaller core of support positions that must be manned year around? Yes, personnel can be rotated here as

well. But might it not be a negotiated perk for long duration, all-season support personnel to have their families on location or nearby? Could not this be a decision for the major contractors involved, rather than for the UPAS? Indeed, should it not be the decision of the personnel involved themselves, so long as this can be managed at the employee's expense?

### Tourism discouraged or not allowed

The treaty even discourages "tourism" on the continent. It would be preferable to establish strict guidelines for tourist ventures, rather than forbid them outright. Only the peripheral shipboard tourism in and around the Antarctic Peninsula is now allowed. The places where tourists may set foot on the continent itself are quite limited. Yes, we understand that tourists must not be allowed to interfere with research and researchers. Yet we allow tourists with the White House, in Congress, even in the Pentagon, and do so, with a manageable minimum of interference and inconvenience. There is a time and a place for everything. One should not have to become an inner core member of Greenpeace to have access to Antarctica.

Greenpeace is an activist environmentalist organization that can take pride in some of its achievements - in fighting whaling, and in embarrassing the US to the point of forcing a badly needed cleanup of the McMurdo station premises among its credits. But it should not have Hight Priest privileges anymore than should NASA. Greenpeace deserves much credit for the recent revisions in the Antarctic Treaty. That said, some of those provisions go unnecessarily far, and need to be trimmed back. If we fail to integrate a protected Antarctica into our human world here on Earth, we shall surely fail to extend permanent human civilian presence beyond Earth to other worlds.

### Summary

1. We need to make a place for families (one's dependents) in Antarctica so that children can grow up there to become a first native-born generation
2. We need to expand the list of approved activities beyond research and tightly-constrained tourism, to include regulated economic activities that can become a basis for supporting permanent populations while respecting the scenic integrity of this pristine continent.

As on the Moon and Mars, the more people who settle these worlds, the more science and research will get done - by these people and their descendants on location. Humankind is not a cancer on Earth-life. We are the means, the only means, by which Earth-Life can be sown off-world, take root, and flower elsewhere on worlds where life cannot arise on its own. We cannot leave the future of Antarctica, the Moon, Mars and other frontiers to those who understand neither the possibilities of opening these frontiers nor the consequences of not doing so.

### We'd like to hear from you

- **Suggest economic activities in Antarctica that could support permanent populations** and at the same time, respect and preserve the environment at large.
- **Suggest ways to open up more of Antarctica while at the same time protecting its treasures|**
- **Suggest ways permanent residents might adjust** to very long daylight summers, and dark winters: Note in Alaska, the extreme seasonal lighting variation from very long days and very short nights to very long nights and very short days may be a source of the states very high suicide rate. Some of the ideas we have suggested for future lunans to adjust to long dayspans and nightspans by controlling lighting in indoor and middoor spaces should be applicable.
- **Show how your suggestions for Antarctica might help open up the Moon and Mars.**  
Send to [kokhmmm@aol.com](mailto:kokhmmm@aol.com) or to PO Box 395, Milwaukee, WI 53208 c/o Moon Society

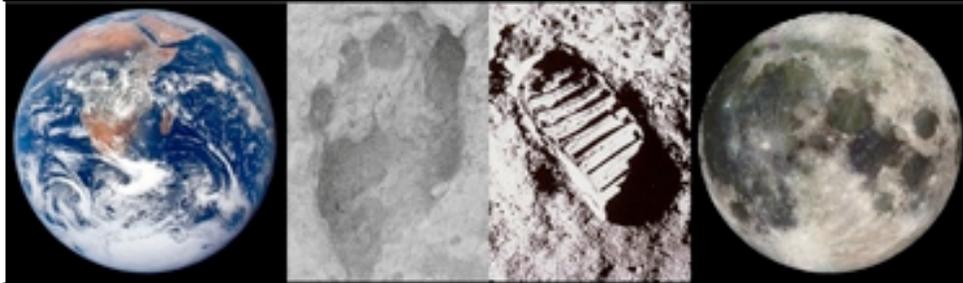


Three Frontiers whose futures are closely linked together - it is up to us!

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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)

**From the desk of Moon Society President Ken Murphy**

**We need more candidates in the upcoming Society elections**

Fellow Moon Society members,

It is once again election time for The Moon Society. This is an annual event, even if officers serve for two year terms, and it is your participation that helps shape the future of our organization.

There are different philosophies on how to approach elections for an organization. Some prefer that carefully groomed and vetted candidates are always put forward to ensure a smooth continuity in the operations of the organization. Others prefer the vibrancy of multiple candidates and the clash of ideas and chaos of uncertain ballots to keep an organization fresh and relevant.

As with most things in the world, the equilibrium lies somewhere in between, and organizations benefit from both new ideas and continuity of existing efforts. Many of the new ideas come from younger members. All of the space organizations are awakening to the need to transition past the generation that grew up on Apollo and

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

has been in charge of our efforts for decades. The Moon Society's leadership now spans three generations, from X to Silent, but we need more younger leaders for the transition we're seeing in society to a greater focus on our Moon's resources. We are positioning The Moon Society as the thought leaders in that regard.

If you are in your 20s or 30s, I am calling on you to step up and take charge. You have an opportunity to help shape humanity's future on the Moon, and a solid team to back you up. We have one open seat on the Board of Directors that I'd like to see filled by a new face.

Our Board of Directors needs You to be the Moon leader you always knew you were. If you have been a member for at least one year by August 1st, 2012 you are eligible to stand for election. If you send in a candidate statement by the end of May we will publish an amended ballot in the June issue of MMM. Contact [President@MoonSociety.org](mailto:President@MoonSociety.org) to get started.

To the Moon!

Ken Murphy

## Moon Society Board and Officer Elections 2012 Ballot

From the Moon Society Elections Secretary

Dear Moon Society member,

We are now conducting the annual election of officers and directors of the Moon Society. This election is being conducted by both email and paper mail ballots. You may vote either way. Your ballot must be received (email) or postmarked by August 1, 2012.

**Two Officer positions** of **President** and **Secretary** are up for election or re-election as usual in even # years, for 2-year terms. **Three Directors** will be elected or re-elected this year: all for 2-year terms

An electoral statement for each candidate is included at the end of the ballot [pages 10-11]. Please consult these statements for guidance in voting.

We have sent an email ballot out to all current members with valid email addresses on file. If you did not receive this ballot, it may mean that we do not have your current address or it was blocked by your spam filter.

If voting by email, please include your membership number, if you know it, and email your completed ballot to this email address: [mailto: elections@moonsociety.org](mailto:elections@moonsociety.org)

If you vote by mail, send the paper Ballot to: **Moon Society, PO Box 940825 Plano, TX 75094-0825**  
Postmarked by August 1, 2011. Do not forget to sign the ballot and, if you can, enclose your membership number.

### OFFICERS VOTE

**President** (Vote for one) for 2-year term ending in 2014

Kenneth J. Murphy #1272 (member since May 4, 2003)

write in candidate \_\_\_\_\_

**Secretary** (Vote for one) for 2-year term ending in 2014

Peter Kokh #239 (member since June 26, 1995)

write in candidate \_\_\_\_\_

### BOARD OF DIRECTORS VOTE (in order of seniority) **Three openings**

Ben Nault #1365 (member since April 1 2005)

Al Anzaldua # 1620 (member since April 15, 2011)

(See note above by Ken Murphy)

**Voter's Signature** \_\_\_\_\_

**Membership #** (if known) \_\_\_\_\_

## Moon Society Candidate Statements

### For President, 2 year term ending in 2014: Ken Murphy # 1272

Increasingly, we are seeing space ventures being discussed in the media. The level of dialogue seems to be rising from sci-fi snickers to a more reasoned look at what space may have to offer. In my view, The Moon Society should be one of the thought leaders in that regard, and so I ask for the continued support of the membership that I may continue the work begun in my first year of service:

- 1) Putting The Moon Society on stronger financial footing. This is being done through a combination of bringing our financial records up to audit quality, and identifying potential sources of revenue. To this end, classic issues of Moon Miners' Manifesto are being prepared for sale on the Kindle and other e-reader platforms.
- 2) A revamp of the website is in the works, but there's a lot of work to consolidate and organize, making for slow going.
- 3) Membership has been stable over my first year, but more work needs to be done to increase membership numbers.

- 4) We continue to work on our Lunar Lava Tubes and Solar Sail Lunar Comm Sat projects. Both offer the opportunity to advance our Lunar capabilities, and TMS will be ramping up efforts to raise additional funding through grants to begin implementation of these projects.
- 5) We continue to develop tools for members to use in their outreach efforts. We now have lapel pins for members, and will soon have informational postcards and glossy membership brochures. We also continue to look at developing a set of up-to-date Moon presentations that members can use for talks and outreach events.
- 6) We will continue to develop The Moon Society as thought leaders in the burgeoning cislunar economy. Your president kicked things off with an article in The Space Review on "The Cislunar Ecosphere." This theme is continued in the TMS track at this year's ISDC. And your leadership has been challenged to each produce an editorial or article on our Moon by year's end.

While much of this work is quiet, behind-the-scenes activity, it is nevertheless vital in positioning TMS for the challenges ahead. It is through this work that we can better support the efforts of our members and the projects they want to work on, as well as the organization as a whole.

I ask for your continued support, and your vote for president so that I can continue to work for you. **KM**

### **For Secretary, 2 year term ending in 2014: Peter Kokh #239**

As Secretary of the Society this past year a, I have worked to support Ken's initiatives, and assist, where asked, in website maintenance, chapters support, exhibits, and elsewhere. I have continued on as Editor of Moon Miners' Manifesto, and at Ken's request, posted the "MMM Editor Job Description" in MMM #252 (Feb 2012) in the hopes of finding assistant editors to phase in, so as to ensure continuity of this publication, should I not be able to continue as editor.

During this period where NASA's focus is no longer on the Moon, the time is ripe for us to lay foundations and promote developments that will accelerate things in the long run. I have been working with (Board Candidate) Al Anzaldúa of Tucson on a paper and document to unite the variously-focused space enthusiast groups around a plan to promote the development of the technologies needed to pursue all three major directions: the Moon, Mars, the Asteroids. This is the "Triway Project," of which you will be hearing more in the coming months.

I am working with Director **Ben Nault** and new Assistant Editor **Mark Lupfer** of our partner NSS Chapter in Los Angeles (OASIS) on reformatting the **MMM Classics** for Amazon.com's **Kindle** Reader. My longer term goal is to get a start on a project dubbed "MMM the Book" with the provisional title, "A Pioneer's Guide to the Moon."

### **For Director, 2 year term ending in 2014: Benoit Nault #1365**

I have been fascinated by the Moon ever since I first looked at it with my small telescope as a 7-year old. A short few years later, men orbited the Moon and then walked on it. I remember skipping school to watch the moonwalks. A new frontier was opening and I wanted to be part of the adventure.

Many of us share that same experience. The adventure has turned out to be a long, mostly fruitless, walk in the wilderness. But the goals of creating a space-faring civilization and of settling the Moon make as much sense today as they did all those decades ago. In fact, they probably make even more sense today than 40 years ago. Science tells us that the Moon probably holds key answers to the creation of the solar system and of Earth itself. Advances in technology make lunar resources available to us to help mankind move out into the solar system and quite possibly make life on Earth better in many ways. It is time to go back to the Moon to stay and the Moon Society intends to be part of the adventure.

I have been a "space activist" for more than 27 years. More recently (since 1991), I have been involved in National Space Society chapter activities. I have had the privilege of holding various positions in the Tucson L5 Space Society including four consecutive terms as chapter president (my last term ended in November 2007). I was also webmaster (and web developer) for the ISDC2000 website which included the very first online registration and payment form for an ISDC.

Professionally, I am a consultant in e-business and e-commerce technologies for medium sized companies. In that capacity, I manage fairly large projects with substantial budgets and work with teams that can range up to 20 people.

As the United States revamps NASA's priorities, the Moon Society is uniquely poised to continue to build on the interest in the Moon that remains. But we must plan our initiatives carefully.

I do not think I have the answers to all challenges facing us. And the challenges are substantial. All space activist groups face a declining and graying membership. I believe that attracting and retaining new and younger members is our number one challenge. Societal change is accelerated by technologies that are changing the world around us at a rate unseen in many generations, perhaps in human history. New ways of thinking and of doing things are appearing quicker than they can be inventoried. The Moon Society must find way to keep up and communicate in modern, relevant, ways.

In real world terms, the Moon Society must continue to work on a strategic plan to favor growth and a higher public profile. We should also put in place tools and instruments to help individual members and chapters with their projects and outreach efforts. I wish I had easy answers but I do not. But I would like to contribute to the debate. Your support is much appreciated.

###

## Chapters & Outposts

### ORGANIZING "OUTPOSTS"

**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)

**Rockford, IL Outpost** - Contact: Bryce Johnson - [lesausl@sbcglobal.net](mailto:lesausl@sbcglobal.net)

**Moon Society Milwaukee Outpost (MSMO)** - [http://www.moonsociety.org/chapters/milwaukee/msmo\\_aboutus.htm](http://www.moonsociety.org/chapters/milwaukee/msmo_aboutus.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 - MAY 16 - JUN 20 - JUL 18**

Our April 18th meeting was held at the Buder Branch Library, Rufus Anderson, Mark Rode, Keith Wetzel, Dave Dietzler, and Dabne Tolson attending. Rufus brought his projector and speakers and Bob his laptop and thumbdrive for the showing of Peter Diamandi's "Abundance is our Future" <http://www.youtube.com/watch?v=BltRufe5kkl>

Dave commented that Dr. Diamandis seems like the typical motivational speaker, really upbeat. Of course, when the human race gets out into space seriously, the power of the sun and the resources of the solar system will enable the first trillionaire - the wealth of everyone will increase. Note that nickel-iron asteroids also have significant amounts of gold and platinum group metals. And carbonaceous asteroids and comets will be valuable for their volatiles. Bob had a question about mining the moon, specifically lithium, which is the rage for laptop batteries and hybrid automobiles. It is a trace element along with Boron and Berillium and KREEP. Dabne opened up the question of mining the moon for thorium, specifically for use in nuclear reactors. In a follow up emailing Bob referenced one of the 3/4 million Google Search hits, the wikipedia article that says uranium reactors are established and the advantages of thorium reactors are not great enough to displace them. However, another Google hits mentioned that India is looking into thorium nuclear reactors. Note that India and China and Japan have all expressed interest in going to the Moon. There may be another space race.

**Moon Society Phoenix Chapter** - <http://www.msphx.org> - Contacts: Craig Porter [portercd@msn.com](mailto:portercd@msn.com) Meeting the **3rd Saturdays of the month** at **Denny's**, 4403 South Rural Road, Tempe - **Next meetings - MAY 19 - JUN 16** **First** we discussed the "Lunar Racing." [Problems: one of the monitors didn't make it, plus signal interference between the controller for the cars and the Video/Audio signal from the car beating against each other, resulting in a generally unusable video presentation.] After field trouble shooting, we let kids there participate in the racing by operating the cars in direct vision mode. They appeared to enjoy themselves with what we had. We have pictures and are developing an article on the racing.

Next we went over the "Stomp" Rocket launching for the kids in the Courtyard. Everything went together smoothly for the launching. We had several good launchings before a Hotel guest complained that the launching were "Dangerous" and the Hotel shut down the launching in the Courtyard. While we were launching rockets with the kids we had rockets soaring over the Palm trees in the Courtyard, more than 30 feet up and from one side of the Courtyard to the other. The rockets were all, except one, made of paper, tape and glue. One rocket had a plastic "Easter" Egg as a nose cone. After we were shutdown in the courtyard, Don and a writer friend of ours took the system out to the parking lot and launched a few more of the rockets, all successfully. There will be an article on the "Stomp" rocket system along with a parts list and instructions on how to make your own. (Note: one of the kids triggered the system without a rocket on the launcher, there was about 15 pounds of pressure on the system and Don, not seeing the youngster press the launch switch almost jumped as high as some of the rockets.

As soon as we iron out the interference problem we will begin talks with the Challenger Center in Peoria about running races out there on occasion. And from there to other places ad may even include the "Stomp" rocket launches, probably renaming them "Pneumatic Rocket Launches."

Generally, the panels that we were on at the Convention were well attended, only one was a disappointment, but kids found Hop later and set down with him and did what he had planned earlier.

Moon Society Phoenix was the only "Fan Table" for people to stop and ask questions at. We handed out a lot of informational fliers and business cards. Care of the "Lunar Racing" equipment has been assigned to one person. All photography will be done by assigned members of the Chapter with back ups. Craig D. Porter

**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: **Monday, MAY 14th** (No April Meeting)

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

## GREAT BROWSING LINKS

### SPACE STATIONS + COMMERCIAL SPACE

Patience, perseverance, and other lessons for spaceports

<http://www.thespacereview.com/article/2060/1>

Launching 64 times a day - what it would involve, what it could accomplish

<http://www.thespacereview.com/article/2063/1>

Swiss space debris effort could open political door to space debris removal -

<http://www.thespacereview.com/article/2032/1>

### MOON

<http://www.space.com/14955-cosmic-rays-moon-space-radiation.html>

Cislunar Space and the Cislunar Ecosphere (by Ken Murphy, TMS president)

<http://www.thespacereview.com/article/2027/1> & <http://www.thespacereview.com/article/2033/1>

Titanium paternity test fingers Earth as moon's sole parent (ruling out "Mars-sized impactor")

<http://www.spaceref.com/news/viewpr.html?pid=36571>

An Outer Space Treaty loophole for property rights on Moon and Mars?

<http://www.thespacereview.com/article/2058/1>

### MARS

<http://www.space.com/14870-mars-water-mud-signs-life.html>

[http://www.marsdaily.com/reports/Europe\\_hopes\\_to\\_save\\_Mars\\_mission\\_999.html](http://www.marsdaily.com/reports/Europe_hopes_to_save_Mars_mission_999.html) - (ExoMars)

<http://www.space.com/14975-europe-exomars-mars-mission-funding.html>

<http://www.space.com/14970-nasa-mock-mars-mission-space-station.html>

[http://www.marsdaily.com/reports/Red\\_Food\\_For\\_the\\_Red\\_Planet\\_999.html](http://www.marsdaily.com/reports/Red_Food_For_the_Red_Planet_999.html)

[http://www.space-travel.com/reports/SciTechTalk\\_Can\\_long\\_space\\_missions\\_work\\_999.html](http://www.space-travel.com/reports/SciTechTalk_Can_long_space_missions_work_999.html)

<http://www.space.com/15271-nasa-mars-exploration-life-search.html>

<http://www.space.com/13681-mars-biggest-mysteries-water-life.html>

[http://www.marsdaily.com/reports/Dark\\_regions\\_on\\_Mars\\_may\\_be\\_volcanic\\_glass\\_999.html](http://www.marsdaily.com/reports/Dark_regions_on_Mars_may_be_volcanic_glass_999.html)

### OTHER PLANETS AND MOONS

Exploring Venus with Robots and Airplanes - Jeff Landis (check out Video in section below)

<http://www.lpi.usra.edu/vexag/may2008/presentations/18Landis.pdf>

New Geological Map of Jupiter's volcanically active moon Io

<http://pubs.usgs.gov/sim/3168/> - [http://pubs.usgs.gov/sim/3168/sim3168\\_sheet.pdf](http://pubs.usgs.gov/sim/3168/sim3168_sheet.pdf)

Designing the Interplanetary Web (Internet)

[http://www.esa.int/esaHS/SEMM5IHWP0H\\_index\\_0.html](http://www.esa.int/esaHS/SEMM5IHWP0H_index_0.html)

### ASTRONOMY + ASTROBIOLOGICS

<http://www.space.com/14927-alien-life-photosynthesis-light-wavelengths.html>

[http://www.spacedaily.com/reports/NASA\\_Goddard\\_Glenn\\_Centers\\_Look\\_to\\_Lift\\_Space\\_Astronomy\\_out\\_of\\_the\\_Fog\\_999.html](http://www.spacedaily.com/reports/NASA_Goddard_Glenn_Centers_Look_to_Lift_Space_Astronomy_out_of_the_Fog_999.html)

<http://www.space.com/15073-ancient-alien-planets-early-universe.html>

<http://www.space.com/15060-billions-habitable-alien-planets-red-dwarfs.html>

<http://www.space.com/15192-sun-siblings-asteroids-earth-life.html> - predicted in MMM #61 DEC 92

Would intelligent "aliens" look like us? - <http://www.space.com/15064-aliens.html>

Did Viking Find Life on Mars in 1976 after all?

[http://www.msnbc.msn.com/id/47031923/ns/technology\\_and\\_science-science/#.T4hdFFF5nzi](http://www.msnbc.msn.com/id/47031923/ns/technology_and_science-science/#.T4hdFFF5nzi)

## GREAT SPACE VIDEOS

<http://www.space.com/14864-manned-asteroid-explorer-prototype-training-wheels-video.html>

Multi-probe Venus mission with drone airplane and rover/sampler by Geoffrey Landis and NASA RASC team

[https://rt.grc.nasa.gov/files/venus\\_mission.mp4](https://rt.grc.nasa.gov/files/venus_mission.mp4)

<http://www.space.com/14959-mars-rover-curiosity-nasa-planetary-science.html>

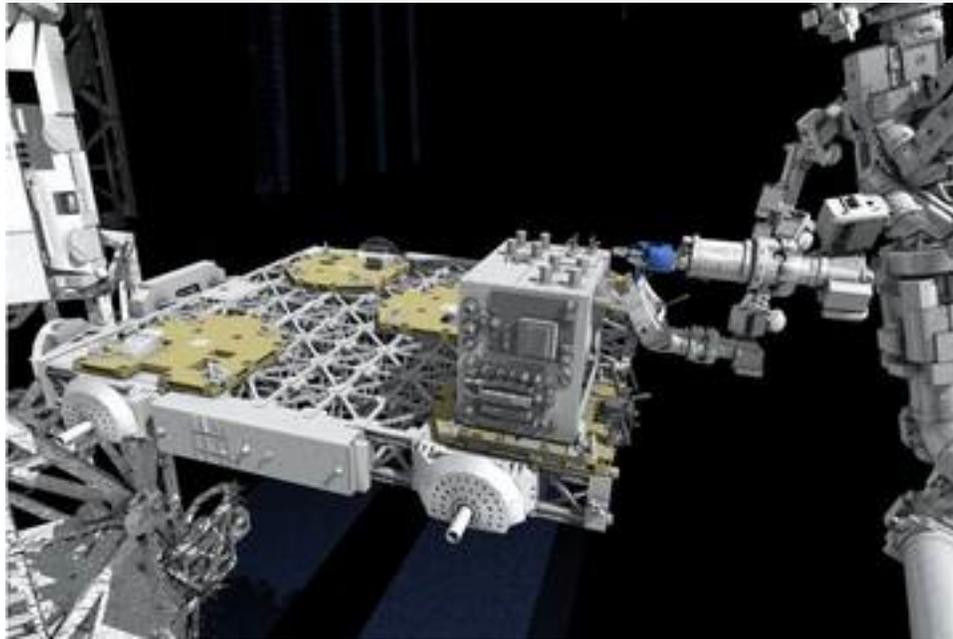
<http://www.tricorderproject.org/about.html#video>

<http://www.space.com/15257-titan-saturn-largest-moon-facts-discovery-sdcmp.html>

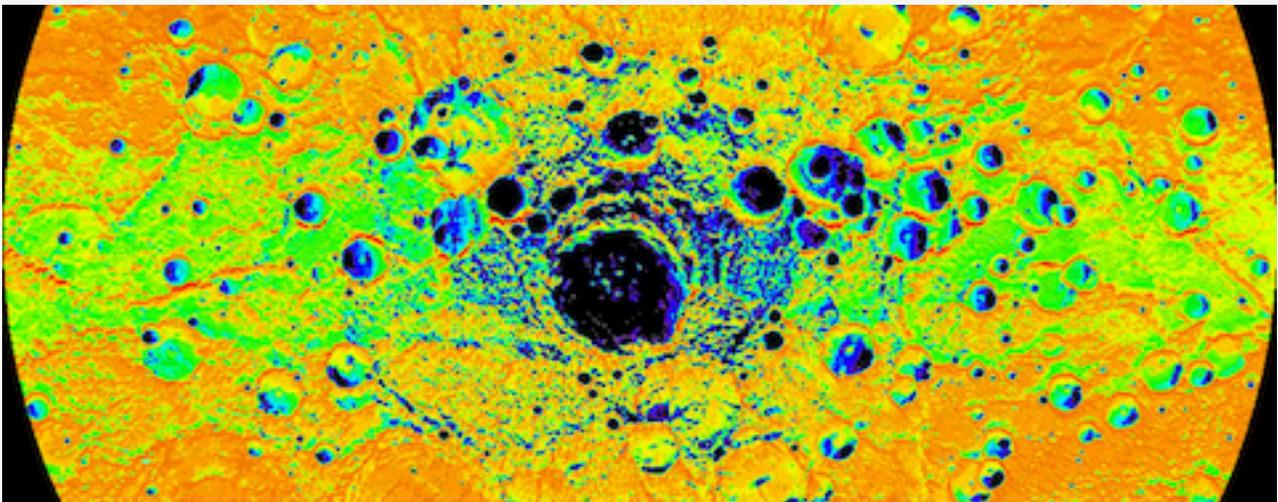
<http://www.space.com/15267-elon-musk-private-space-challenges.html>

<http://www.space.com/15361-spacex-dragon-mars-settlement.html>

## MMM PHOTO GALLERY

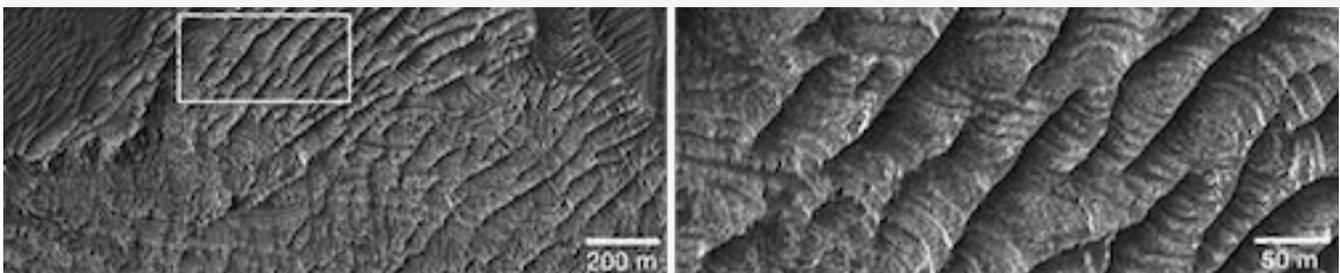


[www.space.com/14910-robotic-refueling-mission-demonstration.html](http://www.space.com/14910-robotic-refueling-mission-demonstration.html)



Mercury's South Polar Area: black areas are permanently shaded and match areas of high reflectance. The lead explanation is that they contain water-ice, but other explanations have not been ruled out.

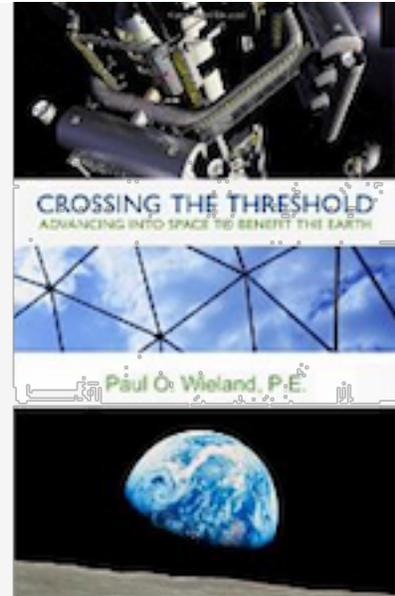
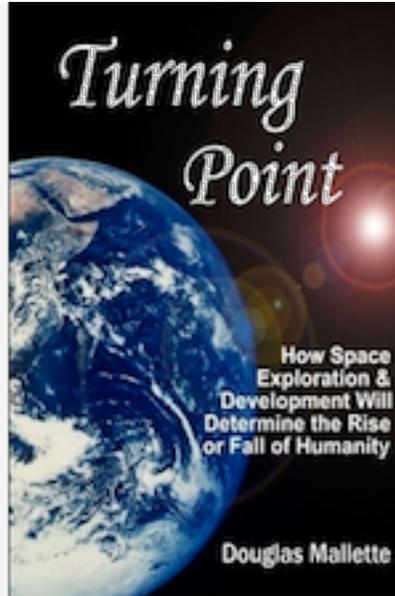
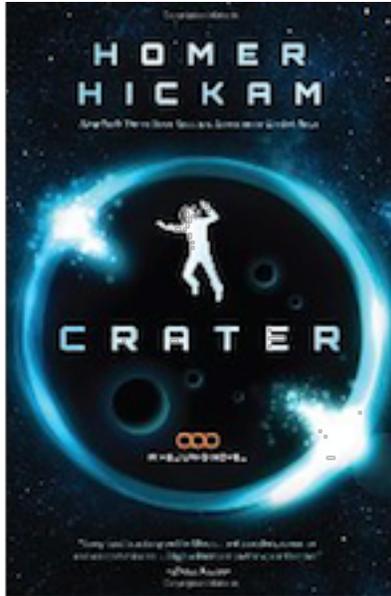
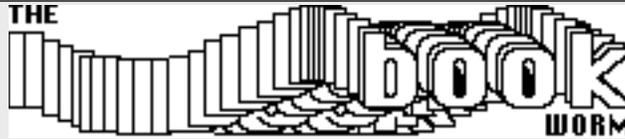
<http://www.space.com/15045-mercury-water-ice-messenger-spacecraft.html>



A new type of terrain has been identified on Mars. The ridges look like sand dunes but, rather than being made from material piled up by the wind, the scientists say the ridges actually form from wind erosion of bedrock, and possibly exposing the history of layers exposed. Such sites may be worth exploring for clues to Mars Past.

[http://www.marsdaily.com/reports/Geologists\\_discover\\_new\\_class\\_of\\_landform\\_on\\_Mars\\_999.html](http://www.marsdaily.com/reports/Geologists_discover_new_class_of_landform_on_Mars_999.html)

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



### Three Recent Books worth a Look

We found these three books listed in “Ken’s Lunar Library” – <http://www.outofthecradle.net/categories/books/> run by Ken Murphy, our new Moon Society President.

**Crater** is a new novel by **Homer Hickman**, author of **October Skies** which many of you may have seen in the movie version. It is available in hardcover and Kindle versions. We recommend that you read Ken’s review which is at <http://www.outofthecradle.net/archives/2012/04/review-crater/> But here are some teasing excerpts:

“Crater Trueblood is an orphan on the Moon, raised in a Lunar company town that mines Helium-3 in the **Vallis Alpes** north of Mare Imbrium. His only souvenir of his long-lost parents is ..... It’s hard and dangerous work, people die, and the need for warm bodies to do the work means that .....

**Turning Point:** By Douglas Mallette, this book is available from Lulu Books at:

<http://www.lulu.com/shop/douglas-mallette/turning-point/paperback/product-5492504.html>

“Turning Point breaks down how space exploration and development can solve many of the key issues we face today in America, such as employment, education, the environment, energy, and international relations. The future of humanity is its exploration of the stars.”

**Crossing the Threshold: Advancing into Space to Benefit the Earth** by retired NASA life support engineer Paul Wieland, is available only in paperback. There is one Amazon.com customer review so far at:

<http://www.amazon.com/Crossing-Threshold-Advancing-Space-Benefit/product-reviews/0982512716/>

**Ken’s Lunar Library** is easy to find. Just go to the Moon Society homepage – [www.moonsociety.org](http://www.moonsociety.org) – and scroll down the right hand column to the image link: Ken’s Lunar Library at:

<http://www.outofthecradle.net/categories/lunar-library/>

As you will notice from the left hand column, **Lunar Library Sections**, there is quite a bit here to explore. Ken has been building this valuable resource for some years now. There is no better guide available.

Peter Kokh has published a list of books as well, but has not had time to keep this page up to date. You will find it on our homepage in the right hand column, again, this time under the **Destinations Menu: Moon Info and Things Lunar**. On that page, look in the right hand column for the link: **Non-fiction Books about the Moon**.

## Last Call!

### International Space Development Conference (ISDC) 2012

May 24-28, 2012 Washington, DC - Th-M, Memorial Day Weekend  
Grand Hyatt Washington, 1000 H Street NW, Washington, D.C., USA 20001  
Tel: +1 202 582 1234 Fax: +1 202 637 4781 - ask for "DC 2012"  
<http://grandwashington.hyatt.com/hyatt/hotels/index.jsp?null>



**Basic Information:** <https://www.nss.org/isdc/2012/> - Registration and Meals, Track Topics, Schedule, Unique Content, Contact Us

**Registration form and rates:** [https://www.nss.org/cgi-bin/register/tdregister?\\$Origin=ISDC12](https://www.nss.org/cgi-bin/register/tdregister?$Origin=ISDC12)

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**NOTE: The Moon Society will sponsor a track on Sunday afternoon: "The Cis-Lunar Ecosphere"**  
This track is about new opportunities to grow our economic sphere into the volume of space encompassed by the Moon's orbit. Sessions will discuss how to lower costs, increase number of missions, develop commercial markets, and use space resources. This track is organized by NSS affiliate The Moon Society. (moonsociety.org)

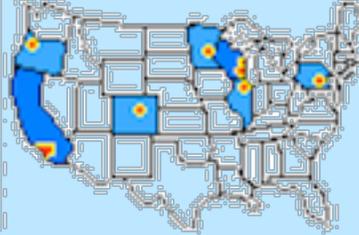
- 2:00 - 2:30 Ken Murphy Cislunar Track Moderator: **Introduction to Cislunar Space**
- 2:30 - 3:00 John Cserep DoD: **Mining the Moon from L1: Lowering Risks, Sharing Costs**
- 3:00 - 3:20 Jim Keravala - CEO - **Shackleton Energy Mining Lunar Polar Ice for Fuel Production**
- 3:20 - 4:00 Panel on **New Lunar Cube Paradigm "Hitchhiker Spacecraft"**  
Moderator: David Dunlop; Dr. Carl Brandon - Vermont Technical College  
**The VTC Lunar Lander Mission: Status & Development**, Dr. Rene Laufer Baylor U.  
**Flight Testing Instruments on Cube Sats:**  
**The Armadillo Precursor Mission to the Kordelewski Clouds (L4/L5)**
- 4:00 - 4:10 **Space Settlement Student Presentation #1**
- 4:10 - 4:40 **Google Lunar X-Prize - What Comes Next?** Moderator: Ken Murphy  
Alexandra Hall(?/Amanda Stiles?) Senior Director GLXP  
**Looking Beyond the Winning of the Google Lunar X-Prize**
- 4:40 - 4:50 **Space Settlement Student Presentation #2**
- 4:50 - 5:20 John Strickland, NSS: **A Reusable Lunar Ferry Logistics System**
- 5:20 - 5:30 **Space Settlement Student Presentation #3**
- 5:30 - 6:00 **GRAIL Mission Report** - Moderator: Dave Dunlop  
Dr. David E. Smith, Deputy Principal Investigator for Gravity Recovery and Interior Laboratory (GRAIL) Goddard Space Flight Center: **Early Results from GRAIL**

The big issue is, of course, that people start heading home on Sunday afternoon. If you are planning to attend this ISDC, and still have some flexibility in your travel plans, we urge you to try to make room for some of these presentations. Actually, the Conference does not officially end until midday on Monday.

**We invite you to join us! You won't regret it!**

KM

## 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**  
P.O. Box 2102, Milwaukee, WI 53201  
<http://www.moonsociety.org/chapters/milwaukee>  
<http://www.nss.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)

✓ We are

✓ Peter's

✓ Our scheduled presentation: elaborations on loop the Moon tours to orbits to skims to landings to excursions

### WISCONSIN



**SSS: Sheboygan Space Society**  
Center St. Kiel, WI 5402-1034  
<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 Thurs even # months

**NEXT MEETINGS: JUN 15 - AUG 17 - OCT 19 - DEC 8 (SAT in Milwaukee)**

### CALIFORNIA



**SDSS - San Diego Space Society**  
<http://sandiegospace.org>

Members will soon be getting our new Membership Packets.

We are planning for our biggest annual event - Yuri's Night Thursday April 12th

CALIFORNIA



OASIS: Organization for the Advancement  
of Space Industrialization and Settlement  
Greater Los Angeles Chapter of NSS  
P.O. Box 1231, Redondo Beach, CA 90278  
<http://www.oasis-nss.org/wordpress/>

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 - MAR 17 - APR 21 - MAR 19 - APR 21 - JUN 16 - JUL 21

OASIS NEWS AND EVENTS: OASIS member Mark Lupfer signs on as Associate Editor for MMM. Mark's first task will be to reformat the MMM Classic files ([http://www.moonsociety.org/publications/mmm\\_classics/](http://www.moonsociety.org/publications/mmm_classics/)) for Kindle.

SAT FEB 11 3 pm OASIS Monthly

FRI-SAT FE

COLORADO



DSS: Denver Space Society  
(FKA The Front Range L5 Society)  
1 Cherry 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 - APR 5 - MAY 4 - JUN 7 - JU; 5 - AUG 2 - SEP 6 - OCT 4 - NOV 1 - DEC 6

ILLINOIS



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

MINNESOTA



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

<http://www.mnsfs.org/2011-Review/>

MNSFS Continuing its tradition of putting up 'Current' space displays MN SFS's current space flight ISS-30 is now on public view at :Radio City Inc.,2663 County Road I. Mounds View, MN 55122

Display text & Graphics from ISS-30-31 Press Kit @

[http://www.nasa.gov/pdf/605284main\\_Expedition\\_30\\_31\\_Press\\_Kit.pdf](http://www.nasa.gov/pdf/605284main_Expedition_30_31_Press_Kit.pdf)

<http://freemars.org/mnfan/MNSFS/2011-12-ISS-30-Display/>

MNSFS NEWS - Ben's Yuri's Night Pix - <http://www.freemars.org/mnfan/MNSFS/2012-04-Yuris-Night/>

OREGON



OR L5 - Oregon L5 Society  
P.O. BOX 86, OR 97045  
<http://www.OregonL5.org>

(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 - FEB 18 - MAR 17 - APR 21 - MAR 19 - APR 21 - JUN 16 - JUL 21

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

PENNSYLVANIA



NSS-PASA: NSS Philadelphia Area Space Alliance  
 928 Clinton Street, Philadelphia, PA 19107  
<http://pasa01.tripod.com/>

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>

**The NSS-PASA Report for April 2012**

**Meeting Locations and Times:** Our next meetings will be on May 12 and June 9. This will be at the Liberty One Food Court Location (second floor towards the 17<sup>th</sup> street side of the building. There will also be a special event after the Science Festival (April 21) hosted by Frank O'Brien as part of the Science Festival activities. He will have a telescope set up at The H.J. Heinz Wildlife Preserve as part of Astronomy Day activities.

We had a pre event meeting, that I was unable to attend, with several members who were volunteering for the upcoming activities coming. Dennis Pearson, Larry, and, Dotty are to do Super Science Weekend at Trenton and where given the material for the Mars display. A founder of our group, Rich Bowers, came and discussed an idea he had many years ago: He rode the trolley from Philadelphia to the Willow Grove Amusement Park outside the city. It was a loop ride. He thought: "you could ride out to the Moon, drop off the carrier, and get back on later for the return trip". This we know as a Cycling Space Ship. Independent invention! This was turned into a hand out at the Trenton event. Frank O'Brien came to volunteer his Apollo Flight Computer (the real thing, Apollo 14) for discussion at The Science Carnival in Philadelphia. He was voted membership for a year by acclamation for his service at the two events. Mitch brought a large number of Ad Astras that will be used as handouts. Except for a severe cold that has gone around we where well prepared for the most part.

**Events:** We had great weather at both locations and great crowds. Larry reported that there where over a thousand people at the New Jersey State Museum site, with many coming to their inside location to view the displays and take literature. A number of children tried the Space bricks, and, the handouts went like hot cakes. Dennis also brought his display on Mining the Moon (among other things, for Helium 3) and discussed this and the rovers on Mars. Larry put together a Solar Cell display that he used to light an l.e.d. to demonstrate solar power directly to the people visiting. You can see panels on poles and houses (especially in New Jersey!), but, having it hooked up right in front of you is more exciting, especially to young audience members. Thanks to the Museum, and Melissa Kelly, in particular as liaison, for helping us be there. And thanks to Dorothy, Larry, and Dennis for doing the outreach ( Larry in particular as he had a severe throat problem).

The other group appeared at The Science Carnival on The Parkway in Philadelphia. Thanks to Mitch Gordon's contact work with the Science Festival Staff, and Derrick Pitts, Chief Astronomer at the Franklin Institute, in particular, we had an excellent location on Logan Circle. We started setting up, after some rules of unloading where followed, and had things out at 9:30 a.m.. People where already coming along the numerous tents and exhibits and we began talking almost non stop from that point. Over the course of the day thousands of people came by and we talked to quite a few. There where a number of volunteers at our two tables (Mitch paid for an extra table): Mitch and I arrived together, then Frank and Rich, and Hank Smith and finally Steven came as backup.

I had printed a number of handouts on Lunar Lava Tubes and SETI sources with an earlier handout on Discovering the Future rounding them out. In addition Mitch brought the **Ad Astras** and a number of handouts. Almost everything went at the event including half of the **Ad Astras**. Lots of membership forms too.

We had a triple threat of exhibits: Mitch had his display book, with much illustrations from years of publications on the Moon, Mars, and, terra forming, as well as space colonization. I had the Lava Tube display as a draw with a large number of visitors getting a tour of the idea of living inside the Moon, and talk of what we have planned to do with material we could mine from it. Many had not heard of the Google Lunar X-Prize so this was a great introduction on what is happening in the near future that they could be involved in. And then we had Frank and his Apollo Flight Computer. There was a steady stream of people of all ages looking at the computer and talking to Frank. Some had worked for NASA and other space organizations and held long conversations with Frank and other participants. And our other members handled questions on a wide range of topics. Hank fielded a number on PSFS, the Science Fiction Society, and talked about Philcon this fall. Rich Bowers talked on subjects from space to politics, to The Hunger Games movie! These were audience driven topics, and the group handled them all.

There where a few things that will have to be fixed up: The Lava Tube display will have to be elevated. Children had to bend slightly to see in, and, the adults had to bend more. This caused "viewing " problems so the display will be raised and I (or whoever uses the display) should work from the front of the table. And internal lighting will be tried again. For literature a display stand for the handouts will have to be built. And, since there was interest from members and visitors, a better Mass drive should be built. I did build "Space Buckets" in place of the "Space Bricks" and these proved a good addition to our exhibits. The accompanying handout explained why we are interested in using buckets to move things, especially with the Mass Driver. There was much more, but, this is enough for now! Thanks to the Science Festival people, and Derrick of course, for including us!

Earl Bennett

**Moon Miners' MANIFESTO**  
**Lunar Reclamation Society Inc.**  
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## **INDEX to MMM #254 - APRIL 2012**

2. In Focus: Why Advocates of Moon and Mars Settlements should work to amend the Antarctic Treaty
3. Antarctic Activities can Blaze the Trail for Pioneers on Moon and Mars
7. Working within the Strictures of the Current Antarctic Treaty

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### **Moon Society Journal Section**

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| 9. Ken Murphy: We need more Candidates!      | 10. Moon Society Elections 2012 Ballot |
| 11. Candidate Statements                     | 12. Chapter & Outpost News             |
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| 13. Browsing Links - Video Links             | 14. MMM Photo Gallery                  |
| 15. Book Review: Abundance (Peter Diamandis) | 16. NSS-MMM Chapter News               |
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- Annual dues with MMM \$25, due March or \$6 per quarter before the next March

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