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

Moon Miners' Manifesto

& The Moon Society Journal

www.MoonMinersManifesto.com

Phase I of **the International Lunar Research Park** is to become real on Hawaii Island

Feature Articles in This Issue.

What secrets will the GRAIL probes reveal?

Starting March 1st, NASA's twin GRAIL probes "**Ebb**" and "**Flow**" will orbit in tandem close above the surface, and will probe the Moon's interior via its lumpy gravitational clues, from polar orbit. GRAIL may confirm, modify, or debunk a recent hypothesis that the farside highlands are the relic of a slow-crash of a second smaller moon. There are sure to be more clues on the Moon's origin.

In Focus What does 2012 have in store to encourage Lunar Enthusiasts

While both the Administration's and NASA's space focus has definitely shifted away from "a been-there-done that Moon," we see these several reasons to take heart, some more obvious than others. Put together, we find ample reason to think positive: The twin GRAIL orbiters [Gravity **R**ecovery and **I**nterior **L**aboratory] orbiting in tandem have sparked high enthusiasm. We know so little about the Moon's interior, and that uncertainty clouds understanding of its origins. What GRAIL finds may well become the "Holy Grail" of lunar science, with implications for how future pioneers can and will "do the Moon."

http://solarsystem.nasa.gov/grail/home.cfm
http://www.nasa.gov/mission_pages/grail/main/index.html

• **NASA funding of additional Google Lunar X-prize contender piggyback science.** Somewhere along the way, the light went on in NASA thinking about a back door approach to funding additional key lunar science missions: offer U.S. GLXP contenders seed money to design and "piggyback" low-weight instruments with the potential to hack away at specific unknowns and uncertainties about the Moon.
http://www.parabolicarc.com/2011/08/08/astrobotic-wins-nasa-award-to-study-lunar-and-martian-lava-tubes-caves/
http://astrobotic.net/updates/press-releases/

With the unlikelihood of NASA being funded for additional Moon missions, the seed money tack is an "end-run" way to accomplish a lot.

• **Russia's scaling back of its contribution to the joint Chandrayaan-2 mission with India** gives India strong incentive to develop moon-rover and other technologies on its own, strengthening the international pool of expertise for scientifically promising missions, even if the cost is another year's delay for that mission.

.• **Ramp up of China's Moon missions** and relevant space station and spacefaring capacities. Mankind's future on the Moon will be an international one, and steady progress by other nations will in time generate pressure on an indifferent public and Congress here.

• **Commercial space venture progress** demonstrates technologies have the power to lower the cost of both manned and cargo missions to the Moon. New rockets cargo and crew capsules and spaceplanes, as well as less expensive yet more expansive inflatable modules and potential commercial space refueling depots.

• **Space Tourism** is about to become less expensive and ever more adventurous. Future space hotels will generate less costly in-space construction methods that will also lead to less expensive lunar outposts. It is not impossible that space tourists will reach the Moon before astronauts of a national space agency.

• **The Mars Science Laboratory Curiosity** is en route to Mars. Any Mars mission that discovers life, even former life, and/or resources, and/or demonstrates the capacity to auto-manufacture on Mars is good news if it builds the rationale for human missions to Mars, Why? Many of the technologies needed to "do Mars" will also be needed for regular manned trips to the Moon and an International Lunar Research Park.

• **The PISCES (Pacific International Space Center for Exploration Systems)** project on Hawaii Island has now committed to build a Phase I (analog) International Lunar Research Park to lead to a robust, expansion-and-lunar-resource-oriented facility on the Moon.
https://sites.google.com/site/internationallunarresearchpark/

We hope you find all this as encouraging as we do! **PK**

About Moon Miners' Manifesto

● **Moon Miners' Manifesto CLASSICS:** The non-time-sensitive articles and editorials of MMM's first twenty years plus have been re-edited, reillustrated, and republished in 22 PDF format volumes, for free downloading from this location: http://www.MoonSociety.org/publications/mmm_classics/

● **MMM Glossary: new terms, old terms with new meanings:**
http://www.moonsociety.org/publications/m3glossary.html

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● **MMM's MISSION:** to encourage "spin-up" entrepreneurial development of the novel technologies needed and promote the economic-environmental rationale of space and lunar settlement.

● **MMM retains its editorial independence** and serves many groups, each with its own philosophy, agenda, and programs. Sharing MMM may suggest overall satisfaction with themes and treatment, requires no other litmus test.

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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 chapter**s 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 - 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

Rock, Rubble and Regolith - Part 3

By Ron Brooks

11. Regolith – When is it Soil? When is it Dust?

There is a difference between lunar "soil" and lunar "dust." This difference is promulgated on the size of the pulverized and weathered grains and impact melt fragments in a given sample. As reviewed above, the overall average lunar regolith grain (including melt fragments) size is ~70µm. There seems to be a general agreement that the uppermost regolith surface is also covered with nearly pure dust with a grain size >~20 µm (McKay, et al., 1991f). This extremely fine, dusty grain makes up about 10-20 wt% of the regolith (McKay, et al., 1991g).

The dust layer has varying reported depths or thickness, but probably averages somewhere between 5cm to 10cm thick. Heiken believes there is a relationship between the increased overall total regolith depth and the accumulation of finer (dust) grains on the surface (McKay et al., 1991h). The top layer of lunar dust could consist of grains as small as >1 µm and as small as grains considered as ultra-fine at <0.01µm (Park, J., et al., 2006b).

One should take into consideration that the larger regolith grains tend to sink into the lower stratum, a result of what is called soil mechanics, whereas the heavy-density soil grains sink downward to leave the very finest grains on the surface (Ostrach & Robinson, 2010a). Ostrach and Robinson worked with soil particle density in their well-known "Brazil Nut" experiments, which supported the idea of density sorting, which leads to having the finest particles on the surface (2010b).

12. Properties of Lunar Dust

The properties of lunar dust are best described as loose and fluffy and thus liken to talcum powder. However, that is where the comparison stops. Unlike the talcum we all know, this dust is hard and abrasive instead of soft (Spudis, 2009). While it may look soft and fluffy, you would not want to get this dust on your skin and definitely not into your lungs for any length of time.

If you have ever worked with Portland Mortar Mix and let it smoothly slip between your fingers, you know how the grains are silky and super fine. However, the mortar mix grains are much larger in size with an average of ~ 90µm, in comparison to lunar dust grains, which can be from ~20µm down to ~1µm or even 0.01µm in size.

This dusty lunar powder has been generated by billions of years of bombardment by micrometeorites of less than ~ 1mm and impacting at speeds estimated to be 10-30 km/s. Even with the very small size of the micrometeorites, enough energy is generated to melt the impacted regolith and produce glassy melt fragments of extremely small, hard, abrasive particles of 1 µm or less.

Dust, then, is defined as the finest component of the regolith. McKay and Halekas describe the dust as grains of <20 µm or less (McKay et al., 1991i; Halekas et al., 2006b). Spudis believes the uppermost few centimeters of regolith is a little greater than ~10µm and the uppermost surface layer of regolith could consist of dust of > 1 µm (2006b). Katzan and Edwards also found that the lunar regolith consists of significant amount of grains of 1µm or less (1991). Lunar dust grains seem to range from less than 1µm up to 20µm.

A curious finding about lunar dust was made during the Apollo flights. Lunar dust has a distinct smell. It is well known that the space suits of Apollo crews were covered with lunar dust, which was then transported into the lunar module. The dust was released into the module and breathed in by the astronauts. The crews reported the dust had a smell like gun powder (Halekas et al., 2006a). Fortunately, due to the small amount of dust and the short duration of exposure, the astronauts were not harmed.

13. Conclusion

As one studies the lunar regolith, one quickly finds it to be extraordinary in what it is and in the way it is produced. The lunar regolith comes in all shapes and sizes, including boulders, rocks, sandy grains, and dust, all with graduated layer depths and distributions. The concoction that covers the Moon's surface has resulted from billions of years of persistent meteoritic impacts and is part of a unique type of space weathering that also includes ionizing radiation from solar winds, solar flares, and cosmic rays.

From the fear that a lunar module might sink into a parched quagmire of dust and rubble, to problems for astronauts and possible malfunctioning of their equipment and instruments, the lunar regolith has been a stimulating topic to those interested in the Moon for many years. Our knowledge of this subject has grown steadily from research leading to and following the Apollo landings and up to the present day.

Those interested in investigating the regolith in more detail should avail themselves of such books as Heiken's **Lunar Sourcebook: A Users Guide to the Moon**, Taylor's **Planetary Science: a Lunar Perspective**, and Paul Spudis' **The Once and Future Moon.** These volumes are excellently written and a treasure trove of information on the Moon's regolith and a myriad of other lunar topics. There are also numerous journal articles and presentations available for more in depth study.

Our Moon is indeed a captivating world that does not follow or need to follow our Earth-generated conceptions. It presents a true challenge and investigative adventure to those who have chosen to study it. Slowly, the mysteries are being revealed about our puzzling and fascinating companion world.

Acknowledgement

The author would like to thank Dr. Timothy Stubbs for his content review and supportive suggestions. His willingness to sure his knowledge was invaluable.

Note 1

Boulders are > 200mm (8 inches) in diameter – in turn, rocks are considered < 200mm in size.
≈ means approximate or the same.
~ means a poorer approximation but in the same order or size.
μm is a micron or 1 millionth of a meter
Å (angstrom) is a unit of length equal to 0.1 nanometer or 1×10^{-10}

Note 2

A meteoroid (classification) can range from a few microns in diameter to meters, perhaps up to 10m to 100m in size. All are of asteroid origin.

An asteroid (classification) can range from a few microns in diameter up to 1000 m or more in size.

Asteroids are most likely to be in an orbital path, mainly between Mars and Jupiter.

Meteoroids and asteroids are basically made from similar compositions with up to 75% being carbonaceous in nature.

Comets are an icy, small solar system body that, when close enough to the sun, display a visible coma and (sometimes) a tail. Comet nuclei are them-selves a loose collection of ice, dust, and small rocky particles. (According to NASA guidelines, a comet must be at least 85% ice.) Comet size ranges from a few hundred meters to tens of kilometers across. Comets travel in orbits that generally take them close the sun and then into the far reaches of the solar system. Comets that have had all their volatiles vaporized by the sun's radiation pressure and solar wind can appear as asteroids.

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Editor's comments: Many thanks to **Ron Brooks** for this in depth article. We cannot deal with moondust if we don't know what it is and how it behaves. For Lunar Pioneers, that will be job #1. **RB**

Whoa! Wait Just A Minute on those Water Engines!

By Bryce Walden, Researcher Oregon L5 Society - http://www.OregonL5.org/ - January 03,2012

I recently viewed a very nice science special about the Moon ("Do We Really Need the Moon?", BBC2 2011). Toward the end they revealed that we now think there are significant deposits of water on the Moon, most notably in permanently-shadowed polar zones, deposited by comets. As usual, one of the first things they thought of was cracking the water into hydrogen (rare, on the Moon) and oxygen (common, in lunar rocks), in order to create fuel and oxidizer for the "clean" and high-ISP rocket engines whose exhaust is nothing more than intensely hot, energetic water vapor.

On Earth, with increasing concerns about exotic and mundane pollution of our atmosphere, such "water engines" are considered righteous and desirable. Given further thought though, on the Moon, maybe not so much.

Despite the discovery of 'certain icy deposits in ultra-cold traps, the fact remains that most of the Moon's rocks and regolith are extremely dry, or anhydrous. This gives them very special properties, some good and some bad from our perspective. Ultraviolet and cosmic ray bombardment may have led to unique compounds and properties in the lunar regolith. Many planners are intending to make use of regolith properties for winning various

resources, including, but not limited to, elemental iron, strong anhydrous glass, solar wind volatiles captured atom by atom over the millennia, etc.

Start spraying water over all this and elements that have remained pristine and undisturbed chemically for billions of years will start reacting and changing immediately. Add a molecule-thick layer of water on each particle of regolith and watch its handling characteristics change, not to mention the processes it might have to be put through just to get back what you once could have had for free.

It is true that if the amount of free water being added to the Moon by rocket exhausts will be very small in relation to the Moon as-a-whole. However, it will be concentrated near our bases which is also where we will be wanting to start regolith processing for reasons of efficiency and convenience. So we will be polluting exactly the places we will be working.

Further, the presence of water vapor, some of which may remain in vapor form or sublimate from frost into vapor every sunrise, will introduce a small but "sensible" atmosphere in the vicinity of the base, changing the high vacuum condition and adding extra trouble to optical astronomers, laser-beam communications, radio propagation, etc.

In other words, the same rocket exhaust we regard as "clean" and "desirable" on Earth might well be considered pollution and undesirable on the Moon. A rocket that burns oxygen and aluminum, on the other hand, would have an exhaust of powdered aluminum oxide, already a regular constituent of the Moon. flOn Earth: dirty; on the Moon: natural. And the powdered aluminum will quickly, ballistically fall back to the Moon, adding just another thin layer of dust and staying out of the near-vacuum atmosphere around the base.

Finally, until we get a much wider solar system economy working, such that we can cheaply import hydrogen to the Moon, using what little hydrogen we have natively on the Moon for throwaway rocket fuel is practically criminal and at the least short-sighted and not very bright. Hydrogen on the Moon should be priced at its replacement cost, and until there's a lot of solar system traffic that includes hydrogen compounds, that replacement cost is the cost of shipping hydrogen to the Moon from Earth. Compare that price to the price of lunar-derived abundant aluminum (or magnesium or other suitable elements) and oxygen, add in the cost of water polluting the local lunar environment, and the water engine no longer seems the easy shoo-in it has been considered so far.

BW

Desolate, Lifeless, Unforgiving: Is the Moon too Forbidding a Challenge?

By Peter Kokh

Why many space enthusiasts are more interested in Mars

Many space enthusiasts see Mars as a more attractive goal than the Moon, despite Mars' much greater distance, and the much harder to reach at very limited travel opportunities.

- **Mars has color:** its pallet is not one of unrelieved light to dark gray tones.
- **Mars sky is bright, not black**, and even though it is not blue that brightness surely helps one's mood.
- **Mars' day is the same length as ours**, almost – just 37 minutes longer and that may be easy to get used to (especially for late sleepers)
- **Mars may be cold, but it is never life-squelching hot.** Mars has an atmosphere, not the kind one can breath, but thick enough to provide shielding from the meteorite rain that is a constant "weather" condition on the Moon
- **Mars air can be mined** for nitrogen, oxygen, methane and other basic organic feed stocks. While the air pressure is very low, less than 1% Earth normal, there is much more CO2, the major ingredient of Mars air, locked up in the polar caps, and it appears to be a feasible goal to use various methods to thaw those ices to raise the pressure significantly.
- **Mars also has a large ocean-like basin**, suggesting possibilities for terraforming Mars into a more Earth-like place. No matter that these possibilities are far-off options.

The Moon, in contrast, has no atmosphere to speak of, and if we were to create one, we'd have a "dust-bowl from hell" for millennia. The Moon may be nearby, but it seems to unforgiving, too unattractive.

Getting past appearances: Any "disadvantage" should be approached as "an opportunity in disguise"

This maxim was a lesson learned from my mother in my early teens. I was helping her redo a room in our home and commented, "If that radiator were not where it is!" To which she replied, "Well, keep looking at it until you figure out how we can turn its position into an opportunity!" And soon we did so. This experience transformed my life, and still gives soul to everything I write as well as to how I am able to turn every crisis in my life into something unexpectedly good.

For past MMM articles, Visit **http://www.moonsociety.org/publications/mmm_classics/**

Optimism (Latin "best") is useless.

Pessimism (Latin "worst") is useless.

Meliorism (Latin "better") is the only attitude that works. Whatever the situation, whatever the facts, we can take the situation and make things better!

Once you try this tack a few times, it takes over your life. Why? Because it works every time. Because it is the only "attitude" that has the power to produces better results. This applies not only to how we see the physical world, but how we fare in the human world that we all have to share.

Is the Moon a wasteland?

"There is no such thing as waste, there are only resources we are too stupid know how to use."
Arthur C. Clarke – to Walter Cronkite during launch of Apollo 13

The Moon: Just the "facts" – one by one

● **Challenge: The airless surface is exposed to constant pulverization**

√ micro-meteorite bombardment,

√ cosmic rays, and periodic solar flares.

√ Temperatures vary from very very hot to very very cold because the Moon is airless, and the day night cycle is so long (29.53 Earth days long).

√ The surface has been pulverized into a moon dust blanket 2-10 meters thick.

(See Ron Brooks very informative 3-part article in MMM #250, #251, with part 3 in this issue above.)

> **Opportunity: We can tuck our habitat structures under that blanket** (2 meters is enough for short tours of duty, 5 meters best for lifetime stays) and be fully protected not only from micrometeorites, radiation and solar flares, but also from the extreme dayspan heat and nightspan cold. Being underground, we can use heat pumps to store excess dayspan surface heat to use for nightspan heating, and conversely, to store surface nightspan cold for dayspan cooling. See link below:
http://www.moonsociety.org/home-page/center-column/changing-images/showimage.php?image=89

● **Challenge: The Moon's day-night ("dayspan/nightspan") cycle is too long** 29 1/2 Earth days, the Sun being over the horizon for 14 3/4 Earth days, and below the horizon for an equal amount of time. One result is that solar power if available for just half a lunar month (since it is defined by the period of sunrise to sunset, not the Lunar month, perhaps we should call it the "sunth")

> **Opportunity: as the pole is not significantly inclined** to the orbit around the sun, there are no "sea-sons" so to speak, to provide variety of weather and break monotony. For the welcome biweekly change of pace see below.

Helpful Reading: "Dayspan" – "Nightspan" – "Sunth" pages 10-13 in
http://www.moonsociety.org/publications/mmm_classics/mmmc5_Jul2005.pdf

● **Challenge: The Moon's long nightspans make industrial operations impractical**

> **Opportunity: as the Moon's dayspans are equally long,** there is ample opportunity to store up power. It is absurd to think that having to store up power in one form or another is a handicap. Power storage has been the backbone of industrialization for thousands of years.

Helpful Reading: "Multiple Energy Sources" pp. 7-10
http://www.moonsociety.org/publications/mmm_classics/mmmc4_Jan2005.pdf
"OVERNIGHTING: Consummating the Marriage of Moon & Base" pp. 52-55
http://www.moonsociety.org/publications/mmm_classics/mmmc9_Jan2006.pdf
"Potentiation" pp 31-35
http://www.moonsociety.org/publications/mmm_classics/mmmc13_July2006.pdf

● **Challenge: The Moon has been geological dead for billions of years** and did not go through active geology and tectonic processes in the presence of water that created ore-rich lodes on Earth, helpful to mining.

> **Opportunity: the same bombardment which produced the meters-thick regolith moon dust blanket means that the Moon is essentially pre-mined:** no deep shaft mining, no landscape-scarring strip mining, Everything we want is in this handy pre-pulverized surface blanket

Helpful Reading: "**Moon Mining & Common Eco-Sense**" p. 60 and "**Moon Mining and Engineering Realities**" pp. 61-61 in www.moonsociety.org/publications/mmm_classics/mmmc4_Jan2005.pdf

Challenge: The moon's vacuum means that we have to wear space suits or travel in pressurized vehicles outside our cozy underground complexes.

> **Opportunity:** our habitat areas can all be actually or virtually interlinked so that one can go almost anywhere without donning a spacesuit

 # Helpful Reading "Middoors" and "Matchport" pp. 14-15 in

http://www.moonsociety.org/publications/mmm_classics/mmmc1_Jul2004.pdf

Making do without the "outdoors" page 39 in

http://www.moonsociety.org/publications/mmm_classics/mmmc10_Jan2006.pdf

- **Challenge: the lunar "sky" is black all the time. That will be hard on the eye, leading to black sky blues**

> **Opportunity:** Both inside and "out-vac" there are ways to create a pleasant and comforting atmosphere

 # Helpful Reading: "M is for mole" **http://www.moonsociety.org/chapters/milwaukee/mmm/mmm_1.html**

"Black Sky Blues" (1) pp 57-59
http://www.moonsociety.org/publications/mmm_classics/mmmc14_July2006.pdf

"Black Sky Blues" (2) p 37, (3) p 56
http://www.moonsociety.org/publications/mmm_classics/mmmc18_Jan2008.pdf

also
www.moonsociety.org/home-page/center-column/changing-images/showimage.php?image=12

- **Challenge: the Moon's gravity is too light**

√ The human body will deteriorate physiologically during stays on the order of a year or more, and may not stabilize at an acceptable level; Infants born on the Moon may not develop or mature properly.

> **Opportunity: First,** one cannot legitimately argue from the physiological degradation that is experienced by many months in a space station at"zero G" that the same degradation will occur at 1/6th lunar gravity or at 3/8ths Mars gravity. No one has been on the Moon for more than a few days. We can do long term experiments with small animals in a rotating environment at or near the Space Station to learn more.

Second, it is precisely the Moon's lower gravity that makes the Moon economically vital as a supply of building materials for structures elsewhere in space (Low Earth Orbit, Geosynchronous Earth Orbit, Earth-Moon Lagrange points, even Mars - because it takes only 1/22nd as much fuel to reach such destinations from the Moon as it does from Earth's surface. The Moon's reduced gravity level is the foundation of its economic and industrial potential. M**ars in contras**t, (1) is at greatly variable distance from the Earth-Moon "system", (2) is handicapped by the infrequent travel windows to and from Earth, and (3) its greater gravity and deeper gravity well, also handicaps Mars in any economic rivalry with the Moon.

Third pioneers will develop sports - and even dance and skating forms that are unique and which may be very entertaining to watch by Earthbound fans.

 # Helpful Reading:

"Native Born" pp 34-36 **www.moonsociety.org/publications/mmm_classics/mmmc5_Jul2005.pdf**

"Hexapotency Toning Centers" pp 13-15
http://www.moonsociety.org/publications/mmm_classics/mmmc13_July2006.pdf

http://www.moonsociety.org/home-page/center-column/changing-images/showimage.php?image=45

- **Challenge: The Moon is too poor in the volatiles needed both for life support (food, agriculture, biosphere) and serious industrialization**

> **Opportunity: While is true that the Moon is impoverished in volatiles in comparison to Earth and even in comparison to Mars, it is not true that the Moon lacks an endowment large enough to both support human settlements and to industrialize.**

√ The solar wind buffeting the powdery regolith blanket of the Moon for billions of years has enriched the surface layer with hydrogen nuclei (protons), carbon, nitrogen, and with the noble gasses such as helium, argon, etc. These can easily be harvested while constructing roads, settlement sites, etc.

√ Previous **probes such as Clementine and Lunar Prospector** gave strong indications of water-ice and other cometary volatiles in "harvestable" abundance within permanently shaded north and south polar craters - confirmed by **Chandrayaan-1, Lunar Reconnaissance Orbiter and** its **LCROSS impactor**

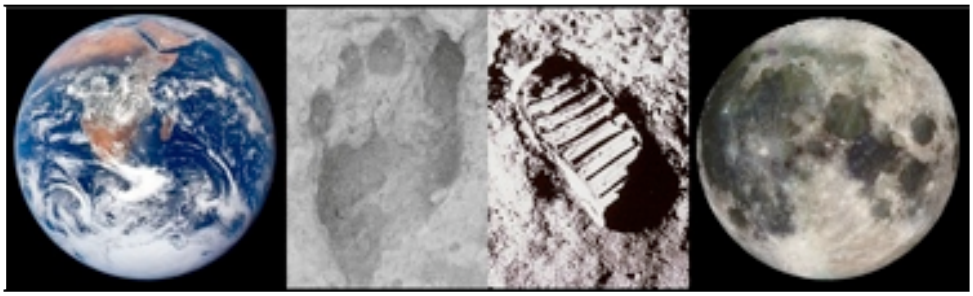
 # Helpful Reading: Byproducts of Helium-3 and Hydrogen Solar Wind endowment harvesting

http://www.moonsociety.org/home-page/center-column/changing-images/showimage.php?image=45
http://www.moonsociety.org/home-page/center-column/changing-images/showimage.php?image=59
'Gas scavenger" - pp 15-17 - http://www.moonsociety.org/publications/mmm_classics/mmmc3_Jan2005.pdf
"Primage" - pp 49-51 - http://www.moonsociety.org/publications/mmm_classics/mmmc4_Jan2005.pdf

PK

THE MOON SOCIETY — LUNAR FRONTIER SETTLEMENT — WWW.MOONSOCIETY.ORG

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 industrialization 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

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

The story behind the "new look and feel" of this issue of MMM

"About time!" Perhaps, but the timing was forced upon us, and not at all planned. On January 10th, an intruder who obviously knew my home well, and even knew where I kept my computer, as well as my habitual schedule for Tuesdays, Wednesdays and Thursdays noon to 1 pm (a former roomer) broke into the house and broke into my bedroom, grabbed the laptop from under the bed and was out of the house in a minute or so. What became of it? The Lunar Reclamation Society board decided to get me a new one, But the Apple Store no longer sells Macbooks and we had to get a Macbook Pro. The problem was that the new machine would not run the word processors and paint programs to which I had become accustomed. I was able to retrieve most of my files from a storage hard drive. I-Works "Pages" was able to read the MS Office for Mac documents, and even older Appleworks documents. Paintbrush™ however, is no substitute for the Appleworks™ paint program. The good news is that "this old dog" can still learn new tricks. I chose the one-column format for Kindle™ compatibility as the Society is planning to make the Classics issues of collected non-time sensitive past articles available on Kindle™. **PK**

MMM Editor Job Description - Requested by Moon Society President Ken Murphy

Over the years Moon Miners' Manifesto has evolved a number of departments/sections

COVER PAGE - Unchanging Masthead - Feature image which may or may relate to an article theme."**Teaser" para graph and linked image** that usually do relate to an article in the issue – **List of principle articles.**

PAGE 2 – Fixed boilerplate text about MMM. In Focus Editorial by the Editor or Guest contributor

PAGES 3-8 – Six pages of major articles; I write many of these, but contributions. welcome. Repeat contributors include Dave Dietzler, Dave Dunlop, Ron Brooks, Larry J. Friesen, and others

PAGES 9-12 – Moon Society Journal. Fixed boilerplate text about TMS, input from the Society President, short articles about **Society projects and goals, Moon Society Chapters and Outposts**

PAGE 13 – **popular "Great Browsing Links" and "Video Links"** – I look for links in the news daily if I can, from news items in the white center area of our homepage, and various other sources: Moon Daily. Mars Daily, SpaceReference archives, etc. I love doing this and I add items day to day so it is painless

PAGE 14 – The MMM Gallery. Assorted photos and illustrations that relate to topical things in the news etc. i am always on the alert for images of interest – I am on the alert for photos through the month.

PAGES 15-16 Various short page filler items: Space Missions, Upcoming Conferences, Book Reviews etc.

PAGES 17-19 News of NSS Chapters who participate in MMM – this waits on reports and I remind the point person in each of those chapters who provide reports (Philadelphia is best at this. Years ago Oregon L5 did a great job) For some chapters, I have to fish for news items, and if I can't find anything relevant on their websites, I just don't bother.

PAGE 20 – MAILER PAGE, plus table of contents, NSS Chapter addresses

Editor's Comments: I work on MMM all month, doing what I feel in the mood to do. If I am not in the mood to write an original article, I tackle the Links page or other areas of the newsletter. Bit by bit it all fits together. For-matting the whole issue is a big job and needs to be done by one person.

The content can be contributed by others. I enjoy doing MMM, and it is what keeps me going. If I were to stop I would have to find a replacement project to work on. Now I do have two in mind, "MMM the Book " with the provi-sional title: **"A Pioneer's Guide to the Moon"**

Suggestions, in order of priority

 # 1 An editor for the reformatted updated versions of the MMM Classic issues to get them ready for Kindle. This task would add more hours to my work load. I would be available for advice and suggestions.

2 **A replacement formatting editor for MMM** – I would continue to submit articles, and can take care of any-thing else for which there are no contributions. That would relieve me of some work. While it does take time, I don't really mind formatting. A new editor, working with his/her chosen software might give MMM a new look and feel. Perhaps the hardest to find, a replacement editor would coordinate all contributions and actually format the final product. This is perhaps the most essential job as without a replacement editor ready to take over, MMM could soon be history. Someone who stepped in to reformat the Classics issues for Kindle, might be a contender for the editor of future Issues of MMM, but, of course, that would be up to him or her and others could apply.

By an agreement between the Moon Society and the MMM Publisher (Milwaukee) Lunar Reclamation Society, should I not be able to continue as editor for any reason, all rights to MMMs past, current, and future would pass to the Moon Society. But should the Moon Society fail to find a replacement editor after one year, these rights would pass to the National Space Society. It is better to be on the lookout now, than in a sudden emergency.

3. **Assistant Editors**, each speaking for one or more of the sections described above.

4. **Contributors** of articles and smaller tidbits

Meanwhile, I love my work and trust that it shows. I am dedicated to continuing as long as I can, and look forward to "the second twenty-five years." Actually – LOL – my current "short term" goal is to reach #301 in De-cember 2016, on the eve of turning 79. However, by then my sights may once again be on "the next five years."

NEXT: Kindle e-book version preparation chores

- **Reformat in one column** – with software on this computer, this should be easy, so I propose to make to do this.
- **Check spelling and grammar** – I can do this. However, one can be blind to one's own errors!
- **Look for bad links –** I would much appreciate if someone else would take on the assignment. (Some of these issues were produced years ago, and some of these linked pages may have disappeared or have been relocated)

Many thanks for your considerations PK inquiries – kokhmmm@aol.com (414) 342-0705

For past MMM articles, Visit **http://www.moonsociety.org/publications/mmm_classics/**

Menus Unlimited for Space Chapter Projects – Part 1

Condensed from http://chapters.nss.org/hub/projects.htm

By Moon Society Chapters Co-ordinator Peter Kokh & Space Chapters Hub webmaster

Projects can be the life force that sustain a chapter. Well-chosen creative, exciting projects: absorb otherwise untapped energies and talents of members, turn passive members into involved ones, give members an extra incentive to attend meetings, and are a big recruiting plus in the ongoing search for new members. Chapters with "engaging" projects have a much better track record and survival rate than chapters who just "exist" as social outlets for members. Projects are the way chapters become "thriving chapters".

Some PROJECT types:

Conducting a community space survey, setting up an information booth and (constructing) exhibits, making models, acquiring or putting together your own Presentations– http://www.moonsociety.org/presentations/ - Video Production for Cable Community access, building up your own Chapter Library of member-owned books available for sharing, and/or special purchases

Reaching out to the Community

If your chapter has one or more members who enjoys public speaking, providing speakers for other groups is a good way to advertise your chapter's existence. Your local library, as well as any of the clubs listed above may be looking for speakers Other potential opportunities to speak are at science-fiction conventions, **m**eetings of astronomy clubs, geology and other science clubs, Mensa, etc, even at Earth Day events.

Identify the Right Project for Your Chapter

- **Take an Inventory** of the proven **expertise**, unexercized **talents**, previous **experience** etc.; and especially the "**interest-buttons**" of all individual present chapter members.
- **Develop ideas** for Projects that match "in house" resources. **Present these ideas** to the Chapter for feedback.

NOTE: if you lack an essential or useful talent but are otherwise eager to take the plunge, use that needed talent or expertise as a hook to **recruit new members** who come so equipped. This is a much better strategy than doing a mediocre job by relying on a talent pool with "not quite enough depth.

Project Proposals should meet certain Requirements

- Evaluate project proposals for relevancy to chapter mission, technical merits, and a a lure for new members.

Basic Chapter Function Projects (some of these are "one person doable")

- **A Chapter Website - always a "work in progress" as you add on reports on projects, events, plans, etc. You can** get a free website with built in ftp software at: http://www.moonsociety.org/chapters/(your city)
- **A Chapter Outreach Display System** – from an "online kit" – note instructions for some types of exhibits and displays are on the Space Chapter Hub at http://chapters.nss.org/hub/exhibits.htm – but by all means use your own collective imaginations to find ways to educate and captivate the public, students, etc.
- **Build up a repertoire of Downloaded Info Flyers**
- **Build up a Pantry of Ready-Made Outreach Tools such as DVDs**
- **Create an Annual Events Calendar** and brain storm how to address each opportunity. Opportunities come and go, so this is an effort in which you may often have to start from scratch with a fresh outlook.
- **Create & Maintain an attractive Chapter Scrapbook**, both hardcopy and/or Online if you can
- **A Chapter Presence at a local Sci-Fi "Con"** – a place to practice presentation talents and enlist expertise.
- **Putt together a Guest Speaker Program** – a good program boosts attendance and the chances of picking up new and active members and try to get willing chapter speakers listed with local Speakers Bureaus, a great way to advertise your existence and get out the word to many who might otherwise never pay attention.
- **Establish a good rapport with local Congressmen**, without becoming unwelcome ("those space nuts") Special Outreach Projects can work if they are a good match for chapter member talents and interests.
- **Start your own Model Rocket Launching** activities if there are no preexisting clubs in your area • If your area not have an existing astronomy club, start your own "**Star & Planet Parties**" offering such activities
- **Start a Space/Sci-Fi Movie Reviewers Club** to look at space/science fiction films – videotape discussions for cable access TV – this will be easier and more productive than starting a new Science Fiction Convention.

More Ambitious projects – if this is a good match for chapter member talents, energies, and free time.

Start a Modest Summer Space Camp for kids and add more and activities and exhibits each year

- **Work with local bookstores to create promotional events** for new books about the space frontier. **PK**

December 2011 **Chapters & Outposts** January 2012

Chapters & Outposts Map (North America) - www.moonsociety.org/chapters/chapter_outpost_map.html
Chapters & Outposts Events Page www.moonsociety.org/chapters/chapter_events.html

ORGANIZED CHAPTERS

Moon Society St. Louis Chapter - http://www.moonsociety.org/chapters/stlouis/

Contact: Robert Perry surfer_bob@charter.net – **Meetings 3rd Wed** monthly at Buder Branch Library, 4401 S. Hampton, in the basement conference room – **Next meetings – FEB 15 – MAR 14 – APR 18 – MAY 16**

Report on the January 18th Meeting.

Karl Strassman, Dabney Tolson, Tom Kulhman, Dave Dietzler, Keith Wetzel, Rufus Anderson, Mark Rode, and Bob Perry were present. Dabney Tolson again brought some of the DVDs from his collection. Karl played the DVDs on his laptop and Mark showed them with his projector. We watched three of the documentaries provided by Dabne from the "NASA Collection Vol.2" DVD set: THE UNIVERSE – Narrated by William Shatner; The Launch and Retrieval of Satellites – Featuring a space walk to retrieve a previously launched satellite that failed to deploy properly, and fasten it as payload and bring it home on the Space Shuttle. An improvised device was contrived and fastened to the end of the STS robot arm to flick a switch on the cylindrical satellite moving at 2 rev/min; and Toys in Space – featuring common toys in zero gravity – like magnetic marbles, a gyroscopes, a paddle-ball, and a Yo-Yo. There was even a scene of astronauts chasing candy. The most surprising was the gyroscope. After spin-up, the astronaut-experimenter pushed on the frame extension and the gyroscope translated rather than precessed. That really looked weird. The gyroscope did precess when he used two fingers, putting a torque on it.

After the showings, we only had a few minutes before the librarian announced it was closing time.

Bob mentioned that one of the astronauts in one of the videos was Charlie Walker, whom he met at Spaceweek back in the 80's when we were an L5 chapter and hosted the week long event. Then we briefly discussed the X-Prize winner's big brother – http://www.stratolaunch.com

Bob and Mark mentioned their participation in Chris Nobbe's school's Moon Madness Night. Bob should have a web page up about it soon, including links to JPGs of the several poster we displayed. The astronaut in the coupola is Dr. Tracy Caldwell Dyson – http://en.wikipedia.org/wiki/Tracy_Caldwell_Dyson ==> http://en.wikipedia.org/wiki/File:Tracy_Caldwell_Dyson_in_Cupola_ISS.jpg

The photo of the moon showing part of the near side and part of the far side is on the web at http://science.ksc.nasa.gov/mirrors/images/html/as11.htm ==>scroll to AS11-44-6667 and click on "image"

Moon Society Phoenix Chapter - http://www.msphx.org – Contacts: Craig Porter portercd@msn.com

Meeting the **3rd Saturdays of the month at Denny's**, 4403 South Rural Road, Tempe
Next meetings – FEB 19 – MAR 17 – APR 21 – MAY 19

Report on the January 21st meeting.

1) Elections. Mike pointed out that the elections were supposed to be in February according to the by-laws. We have had the elections in December in the past and it was moved and seconded to have our elections during this meeting, a call for votes were 6 for, 0 against no abstentions. It was moved and seconded that the seated officers be nominated for reelection to the offices that they hold and the call for a vote was again 6:0. The office of Secretary remains empty, no nominations and no volunteers.

2) Chapter Status; Mike was asked to look into our status for Tax purposes and let us know next meeting what we need to do to insure a non-profit status for the chapter. He was also asked about checking the requirements that would effect us in selling products to build our treasury and accepting donations to support various projects as they develop.

3) LeprerCon38. Currently we are suggesting two discussion panels for the Convention on Conspiracy Theory's and on the possibilities of changes brought on by 2012 and prophecy. We are still contemplating sponsoring a student Rocket Launching, pending information that we asked for on safety, supervision and costs.

4) The Chapter Shirts were picked up last week and arrangements for the persons that ordered a shirt to get theirs.One shirt was sent to Peter as a Christmas Present and he notified us he had received it. We have one shirt of the initial order left, The shirt is a large size Polo Shirt with one of the suggested Chapter Logos on it. The cost is $17.00 plus $3.00 shipping and handling. If you want it e-mail me and let me know you want it. First come, first served. If enough people want a shirt we will order another run of the shirt, six minimum.

Clear Lake NSS/Moon Society Chapter (Houston) -http://www.moonsociety.org/chapters/houston/

Contact: Eric Bowen 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 ?**

GREAT BROWSING LINKS

SPACE STATIONS + COMMERCIAL SPACE

http://www.space.com/72-**iss-module-russian-mrm-1-rassvet.html**
http://news.cnet.com/8301-13772_3-57342415-52/**paul-allens-stratolaunch-grand-plan-for-next-gen-space-travel**/ **Same topic** - http://www.thespacereview.com/article/1994/1
http://www.**bigelowaerospace**.com/**in-the-news**.php
(Commercial) Human Achievements Beyond LEO soon - http://www.thespacereview.com/article/1985/1

ASTRONAUTS + SPACE TECHNOLOGY

http://www.space.com/73-**orion-capsule-emergency-escape-system-test.html**
http://mis-asia.com/resource/industries/**nasa-declares-solarsail-d-mission-complete**/
http://io9.com/5863422/**10-mega**%20**construction-projects-that-could-save-the-environment--and-the-economy** (# 1, 2 space-relevant)
Louis Friedman: on asteroids and interstellar flight - http://www.thespacereview.com/article/1973/1

EARTH

http://www.universetoday.com/92022/**earths-other-moons**/
Paleoclimate Record/Potential Rapid Climate Changes http://www.spaceref.com/news/viewpr.html?pid=35499
Did Early Earth experience extreme glaciation? - http://www.spaceref.com/news/viewpr.html?pid=35497

MOON

http://astrobotic.net/2011/11/29/**astrobotic-wins-nasa-contract-for-robot-teams-to-explore-martian-and-lunar-caves**/
http://www.universetoday.com/92022/**earths-other-moons**/
http://www.indiavision.com/news/article/scitech/264139/**nasas-twin-grail-probes-may-find-remnants-of-moons-lost-sibling**/
Solar Power ring around Moon's equator - http://www.shimz.co.jp/english/theme/dream/lunaring.html
http://old.news.yahoo.com/s/space/20120105/sc_space/**moonmineralfoundinancientaustralianrock**
Shackleton Energy Co: Humans to the Moon by 2019 http://www.spaceref.com/news/viewpr.html?pid=35264

MARS

http://tehrantimes.com/science/92828-**on-mars-rover-tools-to-plumb-a-methane-mystery**
http://www.theengineer.co.uk/sectors/aerospace/news/**seeker-navigation-system-could-take-mars-rovers-further**/1011200.article
http://rightbasicbuilding.com/**asteroid-maps**/**phobos-and-deimos-moons-of-mars-captured-asteroids**/
http://www.marssociety.org/home/press/news/**illputmillionsofpeopleonmarssayselonmusk**
Curiosity Rover to study radiation on way to Mars
http://www.msnbc.msn.com/id/45715472/ns/technology_and_science-space/
Opportunity: Mineral Vein Deposited by Water http://www.jpl.nasa.gov/news/news.cfm?release=2011-377
Why Mars -http://www.msnbc.msn.com/id/45743803/ns/technology_and_science-space/#.TvKNRBzyDtU

ASTEROIDS

http://www.space.com/13948-**nasa-comet-harpoon.html**
www.signonsandiego.com/news/2011/dec/21/**dawn-spacecraft-beams-back-new-images-of-asteroid**/
NASA Dawn Visuals Show Vesta's 'Color Palette' - http://www.spaceref.com/news/viewpr.html?pid=35448
NASA Developing Comet Harpoon for Sample Return - http://www.spaceref.com/news/viewpr.html?pid=35541

OTHER PLANETS + MOONS

http://www.space.com/13889-**mercury-spin-asteroid-collision-tidal-locking**.html
www.engadget.com/2011/12/12/**nasa-looks-to-send-landers-to-europa-in-2020**-wants-to-break-the/
http://www.physorg.com/news/2011-12-**nasa-europa**.html
http://timesofindia.indiatimes.com/home/science/**On-Pluto-hints-of-building-blocks-of-life**/articleshow/11227377.cms
http://astrobio.net/pressrelease/**4434/the-lakes-and-storms-of-titan**
Titan plane http://story.albuquerqueexpress.com/index.php/ct/9/cid/89d96798a39564bd/id/202361705/cs/1
Top 10 must planetary probes -http://astrobio.net/index.php?option=com_retrospection&task=detail&id=4420

SPACE SETTLEMENTS

NSS Space Settlement Journal – http://blog.nss.org/?p=3175 – www.nss.org/**settlement/journal/index.**html

ASTRONOMY + ASTROBIOTICS

http://www.foxnews.com/scitech/2011/12/21/**hubble-telescope-spots-complex-organic-molecules-on-surface-pluto/**

www.indiavision.com/news/article/scitech/263379/**soon-seti-to-search-the-moon-for-alien-artifacts/**

http://old.news.yahoo.com/s/space/20120105/sc_space/**thehuntisonforhabitablemoonsaroundalienplanets**

Assessing odds of life on other worlds – http://www.spaceref.com/news/viewpr.html?pid=35310

EDUCATION + OUTREACH + MEDIA

http://lightyears.blogs.cnn.com/2011/12/27/**space-idea-factory-brainstorming-school/FICTION**

GREAT SPACE VIDEOS

http://www.space.com/13913-**harpoon-comet-spacecraft-carry-canon-fired-sampler.html**

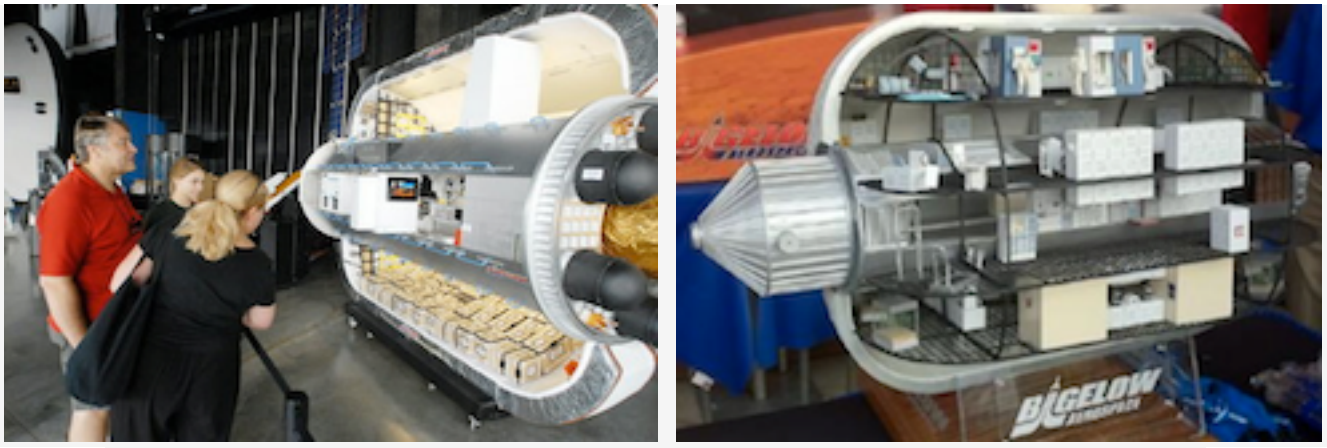
Soar over Vesta in 3d – http://multimedia.esa.int/Videos/2011/12/**Earth-from-Space-Indus-River**

http://www.jpl.nasa.gov/video/index.cfm?id=1041

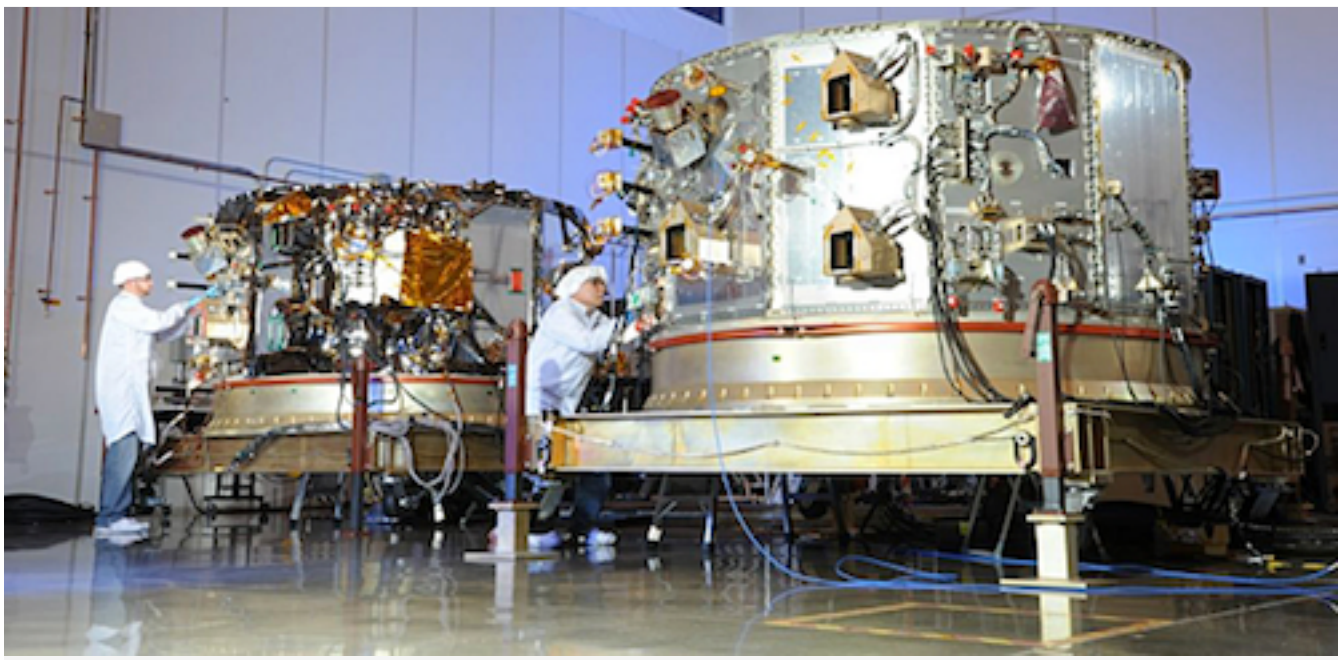
Baseball solo on ISS – http://abcnews.go.com/GMA/video/japanese-astronaut-plays-baseball-space-15023128

Modeling Bigelow Aerospace Inflatable Modules – http://www.8newsnow.com/story/14916667/i-team

MMM PHOTO GALLERY



Bigelow Aerospace is learning how to arrange B330 interiors through the exercise of modeling



Orbital Sciences Cygnus Modules may soon take cargo to ISS for NASA

For past MMM articles, Visit **http://www.moonsociety.org/publications/mmm_classics/**

THE book WORM

Abundance –The Future is Better Than You Think - Peter Diamandis

√ Ray Kurzweil calls Abundance... "A brilliant must-read book."
√ Sir Richard Branson... "Provides proof we can meet any grand challenge."
√ Jeff Skoll... "An audacious and powerful read!"
√ Elon Musk... "Essential reading for anyone looking for a better tomorrow."
√ Arianna Huffington... "A reminder of the infinite possibilities for doing good".

Peter Diamandis writes: "I'm thrilled to announce the publication of my first book (co-written with Steven Kotler), **Abundance –The Future is Better Than You Think** (to be published on Feb 21st, 2012). Abundance tells the story of the **X PRIZE** and explores how four emerging forces—exponential technologies, the DIY innovator, the Techno-philanthroprist, and the Rising Billion—are transforming our world.

Please check out the book website: www.AbundanceTheBook.com.

Tell your friends about Abundance on Facebook, Twitter, or by email. To thank you, I'm offering a ticket on a zero-gravity flight (http://www.gozerog.com) and a seat to one of SU's Executive Programs, worth $5,000 each. Please visit: www.abundancethebook.com/tell-a-friend for more information.

Peter H. Diamandis, MD - Chairman & CEO, X PRIZE Foundation

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

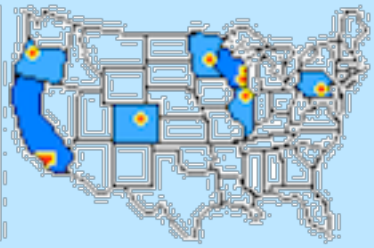
Circle the dates and keep them open - THE SOONER YOU REGISTER, THE LOWER THE RATES!

ISDC 2013 will be in San Diego, California

Previous ISDCs on the West Coast: ● 2006 Los Angeles (with the Planetary Society) ● 2003 San Jose ● 1990 Anaheim ● 1986 Seattle ● 1984 San Francisco ● 1982 Los Angeles

For past MMM articles, Visit http://www.moonsociety.org/publications/mmm_classics/

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**
VICE-PRESIDENT Doug Armstrong NSS (414) 273-1126
SECRETARY – • **James Schroeter NSS** (414) 333-3679 – James_Schroeter@excite.com
TREASURER/Database – • Robert Bialecki (414) 372-9613 – bobriverwest@yahoo.com

√ We are in the process of reincorporated under a new (actually our original) name: **"Milwaukee Lunar Reclamation Society.** – Along with 250,000 other small non-profits, we had lost that status.

√ **Peter's laptop was stolen in a burglary on January 10th** – the club bought him a new **Macbook Pro** so that he can continue putting out newsletters. But the software he was used to using did not work on the new machine – that turned out to be a good reason to start with a fresh new template and look. This issue is our first crack at it, and we hope to improve the looks of MMM with future issues. We decided to switch to a one-column template as we are looking into the possibility of putting back issues in the form of the **MMM Classic issues,** on **Kindle™,** and Kindle™ wants a 1-column format.

√ Our scheduled meeting this month on **FEB 11** will be in Mayfair Mall Garden Suites East (lower level) as usual, **but this month only, we will be in room G150** rather than our usual **G110**.

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
SSS Sec. Harald Schenk 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: FEB 17 - APR 20 - 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**

For past MMM articles, Visit **http://www.moonsociety.org/publications/mmm_classics/**

CALIFORNIA

OASIS: Organization for the Advancement of Space Industrialization and Settlement
Greater Los Angeles Chapter of NSS
P.O. Box 1231, Redondo Beach, CA90278
http://www.oasis-nss.org/wordpress/

Events Hotline/Answering Machine: 310-364-2290 – **Odyssey** Ed: Kat Tanaka odyssey_editor@yahoo.com
http://www.oasis-nss.org/wordpress/ - oasis@oasis-nss.org – **Odyssey** Newsletter www.oasis-nss.org/articles.html
Regular Meeting 3 pm 3rd SAT monthly – FEB 11– MAR 17 – APR 21 – MAR 19 – APR 21 – JUN 16 – JUL 21

OASIS NEWS AND EVENTS

SAT FEB 11 3 pm OASIS Monthly Board Meeting. Chez Lisa Kaspin, 3206 Summertime Lane Unit 206, Culver City

FRI-SAT FEB 17-19 Gallifrey One, Network 23 (Dr. Who Convention) Come join us for this fun event as we find out WHO wants to go to space! Please note: You MUST purchase a membership to attend this event. More info available at: www.gallifreyone.com

SAT MAR 3 – Cerritos High School: Bottle Rocket Rally. A fun hand-on event for kids to build their own water-pressurized bottle rockets. Cerritos High School 12500 183rd Street, Cerritos, CA.

COLORADO

DSS: Denver Space Society
(FKA The Front Range L5 Society)
1 Cherry Hills Farm Drive, Englewood, CO 80113

Eric Boethin 303-781-0800 eric@boethin.com – **Monthly Meetings 6:00 PM on 1at Thursdays**
Englewood Public Library, Englewood, CO 80110 – 1000 Englewood Parkway, First Floor Civic Center
NEXT MEETINGS – MAR 1 – APR 5 – MAY 4 – JUN 7 – JU; 5 – AUG 2 – SEP 6 – OCT 4 – NOV 1 – DEC 6

ILLINOIS

CSFL5: Chicago Space Frontier L5i
610 West 47th Place, Chicago, IL 60609

Larry Ahearn 773-372-0349 – LDAhearn@aol.com

MINNESOTA

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

http://www.nasa.gov/pdf/605284main_Expedition_30_31_Press_Kit.pdf
http://freemars.org/mnfan/MNSFS/2011-12-ISS-30-Display/

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

MNSFS NEWS – All members were invited to the Annual MN SFS Space Explorer Memorial Dinner Saturday, January 28th, 2012, 6 PM, to commemorate Apollo 1 / Challenger / Columbia and all the heroes of the dream
Here are the photos - http://freemars.org/mnfan/MNSFS/2012-01-Day-of-Remberance/

OREGON

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

(LBRT – Oregon Moonbase) moonbase@comcast.net

* **Meetings 3rd Sat. each month at 2 p.m. -** Bourne Plaza, 1441 SE 122nd, Portland, downstairs
* **Regular Meeting 3 pm 3rd SAT monthly – FEB 18 – MAR 17 – APR 21 – MAR 19 – APR 21 – JUN 16 – JUL 21**

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 - 856/261-8032 (h), 215/698-2600 (w)

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

The NSS-PASA Report for December 2011

Next meeting: We will meet at our regular location, the Liberty One Food Court on the second level of the building, from one to three p.m. on January sixteenth. Our next events will be helping with our special awards judging at the George Washington Carver Science Fair. This will be in February and March. Then, in April, we will be going to The New Jersey State Museum and, in the same general time frame, The Franklin Institute sponsored Science Fest, which we have also been invited to do outreach at.

Our first talk was by Hank Smith on Philcon and the ongoing talk about changing the venue and how things went, financially, this year. One of the changes that may bring more people is the increase in the young people who enjoy anime and costuming. Dressing like favorite characters, or people who could inhabit the worlds described in stories (with judging based on adherence to dress styles described in the works), is part of the fun of that form. Hank says that Gary Feldbaum will be chair for next years Con. During this presentation writer Joe Farley stopped at our gathering because he heard us talking about the fiction events. He gave us a book he had written (that I gave to Hank for first reading) and then he went on to find the writers group in another area of the Court. He may join us at another time. He appears in The "Fabulist" magazine. We also had another visitor who briefly stopped thanks to Hanks presentation. Thank you Hank!

Larry discussed, with Mitch, the changes to the website that Mitch thought where great additions. He printed out a sample page for the meeting and it has been attractive for people with smart devices to check out our group and our activity. Very nice, Larry.

Dorothy brought "Time Out, New York" and its' report on the Space Travel Exhibit at the American Museum of Natural History. This will be there until August 2012. There are a wide range of subjects connected to space exploration, from alien life to Lunar commercial enterprise to Star Flight and the Space Elevator. We discussed going up in the spring to join with the New York chapter of N.S.S. for a joint visit to the Museum. The exhibit is part of the regular admission to the Museum, which is $25. Dorothy also mentioned that she and Larry would visit the Lunacon Convention at the Ryetown Hilton, in New York State, From March 16 to 18th. They, Dotty and Larry, will talk to the coordinators of that event about improving science programming possibly with support/ presenters from N.Y. N.S.S. or us. Go, Guys! (The Museum exhibit is called "Beyond Planet Earth", see the website write up).

Dennis Pearson joined us and brought the book he was given at the joint A.I.A.A./ NASA event on Space Based Solar Power that was sponsored by N.S.S. Lots of material on possible modes of transmitting the power from space to ground receivers where described. Mark Hopkins and Candace Pankin where both speakers at the event, and the report is available for download. When I find the link, or if Dennis would kindly supply it to Larry, I will pass it on to Larry. The only quibble I have with what I have seen is that it did not appear easy to find data on the Earth side receiver/ power converters. This may be the area where new research and engineering would occur as much of the r.f. Version of the system can use older technology, while the new, LASER transmitters might require development of an advanced/ new version of the classic photo converter. Thanks for bring the book Dennis, and N.S.S. for sponsoring this conference.

Mitch brought in "Time: the Invention Issue" which had material on NASA's new twin lunar probes, the Mars Rover "curiosity" (recently launched) and a solar powered plane (not from NASA). And the new Ad Astra. Lots of new stuff there too! A very full, fun, report (Mitch told us of the Science Week invitation we received).

And then my report: At the meeting: I brought up the possibility of build a scaled Lava Tube display using "N Gauge" figures as part of the display. They are about .5 inches tall, so that, the structure would then be built to the size of the tube discovered by the LIDAR on the Japanese probe several years ago (1450 feet scaled). This would make the display fourteen and a half feet tall! This has been put for ward by me now, but was tabled for

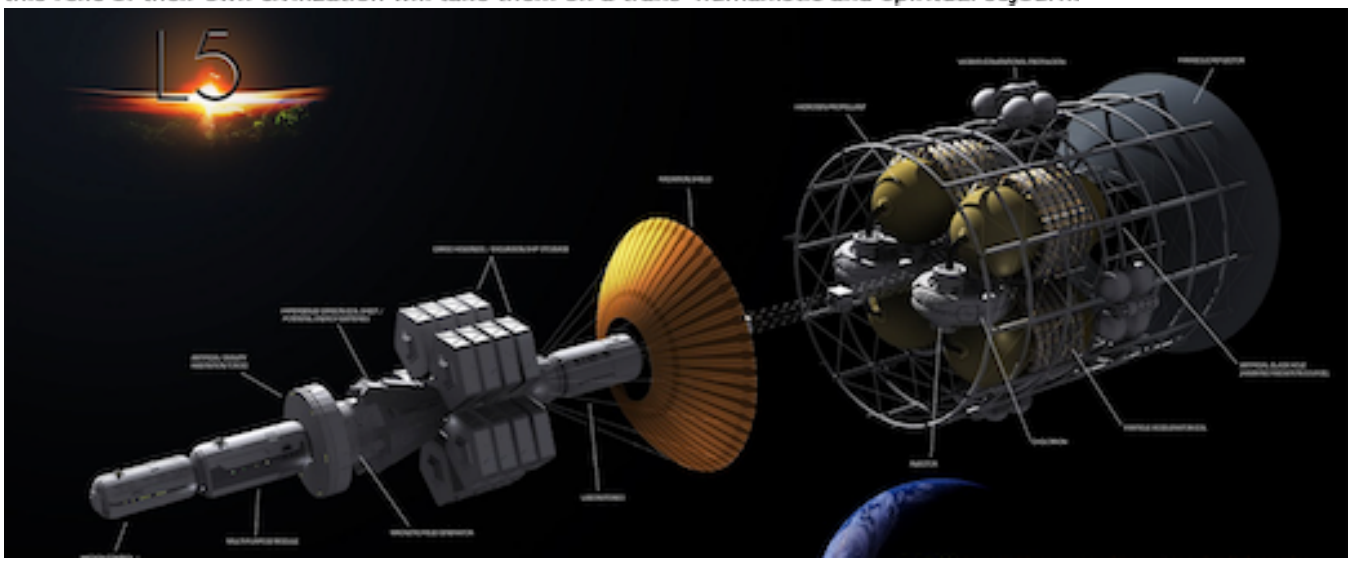
January consideration. Dennis Pearson, however, set me on a new track to possible implementation: an inflatable design. This has to be fleshed out and the internal display elements have to be developed also. I am thinking "Air Plant", not, "Empire State Building".

Then there are many interesting articles: from "Analog, Science Fiction, Science Fact Magazine" for January/February 2012. Jeffery D. Kooistra has a report titled "Talking About My Generation" in the Alternate View part of the magazine. The title is a bit deceptive. The generation talked of is power, not our cohort. The particular kind is nuclear, with an emphasis on Thorium as an alternative, and replacement for, uranium.
There has been much work done on this over the years and Jeffery makes several good points. One stands out however: Thorium can't be made into nuclear weapons (of the conventionally thought of "bomb" kind anyway, and, the residue is not nearly as objectionable as from uranium reactors. The December NASA Tech Briefs has several good pieces including: "Umbilical Deployment Device" for landing probes and rovers on other planets. This report is on the technique that will land "Curiosity" on Mars next summer. There is also a feature on a John H. Glenn test facility that was original designed for nuclear engine in vac tests. It is huge: 122 feet high and 100 feet in diameter. This is in the "Inside NASA" section. It also has an outreach number if you are interested in doing a business partnership for using this capability. And much more! Submitted by Earl Bennett

Video alert: Watch for the new "L5" science fiction miniseries!

[from: http://www.discovery-enterprise.com/2011/09/l5-miniseries.html]

"Imagine returning from an exhausting adventure only to find that your home is abandoned, empty. Not just your home, but your neighborhood, your city, in fact, everyone, everywhere, seems to be missing. This is what happens to the crew of the first manned mission to Barnard's Star - they return after awakening from suspended animation to find that their ship-board AI has sent them on a relativistic tour of the stellar neighborhood while they slumbered, dilating time so severely that nearly 200 years have passed on Earth. After coming to, they discover their vessel is adrift at Lagrange point 5, within visual range of a vast O'Neill cylinder-colony. The night side of the Earth shows no lights, and no one answers their calls across all frequencies. They have no choice but to dock with the colony and explore its cavernous interior in the hopes of finding help. When they find the colony to be airless and devoid of life, the remains of human civilization baking in the Sun for decades, their predicament becomes even more dire. Following in the traditions of great legendary hard science fiction, their exploration of this relic of their own civilization will take them on a trans-humanistic and spiritual sojourn.



L5 is a hard science fiction dramatic miniseries for online distribution. The first episode of the miniseries will be 10 minutes, and will depict the late homecoming of the astronauts and the first steps towards exploring the interior of L5.

The pilot episode of L5 will be distributed through Vimeo and YouTube in high definition, as well as Quicktime format on our website, and will be promoted as viral content on web forums, news fed sites, emails, as well as a production blog that will have production information and artwork, and most excitingly, the step by step construction process of the replica spacesuits.

More information on this series can be found on the film production' web site http://www.l5-series.com/ and associated blog site - http://l5production.blogspot.com/

Moon Miners' MANIFESTO
Lunar Reclamation Society Inc.
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LUNAR RECLAMATION SOC. (NSS-Milwaukee) • $15 low "one rate" to address above

MINNESOTA SPACE FRONTIER SOCIETY • $25 Regular Dues

OREGON L5 SOCIETY • $25 for all members

O.A.S.I.S. L5 (Los Angeles) • $28 regular dues with MMM

PHILADELPHIA AREA SPACE ALLIANCE

- Annual dues with MMM $25, due March or $6 per quarter before the next March

SHEBOYGAN SPACE SOCIETY (WI) • $15 regular, • $10 student • $1/extra family member

Individual Subscriptions outside participating chapter areas: • **$15 USA** • **$25** Canada;

- US **$55** Surface Mail Outside North America – **Payable to "LRS",** PO Box 2102, Milwaukee WI 53201

For past MMM articles, Visit **http://www.moonsociety.org/publications/mmm_classics/**