# "Towards an Earth-Moon Economy - Developing Off-Planet Resources" Moon Miners' Manifesto

& The Moon Society Journal

www.MMM-MoonMinersManifesto.com



A peek inside the Space-X 7-person Crew Capsule

#### **Feature Articles**

- 2 In Focus: New Companies, Forces, Plans that could Accelerate the Future Peter Kokh
- 3. The Moon: a Better Way to a Closer View Dave Duca
- 4. Kepler Shipyards: an Innovative new force that could reshape the future
- 6.Kepler Shipyards: a sudden setback, but determined to continue
- While on things "Kepler" Kepler Space Telescope Findings to date Peter Kokh
- 7.Early Conclusions from Kepler Space Telescope Findings Peter Kokh



# **About Moon Miners' Manifesto –** "The Moon - it's not Earth, but it's <u>Earth's!</u>"

- MMM's VISION: "expanding the human economy through off-planet resources"; early heavy reliance on Lunar materials; early use of Mars system and asteroid resources; and permanent settlements supporting this economy.
- MMM's MISSION: to encourage "spin-up" entrepreneurial development of the novel technologies needed and promote the economic-environmental rationale of space and lunar settlement.
- Moon Miners' Manifesto CLASSICS: The non-time-sensitive articles and editorials of MMM's first twenty years plus have been re-edited, reillustrated, and republished in 23 PDF format volumes, for free downloading from this location: <a href="http://www.MoonSociety.org/publications/mmm\_classics/">http://www.MoonSociety.org/publications/mmm\_classics/</a>
- MMM THEME Issues: 14 collections of articles according to themes: ..../publications/mmm themes/
- MMM Glossary: new terms, old terms/new meanings: www.moonsociety.org/publications/m3glossary.html
- 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.

**Opinions expressed herein**, including editorials, are those of individual writers and may not reflect positions or policies of the **National Space Society**, **Milwaukee Lunar Reclamation Society**, or **The Moon Society**. **Copyrights** remain with the individual writers. Reproduction rights, with credit, are granted to NSS & TMS chapter newsletters.

- MMM color online downloadable PDF file version option for Moon Society Members using their username and password do write <a href="mailto:secretary@moonsociety.org">secretary@moonsociety.org</a> if you need help with your password.
- For additional space news and near-term developments, there is a daily RSS feed space news section on <a href="http://www.moonsociety.org">http://www.moonsociety.org</a>. You can also read Ad Astra magazine mailed to National Space Society members. Milwaukee Lunar Reclamation Society is an independently incorporated nonprofit membership organization en-

gaged 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: – <a href="http://www.moonsociety.org/chapters/milwaukee/">http://www.moonsociety.org/chapters/milwaukee/</a>

• 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 (202) 429–1600 - 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 <a href="KokhMMM@aol.com">KokhMMM@aol.com</a> Email message body text or MS Word, Open Office Text files, and pdf file attachments or mailed CDs, DVDs, or typed hard copy [short pieces only, less than 1,000 words] to:

  Moon Miners' Manifesto, c/o Peter Kokh, 1630 N. 32nd Street, Milwaukee, WI 53208-2040

# In Focus New Companies, Forces, Plans that could Accelerate the Future

In the past year there has been some very encouraging news. We have become so used to the same old story: Congress won't dish out the money, so NASA has to push its plans for various missions, manned and unmanned into the future – or shall we say, into the next generation. This has is one of the things that has forced NASA to rethink its plans. But another finding, that humans on a long trip to Mars will be subject to radiation dosage that could lead to cancer down the road. After years (or decades) of refusing to fund the Vasimir engine project, NASA is now ready to invest in new technologies that would deliver humans to Mars in less than half the time. <a href="https://www.spacedaily.com/reports/NASA\_Selects\_Companies\_to\_Develop\_Super\_Fast\_Deep\_Space\_Engine\_999.html">www.spacedaily.com/reports/NASA\_Selects\_Companies\_to\_Develop\_Super\_Fast\_Deep\_Space\_Engine\_999.html</a>

Meanwhile, despite the recent Space-X failure, private companies are winning more and more contracts. Helping on the side is a lot of **public/private brainstorming** encouraged by NASA.

http://www.nss.org/docs/EvolvableLunarArchitecture.pdf

And by outsider groups: <a href="http://keplershipyards.com">http://keplershipyards.com</a> (see next page)

For those of us oldtimers who have waited decades only to see other nations like China zoom past us, the "new future" - although on a better track - comes late, too late. But at least we will pass on more certain that the true spacefaring era is coming at last.

We'll be staying tuned in. PK

# The Moon: a Better Way to a Closer View

By Dave Duca

There it is....Every night, when available to our view and, weather permitting. The Moon!



But, during those times of thinned out phases and overcast weather, there is a splendid way to explore BOTH SIDES of the Lunar Features...

# The **Virtual Moon Atlas** is literally one of the best "Freely Available" http://ap-i.net/avl/en/start

The Virtual Moon Atlas is now freely available, as a commemorative to the late Neil Armstrong. This Atlas is a power house compendium of intense features that has been compiled over many years of pin point accuracy, topography, elevations, thermionic, gravimetric, and several dozen attributes of exploration. This is worthy of thoroughly immersing yourself into.

It doesn't stop there...the Downloads Page has available several dozen high resolution imagery and overlays continuing immense detail.

# "Google Earth / Moon cannot possibly touch the intensity of Virtual Moon Atlas"

Never before have we seen the lunar landscape like this. Every possible means of understanding this doorstep to the Heavens is included.

Google Earth is just "tossing a ball"...the Virtual Moon Atlas is your last word in planning to go there!

Dave Duca

(Dave is a free lance visionary to explore the "3rd-1/2 and 4th Rocks from the Sun)

# Introducing an Innovative new force that could reshape the future



http://keplershipyards.com
Technologies to Explore the Next Frontiers and Settle New Worlds

#### **SPACE VEHICLES**

Kepler Shipyards Space Vehicles division focuses on three primary classes of vehicles that are conceived around common cores, or similar architectures: launch vehicles (LVs), landers, and microgravity transport vehicles.

The **931 and 12-331: microsat-sized launch vehicles** that use the same tankage and engines as used in the Speck Lunar Lander, further reducing costs. They are composed of a many very inexpensive common modules. These modules use the same tankage and engines as used in the Speck Lunar Lander, further reducing costs.

The "Speck" Lunar Lander System, currently under construction, is only the first of a large family of modular, reconfigurable landing systems to provide simple, straightforward transportation for goods and passengers between the Earth and the Moon.

"The Hawk", the next larger variant, will be an open-seated lander with a large gantry and an open bay in the middle. Constructed from Speck lander components—when you land three Speck landers on the surface, you can then build a Hawk out of the parts. Used to pick people or cargo up from lunar orbit and bring them back down to the Moon, or for long-distance surface transport. Its large open central bay can be reconfigured for a variety of missions, from personal transport to bulk cargo transport to tankage. The Hawk will be the backbone of early lunar and cislunar transport.

The "Sled" is another Hawk variant designed specifically to operate in micro-gravity, never to touch a planetary surface. Used for a variety of missions: close-in exploration, personnel transport, satellite servicing and refuelling. Designed to exist in space, it will operate more efficiently than a spacecraft that has operated in another environment first.

The eventual goal? We envision an Aldrin-styler cycler in a continuous orbit around Earth and the Moon – like a ski gondola, always moving, able to transfer people on and off — With Hawks or other spacecraft at either end, travel will be convenient and feasible for people not trained as astronauts or pilots. That means a lot less time spent in a space suit, too.

# **SURFACE STRUCTURES** - http://keplershipyards.com/surface-structures

If humans are to explore and eventually colonize other worlds, we'll need a place to live, work, and recover—a home away from home. The two most immediate needs for any long-term expedition are a general-purpose shelter and workspace, and a form of life support (in other words, a way to procure food, water, and air).

We're partnering with the **OpenLuna foundation** to develop their **Mk 1 Outpost** and **Aquapon-ics Module** for deployment on the lunar surface.

Before we can engage in long-duration exploration and colonization of space, we need to resolve the issues of oxygen supply, CO2 scrubbing, water treatment, waste handling, and food production. On planetary surfaces, all of these issues can be resolved by employing a single solution: aquaponics, combining hydroponics and fish farming. The same setup can also be used on Earth to solve these same problems.

We'll be building the Outposts fon Earth as quick-deploy shelters for emergency situa-tions and in remote environments, in areas where food and clean water are needed and cannot be provided by more conventional methods, such as developing areas or disaster sites.

#### **SPACE ACTIVITY SUITS**

Current spacesuits are no longer capable of providing support for the wide ranging missions Mankind will soon be tasked with; these suits are large, complicates, bulky, and difficult to move in. Kepler is solving this problem with a common core "pressure liner" that can be worn as a daily wear uniform that is worn, and can be reconfigured with armour and PLSS (Portable Life Support System) to match the mission at hand. Some expected options include;

#### SAS - THE SPACE ACTIVITY SUIT

This is the suit commonly thought of as the Space Suit. it will be used for all on-orbit activities.

# **LUNAR SUITS**

The **Lunar Excursion suit** is meant for short two day to a week duration on the Lunar surface. It won't include the advanced medical support systems of the Expedition grade suit.

The Lunar Expedition suit is meant for durations of up to a month on the Lunar surface.

#### **MARTIAN SUITS**

The Martian Excursion suit is meant for up to a week duration on the Martian surface- without the advanced medical support systems found in the Expedition grade suit.

**Excursion** - Meant for much longer duration on the Martian surface.

#### **ASTEROID OPERATIONS SUITS**

In addition to the Space Activity Suit common cores ballistic armour and solar shielding, the Asteroid exploration and mining suit will integrate the armour of the Lunar and Martian surface suits and more advanced grappling tools designed for the target asteroid.

JUMP SUIT - a protective suit designed for jumping onto a planet's surface from the outer atmosphere—the Earth's, Mars's, wherever. The immediate practical applications: the as-yet untried sport of spacediving (parachuting from space) back to Earth's surface. This will require a suit specifically configured for this purpose from the Kepler Space Activity Suit common core.

#### **INTERGROUP TECHNOLOGIES**

Intergroup Tech is the intersection of two or more other divisions. To run a suborbital experiment, with assistance with flight operations and suits, we can help. To explore and mine a near-Earth object, we can set you up with the suits, habitation, and flight operations support. We can also provide equipment and training, and even arrange flight integration.

If you're looking to set up an incredibly remote long-term mining or relief operation and need habitation, clean water, food, power, and communications, WE can fulfill your needs.

If you want to build a Lunar or Martian colony, we can do that, too. The OpenLuna Foundation has selected us as the prime contractor for all their non-volunteer manufacturing.

#### COMPANY: THE MISSSION OF KEPLER SHIPYARDS:

"to provide reliable, cost effective space exploration technologies to expand humanit's reach beyond our planet of origin." Kepler Shipyards was Incorporated in January 2014 in Austin, Texas. This new company represents a coming-together of decades of engineering expertise, proven technology, and real-world experience.

# **Primary purpose:** to develop space exploration technologies with adaptability.

Technologies designed for use on other planetary surfaces can be retooled for terrestrial use and commercialization. The surface lander can be reconfigured to transfer cargo back to orbit. A jump suit differs only in a few key details from a space suit.

Redundancy is mandatory: waste is not an option. The past inspires but does not limit us.

We're not afraid to take on what other people call impossible challenges.

We are endlessly innovative, but we never reinvent the wheel just because we can.

Most of all, we bring competence and experience to the table. We know what we're doing, and we're interested only in solving the problem in the most cost-effective way possible.

Kepler Shipyards: experienced, hard-edged, intuitive, and iconoclastic, we build the very best.

# **CAREERS**

We develop and build cutting-edge space exploration and life support equipment. People's lives (and hundreds of millions of dollars) are on the line with every project we undertake. We can't afford anything less than the very best for these projects.

Do you have a pioneering can-do attitude? Are you willing to learn from both the victories and the, er, less-than-optimum results of the past, but never be bound by either? Are you one hundred percent convinced that you can do absolutely anything, given the right tools? Are you always hearing "That's a great idea! I've never seen it done like that before!"? Are you the kind of person who engineers and builds the very highest quality, but simplest and most reliable, "bomb-proof" hardware? Do the best of the best call you when they have a problem they can't solve? If so, then you might—just maybe—be good enough for us.

en you speak or write, do people pay attention? Do your graphics and animations make people weep with emotion? We're looking for those kinds of people, too.

We are currently looking for: Ultra-lightweight structural engineers, 3D scanning and rapid prototyping innovator: Al coders: 3D modelers and animators: Marketing and PR "dream-sharers"; Graphic artists.

Contact us: 6805 Crystalbrook Drive, Austin, TX 248-274-0177 (USA) 519-488-0362 (CAD) ## For past articles, Visit http://www.moonsociety.org/publications/mmm classics/ or /mmm themes/

# Kepler Shipyards: a sudden setback, but determined to continue

From Paul Graham (Open Luna Foundation, and Kuiper Shipyards) - Contact: <a href="mailto:paul@openluna.org">paul@openluna.org</a>

I have been out of touch with Paul for a while. He was my Crew Commander on my first 2 week crew at the Mars Desert Research Station, #34, the "retrofit crew" in 2005. I commanded The National Space Society/Moon Society/Lunar Reclamation Society crew, #45, at the station, building the simulated "Heinlein Tunnel" between the Hab and Greenhab, with Paul's design approval, as then head of the MDRS Engineering team.

Together in 2010, Paul and I, as desingers of a team headed by Maria Catalina, worked on an effort to design a "Moon, Mars Atacame Research Station" to be buit in northern Chile around a core module, the fuselage of a retired C130 air freighter, to be supplied by the Chilean Air Force. This effort was undercut by the University of Antofagasta, Chile, which on the one hand chose our plan as the best, but on the other hand, dismissed our crew, saying that they would buid the station themselves. After hundreds of hours of planning, this was a big blow to our crew, Paul and I in particular.

Since then, Paul launched Open Luna Foundation in , a co-sponsor of the **To The Stars International Quarterly**.

I have the greatest respect for Paul. It is great to see what he has come up with and it makes eminent sense (which NASA plans selcom have.)

A Setbadk for Kepler Shipyards: [email received September 12, 2015) From Paul Graham to Peter Kokh

"I've hit a bit of a slowdown recently. My shop was broken into, and amount \$100k in other stuff, all of my prototypes, plus the documentation photos were stolen. This is basically a year's setback for me." - paul@openluna.org

**Comment:** Paul is not looking for handouts, but gracious donations could speed up the effort to get Kepler Shipyards back in busines in this bold, piorneering enterprise to open Moon and Mars for settlement.

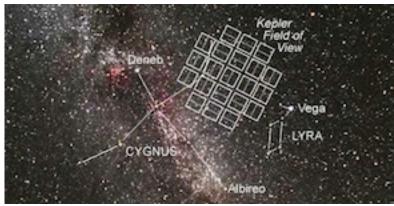
Kepler Shipyards factory is located in London, Ontario halfway between Detroit and Toronto.

# While on things "Kepler" - Kepler Space Telescope Findings to date

By Peter Kokh



Above: The Sun (and Earth) lie in onw of the spiral arms of our "Milky Way" Galaxy. The yellow beam shows the Kepler Telescope search area, aimed at a small are of the northern sky in the "Cygnus arm". Presumably, this small area has a population of stars, and planetary systems, typical of the galaxy at large.



Kepler's target area in the northern sky

#### https://en.wikipedia.org/wiki/Kepler (spacecraft)

"Designed to survey a portion of our region of the Milky Way to discover dozens of Earth-size extrasolar planets in or near the habitalbe zone and estimate how many of the billions of stars in the Milky Way have such planets. Kepler's sole instrument is a photometer that continually monitors the brightness of over 145,000 main sequence stars in a fixed field of view. This data is transmitted to Earth, then analyzed to detect periodic dimming caused by extrasolar planets that cross in front of their host star."

Kepler entered service in May 2009. "As of January 2015, (since Kepler and its follow-up observations had found 1,013 confirmed exoplanets in about 440 stellar systems, along with a further 3,199 unconfirmed planet candidates."

#### What Kepler does not see

There being systems with orientation anywhere from 90° to our line of sight, only 1 in 90 planetary systems will have planets whose path carries them in front of or behind their Sun. Such a restricted sample should be typical, allowing us to draw conclusions on frequency of planet-bearing "solar systems." Table of confirmed planetary systems In Kepler's field of view (to date)

http://kepler.nasa.gov/Mission/discoveries/

# **Early Conclusions from Kepler Telescope Findings**

The term "Earth-like" is used with unprofessional looseness - or should we say "carelessness."

We have no problem with looking for planets in the "goldilocks" zone – the band around the star in which a planet's surface Is not so hot that any surface water would boil away, and not so cold that any surface water would be perpetually frozen.

But "Earth-like" should also **exclude** planets in the "goldilocks" zone that have no surface water, as well as those whose surfaces are totally ocean-covered. In the Star Trek science-fiction television series, the term "M-Class Planet" was used. Here is our own definition of what kinds of worlds make the "M-Class cut."

http://moonsociety.org/publications/m3glossary.html entry hydro\_tectonic

"Hydrotectonic Worlds - "Earth-like planet", "M-Class Planet" - We've all heard these phrases but no one seems to have tried to get at the essence of what they mean. "Hydrotectonic" is our definition: active plate tectonic processes in the presence of water, i.e. continents and oceans. Mars does not even come close. Any tectonic activities on Mars will have ground to a halt long ago, probably due to insufficient water and too swift an internal cooling."

- **Polar inclination is important:** If the planet's axis lies on its side, the swing in seasons may be too extreme. If the planet's axis is near perpendicular to its orbit, there may be no seasons at all. A lack of seasons may well slow down evolutionary development.
- Oceans and continents: Earth, despite the plurality of names, has one continuous ocean with several "lobes". This is probably essential for plate tectonics and the development of a richly diversified All water, no continents, and no tectonic activity will slow evolution and limit the evolution of life.
- The age of the planet's sun is critical. Earth reached its present biological stage until our solar system was 4 billion years old. Younger systems are just as likely to have planets, but even those with abundant water will have ecosystems in early stages. [timeline? <a href="https://www.newscientist.com/article/dn17453-timeline-the-evolution-of-life/">www.newscientist.com/article/dn17453-timeline-the-evolution-of-life/</a> ]
- Mars seems to have had mini-oceans covering 20% of its surface at one time: probably in the Hellas basin (calling it a "plain" is an indefensible misnomer by unthinking astronomers) and in the depest areas of the northern hemisphere. To restore them will be a feat beyond us at this time, but not impossible.
- Venus shows clear signs of tectonic plates: two apprecialbe "continents" and a surrounging "oceanic" basin. But the water involved in those "tectonics" is long evaporated. Actually, 89% of the water needed to refill those

basins is already on hand in the form of the ecessive CO2 atmosphere. We just need to get rid of all that carbon, or turn it into usable solids, and free up the Oxygen to mate with imported hydrogen. Something for the future.

• Moving planets inward (Mars) and/or outward (Venus) is also a feet for future centuries.

# **Back to the Kepler Telescope Project**

While the area of the sky is only a few square degrees (the heavens are 43,000 square degrees: on a planet, the sky is half that big, the other half is below the horizon) the area chosen for the Kepler Telescope project is similar to the area of the galaxy where we are situated. We expect, then, that what we find out there will be similar to what lies within an equal range of our Solar System.

So far, we have not found an "Earthlike" planet strictly speaking (defining it as we have above) and that seems to indicate that rocky planets the size of Earth are to be found in the goldilocks zone, only now and then. Hopefully, we will one day understand how Earth happened to form in, or be moved to, its present position about the sun. There is probably a size and mass limit to planets cabaple of supporting hydro-tectonic systems over billions of years. We probably are not there yet.

Currently, a "super-Earth" much bigger and more massive than Earth, that might have an ocean, is the closest match. The higher gravity will no doubt express itself in the kinds and sizes of vertebrate life that could arise on such worlds. <a href="https://www.space.com/30026-earth-twin-kepler-452b-exoplanet-discovery.html">www.space.com/30026-earth-twin-kepler-452b-exoplanet-discovery.html</a>

www.space.com/30029-earth-s-older-cousin-60-percent-bigger-and-that-s-a-good-thing-video.html http://www.space.com/30260-earth-sized-planet-could-have-oceans.html

#### **Planet Migration**

Present thought is that our system's planets are not in their original positions. We won't address that, because we don't quite understand it. But you would think the same processes of planet migration would be in effect around other stars of similar mass. We don't seem to have reached the point where given the spectrum, mass, and age of a star, we can predict what kind of solar system the star will have.

We are at an early stage of planetary formation science. Hopefully, we will soon have all our marbles in place, look at a star, and given its spectrum, mass, and age, make a pretty good guess as to what its planetary system is like. We have a lot of homework to do first. If there are "rules" we will find them, sooner or later.

#### Other immature investigations: Brown Dwarfs

Brown Dwarfs are sun-like bodies with not enough mass to generate permanent fusion in their cores. They can have planets too. And some of them, maybe a considerable fraction of them, will have ice crusts covering global oceans: other "Europids." Indeed, if we do find at least primitive life forms in Europa's global ocean, that kind of life will be by far the most abundant in the universe. There are likely to be a hundred Europas to every "Earth." Brown Dwarfs themselves should be more numerous than all the other types of stars put together. The problem is that w have not found that high a concentration of Brown Dwarfs in our part of the heavens – not yet.

#### Other nearby disappointments

**Tau Ceti** is a relatively "sun-like" and relatively "nearby" – leading many to expect that its planetary system could harbor the nearest "Earth-like" planet. Many a science fiction story has centered around or included Tau Ceti. It's diameter is 79% of the Sun's and its spectrum is sun-like. But we have recently found indicatios that it does not harbor an "Earth-like" planet. <a href="http://phys.org/news/2015-04-tau-ceti-earth.html">http://phys.org/news/2015-04-tau-ceti-earth.html</a> **Age is important** 

If we do find a growing number of "Earth-like" "life-friendly" planets, only a fraction will be at an age in which complex life might have evolved. Some will be considerably older, and as we can only guess what the future of life on Earth will be like, given our present popultion of people who don't give a damn what happens after they pass, We don't know if intelligent life will be a short-lived phenomenon or just a dangerous period of juvinile irresponsibility.

#### Hold vour breath.

New discoveries are coming in at an ever increasing pace. Some of our questions might be answered in the near future. On other topics, we might not know what to expect for some time to come. That we have received no "messages" from older, senior races should not lead to conclusions. Wise mature races may well have adopted the "Prime Directive" of not interfering with adolescent species, and maintaining interstellar silence.

# In the Meantime

Let's stop using the term "Earthlike" so loosely. **Earth is very special.** It is more than a rocky planet in the "goldilocks zone." We all want to know not only if "life" is common (and how common) in the universe, but also if "sentient life" is common, but as a rule short-lived (for example, dominated by "conservatives" who do not want to bother "conserving.") An alliance of "Earth lovers" and "space lovers" in a Mother Earth/Father Sky alliance could tip the ballance towards longevity of our civilization, and of Earth as a mature life-bearing world.

How many inhabited planets will mature in this way? How many will not? You can bet that the overwhelming majority of planets inhabited long-term will have been wise enough to make the right decisions, guaranting the lognevity of their civilizations. If we do ever find evidence of other civilizations, we can bet that they did take that plunge and become responsible custodians of the planet that gave them birth. ##

## 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: to inspire and involve people everywhere, from all walks of life, to create an expanded Earth-Moon economy that contributes solutions to the major problems that 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

# From Moon Society President Ken Murphy



September has been a Moon-filled month, sporting both International Observe the Moon Night and the Lunar Eclipse for those in the U.S. Board member and COO of Shackleton Energy was on The Space Show to discuss the cislunar econosphere (http://www.thespaceshow.com/detail.asp?q=2555).;

October offers us World Space Week, which this year explores the theme of "Discovery" (http://www.worldspaceweek.org/). One of the things I've long wanted for our website is a monthly calendar featuring space holidays and historical dates, but also accessible to chapters and members to add their own Moonrelated events to the calendar. Conferences and workshops would also be included, with the underlying intent to show the Moon in a much more positive and active light.

I've also wanted to upload some presentations that members could modify for use in their own communities, but have been stymied by upload limits at the website. I've also wanted to create some project pages to allow members to collaborate on projects like our bequest to conduct some Lava Tube Science, or the creation of Moonthemed STEM projects, or a Make-friendly update to our Power-Beaming Demo.

While we've made great strides in the update of our website, and our web committee has done yeoman's work to date, providing a website that can be viewed across any platform. However, we also carry the legacy of large volumes of Moon-related data and writing, and that has proven more problematic.

For past articles, Visit http://www.moonsociety.org/publications/mmm\_classics/ or /mmm\_themes/

# The Moon Society – Lunar Frontier Settlement – www.moonsociety.org p. 2

Given our manpower limitations, the Board and Leadership has decided to secure professional assistance to help us cross the finish line with a tool that will assist us in our projects moving forward.

In the interim, there is a project that The Moon Society can undertake that will be an important contribution to the development of the space industry and advance our efforts towards the Moon. I propose that we work together to prepare a report on the "State of Cislunar Space". This report would provide background on the various domains of activity, from suborbital efforts to near-future Lunar efforts. One thing the report can do is highlight those areas where more work is needed. It will be a comprehensive guide to commercial and other efforts currently being undertaken in near-Earth space, with the intent of showing how important these efforts are, and how they can further contribute to economic growth.

The **general domains** to be covered would be along the lines of:

- Suborbital (focus on microgravity science efforts, address tourism)
- **LEO** (lots of material to cover here)
- **HEO/MEO** (mainly military stuff)
- GEO (an inventory of dead sats would be useful)
- EML-1 (highlight what could be done here, i.e. fuel depots)
- Other EMLs
- Moon

That's a lot to cover, which is why we need all TMS members on deck to help prepare the guts of the report. There has be some particular area for which you'd like to contribute. Together, we can create a reference that will be read around the world at the highest levels of influence. This is one of the best ways that we, The Moon Society, can contribute to space development right now, by providing the definitive reference to the near-future marketplace of cislunar space.

This project, the website issues, other project efforts and more, like the imminent retirement of our MMM editor, will all be addressed in the upcoming **State of The Moon Society** and our upcoming **Annual Meeting** later this year.

In the interim, please let me know what you want from your Moon Society at president@moonsociety.org

# **Note on Kepler Shipyards Crisis**

By Ken Murphy, Moon Society President

On page 6 above, we read of a major setback in the work Paul Graham is doing for the Kepler Shipyards project.

Paul has been a good friend to The Moon Society over the years, sharing booth space at conferences and helping to get the word out about Moon development. Paul's approach at OpenLuna of open-sourcing the hardware designs to provide the broadest possible access to Moon-ready or near-Moon-ready technology. That makes this break-in at Paul's facilities rather troubling. If you believe that you can help him get back on his feet, please contact Paul at the e-mail address above ( paul@openluna.org ) to see if your generosity aligns with his needs for getting things moving again.

Thanks, Ken Murphy.

# To The Stars International Quartely - Resource for MMM Readers

By Peter Kokh

In every MMM, we run a page with **Space News Browsing Links.** In TTSIQ, published Quarterly, you can get brief descripitions and some lead in illustrations on all these stories and more. TTSIQ is a project aimed at international readers and students, and is sponsored by both the Moon Society and by the National Space Society. These publications can be downloaded freely form either of two websites.

www.moonsociety.org/international/ttsiq/ and at: www.nss.org/tothestars/

TTSIQ is published at the beginning of January, April, July, and October

The current issue, TTSIQ #13, is published concurrently with this issue of MMM>

TTSIQ is a great companion to MMM, and we encourage online readers to check it out. Like MMM, it is published in PDF format in color. Unlike MMM, it is not also published in black and white hardcopy to receive in your mailbox. That keeps the cost neglibile. Check out the current issue, TTSIQ #13.

# The Moon Society – Lunar Frontier Settlement – <u>www.moonsociety.org</u> p. 3

# MMM Countdown - Just 11 issues to come before Editor Retires

From Peter Kokh < kokhmmm@aol.com >

As announced last year, I will be stepping down from the role of MMM Editor after 30 years and 301 issues (10 issues a year). No, I am not out of ideas, and I will be contributing an article now and then, possibly one per issue (as long as I am still alive and able, of course.)

The reason I am retiring is that my work on "the Manifesto" (or "Moon Miners" as some call it) has been so time consuming (especially since I took on the **To The Stars International Quarterly** as well) that **it has kept me from another writing project** to which I committed myself way back in September 1961 after an "eureka moment" – in short, my conception of what makes the universe tick, and how that should affect how we approach our daily lives

No more about that at this time. I will have just turned 79 when I retire from MMM, and that carries a big risk, that this "more important project" may never be finished or see the light of day.

# Putting out 20 pages ten times a year is a daunting assignment.

Why 20? There are two editions of each MMM, a printed one in black & white, and a colored PDF file downloadable from the web. It is the print version that sets the limits. The number of pages have to be divisible by 4. MMM print editions are currently **5 sheets**, 17x20 inches – 2 pages per side, 4 pages in all – stapled in the middle. It will be possible to put out shorter editions: 16 pages, 12 pages, 8 pages, 4 pages minimum.

So far we have had one "expression of interest" but from someone with experience in online publications only – where pages and page limits are not a factor – and the total length can vary widely.

Perhaps the Society should be looking for a "Publishing Team" – a divide and conquers approach both to content and assembly.

# Legalities

Legally, the Moon Society and the Milwaukee Lunar Reclamation Society (the actual publisher) signed an agreement that after I retired (or died or became incapacitated) the rights to the name ("Moon Miners' Manifesto") would pass to the Moon Society, provided they found an editor before a year passed. In the event that this does not happen, the rights to the name will pass to The National Space Society, of which I have been a member since 1974, life member #2 (after Wernher von Braun, actually.)

So individual members and/or readers should consider a) taking on the assignment of MMM Editor (with or without a supporting team) or b) of volunteering to be on such a team.

We have just over a year to put something together if the MMM #302 February 2007 issue is to come out on schedule. Remember, MMM comes out 10 times a year, not 12 – that was a decision I made because I chose to use a continuing # system that would tell the reader for how many years (multiples of 10) the publication has been in business. (This arrangement was inspired by a publication to which I had subscribed for many years, **Mother Earth News**) Most importantly, choosing to do just 10 issues a year, none in January or July, gave me 2 breaks a year with time to refresh and avoid burnout.

You can be a member of either the Moon Society or of the National Space Society, preferably of a joint Moon Society/National Space Society chapter that gets MMM.

# Interested? Willing to consider being on an MMM publication team as Editor, or an assistant role?

Send an email to me, Peter Kokh ( <u>kokhmmm@aol.com</u> ) and copy to Moon Society President Ken Murphy <u>murphydyne@hotmail.com</u> and Board Chairman Philip Crume <u>pcrume.moonsociety@gmail.com</u>

And yes, whoever takes over, one person or a team, should feel free to reformat the front page header, change fonts, etc. It will be your baby then. By agreement with the Moon Society (MMM was originally just the publication of the Milwaukee NSS chapter issues #1-89) the centerfold sheet (pp. 9-12) is reserved for the Moon Society

Again, I plan to contribute an article here and there. One an issue? Maybe, but no promises. MMM has been a labor of love for me. I have always had enough article ideas to go "for another two years" – sort of like the New Testament Parable of the Loaves and Fishes.

Feel free to get your fellow chapter members (if you belong to a chapter getting MMM) involved in considering how to carry on MMM into the future. PK

# The Moon Society – Lunar Frontier Settlement – www.moonsociety.org p. 4

# September-October Chapters Doutposts 2015

# **ORGANIZING "OUTPOSTS"**

Bay Area Moon Society, CA Outpost - South San Francisco Bay -

http://www.moonsociety.org/chapters/bams/ Contact: Henry Cates hcate2@pacbell.net Meeting the 1st Tuesday of the Month at Henry's home

Moon Society Nashville Outpost - Contact: Chuck Schlemm - cschlemm@comcast.net

ORGANIZED CHAPTERS (\* Joint chapter of the National Space Socity and of the Moon Society)

\* Milwaukee Lunar Reclamation Society

http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/ - http://www.space-Mlwaukee.com

Contact: Peter Kokh - kokhmmm@aol.com - MEETINGs, 2nd Sat 1-4 pm monthly except July, August, At Mayfair Mall lower level Community room G150 for all meetings except December, in G110: September 12<sup>th</sup> Meeting Report: Our "Pluto-Palooza" Party. Two NSS Sheboygan chapter members joined us. Our next meetings are OCT 10, NOV 19, and DEC 12 (our annual Anniversary Banquet #29) in Room G110

\* Moon Society St./NSS Louis Chapter - <a href="http://www.moonsociety.org/chapters/stlouis/">http://www.moonsociety.org/chapters/stlouis/</a> http://www.meetup.com/Saint-Louis-Space-Frontier-Meetup/

Contact: Robert Perry <a href="mailto:surfer\_bob@charter.net">surfer\_bob@charter.net</a> - <a href="http://stlouisspacefrontier.org/">http://stlouisspacefrontier.org/</a>

We meet the **4th Saturday month** in room 162 of McDonnell Hall of Washington Univ., held jointly with the St. Louis Space Frontier, a chapter of the National Space Society.

On Saturday, August 25<sup>th</sup>, we held a one day "Gateway to Space" event in the Boeing Prologue Room to educate attendees about the significant contributions of McDonnell Aircraft Corporation, McDonnell Douglas, and Boeing to spaceflight; to explore current commercial Space endeavors; and to envision how commercial spaceflight will impact future space colonization.

Upcoming meetings: OCT 24 - NOV 29 - DEC 28

\* NSS/Moon Society Phoenix Chapter - <a href="http://nssphoenix.wordpress.com/">http://nssphoenix.wordpress.com/</a> - c/o Mike Mackowski. <a href="http://www.meetup.com/NSSPhoenix/">http://www.meetup.com/NSSPhoenix/</a> - email: Meeting 3rd Saturdays monthly at Humanist Community Center, Mesa, 627 W. Rio Salado Parkway.

Upcoming meetings: OCT 17 - NOV 21 - DEC 19

\* Tucson L5 Space Society – Now serving Moon Society Members <a href="www.tucsonspacesociety.org/">www.tucsonspacesociety.org/</a> (static page not updated) – <a href="www.meetup.com/NSSPhoenix/events/161939572/">www.meetup.com/NSSPhoenix/events/161939572/</a> (last updated May 2014)

Contact: Al Anzaldua <a href="mailto:info@tucsonspacesociety.org">info@tucsonspacesociety.org</a>

Meets monthly, every 2nd Saturday, 6:30 PM

NEXT: OCT 10 - NOV 14 - DEC 12

In the conference room of the Bay Area Community Center at Clear Lake Park north of NASA Road 1 in Seabrook. Note: The physical address is 5002 NASA Road 1, Seabrook, Texas 77586. View Map. The conference room is located at the East end of the building; from the East parking lot enter the side door and take the first right turn in the hallway. NOTE: There has been some confusion in the past; there are 2 buildings with meeting rooms at Clear Lake Park. The building we are meeting in is NORTH of NASA Road 1, AWAY from the lake. If you are coming from the space center you will turn LEFT at the traffic signal and drive the perimeter road all the way around the baseball fields until you reach the large building at the far north end of the property. After five o'clock or so the main doors in the front of the building may be locked. Enter through the SIDE door in the east end of the building directly across from the parking lot. Take the first right turn in the hallway to get to the conference room. ##

# SEPTEMBER 2015 SPACE NEWS BROWSING LINKS

# SPACE STATIONS + ROCKETS + COMMERCIAL SPACE

 $\underline{www.space.com/30518-spacex-crew-dragon-spacecraft-interior-video.html}$ 

www.space.com/30515-spacex-unveils-the-interior-of-crew-dragon-video.html

www.space.com/30543-jeff-bezos-blue-origin-florida-rocket-launches.html

www.space.com/30557-jeff-bezos-billionaires-private-spaceflight.html

www.space.com/30529-darpa-robotic-space-transportation-hub.html

www.space.com/30539-astronaut-drives-robot-with-the-force.html

www.space.com/30446-nasa-hoverboard-technology-cubesats.html

www.space.com/30466-if-greenland-s-ice-melts-sea-levels-rise-23-feet-video.html

www.space.com/30477-world-view-balloon-flights-cost-sharing.html

www.space.com/23288-space-tourism-balloon-rides-world-view-pictures.html

www.space.com/30431-spacex-falcon-9-rocket-upgrades-next-launch.html

#### moon

www.space-travel.com/reports/Moons\_crust\_as\_fractured\_as\_can\_be\_999.html www.space-travel.com/reports/Russia\_Eyes\_Moon\_for\_Hi\_Tech\_Lunar\_Base\_999.html

#### **MARS**

www.space.com/30403-mars-colonization-interview-stephen-petranek.html

www.space.com/30502-mars-giant-ice-sheet-discovery-mro.html

www.space.com/30487-nasa-hedgehog-robot-space-exploration.html

www.space.com/30519-new-antenna-connects-mars-rovers-to-earth.html

www.marsdaily.com/reports/Sweeping over the south pole of Mars 999.html

www.space.com/30469-nasa-the-martian-movie-mars-exploration.html

www.space.com/30544-astronaut-abby-launches-mars-generation.html

www.space.com/30563-spacex-dragon-mars-landing-images.html

www.space.com/30580-nasa-manned-mars-mission-reality.html

#### ASTEROIDS + COMETS

www.space.com/30487-nasa-hedgehog-robot-space-exploration.html

www.space.com/30582-asteroid-mining-water-propulsion.html

www.space.com/30451-nasa-comet-hitchhiker-concept-mission.html

#### OTHER PLANETS + THEIR MOONS

 $\underline{www.space.com/30419} \\ - \underline{alien-life-search-enceladus-mission}. \\ html$ 

www.space.com/30390-nasa-studies-uranus-neptune-orbiters.html

www.space.com/30517-mercury-spins-faster-than-thought.html

www.space.com/30447-hell-earth-nasa-recreates-venus-extreme-atmosphere.html

www.space.com/30476-nasa-europa-mission-lander-possibility.html

www.space.com/30530-jupiter-moon-io-magma-volcano-mystery.html

www.space.com/30608-mysterious-saturn-hexagon-explained.html

www.nasa.gov/press-release/cassini-finds-global-ocean-in-saturns-moon-enceladus

www.space.com/30598-saturn-moon-enceladus-sample-return-mission.html

www.space.com/30503-pluto-moon-charon-polar-patch.htm

www.space.com/30603-pluto-flyover-video-new-horizons.html

#### ASTRONOMY + ASTROBIOTICS

http://news.sciencemag.org/space/2015/08/where-seti-should-search-intelligent-life

www.space.com/30408-tiny-space-telescope-super-earth-atmospheres.html

www.space.com/30439-alien-oceans-habitable-exoplanets.html

http://www.space.com/30440-tatooine-planets-twin-suns-formation.html

www.space.com/30393-lisa-pathfinder-refine-hunt-gravitational-waves.html

www.space.com/30511-tightly-packed-giant-planets-birth-image.html

www.space.com/30566-alien-civilization-signals-ska-radio-telescope.html

# **EDUCATION + OUTREACH + MEDIA**

www.nasa.gov/press-release/nasa-awards-grants-to-expand-stem-education www.space.com/30602-buzz-aldrin-welcome-to-mars-kids-book.html

For past articles, Visit http://www.moonsociety.org/publications/mmm classics/ or /mmm themes/

# **Moon Society WHITE PAPERS**

The Moon: Why and How we Should Return © 2004

http://www.moonsociety.org/publications/mmm papers/moonreturn positionpaper.htm

The Hubble Space Telescope and the Future of Space-Based Astronomy in the Light of a Return to the Moon © 2004

http://www.moonsociety.org/publications/mmm papers/hubble positionpaper.htm

\_\_\_\_\_\_

# MMM PAPERS

"Spinning Up" Glass-Glass Composites Technology © 1987

http://www.moonsociety.org/publications/mmm\_papers/glass\_composites\_paper.htm

MUS/cle Strategy for Lunar Industrial Diversification © 1988

http://www.moonsociety.org/publications/mmm\_papers/muscle\_paper.htm

PRINZTON: A Rille-Bottom Settlement for Three Thousand People © 1989

http://www.moonsociety.org/publications/mmm\_papers/rille\_paper1.htm

http://www.moonsociety.org/publications/mmm\_papers/rille\_paper2.htm

http://www.moonsociety.org/publications/mmm papers/rille paper3.htm

http://www.moonsociety.org/publications/mmm papers/rille paper4.htm

http://www.moonsociety.org/publications/mmm papers/rille paper5.htm

http://www.moonsociety.org/publications/mmm papers/rille paper6.htm

Extending the System of Lunar Nomenclature © 1989

http://www.moonsociety.org/publications/mmm papers/lunar nomenclature.html

The Lunar Hostel: An Alternate Concept for First Beachead and Secondary Outposts © 1991

http://www.moonsociety.org/publications/mmm\_papers/hostels\_paper1.htm

http://www.moonsociety.org/publications/mmm papers/hostels paper2.htm

"The Frontier Builder" An Earth-Moon Hotel Cruise Ship: Definition & Design Exercise © 1992

http://www.moonsociety.org/publications/mmm\_papers/transitel.htm

http://www.moonsociety.org/publications/mmm papers/transitel 2.htm

Research Goals for the next 5, 10, and 20 years: a proposal for Space Studies Institute © 1993

http://www.moonsociety.org/publications/mmm\_papers/ssi\_goals.htm

Railroads on the Moon © 1993

http://www.moonsociety.org/publications/mmm\_papers/rr\_moon.htm

The Prehistory of Lunar Prospector © 1995

http://www.moonsociety.org/publications/mmm papers/lp prehistory paper.htm

The Potential of Lunar Lavatubes © 1996

http://www.moonsociety.org/publications/mmm\_papers/lavatubes\_ccc.htm

Reinventing Space Settlements © 1996

http://www.moonsociety.org/publications/mmm papers/reinv so.htm

Rehabilitating Venus as a Human Destination © 1992, 1998, 2000

http://www.moonsociety.org/publications/mmm\_papers/venus\_rehabpaper.htm

Living "Off the ice" on Europa © 1997, 1998, 2001

http://www.moonsociety.org/publications/mmm papers/europa outpost paper.htm

What do Lavatubes Look Like? © 1999

http://www.moonsociety.org/publications/mmm papers/lavatube pix.htm

TransHab and the Prehistory of its Architecture © 1999

http://www.moonsociety.org/publications/mmm\_papers/transhab.htm

Steps to Civilian Lunar Home Rule Authority © 1999

http://www.moonsociety.org/publications/mmm\_papers/homerule\_paper.htm

The "MarsPulse" Calendar © 1999, 2004

http://www.moonsociety.org/publications/mmm papers/marspulse cal.html

Improving" the Moon and The Developer's Role © 2000

http://www.moonsociety.org/publications/mmm\_papers/improving\_moon\_paper.htm

#### Habitat Structures on Moon & Mars © 2002

http://www.moonsociety.org/publications/mmm\_papers/habitatmoonmars\_1.htm

http://www.moonsociety.org/publications/mmm papers/habitatmoonmars 2.htm

http://www.moonsociety.org/publications/mmm\_papers/habitatmoonmars\_3.htm

http://www.moonsociety.org/publications/mmm\_papers/habitatmoonmars\_4.htm

http://www.moonsociety.org/publications/mmm\_papers/habitatmoonmars\_5.htm

Adopting a Lunar Calendar © 1987, 1996, 2001, 2005

http://www.moonsociety.org/publications/mmm\_papers/mooncalendar\_paper.htm

The Outpost Trap: Technologies Needed to Break Free © 2006

http://www.moonsociety.org/publications/mmm\_papers/outpost\_trap.html

Beyond Our First Moonbase (pdf file) © 2006

http://www.moonsociety.org/publications/mmm\_papers/beyond\_moonbase\_1.pdf

What a Lunar Analog Research Station Should Attempt to Demonstrate  $\ensuremath{\mathbb{C}}$  2006

http://www.moonsociety.org/publications/mmm papers/lunar analog goals.html

Assuring Mental Health Among Future Lunar Frontier Pioneers © 2008

http://www.moonsociety.org/publications/mmm\_papers/pioneer-mental-health.html

MMM Glossary of New Words and Old Words with New Meanings © 2009

http://www.moonsociety.org/publications/m3glossary.html

\_\_\_\_\_\_

# **Vector Pages - one page introductions** to key topics

Art - Lunar bases Thumbnail Gallery - http://www.moonsociety.org/art/

<u>Asteroids</u> - The Moon and Asteroids - <a href="http://www.moonsociety.org/asteroids/">http://www.moonsociety.org/asteroids/</a>

Flag - A Flag for the Moon? A Flag for the Moon Society? - http://www.moonsociety.org/flag/

<u>Humor</u> - Work in Progress - <a href="http://www.moonsociety.org/humor/">http://www.moonsociety.org/humor/</a>

Mars - The Moon and Mars. How the Red Planet Fits In - http://www.moonsociety.org/mars/

<u>Research</u> - Encouraging Needed Research - <a href="http://www.moonsociety.org/research/">http://www.moonsociety.org/research/</a>

<u>Tourism</u> - The Moon and Space Tourism - <a href="http://www.moonsociety.org/tourism/">http://www.moonsociety.org/tourism/</a>

\_\_\_\_\_\_

#### **Select Presentations** (in pdf format)

http://www.moonsociety.org/presentations/pdf/Artemis\_Sim-1b.pdf

http://www.moonsociety.org/presentations/pdf/Environment-Space.pdf

http://www.moonsociety.org/presentations/pdf/LunarFrontierPainting.pdf

http://www.moonsociety.org/presentations/pdf/SkylightExplorer.pdf

http://www.moonsociety.org/presentations/pdf/Triway1.pdf

http://www.moonsociety.org/presentations/pdf/UsingMoonRockstoSavetheEarth.pdf

http://www.moonsociety.org/presentations/pdf/lunar\_surface\_ease.pdf

http://www.moonsociety.org/publications/papers/NationalParkSystem.pdf

# The MMM Classics - Each year's collected articles

(with a 2-3 year delay in publication)

http://www.moonsociety.org/publications/mmm\_classics/

# The MMM Theme Issues - Collections of articles by Themes

http://www.moonsociety.org/publications/mmm themes/

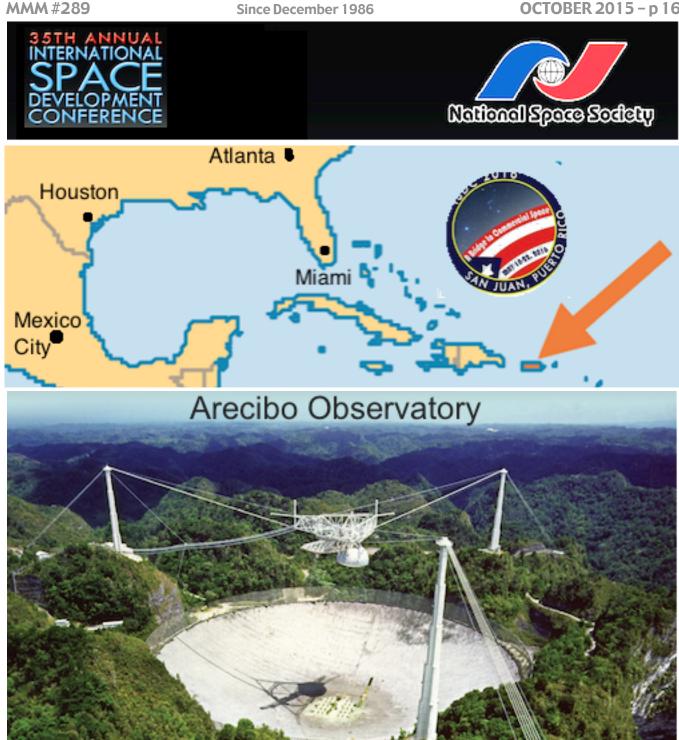
\_\_\_\_\_\_

**MMM Glossary:** Old words with new meanings, & new words coined when no existing word will fit" <a href="http://moonsociety.org/publications/m3glossary.html">http://moonsociety.org/publications/m3glossary.html</a>

MMM Cue Images: A selection of images, some from past issues of Moon Miners Manifesto, and others especially created as teaser pointers to ideas and concepts found in MMM through the years.

http://moonsociety.org/publications/cue images.html

For past articles, Visit http://www.moonsociety.org/publications/mmm\_classics/ or /mmm\_themes/



A Bridge to Commercial Space - May 18-22, 2016 **Sheraton Pureto Rico Hotel & Casino** San Juan, Puerto Rico

If you have never been to Puerto Rico, this is your chance to see an island of legendary beauty, history, scenery, and rich culture - including a visit to the famous Areceibo Radio Telescope. This is a temptation not to resist! You dersrve it! Plan now! -http://isdc.nss.org/2016

# **NSS Chapters that share Moon Miners' Manifesto**





Space Chapter Hub Project Menus Unlimited <a href="http://nsschapters.org/hub/projects.htm">http://nsschapters.org/hub/projects.htm</a>

WISCONSIN



# MLRS - Milwaukee Lunar Reclamation Society

PO Box 2101, Milwaukee, WI 53201 - <a href="http://www.moonsociety.org/chapters/milwaukee/">www.space-Milwaukee, WI 53201 - <a href="http://www.moonsociety.org/chapters/milwaukee/">www.space-Milwaukee, WI 53201 - <a href="http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/">www.space-Milwaukee, WI 53201 - <a href="http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/">www.space-Milwaukee, WI 53201 - <a href="http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/">www.space-Milwaukee, WI 53201 - <a href="http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/">www.space-Exploration-Meetup/</a></a>

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

PRESIDENT/MMM EDITOR • Peter Kokh NSS 414-342-0705 - kokhmmm@aol.com VICE-PRESIDENT Doug Armstrong NSS (414) 273-1126 - SECRETARY - Charlotte Dupree NSS (262) 675-0941 grdupree@charter.net

• <u>James Schroeter</u> (414) 333–3679 – <u>james\_schroeter@yahoo.com</u> TREASURER/Database • <u>Robert Bialecki</u> (414) 372–9613 – <u>bobriverwest@yahoo.com</u> (• Current Members of the MLRS Board of Directors)

2015 Meeting Schedule: in room G150 for all meetings except December, in G110: OCT 10, NOV 14, DEC 12 Will Foerster and Al Zeliske (Sp?) of the Sheboygan Chapter joined us for our September 12th Pluto meeting

WISCONSIN



# SSS - Sheboygan Space Society 728 Center St. Kiel, WI 54042-1034

www.sheboyganspacesociety.org c/o Will Foerster 920-894-1344 (h) astrowill@frontier.com SSS Sec./Tres. c/o B.Pat Knier <a href="mailto:dcnpatknier@gmail.org">dcnpatknier@gmail.org</a>

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

2015 MEETINGS: OCT 15 - DEC 12 (2<sup>nd</sup> SAT in Milwaukee)

Will Foerster & Al Zeliske took in the September 12th "Pluto Palooza" meeting in Milwaukee

CALIFORNIA



OASIS: Organization for the Advancement of Space Industrialization & Settlement Greater Los Angeles Chapter of the National Space Society PO Box 1231, Redondo Beach, CA 902

Events Hotline/Answering Machine: 310-364-2290 - Odyssey Ed: Kat Tanaka <u>odyssey\_editor@yahoo.com</u> <u>oasis@oasis-nss.org</u> - Odyssey Newsletter <u>www.oasis-nss.org/articles.html</u>

Regular Meeting 3 pm 3<sup>rd</sup> SAT monthly - 2015 SCHEDULE; OCT 17, NOV 21, DEC 19

COLORADO



DSS: Denver Space Society fka Front Range L5
1 Cherry Hills Farm Drive, Englewood, CO 80133
http://www.denverspacesociety.blogspot.com/

Eric Boethin 303-781-0800 <a href="mailto:eric@boethin.com">eric@boethin.com</a> - Monthly Meetings every 3rd Thursdays, 7 pm Englewood Public Library, Englewood, CO 80110 - 1000 Englewood Parkway, First Floor Civic Center 2015 MEETINGS: = Oct. 15, Nov. 19, Dec. 17

For past articles, Visit <a href="http://www.moonsociety.org/publications/mmm\_classics/">http://www.moonsociety.org/publications/mmm\_classics/</a> or /mmm\_themes/

ILLINOIS



LDAhean@aol.com

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



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

MNSFS monthly meetings are held on the first Thursday of each month at the Fairview Community Center (Great Room), 1910 County Road B West, in Roseville, MN 55113 Meetings usually start at 7:00 p.m. and last about two hours. Each meeting features Board member introductions, general announcements,

OREGON



Oregon L5 Society - <a href="http://www.OregonL5.org">http://www.OregonL5.org</a> PO Box 86, Oregon City, OR 97045

2015 Meeting Schedule: October 17, November 21

Pearson Air Museum at Fort Vancouver National Historic Site, 1115 E. Fifth St, Vancouver, WA
From I5 take the Mill Plain Blvd. exit and head east, Turn right onto Fort Vancouver Way
Turn left when it dead ends at Fifth. Come Early and Enjoy the Museum The Pearson Air Museum is an operational preserved aerodrome and part of the Fort Vancouver National Historic Site of the National Park Service.

**Ongoing activities:** We continue to manage **NSS in Second Life** for the National Space Society, with public meetings every week on Monday at 15:00 Second Life Time (= Pacific Time) with participants from US, Brazil, England, France, and other points world-wide.

PENNSYLVANIA



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

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

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

The NSSPASA Report for September 2015

And: More on the Mars Society Conference and Franklin Institute Event

There were a number of great things at the Mars Society conference that Michelle and Earl attended in August beyond what was reported previously: people at the event were also interesting to talk to in their own right. As we were relaxing during the conference breaks we met a young women, Etsuko, who was a contestant for a seat on the Mars One space flight. This is the "go and stay" program (another is a circumnavigation flight). We got to talk to Etsuko for about a half an hour and learned of her varied path to this point: she was a software engineer in Japan for 20 years, and currently works in Mexico teaching authentic Japanese cooking! Next stop Mars? Bas Lansdorp is the President & founder of this effort and was principal speaker, and debater, at the conference in trying to convince advocates and donors to support it. The launch for this flight is supposed to happen in 2018 and paying for it is a paramount requirement now (see the website).

The Mars Society allowed NSS to have an information/outreach table at the conference. David Cawoood and Donnie Lowther (president of Washington chapter) talked to the attendees about the NSS and its' activities including political outreach and public event outreach. They brought some of their props for outreach that included "Space Bricks" and "soil stimulants" for Mars and the Moon. David has also been in the video production business and can be found at <a href="mailto:AroundSpaceTV@yahoo.com">AroundSpaceTV@yahoo.com</a>, and, <a href="mailto:DavidCawood@rcn.com">DavidCawood@rcn.com</a>. They had a giveaway on spectroscopy, created by David, and, material on the recent Pluto flyby. We also got to talk to writer "Andy", Adrianne Mac Lean as well as Joe, an acquaintance of Michelle's who informed us of the Starship conference (The ICARUS Starship) in Philadelphia in September. Also to be noted: Bruce Mackenzie has asked for help to work on the problems of

printing habitats on Mars. Contact him at <a href="mailto:BMackenzie@alum.mit.edu">BMackenzie@alum.mit.edu</a>. Bruce is a long time Mars advocate and is an affiliate of: The Mars Foundation, part of The Mars Society Steering Committee, and WPI.

**Meeting times and locations:** October 17 at Liberty One's food Court on the 17<sup>th</sup> street side of the Court. In November we will meet on Saturday the 21<sup>st</sup> at the Crowne Plaza, at the restaurant in the hotel, for our annual dinner meeting. The event is Philcon and we will offer our help for it's various talks and programs. The Con runs from the 29th to the 22nd. Check out our, and there, websites for more. Our December meeting will be at our regular location, The Food Court, on the 17th.

Our September meeting: Dorothy and Larry were off at a family event. Mitch reported first that he likes the new card that Larry designed, and used it as a springboard to a new membership card in the same size format (for portability). This is a way to show others our membership. At one time we had a members discount at a bookstore/coffee shop if we showed the card that we used to have. Mike Fisher, who does a lot of volunteer work for the Carver Science Fair, arranged that.

Mitch is going to do public outreach in the next month at two locations: he has an arrangement to do this at the University of Pennsylvania and is finalizing one with Drexel University. These will be weekday events so that some of our central Philadelphia residents will work with Mitch. The object is to talk to returning college students when they will be on campus. He also discussed a speaker that had been at the Free Library in June who had explained some of the words used in space exploration. His definitions included the location the space station as being in low Earth orbit (in the 230 to 250 mile range) avoiding The Van Allen Belt(s). From Ad Astra: the NASA 3D "Printed Habitat Challenge". Registration ends on September 26<sup>th</sup> so on line readers of this report could still try for this \$2.25 million competition. See <a href="http://americamakes.us/Challenge">http://americamakes.us/Challenge</a>. There will be 30 top entries picked in the first phase (prize to be given at the World Maker Faire in New York (Sept. 26 and 27th), and, one of the contestants will receive a \$50,000 prize for their design concept. The second phase is broken into two parts and the prizes are over a million dollars each. There are two competitions: The Structural Member Competition, and, The On-Site Habitat Competition. Go to the website for details.

Two of the many intereting articles in this issue of **Ad Astra:** Clifford McMurray interviewed Dr. Alan Stern, Principal Investigator, for the New Horizons mission to Pluto, and, Hayabusa2. This craft will rendezvous with asteroid 1999 JUS. This will occur in 2018 and it is a sample return mission like the original Hayabusa mission.

Earl reported on several publications and the Mars Society Conference noted above: from The Amsat Journal for July/August: there were several reports on ongoing projects and opportunities. There is a chance to revive the P3E satellite with its powerful communications enabling equipment. It had been shelved during the economic downturn and legal changes associated with 9/11 about a decade ago. See the Amsat –DI (German developers of the spacecraft to be used for science experiments and "ham" radio) and the Amsat–NA Journal. Also reported is the development of several CubeSats including one now designated Fox 1 "Cliff" that will be launched during the 2015/2016 period. The Cliff designation is in honor of one of the Amsat members who was instrumental in promoting the development of CubeSats at Cal Poly and worked on Oscar and Amsat projects for many years. Cliff Buttschardt, and his wife Mable Vierthaler, have both passed away and have designated Amsat as one of two groups to receive substantial monies. This came as a surprise to the Amsat Board.

And much more. Due to the quantity of material in the NASA Medical Design Briefs for September, both for specific applications like "Wireless Implant Could Deliver Drugs by Remote Control" (pg. 44) to the R&D Roundup Section with "Smart Patch Releases Insulin When Necessary" (p. 42) to "Live-Cell Microscopy and Traction Force Measurements with Simulated Microgravity"Clinochip"" (p. 52) I advised going to the medical designbriefs.com website.

Hank Smith brought Philcon material on the Principal Speaker, Wen Spencer (fantasy author of the EIFHOME series among others, and, a John W. Campbell Award Winner). He says that things are moving forward at PSFS, but, that the hotel will be the same next year apparently. A new feature of the event is "The Time Traveler's Masquerade Ball". Dorothy and Larry have contacted the Philcon Operations people and we will have an outreach table.

Steve, an Associate Member, commented on the continued release of pictures of Pluto. These releases will keep coming with the download of the data from New Horizons. It was the clarity of the images, allowing better analysis of mountain ranges and other structures, that impressed him.

And finally: We were invited to The Franklin Institute on August the 29th for . We were given a location in The Space Command Center adjacent to the Planetarium. Thanks to Derrick Pitts invitation we had a great time doing public outreach to an audience interested in space and space exploration. Our new business card was well accepted by the general public and our exhibits were a hit. Frank brought the Apollo Guidance Computer and he and Derrick talked at length. Many people stopped to hear about where much of our, now everyday, technology was conceived. And Mitch had his past, present, and future display books that he created that includes Apollo era material. Earl brought several versions of the Lunar Lava tube Display and added a section on powering nano space probes to that hand out. A number of our people were able to volunteer and give visitors different aspects of why they are involved in promoting space exploration and the educated populous that such an endeavor requires. Hank Smith, Wallace Kemp, Steven, and, Dennis Pearson came to perform outreach at this fun event. Earl emet a young man whose design for a tool was accepted in a NASA 3D printer contest! Earl brought some CubeSat models to emphasize why NASA is planning to 3D print there structural elements (only at this time) in space: using a scale and some imagination the benefits of building low mass, low strength required structures was discussed. Kids liked the idea.

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



PRSRT STD U.S. POSTAGE PAID MANASOTA FL PERMIT No. 802

Please renew promptly so as not to miss an issue Address Service Requested -->> Mail Carrier, Time Sensitive Material

# INDEX to MMM #289 October 2015

#### **Feature Articles**

2 In Focus: New Companies, Forces, Plans that could Accelerate the Future - Peter Kokh

- 3. The Moon: a Better Way to a Closer View Dave Duca
- 4. Kepler Shipyards: an Innovative new force that could reshape the future
- 6. Kepler Shipyards: a sudden setback, but determined to continue

While on things "Kepler" - Kepler Space Telescope Findings to date - Peter Kokh

7.Early Conclusions from Kepler Telescope Findings - Peter Kokh

#### **Moon Society Journal Section**

9. The President's message

---

13. Browsing Links - Video Links

16: ISDC 2016 San Juan, Puerto Rico

10. MMM Countdown - Just 11 issues before editor retires

12. Chapter & Outpost News

14. MMM Resources

17. NSS-MMM Chapter News

CHAPTER MEMBER DUES -- MMM Subscriptions: Send proper dues to address in chapter section

CHICAGO SPACE FRONTIER L5 ● \$15 annual dues

MILWAUKEE LUNAR RECLAMATION SOC. ● \$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/teacher/friend • \$1/extra family member Individual Subscriptions outside participating chapter areas: • \$15 USA • \$25 Canada;

• US \$55 Surface Mail Outside North America - Payable to "MLRS", PO Box 2102, Milwaukee, WI 53201

For past articles, Visit <a href="http://www.moonsociety.org/publications/mmm\_classics/">http://www.moonsociety.org/publications/mmm\_classics/</a> or /mmm\_themes/