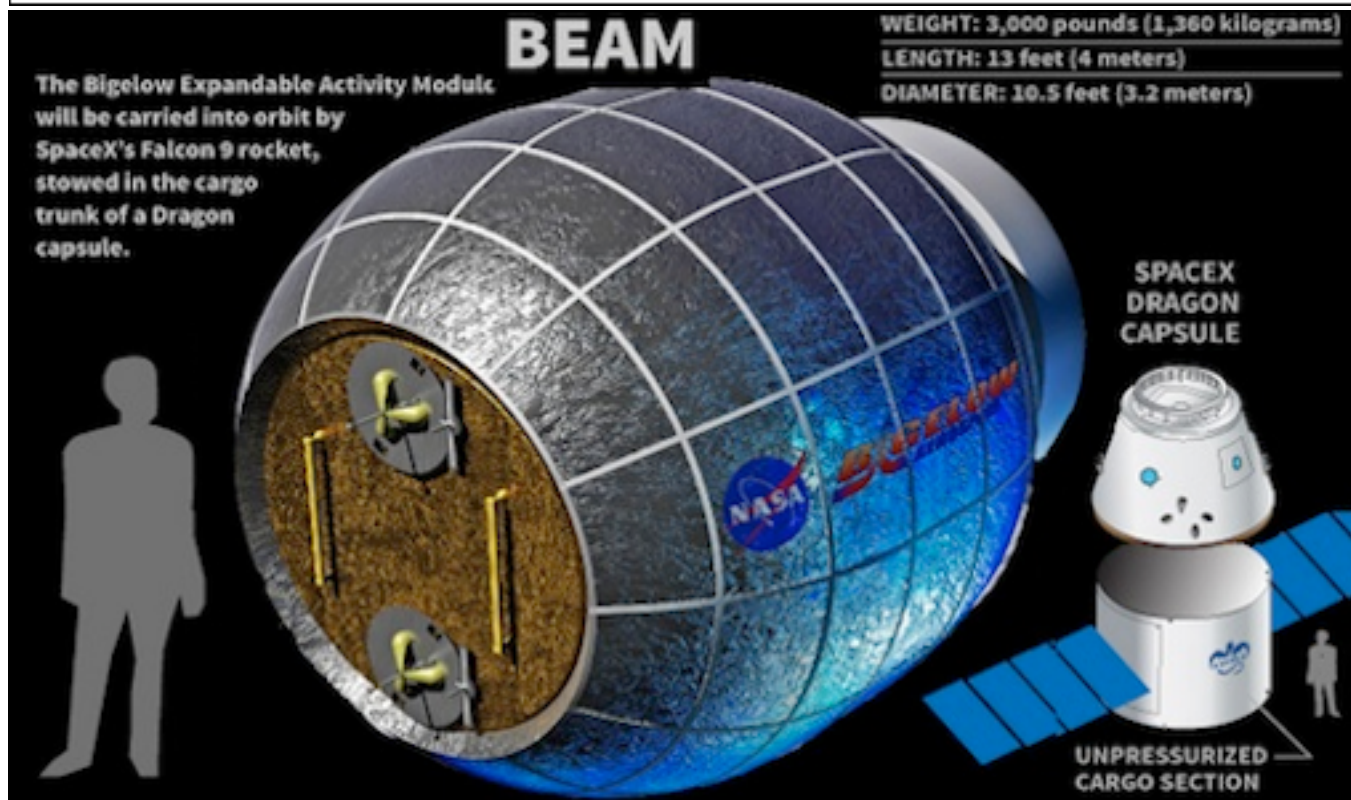


**"Towards an Earth-Moon Economy – Developing Off-Planet Resources"**

# Moon Miners' Manifesto

& The Moon Society Journal

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

ABOVE: The Bigelow Expandable Activity Module – BEAM – to be added to the International Space Station in 2015.

## Feature Articles: Note: This issue completes MMM's 28th Year

2. In Focus: **ISS Neglected Research:** We welcome more Space Stations – by Peter Kokh
4. We Need More Good & Realistic Moon and Mars Outpost and Settlement **Art** – by Peter Kokh
5. **Shielding:** "The Good, the Bad, the Ugly" > "The Drab, the Nice, the Beautiful" – by Peter Kokh



Moonbase Alpha - Space 1999



Above: Three examples of what outposts and settlements on the Moon and Mars will **NOT** look like: They are portrayed "unshielded" and fully exposed to both cosmic radiation and hot and cold extremes.

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



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

- **MMM's VISION:** “expanding the human economy through off-planet resources”; early heavy reliance on Lunar materials; early use of Mars system and asteroid resources; and permanent settlements supporting this economy.
  - **MMM's MISSION:** to encourage “spin-up” entrepreneurial development of the novel technologies needed and promote the economic–environmental rationale of space and lunar settlement.
  - **Moon Miners' Manifesto CLASSICS:** The non-time-sensitive articles and editorials of MMM's first twenty years plus have been re-edited, reillustrated, and republished in 23 PDF format volumes, for free downloading from this location: [http://www.MoonSociety.org/publications/mmm\\_classics/](http://www.MoonSociety.org/publications/mmm_classics/)
  - **MMM THEME Issues:** 14 collections of articles according to themes: [.../publications/mmm\\_themes/](http://www.moonsociety.org/publications/mmm_themes/)
  - **MMM Glossary:** new terms, old terms/new meanings: [www.moonsociety.org/publications/m3glossary.html](http://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 [secretary@moonsociety.org](mailto:secretary@moonsociety.org) 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 <http://www.moonsociety.org>. You can also read **Ad Astra** magazine mailed to **National Space Society** members.
  - **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 (202) 429-1600 – [www.NSS.org](http://www.NSS.org)
  - **The Moon Society** seeks to overcome the business, financial, and technological challenges to the establishment of a permanent, self-sustaining human presence on the Moon.” – Contact info p. 9.
  - **NSS chapters and Other Societies** with a compatible focus are welcome to join the MMM family. For special chapter/group rates, write the Editor, or call (414)-342-0705.
  - **Publication Deadline:** Final draft is prepared ASAP after the 20th of each month. Articles needing to be keyed in or edited are due on the 15th, Sooner is better! – **No compensation is paid.**
  - **Submissions by email** to [KokhMMM@aol.com](mailto:KokhMMM@aol.com) – Email message body text or MS Word, Text files, and pdf file attachments or mailed CDs, DVDs, or typed hard copy [short pieces only, less than 1,000 words] to:  
Moon Miners' Manifesto, c/o Peter Kokh, 1630 N. 32nd Street, Milwaukee, WI 53208-2040
- 

## In Focus International Space Station shortcomings and the future

By Peter Kokh

### From first request in 1985 through construction 1998 through present

Space advocates worked hard to get Congress to agree to put up a U.S. Space Station: a controversial issue that passed by just one vote. Zarya, the first ISS module, contributed by Russia, was launched by a Russian Proton on 20 November 1998. The STS-88 Endeavor shuttle mission followed two weeks after Zarya was launched, bringing the American Unity module, the first of three node modules, and connecting it to Zarya.

The ISS consists of 15 pressurized modules: seven US modules (Destiny, Unity, Quest, Tranquility, Harmony, Cupola, and Leonardo), five Russian modules (Zarya, Zvezda, Pirs, Poisk and Rassvet), two Japanese modules (the JEM-ELM-PS and JEM-PM) and one European module (Columbus). The Bigelow Expandable Activity Module – BEAM – to be added next year in 2015. One more Russian pressurized module, Nauka, a Multipurpose Laboratory Module is scheduled to be added to the station in 2017.

Video of ISS Expansion, module by module – <http://www.youtube.com/watch?v=yRqUPjI3tTQ>  
[http://en.wikipedia.org/wiki/Assembly\\_of\\_the\\_International\\_Space\\_Station](http://en.wikipedia.org/wiki/Assembly_of_the_International_Space_Station)

### Unfulfilled Expectations: Modules, Supported Activities

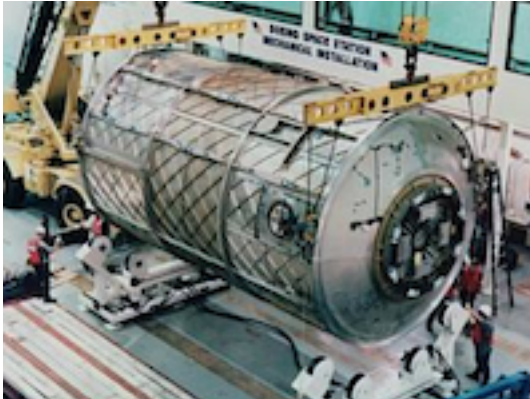
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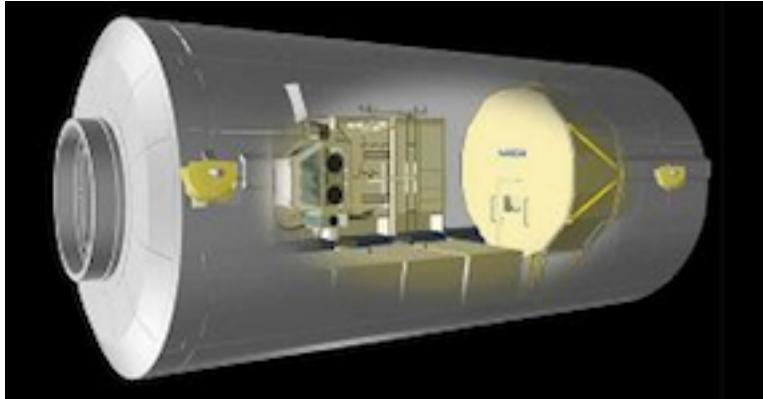
Among proposed modules that have not been added, are the following:

- **Habitation Module HAB** – [http://en.wikipedia.org/wiki/Habitation\\_Module](http://en.wikipedia.org/wiki/Habitation_Module)

With the cancellation of the Habitation Module, sleeping places are now spread throughout the station. There are two in the Russian segment and four in the US segment. It is not necessary to have a separate 'bunk' in space — visitors just strap their sleeping bag anywhere, get into it and sleep.



Left: Habitation Module

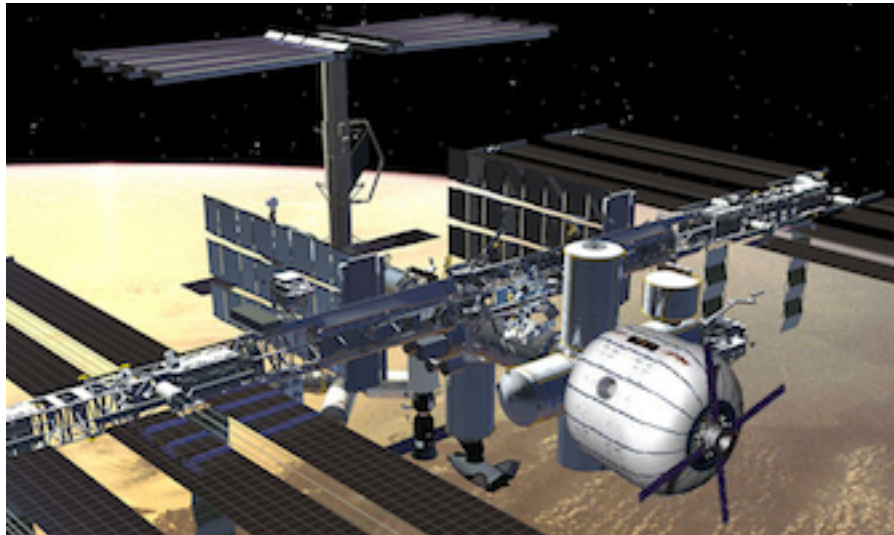


Right: Centrifuge Accommodations Module

**The biggest disappointment:** NASA could/should have ordered the larger Bigelow Inflatable Module, and has now considerably limited the research that could have been done

### BEAM: Bigelow Expandable Activity Module vs. Bigelow 330

<b>Mass:</b>	1,360 kg (3,000 lb)	20,000 kg (43,000 lb)	14.7 times heavier
<b>Length:</b>	13 ft (4 m)	44.9 ft (13.7 m)	3.45 times longer
<b>Diameter:</b>	10.5 ft (3.2 m)	22.0 ft 6.(7 m)	2.09 times wider
<b>Living volume:</b>	565 cu ft (16 m <sup>3</sup> )	11,654 cu ft (22.0 m <sup>3</sup> )	20.6 times more volume



Bigelow 330 as it would have looked attached to the International Space Station

<http://moonandback.com/2013/01/16/nasa-to-test-bigelow-expandable-module-on-space-station/>

- A Larger inflatable module would have allowed experimentation with Zero-G sports and exercise, even "dancing" – possibly increasing public interest in future orbital hotels
- An artificial gravity module or annex: Lunar & Martian Gravity Levels. plants <, animals <, people < (Centrifuge Habitation Module (CAM) – [http://en.wikipedia.org/wiki/Centrifuge\\_Accommodations\\_Module](http://en.wikipedia.org/wiki/Centrifuge_Accommodations_Module) (would have been attached to Harmony (Node 2)

### Decommissioning ISS in 2020 2024

- It will go down in history as a "crime against the future" perpetrated by NASA in forcing Russia to deorbit Mir when it could have been boosted to a higher stable orbit to serve as the first International Space "Monument."
- On decommissioning, ISS Modules should be offered free (or at 'clearance prices' to other space-faring nations and to commercial interests for use in starting up commercial space stations or hotels ##

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



## We Need More Realistic Art Work of Moon & Mars Outposts & Settlements

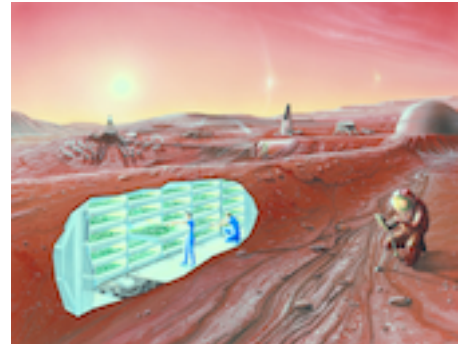
By Peter Kokh

There is all too much artwork out there depicting Moon and/or Mars outposts in which habitat and activity structures are shown in the open, unprotected from cosmic radiation and meteorite rain, exposed to temperature extremes. This continues to reinforce false impressions of Lunar and Martian environments.

We need to show structures covered with several meters of shielding – moondust or marsdust either directly or indirectly: (the habitat structures are within/under a shielded “hangar” so that their interconnections can be rearranged and so that access to external fittings is easy.



**Good Examples: shielding applied in various methods**



We propose that the Moon Society and National Space Society hold an art contest with attractive prizes.  
Submitted Art work to be shown at ISDC 2015 Toronto, May 20–25, 2015

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



## SHIELDING: “The Good, the Bad, the Ugly” > “The Drab, the Nice, the Beautiful”

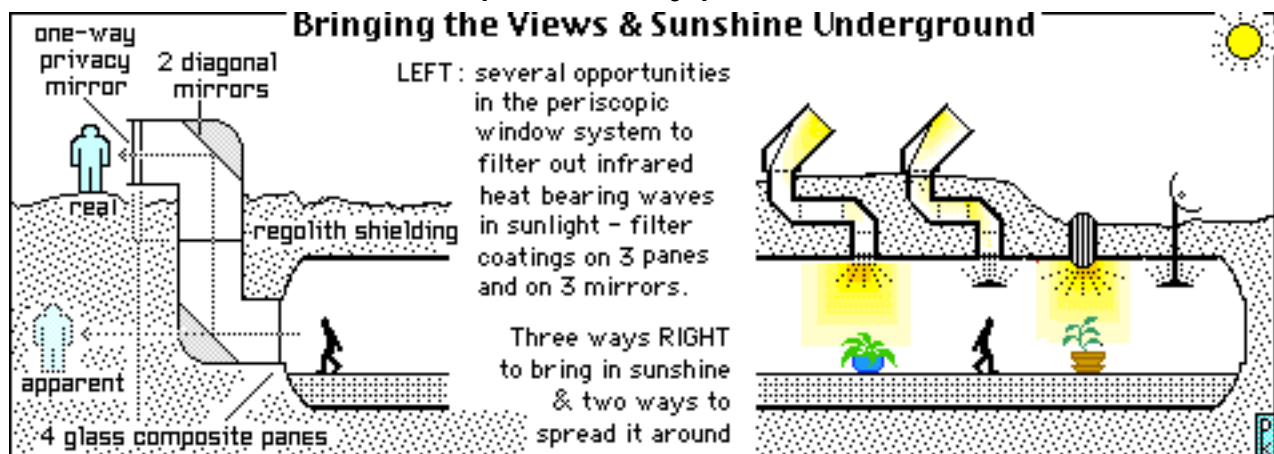
By Peter Kokh

### Shielding” need not be boring

- Landscape architects” will have plenty of leeway for a homeowner that wants his/her abode to stand out and be distinctive, or who just wants to be able to spot it from outside.
- Moondust from other areas may have various shades and tones
- Moondust piles can be “retained” and/or shaped by retaining walls of various kinds
- Retaining walls can mirror the architecture of the covered residence or other type of building
- The top cover can be **adorned** – “finished” in various ways:
- **Stones, broken glass or ceramics** – be inventive.
- Using regolith “soils” from various locations can provide various tints and shadings
- Areas around the base can be kept natural, or “Zen raked,” or “paved,” or decorated with sculptures.
- The **underlying architecture** of the modules being shielded – habitats, corridors, pressurized streets, parks, etc. will add design and pattern automatically
- There is plenty of room to express individuality, personal tastes, period styles, etc.
- New ways to personalized shielding mounds will be pioneered by individuals and by “mound-scaping” companies

**Future Lunar and Martian “Shielding Engineers” and “Architects”  
will be more inventive than these sketches by the editor suggest**

Having to live “underground” does not mean that you cannot see outside  
or that you cannot enjoy the sunshine!

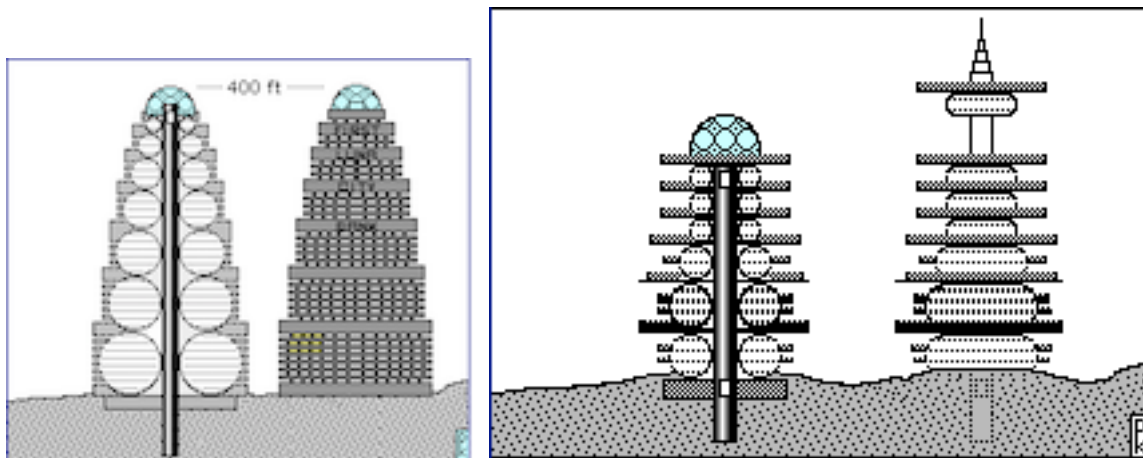


A shielded home can still have access to the view outside and to sunlight

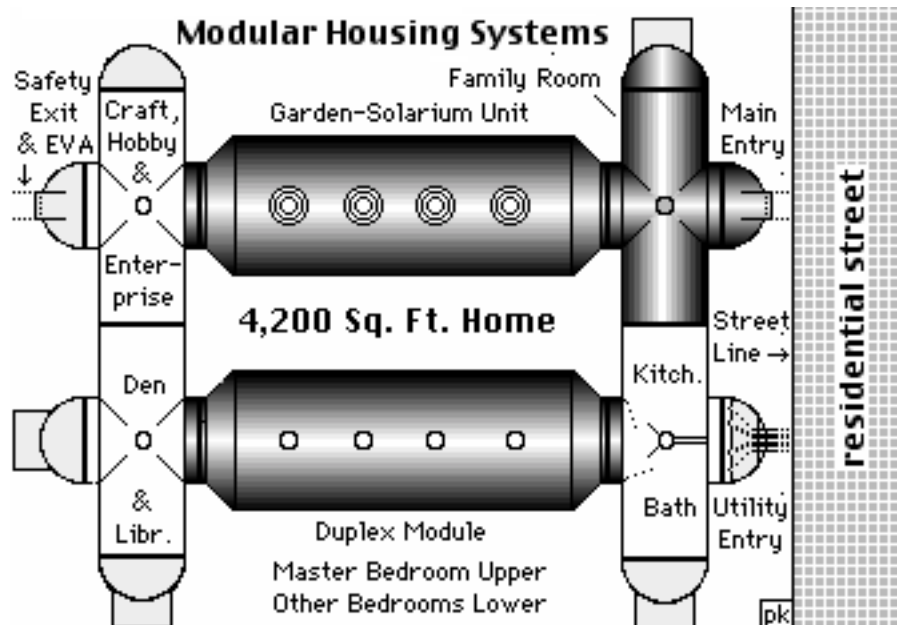


The hotel proper consists of a stack of increasingly smaller torus ring levels. Exterior shielding is restrained by cast cement or basalt walls. The (blue) interior space is a tree, plant, and wildlife park.



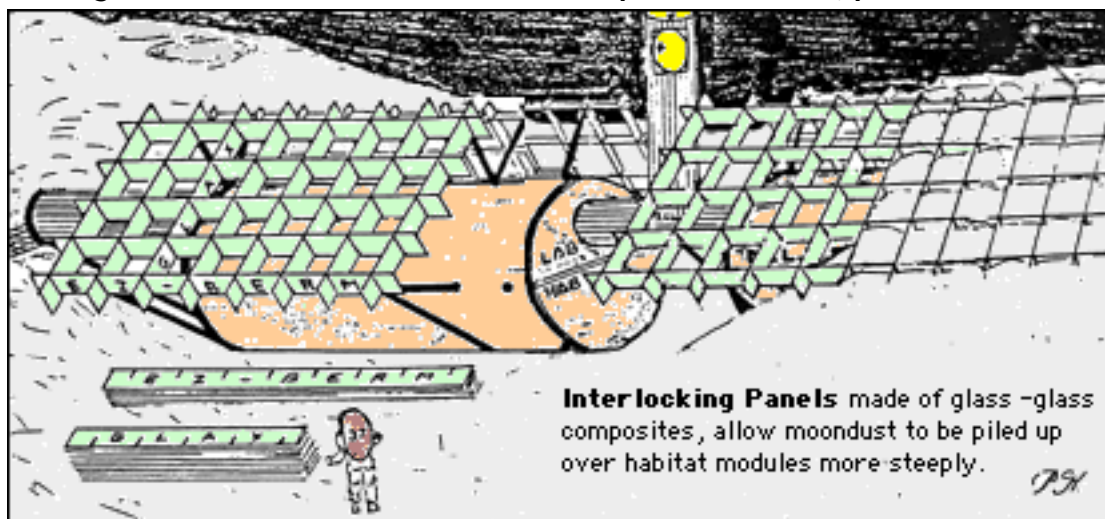


Two other fully shielded “SpaceScrapper” Designs – Many options to “break” the “mound trap”



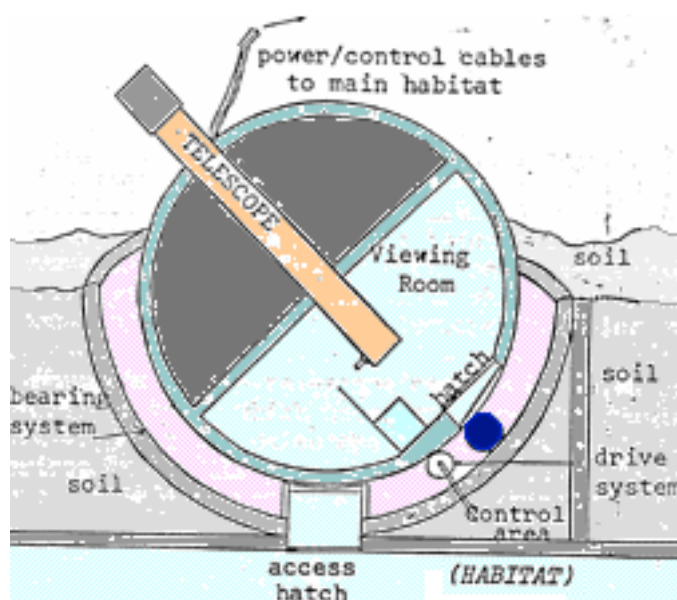
One of an indefinite number of modular home designs

Shielding mounds will not be a case of “when you’ve seen one, you’ve seen them all.

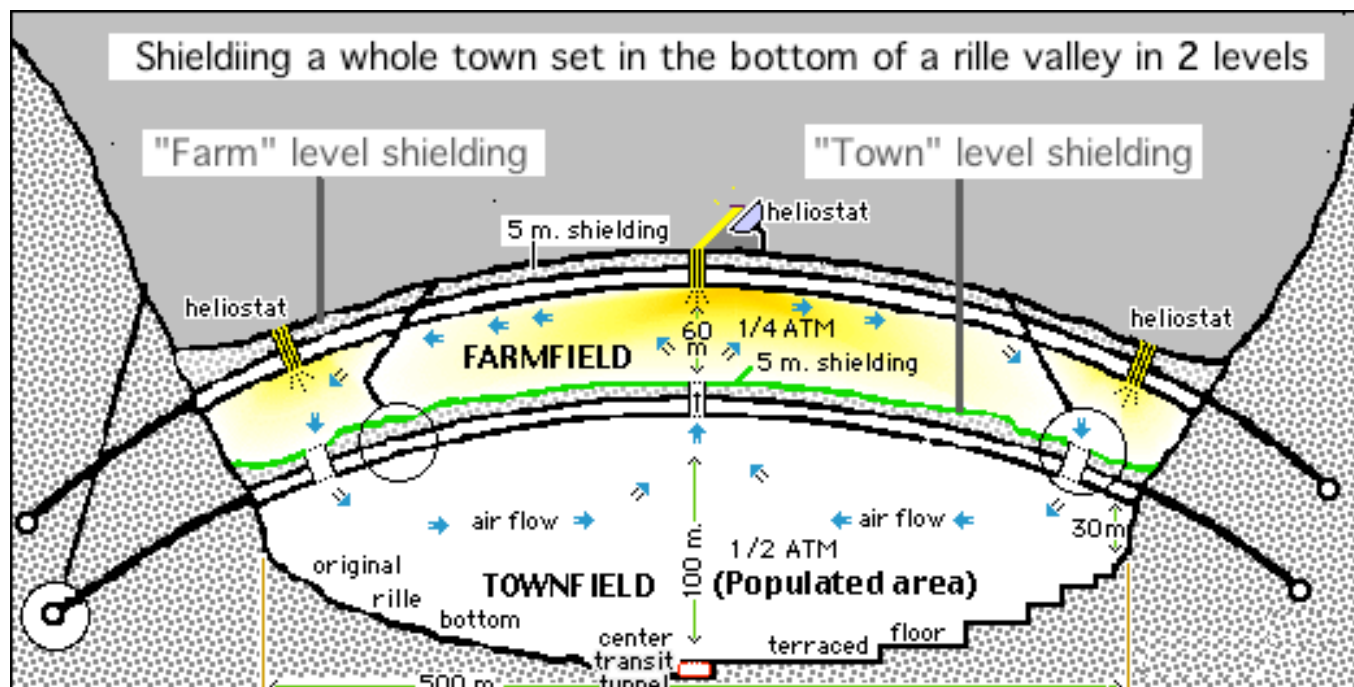


One simple way to “constrain” a shielding mound

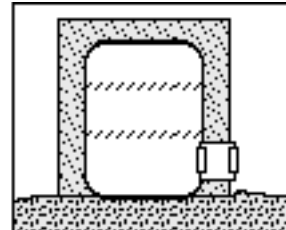
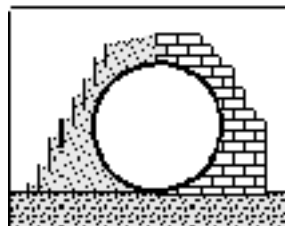
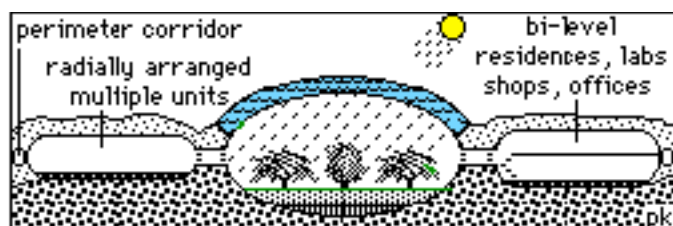




Living “underground” does not mean that you can’t see the stars!



See: [http://www.moonsociety.org/publications/mmm\\_papers/rille\\_paper1.htm](http://www.moonsociety.org/publications/mmm_papers/rille_paper1.htm)

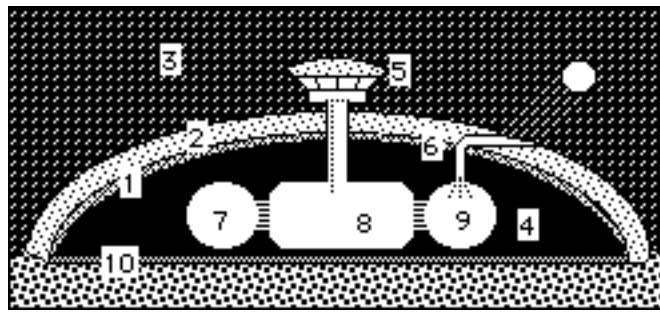


**Left:** Water makes excellent shielding but it will take constant circulation to keep the water from freezing in nightspan and from boiling in dayspan. Glass dome needs to have “sacrificial replaceable outer panes” less micrometeorites eventually break through and the atmosphere rushes out into the vacuum

**Right:** Various simple ways to shield a horizontal and a vertical cylinder (such as MDRS)

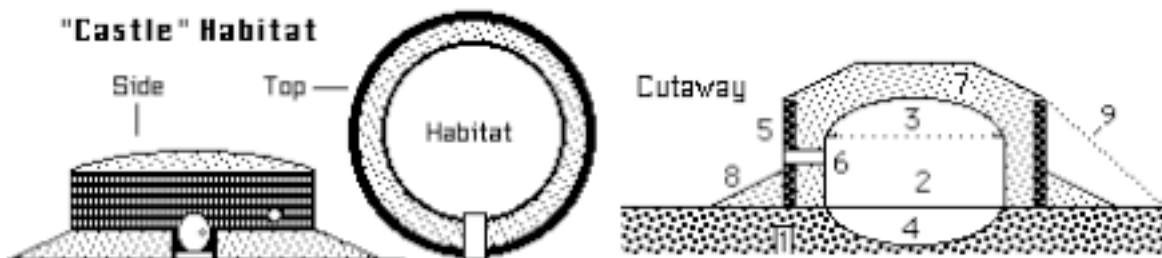
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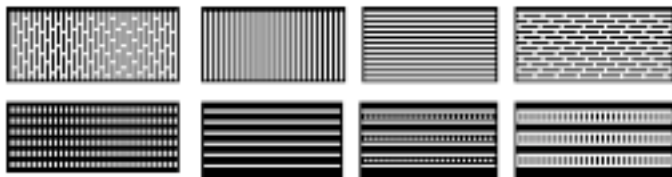


A shielded but unpressurized hangar allows pressurized modules below to be added to, to be rearranged and/or to be replaced with ease.

KEY: (1) Space Frame Arch, Fabric Cover; (2) 20 cm or more regolith dust shielding; (3) exposed vacuum, radiation, micro-meteorites, UV, solar flares; (4) protected lee vacuum area; (5) observation cupola with ladder shaft to habitat space below (7, 8, 9); (6) broken-path solar access via heliostat & fresnel lens diffuser; (10) compacted, sintered hangar apron



KEY: (1) surface, minimally excavated to nest the rounded bottom of habitat hull; (2) Habitat Hull, in this case a squat vertical cylinder with round end caps; (3) vaulted, cove-lit ceiling; (4) "basement" area for utilities and systems and extra storage; (5) the "castle" rampart retaining wall; (6) shaft for "window"; (7) regolith shielding and (8) berm slope of shielding with and (9) without a retaining wall



Retaining wall panels can differ in pattern, shade, and color



LEFT KEY: (1, 2, 3, 5, 6) as above. (7) wall-mount rail suspension system, (8, 9) bench seat transit car.

RIGHT KEY: (1, 2, 3) as above. (4) living wall / hanging garden, (5) planter-topped divider, (6) vehicles.

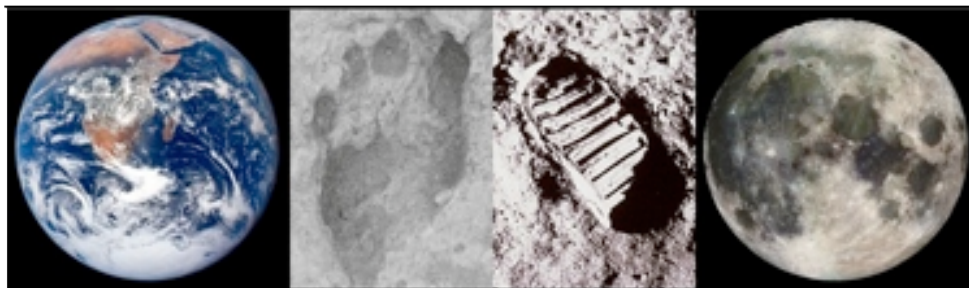
**Conclusion:** We should not expect that the need for shielding from cosmic rays, and thermal extremes will mean settlements will be boring. There are so many ways to achieve this need that lunar and Martian settlements, as seen from the outside will be varied and interesting.

**SUMMARY:** The purpose of this article is not to predict precisely how lunar settlements will look, but rather to show some of the many opportunities to build settlements that do not look like "molehills" and that can be distinctive and unique and great to live in, in many ways. PK

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



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



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

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

## About the Moon Society

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

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

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

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

**Moon Society Mission:** 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](mailto:president@moonsociety.org)

## From Moon Society President Ken Murphy “Sociopathy”

A topic of endless fascination for the general media is the question of “Where are the kids?” Companies and organizations around the world are seeing a general aging of their participants, with The Moon Society being no exception. The median age of members in The Moon Society is 56, and thus would have been ~11 years old when we landed on the Moon.

What this highlights is that the **younger members don't have an Apollo connection to the Moon.**

It's also important to consider the demographics. We have two full post-Apollo generations who have come of age at this point – Gen X (aged early 30s to mid-40s) and the Millennials (teens to early 30s) – with a third on the way. Both of these generations have grown up in an era of increasingly broken government, increasing corporate exploitativeness, and an ecosystem perceived as being taxed to its limits by human activity.

In this environment, there's a reason these demographics have an increasing distrust of existing insitutions, and a lack of engagement with their work.



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

That's why we see people more than happy to 'like' us, give us a 'thumbs up', +1 our efforts. We've got close to 5,000 likes on Facebook, but nowhere near that many actual dues-paying members of The Moon Society. This needs to change. So how do we engage younger audiences?

Our Chairman of the Board, Philip Crume, has suggested that we create **a robot farm that can be controlled from the internet**, allowing interested parties to control the robots and their activities. The constraint is that the robots need to be supervised for when people knock them over, although this could perhaps be addressed through a partnership with a university undertaking robotics studies.

Robots also tie into a project we've long been hoping to undertake – **robotic exploration of lava tubes and communications strategies associated therewith**. We've dedicated two ISDC tracks to lavatubes, but the video we hoped to capture was lost, which put a big crimp in the idea of doing a Kickstarter to raise further funds (and for which we would have used the ISDC video). We're going to keep trying, though.

From the education perspective, I continue to highlight in my talks that **"Lunar & space development offer access to energy & resources that can help us address many of the issues we have here on our home planet"**

What projects would you suggest, or what ideas might you have for capturing the attention of younger audiences? Drop me a line at [president@moonsociety.org](mailto:president@moonsociety.org)

### Now for a Challenge to the Membership:

I call on each member to **start cultivating a youngster for membership in The Moon Society**. Surely you know someone in their 20s or 30s who has an interest in space exploration. Start talking to them about the value of humans on the Moon, and encourage them to be a participant in helping to make it happen. If every member undertakes this challenge we can double our numbers in one year, and rejuvenate the membership to tackle some of the interesting projects we have in mind.

Or they can bring their own projects to the table and we can help make it happen.

Exciting things are happening in the Lunar arena – let's bring more friends to the party! We just need them to show up!  
Ken Murphy, President

**>>> Join us Online at our Annual Membership Meeting <<<**

**Wednesday Evening, Dec. 17th, 9–11 pm ET, 8–10 pm CT, 7–9 pm MT, 6–8 pm PT**

**INSTRUCTIONS on how to connect will be emailed to all members with current email addresses**

### **Student Model Space Station, Moonbase, Marsbase Competitions Using Post-Consumer Waste Items as much as possible**

By Peter Kokh

Since the idea occurred to me at a "horror fest" in Milwaukee in October 2007 at which we had a space exhibit, I have been collecting consumer waste items such as various sizes and styles of plastic bottles and jars, various kinds of caps, including hinge-opening caps, various kinds of tubes, etc.

The motivation then (and motivating me still) was to start an annual local, regional, and national round of competitions using post-consumer waste to model Moon and Mars outposts, space stations, space hotels, etc.



Since then, motivated by my commitment to build a "lava tube settlement" exhibit for the 2013 International Space Development Conference in San Diego, the habitat/outpost within the "tube" was made of such items.

### **Collecting possibly useful post-consumer waste items can be fun**

And it gets kids of all ages in the habit of sorting recyclable items from general trash.

Fitting various items together to make habitat modules of different widths and lengths, and other modules as well as interconnecting corridors (think toilet paper and paper towel roll cores) can be fun. And these days, there are many types of hinged plastic bottle and jar caps (think airlocks) to work with.

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



As for the exhibit base, wood framed white boards or cork boards from Walmart or office supply outlets are fairly stable and come in convenient sizes. The base of a refrigerator, stove, or washer or dryer shipping carton, if you can find one, is a bit less stable but might work if you come across one free. Plywood can warp.

You can show moondust or marsdust shielding by having your modules or outpost partly buried, partly exposed, from sculpted and painted foam board layers.

For the lunar or Martian surface, foam board, such as is used for insulation, in 3/4 inch thickness is easy to work with. A heated spoon can melt “craters” into the surface. Hills can be made by adding appropriately carved layers of foam board. The edge of a steak knife can blend the layers to one another.

Color the sculpted moonscape or marsscape foam board with a brushed on latex primer of the appropriate color and when dry, spray with the appropriate multi-shades of “Fleck” spray paint for a more realistic texture.

### Exhibit Competitions

**Your chapter can advertise a competition** in your local school system, with rules, deadlines, and instructions on how to enter your creation. Contact businesses and/or your local municipal recycling systems for prizes.

#### Set a time and place for exhibits and judging.

While creating items from scratch may give young people a greater challenge, acquiring and using recyclable items requires considerable ingenuity and gets young people in the habit of recycling.

On the Moon and Mars, where imports will be expensive, young people will find their creativity and imagination better exercised by acquiring usable post-consumer waste elements. And as a bonus, this process will model how the actual future pioneers will express their **ingenuity, creativity and resourcefulness** “far less expensively” by using post-consumer waste, and by scavenging through trash and scrap piles.

Next, work with your local school system to schedule and advertise such a competition.

Then besides prizes offered by your chapter, solicit prizes from commercial companies, especially those whose discarded recyclables are likely to be used.

This is a movement that could go statewide, if not national.

In the process, young people will get an idea of how lunar, Martian, and in-space outposts will be built and operate. We can't lose! Some of these young people may join our societies in the future, even make it happen! ##

October

## Chapters & Outposts 2014

### ORGANIZING “OUTPOSTS”

**Bay Area Moon Society, CA Outpost – South San Francisco Bay** – <http://www.moonsociety.org/chapters/bams/>  
Contact: Henry Cates [hcate2@pacbell.net](mailto:hcate2@pacbell.net) Meeting the 1<sup>st</sup> Tuesday of the Month, at Henry's home

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

### ORGANIZED CHAPTERS – JOINT TMS/NSS CHAPTERS

**Milwaukee Lunar Reclamation Society** – [www.MilwaukeeLunarReclamation.org](http://www.MilwaukeeLunarReclamation.org)

<http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/> – <http://www.space-Milwaukee.com>

Contact: Peter Kokh – [kokhmmm@aol.com](mailto:kokhmmm@aol.com) – MEETINGS, 2nd Saturday 1–4 pm monthly except July, August, at Mayfair Mall lower level room G110 – **DEC 6 (note: “1st” Sat) annual anniversary & potluck meeting.**

**2015 Schedule: We switch to room G150 for all meetings except our December one, in G110:**

**JAN 10, FEB 14, MAR 14, APR 11, MAY 9, JUN 29, (JUL AUG) SEP 12, OCT 10, NOV 14, DEC 12**

**October 11 Meeting Report:** We were delighted to see a member absent for several years, Ken Paul, as well as to meet David Schenk, son of Harold Schenk of NSS Sheboygan. David lives in Milwaukee, and may be contributing articles to MMM on his favorite topics. His father Harold had passed away recently at age 70. He had me speak at one of his classes at UW–Sheboygan a couple of years ago. He will be greatly missed.

Peter gave a presentation on Marquette University's **Golden Eagle One cube sat**, set to fly next year. He will not be at our November 8th meeting as he will be in St Louis at the Gateway to Space Regional Space Development Conference giving a presentation on the topics covered on pages 4–8 of the October issue, MMM #279.

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

<http://www.meetup.com/Saint-Louis-Space-Frontier-Meetup/>

Contact: Robert Perry [surfer\\_bob@charter.net](mailto:surfer_bob@charter.net) – Meetings 2nd Wed monthly at Buder Branch Library, 4401 S. Hampton, in the basement conference room. We've been busy with the upcoming **Gateway to Space conf.**

But meanwhile, our two chapters had adjacent display tables and jointly gave presentations and panels at **Archon 38**, the region's annual science fiction convention.

Bob Perry



## The Moon Society – Lunar Frontier Settlement – [www.moonsociety.org](http://www.moonsociety.org) p. 4

**NSS/Moon Society Phoenix Chapter** - <http://nssphoenix.wordpress.com/> - c/o Mike Mackowski.  
<http://www.meetup.com/NSSPhoenix/events/161939572/>

Meeting 3rd Saturdays monthly at Humanist Community Center, Mesa, 627 W. Rio Salado Parkway.

**Tucson L5 Space Society** – <http://www.tucsonspacesociety.org/>

<http://www.meetup.com/NSSPhoenix/events/161939572/> Now serving Moon Society Members

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

**Joint Meeting of the Phoenix and Tucson Chapters** of the NSS & TMS, Saturday, Oct. 18, 2014

The **October meeting** of the Phoenix chapter featured guest speaker LuAnn Dahlman, a Communication Specialist in NOAA's Climate Program Office. Ms. Dahlman summarized some of the recent climate reports and provided information detailing what is happening and what we can do about it. Some of the space technology and remote sensing resources that are crucial to climate research was noted. We had about a dozen people at the meeting, including some members we had not seen in a while.

After the regular meeting, most of the group joined the chapter officers for a planning meeting over lunch at a nearby restaurant. We discussed future meeting ideas, as well as some larger projects. This included a possible SpaceUp in March, Yuri's Night, and the Space Access conference. Out-of-town members, Al Anzaldua and Doug Plata recently visited with Mackowski and Doug's idea for some lunar conferences was noted.

**Regarding the SpaceUp event**, we initially attempted to work with the local Challenger Center to host the event, but that did not work out. Subsequently, we heard back from Mesa Community College and they are very excited about the prospects of hosting the event. Stay tuned for updates on this.

Other ideas included **adding some Mars or Moon content to the Space Access conference**, particularly if it does not sync up with Yuri's Night. Another idea was to **tie Yuri's Night to STEM** or the education community in some way. There is a **MakerFest coming up in Mesa in March** and it was suggested we look into a display at that event. There are local indie film festivals that might be open to space exploration themes. Phoenix's big **ComiCon** is in June and we will see if we can get involved in some of the hard science panels they generally include.

Overall, the planning lunch generated a lot of good ideas. If we can find some fresh faces to support them we should have an interesting 2015. Submitted by Phoenix Chapter President, Mike Mackowski, 10/12//2014

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

Contact: Eric Bowen [eric@streamlinerschedules.com](mailto:eric@streamlinerschedules.com) – **Meeting 7 pm** in the conference room of the Bay Area Community Center at Clear Lake Park – Even # months: **OCT 20 – DEC 15 – FEB 16 – APR 20**

Our Joint chapter will hold its annual business meeting and election of officers in the conference room of the Bay Area Community Center in Clear Lake Park; 5002 NASA Pkwy; Seabrook, TX 77586 at 7:00 p.m. Monday, November 17, 2014. Nominations by email are open until 11:59 p.m. Central time Saturday, November 8. Nominations may also be made in person at the meeting prior to the vote. The following positions are up for election:

- President; currently held Eric Bowen. The incumbent is willing to serve another term.
- Vice-President; currently Doug Hall. The incumbent is willing to serve another term.
- Treasurer; currently Jay Lewchanin. The incumbent is willing to serve another term.
- Secretary – currently open.
- Director, position 1; currently Marianne Dyson. She has not formally indicated her intentions for next year.
- Director, position 2; currently held by Murray Clark. He has not formally indicated his intentions for next year.
- Director, position 3 – currently open

All nominees must be, or must be willing to become, members in good standing of **both** the National Space Society and the Moon Society as required by our bylaws. Nominations will only be accepted from individuals who are members in good standing of either the National Space Society and/or the Moon Society. Email nominations require two independent qualified nominations; nominations made in person will require a second. Email nominations must include good contact information to allow any questions to be verified. You may nominate only one person to any specific position, except you may submit up to three nominations for Director. The actual vote must be given in person at the meeting; if you are not on our roster as a current member of our parent organizations you will be given an opportunity to purchase a renewal of your membership before the actual voting.

We are in the process of planning a holiday party for our meeting in December; time, date and place are still TBD. I hope to see you in November----Eric Bowen.

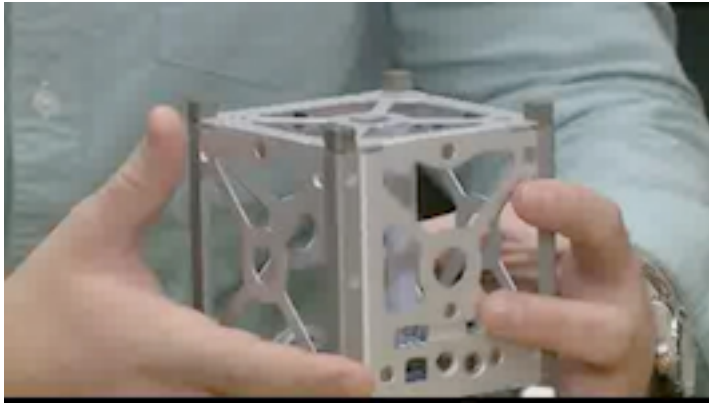
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## Milwaukee's Marquette U. "Golden Eagle One" Cubesat to fly in 2015

Milwaukee Institution, the MMM editor's Alma Mater, to get into space

[www.wisn.com/education/Marquette-s-CubeSat-to-be-launched-into-space/24570122](http://www.wisn.com/education/Marquette-s-CubeSat-to-be-launched-into-space/24570122) VIDEO



LEFT: Empty cube sat case before being packed with instruments RIGHT: The Golden Eagle One Logo

<http://aaq.auburn.edu/node/911> – NASA Academy of Aerospace Quality – AAQ

**Golden Eagle One;** The Golden Eagle One (GE1) CubeSat project is student-led and has a main goal to get students involved in building spacecraft. ["Golden Eagles" is the name of MU Sports Teams.]

While the satellite is not quite ready to fly as of Fall 2014, the near 1 kg cube satellite will primarily be used as an **observational satellite, with a main payload of two cameras (one infrared, one visible light.)** In order to capture and transmit pictures, there are **basic components needed on the cube-satellite: solar panels, power regulation, a central computer, and bidirectional communications.**

On the team, there are two main faculty advisors. In addition, on average there are 20 student members at any given time, but during the summer months it can drop to only around 5 active members.

### The future of Golden Eagle One

**GE1 has been in development since April of 2011.** NASA has chosen GE1 as one of the CubeSats it will launch into orbit. The **GE1 team expects a useful mission of 3+ months**, with the time being so limited by the commercially available parts that might not be suited for use in space.

Currently, **the team plans on being ready to fly by the Fall of 2015.**

### What is the main problem experienced thus far in the project?

According to Peter Jorgensen, a student leader on the GE1 team currently working on his Master's of Science in Mechanical Engineering, **the largest problem the team has faced so far is team member turnover.** The GE1 team gains and loses members every semester, a product of it being a student-led project/organization.

A lot of time working on the project is spent bringing new members up to speed. Peter Jorgensen states, "This (problem) is being remedied by implementing a more structured project management approach, as well as incentivizing some students to be more active through the summer internship opportunities."

Although there is lost productivity in regard to the large student turnover, it should also be noted that there is still a positive result: a large amount of students gain experience and are exposed to building spacecraft, which is considered to be the main goal of the project.

### A statement from Peter Jorgensen:

"Some may say that spending 4+ years on one satellite is too much, and the team has definitely seen its share of drawbacks. However, we are dedicated and relentless, and I am consistently amazed at the work ethic and ingenuity of the students with who I am privileged to work."

**Additional pictures and videos about Golden Eagle One and CubeSats can be found at the following links:**

<https://www.youtube.com/user/MarquetteSpacecraft>

<https://www.facebook.com/MUSpacecraft>

<https://www.youtube.com/watch?v=AuN2AThzYzs>

<https://www.youtube.com/watch?v=9bAj1lTaWxM>

{ NB. Peter Kokh attended Marquette University 1955–56 and 1962–64 }

##



**OCTOBER 2014 NEWS BROWSING LINKS****SPACE STATIONS + COMMERCIAL SPACE**

[www.space.com/27210-biosuit-skintight-spacesuit-concept-images.html](http://www.space.com/27210-biosuit-skintight-spacesuit-concept-images.html)

[www.space.com/27214-skintight-spacesuit-biosuit-photos.html](http://www.space.com/27214-skintight-spacesuit-biosuit-photos.html)

[www.spacedaily.com/reports/Work\\_completed\\_on\\_satellite\\_launch\\_center\\_in\\_Hainan\\_999.html](http://www.spacedaily.com/reports/Work_completed_on_satellite_launch_center_in_Hainan_999.html)

[www.space.com/27356-bigelow-inflatable-room-space-station.html](http://www.space.com/27356-bigelow-inflatable-room-space-station.html)

<http://news.yahoo.com/commercial-supply-rocket-explodes-liftoff-224100998.html>

**MISSION TO PLANET EARTH**

[www.nasa.gov/press/2014/october/nasa-study-finds-earth-s-ocean-abyss-has-not-warmed/](http://www.nasa.gov/press/2014/october/nasa-study-finds-earth-s-ocean-abyss-has-not-warmed/)

[www.nasa.gov/press/2014/october/satellite-data-shows-us-methane-hot-spot-bigger-than-expected/](http://www.nasa.gov/press/2014/october/satellite-data-shows-us-methane-hot-spot-bigger-than-expected/)

**SPACE TOURISM**

[www.space-travel.com/reports/Dream\\_Chaser\\_Teams\\_with\\_Stratolaunch\\_to\\_Carry\\_People\\_into\\_Space\\_999.html](http://www.space-travel.com/reports/Dream_Chaser_Teams_with_Stratolaunch_to_Carry_People_into_Space_999.html)

[www.space.com/27351-virgin-galactic-space-launches-richard-branson.html](http://www.space.com/27351-virgin-galactic-space-launches-richard-branson.html)

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[www.space.com/27349-dream-chaser-space-plane-stratolaunch.html](http://www.space.com/27349-dream-chaser-space-plane-stratolaunch.html)

[www.space.com/27351-virgin-galactic-space-launches-richard-branson.html](http://www.space.com/27351-virgin-galactic-space-launches-richard-branson.html)

[www.space.com/27525-private-astronaut-training-spacesuits.html](http://www.space.com/27525-private-astronaut-training-spacesuits.html)

[www.space.com/27210-biosuit-skintight-spacesuit-concept-images.html](http://www.space.com/27210-biosuit-skintight-spacesuit-concept-images.html)

**MOON**

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

[news.discovery.com/space/asteroids-meteors-meteorites/asteroid-capture-earth-gravity-satellite-mini-moon-130207.htm](http://news.discovery.com/space/asteroids-meteors-meteorites/asteroid-capture-earth-gravity-satellite-mini-moon-130207.htm)

[www.space-travel.com/reports/Origin\\_of\\_moons\\_ocean\\_of\\_storms\\_revealed\\_999.html](http://www.space-travel.com/reports/Origin_of_moons_ocean_of_storms_revealed_999.html)

[www.space-travel.com/reports/Turning\\_the\\_Moon\\_into\\_a\\_cosmic\\_ray\\_detector\\_999.html](http://www.space-travel.com/reports/Turning_the_Moon_into_a_cosmic_ray_detector_999.html)

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[www.nasa.gov/press/2014/october/nasa-mission-finds-widespread-evidence-of-young-lunar-volcanism/](http://www.nasa.gov/press/2014/october/nasa-mission-finds-widespread-evidence-of-young-lunar-volcanism/)

[www.space.com/17273-tiny-lunarcubes-spacecraft-moon-exploration.html](http://www.space.com/17273-tiny-lunarcubes-spacecraft-moon-exploration.html)

[www.space-travel.com/reports/Russian\\_Luna\\_25\\_Mission\\_to\\_Cost\\_Billions\\_999.html](http://www.space-travel.com/reports/Russian_Luna_25_Mission_to_Cost_Billions_999.html)

[www.space-travel.com/reports/Russia\\_to\\_take\\_Moon\\_exploration\\_as\\_core\\_of\\_space\\_program\\_999.html](http://www.space-travel.com/reports/Russia_to_take_Moon_exploration_as_core_of_space_program_999.html)

[www.space.com/27546-china-roundtrip-moon-mission.html](http://www.space.com/27546-china-roundtrip-moon-mission.html)

[www.asianscientist.com/2014/10/topnews/hakuto-unveils-rovers-google-space-race/](http://www.asianscientist.com/2014/10/topnews/hakuto-unveils-rovers-google-space-race/)

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

**MARS**

[www.nasa.gov/press/2014/october/nasa-selects-nine-space-radiobiology-research-proposals/](http://www.nasa.gov/press/2014/october/nasa-selects-nine-space-radiobiology-research-proposals/)

[www.marsdaily.com/reports/Four\\_candidate\\_landing\\_sites\\_for\\_ExoMars\\_2018\\_999.html](http://www.marsdaily.com/reports/Four_candidate_landing_sites_for_ExoMars_2018_999.html)

[www.space.com/27348-nasa-mars-crew-deep-sleep.html](http://www.space.com/27348-nasa-mars-crew-deep-sleep.html)

[www.marsdaily.com/reports/Eight\\_months\\_on\\_Hawaiian\\_Mars\\_tests\\_rigors\\_of\\_exploration\\_999.html](http://www.marsdaily.com/reports/Eight_months_on_Hawaiian_Mars_tests_rigors_of_exploration_999.html)

[www.marsdaily.com/reports/Four\\_candidate\\_landing\\_sites\\_for\\_ExoMars\\_2018\\_999.html](http://www.marsdaily.com/reports/Four_candidate_landing_sites_for_ExoMars_2018_999.html)

[www.marsdaily.com/reports/Russian\\_Scientists\\_Develop\\_Mechanism\\_for\\_Rovers\\_Descent\\_to\\_Mars\\_999.html](http://www.marsdaily.com/reports/Russian_Scientists_Develop_Mechanism_for_Rovers_Descent_to_Mars_999.html)

[www.nasa.gov/press/2014/october/nasa-mission-provides-its-first-look-at-martian-upper-atmosphere/](http://www.nasa.gov/press/2014/october/nasa-mission-provides-its-first-look-at-martian-upper-atmosphere/)

[www.spacedaily.com/reports/NASA\\_Prepare\\_its\\_Science\\_Fleet\\_for\\_Oct\\_19\\_Mars\\_Comet\\_Encounter\\_999.html](http://www.spacedaily.com/reports/NASA_Prepare_its_Science_Fleet_for_Oct_19_Mars_Comet_Encounter_999.html)

[www.nasa.gov/press/2014/october/nasa-seeks-ultra-lightweight-materials-to-help-enable-journey-to-mars](http://www.nasa.gov/press/2014/october/nasa-seeks-ultra-lightweight-materials-to-help-enable-journey-to-mars)

[www.space.com/27348-nasa-mars-crew-deep-sleep.html](http://www.space.com/27348-nasa-mars-crew-deep-sleep.html)

[www.nasa.gov/press/2014/october/nasa-selects-advanced-oxygen-recovery-proposals-for-spacecraft-missions](http://www.nasa.gov/press/2014/october/nasa-selects-advanced-oxygen-recovery-proposals-for-spacecraft-missions)

<http://www.space.com/27451-private-mars-colony-feasibility-study.html>

**ASTEROIDS + COMETS**

[www.marsdaily.com/reports/Comets\\_Close\\_Encounter\\_One\\_in\\_a\\_Million\\_999.html](http://www.marsdaily.com/reports/Comets_Close_Encounter_One_in_a_Million_999.html)

[www.space.com/27475-comet-siding-spring-mars-history](http://www.space.com/27475-comet-siding-spring-mars-history)

[www.space.com/27337-rosetta-spacecraft-comet-jets-photo.html](http://www.space.com/27337-rosetta-spacecraft-comet-jets-photo.html)

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[www.space.com/27450-messenger-mercury-water-ice-photos.html](http://www.space.com/27450-messenger-mercury-water-ice-photos.html)

[www.space.com/27428-cubesat-mission-europa-jupiter.html](http://www.space.com/27428-cubesat-mission-europa-jupiter.html)

[www.space.com/27461-saturn-moon-mimas-interior.html](http://www.space.com/27461-saturn-moon-mimas-interior.html)

[www.space.com/27334-uranus-frankenstein-moon-miranda.html](http://www.space.com/27334-uranus-frankenstein-moon-miranda.html)

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[www.spacedaily.com/reports/Organic\\_molecules\\_in\\_Titans\\_atmosphere\\_are\\_intriguingly\\_skewed\\_999.html](http://www.spacedaily.com/reports/Organic_molecules_in_Titans_atmosphere_are_intriguingly_skewed_999.html)

[www.space.com/27558-saturn-moon-titan-methane-cloud.html](http://www.space.com/27558-saturn-moon-titan-methane-cloud.html)

[www.space.com/27416-new-horizons-mission-beyond-pluto.html](http://www.space.com/27416-new-horizons-mission-beyond-pluto.html)

[www.space.com/27445-hubble-telescope-new-horizons-kuiper-belt.html](http://www.space.com/27445-hubble-telescope-new-horizons-kuiper-belt.html)

### **BEYOND OUR SOLAR SYSTEM**

[www.space.com/27346-aliens-too-distant-contact.html](http://www.space.com/27346-aliens-too-distant-contact.html)

[www.spacedaily.com/reports/Moons\\_Can\\_Help\\_Planets\\_Remain\\_Stable\\_Long\\_Enough\\_for\\_Life\\_to\\_Form\\_999.html](http://www.spacedaily.com/reports/Moons_Can_Help_Planets_Remain_Stable_Long_Enough_for_Life_to_Form_999.html)

[www.spacedaily.com/reports/NASAs\\_Hubble\\_Maps\\_the\\_Temperature\\_and\\_Water\\_Vapor\\_on\\_an\\_Extreme\\_Exoplanet\\_999.html](http://www.spacedaily.com/reports/NASAs_Hubble_Maps_the_Temperature_and_Water_Vapor_on_an_Extreme_Exoplanet_999.html)



## **Our Next Breakthrough Space Technologies**

**34th International Space Development Conference**

**May 20-24, 2015 Hyatt Regency Hotel, Toronto, Canada**

**<http://isdc.nss.org/2015>**



### **2015 International Space Development Conference**

**May 20th – 25th, 2015 in midtown Toronto, Ontario, Canada**

(Toronto is now the 5th largest Metropolitan area in North America  
after Mexico City, New York, Los Angeles, and Chicago)

**At the Hyatt Regency Hotel, 370 King Street West**

**Save the dates! - Memorial Day Weekend**

**Hosted by the Canadian Space Commerce Association & the National Space Society**

**<http://isdc2015.nss.org/wordpress/> – Sign up now for low advance rates**

(The MMM Editor has signed up – 1st ISDC since 2010 Chicago)



**Hyatt Regency**

**Toronto**





## Corrections to MMM #277 from Larry J. Friesen

In the MMM #277 August 2014 issue, in your article “Which World would You rather Pioneer? Moon or Mars?” pages 3–8, on page 7, in the section “Gateway to the Asteroid Belt?”. you raise the question of whether the Moon or Mars makes a better gateway to the asteroid belt.

You make two claims related to orbital dynamics in the very same sentence.

One claim is true. The other is not.

The first claim is that the closer the orbits of two bodies are, the less frequent the opportunities will be for coasting opportunities between them. I presume you mean low delta-V Hohmann ellipse type trajectories. That claim is quite true.

The second claim is that the closer the orbits, the longer the trip time between them. That claim is not true. Hohmann trip time is not related to how close the orbits of two bodies are. It is related to how far each body is from the Sun, and therefore how long the semimajor axis of the Hohmann transfer ellipse is. The two statements are not functionally equivalent.

Example #1: Saturn is much farther from the asteroid belt than Mars is, but low-energy transfers between Saturn and the asteroid belt will take much longer than transfers between Mars and the asteroid belt. That is because Saturn is so far from the Sun, so the transfer ellipse will be huge. Don't count on any transfer times much under 15 years.

Example #2: Venus is closer to Earth than Mars is, in both absolute and relative terms. But transfer times between Earth and Venus are shorter than transfer times between Earth and Mars, not longer. That is because Venus is closer to the Sun than Mars is, so the semimajor axis of the transfer trajectory is smaller.

### Editor's Response:

Thanks, Larry, I stand corrected. This is one of those cases where I would have done well to run the piece by you first. Indeed, I was somewhat unsure of that assertion when I made it. I was in a rush to meet publication deadline, but in retrospect, that is a lame excuse! PK

## In one week, the Commercial Space Sector has had two major setbacks

From the Editor

### ISS-bound Cygnus Cargo Capsule & Antares rocket explode on liftoff Student-built Cubesats and other experiments lost

<http://news.yahoo.com/commercial-supply-rocket-explodes-liftoff-224100998.html>

<http://www.space.com/27594-private-antares-rocket-explosion-full-coverage.html>

<http://www.space.com/27597-antares-rocket-explosion-astronaut-reactions.html>

<http://www.space.com/27595-antares-rocket-explosion-science.html>

-

Then, rubbing salt into our wounds

### Virgin Galactic's SpaceShipTwo Crashes in Test Flight: 1 Dead, 1 Injured

<http://www.space.com/27618-virgin-galactic-spaceshiptwo-crash-kills-pilot.html>

<http://www.space.com/27617-virgin-galactic-spaceshiptwo-test-flight-anomaly.html>

<http://www.space.com/27618-virgin-galactic-spaceshiptwo-crash-kills-pilot.html>

### *We must not be discouraged! We must not be intimidated!*

Accidents and tragedies have “paused” NASA’s onward and upward push also and more than once. The Apollo 1 fire that killed 3 astronauts, and the two fatal Space Shuttle accidents, Challenger on lift-off, Columbia on the ride home.

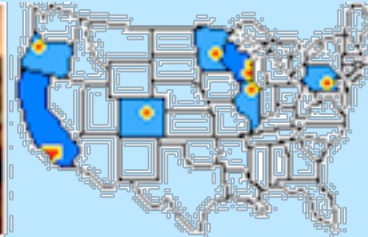
Now there will be those, forgetful of NASA’s tragedies, who will say “see, I told you so! Those commercial companies have not got what it takes!

It is not tragedies that determine whether those involved “have what it takes,” but how they pick up the pieces, and steadfastly move on. We have no doubt that Orbital Science and Virgin Galactic will go on to make us proud! PK

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



## NSS Chapters that share Moon Miners' Manifesto



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

### WISCONSIN



#### MLRS – Milwaukee Lunar Reclamation Society

PO Box 2101, Milwaukee, WI 53201 – [www.moonsociety.org/chapters/milwaukee/](http://www.moonsociety.org/chapters/milwaukee/)  
[www.Space-Milwaukee.com](http://www.Space-Milwaukee.com) – <http://www.meetup.com/Milwaukee-Space-Exploration-Meetup/>

*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](mailto:kokhmmm@aol.com)

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

SECRETARY – Charlotte Dupree NSS (262) 675-0941 [grdupree@charter.net](mailto:grdupree@charter.net)

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

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

(• Current Members of the MLRS Board of Directors)

Meeting place Mayfair Mall Garden Suites East G110 – NOV 8 – DEC 6 (note: 1st Sat, 2nd Sat slot not available)  
 our annual anniversary & potluck meeting with displays and a sci-fi movie.

Note: For our 2015 Meeting Schedule: We switch to room G150 for all meetings except December, in G110:  
 JAN 10, FEB 14, MAR 14, APR 11, MAY 9, JUN 29, (SUMMER BREAK) SEP 12, OCT 10, NOV 14, DEC 12

### WISCONSIN



#### SSS – Sheboygan Space Society

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

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

SSS Sec./Tres. c/o B. Pat Knier [dcnpatknier@gmail.com](mailto:dcnpatknier@gmail.com)

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: DEC 6th (1st SAT 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 90278

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

Regular Meeting 3 pm 3<sup>rd</sup> SAT monthly – NOV 18 – DEC 20 – JAN 17

No information about coming meetings and chapter events could be found by press time.

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



## COLORADO



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

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

Eric Boethin 303-781-0800 [eric@boethin.com](mailto:eric@boethin.com) – Monthly Meetings 6:00 PM on 3rd Thursdays, 7 pm  
Englewood Public Library, Englewood, CO 80110 – 1000 Englewood Parkway, First Floor Civic Center

**NEXT MEETINGS: NOV 20 – DEC 18 – JAN 15**

## ILLINOIS



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

## MINNESOTA



**MSFS: Minnesota Space Frontier Society – <http://www.mnsfs.org>**

**c/o Dave Buth, 433 South 7th St. #1808, Minneapolis, MN 55415**

## OREGON



**ORL5 – Oregon L5 Society – <http://www.OregonL5.org>**

**PO Box 86, Oregon City, OR 97045**

(LBRT – Oregon Moonbase) [moonbase@comcast.net](mailto:moonbase@comcast.net) – Charles Radley: [cfrjlr@gmail.com](mailto:cfrjlr@gmail.com)

**Shari's in Oregon City on 99E (sharis.com) 1926 SE McLoughlin Blvd Oregon City, OR**

**The Third Saturday of the Month at 2:00 PM NOV 18 – DEC 20 – JAN 17**

## PENNSYLVANIA



**NSS-PASA: NSS Philadelphia Area Space Alliance**

**928 Clinton Street, Philadelphia, PA, 19107**

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

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

### The NSSPASA Report for October 2014

**Meeting Dates and Locations:** our November meeting will be at the annual Philcon Science Fiction Convention at The Cherry Hill Crowne Plaza in Cherry Hill New Jersey. The convention will be held on November 21<sup>st</sup> through the 23<sup>rd</sup>, with our meeting being on Saturday the 22<sup>nd</sup>, in the early evening. Check the convention website and the hotels for directions. Our December meeting will be on the December 6<sup>th</sup>, and, our snow date of the 13<sup>th</sup>.

Larry stared off with his additions to our website: we now have a days to meeting and events calendar and a scrolling banner also. He has changed the newsletter section from a January to current report format. For some devices there may be problems downloading but laptops and tablets should have no problem. He also reported on the upcoming comet flyby of Mars. A later report said the closets approach will be 80,000 miles. And what will we see? Anything all of those rovers and orbiters can! Cool.

Dotty brought material from several sources including an announcement that the new doomsday movie "Interstellar" will be on the Franklin Institutes I-Max screen. She reported on the Capclave convention and the pres-

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entation by Inga Heyer on astronomical technology: “Between Earth and Heaven, Between Gamma Rays and Radio Waves” which included the creation of effectively huge instruments ( using techniques like aperture synthesis as one technique and using the Internet as a combining device for the data from various instruments in a timely manner). Inga has worked for the Space Telescope Institute for some time and was the highlight of the science track at the convention. She also contacted the Philcon coordinators to reserve a table for us to do outreach at the vent.

Hank brought handouts for the convention in November and word of some changes for next year: the Chair for Philcon next year will be Stephanie Lucas and Hank is rooting for a change in venue again.

Mitch brought word on his public outreach activities at the University of Pennsylvania again: he was alone this time but enjoyed the contact with the incoming students on campus. He also announced his upcoming activity which he will arrange at the Drexel University campus. From Discover Magazine he brought “Phantom Worlds” on possible habitable worlds around Red Dwarfs and Red Giants. See the November issue of the magazine. He also proposed that we create an award for a habitat art contest that would be for Philadelphia students. This is not a part of the Carver Science Fair and would have a separate budget. And...

Dennis Pearson brought good news on several fronts: chapters in good standing, like NSSPASA, can get outreach material, like buttons and bookmarks, flyers and posters, and financial support for worthwhile projects. Mitch should work on a presentation to NSS! Dennis also announced a new version of the NSS Chapters Forum conferencing technique using FUZE software. This would allow voice and images to be sent simultaneously. Since it is an online system, documents would be viewable as well. This might make collaboration among chapters easy. “Show me your idea” sounds cool.

Earl brought a number of publications and started with “SPEARED” The Single-Person Emergency Atmospheric Reentry Device” by Tom Ligon, Stephanie Osborn, and Arlan Andrews Sr.. The people who wrote this report saw the Shuttle tragedies and have come up with a possible technique to save the crew from a major flight disaster. They came up with a safety device that encapsulates the individual, and their seat and space suit, dramatically decreasing their mass per unit volume.. Using something similar to common expandable foam they carried out experiments to get data to present to NASA and other possible developers of safety equipment. See the article, and background documents, in the December Analog.

From Microwaves and R.F. for September we have several articles on space and space related technologies: page 21 has “Zigbee Conquers Space Based Satcom Tests describing new designs of Pico Satellites such as VELOX-1 (with pictures courtesy of World Scientific: Unmanned Systems). This satellite is pictured packed and opened (deployed). The technology featured is the use of wireless data transfer inside the spacecraft in place of conventional inter-element wiring. The company that created the satellite had a special issue of its publication “Unmanned Systems” (page 22).

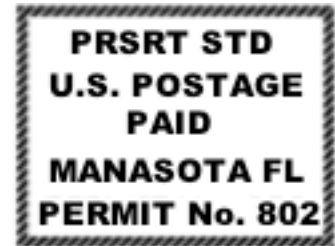
On page 24 is “Experimental Space Plane Design” with a new system being financed by D.A.R.P.A. ( The Defense Planning and Research Agency). Several major companies are working on competing designs: Boeing and Blue Origins on one team, Masten Systems and XCOR Aerospace, and, Northrop Grumman and Virgin Galactic. This is Phase One of the program and the vehicle being examined is the XS-1 demonstration Vehicle. This will be a hypersonic delivery system to L.E.O.. The final boost to orbit for the cargo, which could be from 3000 to 5000 lbs., with costs of less than \$5 million per flight. The plan is to fly 10 times in 10 days, go up to Mach 10+ ( at least Once) and launching a small sample payload to orbit. I think this one will be available for commercial launches in the future. This is different from the X37B, which Dotty mentioned in her Facebook news, which recently came back from a secret mission (It has been operating since 2012).

And finally, on page 26 “High Altitude Balloons Float Toward Multiple Application Possibilities” about the Kickstarter campaign of Rockzip High Balloons on creating a new class of payload carriers that can fill a commercial void between orbital transponders and equipment, and, aircraft on extended loiter. The possibility of using them as part of S.T.E.M. programs is mentioned. They are raising funds and should have news on the companies site. There is a large number of interesting technical topics including the very recent work on restoring vision capability in people suffering Macular Degeneration. This is being done in a small group of volunteers with some success. By the time we have the infrastructure established for the voyages out to Mars, and maybe the closer trips to the Moon, we may have a medical kit that includes this technology for injuries that would otherwise require a possibility of disability or death that would put a mission, especially one out to Mars, in jeopardy. And much more! –

Report by Earl Bennett, President, NSSPASA



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



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

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MILWAUKEE LUNAR RECLAMATION SOC. • \$15 low “one rate” to address above

MINNESOTA SPACE FRONTIER SOCIETY • \$25 Regular Dues

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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 “LRS”, PO Box 2102, Milwaukee, WI 53201

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