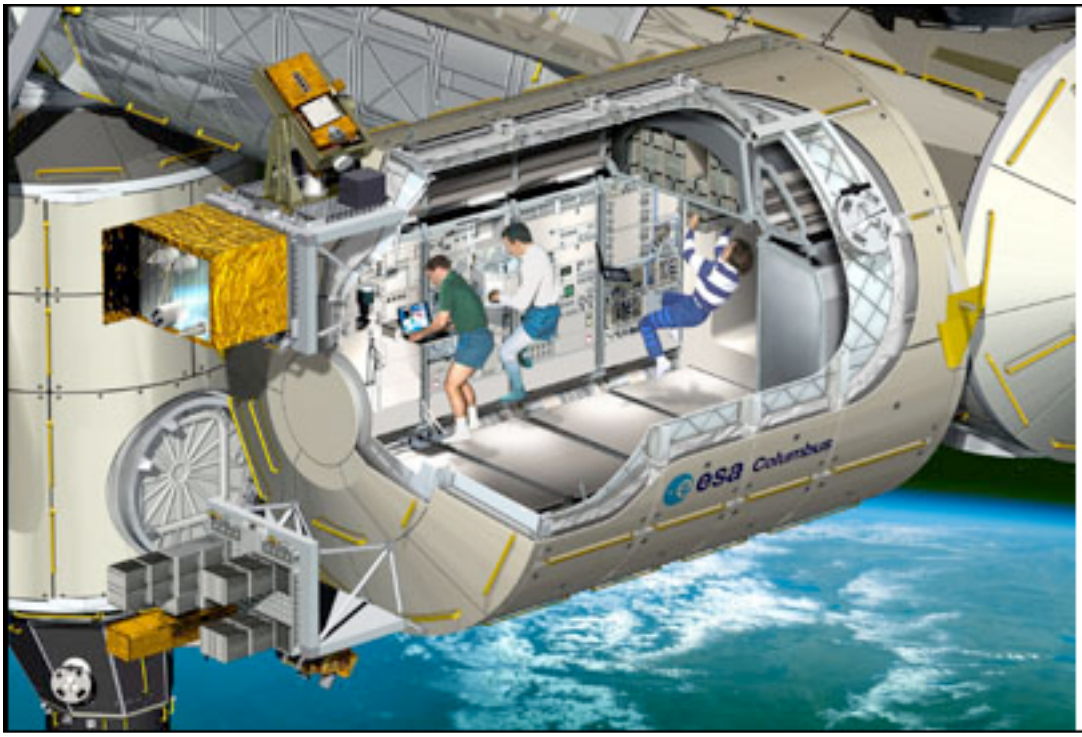
"Towards an Earth-Moon Economy Developing Off-Planet Resources"

Moon Miners' Manifesto

& The Moon Society Journal

www.MoonMinersManifesto.com

212 FEBRUARY 2008



Europe's significant contribution to the International Space Station was delivered by SS Atlantis Feb. 7th

The 24.5 foot diameter module adds significant research capabilities to ISS, while sharing life support systems with Italy's Multi-Purpose Logistics complex.

ISS is a functioning International partnership involving the U.S., Russia, Canada, Europe, and Italy, and, in the near future, Japan.

In this context, NASA's determination to "go it alone" on the Moon is in dire need of a major attitude adjustment.

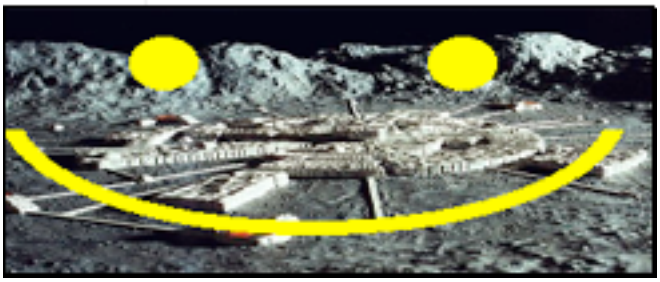
Feature Articles in This Issue

In FOCUS ESA Columbus Module Flies: International Moonbase next?

The Unites States, presuming the next Administration which takes office January 20, 2009 does not cancel NASA's current mission to deploy a permanent facility on the Moon by 2020, may not be alone. Russia, China, and India have declared their intentions of getting in on the action. So far only Russia has asked to partner with NASA, and that suggestion was turned down out of hand by the agency. Has working with Russia been that bad? ISS would have long crashed into the [➪ p. 2, col. 2]

Can Lunar Pioneers truly be happily "at home?"

Right > Moonbase Alpha from "Space 1999" TV series sprouts a "happy face." It's one thing to send volunteers to the Moon for limited periods. You can handle almost anything, if you know it is temporary. But what will we have to do to create an environment in which pioneers who come to stay, will in time no longer feel surrounded by an "alien," unforgiving, hostile life-squelching world? This is the topic of our major article this issue, pp. 3-8



Moon Miners' Manifesto

Published monthly except January and July., by the **Lunar Reclamation Society** (NSS-Milwaukee) for its members, members of participating **National Space Society chapters**, members of **The Moon Society**, and individuals worldwide.

• **Moon Miners' Manifesto CLASSICS:** The non-time-sensitive articles and editorials of MMM's first eighteen years have been re-edited, reillustrated, and republished in 15 PDF format volumes, for free downloading from either of two locations:

www.Lunar-Reclamation.org/mmm_classics/
www.MoonSociety.org/publications/mmm_classics/

• **MMM's VISION:** "expanding the human economy through off-planet resources"; the early era of heavy reliance on Lunar materials; early use of Mars system and asteroidal resources; and establishment of 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.

• **MMM retains its editorial independence.** MMM serves several groups, each with its own philosophy, agenda, and programs. Participation in this newsletter, while it suggests overall satisfaction with themes and treatment, requires no other litmus test.

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• **The 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. LRS serves as NSS' Milwaukee chapter: www.Lunar-Reclamation.org

• **The National Space Society** is a grassroots pro-space membership organization, with 10,000 members and 50 chapters, dedicated to the creation of a spacefaring civilization.

National Space Society, 1620 I Street NW, Suite 615, Washington, DC 2006; Ph: (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 chapter**s and **Other Societies** with a compatible focus are welcome to join the MMM family. For special chapter/group rates, write the Editor, or call (414)-342-0705.

• **Publication Deadline:** Final draft is prepared ASAP after the 20th of each month. Articles needing to be keyed in or edited are due on the 15th, *Sooner is better!* - ***No compensation is paid.***

• **Submissions by email** to KokhMMM@aol.com - Email message body text or MS Word, Appleworks, pdf attachments

√ Mac compatible CD / or typed hard copy must be mailed to:
Moon Miners' Manifesto, c/o Peter Kokh,
1630 N. 32nd Street, Milwaukee WI 53208-2040

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⇒ IN FOCUS Editorial continued from p. 1.

ocean if it where not for the Russians maintaining it with Soyuz manned and Progress cargo flights for the three years when the Shuttle was grounded after the loss of SS Columbia. "Those ungrateful SOB's" the Russians must be muttering! It goes to show that NASA accepted Clinton's formula for getting Congress to approve the Space Station project ("partnering with Russia will help keep Russian scientists from selling their services to hostile nations") only grudgingly. NASA has always looked down on the Soviet/Russian space program, a leftover attitude from the high stakes "Race to the Moon" in the 1960s. Well, NASA, it is time to grow up. Let's can the NASA officials who are behind this "dump the Ruskies" campaign!

There is a lot at stake. Do we want only the bare boned "permanent structure, intermittently manned" camp site NASA is working towards? GW Bush wanted one that was "permanently manned." Or do we want an **International lunar Campus** in which both other spacefaring nations, *and private enterprises,* can make significant contributions that will accelerate realization of a fully functional, *and ever expanding* human presence on the Moon? For us space advocates, there should be no hesitation, unless we share NASA's attitude, an attitude that accepts the risk of failure out of an exaggerated national pride. Of course, for those who will be quite happy with a Little America II (forget about McMurdo II) that may be acceptable. But I trust that most of us want to see true lunar settlement, not just an Antarctic style presence.

What will internationalization do? For one thing, we will get *true permanence.* Because American space efforts are subject to annual re-approval by Congress and succeeding administrations, it is us, the US of A, who historically have been the most unreliable in keeping to our grand intentions. If our first human outpost on the Moon is an International effort, the prognosis for its long term survival will be immensely improved.

But that is not all. If the Moon base is an international effort there will be (**a**) less duplication of effort and a much more robust installation with much greater joint capability, and (**b**) much less tendency for other nations (let's include ourselves) to Balkanize the Moon into national territories. From the writer's point of view, the goal is a Moon settled by civilians and with global home rule. Ultimately, Lunans should rule theselves.

What will opening an International Lunar Campus {"ILC") to *Enterprise* accomplish? Everything! Companies can establish facilities in and around the ILC to provide auxiliary services such as fuel and oxygen production, on location transportation services, production of additional modules with lunar materials, temporary staffing, energy storage, and much much more. Enterprises are much quicker to cash in on perceived needs than are government agencies. With enterprise welcome to take part, this initial complex will greatly expand beyond the initial plan and be poised to introduce civilians, and to make real, not token, progress towards a civilian lunar frontier.

There is a catch, but one that has an easy fix. NASA's proposed Shackleton rim S Polar site is way too small an area for the kind of *buildout* an ILC promises. But with enterprise rising to the demand in providing both energy and energy storage, we could easily set up anywhere on the Moon, at places from which all the Moon's various resources are accessible. PK

Assuring Mental Health Among Future Lunar Frontier Pioneers

Space 1999 Moonbase Alpha sporting a "happy face"

by Peter Kokh

[This article has been submitted to
the Space Nursing Society newsletter]

Introduction

A central focus of MM "Manifesto" from the start has been to show how, using lunar resources, pioneers can make themselves "at home" on the Moon. This will include psychological, physiological, social and cultural adjustment to living in the Lunar environment, perceived by us outsiders as "alien."

It is crucial that pioneers, people who may or may not have originally come "for a tour of duty" but have decided to stay, must get to that stage where they are "at home" on the Moon, comfortable with it, feeling secure. Staffing a settlement with recruits for limited tours of duty will not promote this transformation into a population of "Lunans" unless there is an aggressive strategy of perks that keep personnel happy, while minimizing homesickness and encouraging an increasing comfort level with this new setting. Without such **perks**, recruits will be discouraged from "re-upping" or reenlisting or "going permanent."

Once we are building new habitat and activity modules from **made-on-Luna building materials**, we can get well beyond the "sardine-can" era of early outposts. Real elbow room and ample private space will be essential. We need to emphasize "contact", visual, and activity wise with the Moon: windows, sunshine access, and **abundant interior vegetation** to keep the air fresh and sweet.

We will need to develop a varied and interesting developing **cuisine** using plants, herbs, and spices grown on location. Regolith-derived art media will allow us to personalize interior spaces with frontier made accessories of basalt, ceramic, glass, lunar cement, and locally made alloys.

We need to invent and develop **one sixth-G sports** as well as **dance forms**. We need to be able to enjoy uniquely lunan performances as they will help bond us to the lunar setting. **Recreation inside, "middoors", and "out-vac"** will allow us to be fully human in any lunar setting.

We need to establish multiple outposts, multiple settings -- getaway places with climate variety, flora and fauna variety, different architectural styles, differing cuisines, etc. We all need to "getaway" once in a while, and we have to enable that form of relief on the Moon itself. " settlement a world doth not make!"

It is not enough to humanize our interior living spaces. We need to adopt the surrounding raw lunar surface outside our habitats and integrate it into our living space. If we do not, we will continue to feel feel that we are in a alien environment. In short, we need to feel "at home" on the surface as well as indoors.

We need to be comfortable with the Moon's rhythms, the slow pace of the dayspan-nightspan cycle. Our productive activities will have to get in step with that pace as available energy will wax and wane accordingly. Even if we have a back-up nuke, we will still have more available energy during dayspan when solar energy is also available. This rhythm will impose a fortnightly change of pace, something we bet pioneers will come to cherish.

We need to find ways to counter the "black sky blues." Out on the lunar surface, We will develop ever more enjoyable substitutes for outdoor hobbies and activities that we had to leave behind on Earth.

In other words, we need to find, create, or develop substitutes for everything we enjoyed on Earth that cannot be imported "as is" from Earth, simply because the Moon is such a drastically different environment. If we fail to do so, life on the Moon will giver rise to many kids of psychological disorders. We must strip the Moon of its alienness by doing what we can to meet her halfway. I firmly believe we can rise to the occasion!

Introducing "perks" in the first outposts

The most critical moonbase system to success is the human one. Our goal of breaking out of the outpost trap towards settlement, means finding ways to encourage personnel to willingly re-up, stay for "another tour" without limit, so long as health of the individual and of the crew at large is not an issue. These measures will:

1. increase morale and improve performance
2. promote willingness to re-up so as to give the weight allowance for his not-needed replacement to valuable imports of materials and equipment, especially tools and equipment to fabricate and experiment
3. create a plan for outpost expansion of modules, the facilities they house and activities they enable

We must provide for a full range of human activities:

- getaway "change of scenery" spaces and out-places both within the outpost and with outlying stations in easy reach.
- customizing options for personal quarters
- menu diversity and variety, including fresh salad stuffs and vegetables on occasion
- schedule breaks (take advantage of the dayspan/ nightspan cycle for regular changes of pace such as a alternating types of work and recreation
- allow fraternization between crew members, without harassment. An outpost should not be a monastery.
- promote expression of artistic and craftsman instincts using local materials and media. We will remain forever "strangers in a strange land" to the extent we confine ourselves to things made on Earth.
- Experiment with lunar sports and other recreational

activities. Lunar-unique sports and performing arts - are things that make crew begin to "feel at home".

- □ out-vac sport & recreation on the surface, learning to do so safely, one step at a time.
- □ an indulgent spa and an exercise gym
- □ telecasts to Earth of everything unique and special
- □ "while you are here" opportunities for excursion exploration and "tourist" experienced and memories
- □ All this both presupposes and prepares for an orderly expansion beyond the original core-function and space limits of the original outpost. It's what we need to do to "breakout of the Outpost Trap."

□ **Point by Point elaboration**

Made-on-Luna Habitat & Activity Expansion Modules

Lunar concrete, glass-glass composites and iron, aluminum, magnesium, and titanium alloys are materials science technologies that need to be pre-developed now using lunar simulant feedstocks. We cannot afford to expand by bringing these heavyweight structures from Earth. Inflatables may be a stopgap way of providing expansion space early on, but are still too expensive for building real settlements. We need to develop a modular language that will lend itself to a great variety of layouts. That language should be open-ended. The very awareness that one has begun to "live of the lunar land" in this major way will reduce our sense of alienation, and increase our sense of security.

Towards a modular biospherics

Centralized biological life support systems (BLSS) such as Biosphere II involve a lot of effort that quickly becomes useless as it precludes growth. These made-on-Luna modules should each incorporate a significant biospheric element, pretreating toilet wastes and using vegetation to refresh the air. With this design constraint, the growth of the pressurized physical complex will not outpace the growth of the biospheric life support system, and new modules can incorporate improved systems, so that the total biosphere becomes ever larger and more collapse-resistant. With such a system, short term crew as well as the long-term pioneers that follow will grow ever more confident that their presence on the Moon is well-founded and hearty.

Beyond a minimum "balanced nutrition" diet

There have been many studies of how we could provide balanced nutrition with a minimum number of crops. That's certainly a useless dead-end avenue of investigation. Nothing is more essential to good morale than good food. And by good food, we mean tasty food and a goodly variety of it. If we need to trim the list, we should concentrate first on those foodstuffs that can be served and prepared in the greatest variety of ways -- potatoes being near the top in that regard. We also need to grow herbs, spices, and salad stuffs that can be eaten fresh as well as lending themselves to a wide variety of cooked dishes. We might have to settle for a closet-sized growth chamber for starters, but surely, no-one is going toto leave Earth in their rear view mirror something that approximates solyent green or algae mush. A starter list of choices can always be complemented by privately grown specialty items, even in a small outpost. As the settlement grows, this will become a great opportunity for "cottage industry" - think jams, condiments, etc.

Keeping physically fit

It never ceases to amaze me how many pro-space people equate 1/6th-G with zero-G. The difference, at least mathematically, is infinite. Muscle tone will decay of course, but then level off at a plateau appreciably higher than is the case for those spending many months in Earth-orbit or free space.

At first, "keeping fit" will mean keeping in shape to return to Earth ready to resume normal activities when one gets back. But as temporary crews slowly transition to a population that includes a significant percentage of permanent pioneers, "keeping fit" will mean what it should, able to work and play with relative ease in what will have become one's home environment.

Terrestrial sports transplanted to the Moon will be just absurd caricatures of the sports we now enjoy. We need to invent sports forms that are interesting to watch and fun to play in an environment where gravity and traction are greatly reduced, while momentum and impact force remain the same. We could start now, with a computer program based on those parameters, applied to both sports and choreography. Future Lunans will miss terrestrial sports and dance less, the sooner they can enjoy sports and dance designed for the lunar environment. The morale boost will apply to players and performers as well as to spectators. Lunar sports, lunar acrobatics, lunar dance and ice-skating forms may gain an audience back on Earth via live or canned telecasts and the Internet.

But we do need to provide special gyms and devices whereby one who wants to maintain an Earth-fit state, to do so. It is one thing to appreciate how much one has adapted to the Moon, another to feel trapped on the Moon because one has lost his/her Earth muscles. The simplest way to retain one's original muscle tone is by isometric exercises that pit muscle against muscle rather than muscle against gravity. exercise in a banked floor rotating gym at variable rates would be an advanced way to preserve one's "Earth legs."

Settlement climate, flora and fauna, even wildlife are wide open choices

As we are talking about contained climates and ecosystems, we can control the settlement climate and seasons. Not everyone enjoys the same climate. While many snowbelters yearn to relocate further south, this writer cannot tolerate heat with humidity, and would rather go further north. Because settlements will have a great measure of control over these things, even apart from cultural and architectural differences, the Moon need not be a world where "once you've seen one lunar settlement, you'll have seen them all." Not only will variety in these areas work to increase the typical length of an Earth tourist visit by lengthening the itinerary, it will give future lunans more places to get away to for a welcome change of scenery.

It is not enough to be "at home" inside one's homestead and settlement

If this is all one accomplishes, a residual uncomfortableness with the barren, hostile moonscapes outside -- "out-vac" -- may remain. Some will feel imprisoned, and even dread venturing abroad. But there are ways, analogous to how we are learning to do this here on Earth, to both "bring the outside indoors" and "take the

indoors outside." For example we could create indoor garden spaces in Zen fashion, using raw regolith (sifted of its ultra fine powder fraction) and lunar stones and boulders, in a cast basalt pan.

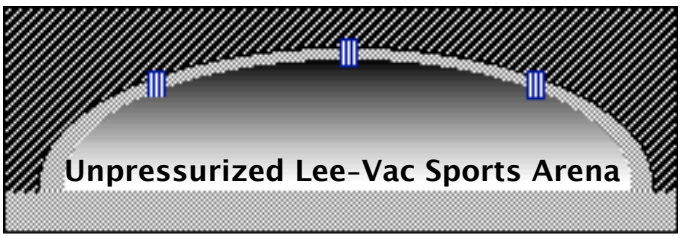
Art accessories can be made of carved basalt or cast basalt, lunar raw blackish glass, etc. We could do something similar outside airlocks using stone or cast basalt "patio" furniture and sculptures. Both approaches would help create a visual transition between exterior surface and interior decor. Once could even create a glass enclosed water feature outside. This will be easier in shaded places with greatly reduced thermal exposure.

Inside, "middoors", "lee-vac", "out-vac"

Here on Earth, we commonly think of just two spaces, indoors and outdoors. However, we are all familiar with a transition space - the walkway commons of enclosed shopping malls. In this example, "indoors" would refer to the interior of the various shops and stores. In a settlement with modular residences, offices, schools etc., interconnected by pressurized walkways, vehicular conduits, and pressurized plazas, courtyards, and parks, these interconnecting passages and spacious nodes/hubs form a sort of "middoors" environment. The middoors could be allowed to cycle between cooler and warmer periods in "moderated" synch with the outside or "out-vac" thermal cycles of the exposed lunar surface. While individual homesteads, offices, and other activity spaces could maintain a constant climate, the middoors would moderate the changes occurring on the surface, varying perhaps twenty degrees Fahrenheit, 36 degrees Celsius above and below "room temperature. That is one of many options.

A third kind of environment, which in turn moderates the thermal and radiation extremes of the fully exposed surface is "lee-vac" (leeward of the cosmic weather.) An example is a sheltered but unpressurized structure, canopy, or ramada within which one is protected from the cosmic elements of radiation and micrometeorite rain, as well as from the full heat of dayspan noon on the exposed lunar surface. Lee-vac spaces would be ideal for warehousing items and supplies that are accessed frequently. In such an environment lighter weight pressure suits would be sufficient, allowing much greater freedom of movement, greatly increasing the time one could work without fatigue.

We can see such a sheltered, but unpressurized sports complex. Sports designed especially for this environment would be different from those designed for pressurized play environments. pressurized spectator stands could line the interior side walls of such sheltered and shielded fields could have large windows, protected from meteorite impact. As these sports would be quite distinct from those played in fully pressurized environments, creating such sport environments would increase the variety of sports fare, improving pioneer satisfaction with their adopted home world.



Finally, we can see development of various kinds of sports and sporting activities for the naked exposed lunar surface itself - the "out-vac." This great variety of sports fare crossing the boundaries of raw exposed lunar surface and settlement interiors, would help psychologically integrate the lunar surface into the overall pioneer lebensraum - living space. The result would an increase in the average Lunan pioneer comfort zone, a mitigation of a "trapped indoors" feeling, and a slow dissipa-tion of the initial tendency to feel like a "stranger in a strange land."

For young people, regular school outings onto the surface would help. And undoubtedly tourist surface excursions will become the specialty of emergent enterprises, serving both visitors from Old Earth and pioneers of the New Moon. Until this familiarity and comfort level with the the raw host environment develops, we can expect some incidence of exophobia to develop, along with a feeling of being trapped.

Adaptations like this are nothing new to humans. Take a person out of his/her native tropics and drop him/her along the arctic coasts, and he/she might soon perish. Eskimos, Innuit, Samoyeds are at home here. They learned to be at home. An initially life-threatening environment is, for them, no longer to be feared. Simply put, the have learned how to cope with the evident extremes and dangers "as if by second nature." When future pioneers have leaned how to cope with conditions once perceived as hostile to life, and those coping measures have become "second nature," they will have become "at home." The Moon, for them, will have ceased to become a hostile, inimical place. It will have become home. Such a transition will be essential for their mental and psychological health. Those who cannot make or resist making the transition will become failed settlers, and will either return to Earth or become a burden to those who have successfully transitioned.

The "Black Sky Blues"

One of the hardest things to get used to in the lunar environment will be the black skies, at high dayspan noon as well as at mid-nightspan. And they are black indeed. When the sun is up, the glare off the moondust forces eye pupils to adjust to the point where one cannot see the stars. We have evolved in the brilliant blue day lit skies of Earth. Mars also has bright skies because unlike the Moon, it has an appreciable atmosphere. Getting used to that black sky may be harder for some than for others such as night owls who do not like to get up until the sun has set. For the rest of us this could be a problem.

Indoors, ceilings could be vaulted instead of flat, painted a matte sky blue and uplit from cove mounted bulbs. This would create welcome eye relief. This will be

especially welcome in high dome ceilinged middoor spaces such as settlement plazas and park spaces.

Uplit matte sky blue awnings mounted on the side of vehicles could give similar eye relief to those traveling across the lunar surface. Remember, that with no air, there is no wind, so unfurled awnings of this type should be no problem.

Taking the monotony out of "Magnificent Desolation"

I have heard my Grandmother say (while in northern New Mexico) that "when you've seen one mountain you've seen them all." For one whose soul as always been in the mountains (and not the beaches, where indeed, one wave looks like every other) I can't sympathize with that. But unless we take care to educate future pioneers how to read the shapes of craters, their width and depth, the presence or absence of central peaks, the amount of debris on their floors and on their flanks, they might get to feeling that "when you've seen one crater, you've seen them all." A good course in selenology and feature appreciation will make the scapes along the road endlessly interesting and thrilling. If we want our future Lunans to appreciate their adopted home world rather than be forever bored by it, we have to first learn how to appreciate it ourselves, and then learn how to pass those insights and the spirit of endless wonder in others. I have run into many Moon-enthusiasts who are really not at all familiar with the Moon's surface features, even the nearside ones. Get yourself a good lunar telescope (wide angle, low to modest power) and start exploring, learning names as you go along.

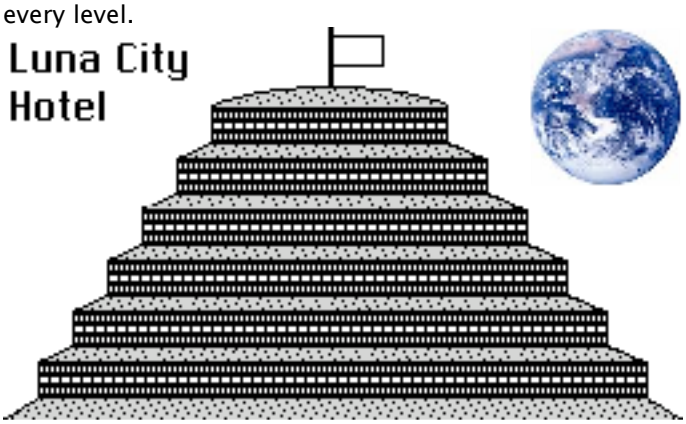
For Lunans, perhaps the most special time to be abroad out on the lunar surface will be during what we call a total lunar eclipse. During full eclipse (the umbra period), the only light reaching the nearside lunar surface is sunlight filtered by the dust in Earth's atmosphere which appears as an orange halo in the lunar sky. But more interesting than the sight of Earth as a lit halo, will be the moonscapes themselves, ruddy in the dim light, looking much more like Mars at dusk or just before dawn.

Surface architectures for Lunar habitats that pay homage to the moonscape yet stand proud.

When it comes to visions of lunar settlements, two clichés persist: a complex of molehill-like, mounds of moondust covering trenched-in horizontal cylinders, and giant glass or unobtanium domes encasing whole cities, skyscrapers and all. The physical problems of the later make them most unlikely. On a world with an unbreathable atmosphere of a density comparable to what we will want to breath, there is no problem. But that much air pressure facing vacuum outside would rip the dome from any restraints and send it hurtling spaceward.

As to the "molehill" we could conceivably give each the personal touch by simply raking it in patterns, covering it with a lighter or darker variety of moondust, covering it with lunar boulders with or without a pattern, and other means. The question is "do we want to blend in or stand proud? Our bet is that we can do both, using materials that blend in, but patterns that by sheer regularity and design, stand proud. Our architectures in so far as they show from above should pay homage to the host world, rather than be statements of defiance. If we want to be at home, we need to design accordingly.

Yet it should be possible to build multistory fully shielded pressurized structures above the surface for hotels and other uses, that pay homage in choice of materials and colors, yet stand proud. The hotel below is a pyramid of torus stories of decreasing outer diameter with a vertical elevator-containing cylinder at the middle. An embossed caison ring holds regolith in place to shield every level.



A bit of Old Earth

It is one thing to leave Earth behind, but quite another to leave one's past behind. As expense as i it is to import anything from Earth, pioneer volunteers should be given a weigh and volume allowance to bring along treasured heirlooms or items of great significance in one's personal history. Say 100 pounds and 2 cubic feet give or take. Pioneers could sell or trade unused weight allowances as some will want more, others need less.

These personal treasures will help tie together their former and new lives. A complete break would be unwise and become the breading ground for neurosis or psychosis. Some things, such as photographs, can be brought along in electronic form. But actual paintings, art objects, pieces of clothing, an heirloom furniture item, must make the journey in the concrete, though with enough shape, texture, and color information some items could be recreated on the Moon as reasonable facsimiles.

A shopper's paradise? Not exactly

With imports from Earth being astronomically expensive, and with initial lunar industries having a relatively small market to serve, there will be few choices. Unless (1) we produce only basic simple "standard issue" items and (2) we design them to serve as is, *but also* to be modification friendly. Purchasers could then give them a personal touch at their leisure, or, for those with little time and/or talent, "issue" wears and wares could be entrusted to talented craftsman and artists on commission to personalize such items for the customer during free time before or after day job duties.

Such a development could see the early years of a settlement becoming a golden age for lunar craftsmen and artists, all in the name of variety and choice, something we all value as contributing to life satisfaction. Creating a home environment that reflects our one personalities is a basic drive, creating a "safe place" in an otherwise uncaring universe.

However, anything Lunans produce for their own domestic needs are potential exports to other in-space communities (orbital hotel complexes and industrial parks for example) at a cost advantage over similar items made on Earth's surface. Thus an initially small lunar

market will grow both on and off the Moon, allowing manufacturers to expand their product lines. Meanwhile a whole suite of cottage industries may be spawned.

The role of music

We are used to making music with instruments it may be very hard to produce on the Moon. We will have no wood (we will want to recycle all waste biomass back into the biosphere), no copper or brass. However, people are enormously inventive when it comes to making music. The steel drum has to be my #1 favorite instrument (for listening, not playing) We will have glass, ceramics, other metals. Marimbas anyone! Our homegrown instruments will give lunar music a distinctive sound. Reinforcing our identification with our new adopted world.

Learning not to fear the Night(span)

No human has ever been on the Moon at night. unfamiliarity builds fear and timidity. What we fear most about the two-week long lunar nightspan is just that. It lasts for 14 and three quarter days. That's a long time to go without the heat, light, and power of the sun. It requires power storage. For some strange unfathomable reason, the idea of storing power frightens a lot of people. This is hard to understand given that our whole civilization is bases on stored power, whether it be the potential power of water stored up behind a dam, or the potential power of wood and other combustible fuels. We seem hell-bent on going to the lunar poles where solar power may be available 70-80% of the time. But we will still have to store power for the 20-30% of the time. So why not learn to store power for 50 % of the time and then we can go anywhere. Fuel Cells and flywheels and other means are ready to go technologies.

We may still have to conserve power during nightspan. If we try to reorganize all our mining and manufacturing operations so that we can sequentially do the power intensive things during dayspan and the power-light but manpower-intensive things during nightspan, to the extent that such sequencing is practical,. we will do just fine. This will create an operational rhythm that gives most pioneers a welcome bimonthly change of pace.

Learning to live and work on Moontime to the beat of the Moon's own rhythms

Continuing the discussion above, while commerce with Earth would be ruled by the Earth standard calendar. life on the Moon could follow the dayspan-nightspan sequence, with each month (or better, "sunth" would coincide with one dayspan-nightspan cycle, a cycle that will certainly govern mining and manufacturing. A sunth would be 29.53 days long, so a sunth-pair would be 59 days, with an added leap hour every 40 days. We could even schedule "local" weekends to that one would occur during dayspan when we need to concentrate on productivity, one at the start of nightspan, one in mid-nightspan, and the 4th just before dawn. What about weeks. All through history, attempts to assign more or less days to a week than seven have met with strongly resistance. To keep the sunths sequencing on time, we could have a free extra day three weeks out of every eight, and if those were weekend days, I predict there would be little resistance except from fundamentalists who believe Earth time pervades the universe.

We have two similar "lunar calendars" in use on Earth: one Jewish, the other Islamic. No one has figured out a way to mate lunar years (some with 12 months, some with 13) to match up with our standard 365.25 day year-based calendar. Actually as 235 lunar periods equal almost exactly 19 standard years, there is that concordance. But the simplest thing is to use the Earth standard calendar to govern commerce and mark years, and the lunar sunth calendar to govern productive activities. ONe further note: on Earth we have 24 time zones offset by an hour each. As the Moon turns so slowly, and dawn at one location can be as much as 24.75 days before or after dawn at another location, sunth-rhythm based calendars will be purely local scheduling aids, and lunans too will use the Earth standard calendar for marking common dates and events.

The Earth standard calendar also marks the dates of the year in which meteor showers, the most interruptive of lunar weather events, occur year after year.

Bringing up the first and future generations of native-born Lunans

The first and future generations of pioneers actually born on the Moon, or at least growing up on the Moon, will take the lunar environment for granted. But unlike the situation facing young people on Earth, they must learn to appreciate the fragility of lunar settlements, not just with regard to maintaining a positive trade balance with Earth and other pockets of humanity as may arise but with regard to maintaining their artificially created mini-biospheres in good health. For Lunan youth, this will be of much greater concern ad due attention than it is for us on Earth. While our environment, suffering from lack of attention and diffidence appears to be degrading before our eyes, lunar settlement biospheres could hit the skids and collapse in a much shorter time frame. Inside these oases in the lunar desert, we will be living essentially downwind and downstream of ourselves. Our lunar ecosystems will need to be maintained within relatively unforgiving tolerances. Unless the health of the biosphere component of our settlements is a factor in the daily life decisions of all Lunans, the prognosis for long term survival is not good.

It will be essential that all Lunans are schooled in how the biosphere works and in what we need to do, not just as a community, but as individuals, to maintain it. Courses about the biosphere and how group and individual behavior can help or hurt in keeping it in good operating condition should be started in the earliest school grade levels, going into greater depth as students advance. On the moon, there will be a "4th R", recycling. Proper recycling begins with proper manufacturing and proper packaging. Assembly should be in "knock-down" fashion so that unlike components can easily be recycled separately. Manufactured items embody the energy of manufacture and elements withdrawn from nature. The less we return to nature as trash, instead of reusing, the more total energy we will consume and the more raw material we will throughput, or to put it bluntly, excrete. Our settlement efficiency index will be a measure of how little energy we consume and how little we excrete to achieve a given standard of living. Lunans must never forget that economic survival is problematic. We are behind the economic eight ball. We need to make the most out of the least in order to go beyond survival to the

state of thriving. A well-grounded realization that our are settlements are thriving, will do much to promote a sense of well-being, that we stand to turn our new world over to the next generation in good health. To the extent that we get low marks in these efforts, the rise of neuroses and psychoses may be appreciable.

The place of youth in all this.

While many believe we should postpone procreation on the Moon until we are sure that our offspring will be healthy, such a position is demonstrably absurd. We cannot know for sure that native-born Lunans will be hale and healthy until we see that the children of native born Lunans have no appreciable physical and health defects. In other words, the only way we can be sure is by taking the plunge, the sooner the better.

To forbid the first generation of settlers to raise families would measurably lower their happiness level, and their satisfaction with life on their new homeworld. It will also negatively affect the happiness level of the first generation of older pioneers, for whom grand-parenting is one of the great rewards of advancing age.

Youth can be entrusted with environmental chores. Collecting, disassembling, and sorting recyclables for instance. Picking up and sorting trash is another. Older children can assemble new artifacts and new toys out of the disassembled, sorted parts of old ones.

Young people coming of age, say 18, could be put to work in a universal service core maintaining the life support systems such as waste water treatment and air refreshing, and farming duties. This would instill in them an appreciation for what makes a settlement biosphere works. The greater the fraction of young people who appreciate such things, the more sure all can be that their settlement will survive and thrive long past their individual deaths. In short properly educated youth will mean a greater comfort and sense of security for all.

The place of retired people and seniors in all this

In the early days of outposts-no-yet-settlements, aging frontier volunteers may be "paroled" to Earth at the end of their "usefulness." While those in their working years may not want to "carry" retired or other older citizens, such attitudes betray a great ignorance about how society works. We've all heard the phrase "it takes a village to raise a child." Grandparents and other seniors are a vital part of any such village. Grandparents can help raise children while parents are busy working in jobs that produce income-earning exports. The personal knowledge and wisdom that seniors have to impart is a vital complement to what teachers do. And there are light chores seniors can do to free younger people for more productive roles. They can do the lion's share of needed clerical work: bookkeeping, database work, communications: the list goes on. This helps rather than hurts the overall efficiency of an all-generation settlement.

Seniors in general are happier than those of middle age. They are more satisfied with their lives and achievements. They have a better sense of what, when all is said and done, really counts in life. Without them, a settlement would soon be adrift. They are anchors.

The place of pets and "urban wildlife"

The latest evidence tracing the mitochondria trail, is that wolves transitioned to dogs in just one place, somewhere in east asia, about 15,000 years ago. Those wolves who, on spotting a human, fled out of caution from the trash dumps of early stone age villages got less food than those who were less fearful of humans. They got to produce more offspring. Humans in turn selected for more and more tame animals.

Early dogs allowed Siberians, Eskimos and Innuit to settle the high arctic. They allowed mountain-dwellers to tame mountain sheep and goats. Their bark created an early warning system and dogs quickly spread by trade to all peoples around the world. Wolves became dogs as Cro-Magnon peoples became human.

The growing percentage of people who rent housing from landlords who do not allow pets, is producing an ever larger percentage of youth growing up with no appreciation of these humanized companions. Is there a place for dogs, cats, and other pets on the Moon?

There will be challenges to be sure. I remembeer seing a cartoon with a dog in a spacesuit lifting its leg over a lunar boulder. But to those who accept them, challenges become opportunities.

There can be no doubt about the psychological benefits of pet ownership. The benefits for seniors is well-documented. Such seniors live longer, happier, more fulfilled lives than those who do not have pets, and are much less prone to depression and loneliness. In young people, pet dogs who love so unquestioningly, bring out the good social qualities, fostering empathy, compassion and consideration for others.

The question is how they will fit in within size and resource-restricted space frontier settlements. But only those who have not had the fortune to be loved by a pet can question that we will find a way. Speaking for myself, I would not sing up as a pioneer if my right to have a pet was at risk. I cannot imagine in a petless situation being as totally happy with life as I am now.

As to urban wildlife, some are pests, others not. We would miss a lot in a settlement with no butterflies, no birds, no fish, no squirrels. I believe we can share our frontier spaces with carefully selected species, with the balance between advantages and drawbacks decidedly in the positive. If only neutered animals were released into the ecosystem and/or to private ownership, with all breeding stock being securely isolated, there would be no danger of runaway populations.

Temporary Conclusions

We make no claim to have "covered" the field of possible mental health issues and adjustment issues that will affect future lunar settlers, Lunans. But we trust that this is a good start. Some things we have not touched upon, but have affected pioneers throughout human history, is the recurrent emotions relating to places and people they have left behind, including friends and relatives. But issues like these have already been widely studied and there is little unique in the lunar frontier situation to warrant bringing them up again.

Inevitably, some pioneers will fail to make a healthy transition and may need to return to their home world. For future new Lunans this will be much easier, and much cheaper, than for future new Martians. But otherwise, much of what we have suggested above will also apply to pioneers on Mars, "mutatis mutandis."

To the Moon! **<MMM>**

The Moon Society

JOURNAL

http://www.MoonSociety.org

http://www.MoonSociety.org/blog/

Please make NEWS submissions to KokhMMM@aol.com

The Moon Society was formed in July, 2000 as a broad-based membership organization with local chapters, to spearhead a drive for further exploration and utilization of the Moon in cooperation with other like-focused organizations and groups.

Artemis Society International was formed in August 1994 as a forum for supporters and participants in the **Artemis Project™** quest to establish a commercial Moon base as a first step to a permanent, self-supporting lunar community. **ASI** does not engage in any form of commercial business directly, but seeks to build a Project support business team. Registered trademarks of **The Artemis Project™** belong to **The Lunar Resources Company®**

PROJECTS: www.MoonSociety.org/projects/

Moonbase Simulations - Lunarpedia wiki

Moon Society DUES with ***Moon Miners' Manifesto***

- **Electronic MMM** (pdf) **$35** Students/Seniors: **$20**
- **Hardcopy MMM**: U.S/Canada **$35** Elsewhere: **$60**

Join/Renew Online - www.MoonSociety.org/register/

Mail Box Destinations:

□ **Checks, money orders, membership questions**
Moon Society Membership Services:
PO Box 940825, Plano, TX 75094-0825, USA :

□ **Projects, chapters, volunteers, information, etc.**
Moon Society Program Services
PO Box 080395, Milwaukee, WI 53208, USA

OUR LOGO above: the Moon in its natural beauty, empty and deceptively barren, waiting for human settlers to shelter and to mother as their adopted second human home world. We have work to do!

Major Changes in Society ByLaws, more … 1st Quarter Board Meeting Report

by Chairman of the Board R. Scotty Gammenthaler

February 7, 2008 - I'm pleased to report that the Moon Society Board of Directors met on Feb 6, 2008. Present were Scotty Gammenthaler, James Gholston and Randall Severy, with Peter Schubert voting by mail-in ballot. The board approved the following actions:

1. **Revised bylaws to streamline operations**. I will publish a conformed copy of the updated bylaws shortly. These revisions include:

   formation of a **Management Committee** consisting of all the Officers and Directors, with the authority to act on behalf of the board on most matters.

2. Adopted a budget for 2008.

3. Set the regular sschedule for Board of Directors meetings to be on the *first Wednesday of each calendar quarter* at 21:00 EST in the moon-leaders room of the ASI MOO. [For the balance of the year, that means April 2, July 2, and October 1, 2008] This allows ample notice.

4. Set the regular schedule for Management Committee meetings to be on the *first and third Wednesday of each month* at 21:00 EST in the moon-leaders room of the ASI MOO. *Scotty Gammenthaler,* Chairman

Comment by Society President, Peter Kokh

We have been working on revisions to the bylaws for some time. The previous wording proved to present many stumbling blocks to quick and timely action, and all too often prevented us from taking advantage of brief windows of opportunity. The prior language required advance written notice of Board meetings, meaning that action was often delayed by a couple of months or more. Another problem is that action required a board quorum and that did not always happen. Most of us have day jobs and other commitments which sometimes interfere with meeting schedules. Now by creation of a Management Committee including officers as well as directors, a quorum is all but guaranteed. There are a few decisions which must be left to the board, but most other matters can be decided by the Management Committee.

While this sounds very dry, the amended wording ***streamlines the decision making process.*** Our Society is not a social one, but one of ambitious dreams, determined to find ways in which we can advance the day when civilians will be living and working on the Moon. It is our purpose to identify and pursue initiatives, projects, and collaborations which will bring that day nearer.

Two Society Outposts advance to full Chapter Status

We are very proud to announce the formation of two new Moon Society chapters: **Phoenix** and **Houston**. Their official chapter certificates will be in the mail shortly. Our congratulations to Craig Porter (Phoenix) and Eric Bowen (Houston) for their outstanding leadership in this regard.

Two new website pages - *check them out!*

"**Online Papers**"
www.moonsociety.org/publications/papers/

"Legislative Action"
www.moonsociety.org/legislative/

Moon Society Elections 2008
Step 1: Call for Nominations for Society Officers and Directors

from President Peter Kokh president@moonsociety.org

Our annual election ritual begins again. This year, the following positions are open: ***respond by May 1st***

Moon Society Officers:

- **President:** for a two year term, ending in 2010: currently held by Peter Kokh[1]
- **Secretary:** for a two year term, ending in 2010: This position is currently vacant, and *you may volunteer at any time to serve the rest of the current term*, as well as nominate yourself for the new term.

Moon Society Directors:

Two Director (Board member) slots: for two year terms, both ending in 2010: currently held by Gregory R. Bennett[2] and Dr. Peter J. Schubert[3].

Notes:

[1] Peter Kokh, President since August 2004, now at age 70, would like to retire from this position but remain very active. He will serve, however, if nominated and reelected.

[2] Gregory R. Bennett, founder and President Emeritus of the Society, has not able to attend meetings for some time now, because of schedule conflicts. Yet he remains an enormous asset to the Society, and we are all indebted to him for our existence and for his inspiration which still motivates us. We will appoint him Chair of the Board of Advisors, if he chooses not to run again.

[3] Peter J. Schubert is running for reelection.

Who is eligible for office or Board positions

Any current member, who has bee a member of the Moon Society for two full years as of August 1, 2008, is eligible for nomination and election. That includes all members with membership #s 1418 or below.

For officer positions, it is important that only those apply who believe that they can regularly attend our Leadership Council meetings held on the ASI-MOO (our advanced chat room environment) the first and third Wednesday evenings each month, 9-11 pm Eastern, 8-10 Central, 7-9 Mountain, and 6-8 Pacific Time (2-3 am Thursday morning UT). We understand that now and then, something may come up that makes attendance impossible. But unless you are sure that such occasions will not be frequent, please do not nominate yourself or accept a nomination. To keep the Society on the move, it is necessary that we meet on this frequent schedule so that we can tend to business (and opportunities) as promptly as possible.

For Board positions, it is important that only those apply who believe that they can regularly attend scheduled quarterly meetings held on the ASI-MOO (our advanced chat room environment) the first Wednesday evenings of October, January, April, and July, at the same times posted above). Two missed meetings in a row without prior excuse will now be grounds for removal under the revised bylaws just adopted. See page 9.

To nominate yourself, write secretary@moonsociety.org

United Nations declares 2009 the "International Year of ASTRONOMY"

20-December-2007, Paris: Early this morning (CET) the United Nations (UN) 62nd General Assembly proclaimed 2009 the International Year of Astronomy. The Resolution was submitted by Italy, Galileo Galilei's home country. The International Year of Astronomy 2009 is an initiative of the International Astronomical Union and UNESCO.

http://ww.iau.org/iau0702.486.0.html

This is an Opportunity for the Moon Society

by Peter Kokh

In the coming year the Society, hopefully in conjunction with other interested parties, will work to produce a comprehensive up to date position paper on Astronomy from the Moon. There is much to be gained.

The astronomical community has considered the Moon as an ideal platform for astronomy for some time. In comparison with Hubble which orbits the Earth every 96-97 minutes, making it difficult to keep any non-polar target in view for very long, the Moon rotates once every 29 days. Hubble's orbit is dirty with dust and debris and getting dirtier. The Moon's gravity effectively purges the near surface boundary layer of space of dust. Lunar gravity makes mechanical support and movement easier.

Of course, there are challenges. We need to find out how high above the lunar surface the dust cloud levitated by static electricity that follows the terminator is a problem. We may need to put telescopes on a tower of unknown height.

The intense radio silence of the lunar farside will be ideal for Radio Astronomy, including SETI especially in wavelengths that do not penetrate Earth's atmosphere or are jumbled by the cacophony of radio, television, microwave and other wireless transmissions that keeps increasing in volume and wavelength spread.

Already, enabling Astronomy from the Moon is the major driver behind Italy's Moon Mission plans. In the United States, Stanford alumnus Steve Durst, a Moon Society member and publisher of Lunar Enterprise Daily, leads an effort by the International Lunar Observatory Association to place a telescope at the lunar south pole. ILOA has contracted with SpaceDev for transportation, and SpaceDev has just pulled off a first successful test of its lunar lander.

Astronomy from space will continue, as it will from Earth's surface. I remember all the predictions for the death of astronomy on Earth when Hubble first flew. The gloom and doom crowd did not reckon with Roger Angel who found a new way to cast much bigger mirrors, or with adaptive optics which can see through atmospheric turbulence. Astronomy on Earth is now in the midst of an unprecedented Golden Age. Each location brings its own advantages.

Astronomy has been a premiere human scientific activity since prehistoric times. We cannot look up and not wonder. Our perch on the Moon will let us do so as never before. *Anyone or any group interested in working on this paper can contact me a*t kokhmmm@aol.com.

Our first goal should be to preview a draft paper for Astronomy Day in 2008 on May 10th. **<MSJ>**

The Moon Society Outpost Report

Chapters & Outposts

Phoenix & Houston to receive Chapter Certificates! *see below*

Moon Society Phoenix *"Chapter!"*

http://www.moonsocphx.blogspot.com/
Meeting the 3rd Saturday of the month
Moon Society Phoenix' next meetings are on Saturdays **February 16th** and **March 15th** at Chompie's at 1160 E. University at 3: PM.

Contact: Craig Porter <portercd@msn.com>

We already have seven members, with several more likely. Temporarily, we are operating with the following officers:

President	Craig Porter
Vice pres	Chuck Lesher (also webmaster)
Vice Pres	Ben Nault
Vice pres/recruiting	- Bonnie Ann Burgard
Treasurer	Craig Porter
Secretary	Craig Porter

Moon Society Houston *"Chapter!"*

http://www.moonsociety.org/chapters/houston/
Contact: Eric H. Bowen eric@streamlinerschedules.com

Meeting **March**, Date & Location TBD

At our first meeting, January 29th, the active members present voted unanimously to reorganize the Houston Chapter. We elected temporary officers for a maximum term of one year or until formal bylaws are adopted.

President	Eric Bowen (also webmaster)
Treasurer	Ken Sweeney Sr.

Moon Society St. Louis Chapter

http://www.moonsociety.org/chapters/stlouis/
Meeting the **3rd** Wed. monthly at Buder Branch Library 4401 S. Hampton, in the basement conference room

Contact: Keith Wetzel <kawetzel@swbell.net>

Bay Area Moon Society Outpost

http://www.moonsociety.org/chapters/bams/
Meeting **4th** Thurs. montlhly at Henry Cates' in San Jose

Contact: Henry Cates <hcate2@pacbell.net>

Moon Society Tucson Outpost

Contact: Ben Nault <bnault@comcast.net>

Mid-Atlantic Outpost Recruiting Opportunity
(Maryland, District of Columbia, northern Virginia)

The 2008 International Space Develpment Conf. (NSS), cosponsored by the Moon Society will be in Washington, DC, May 29 - June 1, 2008. If you live in the Washington, Arlington, Baltimore, Fredericksburg, Anapolis area, why not drop in on us? "***No cost" details to follow***.

Former MMM Contributer on Atlantis Mission

http://bulletin.hmc.edu/archives/2006/fall/alumni_profile%20Love87.html

Stan Love, a member of the Seattle LUnar Group Studies (SLuGs), an activity group of the Seattle L5 Society back in the late 1980s and early 90s, is aboard **Atlantis** on the **STS-122** mission to the International Space Station, launched successfuly on February 7th.

In 1997, fouteen of Stan's wide-ranging technical abstracts were published in MMMs #106-108, recently ***republished in MMM Classics #11***

p. 44 "Balloon Launch of Small Rockets;"

p. 49 Magsail Asteroid Mission," "Magsail Mars Missions," and "Magsail Stabilization of Lagrange Point Structures"

p. 50 "Remote Lunar Geological Survey" and "Survey of Earth-Crossing Objects"

p. 51 "Food Animals in Biological Life Support Systems," "An Artificial Lunar Magnetic Field," and "Magnetic Radiation Shield"

p. 57 "Another Use for a Space Elevator"

p. 58 "Magnetic Solar Wind Collector" and "Using Structural Steel on the Moon"

p. 59 "Varitety in Biological Life Support Systems" and "Sunwatch Systems"

Also in MMMC #11 p. 79, we ran this bio.

Stan Love is a graduate student in the Ph.D. program of the Astronomy Department at the University of Washington in Seattle. He received his Bachelor's in Physics from Harvey Mudd College in Claremont, CA, in 1987. His primary research area is the astronomy, geology, and physics of the solar system. He also pursues research in Aeronautical and Astronautical Engineering. Mr. Love is currently serving as an Officer-at-large on the Board of Directors of SLuGS. Recreational interests: hiking, rock climbing, dancing, boating, reading, role-playing game design.

For more on SLuGs see p. 41, in the same Classics issue. To download this issue (pdf file) go to:

www.moonsociety.org/publications/mmm_classics/

Notice about article published in December issue, MMM#211

Last October 1-5, Houston area member, and Moon Society Advisor, **Larry J. Friesen** attended the LEAG (Lunar Exploration Analysis Group) Conference in Houston on our behalf. He sent us a comprehensive report which was too long for us to print in MMM. Obligingly, he cut it down to somewhat less than half the orginal length, and by squeezing it by using a smaller font, we managed to print it in the December issue, on pages 7-8.

We are pleased to be able to publish the whole original paper *online* at the address below, a new page on the Moon Society website:

www.moonsociety.org/publications/papers/

Check out this paper and others at this location!

GREAT BROWSING !

New insights into mass & origin of Saturn's Rings
www.astronomy.com/asy/default.aspx?c=a&id=6104

InterPlanetary Ventures
[Google Lunar X-Prize contestat]
www.kemcom.net/ivnet/media.html
www.interplanetaryventures.org

Great Moonbuggy Race 2008
http://moonbuggy.msfc.nasagov/
[cosponsorship requires a minimum $500 donation]

Crippled Mars Rover Spirit, dragging a jammed wheel behind it, makes a startling discovery
www.sfgate.com/cgi-bin/articlecgi?f=
/c/a/2007/12/11/MN4OTRSU8.DTL

Inventions & Ideas from Science Fiction
http://www.technovelgy.com/

Could E.T. Astronomers detect Earth?
www.astronomy.com/asy/default.aspx?c=a&id=6428

Help Create an Orbital Propellant Station
http://www.lunarwire.com/

Apollo Image of the Week
http://apollo.sese.asu.edu/

"Planetary Defense" on DVD
www.SpaceViz.com/documentaries/planetarydefense/
planetarydefense.htm

'Drilling Up' Into Space for Energy
www.physorg.com/news117649731.html

BBC Science Moon page
www.bbc.co.uk/science/space/
solarsystem/earth/moon.shtml

Deep Impact heads for Hartley 2 encore
www.astronomy.com/asy/default.aspx?c=a&id=6395

Gallery of NSS Space Settlement Art Contest
www.nss.org/settlement/calendar/gallery.htm

Gates & astronaut fund deep space telescope
www.networkworld.com/community/node/23514

NASA designs lunar positioning system
www.flightglobal.com/articles/2008/01/16/220851/nasa
-designs-lunar-positioning-system-for-exploration.html

NASA GRAIL mission to explore inside of Moon
www.itwire.com/content/view/16134/1066/

LEAG 2007 Workship "Enabling Exploration: The Lunar Outpost and Beyond"
www.lpi.usra.edu/meetings/leag2007/presentations/

Space Hotel Sees 2012 Opening"
www.space.com/news/070811_space_hotel.html

Siimulated Moondust business is booming
www.utdallas.edu/news/2008/01/16-001.php

Aerospaceplanes and space solar power
www.thespacereview.com/article/1016/1

China and India want to play
www.thespacereview.com/article/1014/1

How to beat the ban of humans on Mars
www.thespacereview.com/article/1012/1

How an intermodal COTS system can accelerate commercial servicing in GEO
www.thespacereview.com/article/1024/1

Spaceports still taxiing towards takeoff
www.thespacereview.com/article/1023/1

Oberg debunks space disaster/conspiracy theories
www.thespacereview.com/article/1043/1

Should China join the Space Station project?
www.thespacereview.com/article/1042/1

Check out "Postcards from the Future"
www.postcardsfromthefuture.net/

Moons like ours form in 5-10% of planet systems
http://news.bbc.co.uk/1/hi/sci/tech/7104558.stm

The Mars Gravity Biosatellite
www.marsgravity.org/main/index.html

Planetary Radio Archives (Planetary Society)
http://planetary.org/radio/archive/date/

Manned Mars mission lander development to start in 2009 - NASA
www.flightglobal.com/articles/2007/12/19/220427/manned
-mars-mission-lander-development-to-start-in-2009.html

The Space Solar Power Library
www.nss.org/settlement/ssp/spacepower/

Ares I rocket has serious vibration problem
http://www.nytimes.com/2008/01/20/science/space/
20shuttle.html?_r=1&ref=us&oref=slogin

NASA Site seeks to draw MySpace crowd
www.nytimes.com/2007/12/03/technology/
03nasa.html?_r=1&ref=business&oref=slogin

SpaceShipTwo & WhiteKnightTwo plans advance
http://arstechnica.com/news.ars/post/20080124-
spaceshiptwo-unveiled-with-open-architecture-like-
linux.html

GREAT SPACE VIDEOS !

MOON COLONY VIDEOS - The Moon Society

30 plus thought-provoking videos, produced for the Moon Society by Chip Proser (Celestial Mechanics, Inc.) can be found at.
http://www.moonsociety.org/video/
or at:
http://www.mooncolony.tv/
http://www.stickymedia.com/

ASSORTED SPACE VIDEOS

InterPlanetary Ventures
http://www.youtube.com/watch?v=O6Rz4EludOk

SpaceDev's lunar lander prototype successful test
http://www.spacedev.com/uploads/
Nov2_2007_Lander_Test.wmv

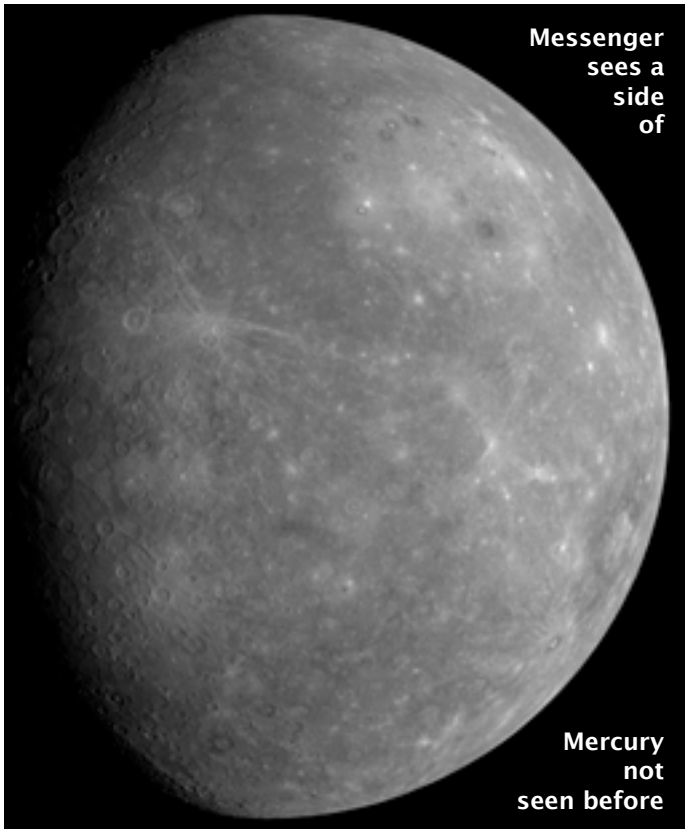
Animation of Mercury Flyby by Messenger Probe
http://messenger.jhuapl.edu/the_mission/movies/
M1_Phase_B_final_text_small.mov

More Messenger encounter vizualization Info:
http://messenger.jhuapl.edu/encounters/
i*nset Mercury image*

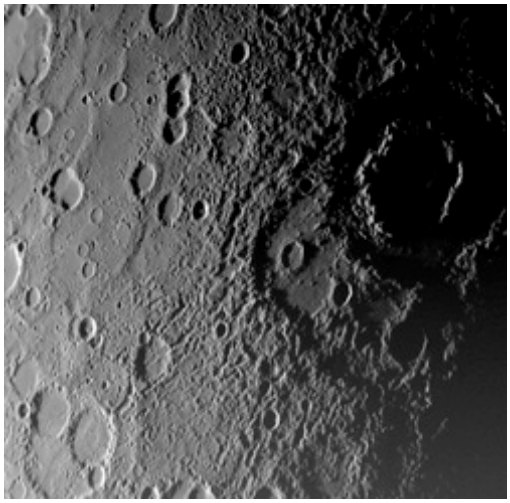
MMM PHOTO GALLERY

Mercury's molten Core

www.nasa.gov/vision/universe/solarsystem/mercury-20070503.html



Messenger sees a side of Mercury not seen before

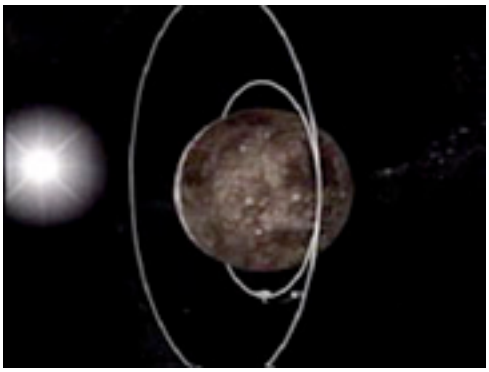


125 mile wide double Crater Vivaldi on Mercury seen by Mariner 10 30 years ago

for a 950x933 pixel larger view: www.astronomy.com/asy/objects/images/mercury_closeup_011408.jpg

MESSENGER's superior camera will also reveal details that could not be resolved on the side of Mercury viewed by Mariner's vidicon camera in the mid-1970s, as well as photographing much of Mercury never seen before.

Messenger will flyby Mercury again October 8th and for a third time in September '09 before settling into orbit around Mercury for a one year mission in 2011-12. At that time, ESA will launch its **BepiColumbo probe** to Mercury, which will arrive on location in 2015, after a 3.5 year tour of the Inner Solar System. Unlike Messenger, BepiColumbo is headed for a polar orbit of Mercury to get a good look at its poles where permanently shaded craters may hold water-ice as hinted by past radar scans.



On January 23rd, Richard Branson revealed models of SpaceShipTwo (*bottom left,* with wings folded up and forward) and **White Knight Two** *(below,* carrying SpaceShipTwo, with wings down and back, slung under the wing in the middle of the twin plane cabins). First flights may come as early as 2009.

Developing the Next Generation of Aerospace Personnel

By James W. Barnard, Denver Space Society

It is a well-recognized fact that the United States will face a severe shortage of students in the science, technology, engineering and mathematics (STEM) fields in the next few years. The aerospace industry has been complaining about this, and asking how to interest young people in these fields for over a decade. Indeed annual issues of Aviation Week & Space Technology Magazine over the past ten years (including the most recent issue) have addressed this in feature articles. They point out that most youngsters would rather become computer programmers and write video games than go into fields relating directly to the aerospace and defense industries.

The oft-stated solution is to talk to high school and college students, and try to persuade them to get interested in the A & D fields, to offer scholarships (especially to children of employees of aerospace companies) as an incentive to follow the "space sciences". Others point to the need to improve employment conditions for people entering the field, in an attempt to remove the negatives (e.g., frequent layoff cycles) to which past aerospace and defense employees have been subjected. Certainly, these factors surely will influence the next generation.

But, in this writer's opinion, simply approaching secondary school students is far too late! Personal experience in the writer's own career, as well as consultation with educators leads me to strongly believe that if children have not been exposed to and interested in STEM subjects no later than fifth or sixth grades, it is probably going to be too late!

The average age of personnel in Mission Control when Apollo 11 landed on the Moon was 26. (Those people are now 65+.) This means that if crewed missions back to the Moon take place in the 2020 timeframe, there is somewhere a 5th or 6th grader who must become interested in space exploration, now!

Unlike the "war babies" and the "baby boom" generation, who were exposed to the rapid advances in aviation in the post-World War II through the Apollo eras, the current generation of children and adults have grown accustomed to (and apparently bored by) "routine" Shuttle operations, except when disasters like the Challenger and Columbia crashes occur. Unlike the days of the famous Collier's Magazine articles and the Wonderful World of Disney's Tomorrow Land productions by von Braun, Ley, et al, there is not so much being done generally, on the national level to interest kids in space exploration.

This is not to say that there have been no efforts by various organizations to interest kids in space! NASA has its Explorer School program of approximately 150 schools which receive about $17,000 for the first year of the program, following which the schools must be funded locally. The schools are supposed to be located in inner-city areas, particularly where the socioeconomic levels are lower. (Interestingly there is only one Explorer School in the State of Colorado, and that is located in Colorado Springs, Colorado, in an area that is not what one would call, low-income!) There are none in Denver, nor the surrounding suburban school districts. NASA did recently send out a request for schools across the nation to apply for Explorer School status.

The Space Foundation, in Colorado Springs, CO teaches the teachers, offering summer courses in the aerospace curriculum. Such courses are open to teachers from all over the country. And they do come! And the courses are excellent! (This writer audited one of the courses several years ago.) But these courses are expensive, and they are limited in how many teachers can enroll. (It is noteworthy that Boeing has been one of the principal supporters of this program.)

Museums such as Denver's Museum of Nature and Science, the Wings Over the Rockies Air and Space Museum, Chicago's Adler Planetarium, Chicago's Museum of Science and Industry, run terrific programs and exhibits! The Space Camp programs certainly offer kids and adults a thrilling experience. And the Experimental Aircraft Association, in cooperation with organizations like Wings do everything they can to show the kids real, "live" airplanes. Also, some aerospace companies send their employees out to public schools, to talk about their programs, and individuals such as this author, et al, have spoken to various schools, scout groups, etc, on a limited basis.

But, there are difficulties. Students who do not live within practical "striking distance" of such museums may not be able to take advantage of their presence. Even where schools are within a relatively short distance from a museum, there may not be funding available for field trips. (Bus transportation becomes more and more expensive as gasoline prices soar into the heavens faster than a Shuttle launch!) Individual parents may be unwilling or unable to schedule trips for their children, if they themselves aren't interested in space subjects.

The "No Child Left Behind" legislation mandated by Congress may prove to have an overall benefit to educating children, but the requirements levied by this program are resulting, rightly or wrongly, in teachers having less and less time to schedule outside speakers into their classrooms. And school administrators are often uncertain whether programs on "space" are worthwhile for their teachers and student, without some sort of imprimatur of a recognized "authority" or organization. Hence, they are reluctant to recommend to the teachers that they make room for such talks.

There is some validity to this skepticism. While talks about the history of space exploration and, perhaps, the experiences of veteran engineers and scientists, including this writer, may prove interesting, kids want to know what is happening now, and what may/will happen in the future. Keeping up with some of the latest developments in space and science, and developing concise programs to be presented in a timely manner can be a time-consuming task for single individuals, and editing and packaging information that can be presented to various grade levels, without either boring the older kids, or going way over the heads of the younger ones can be a daunting task for one individual. (This author spoke to two after-school groups composed of K-6th graders! What was amazing was the younger students were asking more detailed questions that the 6th graders!)

One might expect the various space advocacy organizations to have come to similar conclusions, and created their own programs along these lines. With the exception, perhaps of Wings Over the Rockies, and the Space Foundation, this writer has been rather disap-

pointed by the efforts seen to date! Even where some regional segments and local chapters have put together programs, their national headquarters have not substantially supported their efforts. Surprising, but sadly, true!

What is needed is a National Committee for the Promotion of Space Education. Such a committee should be composed of representatives from as many space advocacy groups as possible, including, but not limited to the National Space Society, Mars Society, Planetary Society, and the Moon Society, as well as aerospace and defense corporations, commercial space developers, etc. Assistance from NASA would certainly be welcomed, provided such assistance did not violate any prohibitions against the Space Agency advertising or promoting itself under the law, and also provided that content of information was not limited to NASA programs or policies. The intent would be to develop programs for presentation to school children in grades K-12, with emphasis on grades 3 - 8, and to develop contacts with school district administrators and teachers throughout the United States. Such a joint committee would develop presentations and information packages to be utilized by local docents for schools and youth organizations.

This effort will not be accomplished without some difficulty. Some organizations may feel they are relinquishing some of their prestige, or may not feel they have the personnel or funds to cooperate in such a venture. It is hoped that if prominent figures in the aerospace community were to exert their powers of persuasion, any reluctance on the part of such organizations might be overcome.

Funding may also be a limiting factor, as it is in the space program itself. It is to be hoped that expenses can be held to a minimum, if such a committee is not bureaucratized too much. Further backing might be obtained from private industry, individuals, and the advocacy organizations themselves.

Regardless of the final form of such an effort, it is vital to the future of our Space Program to interest and educate youngsters. Even those who do not choose to become actively involved in the space program can, if sufficiently interested, become advocates for the exploration of space.

To aid the various organizations in implementing this project, the attached Draft Resolution is offered for presentation to the governing bodies of the various space advocacy organizations.

Space Education Draft Resolution

By James W. Barnard

Whereas, there has been and is an ongoing shortage of students and graduates in the Science, Technology, Engineering and Mathematics (STEM) fields who are interested in careers in the aerospace industr(y)(ies), as evidenced by periodic reports from industry and government (including annual articles on the subject in Aviation Week & Space Technology Magazine, over the past decade), and,

Whereas, the number of college graduates in the STEM disciplines in countries such as China and India, far outstrips those graduates in the United States (approximately one-half million versus 70,000 according to Norm Augustine, former CEO of Martin-Marietta, et al), jeopardizing the United States' technological lead and base in the space sciences, and,

Whereas, it is recognized by many educators that children are highly influenced as to the career fields they choose in the early primary grades through the mid-secondary grades, and,

Whereas, even those children who do not choose careers in space, can have a positive influence on their parents, and by themselves as adults in supporting the expansion of our exploration of space, and,

Whereas, a program conducted under the aegis of international and national space advocacy organizations often carries more weight than one run by a smaller group or individual, therefore,

Be it resolved, that the "_____ Society" shall institute a program to introduce, acquaint and educate students in grades K-12, and especially in the grades 3-12, with the rationale for, history of, and current and potential future efforts in robotic and human space exploration and commercial space projects.

Such a program shall include programs to for presentation to schools, clubs, scout organizations, etc., and shall include but not be limited to programs and projects relating to space and how it benefits humankind. Said program(s) to be conducted through and by local chapters, and individual members, with the support of the parent space advocacy organization, in as close cooperation and coordination with such other space advocacy organizations as may be practicable.

Support by the parent organization headquarters shall include, but not be limited to, preparation of guidelines for contacting administrators of the above-mentioned schools, groups, and industrial companies, etc.; preparation of materials and aids for use in such presentations; assistance in obtaining guest speakers, such as astronauts, engineers, etc., from both government agencies and private industry; and financial aid as may necessary.

It is recognized that such a program will require funding. To the extent that the organization's national headquarters cannot provide this funding, contributions should be solicited from local chapters and individual members. Private industry, including the major aerospace and defense corporations should also be asked for support. It is, after all in their best interest to have a pool of potential future personnel obtained from such educational programs.

This proposal is offered with the conviction that only in this way can the space exploration and development effort be maintained, and the future of America and humankind in space guaranteed.

Ad Luna! Ad Ares! Ad Astra!

James W. Barnard, August 28, 2007

To discuss this concept further with the writer, contact:

James W. Barnard
2359 E. Crestmont Ln.,Highlands Ranch, CO 80126-4500
Ph: (303) 791-6068; FAX: (303) 683-5357;
trailrdr@ecentral.com **<JWB>**

and *online*

Who is James W. Barnard?

www.moonsociety.org/publications/papers/jwbarnard_bio.html

Lunar Reclamation Society, Inc.

P.O. Box 2102
Milwaukee
WI 53201

www.lunar-reclamation.org

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

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< James_Schroeter@excite.com > 414-333-3679
TREAS./ Database – *Robert Bialecki 414-372-9613

LRS News

• **January 12th meeting**: Bob Bialecki brought along a Discovery Channel DVD, "**Moon for Sale**" – very interesting though it gave time to Dennis Hope's Lunar Embassy lunar land sales program, an illegitimate scheme (the Moon isn't his to sell) that has netted Hope millions of dollars from gullible enthusiasts. We had a discussion about how legitimate property rights could be established via "homesteading," "working the land," and by making land improvements (power and utility access, etc.)

Charlotte informed us about the upcoming amateur astronomy conference in Port Washington hosted this year by Northern Cross Science Foundation to which she and Gene belong. See the Sheboygan Space Society news on the next page for more information.

• **Wisconsin Mars Society chapter**, once our steady outreach partner, is all but dead. WMS members have scattered to the four winds, leaving Peter with the website and the displays. Peter is trying to revive it and find new members, in hopes of reviving that dynamic collaboration during the 1999-2005 periods. Mars is a secondary focus of the chapter as well as of MMM, and the two frontiers have more in common as compared to Earth, so collaboration should be a benefit for both groups, and frontiers.

LRS Upcoming Events – February, March

Saturday, February 9th, 1-4 pm

LRS Meeting, Mayfair Mall, Garden Suites Room G110
AGENDA: www. lunar-reclamation.org/page4.htm
Reports on Summer events, Updates on space and space mission news, conferences etc. A look at the calendar ahead. Bob Bialecki will bring along another Discovery Channel video DVD: "**Base Camp Moon**."

Saturday, March 8th, 1-4 pm

LRS Meeting, Mayfair Mall, Garden Suites Room G110
AGENDA: www. lunar-reclamation.org/page4.htm

MMM 8 NSS Chapters Strong

NSS Chapter Events
Space Chapters HUB Website:
[http://nsschapters.org/hub/]

Oregon L5 Society

P.O. Box 86, Oregon City, OR 97045
voice mail / (503) 655-6189 -- FAX (503)-251-9901
[http://www.OregonL5.org/]

Allen G. Taylor <allen.taylor@ieee.org>
Bryce Walden <moonbase@comcast.net>
(LBRT – Oregon Moonbase) moonbase@comcast.net

Meetings 3rd Sat. each month at 2 p.m.
Bourne Plaza, 1441 SE 122nd, Portland, downstairs
• **February 16th – March 15th – April 19th**

Chicago Space Frontier L5

610 West 47th Place, Chicago, IL 60609

INFORMATION: Larry Ahearn: 773/373-0349

Minnesota Space Frontier Society

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

Tom Greenwalt (w) 763-784-6244 (h) 763-442-6015
David Buth (w) (612) 333-1872, (h) (763) 536-1237

Email: tomg@mnsfs.org

[www.mnsfs.org/]

MN SFS News & Pictures

We are planning for the **MarsCon 2008 Science Room**
Friday February 29th – Sunday, March 2nd
Science GoHs: Geri Haracz, Larry Ahearn, Peter Kokh

NASA @ Mall of America Pix
www.freemars.org/mnfan/MOA-USGOV/2008/

WISCONSIN

Sheboygan Space Society

728 Center St., Kiel WI 54042-1034

c/o Will Foerster 920-894-2376 (h) <willf@tcei.com>
SSS Sec. Harald Schenk <hschenk@charter.net>
>>> **DUES:** "SSS" c/o B. P. Knier
22608 County Line Rd, Elkhart Lake WI 53020

[http://www.tcei.com/sss/]

We meet the 3rd Thursday of the month 7-9pm

MAY 19th: UW-Sheboygan, Room 6101, **Sheboygan**
JUN 16th The Stoelting House, **Kiel**
JULY 21st: UW-Sheboygan, Room 6101, **Sheboygan**

Harald Schenk, an SSS member with many credits, will be a featured speaker at the **2008 NCRAL** (North-Central Region of the Astronomical League) Conf. to be held **April 18-19**, 2008 at the Lakeview Conf. Center in **Port Washington**, WI.

You can check Harald's impressive credits at:
http://www.sheboygan.uwc.edu/uwsheboygan/webPages/hschenk/index.htm

Keynote Speaker will be Jack Foley Horkheimer, Executive Director of the Miami Space Transit Planetarium. "Foley" as prefered to be called in his high school days, was one year behind MMM Editor Peter Kokh at Campion Jesuit High School in Prairie du Chien, WI in the early-mid '50s.

COLORADO

Denver Space Society

(formerly Front Range L5 Society)

1 Cherry Hills Farm Drive
Englewood, CO 80113

http://www.angelfire.com/space/frl5/

Eric Boethin 303-781-0800 eric@boethin.com

Next Meetings, all starting at 6:00 pm:

Mon February 11th, Tues March 18th, Tues April 1st

Denver University's Olin Hall, Room 105
http://www.du.edu/maps/olin.html
at **2190 East Iliff Avenue**, Denver, CO

PENNSYLVANIA

Philadelphia Area Space Alliance

928 Clinton Street, Philadelphia, PA 19107

c/o Earl Bennett, EarlBennett@erols.com
215/633-0878 (H), 610/640-2345(W)

[http://pasa01.tripod.com/]
[http://phillypasa.blogspot.com]

PASA Address change note: we are no longer using the postal box! The new address will be Mitch's:
928 Clinton Street, Philadelphia, PA 19107

PASA regular business luncheon/formal meeting 1-3 pm, the **3rd Saturday of every month** at the **Liberty One food court** on the second level, **16th and S. Market.** Go toward the windows on the 17th street side and go *left*. Look for table sign. Parking at Liberty One on 17th St. Call Earl/Mitch 215-625-0670 to verify all meetings.

Next Meetings: Feb. 16th - March 15th - April 19th

December Meeting Notes: we had a good meeting with the lead off being our treasurer, Michelle Baker, reporting our solvancy. Always good to know! This led to a question on dues and the renewal of Alex Howertons membership. More on him later. In adition to the treasurer's report, Michelle also prompted us to list our activities of 2007 for the annual report to The National Space Society. We are a 501C-3 under there umbrella but must report our outreach activities as part of this inclusion by them.

Larry, our webmaster, has stopped the subscription to the web counter service and will use the hit counter on the site instead. Also, he notes that our blog address in Moon Miners' Manifesto should be:
http://phillypasa.blogspot.com.
This has been an irritation for the webmaster for some time. [This link was corrected in the December issue of MMM, #211] Most net contacts are World Wide Web, or "www." as the short hand goes, but not all. The next time we do buisness cards we will have to add this info. also.

Dotty brought in notes on the ongoing performance of "Cosmic Collisons" at The American Museum of Natural History.

Hank Smith told us of the Philcon debriefing today. The con may have lost money this year, and Hank, who has been part of that group for a number of years, was very unhappy with what he views as the interpersonal conflicts that resulted in very poor performance of the overall organization this past year in buisness terms. The group that runs Philcon is now looking for a different venue for the event for various reasons. I hope this is achieved soon as this is a fun and educational event that is easy to attend. Hopefully, Hank will have input on fixing the behind the scenes problems and it will be back in November. On a happier note, Hank will attend

Lunacon or Balticon this spring and maybe The National Science Teachers Convention in Boston arround Easter.

Alex Howerton discussed activities at the NASTAR Center which included a working visit by Sir Richard Branson and associates. This was a working visit for testing of Mr. Branson et al. on equipment at the Center used to prep future space travellers. Cool! In adition: the company is also working on testing processes for equipment to validate it for high-G operation. This testing capability will be made available as a service. And much other great stuff. The parent company is Enviromental Tectonics whose CEO and President is William Mitchell.

Earl reprised the Lunar X-Prize Compatition and was informed that the number of potential entrants is growing rapidly. This lead to refrencing an article Earl brought from Wired Magazine (12/07) about "Slicing Up the Moon", by Richard Morgan, on what could happen in the Arctic and how it might be applied to Luna. The piece refers to the Moon as "a global commons", one among several. These brought forth more discussion; in particular about ownership and property rights on the Moon and other celestial bodies. On Earth, physical possesion was often considered the standard. The ability to fight off potential thieves or claimants (not the same thing) was also a consideration.

There may be four bases, according to the author, by about 2030. On the technical side there is a great Geek piece called "R-2, We Have a Problem" on The San Diego Tripoli Rocket Associations' constuction and launch of a Star Wars (original, not vaporware) X-Wing!. Page 61 for the flight. The next project: A Klingon D-7 Battle Cruiser.

And speaking of real stuff: The January Nuts and Volts has another Near Space article on the practical side of flight hardware. One is for a camera timer for pictures. The other is a bit unusual: Balloonsats, as they are called, are eventually either naturally ruptured or deliberately cut loose. For instrument retrieval, and other reasons, cutting loose is prefered. The details of a way to do this are described. There are actually two space related projects in the issue, but also two short reports on nanotechnology (radio reception with a nano tube, and a Barium Titanate nano power generator repectively) in the " Tech Knowledgey 2008" column.

And finally: from Analog Science Fiction and Fact for March 2008, page 54 has Project Boreas: A Base at the Martian North Pole by Stephen Baxter. This was a study done by the famous British Interplanetary Society with Fellow Baxter as a particapant. This project involves sending a drilling rig to get geologic and historical data from cores taken from the ice at various depths why different things would be done and learned are the highlight of the piece. and more from John G. Cramer in the "Alternate View" column.

Mitch Gordon brought **the Winter issue of Ad Astra** which had a number of good articles including " Lunar Enterprise Zones", wherein buisnesses would locate in an area to share common infrastructure elements to keep costs down by distributing costs and resources over there units. This is an application of "economies of scale" that can be seen in a common setting: Malls. Also included: "Opening Asteroids to Space Settlement" and a listing entitled "The Top Twenty Space Visionaries" with the comments of this group. It includes Richard Branson, Stephen Hawking, Burt Rutan, and "Rusty" Schweikart among others. See the magazine.

Also : our officers now include **Alex Howerton as our Education Outreach Coordinator.** This is great as we are about to start our annual George Washington Carver Science Fair activities. When he joined us last year Alex began helping by judging for us at these February and March events. He will be a great addition to our Coordinators in this capacity. And later in the year: several of us will be going to the I.S.D.C. between May29 to June 1 at The Capital Hilton in Washington D.C.

Submitted by Earl Bennett.

January Meeting Notes: Our first report was from Larry, our webmaster, asking for more material for the web, blog and picture sites, with titles on the photos please. Since we are coming up on the Carver Science Fair this is a good reminder. Dotty reported on several upcoming events in our area with The Franklin Institutes special Star Wars Exhibits starting February 9 and ending May 4 being of particular note. This will mix the fictional science and technology of the series with what is real and what can really be achieved. For example: we can't build R2-D2 much less C3PO but we can build robots that can carry out limited tasks now,and some of these will be on exhibit, along with our "dream machines" of the Lucas films. And similarly, there will be space ships (or Ships as Arthur C. Clarke called them), both Star Wars and "real". In addition: the film "BioWorlds: Life Beyond Earth" will also be playing.

Michelle says "we are solvent". This is partly due to membership and also contributions by members and friends to our treasury. I was recently going through my email and found an offer to help with some of our costs due to our public service work in promoting science and technology education. I will contact a possible donor on this during the next month and give Michelle the results.

Mitch Gordon is taking over the duty of receiving our mail, as noted above, and should be sent all correspondence from NSS and others to our group. This should be changed in Moon Miners and Ad Astra in the near future. If you renew membership by mail, send to the new address! Mitch brought up a special exhibit at The Academy of Natural Sciences where The National Geographic Travelog was appearing. Mitch pointed out that the travelogs have never involved space. This may change soon as a related report Mitch gave from The Futurist Magazine for Jan/Feb. on Richard Branson and the work on bringing the cost of space touring down to $200,000 as well as others working on various activities from Space Camp to the $20,000,000 stay at the ISS. This is in "The View From Here". In addition: work done at Bristol University ("Self Repairing Spacecraft Heal Themselves") is reported in this special Space issue. Mitch also brought up our upcoming exhibit at Super Science Weekend and checking out a possible presentation venue, The White Dog Cafe, which Michelle suggested we visit in the near future to see if the patrons would be a good audience for our talks.

Hank Smith brought news of the PSFS organization and his near term plans: the group that runs Philcon broke even this time but needs to expand there methods to reach out to sci-fi fans and potential attendees with current methods: members of our group brought up blogging from the event, U-Tube video presentations,

podcasts (which admittedly have limited appeal, but where discussed at Balticon in a "how to" panel) and the traditional handouts and public service spots. Getting good publicity for our events in general is an important activity to discuss since our goals will touch everyone in some way if the primary goal, cheap human access to space and the resources in it, are achieved. I remembered seeing video on a local public station and suggested that that could bring people again, but didn,t know if it worked well before. Hank may go to Boscon in February. He is still deciding about forgoing another sci-fi convention for the Science Teachers Convention in place of Lunacon.

Janice had a reprint of a NASA report that she downloaded on an inflatable lunar habitat. This was from The Johnson Spaceflight Center and can be found through the nasa.gov site and digging in. The prototype is pictured in color prints of the habitat with inside views of the chamber towards an air lock and an outside view of the inflated structure. Earl's report was more of a suggestion based on the discussion of the above work on inflatable structures and Peter Kokh's writings on exhibits he has constructed. We will do our annual public outreach in May at Super Science Weekend with space oriented science and technology topics. What I am suggesting is that we put together a habitat display such as a Lava Tube housing a dwelling, or maybe a "Ramada" or hanger type shelter with a habitat, an inflatable mock up, for example, under it.

Post meeting technical report: I have received Analog Science Fiction and Fact for April 2008 with Jeffery D. Kooistras' "The Hospital of the Future" being an interesting piece. It turns out that what we have now, in facilities and treatments, are what we hoped for "in the future". This is not to say we have the nano tech tools and matter transmitter cell cleaners of some stories but many of the things in the article where "science fiction" in the 50s through 70s. Also: Popular Science for February had several interesting notes including Space Tech on "The Buddy System" wherein the new CanadaArm2, or Dextre, is described. The new device is a two armed "robot" that can be controlled from the ground, typically, or from inside the ISS as needed. The shuttle is due to bring the arm system up now with additional attachments to follow.

There is also a short piece on "wireless" powering of home equipment being developed at several universities and companies, Powercast of Pennsylvania and MIT being among them. I will editorialize for a moment: I have been interested in sending power, or directly applying it, for a few score years. As an alternative energy source advocate I think the idea of beaming energy, from space to Earth or vice versa is a great idea (including seeing a study on augmenting commercial aircraft fuel efficiency via space based laser enhancement!) with the PowerSat being a wonderful thing. On a small scale, our homes, I am leery of the possible side effects of millions of not so low powered devices generating EMI (interference) in the radio bands. If the systems described move there radio energy source frequencies to the microwaves, ala the PowerSat systems, the EMI can be cut back via various techniques. The good news is that progress in wide spread dissemination of this technology could make building PowerSats accept-able to the public at large. Back to our report: we will be giving prizes at The George Washington Carver Science Fair in March that include: a "sensor" kit from Radio Shack and a copy of "Liftport" (about the Space Elevator in fact and fiction). And more goodies!

Submitted by Earl Bennett.

CALIFORNIA

OASIS: Organization for the **A**dvancement of **S**pace **I**ndustrialization and **S**ettlement
Greater Los Angeles Chapter of NSS

P.O. Box 1231, Redondo Beach, CA 90278

Events Hotline/Answering Machine:(310) 364-2290
Odyssey Ed: Kat Tanaka - odyssey_editor@yahoo.com

[www.oasis-nss.org/wordpress/]
check out our NEW website!
oasis@oasis-nss.org
Odyssey Newsletter Online
http://www.oasis-nss.org/articles.html

Regular Meeting 3 pm 3rd Sat. each month
Microcosm, 401 Coral Circle, El Segundo.
• February 9th - March 15th - August 19th

Information: OASIS Hotline, 310/364-2290; website.

Upcoming Events

- **Sat. Feb. 9th*, 1:00 pm** - OASIS Board Meeting to be followed by a **lecture at 3:00 pm:** "50th Anniversary of Explorer 1" by Dr. Jim Busby - Long Beach Public Library, El Dorado Branch, 2900 Studebaker Road at Spring Road, Long Beach, CA 90815
  * *one week earlier because of following event. This is not a Library-sponsored event.*
- **Fri-Sun Feb. 15-17** - 19th Annual **Doctor Who Convention**. http://www.gallifreyone.com
  There will be 3 OASIS speakers
  - ☑ **Sat Feb 16: Steve Bartlet** - "Return to the Moon" noon-1 pm
  - ☑ **Sun Feb 17: Kahled S. Ali**, "Mars Rover" noon-1 pm
  - ☑ **Sun Feb 17: Bob Gounley,** "Dawn Mission" 2-3 pm
- **Sat Mar. 15th, 3:00 pm** - OASIS Monthly Business Meeting 1738 La Paz Road, Altadena, CA 91001-3317
- **Sat. Apr. 19th, 3:00 pm** - OASIoard Meeting at (information not available at press time)

Recuring Events

- **Fridays** -- Mike Hodel's Hour 25 webcast. The world of science fact and fiction with interviews, news, radio dramas, artists, writers, stories, reviews, and much more. Information: http://www.hour25online.com/.

For more up to date information, go to:

http://www.oasis-nss.org/wordpress/

NAME _____

STREET _____

CITY/ST/ZIP _____

PHONE#S _____

○ **$45 National Space Society dues** include *Ad Astra*
○ **$20** NSS dues **if under 22 / over 64.** *State age* ___
600 Pennsylvania Ave SE #201, Washington DC 20003

Moon Society dues include *Moon Miners'Manifesto*

- **Electronic MMM** (pdf) **$35** Students/Seniors: **$20**
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Moon Miners' MANIFESTO

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