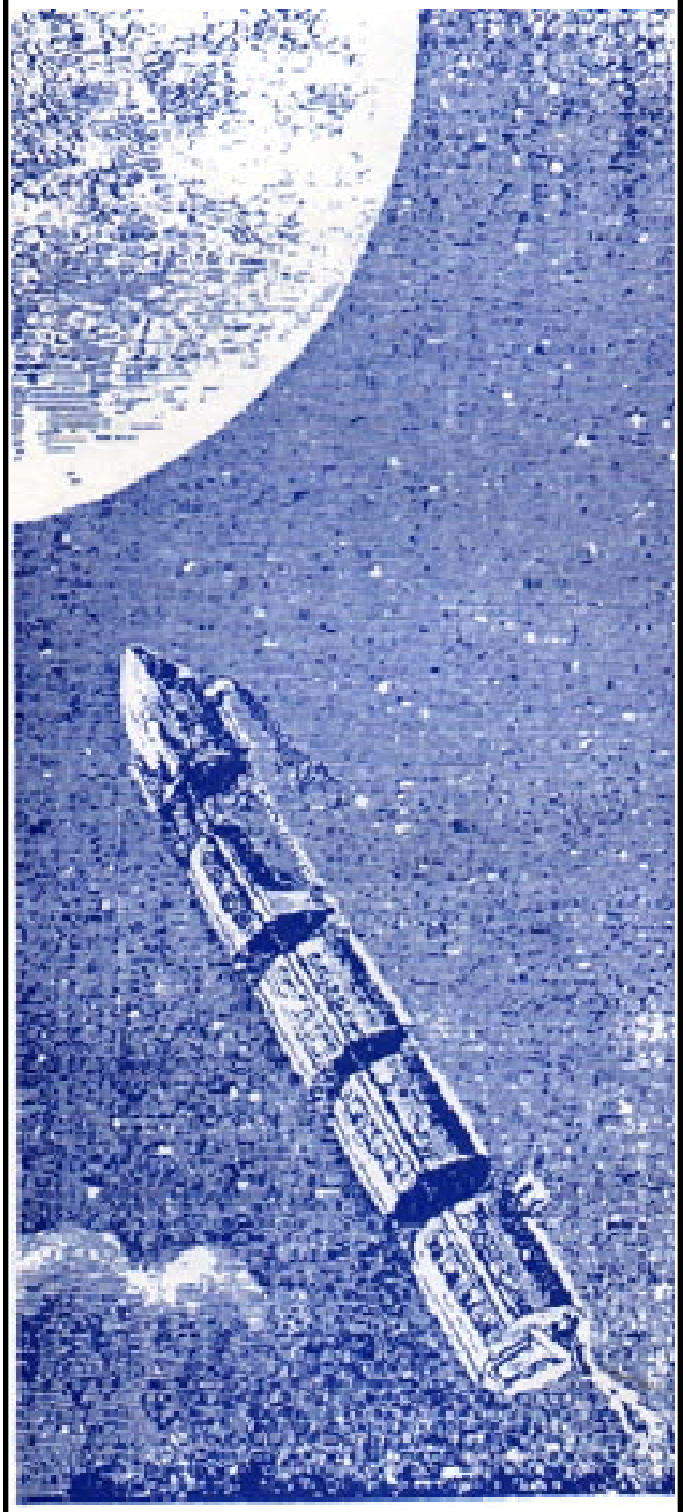
Moon Miners' REVIEW
& Moon Society Journal



#34 January 2004

In This Issue

The **Moon Miners' REVIEW** is published semi-annually each January and July by and for the members of the MMM family of National Space Society chapters, members of The Moon Society, and for individual subscribers worldwide.

The **REVIEW** provides a semi-annual burnout prevention and regeneration break for **Moon Miners' Manifesto.** editor.

Moon Miners' Manifesto will return next month (February, 2004) with issue #172.

E-mail: KokhMMM@aol.com

E-mail submissions preferred *with text in the body of the message,* not *as an attachment.*

Hardcopy submissions: MMM, c/o Peter Kokh,
1630 N. 32nd Street, Milwaukee WI 53208

ISDC 2004 – Oklahoma City, OK

May 27–31, 2004

http://isdc.nss.org/2004/

Track Description (Preliminary)

- Space Port Issues Symposium - the Oklahoma proposed Spaceport incl. federal and legal issues.
- Space Education Symposium - education
- Advanced Propulsion & Technology - everything beyond currently USED space technology, incl. Earth to Orbit launch tech, not just tech development.
- Space Health and Biology - space medicine and exobiology (ex: survival of Earth species in low grav. fields)
- Commercial / Financing Space - private enterprise, launches in space, tourism, profit models, etc (ex: define interface point between govt. and private (profitable) space activities)
- Space and National Defence - Pentagon helps NASA, NASA helps Pentagon, etc. incl. launch vehicles
- Roadmap to the space Frontier - space Purposes, Goals, Policy, resulting decisions on mission architecture, reusability, etc, including design for spacecraft, planetary and space colonies and settlements.
- Solar System Resources - Space Solar Power, Lunar, Asteroidal and Mars resource extraction and use.
- Space 101 - introduction to basics of spaceflight and related issues, not a panel.
- Space Law and Policy` - Space law , Policy - might overlap onto Spaceport and Roadmap Track areas.
- Space Activism/Chapter projects - (example: demonstrate validity of a weighted inflatable struc-ture using moon or mars bricks for weights and shielding.

Hotel – Clarion Meridian Hotel & Convention Center
737 S. Meridian, Oklahoma City, OK 73108
(405) 942-8511 **Room rate: $65 + tax, 1–4 people**
(suites & adjacent Hilton Garden Inn higher)

Tours

- Cosmosphere Space Museum, Hutchinson, KS (all day Thursday, May 27), with Max Ary
- Oklahoma Spaceport
- (Murrah Building bombing memorial
- Omniplex (planetarium, space & science museums)
- * Sam Noble Oklahoma Museum of Natural History (world's largest apatosaurus & more)

Registration

- Members of cosponsoring organizations* **$75 by 5/1/04 - *** National Space Society, Mars Society.
- Non-member Adult rates (one banquet included): **$125** by 5/1/04; **$150** at the door. *Seniors(65+)/Students* (one banquet included): **$100** by 5/1/04; **$125** at the door.

Mars Society Convention 2004 (#7)

Chicago, IL – August 19th–22nd, 2004

www.marssociety.org/convention/2004/index.asp

CONTACT: Matt Lowry - lowryclan@yahoo.com

Palmer House Hilton

17 East Monroe Street, Chicago, IL 60603 **Tel: 1–312–726–7500 Fax:1–312–917–1707**

[as of 1/7/04 - room rate not yet available]

Ideally located in the heart of Chicago's "LOOP," The Palmer House Hilton offers modern conveniences combined with over one hundred years of elegance. For the demanding traveler there are four restaurants, an enclosed shopping arcade, fitness center with steam room, sauna, and indoor pool Just a few steps outside our doors you will an abundance of shopping activities along world famous State Street and North Michigan Ave....

Convention Registration:
[as of 1/7/04 - registration rates not yet available]

Program:

- Latest NEWS on Sprit & Opportunity
- findings from Mars Observer & Mars Express
- Achievements of Mars Analog Research Station
- Making Manned Expitition to Mars National Policy

35th Lunar & Planetary Science Conf.

South Shore Resort and Conference Center
League City, Texas, March 15–19, 2004.

This conference brings together international specialists in petrology, geochemistry, geophysics, geology, and astronomy to present the latest results of research in planetary science.

www.lpi.usra.edu/meetings/lpsc2004/lpsc2004.1st.html

John ~~Young~~ – Oops!– John Glenn

1/6/04 - I just downloaded your Nov. 2003 issue of Moon Miners' Manifesto and I started reading the first few lines on the first page only to find that you have listed John Young as the first American to orbit the Earth.

I hope we all know that it was John Glenn who was the first American to orbit the Earth.

Thanks

Robert Barton, Beaverton, OR

Recommendation for Space Studies Institute to take over Management of Biosphere 2

From: Mitchell James < mejames@innertransit.net >

To: Space Studies Institute < ssi@ssi.org >

Space-age structures in the desert help recreate the earth's enviornment (Biosphere 1).

Synopsis:

Biosphere 2 is currently at a perfect point for it to be returned to use as a space science facility. The combination of Space Studies Institute management and the Biosphere 2 facility would provide a foundation of needed direction to Biosphere 2 activities and an opportunity to enhance and expand SSI.

Why this post:

I was visiting my snowbird parents in Quartzsite, AZ for Christmas. On my way back I decided to stop at Biosphere 2 with my two teenage kids who couldn't remember our previous visit when the first set of biospherians were inside. After paying our $20 per head we joined the last tour of the day, 28Dec2003. The guide had been there since the beginning of Biosphere 2 and I think he was the same guide that we had on our first visit. I remember my wife complaining about his accent as my daughter complained this time.

There have been a number of changes since my last visit. On our first visit the guide said that no tourist would ever be allowed in Biosphere 2 because it was to be maintained as a completely closed system. Now there is a tour through the living facility, Ocean, and Desert sections and into the south lung. The Biosphere is no longer maintained as an extremely closed environment. The tour was a disturbing experience. There was paint peeling into the ocean. Most of the plant, animal, and insect populations had become monoculture or were well on the way to that end. It was if the entire project had become a dying memorial to the one interesting activity conducted there, the two year closed habitation by six people. It was not only the dissolution of the physical facility, there seemed to be mental and cultural problems as well. There was no interest or activity into looking at why major populations of plants, insects, and animals were disappearing or into how to fix problems that had become obvious. Anything outside of the very small area used by Columbia University academics had been ignored.

Some tidbits of information that I got out of our gregarious guide:

- Mr. Bass intends to take some time selec-ting the next administrators.
- Mr. Bass paid Columbia University $10,000,000 a year for whatever it is that they did.
- Visitors bring in about $600,000 a year. This didn't quite square with $20/head and the number of people that he said came each year.
- It takes $3,000,000 a year to keep the lights on. Half of that is power cost.
- There is also a hefty tax to the state of Arizona. I forgot what the figure was but it was a significant part of the 'keep the lights on' cost.

Mr. Bass would like to find somebody with a plan that would make the facility self-sustaining over a reasonable number of years. There is some other stuff going on with the sale of land owned by Mr. Bass that does not affect the biosphere. The news media is expected to be confused by it.

- My guide was not a happy person about the way the biosphere had been managed for the last X years. But I ran out of time to probe further.
- Some attention is being paid to tourists by somebody because there is a new visitors center being opened in a much more accessible location to the biosphere than the minimalistic previous one. There seemed to be a general consensus that zero science was done during any of the tenures of any occupants because there was too much work involved just to survive and no time left over for science.

My overall impression was that of a facility with the potential to be the cultural center of space colonization preparation being left to rust with neglect because it had been directed by the wrong types of organizations.

Why universities are poor administrators:

The purpose of a university is to educate students. There is very little that a facility out in the middle of the Sonorian desert can do to aid in that endeavor. Therefore university administrators must justify being involved with such a project by the amount of money it would bring in.

- Which leads to the fact that universities are money sinks. They are always looking for the next handout. They do not maintain expensive facilities that are not cost effectively fulfilling the purpose of a university.
- University administrations are the leading edge of being "Politically Correct". If it is "Politically Correct" to be studying global warming, then that is what they will be doing. Even if the tool (Biosphere 2) is not very useful for that endeavor. Space Colonization does not seem to be "Politically Correct" as the displays at Biosphere 2 try very hard to avoid anything to do with space.
- Universities now consider research a profit center. Research is kept secret. Research not leading to marketable patents is not "Politically Correct". I would rather see activities at Biosphere 2 be on a totally open forum, instantly available on the web to be commented on and reviewed.

Comments on a proposed solution:

The main problem with the facility is that it needs the right mission statement so that it is possible to see where it should going: what things should stay, what should be removed, what should be added.

Proposed mission statement:

To facilitate design, manufacture, testing, and distribution of organic, mechanical, and computer systems necessary to construct and maintain enclosed habitats.

Proposed facility rename:
Space Colonization Studies Center.

Activities at the center should be considered as part of practical engineering projects to meet the mission statement. Most activities will therefore be result oriented. Research will be done to solve defined engineering problems or questions. As opposed to looking for a problem to study and then figuring out how to bludgeon the facility into being useful as a tool in the study of the problem.

1. The first priority is to figure out how to maintain the facility for a lot less money then is required now.
2. The second priority is to increase the only current income stream: tourism. The current experience is not worth $20 a head and sufferers from badly mixed messages and really needs some expert help to make it an educational and enjoyable experience.
3. The third priority is to start working on solving habitat problems so that there can be results to distribute. Habitat solutions will be bought from someplace that can show a working habitat.

What is in this for Mr. Bass: I think this one is straight forward. Mr. Bass is looking for administration that can use the facility for the purpose for which it was made and that has some sort of plan that could get it off of the dole. I believe that we (the members of SSI) could create a plan that could work. The SSI brings to the bargain an established track record of low cost goal oriented research and the administration to make that happen.

What is in this for the SSI:

An opportunity to push research in all areas of space colonization farther and faster.

- Publicity and membership. Biosphere 2 is already orders of magnitude more well know than the SSI. Successful administration of the center would greatly increase SSI membership and fame.
- I also think that this combination would present opportunities for SSI members to participate in ways that we have always grumbled about being unable to do before.

I have written all of the above and still haven't gotten to what really excited me about this concept. What the facility really needs is autonomous and remote controlled robotics to do all those things that the biospherians were doing that they shouldn't have been doing. Can you imagine sending highly trained scientist up to a space habitat and have them spend all day every day working hard to just survive instead of getting the job done that they were sent up for?

This in turn couples with www.Innertransit.org, my site for collaborative engineering on the web, and some work that I am doing at my day job with helmet mounted displays and real-time computer generated visual scenes. There could be a lot of interesting development that can be done by anybody with web access and increase the drawing power of the facility for tourists.

The label "Biosphere 2" is just too small and is crippling that facility. Every piece of equipment used in that facility is something that will have to be created from lunar or asteroid material for a space habitat. That facility should be used as a center to design, manufacture, and test *everything* associated with a habitat. When the first habitat is created, the center should be a one stop shopping place. A lot of the research that SSI has already done could be subsumed into this center. Why not have SSI in charge of it?

Mitchell James
mejames@innertransit.net
www.InnerTransit.org
(center for collaborative engineering on the web)

NOTE: Biosphere 2 is nestled in the foothills of Arizona's Santa Catalina Mountains about 30 miles north of Tucson.

Editor's Comment: Neither Space Studies Institute nor the National Space Society is financially able to more than produce a study of the possibilities. What Michael James proposes is great, but we will need a (very) deep pockets benefactor to make it possible. - PK

Thorny Issues in Spaceship Design

Dave Dietzler <L Dietz37@msn.com >

In search of comfortable transit

There are some who do not like the inter-lunar cycling station concept. If we use rocket ships powered by aluminum, magnesium and LUNOX, we are going to need lots of fuel from the Moon miners and we will travel in small, spartan spaceships. Oh well, most of us are not such weenies that three days in a spacesuit with about as much personal space as there is in a closet will deter us from travel to the Moon! Even so, I want better conditions! Who can stand those terrible zero-G suction toilets? How are we going to change diapers in cramped weightless ships? The kids are going to whine like hell when all they get to eat is space food and if you think they are bad enough in the back seat of the family sedan during a long drive, imagine them in a spaceship with about as much room per person as an Apollo capsule! In the early days of lunar development, rugged workers, scientists and roughneck Moon miners will endure spartan conditions on their way to the Moon; however, the day must come when families can visit the Moon. At least that's my dream.

Earth-Moon cycling stations will allow the ease and comfort of "artificial gravity" as the stations turn end over end (great for cooking and dining, as well as medical procedures, child care and toilet tasks), lots of volume for every passenger and plenty of distractions including the observation dome in the weightless hub. The stations will glide through frictionless space only with an occasional course correcting rocket burn and perhaps thrust from a microwave beaming complex on the Moon that pushes gently on the expansive gossamer wings-thin cell photovoltaics that power the stations, to keep her on course. Taxis will burn quite a bit of metal fuel and LUNOX to shuttle passengers on one or two hour flights to and from the cyclers, but the taxis will be packed with people like an airliner and the amount of fuel and LUNOX burned per person will be low.

The Challenges

The cycling station concept seems limited by the fact that travel to the Moon is possible only once a month, unless some tricky orbital maneuvering is possible. Fusion powered science fiction spaceliners that can embark for the Moon at almost any time are more appealing. The only problem is that controlled commercial fusion is not possible today and it might be 50 years before it is. Certainly, we won't be building large numbers of cycling stations and hauling tourists to the Moon for several decades. Even so, it appears now that without some kind of miracle or miraculous technology, fusion reactors and thus fusion space drives will be incredibly massive devices. They will probably only be profitable for ground based electricity generation when economies of scale-meaning really huge power plants of several gigawatts capacity, and aneutronic helium 3 fusion are possible. Magnetic containment and laser fusion reactors will amass tens of thousands of tons. Electrostatic containment reactors might be light enough for space drives, but this remains to be seen.

Moon liners might use nuclear fission electric propulsion with abundant lunar magnesium for reaction mass. There is plenty of magnesium in regolith to fuel large scale NEP (nuclear electric propulsion) spaceliner traffic. The uranium vapor core reactor with MHD and rankine cycle turbines which is being studied at the Univ. of Florida's Innovative Nuclear Space Power Institute (INSPI) by Dr. Travis Knight, Dr. Samim Anghaie and others could power electric drives. The VCR-MHD-turbine power plant could develop more than one kilowatt per kilogram of system mass. There's only one problem-the Van Allen Radiation belts. Unless the Earth's magnetic field drops to zero very soon and the belts vanish, spaceliners will take too long to get through the radiation belts unless the ship is shielded to an absurd degree, thereby slowing the ship's spiral out to escape velocity and increasing radiation exposure time. The passengers and crew of the NEP liner will get fried by radiation and come down with cancer someday. We could build a spaceliner with an enormous power plant and "high thrust" ion drives to get through the belts faster, but this is still a very thorny issue. The power plant and radiation shield mass becomes so great that accommodations for the passengers must be minimized. We might as well go back to the metal fuel and LUNOX powered rockets of yesteryear. Nuclear electric propulsion will work for ships leaving GEO or a Lagrange Point station en route to Mars or Saturn because these ships won't have to pass through the radia-tion belts, but it will not make sense for manned inter-lunar travel.

Without a fusion miracle, the inter-lunar cycling station becomes the only way for families and people accustomed to a high standard of living to travel in comfort to the Moon. Since the first lunar tourists will be wealthy and include English Royalty as well as Arab Sultans and their huge families, we might as well cater to their needs for creature comfort. There's no need to pack the workers who mine the Moon and build the underground Moon cities and solar power satellites into small ships like cattle either. Cycling stations could be built early on to give the poor working man some comfort. We can't send roughnecks and weirdo scientists who like to go backpacking in small ships to the Moon forever without their wives and kids. Cycling stations will enable the lunar work force to enjoy normal family life and all the comforts of home during their travels in space. We will even build O'Neill's Island small town space colonies for the workers instead of creating an almost all male scenario reminiscent of that seen in the movie *Outland* with drugs, rampant immorality and gunfights. Makes for good movies though, doesn't it? **<DD>**

Back Reading: Moon Miners' Review # 12, JAN, '93, pp. 2-12

"The Frontier Builder" - an Earth–Moon Hotel Cruise Ship

[a Classic Reprint from MMM #46, June, 1991]

Name Games for Planets Around Other Suns

By Peter Kokh [slightly abridged]

We are now discovering one new planet after the other - *around other stars*. It is natural to want to give names to these exo-worlds. Names *are* how we prefer to handle things. We can use grid and/or cataloging numbers, of course. And for many objects literally too numerous to name, this is the only designation we ever give them.

Traditionally, the "right of naming" belongs to the discoverer. Some delight in this ritual sharing in "Adam's privilege"; some do not, and gladly leave the job to others. Nowadays, the IAU, International Astronomical Union, has a committee to oversee the naming backlog and guarantee that there is a semblance of pattern and appro-priateness.

So what will we do if we discover exo-planets in great numbers? I think this time we ought to prepare for the flood with some helpful ground rules. First, please note that only a few of the very brightest stars visible from Earth have names - those being given by early Arab astronomers. Vega, Deneb, Altair, Capella, Sirius, Rigel, Canopus, Alcor and Mizar, Betelgeuse - all these beautiful, venerable names are phonetic corruptions of millennium-old Arabic namings. A few more stars have 'name-like' Bayer designations, combinations of Greek letters and constellation name: Alpha Centauri, Tau Ceti, and Sigma Draconis, to name just three favorites of Science- Fiction. Next in line of name-like handleability are those with Flamsteed numbers like 66 Orionis, and special catalog numbers such as Wolf 359 and Groombridge 34. But then we are left with the vast majority which at best have such unpoetic anti-mnemonic handles such as AC+41º19-173 (which *does* speak to the initiated!).

It would seem silly to name a planet that circles a still nameless star! RULE 1. Only exo-planets around named stars (or with Bayer letters or Flamsteed numbers etc.) shall have names. Planets found around stars with catalog designations only, and all exo-planets at first, can be referred to using small Roman letters, in the pattern of starname/I.D>#-a, in order of discovery within the system. As it may well not be that the first planet discovered within a system (likely the local equivalent of Jupiter) will conveniently also be the nearest its sun, a number designation would be premature. (Spica-a may turn out to be Spica VII)!

Remembering which new planets belong to which old stars may be a welcome bit easier for all if the following pro-mnemonic device is employed. RULE 2. The first planet to be discovered around a named star will be given a name starting with the first letter of that star's name and so on. In order of discovery, the planets around Rigel would be named R----, I---, G-----, E---, and L---, then R-- again etc.

To avoid hesitation, deliberate levities that will all too soon cease be amusing or ideological mischief, the choice could be left up to a computer program operating within the guidelines above, which would pick names from a two-tiered hat. Into the first tier could go names of make-believe planets from science-fiction literature and films published or released before a certain cut-off date such as the date of the discovery of the first exo-planet. Some of these S-F names would be very familiar: Pern, Arrakis, Trantor, Tatooine, Vulcan. Others would be less well-known. Names of any fictional planets mentioned only in passing (mere name-droppings, not really part of the story) might be excluded, however. Collecting all these treasures would require a labor of love by a team of science-fiction fans. Such a project *has* sufficient appeal to be realized.

The hat's second tier could hold a pool of computer-generated random names that follow set rules of phonetic composition and spelling to be decided by a committee, filtered to remove those with chance objectionable connotations (e.g. Shat, Shet, Shot, Shut would pass but the i-variant might not). If up to four syllables are allowed, this pool should supply many thousands of choices. Beyond that, our compulsive naming appetite might be sated.

It is unlikely that we"ll also tele-discover moons around any of these planets, or any surface features, until and unless we receive return data from actual interstellar probes. So for the foreseeable future, we needn't worry about naming such system-local details. They're better left to future interstellar pioneers themselves - if ever!

But back to the hordes of nameless stars! We might well consider giving names to at least some of those around whom we detect planets, in due recognition of that paternity, if you will. This can be done quite simply by the use of a formula that gives phonetic alphabetic value to the components of a current numeric catalog designation. For example, a, e, i, o, u, ai, au, eu, oi, ui could render 1 through Ø. Consonants could be chosen from alternating groups of ten: b, ch,, d, f, g, h, j, k, l, m and n, p, r, s, sh, t, th, v, z, zh.

Per this suggestion, AC+41º19-173, ignoring the AC and using a 2-part form to reflect the celestial latitude/longitude information, using the first consonant group for northern stars (+), the second for southern stars (-), we get Fa-Buinaud - suitably alien, suitably romantic, and above all suitably back-translatable to the original location-cuing catalog designation. Ignoring the catalog prefix DM, DM-53º117 becomes Ri-Bath. Te-Ditha translates -62º3371, Mau-Lusi +07º09533, etc. Catch the flavor?

Colorless number designations may be fine for stay-at-home astronomers with a wanderlust quotient near zero. But for those of us headed one-way outbound, something more Adamic would be a definite psychological crutch. Wouldn't you rather explain to some waning flame that you're leaving her(him) and the Solar System itself to colonize Cha-Zhula IV (four)- instead of "BD+21º0581-IV"?

Sci-Fi writers *could* begin such a custom of translating #s to names *now*, leaving the IAU to follow. ***Engage!***

http://www.moonsociety.org

Please make all 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®**

Join/Renew Online at

www.moonsociety.org/register/

- $35 USA/Canada + MMM hardcopy
- $60 elsewhere + MMM hardcopy
- $35 anywhere + MMM electronic PDF file
- $20 Student/Senior + MMM electronic PDF file

Questions? email: membership@asi.org

The Artemis Project™ http://www.asi.org/

- Artemis Reference Mission
- Artemis Data Book

Project LETO™ http://www.projectleto.org/

Please send all mail related to Memberships to:
The Moon Society Membership Services
PO Box 940825, Plano, TX 75094-0825, USA

How to fix MMM Subscription Errors:
www.asi.org/adb/06/09/04/1999/09/news-19990915.html

Moon Society to Participate in Student Moon Mission Contest in India

from Peter Kokh, Chapters Coordinator

Last fall, we received an email appeal from Amrut Yalagi, head of The Planetary Society of Youth {TPSY] in India, for the Moon Society to become involved in a student design contest for a "Mission to the Moon and Beyond."

Yalagi is based in Bangalkot, Karnataka, a state in southern India. TPSY has 500 members currently, but the Contest would be open to students throughout India.

The problem for us, however, was in the phrase "and beyond." Students could design a mission to Luna, the moon of Earth, but could also pick a moon of another planet.

We signaled our interest in cosponsorship, sending a number of Artemis Project™ posters for promotion. But we also indicated that our interest lay solely in contest entries for missions to THE Moon, Earth's moon, Luna. We would be interested in judging these entries, and made some suggestions for possible interesting mission types:

- **Mapping concentrations of various elements:** the distribution of some elements will shed light on the processes by which the Moon's surface evolved to its current state. Other elements may be crucial to any future effort to develop resource-using human settlements. ...
- **Exploring the permanently shaded areas of craters and valleys in the Moon's north and south polar regions.** Instruments aboard Lunar Prospector (January 1998 - July 1999) found major concentrations of hydrogen in these areas. ... The hydrogen is no doubt there. But "ice fields" do not seem to be there. ... What more can we learn from probes in orbit around the Moon? by "ground truth" lander missions to these dark and cold craters?
- **Locating likely lavatubes**, by finding entrances or uncollapsed segments of sinuous rille valleys. These rilles are now interpreted as collapsed lavatubes. Uncollapsed sections could provide ready made shelter for settlements, agriculture, warehousing, and industry. ...
- **What ... [is] behind the "Transient Lunar Phenomena" events** reported through the years by amateurs and professionals observing the Moon through telescopes from Earth? ... How might a Moon Mission of one type or another shed light on these questions?
- **Could the Moon have unsuspected pockets ... of trapped underground gases?** ... Discovery of underground reservoirs of carbon dioxide or monoxide could be encouraging for the prospects of future settlements.
- **Discovering Craters which are the result of impact with metal-rich asteroids** .[// Sudbury, Ontario, Canada]
- **Explore other interesting questions about the Moon**
- **You may design missions that involve human explorers**

You can check out the details at:
www.geocities.com/amplanetary/moon_mission_contest.html

Mail for MSJ

Lunar Radiometer Proposal for the Moon Society

from Charles F.Radley < c.radley@comcast.net >

Dear Moon Society directors, leaders, and chapters

Transorbital Corporation is collaborating with Dr. Claudio Maccone of the International Academy of Astronautics regarding our plan to fly a lunar radiometer experiment on a near term lunar orbit mission.

We would like to open discussion with the Moon Society concerning afundraising campaign to bring the Radiometer flight to fruition.

Dr. Maccone has already developed and validated prototype hardware, and at this time the main remaining task is to raise sufficient funds to cover the launch costs. The experiment is estimated to weigh one kilogram, and at standard lunar insertion rates quoted by Transorbital at this time the total funding to be raised would be approximately $2.5 Million US.

The Radiometer will gather vital data needed to define the feasibility of radio astronomy observatories in the quiet zone on the far side of the Moon, and would be entirely consistent with the objectives of the Moon Society to expand lunar development.

Appended below is some more information about the Trailblazer mission, and some relevant web links.

If you wish, you can contact me by cell phone on (503)-320-3529. Charles F. Radley AFAIAA

International Academy of Astronautics SETI Permanent Study Group http://www.setileague.org/iaaseti/lunar.htm

"**LUNAR FARSIDE RADIO LAB**"
http://www.iaanet.org/commissions/lunar.pdf

CURRICULUM VITAE AND SCIENTIFIC ACTIVITY :
Dr. Claudio MACCONE, Ph. D.
http://www.is.svitonline.com/cmaccone/

The TrailBlazer Commercial Lunar Mission and its Scientific Return – W. P. Blase (1) and C. Maccone (2)
(1) TransOrbital, Inc., Alexandria, VA USA,
(2) International Academy of Astronautics,
pblase@transorbital.net/Fax: 1.603.619.5538,
clmaccon@libero.it

The TrailBlazer lunar mission is a commercial imaging probe to be launched by TransOrbital, Inc. Its primary purpose is to take a variety of high definition video imagery of moon and the voyage there, both for commercial use and for sale to the scientific community. Taking advantage of this opportunity, TrailBlazer will be carrying a radio receiver intended to measure the degree of attenuation of man-made RFI inside the quiet cone above the Farside of the Moon on four microwave frequencies. These frequencies are: the hydrogen line at 1.426 GHz, the OH radical line at 1.6 GHz, the H2O maser line at 22 GHz, and Ka communications band at 32 GHz. The first is important for radio astronomy and SETI (Search for Extra-Terrestrial Intelligence) purposes, the second and third for astrobiology searches for pre-biotic molecules, and the last because it is widely used for spacecraft communications. The test receiver would be carried within TrailBlazer and utilize its primary high-gain, parabolic communications antenna during the quiet time when it is above the Farside and out of contact with Earth. If these measurements could be accomplished by pointing the TrailBlazer antenna towards some specific astronomical source, a direct comparison could be made with corresponding RFI-noisy measurements made on the surface of the Earth.

Planetary Society Makes it to Mars!

It seems like we have been holding our breath for four years - and now we let out a huge sigh, as we sit on Gusev Crater waiting to move out toward the horizon. The Planetary Society has made it to Mars -- the first non-governmental, privately funded organization to do so.

Look at this stunning panorama taken by NASA - and see a new world to explore. Then look carefully at the rover and machine that took it there. Onboard the rover, is the sundial which we worked on under the leadership of Bill Nye the Science Guy a Member of our Board of Directors. Sitting on the lander is the DVD which we created. That DVD contains four million names of Mars enthusiasts who signed up with NASA to send their names to Mars. The names of all Planetary Society Members as of October 2002 are sitting with them on the floor of Gusev Crater. Look at the panorama here:

http://www.planetary.org/tps_onmars.html

The DVD and the sundial engage the public in Mars exploration in unique ways. We'll be posting more information and fun activities connected with these pieces of hardware over the next month at http://planetary.org. For now, we just wanted to let you know we made it!

But there are already exciting features aboutthe mission you can read on our website. Ourinternational team of Student Astronauts working in mission operations, will be processing daily images of the sundials, as well as participa-ting in other activities. You can read their daily journals at http://planetary.org/rrgtm/studast.html. Our intrepid Astrobot explorers Biff Starling and Sandy Moondust, who appear on the face of each DVD, are telling their enter-taining stories of being on the spacecraft at: http://planetary.org/rrgtm/astrobots/

Louis D. Friedman, Executive Director

MESSENGER [Mercury] Mission New,s 12/30/03

Keeping MESSENGER Cool

MESSENGER (**ME**rcury **S**urface, **S**pace **EN**vironment, **GE**o-chemistry, and **R**anging)is a scientific investigation of the planet Mercury, and the 1st NASA mission designed to orbit the planet closest to the Sun. Dr. Sean C. Solomon, of the Carnegie Institution of Washington, leads the mission as principal investigator. The Johns Hopkins University Applied Physics Laboratory in Laurel, Md., is building and will operate the MESSENGER spacecraft & manages the **Discovery−class mission** for NASA.

While orbiting Mercury, MESSENGER will "feel" significantly hotter than spacecraft that orbit Earth. This is because Mercury's orbit swings the planet to within about 46 million kilometers (29 million miles) of the Sun,or about one-third of the distance between the Sun and Earth. The Sun also appears 11 times brighter at Mercury than we see from our own planet.

Without extra protection in such an extreme environment the spacecraft and its instruments would overheat and cease to function - but MESSENGER engineers answered this challenge by designing a heat-resistant and highly reflective sunshade. The team installed the 254-by-180 centimeter (8-by-6foot) shade on Dec. 12, shortly before moving the spacecraft to NASA Goddard Space Flight Center for prelaunch tests.

The thin sunshade is a high-tech parasol constructed from Nextel ceramic cloth, with several inner layers of Kapton plastic insulation. While MESSENGER's Sun-facing side could heat to above 310° Celsius (590° Fahrenheit) during the orbit, preliminary tests and thermal analyses show the sunshade will keep the spacecraft operating near room temperature, around20° C (or 68° F).

For more information on: http://messenger.jhuapl.edu.

STARDUST: On Jan. 2 the Stardust spacecraft will fly through the cloud of dust and gas surrounding comet Wild 2, collect particles and return them to Earth in 2006.
http://jpl.convio.net/site/R?i=3D8cCgjKIrhcpO-3BCLCXxIg

MARS EXPLORATION ROVERS:
http://jpl.convio.net/site/R?i=3D3M30UaSlWAZO-3BCLCXxIg

CASSINI: After nearly seven years of interplanetaryr travel, the Cassini spacecraft will reach Saturn orbit on July 1. Cassini will study the planet, its rings and its moons, notably Titan.
http://jpl.convio.net/site/R?i=3DpgzJFDc750VO-3BCLCXxIg

One tenth of stars may support life

1 January 04 - NewScientist.com news service
www.newscientist.com/news/news.jsp?id=3Dns99994525
Reference: **Science** (vol 303, p59)

One tenth of the stars in our galaxy might provide the right conditions to support complex life, according to a new analysis by Australian researchers. And most of these stars are on average one billion years older than the Sun, allowing much more time, in theory, for any life to evolve.

The concept of a "galactic habitable zone" (GHZ) for the Milky Way was first proposed in 2001. Now Charles Lineweaver of the University of New South Wales and colleagues have defined a life-friendly GHZ using a detailed model of the evolution of the Milky Way to map the distribution in space and time of four major factors thought essential for complex life. "We're looking at what we think are the most robust and conservative prerequisites for life - but they are very, very basic," Lineweaver says. The researchers conclude that

> a disc-shaped habitable zone emerged about eight billion years ago, roughly 25,000 light years from the core of the Milky Way. The zone has expanded slowly, and now includes stars born up to c. four billion years ago, It encompasses close to ten percent of all stars ever born in this galaxy.

Garbage−in, garbage−out?

Little is yet known about the prerequisites for the origin of life and about how complex life evolves, for this type of mapping to inspire real confidence. But Lineweaver stresses that his team is not arguing that complex extra-terrestrial life is probable, or even exists, within their GHZ., only that this is the region with the most potential for the formation of complex life.

The team has used these four factors in mapping the GHZ:

1. presence of host stars for a solar system
2. presence of sufficient heavy elements to form terrestrial planets
3. sufficiently safe distance from exploding supernovae
4. enough time for biological evolution - The team set this figure at a minimum of four billion years, since this was the amount of time it took for complex life to emerge on Earth.

Future work

Researchers want to test the importance of some of these factors. Meanwhile, only about 100 extra-solar planets have been spotted to date, all of them Jupiter-like gas giants. But the launch of NASA's Terrestrial Planet Finder telescope in about 2013 will mark the start of a major search for nearby planets that could harbor life.

[New Scientist News Service article cited by Emma Young, Sydney, NSW, Australia]

The Lunar Reclamation Society, Inc.

PO Box 2102
Milwaukee
WI 53201

www.lunar-reclamation.org

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

LRS OFFICERS Contact Information

LRS PRESIDENT, MMM/MMR Editor - Peter Kokh*
< kokhmmm@aol.com > 414-342-0705
VICE-PRES/TREAS../LRS/MMM Business & Database Manager - Robert Bialecki*..... 414-372-9613
SECRETARY. - Charlotte DuPree
< cmdupree@netwurx.net > 262-675-0941
NEWSLETTER ASSEMBLY - Charlotte DuPree and Carol Nelson 414-466-2081
(* Board Members, & Ken Paul < kenpaul@cape-mac.org >

LRS NEWS

• **Annual Holiday Party:** Fifteen Members of the Lunar Reclamation Society and the Wisconsin Mars Society joined together on December 13th for a pot-luck luncheon followed by a classic science fiction film, **When Worlds Collide** (1952) shown on DVD.

LRS JUNE Events

Saturday, JAN 10th, FEB. 14th, 1–4 pm

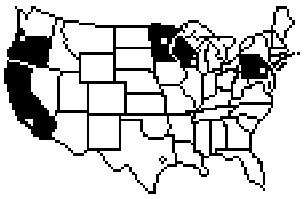
LRS Chapter Meeting, Mayfair Mall, Garden Suites **Room G110** (lower level, NE part of Mall) near the ground-level entrance below General Cinemas.

Collaborating Milwaukee Area Space Groups

Moon Society Milwaukee Outpost c/o Peter Kokh
414-342-0705 - kokhmmm@aol.com
http://www.moonsociety.org/chapters/milwaukee/
MSMO currently meets jointly with LRS

Wisconsin Mars Society c/o Matthew Giovanelli
7133 West Wells Street, Milwaukee, WI 53213
414-774-8952 - marsmatt@wi.rr.com
http://chapters.marssociety.org/usa/wi/
WMS usually meets at address above on 3rd Sat. 1pm
contact Matt by phone or email address above

U.S. CHAPTERS



NSS Chapter Events
MMM
6 Chapters Strong

For Chapter Resources, visit the Space Chapter HUB Website: [http://nsschapters.org/hub/]

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@excel.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 Tuesday** of the month at **7–9pm**

JANUARY 15: UW-Sheboygan, Sheboygan
FEBRUARY 19: Stoelting House, Kiel
MARCH 18: UW-Sheboygan, Sheboygan

MINNESOTA

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/]

January Events

Satu., JAN 3rd, 10:30 CT landing of Spirit on NASA–TV | PIX:
www.freemars.org/mnfan/mnsfs/MER-A-landing-party/

Tuesday, JAN 13th, 7–9 pm – MN SFS General Meeting.
- Coffman Union UofM Room 324
- Politics in Space: Open discussion of the various 2004 Presidential candidate's policies on space development and exploration.

Saturday, JAN 17th, 1–4 pm – MN SFS Business Meeting
- St. Anthony Park Library's Meeting Room, 2245 Como Avenue, St. Paul, MN 55108.
- Meet new Board of Directors and planning for 2004.

CALIFORNIA

OASIS: Organization for the **A**dvancement of **S**pace **I**ndustrialization and **S**ettlement

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

Events Hotline/Answering Machine: (310) 364-2290

Odyssey Ed: Craig Ward - cew@acm.org
E-mail: oasis-leaders@netcom.com

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

- **JAN 17**, 2004, 3:pm -- OASIS Monthly Business Meeting, at the home of

  Bob Gounley and Paula Delfosse,
  1738 La Paz Road, Altadena.

  Call the OASIS Hotline,

Recurring Events

- **Fridays, 7 pm** "Night Sky Show." - **8 pm** Guest lectures. Santa Monica College John Drescher Planetarium, 2nd Flr Technology Bldg, 1900 Pico Blvd. $4/show; $7/both. 310/452-9223 www.smc.edu/events/weeklyeven.
- **Fridays** - "Mike Hodel's Hour 25" webcast. The world of science fact/fiction: interviews, news, Radio dramas, artists, writers, stories, reviews. www.hour25online.com

SOLAR SYSTEM AMBASSADORS

www.jpl.nasa.gov/ambassador

Michelle Baker
Princeton/Philadelphia
chaos@cybernet.net

Bill Higgins
Chicago, IL
higgins@final.gov

Harold Schenk
Sheboygan, WI
hschenk@excel.net

Bill Hensley
Kenosha, WI
hensley@acronet.net

OREGON

Oregon L5 Society, Inc.

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**

NEXT MEETINGS: **JAN 17th, FEB 21st, MAR 20th**

PENNSYLVANIA

Philadelphia Area Space Alliance

PO Box 1715, Philadelphia, PA 19105

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

[http://pasa01.triipod.com/]

• **PASA regular** business luncheon/formal meeting, **1-3 pm**, the **3rd Saturday**, every month, at the New and Improved **Liberty One** food court on the second level, 16th and S. Market. Go toward the windows on the 17th street side and turn right as you enter the area near the windows. Look for table sign. Parking at Liberty One on 17th St.

Meeting Dates: JAN 17th, FEB 21st, MAR 20th

Call Earl or Mitch 215-625-0670 to verify all meetings

• **No PASA report this month**

~~Amateurs Built the Ark.~~

Professionals Built the Titanic

NAME _____

STREET_____

CITY/ST/ZIP_____

PHONE #S_____.

❍ **$38 NATIONAL SPACE SOC.** dues includes *Ad Astra*

❍ **$20** NSS dues if under 22 / over 64. *State age* ___

600 Pennsylvania Ave SE #201, Washington DC 20003

Join **The Moon Society** - dues address on page 7

- **For members residing in the U.S & Canada:**
  Printed **MMM** delivered by postal mail: **$35**
  Electronic (pdf) **MMM** available on website: **$35**
- **For members residing in other locations:**
  Printed **MMM** delivered by postal mail: **$60**
  Electronic (pdf) **MMM** available on website: **$35**
- **Students/Seniors** Electonic (pdf) **MMM** on website: **$20**

Member Dues –– MMM/MMR Subscriptions:

Send proper dues to address in chapter news section

=> for those outside participating chapter areas <=

❍ $18 Individual Subscriptions to MMM/MMR: Outside North America ❍ $50 Surface Mail -- Payable to "LRS", PO Box 2102, Milwaukee WI 53201

CHICAGO SPACE FRONTIER L5

❍ $15 annual dues

LUNAR RECLAMATION SOC. (NSS–Milwaukee)

❍ $18 reg. ❍ $24 family ❍ $15 student/senior

MINNESOTA SPACE FRONTIER SOCIETY

❍ $25 Regular Dues

OREGON L5 SOCIETY

❍ $25 for all members

O.A.S.I.S. L5 (Los Angeles)

❍ $25 regular dues with MMM

PHILADELPHIA AREA SPACE ALLIANCE

❍ Annual dues for all with MMM $20, due in March or $5 times each quarter before the next March

SHEBOYGAN SPACE SOCIETY (WI)

❍ $15 regular, ❍ $10 student, ❍ $1/extra family memb "SSS" c/o B. P. Knier, 22608 County Line Rd, Elkhart Lake WI 53020

Moon Miners' REVIEW # 34

Lunar Reclamation Society Inc.
PO Box 2102, Milwaukee WI 53201-2102.

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