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

Moon Miners' Manifesto

& Moon Society Journal

www.lunar-reclamation.org/mmm/

177 August 2004

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 world-wide. **Editor:** Peter Kokh, c/o LRS, PO Box 2102, Milwaukee WI 53201. Ph: 414-342-0705. **Submissions:** "MMM", 1630 N. 32nd Str., Milwaukee, WI 53208; Email: kokhmmm@aol.com

In FOCUS: Milestone Achievement Prizes:

Good fortune in the space world, can be rather elusive. But here's hoping it shines on Burt Rutan and/or the rival Canadian Da Vinci team. Both have announced dates for the first of the two required flights in the same ship, carrying three persons within a two week limit, at the end of September and beginning of October, respectively. We trust that if either has a snafu, they will try again successfully. The Ansari X-Prize Foundation is only too happy to part with the $10 million prize money.

Such prizes, over a hundred in all from 1905 to 1935 successfully encouraged the technology developments that led to the birth of today's passenger airline industry. Can we follow up the expected X-Prize success, with a series of follow-on prizes that will lead to cheaper (than a $20 million Russian ticket to the Space Station) ride for paying civilians to orbit? To orbiting hotels? To "Loop the Moon" (skimming over the farside without landing) tours? To self-contained Moon landings? to Moon landings at in-place tourist facilities offering surface excursions?

It is certainly worth our best shot. To lead to success, however, the prize requirements will need to be carefully "terraced" so that one success logically prepares the way for the next. That will require some collaborative planning. Meanwhile, there is a new bill in Congress that, if passed, would lend government support and seed money for such a prize program. **S. 2772, the Space Commercial Human Ascent Serving Expeditions (Space CHASE) Act** will presumably take the place of the original HR 3752, adding this definition of a suborbital vehicle: "a vehicle, rocket-propelled in whole or in part, intended for flight on a suborbital trajectory whose thrust is greater than its lift for the majority of the rocket-powered portion of its flight." Sponsored by Senator Jim Inhofe (Oklahoma) the bill's full title is "A bill to promote the development of the emerging commercial human space flight industry, to extend the liability indemnification regime for the commercial space transportation industry, to authorize appropriations for the Office of the Associate Administrator for Commercial Space Transportation, and for other purposes." Read the bill at: http://www.spaceref.com/news/viewsr.html?pid=13632

This bill would not offer prize money, but clear the many bureaucratic hurdles that X-Prize contenders had to surmount. This will make new private prize efforts that much more likely to end in successful achievements. But we do not need efforts that merely raise the bar to trivially newer heights, say "100 miles." Rather, [⇒ page 2, column 2]

M.A.P.ing Enterprise Pathways to Space

Can X-, Y-, Z-Prizes Get us to the Moon?

Should the Bush Administration's Moon to Mars Initiative be approved by the incoming Congress and fully funded, *year after year after year,* we have a good chance of seeing a NASA science outpost on the Moon of limited capacity, probably in the polar boondocks. What we need is a private enterprise presence. Carefully "terraced" prize competitions could help make that dream become a reality.

Moon Miners' Manifesto

Moon Miners' MANIFESTO/ Moon Soc. Journal is published every month except in January and July, by the Lunar Reclamation Society.

• **MMM** is being reedited for the World Wide Web by members of Artemis Society International. => www.asi.org/mmm

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

• **MMM's MISSION:** to encourage "spin-up" entrepreneurial development of the novel technologies needed and promote the economic-environmental rationale of space/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. Any presumption that participating organizations can be labeled by indirect mutual association is unwarranted.

• For the current space news and near-term developments, read ***Ad Astra***, the magazine of the **National Space Society**, in which we recommend and encourage membership.

• **The Lunar Reclamation Society** is an independently incorporated non-profit 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 over 25,000 members and 80 chapters, dedicated to the creation of a spacefaring civilization.

The National Space Society, 1620 I Street NW, Suite 615, Washington, DC 2006; Ph: (202) 429-1600 <= **NEW HQ**

FAX: (202) 463-8497; nss@nss.org ⇒ www.nss.org

• **MMM's desktop publication** has received ongoing support (computer hardware and software) from the **Space Frontier Foundation**, 16 First Ave., Nyack NY 10960; 800-78-SPACE - SFF seeks to open the space frontier to human exploration and settlement as rapidly as possible.

openfrontier@delphi.com ⇒ www.space-frontier.org

• **The Moon Society** is "dedicated to overcoming the business, financial, and technological challenges necessary to establish a permanent, self-sustaining human presence on the Moon." — See contact information on page 9.

• **NSS chapters** and **Other Societies** with a compatible focus are welcome to join the MMM family. For special chapter/group rates, write the Editor, or call (414)-342-0705.

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

√ **EMAIL** to KokhMMM@aol.com (*preferred*)

√ **Typed* hard copy** to:

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

* *Handwritten submissions may be ignored.*

⇒ In FOCUS: Essay continued from page 1.

we need prizes that each represent a quantum leap in the public mind. To ensure momentum, we need something more than a continuation of technological achievement; we need boosts in public interest -- in the public appetite for space tourism that is affordable to a large enough percentage of the population to create a "sustainable market." Being able to tap such a market will then be prize enough.

Next Quantum Level in Prize Offerings

How about the first intercontinental flight with an apogee of 100 miles or more, defined as involving a landing at some distance to be determined, say in excess of 5,000 miles (8,000 km.). That would give passengers not only their astronaut wings but a substantial period of zero-g filled with amazing views of the Earth below. The cabin should have windows to provide such views. Flights like this would last on the order of a half hour to an hour plus.

Flying a cabin that holds perhaps two dozen passengers over such a route would be a good next step. More fares means lower prices for all. The next step would be to fly such a capsule into orbit, for a loop or two, without facilities to sustain passengers over longer periods.

Prizes work

Historically, prizes of this sort have raised an average 50 times as much money, by the competitors, as the size of the price offered. Those to gain from the achievement, such as companies in the luxury tourist market, and companies contending to supply supporting equipment, would be among the logical sources of the needed prize money, along with wealthy interested individuals.

Again, we need a series of prizes, one introduced at a time, that in the end will lead to the creation of a viable and sustainable space tourism market. Nobody is going to do it unless we do it, we including private enterprise> - PK

NOTICE – NOTICE – NOTICE

from Peter Kokh, MMM Editor, kokhmmm@aol.com

If you missed last month's newsletter, it should have been **Moon Miners' Review #35**, that's because to cut printing and postage costs, we have suspended the twice-a-year Review, available as both hardcopy and pdf file, and replaced it with the pdf file only **Moon Miners' Classics.** Our goal is to re-edit, reformat, and republish 2 years worth of timeless articles & essays every January and July until the first ten years of MMM are republished in this format.

Last month two pdf files were reeased, both freely available with *unrestricted access* at:

http://www.lunar-reclamation.org/mmm_classics/

The files are 31 pages (1.3 mb) and 54 pages (2.0 mb) respectively. Enjoy! We regret that those of you without Internet access are left empty handed, but all the more reason to join the 21st Century, the Century in which mankind begins to settle Space!

Earth's Mushrooming Power Appetite: a Reality Check

by Dave Dietzler < Dietz37@msn.com >

The Power Generation Situation

From Dr. Robert Zubrin's *Entering Space* we find some interesting figures on energy usage listed in the table below.

YEAR	POWER (TW)
2000	15
2025	28
2050	53
2075	101
2100	192
2125	365

I've compared this to figures on total world energy consumption in BTUs from other sources and it matches well. The 15 trillion (tera-) watts we generated in 2000 includes electricity from hydro, coal, nuclear, etc. as well as auto and truck fuel, and heating gas. The projected rate of energy use increase is 2.6% based on current growth. So you never know what really will happen given things like the rapid growth in China. Also, the population will probably level off in the mid to late 21st century and so will growth a little later.

We will have to curtail fossil fuel burning in the next 50 years and get all our energy from electricity generated by other means for heating as well as hydrogen generation for auto and truck fuel. Perhaps small airplanes, motorboats, snowmobiles, motorcycles, lawnmowers and a few other applications will still run fossil fuels as these will not dump much carbon into the air. Let's hope some Mean Green alliance doesn't outlaw backyard barbecues!

Solar Power Satellites to the Rescue?

So how do we get all this electricity? If we want solar power satellites to generate 50 TW by 2050 we will need a thousand 50 GW satellites. I read about solar trough collectors that were 60% efficient; but what about the turbogenerators? At best you get 50% with Brayton cycle turbines so I would guess overall you'd get 30% efficiency or 0.3*1350 watts/square meter=405 w/m2 Thus the satellite must be 11,111 meters on a side!! That's 6.88 or almost 7 miles!

O'Neill designed a 5GW satellite that would amass 80,000 tons. This one will amass 800,000 tons at least. So we are talking about moving 800 million tons of material from the Moon to build 1000 satellites by 2050 AD. If we use thin film silicon cells the SPS must be larger in area but I don't know about its mass.

Anyhow, *it isn't going to happen.* There is no way we can do that much work in 50 years with no previous experience and no infrastructure to support the thousands of workers and robots that would be needed.

When you consider the cost of space launches today and the cost of the ISS program the situation becomes even more difficult. If we develop something like Bob Truax's Sea Dragon that could put 550 tons of payload in orbit for a fraction of the cost of a Saturn V launch and make advances in AI and robotics, then launch tens of thousands of tons of payload to the Moon which grows into an industrial base amassing millions of tons we might just do it, but not by 2050. I'm not that optimistic. Who would dare gamble on this? Experience has proven space travel to be dangerous and expensive. Only some new ways of doing things could change all this.

Other Options

Perhaps orbital tourism over the next few decades will bring about cheap transportation of humans to LEO. With Sea Dragons or a Shuttle Derived Cargo Vehicle we could launch cargo, unless you think we will have a cable dangling from GEO in the next 50 years!

I have no doubt that AI (artificial intelligence) will astound us in coming years. I've read that the real barrier is not hardware but software.

In the meantime, the only realistic power source for the Earth is nuclear fission with breeder reactors to tap the plutonium and thorium/U233 cycles and perhaps even the extraction of uranium and thorium from seawater and other novel sources.

There might be a fusion breakthrough, maybe due to the growing of giant laser crystals in space factories that would fall apart when molten in Earth's gravity. We can't gamble on that either.

Count on these half measures for sure

We are going to see more hybrids, diesels, mass transit, electric cars, clean coal plants, natural gas fired power plants, wind farms, conservation, LEDs, fluorescents, etc. in the near future and higher energy prices.

The age of cheap oil is over with as demand from other countries increases and drives up prices. *We are going to need nuclear fission with breeder reactors or civilization will collapse.* Fission will keep industrial growth going, clean up our air and allow the creation of the hydrogen economy. Even so, we will need thousands of fission power plants and that will cost lots of money when a nuclear power plant costs about $2 B. For that you could buy 4 or 5 shuttle launches. If you could buy 40 or 50 shuttle launches or even 400 to 500 shuttle launches for that price, maybe we could gamble on space solar power satellites, but this is not the fact of the matter. *So we are more likely to see trillions of dollars spent on nuclear power plants instead of space development.*

The Bright Side

The bright side is that we can prevent ecological catastrophe and still generate cheap clean energy with nuclear. Economic growth will continue and we might create an economy large enough to afford space travel by wealthy

private citizens to LEO in a couple of decades and to the Moon in 50 to 100 years. We've already seen the first rocket plane, Rutan's Spaceship One. Meanwhile, we can build larger more powerful broadcasting stations in space, defense stations, advanced telecommunication stations, manufacturing labs, etc.

How the Moon fits in

The question is, what do we do with the Moon for now? We still need to get the ground truth on the polar ice deposits indicated by the *Lunar Prospector* data, but unconfirmed by radar. We need to search for Sudbury type impact basins that could be rich in copper, nickel, zinc, gold, platinum, etc. We need to develop shelters and long term life support systems for ground crews. We need to develop regolith refining and aluminum/oxygen rocket technology. We need to develop mass drivers.

Perhaps we need to deploy a small satellite amassing 25 tons that sends a microwave beam down to Earth for proof of concept. Experiments in microwave power transmission have been done on the ground and we could probably do more. Can we send a tight beam of microwaves 22,400 miles? Or even 240,000 miles if you like David Criswell's concept of power beams directly from the Moon. We need to work out all the manufacturing details for construction of Moon bases, lunar power plants, mines, refineries, mining machines and mass drivers. Exactly how many and what kinds of machine tools are we going to need to make all this stuff? I don't know if it is humanly possible to work that out in your head. We don't know how things will hold up in the vacuum, low gravity, abrasive dust, radiation and temperature extremes of the Moon so we would be best to test things out at a Moon base.

I think we waste too much money on Mars rovers when we need more lunar rovers and a manned presence on the Moon to do research with the long range intention of building solar power satellites and mining for helium 3 so that we can get an even better, cleaner power source than nuclear fission that cannot meltdown or generate radioactive waste. If we are talking 1000 SPSs rated at 50 GW each to power the world of 2050 AD and we grow to demand 192 TW by 2100 AD we are talking about 2000 SPSs rated at 100 GW. I think we would be more realistic to expect growth to level off at around 200 TW and those satellites to be built in the 22nd century, barring major a fusion breakthrough in which case everything goes fusion and the only reason to go the Moon then is for Helium-3 and tourism as well as creating a "spring board" to Mars and the outer planets (especially Uransus) for future Helium-3 mining.

The Last Word

What it's really going to depend on is costs. *The cheapest form of energy will win,* and nobody can predict that without the God given gift of prophesy orby paying Lucifer a high price for a little bit of knowledge. **< DD >**

Personal Self Reliance on the Frontier

by Dave Dietzler < Dietz37@msn.com >

Prescriptions for Misery (on Earth or Elsewhere!)

Pity the poor person who depends on drugs, alcohol and sex. One's life is one of addiction and slavery, diseases from hepatitis to liver damage and worse (AIDS, brain damage), drug dealers and bars that suck all the money out of one's pocket as well as one's pride. Perhaps the most damaging is an addiction to sex. Partners are chosen for the wrong and shallow reasons. relationships and marriages built on lust alone are headed for personal and family disasters and likely financial ones as well.

Stress Levels for Space Frontier Pioneers

This will all hold just as true on the space frontier, where greater stresses may leave one more vulnerable to the temptations of false diversions and cures. Pioneers will have left behind much that they love and enjoy: open air environments with blue skies; many outdoor sports and kinds of recreation; an endless selection of places to go for get-away-from-it-all vacations and weekends; a vast and infinitely varied selection of consumer goods from clothing, to electronics, to food and more; many places to escape into the faceless, nameless crowd when one feels the need. In early settlements, in contrast, at first everyone will know everyone else. The small town syndrome. The general store will have little to choose from. The list of things to do on a Saturday night will be few. And on and on. If we leave it like that, we are headed for trouble.

Prescriptions for a Healthy Life Style

Self reliance begins with a good ballanced, varied, and nutritious diet. It is so important to feed the body and feed the soul for the sake of maturity and self reliance that it is even permissible to eat animal meat, despite the fears of vegetarians. We will produce enough food on the Moon to feed everybody three square meals a day of meat, milk, fruit, vegetables and grains as well as a couple of snacks. If we don't we might have a bunch of impover-ished weaklings on our hands and they won't make it on the harsh frontier.

We will produce limited amounts of alcohol, only be available on weekends -- during the work week, we'll need as close to full productivity from everyone as we can get. In an environment where survival depends on the mastery of high tech equipment and alertness, intoxication can be deadly, as it is so many times on Earth's highways.

There won't be much tobacco. In confined environments, smoking will quickly lower air quality levels to harmful if not intolerable levels. No windows to open to let in fresh air! There will be nowhere to "step outside" for a puff. A smoking habit will thus be a big negative on any settler applicant's resume or profile. Chewing tobacco? Perhaps for those who don't mind losing a tongue or jaw to cancer.

Lunans will exercise regularly and lift weights to

avoid atrophy in the low gravity. Physical strength and muscle tone must not be lost. Ask any astronaut who has to fight the spacesuit. Going outvac in a spacesuit will give Lunans good workouts. Workplace clusters may share gyms.

Exercising one's Spiritual Side

Religious rituals have importance also. I discovered the chanting of the maha-mantra when I was about thirty years old. Others find Christ and get something out of church services. Some find peace through submission to the commands of Allah and prayer five times a day facing Mecca. There are many other spiritual traditions out there. I've become interested in some of the European Pagan observances of the seasonal changes recently through acquaintance with a woman who participates in Wicca. There will be temples and meeting places for religious groups in our lunar cities. Hopefully, they will all learn enough about each other to develop mutual respect and peaceful coexistence.

Lunans will probably be highly educated and highly skilled. Ignorance and bigotry are no more desirable on the High Frontier than are chemical dependency, domestic violence and fractured families. Lunans will be a special, hearty breed of humans who survive by the use of intelligence and common sense. They will set an example to the rest of humanity. If they don't, they will not survive.

The Space Frontier as an Uplifing Vision

Life can be harsh, but humans, being what they are, have developed character through the struggle to survive for millions of years. If we didn't, we'd be extinct, and there would be no galactic civilization of the future. What a pity it would be if our species went extinct when such a glorious future awaits us "out there." By spreading the vision of the High Frontier, we can uplift today's people's spiritually and perhaps put an end to some of their dysfunctional behavior by showing them that there is more to live for than alcoholic and narcotic stupor, legendary sex partners, a miserable home filled with violence, children who go astray and hopeless floundering in financial troubles.

Summing up

Stress-relieving addiction is a very complex subject and psychologists are studying the problem. The important thing is that we can't have dysfunctional behavior on the Moon or in the free floating space colonies, where O'Neill and others including the painter Don Davis have pictured a quasi-utopian existence, or we will end up expending scarce resources and endangering the survival of the colonies.

We must know more about psychology before we can really put people up there for long periods of time. It is sort of like the life support issue. We may have propulsion systems that can send a team to Mars but we do not have the life support systems to sustain them for years.

We may not yet have the spiritual/psychological support systems we need either. Perhaps a study of Antarctic research base personnel is warranted, and maybe we should study colonies in isolated places on Earth today to figure out what is conducive to spiritual/psychological survival in harsh, dangerous environments. Perhaps we need to discuss this some more.

Besides nutrition, exercise, and prayer/ritual, there is also the family support network. This is perhaps the most important part of O'Neill's vision -- normal family life in space rather than some kind of military base that looks like a prison or inside of a nuclear submarine. That's another thing to look at -- how nuclear submarine personnel maintain psychological health while confined together in close quarters for months at a time. The military may have many of these questions answered already. More to learn!!

The need for emotional support is a strong one. At the very least we will need intense psychological screening and character history investigation before we send someone to the Moon. Unfortunately, this won't be possible with tourists, so we're going to need trained persons ready to handle security problems up there! And even if the original settlers are screened, that won't prevent their offspring from developing anti-social behavior. Proactive measures that encourage healthy living and healthy inter-personal relationships are a must. **‹ DD ›**

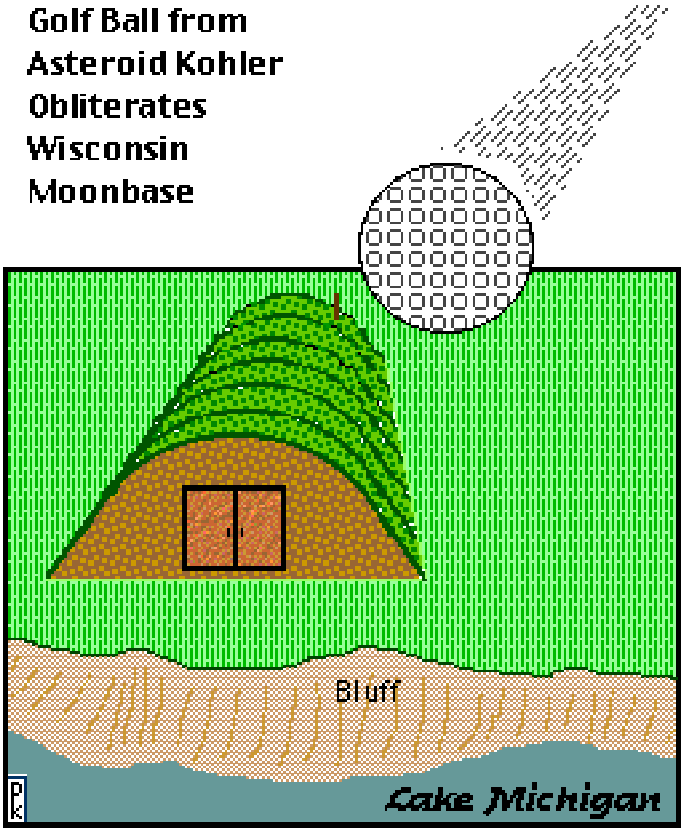
Read MMM #97 July 1996, p 8. SPIRITUALITY: Effects of the Lunar Environment on Spirituality and on Reinforcement of Personal Religious Sensitivities, P. Kokh

Many MMM articles have addressed the need for morale-lifting, stress-reducing measures such as spacious quarters with real elbow room, abundant color and vegetation, fresh air, "water features", get-away vacation options, job routine variation, arts & crafts & hobby options, music, sports, outvac recreation options, and more.

Articles have also dealt with the need for every citizen to be environmentally conscious, since "living immediately downwind and downstream of ourselves" leaves little room for "carrying" the environmentally insensitive. The burden of those who won't co-operate can be very stressful. Education of frontier children would feature Recycling as "the 4th R" and include chores and "universal service stints" in the systems that keep the settlement alive: farms, water and air refreshening; recycling of scrap materials, etc. On the frontier, it will be truer than ever that *"if you aren't part of the solution, you are part of the problem!"*

On any early frontier, there is always more to do than people to do it. We cannot afford to lose anyone to addictions, nor incarceration. We must find other "corrective" options, such as assignment to necessary but unattractive jobs, inside and outside the settlement. Prevention and early detection of unhealthy behavior will be paramount.

Without continued proactive remedial attention, the frontier will tend to be stress-heavy. The challenge is to to make it stress relieving instead: a happy, healthy place to live, work, raise families, grow old, and die fulfilled. **‹ PK ›**



Whistling Straits, site of the 2004 PGA, & the Dashed Dreams of 2 Wisconsin NSS Chapters

A "Local Color" Story with Some Lessons

by Peter Kokh < kokhmmm@aol.com >

What do Tiger Woods and the vanished dream of a Wisconsin Moonbase Summer Camp for area kids have in common? Well, the story all begins back in the early Spring of 1995. George French, President of the Wisconsin Space Business Roundtable (which NSS-Milwaukee, the Lunar Reclamation Society, had helped launch two years earlier) had learned that the Florida Spaceport Authority had a spare meteorological suborbital sounding rocket, a 12.5 ft. Super Loki, that it was looking to donate to a suitable organization. A call to the governor's office, and Tommy Thompson quickly dispatched French and a Wisconsin Air National Guard c rew down to Florida to pick it up before anyone else had time to get interested. The bird was flown back to WANG's Volk Field ammunition storage facility near Mauston for safe-keeping. Wisconsin Space Business Roundtable was the proud owner.

Meanwhile, WSBR and LRS began brainstorming, quickly agreeing upon a plan. We would look for a suitable launch site, then organize a weekend long event, hopefully in the Spring of '96, involving some 40 students from each of the state's 9 congressional districts, in an obvious move to garner total support from our Congressional delegation.

After putting together a "short list" of promising launch sites, we unanimously pounced on a site some 6 miles

upshore from Sheboygan and about 60 miles north of Milwaukee. The reason? The site, dubbed "**Haven**," had been an artillery and ordinance test side during WW II, and, happily, the associated "no fly zone" off shore in western Lake Michigan, was still on the charts, having never been decommissioned -- a safe and secure down range area of sufficient size.

A quick check found that the property of the former military base now belonged to Wisconsin Electric Power Company and that they would be willing to discuss a 99 year lease! That meant we could start brainstorming not just a one-time event, but continuing operations. The dream of "Spaceport Wisconsin" was born.

On April 8th LRS members Mark Kaehny, Dave Dunlop, and Peter Kokh, along with Sheboygan Space Society President Will Foerster, attended the WSBR Board meeting in nearby Kohler, and joined the WSBR tour of the site to have a look-see. The area was generally level, atop the usual bluff frontage along Lake Michigan. But we all got excited when we spotted an unexpected pair of 40' x 60' mounds -- *bermed, earth-covered bunkers*. The rusted steel doors of one of them were unlocked. We took a peek inside. There was a space eight feet high, and perhaps twice that wide and maybe 40 ft. long with no windows, no furnishings. It was a little damp and musty inside and in need of a good cleanup. I'm not sure about utilities, but that was a minor matter. We all realized at once that we had a pair of structures ideal for Moonbase simulations for kids.

Our 99 year lease started taking on shape in our heads and our brainstorming picked up speed, all brakes disengaged. Perhaps WSBR could erect some sort of facility with a space museum and store, and meeting rooms for tourists. We'd find volunteers to clean-up the bunkers, retrofit them with electricity and plumbing and communications, donors for the supplies and equipment needed. Milwaukee (LRS) and Sheboygan (SSS) chapter members would man and conduct a two-week summer camp each year.

Alas, we were all too soon (mercifully soon, perhaps) notified by WEPCO that it had a customer, Kohler Corp. of nearby Kohler, Wisconsin (yes, the manufacturers of premier and avant garde bathroom fixtures), who were interested in the site as a promising location for a future golf course. But Kohler would not be ready to proceed for some time and we might be able to use the site for the planned Spring '96 event the following year.

But we had all come to like the idea of Spaceport Wisconsin and some kind of annual event, so we began searching for an alternate location. Luckily, the Sheboygan Armory at the mouth of the Sheboygan River in the heart

of this town of 50,000 six miles south, was available, and still fronting the flight restricted area over the Lake.

With the leadership of Dave Dunlop (WSBR & LRS) we proceeded designing and organizing the event. Saturday, May 5, 1996. was a glorious day. Thousands of adults and kids came to view the many exhibits, including those of the Lunar Reclamation Society and the Sheboygan Space Society and of several Wisconsin corporations with space business contracts, the Wisconsin Space Grant Consortium, NASA itself, and amateur rocket suppliers and societies.

Many amateur rocket engines were lit. But the real climax came when the Super Loki took off. Not much bigger than a really big amateur rocket, it quickly made the distinction clear by vanishing out of sight within two seconds. Equipped with a color web cam, it took pictures all the way up some 30 miles over the Lake. Engine spent and its parachute out, it drifted over Michigan's lower peninsula.

As of 2004, the annual "Rockets for Schools" event is still going strong, without the Super Loki perhaps, but with other additions and attractions. Our loss of the bunker site six miles further north became the golf world's gain. The course at Whistling Straits is one of the most beautiful and prestigious in the Country. You can have a peek at it at:

www.destinationkohler.com/ws/straits.html

If you are ever in the area, do drop in and take a swing -- and be sure to have a brat. Sheboygan, after all is well known as the Brat Capital of the World. It has a nice Riverwalk and beautiful lakefront. The nearby Kohler bathroom fixture showroom is an absolute must. Plus "Rockets for Schools" (google that for details) weekend each May.

In retrospect, nine years later

The existence of an already soil-shielded substantial structure on property that for one shining moment we thought was ours to use, was an admittedly great "given" on which to base a space camp operation for kids. Disappointed at the property's sale, we, "of course" abandoned the idea.

But should we have? I'm not sure. A lot of money has gone into designing and fabricating "look-like-the-real-thing" Mars Outposts for simulation exercises on Canada's far north Devon Island and in south central Utah, terrain chosen because it resembled terrain we expect to find on Mars. This expense and effort is in our view well justified because it drew and still draws ample publicity, co-essential, along with the findings of the simulation exercises themselves, to advancing the goals of the Mars Society.

But kids do not need that high a degree of simulation, of look-like-real fidelity. *Their imaginations can make the leap.* For a space camp for young people, much less money need be spent on structure, just a little on creating an atmosphere, and the rest on the educational exercises. Now, nine years s after our visit to Haven and its blufftop bunkers, I think we should have held on to our space camp plans, adjusted them and found another site. **‹ PK ›**

Space Camps for Kids -- on the ¢heap

by Peter Kokh < kokhmmm@aol.com >

Let's continue our train of thought from the article just above and see where it might take us. Several NSS chapters and other small-budget organizations *have* set up "space camp" and "Moon/Mars base" simulations for youth. In the late 1980's, Oregon L5 gained access to a pair of lavatubes outside Bend, Oregon, and erected an outpost structure within out of a tarp covered PVC tube frame. The setting and its isolation did the trick, not the structure.

Make-do Outpost Locations

Few chapters will have access to such ideal mood-setting locations. While desert and mountainous areas with sparse vegetation seem ideal, localized "green-free" areas can be found in many states in the form of limestone caves, quarries, and old strip mines. Even a large unused parking lot could be pressed into service. Of course, getting permission to use such sites is trick number one.

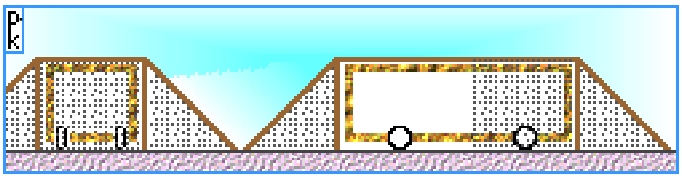
Mockup "Outpost Structures"

If you find such a location logistically handy for your group's use, and can negotiate usage rights, here are some ideas for a structure There may be a construction or operations shack already on site that can be adapted or expanded, using common carpentry skills. No such luck? Options for inexpensive ready-made shelter include an old mobile home, an old school bus, or an old trailer from an 18-wheeler semi, modified for access and ventilation..

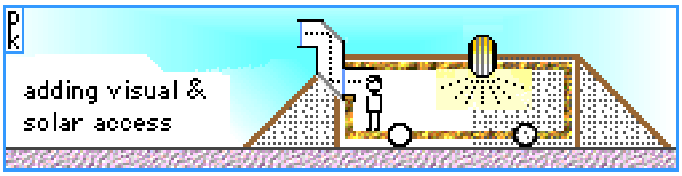
Once your adopted shelter is driven or towed to the location, the real fun begins. You will want to brainstorm how you are going to use it, paying attention to its usable volume and layout constraints, then outfit the interior accordingly, remembering that simple suggestiveness is ample enough as a springboard for young imaginations. A dashboard becomes the mission control center. A vestibule add-on structure outside the door makes an air-lock. If the interior needs to be paneled, choose "glassboard" bathroom panels to simulate glass composites, or Masonite sprayed with Rustoleum Hammerite Silver to simulate metal.

Simulating shielding

Nothing will set the scene better than covering your outpost structure with faux lunar or Martian rego-lith (rock powder blanket) shielding. No need to truck in many cubic yards of sand or gravel or dig up the surroundings for free dirt! Just make a frame of 2"x2"s, staple on chicken wire for support, then staple on canvas or other weather-resisant fabric, spray painted to simulate regolith shielding. Use a gray primer for the Moon and a rust primer for Mars. Blotch overpaint with Kraylon's "Make it Stone" multi-color fleck paints in the appropriate shades. Be sure to leave access to the interior for entry, light, and ventilation. Scatter available rocks or boulders around the perimiter, and Voilà. *Step into another world!*



Above: "Shielding" a Reassigned Vehicle or Structure

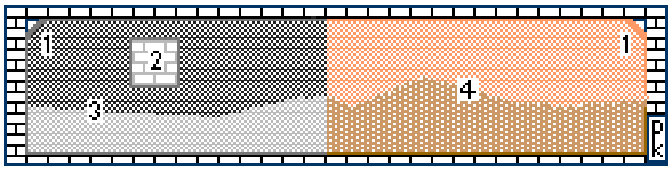


Above: easy upgrades with mirrors

The Urban Warehouse Space Scene Makeover

For even greater simulation, and without the need to look for "life-barren" locations, all we need to do is *move indoors to a large undivided windowless space.* Such an environment allows total lighting control -- *thus* simulation of the two week long lunar dayspans and nightspans or of the 24 hr. 39 minute Martian day, or of any other pattern. Therein we can study human, and plant, reactions and adaptations to non-terrestrial day/night rhythms.

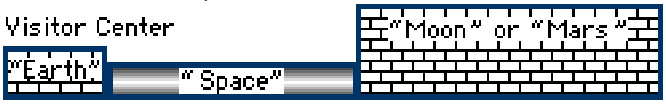
For this purpose a large empty urban warehouse, an unused gym, or an abandoned factory will do - structures which can be found in most urban and even rural settings. Cover and black out all the windows, Use spotlighting to simulate the Sun. For a moonbase, paint the upper walls and ceiling black and the floors gray. For a Mars outpost, paint the upper walls and ceiling the salmon colors of the Martian sky and arrange hidden uplighting to illuminate that setting.



KEY: (1) cove, blending wall into ceiling. (2) block up any windows and painting them out. (3) upper walls and ceiling painted black and lower walls in graytones for the Moon base simulation. (4) upper walls and ceiling salmon color and lower walls in Mars tones for Mars base simulation.

Lightweight frames of wood and chicken wire can support tarps painted to look like the lunar surface shaped like craters and ridges. This will be suitable for areas not "explored on foot." Foot paths will need firmer foundations.

Outside the warehouse there could be a long, black, pitch dark hall connecting to the visitor center. At the center (gift shop, library, exhibits, conference room/ theater, State Space Hall of Fame), kids would enter a golf cart type vehicle redone as a spaceship, for travel through space (the black tunnel) to the "Moon" or "Mars" (the warehouse interior).



First Steps

Now you have a plan for creating a Moon or Mars base outpost that can be used as a Space Camp for kids, a versitile and adaptable design that should put realization within reach of an ambitious chapter or other small-budget organization. You can get started by forming a non-profit foundation, eventually to operate it, but more immediately to receive gifts from sponsors to include the warehouse itself (or other suitible structure) and its use, making the necessary interior makeover along with any needed utility runs; and supplies: wood, wire, tarps, and paint; and other educational resources.

Operations

Missions suitable for young people will be mostly educational. But there is no reason why adults could not have their time in the facility to simulate real operations for the purpose of experimenting with procedure options, equipment options, and testing tolerances, limits, and other aspects, much as would be done in a serious outpost analog station such as the M.A.R.S. or M.D.R.S.

It would, in fact, be natural for both the new facility and its usage to evolve over time. The mighty oak begins with a little acorn. Futures presuppose starts.

The Point

The point is that there are a lot of inexpensive options *once you realize that children do not require the same degree of realism as adults.* Their eager imaginations readily supply the rest. Once operational, improvements can always be made. We have the chance to teach and get across real lessons about space, the possibilities of not only exploring other worlds, but making ourselves at home there, will be driven home. We will be nurturing space supporters, explorers, entrepreneurs, and pioneers of the future.

It is easy to make an endless list of plausible "buts," reasons why this approach is simplistic, reasons not to take even the first step. Yet nothing is to be lost by looking into such a bold plan in the community in which you live. You may indeed uncover a "showstopper." The obstacle may prove temporary. "Nothing ventured, nothing gained."

Recruiting help

But what if none of your chaptermates thinks this is within reach? If no one wants to pursue this idea with you? If no one even wants to humor you? Do as much homework on all aspects of the plan as you can, on your own and then present the idea again, footwork done.

If you get the same reaction, it may be time to recruit fresh support. Start by making your outpost plan the main feature of your public outreach display. A crude model will draw the eye and attract the curious, giving you a chance to hook them on your dream.

Give talks about the "project". People with talents and energies you need may join your chapter just to be a part of your exciting project, to help make it real. **‹ PK ›**

http://www.moonsociety.org

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 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:

The Artemis Project™ http://www.asi.org/
- Artemis Reference Mission
- Artemis Data Book

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

Moon Society DUES include **Moon Miners'Manifesto**

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

Join/Renew Online at
www.moonsociety.org/register/

Or mail check or money order to:
PO Box 940825, Plano, TX 75094-0825, USA

Please send all mail related to Memberships to:
The Moon Society Membership Services
at the address above.

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

Moon Society Elections 2004 "and the Winners are ..."

from Amy McGovern, Chair, 2004 Elections Committee

August 1, 2004

We are please to provide the following report on the results of balloting in the 2004 Moon Society elections. Voter turnout was approximately 21% of those qualified to vote, which is excellent. Amy McGovern certified the eligibility of each voter whose ballot was counted. The Society thanks all of you who exercised your voting privilege.

The voting was done with a preferential ballot with contested elections for the office of President and for the four open positions on the board of directors.

The following ballot count report is certified by Amy McGovern (retiring Secretary), Gregory Bennett (retiring President), R. Scott Gammenthaler (Treasurer).

Officers

In the first-round count for the office of **President, Peter Kokh** received a clear majority of first-place ballots and is therefore elected as President.

In the first-round count for the office of **Secetary, Gary Gray** received a clear majority of first-place ballots and is therefore elected as Secretary.

Peter and Gary's elections to office eliminates them from candidacy for positions on the board of directors, leaving four candidates for the four open positions and the ballot counting for board of directors becomes moot.

Directors

There were no write-ins for board of directors. Therefore, the four remaining candidates, each having received votes on at least one ballot, are elected to the Board of Directors:

- **Gregory Bennett**
- **Mike Delaney**
- **Steve Jackson**
- **Michael Mealling**

Congratulations to those ellected; thanks to the voters.

Mars is in our "Field of View"

by Peter Kokh

The Moon Society is focused on the Moon, obviously. But for lunar settlement to be truly viable, the pioneers will need to tap resources the Moon lacks in economically accessible abundance: industrially strategic metals such as copper, zinc, platinum, gold, and silver; and perhaps carbon and nitrogen-rich volatiles. The Moon also needs markets for its products.

Mars first fans are quick to point out the resource-challenged character of the Moon. That established fact turns out to be irrelevant. Japan too, lacked many industrially strategic resources: coal, oil, iron ore, and on and on. So it *went out* and developed "markets" in resource-rich areas

of the Pacific Rim, becoming rich and prosperous in the process. Japan is the development model for the Moon. Our satellite does, however, start with the three most important resource of all: "location, location, location" -- the Moon has it, and Mars does not.

The story does not end there. Greater Mars (with its two moonlets, Phobos and Deimos) is a potential market for goods manufactured on the Moon, but more importantly, a potential sourcs of volatiles and strategic metals that can be shipped to the Moon for far less fuel cost than up out of Earth's deep gravity well. It is in the Moon's interest to promote the opening of "Mars PhD", *not eventually, but without delay,* apace with the opening of the Moon.

But it is also in the best interests of the future Martian frontier to have the lunar frontier develop side by side. Why? It is difficult to conceive of an export product that Mars could market to customers on Earth: Mars has no resources in abundance that are scarce on Earth. Tourism? Who will be willing to take two to three years out of their life for a round trip jaunt to Mars, when most of that time will be spent coming and going? But Mars does have potential exports it can market to the Lunar Frontier. In fact, without the Moon in the picture, it is exceedingly difficult to establish any believable "economic case for Mars."

An Earth-Moon-Mars economy can work. The Moon has three potential product areas that might be developed for direct sale to customers on Earth: microwaved-power, helium-3, and tourism. Beyond that, any item that lunar industries develop for local, lunar consumption, should be marketable to in-space markets such as LEO industrial parks and tourist facilities, at a cost advantage over equivalent products produced on Earth: the Moon has a 20:1 fuel savings advantage. But again, what the lunar economy will be able to produce, and the extent to which it will be able to diversify, will be limited without a less expensive source of lunar-deficient materials than Earth.

Mars too will benefit from immigration of Moon-seasoned pioneers. For Lunans, Mars will be a walk-in-the-park. A Lunan recruit will be worth as much on the Martian frontier as many recruits direct from Earth. Simply because of distance and frequency of launch windows, the lunar frontier will initially develop faster than the Martian one. Made on Luna equipment and supplies will be shipped to Mars at considerable fuel cost savings, allowing Martian hard currency credits to stretch further, helping to insulate the Martian frontier from a cut-off or cut-back of support by benefactor governments and corporations on Earth.

Whichever world you personally would rather pioneer, it remains all but certain that the Lunar and Martian Frontiers will have an immensely better chance of successful development, each more quickly reaching viability in the case of interruption of support from Earth, *together* than separately. The Moon and Mars then are more appropriatly seen as natural allies, not as "us vs. them" competitors.

Well-intentioned enthusiasts who buy into the "Moon or Mars" debate, not only deceive themselves, but unwittingly work for the failure of both. Can we afford both? Let's rephrase the question: Can we afford to pick just one if it entails certain failure? The Moon Society calls for the opening of both frontiers simultaneously, with new equipment (e.g. mining, processing, manufacturing, and transport) and systems (pocket hosptitals, air and water recycling, biospheric, etc.) of use on both worlds, tested on the Moon first, where rescue, resupply, repair are easy.

This will provide a triple benefit for Mars:

1. New equipment will arrive on Mars with a much higher confidence and assured reliability level for use in a location where rescue and/or resupply can be months or years away.
2. Development of such equipment and systems can be *charged to the cost of opening the Lunar Frontier, greatly reducing the incremental cost of opening Mars.*
3. With the new, debugged equipment from the Moon will come personnel familiar with its use, rugged proven pioneers rather than untested romantics from Earth.

There are, of courses, differences between the Moon and Mars, differences that matter. Some equipment and systems will be unique and special to one frontier or the other. But that should not keep us from working to identify and maximize equipment and systems that can be standardized, at least in part, for use in both locations, saving precious money and funds for other vital expenditures.

The Moon Society sees the Mars Society not as a rival, but as *a logical partner in working to realize this vision.* If some things get tested on the Moon first, that initial delay will greatly speed-up the pace at which the Martian Frontier successfully develops *over the long run.* But we have to work at it, to guarantee that both frontiers open and develop apace. Patience? Not exactly. "Aggressively industrious patience," yes! Impatience gets quicker results, to be sure, but far more often than not, those results are flawed and soon lead to failure.

So let us both, the Moon Society and the Mars Society, work together, cooperating and collaborating, helping each other achieve a shared, brighter, open-ended future. Yes, the Moon Society is focused on the opening of the Lunar Frontier. *But Mars looms large in our Field of View.* It is in this spirit, and with this hope, that the Moon Society is cosponsoring Mars Convention 2004 in Chicago.

This vision is just the beginning. In time humanity will call all the Solar System home, and will have begun to reach for the Stars! ###

Meet Incoming Secretary, Gary Gray

by Gary Gray

The Editor of MMM has given me an opportunity to tell Moon Society members a little about myself and my understanding of how our Society can help in getting people into space. But first, I wish to thank all the members who took the time to vote in the 2004 elections. Individual participation in Moon Society activities is essential.

I have been a member of the National Space Society for many years and am also a member of the British Interplanetary Society and the Space Studies Institute. By profession, I am an accountant with a M.A. in Accounting and also have a Certified Public Accountant (CPA) certificate.

One of the reasons I ran for the office of Secretary of the Moon Society is that I believe that I can work with other Moon Society leaders in promoting the goals and objectives of the Society which include the human settlement of the Moon. The Moon Society can have a major influence in the human advance into space.

I believe that in order to promote space developments we need to use or learn to use, terms. words or phrases that non-space junkets can understand. We need to think how to sell our goals in creative yet practical ways. We need to convince the general public to support space development or at least not to oppose it.

The Moon Society needs to increase its influence within the general public, the space community, and governmental agencies. We can do this by greatly increasing our membership and actively take advocate positions on various space issues.

We need to grow and reach out.

I wish that all the members of National Space Society, the Planetary Society. Space-Frontier Foundation, and Space Access Society were members of the Moon Society but that would not increase the overall support of the space movement. *What we really need is an aggressive recruitment effort targeting people who are not currently members of any advocate space group.* Towards the goal of increasing membership, we need to look beyond the already tapped pool of members of other space organizations, towards other organizations that might have a small "space interest element" within their constituencies. We can also promote formation of space-interest groups within many organizations that lack a space connection as part of their basic agenda or focus.

Other way to increase our influence is to take sound, well thought-out space issue positions to advance to the general public, government officials, and private companies. I can not think of any valid reason why we can not be in a leadership position and/or in a coalition of other groups when promoting or advocating space based goals.

We live in a most exciting time of a real possibility of major advances into space. We have a President of the United States who supports a Vision of Space Exploration. Probably, almost everyone interested in space has a problem or problems with the Vision. But who was the last US President who made a positive, definitive space statement that supports our goals. .Just for the record, the three problems I personally have with the Vision and its process are the seemingly standard 10 years timeline to develop a new project (should be less), the projected shoot out method of only two companies before NASA selects the only company to develop the final version of a CEV (should be more than two with equal opportunities for smaller firms to lead), and the limited mention of private enterprise in the recent Space Commission report (should have been strong for this) and NASA's apparent limited understanding of how to implement private/public space development .

I welcome your thoughts or comments by email to ggrey2@juno.com or to secretary@moonsociety.org

Robust Moon Society Presence at the Mars Convention 2004 in Chicago

from Peter Kokh, Moon Society President

Chicago, August 22, 2004 -- as I pack up our information booth and displays, headed for home, I cannot help but feel that the Moon Society presence here was most productive. We cosponsored the event, and that was well advertised. Our exhibit which featured a table top-modular homestead shielded with regolith, half in gray, have in mars tones, got across that much of what pioneers will need to do to make themselves at home will be similar on both worlds. Our flyers included one listing similarities between the Moon and Mars, a companion one suggesting a wide menu of possible collaborations between the two societies. While some attendees passed us by, overall there was much interest, and 50-some Moon Society registration flyers were taken. New Secretary Gary Gray was also on hand to help.

I had promising discussions with both Mars Soc. President/Founder and guiding light Robert Zubrin and his amazing and dynamic Executive Director, Maggie Zubrin, who really runs the shop. Both visited our table, made favorable comments and took samples of all the flyers.

A more complete report will be sent out to all current and lapsed members with current email addresses. I hope to report to the membership on a regular basis on Moon Society initiatives and progress, so please do take time to check if the email address we have on file is current. Go to www. moonsociety.org/teamdir/ to check or correct your listing. If you have trouble, please email president@moonsociety.org. **<PK>**

Planetary Society Convenes International Lunar Workshop in Beijing , China

http://planetary.org/news/2004/lunar_meeting.html
by Susan Lendroth

May 21, 2004:

The Planetary Society organized a special international lunar session on May 28, 2004 as part of the United Nations/European Space Agency (UN/ESA) Basic Space Sciences Workshop in Beijing, China at the Prime Hotel at 2 Wangfujing Avenue. Representatives and specialists from the space agencies of the United States, China, Europe, Japan, and India will discuss ongoing and planned lunar missions in the context of planetary exploration. Dr. Louis Friedman, Executive Director of The Planetary Society, chaired the meeting.

After three decades of being almost ignored, the Moon will soon become a busy place for robotic spacecraft. Europe's SMART-1 mission, a technology test of low-thrust ion propulsion, is currently on a 16-month journey to the Moon. SMART-1 will measure the chemical composition of the lunar surface, including the polar regions. Japan is developing two missions: Lunar-A, an orbiter that will fire penetrators into the surface, and SELENE, an orbiter with two sub-satellites. India also is planning a lunar orbiter, Chandrayaan-1, and China has described Cheng'e as a lunar program with two missions - an orbiter and a lander.

"Moon and Mars exploration is becoming a global effort with a great technical and programmatic future," said Bruce Murray, a Planetary Society co-founder and Chairman of its Board, "which is why the Planetary Society urges worldwide collaboration on lunar missions." The Society proposes that an international lunar way station be part of the preparations for human outposts on Mars.

Lunar session participants will include James Burke, retired from NASA's Jet Propulsion Laboratory and the first project manager of a mission to the Moon (the Ranger missions in 1960-62); Bernard Foing, the European Space Agency Project Scientist for SMART-1and Chair of the International Lunar Exploration Working Group; Hitoshi Mizutani, the Japanese Space Agency Project Scientist for the Lunar-A mission; and Narendra Bhandari of India's Chandrayaan-1 project. Scientists from the Chinese Academy of Sciences will also participate in the meeting. Louis Friedman, Executive Director of The Planetary Society, will chair the session.

"Promoting international cooperation with the lunar missions is just one the Society's activities in support of the new Moon-to-Mars space exploration policy," Friedman noted. He cited his testimony to the President's Commission on Implementation of US Space Policy earlier this month (http://aimformars.org/friedman_mtm.html).

Chapter & Outpost News

Moon Society Mid-Atlantic Chapter

http://www.moonsociety.org/chpaters/mid-atlantic/

The Midatlantic chapter is planning to go to the Dulles annex of the Air and Space Museum on July 10th. Since that's the day before the moon-mars blitz starts http://www.nss.org/legislative/index.html if you're going to be in town you are welcome to join us. Email me if you are interested.

Dana Carson < dcarson@cyberteams.com >

Moon Society St. Louis Chapter

http://www.moonsociety.org/chpaters/stlouis/

These are regularly scheduled monthly meetings:

- **Second Wednesday** of the month 7:30 PM - Buder Branch Public Library 4401 S. Hampton, basement conference room
- **Third Thursday** of the month 7:30 PM - Borders Books in Brentwood,just south of highway 40 on Brentwood Blvd., a little west of 1-70.
- **Fourth Tuesday** of the month 7:30 PM - Schlafly Branch Public Library: 225 Euclid (at Lindell), conference room.

Archon 04 (St. Louis area science fiction convention)
http://www.archonstl.org/28/index2.html
Thurs-Sun, September 30 - October 3, 2004

David Dietzler, Keith Wetzel and David Heck plan on attending, and maybe doing a panel on the Moon/Mars Initiative. Check their website above for the current info on Archon plus contact info for setting up Panels. If you want to be on a panel, or if you have a suggestion for a panel, email us or let David Heck know.

Utah Outposts to Dissappear ?

from Jonathan Goff < jag42@et.byu.edu >

I wanted to let you (the Chapters Coordinator) know that I'm just finishing up my thesis and preparing to move out to California to join some friends in a rocket startup Unfortunately, my graduation and relocation will likely leave the Utah Moon Society Outpost defunct for a while since I was not able to get anyone to sign up for that (in spite of getting the student discount)

~Jonathan Goff

[Jonathan had started both the Utah Outpost and the Brigham Young Univ. (Provo) Outpost, doing business as the BYU Space Development Club.]

Calling all Utah members and readers. Now is the time to rise to the occasion and keep this great start goling!.

Shoemaker–Levy 9 Jupiter Comet Crash

Pine Mountain Observatory Experience

By Bob McGown

It has been ten years since, the great Jupiter comet crash. In July of 1992, Comet Shoemaker-Levy broke up during a close passage of Jupiter. The fragments impacted the planet from July 16-22, 1994. Pre-impact estimates of impact energy were uncertain and ranged up to a million megatons of TNT (a million hydrogen bombs).

Beginning on July 16th, 1994, a 'string of pearls' in the form of 20 cometary fragments impacted on the back-side of Jupiter's disk on the south southern temperate belt (SSTB). Amateurs from around the Earth began preparing for the unexpected "Great Comet Crash". At Pine Mountain Observatory, elevation 6,500', it was no exception. Listening to the ever-present radio transmissions, we heard up to date information from the Hubble Space Telescope (HST) and observatories around the world as well as other space-based telescopes. PMO and RCA member local Richard Berry imaged the 'string of pearls ' in a six-inch telescope living nearby in the Cascades. His image was taken with a 192 X 165 pixel TC211 CCD camera with one-minute alignment of images. This resulted in a 19.5 mag image that calculated the shift tracking the stars and keeping the 72 one minute exposures of the comet stationary. This was pushing the limits of amateur CCD observing with the brightest members of the comet SL-9. Richard experienced a lot of excitement in the air at Table Mountain star party, which was being held the same weekend as the fragment A impact. The actual high energy impacts happened two years after first sighting the comet orbiting Jupiter. These were the brightest features that have been ever observed on the Jovian world.

Comet Shoemaker-Levy 9, named after its co-discoverers, was often referred to as the "string of pearls" comet.

At a distance of 2.3 million miles from Jupiter, about four days before impact, nucleus "G" of Comet S-L 9 apparently penetrated Jupiter's the magnetosphere. During a two minute period on July 14, HST's Faint Object Spectrograph (FOS) detected strong emissions from ionized magnesium (Mg II), an significant constituent of both comet dust and asteroids. The nuclei were ice-laden, as anticipated of a comet nucleus, astronomers predicted hydroxyl radical (OH). Casting doubt on P/Shoemaker-Levy 9's cometary nature, Hubble did not see OH.

From the deck 15" Cassergrain telescope, Mel Bartels, Alan Chambers, Kelley Grant, Rick Kang and myself made constant observations and created astro-photography images as each new impact thousands of kilometers high came over the limb. Rick and Dave Cole spent the night on the 32" trying to get image despite the tracking problems. On the newly built deck at the 15" telescope dome, my 20" Obsession alta-azmith scope, with aperture mask, gave crisp images and even a flash from the impacts. As the event unfolded, we recorded impacts and limb phenomenon. Darker than the red spot, this clouded atmospheric ooze left an unforgettable mark, if it happened on the Earth, it would have probably been a mass extinction event. We recorded our observations on tape recorders as well as sketch books going into hysteria with an occasional emergence of a Jovian impact structure or possible flash. It was a fire works shot that will burn forever within us.

We looked for auroral activity on Jupiter's ropy polar regions. We heard a radio broadcast that the HST discovered unusual auroral activity in Jupiter's northern hemisphere just after the impact of SL- 9's "K" fragment. Jovian auroras, glowing gases that create the northern and southern lights, are caused by energetic charged particles exciting the gases are present in the magnetosphere. The impact completely disrupted the radiation belts which have been steady for over the last 20 years of radio astronomy observations. A new feature seen by the HST was unusual because it was at present and more pronounced than the normal aurora, short-lived, beyond the area where Jovian auroras exist. It is theorized electromagnetic disturbance by the K impact that traversed magnetic field lines into the radiation belts. The scattered charged particles traveled from the radiation belts into Jupiter's upper atmosphere.

On the 24" Boller & Chivens Cassegrain, I assisted Mark Barbour and Alan White with an amateur astronomer effort of a photometry experiment using a polarimeter from Dr. Kemp. The goal of the photoelectric modulator and photomultiplier experiment set up on the 24" telescope was to record particles in the Io Torus of Jupiter. Io is surrounded by a thin glowing yellow cloud of atoms, probably knocked off the surface of Jupiter. This cloud is too faint to be seen through telescopes but is bright enough to be seen as an aurora if an observer were on Io. Sulfur and oxygen atoms have been found spread along Io's orbit. It is now known that Io orbits within Jupiter's intense magnetic field and is coupled to Jupiter by electric currents through this field. Jupiter's magnetosphere is so vast, if visible from Earth, it would be about the size of the full Moon. We attempted to record dramatic changes at the magneto-sphere but the data flux was too low to yield valuable information. This would have provided a unique event to gather more clues on the comet's true composition.

Immediately after the collision of Shoemaker Levy-9, three eclipse times were different than those predicted with standard Jupiter transits. The (O-C) observed-minus-calculated, time transit differences were too great to attribute the ephemeris. There were differences in various eclipse times of the Galilean moons of up to 8 seconds. Observed phenomena were probably due to the cometary explosions at high very altitude.

The fragments became visible in Jupiter's cloud tops on 16 July. A crescent shaped feature and dark streak several thousand kilometers in size was visible 1 1/2 hours after the impact on 16 July 1994, 5:30 ESDT. It entered the Jovian atmosphere from the south at an angle of about 45° off of the vertical, where the comet ejected material from the plume. The dark features are probably dark condensite dredged up from Jupiter's interior. The fragments D, F G and the nucleus H were a spectacular sight to sketch and observe. The shadow transit of Europa on Jupiter's disc was remarkable. The entire astronomical impact show lasted from 16-22 July, 1994 and lingered more than 8 months on Jupiter's' SSTB. The F impact and E plume were under the semi transparent Great Red Spot, now the great pink spot, which and were only visible when the Red Spot was on the leading or lagging limb. On July 18th, the A plume made four rotations since its initial impact. The atmospheric scientists were surprised about the long life of these features.

After the initial shock that the impacts were really happening, the amateur astronomers from Pine Mountain Observatory continued to gather information with CCD and astro-imaging for research and to educate students and the public with classic views of Jupiter, even in the day time. I helped Dennis Luse with a CCD rotational Jupiter animation. Mel Bartels and myself gathered information of local amateurs for Steve Lucas of the Astronomical League for the Jupiter Impact Observing Program. For the next 8 months, even after Jupiter went around the Sun, I continued to observe the greatest astronomical catastrophe in the solar system in recorded history with my family and friends.

National Academy of Sciences to NASA: "Don't rule out Hubble Shuttle Rescue!"

The National Academies of Science has released its recommendation to NASA on the future of the Hubble Space Telescope. They conclude that 'NASA should take no actions that would preclude a space shuttle servicing mission to the Hubble Space Telescope.' They also say that none of the safety requirements of the CAIB [Columbia Accident Investigation Board] report preclude a manned servicing mission to HST."

Assessment of Options for Extending the Life of the Hubble Space Telescope: Letter Report ('04) Aeronautics & Space Engineering Board (ASEB) Space Studies Board (SSB)

http://www.nap.edu/books/NI000551/html/

PDF version: http://books.nap.edu/html/Hubble_Space_Telescope/letter_report.pdf

http://www.nap.edu/catalog/11051.html

GREAT BROWSING !

Slide show of SpaceShipOne
http://www.rokits.org/gallery/slideshow.php?set_albumName=x-prize

Planetary Society Lunar Workshop in China:
http://planetary.org/news/2004/lunar_meeting.html

Planetary Society Saturn/Titan/Cassini Coverage
http://planetary.org/saturn

Book a microgravity flight... US based company ZERO-G is booking seats on its parabola flying jet.
http://www.nogravity.com/

John Spencer's "Space Tourism - Do You Want to Go?" release 8/30/04 available at Amazon.com Once on the Amazon.com site put in "space tourism" for a search. It is the 10th book listed at the bottom.

Follow along on Elaine Walker's Journal at the NASA-Haughton-Mars Project (separate from the Mars Society's Haughton Crater Outpost)
http://www.marsonearth.com/.

Aim to Mars! Two Planetary Society Reports
http://planetary.org/aimformars/initiatives.html

James Cameron Aims for Mars
http://aimformars.org/cameron.html

The Mars Homestead Simulation Project
(open to members of the Moon Society, also, as most of the things discussed and considered, will apply to Lunar Homesteading as well.)
http://www.MarsHome.org

Ammonia in Mars' Atmosphere?

Ammonia may have been found in Mars' atmosphere which some scientists say could indicate life on the Red Planet. Researchers say its spectral signature has been tentatively detected by sensors on board the European Space Agency's orbiting Mars Express craft.

Ammonia, like Methane, survives for only a short time in the Martian atmosphere so it mustbe getting constantly replenished.

There are two possible sources:

- either active volcanoes, none of which have been found yet on Mars,
- or microbes...

http://news.bbc.co.uk/1/hi/sci/tech/3896335.stm

"Our lives begin to end the day we become silent about things that matter." Martin Luther King Jr.

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

• **July & August Activities:** Peter manned our exhibit table at Discovery World Museum for Secret Lab Saturday on July 10th, and again on August 14th, making improvements on the exhibit items each time.

On August 1st, the Moon Society election ballots were counted and Peter was elected President. He will be attending the Mars Convention 2004 in Chicago, Aug. 19-22, where he is speaking and manning the Moon Society booth.

LRS SEPTEMBER Events

Saturday, SEP. 11th, 1-4 pm

LRS Meeting, Mayfair Mall, Garden Suites Room G110
AGENDA: www. lunar-reclamation.org/page4.htm
We hope to invite about three dozen NSS members in the area (we just got the list from NSS.)

U.S. CHAPTERS

NSS Chapter Events
MMM
6 Chapters Strong

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

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/]**

Tue. August 10th Meeting 7pm Roseville Public Library, 2180 N. Hamline Ave - Tom Greenwalt on Cassini mission.

- **Tom Trancer's Pictures from Space Ship One Flighty**
  http://www.trancer.com/~tomg/gallery
- **Pics from ISDC in OKC.**
  http://www.freemars.org/mnfan/ISDC/2004-OKC/
- **Convergence pics** - Ben
  http://www.freemars.org/mnfan/convergence/2004/
- **Our rover's great weekend in Wisconsin's north woods**
  www.freemars.org/mnfan/mnsfs/Rover-WI-Trip-July-2004/

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@attbi.com>
(LBRT - Oregon Moonbase) moonbase@attbi.com

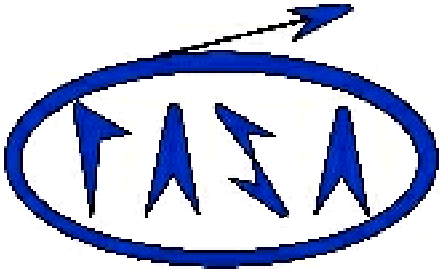
Meetings 3rd Sat. each month at **2 p.m.**
Bourne Plaza, 1441 SE 122nd, Portland, **downstairs**
Aug 21 - Mercury to Apollo, by Dan Gerhals
Sept 18 - Saturn from the Casinni, by Lamont Brock
Oct 16 - Celestial Navigation Work Shop, by Bob McGown

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 Thursday** of the month at **7-9pm**
AUG 19th: Stoelting House, **Kiel**
SEPT. 16: UW-Sheboygan, Sheboygan Room TBA
OCT. 21st: Stoelting House, **Kiel**



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 from **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.

Meeting Dates: May 15th and June 19th. Call Earl or Mitch 215-625-0670 to verify all meetings

•**June Meeting Notes:** At this time (6/23/04) we still do not have a time for the broadcast we taped on June 4th. At the station Gary Fisher, President of Independence Mars, the local chapter of The Mars Society, and your correspondent where given an hour long interview with Catherine Pugh who hosts "48 Update" an early evening (7-8 p.m.) local discussion show on various topics. I was given July 1st by Kim Stavisky, the show's associate producer as the air date.

New business card

There was also a report and e-mail from Larry, our Webmaster, who has worked on a new business card for our members to use when representing our group. We approved a change in the design at a previous meeting and Larry went ahead with the changed design; we have 250 of the new cards for our paid members. We will make individual membership cards only if a sufficient number are asked for. This project was developed by Larry who has worked on the business cards, with feedback from attending members to our meetings and any postings to him on this. I have seen the final product (via e-mail) and it will not be easily missed in a stack of cards or go unnoticed into the pocket of the recipient. Thank you, Larry!

Gary Fisher, has been busy on home projects but did bring two interesting things; one Mars related and one for the "first step" to space. There is a mineral formation, found on Mars recently, that have been nicknamed "Blueberries" by someone on the rover teams. The interesting things about these formations, that resemble the small (~.25-.375") blueberries, is that (1) on Earth we have a similar looking mineral deposit deposit formed by biologic activity, (2) there are deposits near the Hanksville Utah site of this material. We'll have to see if the various analysis tools on the rover that found these can give us a definitive answer about there origin process. Biologic origins of various mineral deposits and places where life exists as "extremophiles" from Hot Smokers to deep drilled (miles down in the crust) to life in Dry Valleys in the Arctic which is very Mars like (i.e.: extremely low humidity and poor soils).

The other topic he brought up was a conference in Washington. now past, on The Space Elevator or "Bean Pole" or "Tower to Infinity" and many other descriptives which a company called Lift Port is hoping to make a reality. This will be possible, according to Brad Edwards of that company, by using carbon nanotubes in large quantities (kilotons) with fabrication and binding technologies they are working on. This would involve several shuttle flights to bring the material into space and then, using a tugboat or other carrier that could move out to geosynchronous orbit and, to attach a counter-balancing mass, almost as far beyond this region. This would produce a system in the next 10 to 20 years that could transfer small masses "continuously" from the surface as far as 22,000 miles up or even more. We as a community have talked of this "wonderful theory, never to happen" idea since the 1960s at least. The ability to grow large quantities of diamond fibers or the use of aramid composites (same family as Kevlar) would allow the elevator to be built for the Moon or even Mars (using carbon or diamond composite cables). The discovery, and increased familiarity with, carbon nanotubes could allow the building by Lift Port or others of such a system for Earth. This system could be the "Prime Mover" for space colonization. As most readers will understand, the deterrent to doing almost anything in space is the extremely high cost of leaving Earth. On the one hand, space is not cluttered by bright kilometer size Coke or Pepsi (or Celibrex nowadays!) ads but then *we* aren't there either. Cast Away guys! Gary also mentioned Skysabove.com for viewing the I.S.S..Other members have done this as well.

Hank Smith told us of the long meeting of the PSFS board on relocation. A Philadelphia property called "The Rotunda" located in the University City part of our town. In other news: Hank will be going to WesterCon in Phoenix and will have a "Space Party" to promote our goals and those of PSFS and his other interests. Good luck, Hank!

Mitch Gordon, our public outreach coordinator among many other jobs, has brought us another possible guest author for a public gathering we sponsor. This is author Marc Wolverton, mentioned previously, whose book: "Depths of Space: the story of the Pioneer Planetary Probes" is out this summer. Due to timing; this will probably be a late summer (September?) event. With the current increased public interest in spaceflight this may prove valuable to us for contacts and for the Barnes & Noble store, a source of sales. We also discussed trying to bring in The Franklin Institute in on the book tour/ public outreach campaign. Mitch is going forward with this at present and

has made contact with Planetologist Derrick Pitts at his Institute offices. He is a major figure in public outreach for the sciences in our area when it is in an area that is associated with the Institute. Maybe Philcon as well. Mitch also brought in the latest *Ad Astra*, the April, May, June issue.

There were a number of interesting things in the publication including Hubble's' possible replacement in an article describing the new *James Webb Telescope* which would go into service in 2011 and be much better than the Hubble. This is in terms of the wavebands the optical system covers and control in comparison to Hubble. The public, who has *seen* what Hubble can do, wants it saved just as I do now, but maybe we can have both (my addition to Mitch's report and part of our groups ongoing discussion of what to do with "this old spacecraft") with Hubble used a a communication transceiver *after Webb is ready to orbit.* The reinstitution of the Shuttle launch program will begin, per another article, will start in March of 2005 with the *Discovery* launching first.

There was also a historical note: 30 years ago an article appeared in *Physics Today* on what could happen with available science if we really wanted to colonize space. This was by **Gerard K. O'Neill** and his students at *Princeton University*. This brief article led to the publication of the *High Frontier* and the founding of the L-5 Society, the Space Studies Institute and many other pro space interest groups in the 70s and beyond. N.S.S. is an successor to L-5. Also mentioned: "Rockets For Schools" and our new N.S.S. Region 7 coordinator: **Michael Fulda.**

And, of course, The World Future Society Convention. In the group's publication for July/August there was an article on "Boarder Surveillance" melding the input from ground level and space communications and imaging to track invaders and smugglers of varied intent. I am not sure, but I think this was primarily for *southern* boarder use. See the publication: *The Futurist* on the technology and its use.

Earl Bennett brought a number of technical publications in ranging from The Air Force Research Laboratory publication *Horizons* with a goodly number of space related articles: "Thermal Protection System Development for Space Operations Vehicles" (p. 43ff., June issue) detailing work on improvements in Shuttle type tile systems and the ability to repair and replace them in rapid redeployment situations. This appears to be for an Air Force program not for the Crew Exploration Vehicle NASA is developing. Neat article*; what* the effects of the launch and reentry are can make you appreciate what material engineers have to do: the sound levels of 100 times a jet engine level to be survived as routine are amazing as are the 2000 degree temperatures for minutes. The very next article, also from the Materials Science Directorate, is on the work to improve the lifetime of "Hall Thruster Insulators" which have a high energy ionized gas that erodes the support insulators for the systems electrodes. The present material is the very tough Boron Nitride (used in fast cutting tool work on Earth) but they, and NASA, want to improve this materials, or an improved matrix of materials, for station keeping and range extension for military use, and also for NASA, the use of the thrusters for deep space missions i.e.: Pluto at least, and Mars for both sample return and, I hope, eventual manned missions. This is generally a good publication (www.afrlhorizons.com).

In *The Industrial Physicist* for June/July is the ongoing discussion on the requirements of the Hydrogen Economy with several expansion on what might be required including the Fusion Economy which includes getting Helium 3 from the Moon to make the Fusion process practical. Yes! The letter mentioning this was from John Tate, Professional Engineer from Bellevue Washington. This from the letters section of the publication. There where also articles on using carbon nanotubes for electronics and the production of single walled tubes consistently in particular (there are lots of variations and this has to be controlled). and, on p. 29, the American Astronomical Society, its history and its mission are presented. Of interest to those working on the problem of reducing the need for importing electronics *from Earth* is a page 12 piece on the development of a fast (giga bits/second) optical modulator. This can be used as part of communication and control systems built using "local (lunar)" material. Intel did the research. -- www.tipmagazine.com

Finally, from *NASA Tech Briefs* (techbriefs.com) is a brief mention in the "Books and Reports" section on a "White-Light Nulling Interferometer for Detecting Planets" which, although brief, describes the technique well: Rather than needing to build large (meter(s) size) optics of extremely high precision, in parts *per thousandths* of a wavelength, the proposed design would use an array of "single mode" optical fiber that suppresses much of the star's light but does not affect the possible planet's intensity very much. The part that requires the extreme precision is called "a nulling combiner" (centimeters) where light traveling down the aforementioned fibers can be combined to cancel out (suppress) the primary. Details in the physical sciences category (cf. npo-30547) at techbriefs.com/tsp.

Janice, our attending non member, brought material from *Science,* the June issue, on heating effects that cause plankton to be harmed. The result is poorer oxygen production and alteration in the removal of Co2 from the atmosphere. The Co2 increases the retained solar input raising the temperature and repeat. Or hopefully not! This intertion is viewable via satellite if viewed at the proper wavelengths.This short article was titled "Plankton: Means of Production" which refers to the fact that most oxygen is produced by them.

I will report on Dennis Pearson's *Lunar Samples Exhibition* that he did in Allentown in the July report.

Earl Bennett

July Meeting Notes: Thanks to weather and other circumstances we had limited attendance. We did have a good time, however, and some talk on activities and events.
First reports.

Larry, our Webmaster, reported that our visit rate was not much changed but he had boughtg our new I.D. cards for the group. We need individual labels that will allow the card recipients to contact the giver. Gary Fisher has volunteered to create some if we supply him with data. Contact him to give him your information.

Dorothy brought material from several sources including a newspaper's report on the problems that occurred with Spaceship One that could have caused failure. As this is written preparation for the next set of launches is going forward in an attempt to achieve the X-Prize goal of fast turn around. She also brought *Air & Space* for May/ June with a number of reports on the Cassini arrival at Saturn and subsequent deployment of the Huygens Probe with splashdown (we hope!) on January 14th, 2005. The object of its attention is Titan the largest Moon in the solar system and one with an extensive atmosphere (200+ km deep). This last is in an article by Dennis L. Matson and Linda J. Spilker. Dottie also brought in *Smithsonian* for July containing "Hubble's Last Hurrah." Happily, the public decided to push for a "continuance" instead of "execution" for the instrument. Lets see if we can "Make it So".

Mitch Gordon, our Outreach Coordinator, brought a large amount of material on various activities including the N.S.S. elections for our N.S.S. members including our Region 7 candidate Mr. Michael Fulda. He is running unopposed. He bills himself as "the Space Policy Teacher" and is a Doctor of Political Science. Mitch also brought in material on his authors appearance quest for the Fall. He is working with Bob Zimmerman's publishers and public station WHYY's' Alan Tu who may book "our" writers. Mitch is working on the author of the book on the *Pioneer* missions which may include connection with the Franklin Institute. He is working on meeting with Derrick Pitts, Planetologist with the Institute. Mitch is also planning for fall events using space at a center city library for Space Week and a joint event with The Rittenhouse Astronomical Society in Philadelphia. We also discussed our appearance on the Channel 48 Update show with praise and critique of our presentation by Gary Fisher and Earl Bennett. More on this below. Rich Bowers, founder of the group in the 70s, pointed out that our kind of presentation was accepted on prime time shows in the 70s. And yet one more proposal from Mitch Gordon: a "Mars Day" as a future oriented celebration and presentation day for what can be done to make "Life on Mars" human life.

Gary Fisher, President of Independence Mars, first discussed the then current crew at the Flashline Mars Station on Devon Island, which included Shannon Rupert a micro biologist. Further news on this activity can be found at marssociety.org . For the Moon/Mars Blitz Gary reported that 70 activists went to Washington to support The Space Exploration Initiative and to push for full funding of Manned Moon and Mars Exploration. There were two major contributors to the Blitz with 1/3rd from the Mars Society and N.S.S. each and the remainder from twenty other organizations. Gary also brought up some of the guests/ speakers at the August Mars Society Convention. Chris Anderson Enterprises will be there among others and there will be an Aldridge Commission Panel Discussion at the conference.

And lastly from Gary a *Scientific American* for August story with the deceptive title " Fly by Wire" which is not about aircraft controlled by electronic signals but rather the application of Tether and Orbital Cable technology. The Title is "Electrodynamic Tethers" by Enrico Lorenzini and Juan Sanmartin. This is on recent experiments (there have been several) and the possible future use of these "wires". The most recent incarnation is built (or at least buildable) using Carbon Nanotube technology as can be developed in the near (10 + years) future. We have gone from "fanciful" Russian speculation of the sixties to "almost possible now" in forty years. Enjoy the convention Gary!

Earl Bennett brought in several publications and also continued the discussion that developed from previous comments on the new space initiative. The technical publication was the July 2004 *Servo Magazine* which is designed for hobbyists and entrepreneurs in this growing public involvement field. Among other things in this issue was a review of 'Sojourner" written by Andrew Mishkin who was part of the project; apparently from its beginning. According to the reviewer, Ralph Lorenz, rocket scientist (and robot enthusiast) the book has some of the technical details that "gearheads" like to see but that a lot of material is about how the project developed and was steered through to launch and triumphant completion on Mars and Earth. The book is a Berkeley Publishing hardcover available for $21.00 retail.

There is also several historical and background articles in the magazine as well as new developments. The other publication brought was the July 2004 *NASA Tech Briefs* that had several non technical vision-oriented reports. The first "A New Era of Space Exploration: Realizing the President's Vision." This shows, via a timeline illustration and supporting text, when this is projected to happen, what will be needed to do the jobs, and how the objectives will be achieved. It is a rather short piece but worth looking at for the timeline if nothing else: the Space Station is completed in the same year as the shuttle is retired, 2010, and we don't go out to the Moon until 2015 (when I'll be in my sixties). The 40+ year delay from Apollo is partly due to the time to build and test a new system called "The Crew Exploration Vehicle" and this (and other projects) is currently being explored. For those in business

you may want to go to the NASA site to see what was wanted and for those interested in the kinds of things required for a spacecraft's development, go to:

https://nacesli1.msfc.nasa.gov/explorationportal

The actual submission of proposals date was passed when I obtained the publication but the awarding will be announced on September First. the Presidents statement being available from Tech Briefs at techbriefs.com/vision. Note the new site name.

In this same publication we have an extensive interview,starting on the next page, with Rear Admiral Craig Steidle (USN Retired) who will be Associate Administrator of The Office of Exploration Systems. This is a long interview with a good amount of detail from the Admiral and should be viewed from the techbrief site if you wish the full information at: www.techbriefs.com/Hess. And to contact the Office of Space Exploration Systems itself you may call 202-358-1363 which will connect to Debbie Ladwig or debbie.ladwig@nasa.gov for posting to her. Suffice it to say at this time that the programs being proposed include increased missions of scientific exploration (such as the "Icy Moons" mission to Jupiter), the return to human planetary exploration (we haven't even gone to G.E.O. for decades) and the development of new propulsion systems. This includes implementation of several current experimental engine designs and reevaluation of Fission Powered Engines for deep space missions, fixed site supplies and extending current isotope based power supplies. This program is called Project Prometheus. As I read the relevant quote the engines will be for the outer planet missions and not for our near Earth operations. This paper, as well as the preceding outline, and other sources, brought on quite a bit of discussion threaded through our group as we went over various points on the proposal and interview. Several members and visitor(s) are concerned with the development of long term life support systems both for space and to keep Earth "clean". This came up, in part, due to introduction of an article on architects' dream projects including those of Soleri who gave us the concept of The Arcology, a mega scale, self contained city/structure in the 1960s. If we could develop a closed loop, or even "controlled loop" (my phrase) system, with limited replenishment of necessities, this could come from space to Earth where it is needed in heavily developed areas. The presence of our founder and Mars Society president insured a wide ranging talk with different points of view. This is an underling purpose of our Sunday meetings.

T.V. Appearance: several of our members, notably Gary Fisher and Earl Bennett, had an hour on Channel 48 Update which aired on July 1st in our area. A few members had recording devices set up, including Gary, and we now have several recordings. Dotti and Larry also put it on DVD..It was generally considered a good introduction to our group and there where plans to re-run it and possibly to have us back. We talked of our backgrounds and how we became interested in space exploration. We were also asked if we would go. Being older, I am a little hesitant now (and quite out of shape) but Gary could go. We discussed various aspects of group events including working with the Science Fairs, The New Jersey State Museum and Philcon (plugs all around) and the "Real Thing" which is what I consider our current members support of The Mars Society activities, when we can, as well as the research being carried out by The Mars Analog Research Stations and related efforts. Gary's hands-on work with the C.E.L.S.S. was mentioned and details of "simulated Mars exploration" (working in space suits etc) where brought out. Catherine Pugh is a good interviewer and guided us to the areas she though would be of interest to the public. I am currently looking into other guests for the show. 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

[http://www.oasis-nss.org/]

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

- **Aug. 21, 3:00 p.m**. --OASIS Monthly Business Meeting.
- **Aug. 21, sunset –10:00 p.m.** -- -- Los Angeles Sidewalk Astronomers Star Party. Autry Museum of Western Heritage, 4700 Western Heritage Way (park in the Los Angeles Zoo parking lot). 323/664-1191 or www.sidewalkastronomers.com/chapters/laevents.html.
- **Aug. 27, 8:00 p.m.** -- "Shooting the Night Sky" by guest lecturer Wally Pacholka, award winning astro-photographer and member of the Orange County Astronomers group, shows how to take beautiful comet and sky photos. Science Lecture Hall 140, Santa Monica College, 1900 Pico Blvd., 310/434-4003 (http://www.smc.edu/planetarium/)

Ongoing Projects

- **MER** (Mars Exploration Rover) full-scale model construction project is seeking volunteers. Contact oasis@oasis-nss.org

NAME _____

STREET _____

CITY/ST/ZIP _____

PHONE #S _____

❍ **$38 National Space Society** dues includes **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 (pdf) MMM $35** **Students/Seniors**: **$20**
- **Hardcopy MMM**: U.S. & Canada **$35** Elsewhere: **$60**

P.O. Box 940825, Plano, TX 75094-0825, USA

INDEX to # 177 AUGUST 2004

p 1. In Focus: Milestone Achievement Prizes: M.A.P.ing Enterprise Pathways to Space, Editorial, P. Kokh
p 3. Earth's Power Appetite: A Reality Check, D. Dietzler
p 4. Personal Self Reliance on the Frontier, D. Dietzler
p 6. Golfball Obliterates Wisconsin Moonbase, P. Kokh
p 7. Space Camps for Kids -- On the Cheap, P. Kokh
p 9. Moon Soc. Journal: 2004 Election Results; Mars is in our Field of View, P. Kokh
p 11 Meet Incoming Secretary, Gary Gray; Moon Soc. Presence at Mars Soc. Conv. 2004
p 12. Planetary Soc.'s Lunar Workshop: Outpost News
p 13. Shoemaker-Levy 9 Jupiter Crash, B. McGown
p 14. Great Browsing Links; Ammonia in Mars Atmosphere
p 15. LRS News; NSS Chapters News

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' MANIFESTO

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

Address Service Requested

==> Mail Carrier, Time Sensitive Material <==

Non-Profit Org.
U.S. Postage Paid
Milwaukee, WI
Permit No. 1275