

Southeastern Space Supporter

Newsletter of HAL5 – the Huntsville Alabama L5 Society chapter of the National Space Society

Volume 8, Number 1 — January–February 1999

FIRST WORD

Great Time To Be In HAL5! 1998 - An Adventurous Year Indeed!

(by Greg Allison, HAL5 President)

HAL5 has just completed another very successful year. Each of you can be proud of what our small group has accomplished with very little money toward advancing low cost space flight.

SL-2 First Launch Attempt

On the 20th of June 1998 HAL5's High Altitude Lift-Off (HALO) Program staged a remarkable adventure in our first attempt to launch the HALO Sky-Launch-2 (SL-2) rocket into space. Everything didn't work as planned (see July-August issue of SSS), but the odyssey was grand indeed.

Near Space Heritage from 1997

In the previous year we launched HALO SL-1 from a grass strip airfield just north of Hampstead, North

Carolina, about a mile west of Topsail Beach. The balloon was over 50,000 feet above the Atlantic Ocean when the rocket was fired. The HALO SL-1 rocket ascended to approximately 36 nautical miles. HAL5 that day

initial build. Mostly it is a matter of money. Most of the funding will go into chartering a boat to take us into the Gulf of Mexico. The new FAA rules do not allow us to do it quite the way we did for SL-1. This is why a boat will be necessary for an SL-2 reflight.

Better Things To Come!

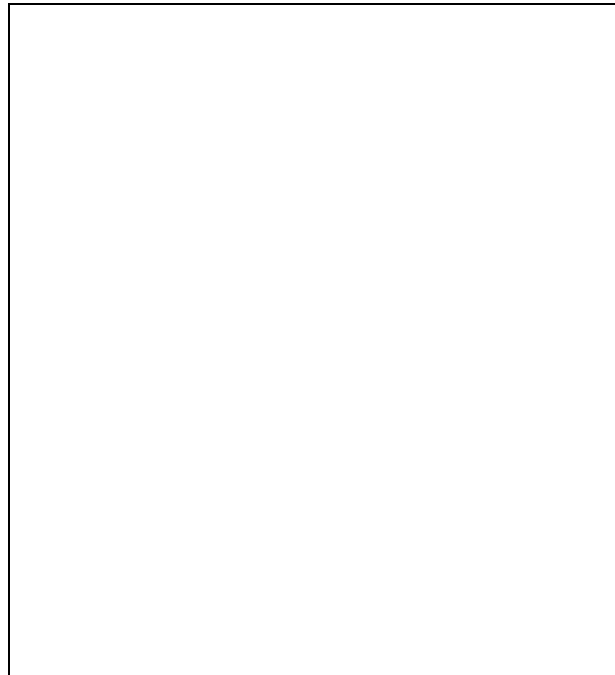
1999 holds exciting promise for HAL5. We hope that the SL-2 mission will once again be poised to fly from a utility boat in the Gulf of Mexico. SL-2, if all goes well should hit space, ascending to over 50 nautical miles! To-date, no amateur group can demonstrate that they have done that. Once again we prepare for a ride into history! Together we shall do it! Next stop: SPACE!

HAL5 plans to continue its interesting lecture series in 1999. Stay tuned for future program announcements. HAL5 is also ready to finally launch the HALO Achievement Program. With artists in place the program is finally coming together!

Time To Renew Your Membership!

HAL5 memberships expired at the end of last year. It is time for all of us all to renew. There is a new exciting year ahead of us! I ask each of you to renew. We need your support to carry our visionary programs into this new year.

HAL5 is a small organization with low membership dues; yet we do quite a bit to advance expansion into space! Please support our continuing quest! Let's try to top 100 members this year! ☆



Steve Mustaikis and the HALO SL-2 Rocket

conducted the world's first high altitude ignition of a hybrid rocket. It is the highest flight of a hybrid rocket to date. That day HAL5 proved to the world that small groups can accomplish great things and made space a little closer to all of us. This past June we proved our stamina by taking another stab at that great quest!

HALO SL-2 — The Next Shot

HAL5 will now embark on preparations to reflly HALO SL-2. Much of the rocket is still intact. A lot will ride on recertification of the oxidizer tank. If the tank recertifies, the rocket can be refurbished for much less effort than the

HAL5 Program Night

Wednesday, January 27, 1999
7 to 8:30 p.m. (with social afterwards)
Huntsville Public Library Auditorium

“The Artemis Project: A Private Trip to the Moon!”

Guest speaker will be Boise Pearson, NASA engineer and President of Artemis Society International.

All HAL5 and NSS members are encouraged to attend, and to bring interested friends and co-workers. Open to the public. Free admission.

Huntsville Alabama L5 Society

President — Greg Allison
Day: 544-4440, Eve: 859-5538

Vice-President — Gladys Young
Day: 852-0561, Eve: 852-0561

Treasurer — Ronnie Lajoie
Day: 971-3055, Eve: 721-1083

Secretary — Clay Sawyer
Day: 971-6408, Eve: 539-3889

Membership — Philomena Grodzka
Day: 536-8638, Eve: 536-8638

Communications — James Hopkins
Day: 971-9362, Eve: 726-0056

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Volume 8, Number 1
January / February 1999

The *Southeastern Space Supporter* is a bimonthly publication of the Huntsville Alabama L5 Society (HAL5), a not-for-profit 501(c)(3) organization devoted to the goal of seeing everyday people living in thriving communities beyond the Earth.

Any opinions expressed in this newsletter are those of the authors or of the Editor, and, unless expressly so stated, are not necessarily those of HAL5 or the NSS.

Visit the HAL5 Web Page on Internet via:

<http://advicom.net/~hal5/>

HAL5 encourages its members to speak out on space-related issues, and welcome submissions of both fact and opinion articles of interest to HAL5 members.

Submit letters or articles to: Ronnie Lajoie
162 Kirby Lane, Madison, AL 35757
Day phone/message: 256-971-3055
Night/Weekend phone: 256-721-1083
FAX number: 256-971-3333
Electronic mail address: hal5@advicom.net

Deadline for submittal is the last day of the following months: February, April, June, August, October, and December.

Preferred format for plain text is ASCII (text with graphics is *MS Word* or *WordPerfect*) either sent by E-mail or on a PC diskette. Also acceptable are letters and articles sent by mail or faxed; however, the more retyping required, the less likely the acceptance. HAL5 is not responsible for receipt of mailed submissions; none will be returned unless sent with a SASE. Hand-delivered diskettes will be hand-returned. No compensation is paid for submissions.

HAL5 Membership Benefits

If you are employed between the ages of 22 and 64, membership to HAL5 costs \$20 per year. If you are under age 22, over age 64, retired (over age 55), or otherwise unemployed, membership costs only \$10 per year. What do you get for your money?

Much of your dues covers your subscription to the 8-12 page bimonthly newsletter, the *Southeastern Space Supporter*, which costs about \$10 annually per person. HAL5 also offers an option to just subscribe to the newsletter for \$10 — this may be better for those of you who are employed but not living in the north Alabama region.

Another part of your dues covers your notices of HAL5 hosted or recommended programming activities. Flyers announcing space-related programs and conferences will be periodically inserted into your newsletter. At other times, postcard announcements will be mailed directly to you. If time is short, we may telephone you and/or send you E-mail. As long as you are interested, HAL5 will keep you informed of upcoming space-related events in Huntsville and vicinity, as well as those times for action when space policy issues arise.

Discounts for HAL5 Members

HAL5 members will receive discounted prices on all HAL5 merchandise. Currently, we are selling Project HALO T-shirts at \$10 for members, and \$12 for non-members (plus \$3 shipping and handling where necessary). We have Medium and Large sizes left only. We are also selling the special Education issue of *Ad Astra* magazine for \$1 for members, and \$3 for non-members.

HAL5 members will receive discounted rates to all HAL5-sponsored events and conferences for which there is an entrance fee. The Executive Committee is discussing having HAL5 host a regional NSS conference in July, to tie in with the 30th anniversary of the Apollo 11 mission to the Moon. HAL5 members will probably save \$10.

HATS Services for HAL5 Members

One of the major benefits of being a HAL5 member is having access to the services of the Huntsville Association of Technical Societies (HATS).

HATS is a non-profit association of Huntsville technical and professional societies dedicated to the advancement of science and engineering, and hosts the annual TABES (May) industrial conference and exhibit.

Career Enhancement Program

HATS runs a Career Enhancement Program which hosts workshops (every month or two). Topics cover putting together effective resumes and creating effective presentations. These career workshops are usually free for members of HATS societies.

Job Assistance and Referral Program

HATS runs a Job Seeking and Referral Program (JSARP) which sends member resumes out to all of its technical societies. If you need a job, this may be your best benefit yet! As a professional courtesy to members of HATS organizations, HATS puts their resumes on file at the HATS office. These resumes are available, at no charge, for review by employers.

The process begins when employers provide HATS with a list of keywords that describe the position they wish to fill. A computerized keyword search is conducted on the actual text of each resume on file. The resumes which reflect at least some of the keywords will then be faxed to the employer.

If you need a job, or a better one, I urge you to submit your resume to the HATS JSARP program immediately.

It's Decision Time

I hope I have convinced you that you get a lot for your dues. Please complete the enclosed HAL5 Membership Renewal Form and mail it, any other completed forms, with your check. Thank You! ☆

The Value of Your HAL5 Membership and Donations

(by Ronnie Lajoie, HAL5 Treasurer)

Why should you renew your HAL5 membership, or join for the first time? This is a very good question. In this article, I intend to convince you that your membership dues and donations are being wisely spent.

HAL5 Income in 1998

For financial reporting purposes, HAL5 separates its Project HALO and non-HALO funds. Since its inception in 1994, Project HALO has survived on the net revenue of the 1993 ISDC plus donations from people like you and, more recently, HATS and NASA. No "HAL5" funds are used for Project HALO. This allows HAL5 to build up a reserve to enable us to do other projects.

Last year, as shown in Figure 1, HAL5 raised \$1,160 in revenue. The majority of that amount (79%), not surprisingly, came from membership dues from our (now expired) 56 members. 15% came from member donations (thank you!), and the remaining 6% came for newsletter subscriptions (or donations) and sales of newsletters and *Ad Astra*.

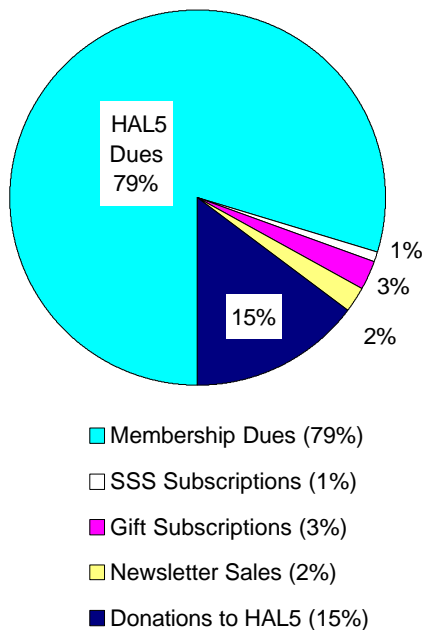


Figure 1. HAL5 1999 Income \$1,160 in revenue

No NSS Membership Income

No revenue came from NSS recruiting rebates since we recruited no new NSS members last year. This is mainly because we now have a high percentage of NSS members in our chapter, thanks to our strong showing in the 1997 NSS "Campaign for the Future."

We will get a chance to correct that this year. The 1999 NSS "Campaign for the Future" membership drive will begin in April and last for one year. In addition to the NSS rebates, we may also win prizes (chapter and individually) based on the number of members recruited.

HAL5 Expenses in 1998

Last year, as shown in Figure 2, a total of \$992 was spent on expenses, leaving a reserve of \$168 to add to our savings. We now have a large enough reserve in which to start a new project. One we are talking about quite seriously is a small regional space development conference to be held in July, around the time of the 30th anniversary of the first manned landing on the moon by Apollo 11.

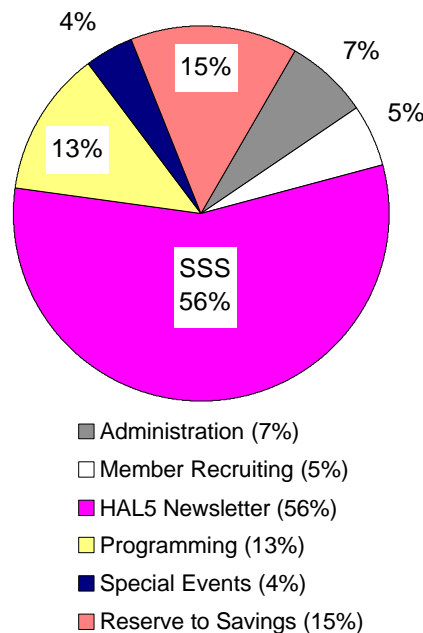


Figure 2. HAL5 1999 Outflow \$992 expenses + \$168 savings

About two-thirds of the expense money (66%, or 56% of the total "outflow")

went to fund the 6 bimonthly issues of the HAL5 newsletter, almost all for copying and postage expenses. All of the writing, editing, and printing is done using volunteer labor. Responses to our HAL5 surveys indicate that this is money well spent. Our only link to many of our members is via the HAL5 newsletter.

Our next largest expense category at 15% (13% of outflow) is our HAL5 monthly public lectures, mostly for flyers and postcard notice copying and postage expenses. We do not pay for advertising and only paid once (long ago) for someone to help put up flyers. We do not copy as many flyers as we used to either, because the turnout does not justify it.

We do use all the free means at our disposal, including sending PSA notices to every newspaper in North Alabama and some radio stations. We also post messages to Huntsville newsgroups.

The savings from these methods are giving us the means in which to plan and execute larger events, such as our first HAL5 Christmas Party. Special events last year were 5% of expenses.

The final 15% of expenses (12% of outflow) was used to cover HAL5 administrative and recruiting activities, mostly to cover copying of membership and survey forms, mailbox rental, and for postage. Like the other HAL5 activities, only volunteer labor is used.

Project HALO Income in 1998

Last year, as shown in Figure 3, HAL5 received about \$11,500 in new revenue for Project HALO. Another \$700 had to be withdrawn from our HALO savings to cover the approximate \$12,200 we incurred in expenses.

The majority of the income (79%) came from the NASA Marshall Space Flight Center to cover certain materials expenses as part of our Cooperative Agreement signed in 1996. None of these NASA funds paid for HAL5 labor. All labor was volunteered or donated.

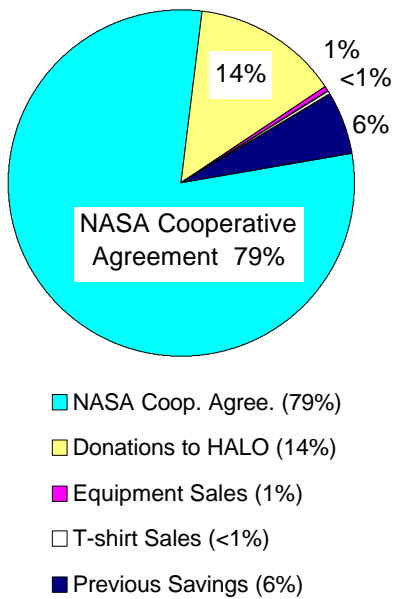


Figure 3. HALO 1999 Income \$11,455 revenue, \$700 savings

Most of the rest of the income (14%) came from cash donations from HAL5 and NSS members (thank you!) and other HALO supporters. Additional “non-cash” donations were made by HALO team members, associated mostly with travel expenses for the first SL-2 mission attempt and gondola rescue operations. These donations are still being tallied (and thus not included in this analysis), and are estimated to be about \$2,000. HAL5 should be proud of its *very* generous HALO team!

Little HALO Sales Income in 1998

The savings withdrawal mentioned earlier accounted for 6% of the income. The rest, a “whopping” \$172 (1.4% of income) came from sales of HALO equipment (a partly used HALO balloon for \$75) and HALO T-shirts (5 for \$52). We had hoped to sell a lot of T-shirts at the 1998 ISDC, but we sold only one. Unlike 1997, when we had the room to ourselves after our HALO presentation, in 1998 we were immediately followed by a talk by Dr. Robert (Mars Direct) Zubrin. Needless to say, the audience was not in the mood to buy T-shirts.

Frankly, we need YOUR help. We need ideas for raising money for Project HALO. Merchandising can work, but

we need specific concepts and estimates of how much we need to invest before we can start selling the products. HALO bumper stickers? HALO pins? I did look briefly into HALO baseball caps since the Barge Team would be exposed to extreme sunny conditions, but I could not make the arrangements fast enough for the first attempt. HALO angel cake?

If you have a serious idea to help us raise money, and our willing to put in a little volunteer time to help make it a reality, please send an email message to me at: hal5@advicom.net as well as Greg at: ghallison@aol.com

Project HALO Expenses in 1998

Last year, as shown in Figure 4, a total of \$12,155 was spent on HALO SL-2 expenses (again, not including donated travel expenses by the HALO team). To the first-order, there was a three-way split between the rocket, the balloon, and the gondola.

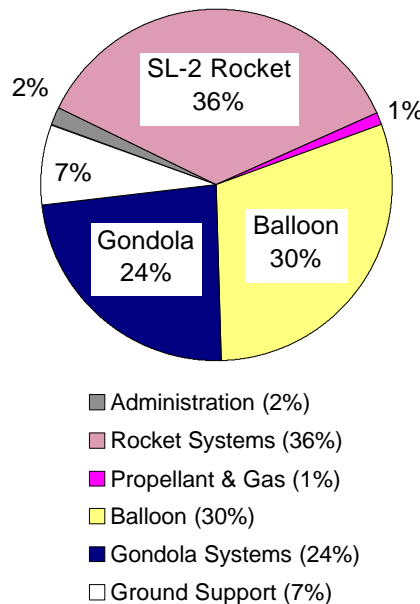


Figure 4. HALO 1999 Outflow \$12,155 in expenses

The largest share of the expenses (36%) went towards the SL-2 rocket. Of that, about 60% went towards rocket avionics — all of which is still operational — and the remaining 40% went towards completing the hybrid motor (mainly the

oxidizer tank) and purchasing rocket hardware (mainly the lightweight fins). Much of the rocket hardware was purchased or donated in 1997.

As Greg mentions on page 1, most of the rocket is still intact. Only one fin needs to be replaced, as well as the parachute canister (the parachute is fine). The fueled motor case with two fins and nozzles is safely in my hall closet. Loose parts are up in my attic, and the oxidizer tank is safely packed in a box in my garage. Our membership cards are still packed and ready for a space flight.

The main unknown is the composite oxidizer tank, which took a tremendous shock when it hit the barge deck. Before it can be reflowed, the tank needs to be “recertified” for flight. This requires a pressure test. Before we do that, we will consult with composites expert John Pavlick to determine if and how we can strengthen it.

The next largest share (30%), over \$3,600, went towards one high altitude balloon. That balloon sailed away perfectly, albeit without the rocket. Its backup (still to be purchased) is safely packed away in its large box, which is resting in a climate-controlled space — my empty dining room!

The third largest share (24%), went towards the balloon gondola, most of which went towards the electronics. Despite a heroic effort to recover the gondola canister (which succeeded), all of the gondola electronics were either lost at sea or were utterly destroyed by contact with sea water.

The gondola structure was recovered, as well as some expensive balloon tether cut-down squibs. (Yes, they are up in my attic too.) These can be refurbished for reflight with not much effort and for not much cost. The gondola electronics, on the other hand, will take a lot more money and considerable time to redo. Fortunately, Gene Young learned much from making the first gondola canister and believes he can build a better one for less money. Way to go, Gene!

(see Your Money on page 8)

HAL5 CALENDAR OF MEETINGS AND EVENTS

January 1999

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
17 ☾	18 Martin Luther King, Jr. Day	19 Project HALO Tech. Meeting Noon at Ponds	20	21 HAL5 Executive Comm. Meeting Noon at Ponds	22	23
24 ☉ ☽ Voyager 2 at Uranus, 1986	25	26 Project HALO Tech. Meeting Noon at Ponds	27 HAL5 Program "Project Artemis" 7 pm at Library	28 HAL5 Executive Comm. Meeting Noon at Ponds	29 World Future Society Meeting 6p at Steak & Ale	30
31 ☐ Explorer 1 launched, 1958	January HAL5 Program Night "Project Artemis: The First Private Base on the Moon!" by Boise Pearson, President of the Artemis Society (and Engineer with NASA Marshall) 7-9 PM, Wednesday, January 27, at Huntsville Public Library Auditorium, 145 Monroe Street, Huntsville					

February 1999

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 Project HALO Tech. Meeting Noon at Ponds	3	4 HAL5 Executive Comm. Meeting Noon at Ponds	5	6
7 First untethered spacewalk, 1984	8 ☉ ☽	9 Project HALO Tech. Meeting Noon at Ponds	10	11 HAL5 Executive Comm. Meeting Noon at Ponds	12	13
14 St. Valentine's Day	15 ☽ Presidents' Day	16 Project HALO Tech. Meeting Noon at Ponds	17 WFS Program "Space Solar" 11:30a at Library	18 HAL5 Executive Comm. Meeting Noon at Ponds	19 1999 IEEE Computer Fair 9a - 7p at VBC	20 1999 IEEE Computer Fair 9a - 5p at VBC
21 Engineers' Week Begins	22 ☉ ☽	23 Project HALO Tech. Meeting Noon at Ponds	24 HAL5 Program "TBD" 7 pm at Library	25 HAL5 Executive Comm. Meeting Noon at Ponds	26	27 Engineers' Week Ends
31	February World Future Society Breakthrough Seminar Luncheon "Electrical Power From Space: Status of Space Solar Power Research" 11:30 AM to 12:30 PM, Wednesday, February 17 at Huntsville Chamber of Commerce Building, downtown Huntsville				February HAL5 Program Night "TBD" 7 PM, Wednesday, February 24 at Huntsville Public Library	

March 1999

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 ☐ Project HALO Tech. Meeting Noon at Ponds	3	4 HAL5 Executive Comm. Meeting Noon at Ponds	5	6
7 U.S. / Alabama Space Week Begins	8	9 Project HALO Tech. Meeting Noon at Ponds	10 ☉ ☽	11 HAL5 Executive Comm. Meeting Noon at Ponds	12	13 U.S. / Alabama Space Week Ends
14 Einstein born 1879	15 1999 ISDC Price Increase	16 Project HALO Tech. Meeting Noon at Ponds	17 ☾ St. Patrick's Day	18 HAL5 Executive Comm. Meeting Noon at Ponds	19	20 First Day of Spring

Get Ready for the 1999 ISDC!

(by Marianne Dyson, ISDC Chair)

Happy New Year, everyone! The Houston ISDC Committee has been very busy, and we are proud to ring in the new year with some really great news:

Silicon Graphics Inc. (SGI) has agreed to be the primary corporate sponsor of the Houston ISDC! This dynamic company will be working with us to bring you the best space conference you have ever attended!

Thanks to SGI's support, you will get to do more and pay less at the conference. For example, you will now have to pay next to nothing (if anything) for the tour of Johnson Space Center because SGI will be underwriting the cost of the buses. Instead of that thing I was going to run off at Kinko's, you will get a spiffy professionally printed program book. The banquets and program speakers will have good quality sound systems, A/V support, and lighting so everyone can see and hear what they came for, and best of all, probably twice as many people will come simply because SGI is going to help us get the word out with advertising.

Although SGI's virtual reality "bus" is not available the weekend of our conference, we are hoping for another of their special exhibits. I'll keep you all posted.

The Best Speakers

About a third of our invited speakers have been confirmed already, including Dr. Michael DeBakey as Honorary Chairman of the Space Medicine Track! We are working on contacting the rest, and will keep you informed.

(Many NASA speakers have said "yes," but before we make it "official" we have to wait on the paperwork, and that seems to take forever!) All of our major meal speakers are confirmed, including:

Friday lunch: Mir astronaut and AIAA Distinguished Lecturer, Dr. Norm Thagard

Friday dinner: Apollo 10 anniversary banquet celebration: Apollo 10 crew members Gene Cernan, Tom Stafford, and John Young.

Saturday lunch: Author and Mars Scientist: Dr. Robert Zubrin

Saturday night "Dreams to Reality" banquet: Star Trek's Majel Barrett Roddenberry, and science fiction authors Geoffrey Landis and Catherine Asaro.

Sunday Lunch: Apollo 11 Astronaut and Space Tourism Advocate, Buzz Aldrin.

Sunday night 25th anniversary of the founding of NSS Awards banquet: NSS President Dan Brandenstein and Past President Charlie Walker, plus NSS Executive Director Pat Dasch.

You have to admit, that is some line-up! Remember, one banquet is included in your registration price.

Volunteer Needed

We still need someone to coordinate the Space Station and Space Law Tracks, so if you would be willing to make some calls and "meet and greet" the speakers for one of those tracks, please contact me right away! The speakers have already been identified, and some already confirmed, but we need someone to do the follow-up, so I don't become an even worse bottleneck than I am! Volunteers get a special discounted registration rate and my sincerest gratitude.

Children's Program

Our early planning included mention of kids spending the night in a space habitat. The children's program is still planned, but we need our instructors to be at least somewhat awake to run the children's program on Sunday (and we admit, there was some concern about liability!), so we are going to run that program until midnight instead of overnight. This should still provide plenty of fun for the kids and give their parents enough time to enjoy the banquet and post-banquet entertainment.

If you are willing to help with this program (i.e give the instructors a lunch or afternoon break!), please contact me.

Pre-Registration is Looking Good

Already 126 people have pre-registered for the ISDC! (This is ahead of the Huntsville ISDC that eventually had over 700 people.)

While this is pretty decent for 5 months out, we know that many more people would send in their registration if they only knew about, or were reminded about, the conference. Tell them to go to <http://www.nss.org/isdc/> and sign up! If you need paper copies of the form to post at work or mail to relatives, send an e-mail to mjdyson@compuserve.com and I'll get them to you.

Beware the Price in March!

Registration for all 4 days is currently \$65, including one banquet (!), for members of NSS and co-sponsoring organizations, and is \$85 for non-members (non-members can have their extra \$20 go to joining NSS!).

The price will be going up to \$85 on March 15 for members and non-members, and to \$95 at the door. Student prices for the entire conference will rise from \$35 to \$45 on March 15 as well. The one-day AIAA symposium price will remain \$35, including lunch (but lunch cannot be guaranteed at the door).

Kids under 18 cost \$5 now until the conference and \$10 at the door.

No Meals/Tours Sold After May 15!

Note: registrations post-marked after May 15 will not be guaranteed a meal or slot on the tour buses because of the time it takes to process the orders. The areas we are visiting can only handle small groups of people at a time, so there will be a limited number of people that can go on the JSC tour. The slots will be assigned on a first-come, first-served basis. So, how do you sign up?

Secondary Registration in April

Everyone who registers will get a secondary registration form in the mail in April with sign-up sheets for meals and tours and classes. On that form, you will select which of the three banquets you want your registration to cover, and then sign up and pay for the other banquets, lunches, breakfasts, and tours or classes you plan to attend.

Each person registered can also purchase meal and tour tickets for members of their family who are not registered. We are anticipating lunch tickets to be around \$25, and banquet tickets to cost \$35 to \$40.

Do not expect to arrive on Friday and get tickets to the Apollo 10 banquet that night! The hotel requires three days of notice, and we can't notify them unless we have your money about a week before that, and besides, it will probably sell out! Same goes for the other banquets. Because of the exhibits, the ballroom only holds about 400.

Transportation

We want to emphasize that people should plan to fly into Hobby airport, not Bush International (previously Houston Intercontinental). It is a 1.5 to 2 hour drive from Bush to Hobby through some very messy traffic. (There is an airport bus, but it is not cheap.)

The Radisson is right at Hobby, and has a FREE hotel bus that takes 5 minutes to reach the hotel. They also provide free shuttles to the local mall, and SGI is providing tour buses, so although Houston does not have buses that service this area, you can get by without a car for the weekend (we're going to keep you busy!). If you want to go to Galveston after the conference, you'll need a car.

Things are really looking up for this conference in 1999. Thanks to all of you for your continuing interest in the International Space Development Conference. May will be here before we know it! Ad Astra! ☆

SPACE NEWS

Private Investors Found to Prolong Mir's Life

(Houston Chronicle, December 23, 1998)

Operators of the Russian space station Mir have found private investors ready to prolong its life, ITAR-TASS news agency said Wednesday. Without new funding the aging station was to have been abandoned by the middle of next year. But Yuri Semionov, head of Energia aeronautic company which operates Mir, said investors were now ready to put up money to keep the space station operational for another three years.

Russian authorities and cosmonauts have said there is nothing technically wrong with Mir. Semionov said he had asked Russian Premier Yevgeny Primakov to provide guarantees for the unnamed investors. Mir costs about 200 million dollars a year to run. ☆

Space Buffs to Recreate Mars in Canadian Wasteland

(Reuters News, January 13, 1999)

The U.S. space agency NASA launched the second of two unmanned missions to search for water on Mars over the weekend but other space buffs hope to do their research altogether closer to home.

The Mars Society, an international group of space enthusiasts, is planning to build a simulated Mars station on Canada's barren Devon Island, the New Scientist magazine reported Wednesday. The island bears a close resemblance to the red planet. It is cold and dry, covered in rocky ridges, valleys and craters.

"It has as many similarities to Mars as you are likely to find anywhere on earth," Robert Zubrin, founder of the society said. But, the magazine said, it differs in one obvious and crucial respect — the atmosphere on Mars is a hundred times thinner.

Zubrin intends to complete the Mars Arctic Research Station by the middle of 2000 at a cost of about \$1.0 million. It will simulate the self-contained environment that life on Mars would entail and will allow scientists and engineers to test equipment that would be needed to survive on the planet. ☆

Mars Polar Lander en Route to December Landing

(Aerospace Daily, January 5, 1999)

NASA's Mars Polar Lander was operating well yesterday after a Sunday launch to the Red Planet's south pole, with a balky star tracker giving controllers at the Jet Propulsion Laboratory their main concern a day after liftoff. Engineers did not expect the problem with the guidance device to threaten the mission, according to a JPL spokesperson.

The spacecraft roared aloft from Cape Canaveral Air Station atop a Boeing Delta II rocket on time at 3:21 PM EST Sunday. At 3:57 PM an 88-second third-stage burn sent the probe out of Earth orbit and on its way to Mars. If all goes as planned, the spacecraft will descend to a soft landing December 3 near the South Pole of Mars, using retro-rocket technology originally developed by prime contractor Lockheed Martin for the Viking Mars landers in the 1970s.

Mission First to Use "Microprobes"

After imaging the planet's surface during descent it will study the Martian soil and atmosphere, with the Mars Climate Orbiter launched last month as a data relay. The probe also will carry a microphone intended to record the first sounds ever collected on another planet, including wind and spacecraft noises. A pair of "microprobes" riding piggyback on the lander will be released about 10 minutes before touchdown to validate technology needed for hard-landing instrumented penetrators that could be seeded around the planet to study soil composition below the surface. ☆

(Your Money, from page 4)

HAL5's portion of ground support expenses for HALO SL-2 came to about \$900 (7% of expenses), two-thirds of which paid for the recovery boat, and the rest for launch support equipment and ground station electronics — which we still have. Per our Agreement, NASA paid for use of the barge, by far the biggest ground support expense.

For the next HALO SL-2 attempt, we are on our own. (NASA primarily wanted proof that large balloons could be safely launched from ocean-going barges — and we gave them that proof.) Thus, HAL5 needs to raise the money to rent a boat from which to launch our balloon.

The SL-1 method of launching from near the coast is still an option, but FAA rules have changed and it will be much more difficult to obtain approval to do that again. We might be required to pay for liability insurance far in excess of any boat rental fee.

Also per our Agreement, NASA paid for the balloon's helium and the rocket's nitrous-oxide; which is why HAL5's expenses came to only 1% of the total. Again, for the next attempt, we will have to purchase these products ourselves.

The final expense category, labeled Administration (which includes fund raising) was only 2% of the total, again because all the labor was voluntary. If we are to raise the money we need though, we will have to invest more in fund raising. We have some ideas, but we could definitely use more, as well as volunteers to help do some of the work. Please email me: hal5@advicom.net ☆

Upcoming Events of Interest to HAL5 Members

- Wed., Jan. 27 — **HAL5 Program** on “**The Artemis Project**” by Boise Pearson, President of Artemis Society International, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 256-971-3055
7:00 - 8:30 PM
- Wed., Feb. 17 — **World Future Society Program** on “**Space Solar Power**”, by Daniel O’Neil of NASA Marshall, at **Huntsville Chamber of Commerce Building**; questions: Les Johnson at 544-0614
11:30 AM - 12:30 PM
- Fri., Feb. 19 to Sat., Feb. 20 **1999 IEEE Computer Fair**, hardware and software, at the Von Braun Center, Monroe Avenue, Huntsville; free
- Wed., Feb. 24 — **HAL5 Program** on “**TBD**” by TBD, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 256-971-3055
7:00 - 8:30 PM
- Sun., Mar. 7 to Sat., Mar. 13 **National Space Week / Alabama Aerospace Week**, focused public education and promotion of current and future space activities; questions on HAL5 participation: 256-859-5538
- Sun., Mar. 21 to Fri., Mar. 26 **1999 ProSpace “March Storm”**, in Washington, D.C.; space activism to Congress; questions: email jkrukin@prospace.org
- Wed., Mar. 24 — **HAL5 Program** on “**TBD**” by TBD, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 256-971-3055
7:00 - 8:30 PM
- Wed., Apr. 28 — **HAL5 Program** on “**TBD**” by TBD, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 256-971-3055
7:00 - 8:30 PM
- Mon., May 18 to Wed., May 19 **Technical And Business Exhibition/Symposium (TABES ’99)**, at the Von Braun Center; free; questions: 256-837-4347
- Tue., May 18 — **HATS Professional of the Year Awards Dinner**” at the Von Braun Center; about \$15; questions: 256-837-4347
7:00 - 9:00 PM
- Wed., May 26 — **HAL5 Program** on “**TBD**” by TBD, at Huntsville Public Library, 915 Monroe Ave.; free; questions: 256-971-3055
7:00 - 8:30 PM
- Thu., May 27 to Mon., May 31 **1999 International Space Development Conference (ISDC)**, in Houston, Texas; \$65 fee; questions: 256-971-3055
- Fri., July 16 to Sun., July 18 Possible **HAL5** hosting of a **Southeast Space Development Conference**, in Huntsville; \$TBD fee; questions: 859-5538

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Special Announcement
Time to Renew Your Membership
HAL5 Program Night on
“The Artemis Moon Project”
Wednesday, January 27, 7–9 pm

Huntsville Alabama L5 Society
 1019-A Old Monrovia Rd, Suite 168
 Huntsville, AL 35806
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