



Southeastern Space Supporter

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

Volume 4, Number 2 — March–April 1995

FIRST WORD

HAL5 Supports Local Environmental Education

(by Ronnie M. Lajoie, SSS Editor)

One of the goals of HAL5's Project HALO is to provide cheap access to space for student experiments. Even at this early stage in the project, Phase 0, we are starting to meet this goal. On the upcoming balloon flight (see article to right), about two pounds have been set aside for student experiments.

Last month, HAL5 allocated \$200 to purchase a reusable 7-foot balloon in support of the TOPE project (see article to right). The balloon will allow teachers and students to take aerial photographs of the ground, then compare them with direct measurements.

HAL5 has also begun to work with both the Student Experimental Payload (SEP) project and the Sub-Orbital Academic Research (SOAR) program, which is launching on rocket on this Saturday (see article page 3). ☆

Project HALO Event

Saturday, March 18, 1995
Launch Time 10 am, Setup 9:15 am
North End, Old Huntsville Airport

Project HALO Phase 0 Component Test at 20 miles

SOAR GTS-1 Flight

HARA Rocket Launches

All HAL5 members are encouraged to attend, and to bring interested friends and co-workers. Open to the public. Free admission. Rain Day – March 25.

PROJECT HALO NEWS

Project HALO Phase 0 Test Flight This Weekend

(by Ronnie M. Lajoie, HALO member)

This Saturday, March 18, HAL5 member Bill Brown will send another balloon to the "Edge of Space". This time, the balloon will carry more than just a video camera and HAL5 membership cards. It will also carry a GPS receiver, student experiments, and test hardware for the HALO rocket.

The most critical time for any rocket flight is ignition, when the motor first fires. If the motor does not ignite, the rocket does not move. (This is probably what happened to a balloon-borne rocket built and flown by a group in North Carolina.) Two of the most critical parts of the rocket, therefore, are the ignitor, which provides the flame; and the oxidizer valve, which feeds oxygen into the combustion chamber.

The test ignitor for the HALO rocket will consist of a 3-inch long tube of metal screen wrapped around with Thermalite, a fast burning wick which emits very hot sparks as it burns. An electronic match called a "squib" will be used to start the wick burning. The squib will be triggered by an on-board battery-powered sequencer, which may receive some commands from the ground. A second squib will be used for redundancy to ensure that the Thermalite ignites. An important goal for the test is to determine the length of Thermalite wick required so that there is sufficient time for combustion to start. A second test ignitor will be flown to help ensure a successful test.

(see HALO Test on page 2)

TOPE Project Summary

(by Roberta Freeman, TOPE Coordinator)

The TOPE project (for "Teaching Observation of Planet Earth") was founded by a group of educators from 11 Huntsville elementary schools as a means for helping young students experience the adventure of remote sensing while conducting real scientific inquiry.

Last summer, these educators attended a training session in the Ground Truth Studies Program, receiving a background in geology, hydrology, and "ground truthing" methodologies. Ground truthing is a process for comparing data gleaned from pictures (taken from the air or from space) with actual measurements made at the ground site. Last year's two space radar flights of Endeavor involved many educators and scientists on the ground to validate (or "ground truth") the radar image data. Ground truthing is an effective way to determine the best remote sensing methods for supporting the Mission to Planet Earth.

TOPE Teaches Remote-Sensing

The group, from different schools, decided to meet monthly to exchange ideas. The TOPE project grew out of their discussions. In the TOPE classes, students have become actively involved in studying remote sensing and ground truthing. For example, one third-grader easily noticed that the lawn in a football stadium (which appeared green in an aerial photograph taken with normal film) was actually plastic Astro-Turf, because it appeared black in the matching infrared photograph. (Vegetation normally shows up red in aerial photograph taken with infrared film).

(see TOPE on page 3)

Huntsville Alabama L5 Society

President — Gregory Allison
Day: 533-3700, Eve: 859-5538
Vice-President — Craig Presson
Day: 880-7692, Eve: 880-7692
Treasurer — Ronnie Lajoie
Day: 961-4832, Eve: 721-1083
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Day: 461-2747, Eve: 534-3993
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Day: 837-4287, Eve: 536-8638
Publicity — William Axenroth
Day: 539-3111, Eve: 539-3386
Special Projects — Larry Scarborough
Day: 881-1944, Eve: 881-4363

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March / April 1995

The Southeastern Space Supporter is a bi-monthly 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 news-letter are those of the authors or of the Editor, and, unless expressly so stated, are not necessarily those of HAL5 or NSS.

Visit the HAL5 Homepage on Internet via:
<http://www.cici.com/homepage.html>
Courtesy of Community Internet Connect.
Contact Bob Ehresman for info: 722-0199

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/articles to: Ronnie Lajoie
162 Kirby Lane, Madison, AL 35758
Day phone/message: 205-961-4832
Night/Weekend phone: 205-721-1083
FAX number: 205-544-8884
Electronic mail address: hal5@cici.com

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

Preferred format for text is ASCII on a diskette or sent by E-Mail. Preferred format for text with graphics is Word on a 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.

(HALO Test, continued from page 1)

The test oxidizer value for the HALO rocket will consist of a 4-inch long cylinder pressurized prior to launch with oxygen or nitrous-oxide. At one end of the cylinder will be a ball valve attached to a small pulley. A string attached to the pulley at one end and a spring at the other will keep the ball valve normally in an open position.

Another string (or possibly a Thermalite wick) will be used to rotate the pulley and temporarily lock the valve in the closed position. A squib will be used, again triggered by the on-board sequencer, to burn through this wick, allowing the spring to open the valve and release its oxidizer. A second squib will be used for redundancy to ensure that the Thermalite ignites. An important goal for the test is to determine the amount of force required to open the valve. A second test ignitor valve will be flown to help ensure a successful test.

Electronic Map to Track Balloon

Results of the tests will be known when the payload is recovered. It is hoped, however, that the on-board video camera will be able to transmit live images during the actual tests. The video camera definitely will be transmitting live color video of the Earth and space out to 20 miles altitude. A GPS receiver will transmit back the balloon's position (latitude, longitude, and altitude), as well as flight time and local temperature. Bill Brown plans to use the GPS data to track the balloon and to plot its progress on an electronic map at the launch site. Two on-board transmitters will be broadcasting at HAM frequencies of 434 and 144.340 MHz.

More Student Experiments Needed

At press time, only one experiment was scheduled to fly. A 3rd grade class at Ridgmont Elementary School will be placing a strip of X-ray film on board the balloon to determine the differences between radiation levels up to 20 miles versus that at ground level (via a

similar piece of film kept on the ground). The film was donated by Steve Gilliard of Central Source, Inc. of Huntsville. More experiments are welcome. For more information, contact Bill Brown (HAM call WB8ELK) at (H) 837-7738 or (W) 876-9290.

Date, Time, and Directions

Launch time is set for 10:30 AM on Saturday, March 18, at the Old Huntsville Airport. (Tentative rain date is Saturday, March 25.) Volunteers should arrive by 9:15 AM. The balloon will take about two hours to reach altitude, burst, then take about two more hours to descend. Live video is expected throughout its flight.

The launch site will be located at the north end of the Old Huntsville Airport. It will be hard to miss since SOAR and HARA will be launching rockets from the same location the same day.

Take South Memorial Parkway to the Airport Road exit, then travel west past Leeman Ferry Road. Turn right into the Old Huntsville Airport. ☆

Upcoming HARA Events

The Huntsville Area Rocket Association will be sponsoring a "Sport Launch" on Saturday, March 18, at the Old Huntsville Airport. Members will be launching model rockets between 10 AM and noon. Anyone is invited to bring and launch their model rockets as well. Free Admission. For more information, contact HARA president Vincent Huegele at 881-2904.

A two-day rocket-launching event will be held April 1-2 in Manchester, Tennessee. Project HALO members are planning to attend. We will be distributing HALO literature, recruiting members, and having fun watching big rockets take off and "land". For directions, contact Vincent Huegele at 881-2904. For information about Project HALO, contact Ronnie Lajoie at (W) 961-4832 or (H) 721-1083. ☆

(TOPE, continued from page 1)

For one of their big projects, each school will launch a tethered helium balloon (courtesy of HAL5's Project HALO) to various altitudes, which will carry a camera able to take aerial photographs at regular time intervals. Two balloon flights are planned for each school, one to take photographs with normal film; another, with infrared film. The students will then study these images to learn first-hand about resolution, windows of visibility, drift, and other issues. Students will take heat measurements of the buildings and plants surrounding their school and compare them to estimates based on the colors in the infrared photographs.

The camera and film are being paid for via a \$1000 grant from the Huntsville Education Association to support Space Week activities. TOPE educators plan to conduct several launches before and during Space Week, and many more after. Once the students become comfortable with their launch techniques, TOPE educators plan to include progressively more sophisticated experiments on board their platform.

All of us at TOPE and HALO agree that tomorrow's scientific leaders are the children of today. What is truly exciting and special about the TOPE children is that they are not waiting for the future to come to them, these kids are launching into tomorrow now.

For more information about TOPE, call Robert Freeman at (H) 882-6327 or (W) 532-4824; or Susan Cameron at (H) 722-7952 or (W) 650-4380. ☆

Project HALO Meeting Times

Members of Project HALO meet regularly to discuss the engineering aspects of the project. Current and prospective members are welcome to attend. The meetings are held on Tuesdays during lunch hours, 11:30 am to 1:00 pm, at the Ponds Restaurant at the Madison Square Holiday Inn. ☆

SOAR GTS-1 Flight Overview

(by Edward Stluka, Coordinator)

The SOAR GTS-1 vehicle will rocket aloft with payloads and dreams of the Whitesburg Elementary 4th and 5th grade students, teachers and many volunteers and Corporate Sponsors. The rocket will carry seven student experiments to 1000 feet, then parachute back to Earth. Launch time is set for 10 AM on Saturday, March 18. (Tentative rain date is Saturday, March 25.) The flight should last about 3-4 minutes.

Experiments include an egg (life science), a stop watch (temporal science), carbon-dioxide, oil and water, and something called "Super Nutant Space Plants". [That's "nutant" and not "mutant" (yet) — Editor.] An on-board transmitter will be broadcasting at HAM frequency 147.455 MHz.

About the SOAR Program

SOAR (for "Sub-Orbital Academic Research") was established as a non-profit organization in early 1989, to afford students hands-on aerospace science and engineering experience. By conceptualizing, designing, building, and analyzing flight data from small sounding rocket payloads and systems, students see first-hand the true value of their academic study.

SOAR is designed to enhance. The overall goal of SOAR is to solicit and increase youth interest in engineering and other technical/scientific career fields. SOAR is funded in part by donations from aerospace industries, such as Thiokol, Aerojet, Campbell, Boeing, and Patel; along with technical societies, such as the AIAA and HATS. The Program involves students from elementary through university grade-levels.

SOAR is envisioned as an on-going program with sounding rocket launches occurring at least once each academic school year. Interested persons may contact Ed Stluka at 852-3850 for more information. ☆

NSS MEMBER NEWS

1995 ISDC Set for May 18-21

The 14th Annual International Space Development Conference (ISDC) will be held this year in Cleveland, Ohio. The conference, normally held during Memorial Weekend, has been pushed up a week (Thursday, May 18 through Sunday, May 21) in an attempt to accommodate more members.

The four-day ISDC will feature many speakers discussing a variety of space-related topics, including the Galileo mission to Jupiter, advanced propulsion, Mars Direct, launch vehicles, solar dynamic power, commercial space transportation, asteroids and comets, power beaming, space nursing, space station, and moon probes.

The 1995 ISDC will also feature workshops on solar power, rocket design, and space investment; The Foundry, "Hammer Your Dream Into Reality"; and special events including tours of NASA Lewis, the Baldwin Wallace Observatory, and the Cleveland Zoo Rain Forest Exhibit; a Music of the Heavens Space Concert, and a Lunar Colonization Model Robot Contest.

Registration price is currently \$75 for NSS members and \$85 for non-members. After April 15 the price will increase by \$15. Student registrations are available for only \$25.

The ISDC will be held in the Holiday Inn at the Cleveland/Independence Convention Center, located on Rockside Road off Interstate 77 (north of Interstate 80). Hotel rates are \$93.89 (tax included) regardless of occupancy.

HAL5 members Greg Allison and Ronnie Lajoie are planning on attending. (Ronnie at least is looking for a roomie to help defer the hotel cost.) Attending an ISDC is not cheap, but it is a "spiritual" blast for us space enthusiasts. For more information, contact Ronnie Lajoie at 961-4832. ☆

SSTO / RLV NEWS

NASA Selects Contractors for X-33 and X-34 Studies

(The Aerospace Daily, March 9, 1995)

NASA has picked the three main contenders to build the X-33 reusable launch vehicle (RLV) prototype for 15-month concept definition studies, and has selected Orbital Sciences Corp. in a team with Rockwell to build and fly the smaller X-34 vehicle beginning late in 1997.

Selected for the X-33 Phase I concept definition and design effort were Lockheed Advanced Development Corporation [teamed with Martin Marietta?], McDonnell Douglas Aerospace [teamed with The Boeing Company], and Rockwell International Space Systems Division. Selection for both the X-33 and X-34 competitions came only nine days after bids were received at Marshall Space Flight Center, where officials used a paperless selection process to speed things along.

Lockheed, McDonnell Douglas and Rockwell have been players in earlier studies of a single-stage-to-orbit RLV, and their entries contained few surprises, according to Frederick Bachtel, deputy director of the Space Transportation Div. at NASA's headquarters Office of Space Access and Technology. Space Access also submitted a bid that was not accepted, Bachtel said.

The goal of NASA's Reusable Launch Vehicle (RLV) technology program is to enable significant reductions in the cost of access to space to promote the creation and delivery of new space services and other activities that will improve U.S. economic competitiveness. The program will implement the National Space Transportation Policy, issued by the White House in 1994, and will accelerate the development of new space launch technologies and concepts to contribute to the continuing commercialization of the national space launch industry.

Evaluating Bids Electronically

Bids for the "Cooperative Agreement Notices (CANs)" as NASA's new industry/ government partnership arrangements are known, were received at Marshall on Feb. 28, and engineers evaluating them were able to make their recommendations on March 6, he said.

"We were somewhat familiar with what we were dealing with, so we knew what kind of people to have there," Bachtel said. "The one big thing that probably made it go so rapidly is we did it all electronically....The subteams all had a computer on the network, and ahead of time we had all the evaluation forms in the computer."

Some 200 engineers took over half of the first floor at the main building at Marshall for the evaluation process, Bachtel said, breaking up into subteams that considered such issues as thermal protection systems, propulsion, structures and the like. The electronic evaluation forms were passed up the selection chain electronically, he said, greatly streamlining the process in line with the new ethic that has guided the entire RLV process at NASA.

"The innovative 'fast track' procurement process resulting in these selections is a true harbinger of how the 21st-century 'faster-better-cheaper' NASA intends to conduct its business," Administrator Daniel S. Goldin said in a statement announcing the selections. "Within a two-month period, X-33 and X-34 CANs were issued, proposals were submitted, and selections made."

X-33 Phase I — 15 Month Study

NASA will spend \$24 million on the 15-month X-33 Phase I studies, with the three bidders co-funding the effort to develop "business investment strategies, operations planning and vehicle design and analysis with enough detail to permit competitive selection of an industry partner or partners and their X-33 design concept(s) at the end of Phase I," the agency announcement stated.

As expected, Lockheed proposed a LOX/Hydrogen aerospace-powered lifting body; Rockwell a vertical launch/horizontal landing wing body with Space Shuttle heritage, and McDonnell Douglas a vertical launch/vertical landing vehicle derived from its DC-X prototype. Bachtel said Rockwell and Douglas both proposed propulsion tradeoff studies between bipropellant and tripropellant engines.

X-33 Phase II

The results of Phase I will provide the basis for a NASA decision on whether to proceed with Phase II, which includes design, building and flight demonstration of the X-33, and would continue through the end of the decade.

The results of Phase II would be used by the Government and private sector to decide whether to proceed with development of an operational next generation reusable launch system.

X-34

For the X-34, intended both as a testbed for X-33 technologies and operability and as a low-cost launch vehicle for small payloads, Orbital/Rockwell proposed a two-stage, air-launched liquid-fuel booster. Like the company's solid-fueled Pegasus launch vehicle, the X-34 vehicle would be launched from the company's converted L-1011 carrier aircraft, with the first stage flying back autonomously to land like an airplane. The upper stage would be expendable. OSC will manage the effort, and both companies will add some \$50 million each to the \$70 million NASA intends to spend on the flight demo effort through fiscal 1999.

Space Access and Kelly Aerospace submitted proposals for the X-34 that were not accepted, Bachtel said. ☆

RLV World Wide Web Site

An RLV World Wide Web Site with information about the program is available over the Internet. at URL: http://rlv.msfc.nasa.gov/rlv_htmls/rlv1.html.

HAL5 CALENDAR OF EVENTS**March 1995**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12 HALO Rocket Work Session 1p at T.Pickens	13	14 HALO Technical Team Meeting 11:30a at Ponds	15	16 HAL5 Executive Comm. Meeting 11:30a at Ponds	17	18 HALO Balloon & SOAR Launches 10a at Old Airport
19	20 Space Week Begins	21 HALO Technical Team Meeting 11:30a at Ponds	22 No HAL5 Program	23 HAL5 Executive Comm. Meeting 11:30a at Ponds	24 Space Week Ends	25 Rain Date for HALO Balloon & SOAR Launches
26 HALO Rocket Work Session 1p at T.Pickens	27	28 HALO Technical Team Meeting 11:30a at Ponds	29	30 HAL5 Executive Comm. Meeting 11:30a at Ponds	31	April 1 2-Day Rocket Launch Event Manchester, TN

April 1995

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2 2-Day Rocket Launch Event Manchester, TN	3	4 HALO Technical Team Meeting 11:30a at Ponds	5	6 HAL5 Executive Comm. Meeting 11:30a at Ponds	7	8
9 HALO Rocket Work Session 1p at T.Pickens	10	11 HALO Technical Team Meeting 11:30a at Ponds	12	13 HAL5 Executive Comm. Meeting 11:30a at Ponds	14	15
16 HALO Rocket Work Session 1p at T.Pickens	17	18 HALO Technical Team Meeting 11:30a at Ponds	19	20 HAL5 Executive Comm. Meeting 11:30a at Ponds	21	22
23 HALO Rocket Work Session 1p at T.Pickens	24	25 HALO Technical Team Meeting 11:30a at Ponds	26 HAL5 Program TBD 7p at Hsv Library	27 HAL5 Executive Comm. Meeting 11:30a at Ponds	28	29

May 1995

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
April 30 HALO Rocket Work Session 1p at T.Pickens	1	2 HALO Technical Team Meeting 11:30a at Ponds	3	4 HAL5 Executive Comm. Meeting 11:30a at Ponds	5 Inputs to HAL5 newsletter due	6
7 HALO Rocket Work Session 1p at T.Pickens	8	9 HALO Technical Team Meeting 11:30a at Ponds	10	11 HAL5 Executive Comm. Meeting 11:30a at Ponds	12	13
14 HALO Rocket Work Session 1p at T.Pickens	15	16 HALO Technical Team Meeting 11:30a at Ponds	17	18 1995 ISDC Cleveland, OH	19 1995 ISDC Cleveland, OH	20 1995 ISDC Cleveland, OH
21 1995 ISDC Cleveland, OH	22	23 HALO Technical Team Meeting 11:30a at Ponds	24 HAL5 Program TBD 7p at Hsv Library	25 HAL5 Executive Comm. Meeting 11:30a at Ponds	26	27

SPACE SCIENCE

Sulfur from Asteroid Impact Said to Have Killed Dinosaurs

(NASA HQ Press Release, Dec. 28, 1994)

NASA scientists now believe it was the sulfur-rich atmosphere created in the aftermath of an immense asteroid collision with Earth 65 million years ago that brought about a global freeze and the demise of the dinosaurs.

The impact of this large asteroid hit a geologically unique, sulfur-rich region of the Yucatan Peninsula in Mexico, according to planetary geologist Adriana C. Ocampo and atmospheric scientist Dr. Kevin H. Baines, both of the JPL. They estimate the impact kicked up billions of tons of sulfur and other materials and was between 10,000 to 50,000 times more powerful than the comet Shoemaker-Levy 9 impact on Jupiter last July.

"We estimate that this asteroid was between 10–20 kilometers in diameter and its collision on Earth brought about total darkness around the world for about half a year," Ocampo said. "But more importantly, persistent clouds generated by the impact on this geologically distinct region of sulfur-rich materials caused temperatures to plunge globally to near freezing."

"These environmental changes lasted for a decade and subjected organisms all over the world to long-term stresses to which they could not adapt in such a brief time span. Half of the species on Earth became extinct as a result."

The researchers based their work on computer models of the impact and atmospheric effects, studies of the crater geology and extensive fieldwork at a rock quarry located 360 kilometers (223 miles) south of Chicxulub at Albion Island in Belize. Fragments bearing the unique characteristics of the impact were found in this area.

In studying the sites and modeling the resulting changes in the biosphere, the

scientists discovered that it was the specific geological location of the impact in a region that is rich in sulfur materials that created catastrophic climate changes and led to the downfall of the dinosaurs.

"If this asteroid had struck almost any other place on Earth, it wouldn't have generated the tremendous amount of sulfur that was spewed into the atmosphere to create such a devastating, worldwide climate change."

On impact, the asteroid hurled some 35 billion to 770 billion tons of sulfur high into the atmosphere, along with other materials. The NASA team, in collaboration with Dr. Alfred Fischer of USC, recently discovered rocks in Belize -- some the size of a small car -- that were blown out of the crater and landed south of the Chicxulub site.

The boulder deposit in Belize also contained fragments of glass that were created by the melting of rock when the asteroid crashed into Earth, Ocampo said. Spherical fragments, known as "tektites," were scattered and formed as the molten glass flew through the air and cooled. The tektites have been found in other regions near the crater, such as Haiti, Mexico, Texas and Alabama, but never in association with large boulders.

Another important find at the Belize rock quarry was limestone with fossils dating to the early part of the Cretaceous. "Fossils of this age don't belong in northern Belize," Ocampo said. "Early Cretaceous fossils have been found deep below the surface near the crater during drilling by the Mexican Petroleum Company. We think the limestone found in Belize was excavated by the impact, which probably blew a hole more than 9 miles deep in the Yucatan Peninsula."

Since 1980, when UCA-Berkeley geology professor Walter Alvarez and his colleagues first proposed the theory, researchers have been searching for impact sites that would explain the sudden disappearance of the dinosaurs.

The main evidence to support the theory came from finding a substance called iridium in a layer of clay in Italy. The concentration of iridium, an element found on Earth in very small quantities, was quite large. High concentrations of iridium are found in asteroids and comets.

In 1989, Pope and Charles Duller of NASA Ames discovered a semi-circle of sinkholes at Chicxulub. Ocampo studied gravity and magnetic data from the crater and correlated them with the sinkholes. She concluded that the area had the classic characteristics of an impact crater, indicating that Chicxulub was, in fact, the place where a colossal asteroid had smashed into Earth millions of years ago. Current estimates of the crater size range from 180 to 300 kilometers (112 to 186 miles) in diameter, making it one of the largest craters known on Earth.

"Initially, thick sulfur clouds, combined with soot and dust generated by this impact, would have spread worldwide and blocked out the Sun," Baines and Pope said. "Night-like conditions probably existed all over Earth for at least six months essentially bringing photosynthesis to a halt. Unlike the aftermath of typical impacts, the skies remained murky for at least a decade, due to chemically generated clouds of sulfuric acid high in the stratosphere."

The reflection of sunlight back into space from these high-altitude clouds caused surface temperatures to drop to nearly freezing for many years all over the planet.

These atmospheric conditions occur in Venus' perpetually cloudy atmosphere, Baines said, where ultraviolet sunlight and water in the high atmosphere can convert sulfur dioxide into sulfuric acid clouds. Sulfuric acid clouds like those that cover Venus may have continued to blanket the Earth for more than a decade after the initial impact of the asteroid, causing a secondary and more long-lasting effect which killed much of life on Earth.

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“The entire ecosystem of Earth, including plants and animals, was subjected to extreme environmental conditions, which a large number of well-established species, such as the dinosaurs, simply could not cope with,” Baines said. Six months of total darkness and 10 years of global freezing ultimately destroyed the dinosaurs and many other organisms, Pope added. ☆

Life on Mars Study Stalled by Death on Earth

(excerpt Inside NSS, Feb-Mar 1995)

In the Jan-Feb issue of SSS, we reported about the role that the NSS is playing in the re-evaluation of a Gas Chromatograph Mass Spectrometer (GCMS) being stored at NASA JPL, its twin of which (on the Viking lander) failed to detect life on Mars. That study is now in jeopardy.

The death in December of Cyril Ponnampuruma, the world's leading expert on the origins of life, has stalled the proposal of NSS Governor Robert Jastrow to re-study the Viking experiment which failed to detect life on Mars.

Under Jastrow's proposal, Ponnampuruma would have supervised a post-doctoral researcher examining a stored duplicate of the GCMS, which was reported previously to have failed to detect signs of life in soil from Antarctica, even though that soil sample was known to contain organic matter. The other Viking experiment, the Labeled Release experiment, gave a clear indication of life.

In December, the NSS Executive Committee backed the proposal and agreed to help raise the estimated \$30,000 required for the work. The NSS Board of Governors was expected to take a leading role in the effort. To date, \$9100 in pledges have been received. ☆

SPACE POLITICS

U.S. House Subcommittee on Space and Aeronautics

Jurisdiction: Legislative jurisdiction and general and special oversight and investigative authority on all matters relating to astronomical and aeronautical research and development including: national space policy, including access to space; sub-orbital access and applications; NASA and its contractor and government-operated laboratories; space commercialization including the commercial space activities relating to the Department of Transportation and the Department of Commerce; exploration and use of outer space; international space cooperation; National Space Council; space applications, space communications and related matters; and earth remote sensing policy.

List of Members (by State)

Bud Cramer (D-AL)
 Matt Salmon (R-AZ)
 Ken Calvert (R-CA)
 Jane Harman (D-CA)
 Dana Rohrabacher (R-CA)
 Andrea Seastrand (R-CA)
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 Alcee Hastings (D-FL)
 Dave Weldon (R-FL)
 Tim Roemer (D-IN)
 Todd Tiahrt (R-KS)
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 Steve Largent (R-OK)
 Van Hilleary (R-TN)
 Ralph Hall (D-TX), ranking
 Sheila Jackson Lee (D-TX)
 Steve Stockman (R-TX)
 Thomas Davis (R-VA)
 James Sensenbrenner (R-WI), Chair

Where to Write

Address letter as in the following example: “The Honorable Bud Cramer, U.S. House of Representatives, Washington, DC 20004.” ☆

Big Changes Seen for NASA

(excerpt of article by Miles Pomper)

Last month, Rep. Robert Walker (R-PA), chairman of the House Science Committee, laid out his vision for NASA at an aerospace industry gathering saying that in “the second Space Age,” government investment in space will increasingly have to give way to private sector financing.

He said that as a measure to increase investment he supports a 10-year tax break for companies which make products on items manufactured in space. Such an incentive, he said, would convince businesses to “come up with a host of new products that we haven't thought of.”

Among the products Walker would like to see is a reusable launch vehicle manufactured by the private sector. “Industry should drive the process” of manufacturing these vehicles, Walker said. “We've allowed government to design the process and we've ended up with the most expensive, gold-plated operation you can find.”

Walker said that House Republicans intend to balance the budget by 2002, and NASA and other science programs will have to be cut by almost \$25 billion to meet this goal. “For those of you who are thinking that this is somehow an aberration, that when the realities crunch in we're not going to step up to the plate, don't bet on it,” Walker said.

HAL5 Poll — Privatize NASA?

In the recent weeks, key members of Congress having been discussing the possibility of essentially selling NASA to highest bidder. What do you think?

Submit your comments by phone message (721-1083) or in writing by the end of April. Mention if you want your comments reprinted in this newsletter. If so, please send them in writing, either by U.S. Mail (to the “Monrovia” address) or by E-Mail: hal5@cici.com ☆

NASA FY '96 Budget Request

(The Aerospace Daily, February 7, 1995)

NASA is in for a "profound" restructuring in an effort to absorb a \$5 billion budget hit in the fiscal 1996 budget request ordered by the Clinton White House, with "significant" layoffs beyond the 2,500 civil service slot already targeted for elimination by the end of the century, top agency managers said yesterday.

The new budget seeks \$14.260 billion in budget authority, down \$140 million for what was projected in last year's NASA request. But by FY '00 NASA's total budget is projected at \$13.168 billion, \$1.532 billion off last year's projection. Overall, the agency is to lose about \$5 billion from a five-year runout that was estimated at \$87 billion last year.

The new budget seeks no funds for the two large new NASA wind tunnels. The agency's new Reusable Launch Vehicle program would get \$193 million, including \$95 million for flight demonstrations with the reworked McDonnell Douglas DC-X, now designated DC-XA.

Here is a breakout of NASA's fiscal year 1996 budget request, released on February 6:

<u>NASA Budget Category</u>	<u>Requested</u>
Science, Aero. & Tech.	6,006.9 M
Human Space Flight	5,509.6 M
Mission Support	2,726.2 M
Inspector General	17.3 M
Total Budget Request	14,260.0 M

Breakdown by Sub-Category

<u>Budget Sub-Category</u>	<u>Requested</u>
Space Science	1,958.9 M
Physics & Astronomy	1,131.1 M
Planetary Exploration	827.8 M
Mission to Planet Earth	1,341.1 M
Life & Microg Sciences	504.0 M
Space Access Tech (RLV)	705.6 M
Aeronautical Research	917.3 M
Mission Comm. Services	461.3 M
Mission Support	2,726.2 M
Science, Aero. & Tech.	6,006.9 M

<u>Budget Sub-Category</u>	<u>Requested</u>
Space Shuttle Program	3,231.8 M
Space Station Program	1,833.6 M
Payload Operations	315.0 M
US/Russian Ventures	129.2 M
Human Space Flight	5,509.6 M

<u>Budget Sub-Category</u>	<u>Requested</u>
Research/Program Mgmt	2,202.8 M
Space Comm. Services	319.4 M
Facility Construction	166.4 M
Safety and Reliability	37.6 M
Mission Support	2,726.2 M

Employment Estimates

<u>NASA Installation</u>	<u>People</u>
Goddard Space Flight Ctr.	3,806
Marshall Space Flight Ctr.	3,300
Johnson Space Center	3,209
Langley Research Center	2,784
Lewis Research Center	2,487
Kennedy Space Center	2,367
Ames Research Center	1,677
NASA Headquarters	1,664
Dryden Flight Research Ctr.	460
Stennis Space Center	208
Full-time Permanent Staff	22,272

Current HAL5 Membership

(by Ronnie Lajoie, Treasurer)

The following is a list of the current paid membership of HAL5, which includes 19 renewals and 7 new members, for a total of 26. Last year's membership peaked at 41, a record for the society. Since all memberships expired at the end of last year, more renewals are expected to come in. Welcome to all our new members!

- Gregory Allison (President)
- Mary Bare
- John Barnum
- Jan Bijvoet
- Bill Brown
- Thomas Craig
- Ronald Creel
- David Dean (N)
- Robert Ehresman (N)
- Ernest Gilmer
- Philomena Grodzka (MC)
- Mary Hester
- Dennis Lajoie (N)
- Ronnie Lajoie (Treasurer)
- James Lindberg
- Offa McCollum
- Renee McDaniel (N)
- Charles Paludan (N)
- Timothy Pickens
- Larry Scarborough (EC)
- Ethan Scarl (Secretary)
- Paul Schwindt (N)
- Edward Stluka
- Ernst Stuhlinger
- George von Pragenau
- Alfred Wright (N)

(VP) - Vice-President
 (MC) - Membership Chair
 (EC) - Special Events Chair
 (N) - New Member

Special Announcement

Project HALO Phase 0 Main Event

Component Test at 20 Miles High

Saturday, March 18, 10 am – 1 pm

Old Huntsville Airport

Huntsville Alabama L5 Society
 1019-A Old Monrovia Rd, Suite 168
 Huntsville, AL 35805

Place
 First Class
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