

ASGSB

Newsletter of the American Society for Gravitational and Space Biology

Volume 10, Number 1
Winter 1994

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NEWSLETTER EDITOR

Janet V. Powers

Dear ASGSB Colleagues:

What a wonderful, but hectic 1993 Annual Meeting. My thanks to all the people who helped make it so successful. The posters and presentations were, for the most part, outstanding. The trip to the Hill was educational for all involved. The symposia were stimulating and timely. Attendance at the meeting held constant, which is very good in this age of tight budgets and the fact that we had competition from the Spacelab Life Sciences 2 mission (SLS-2). The people associated with SLS-2 were missed during the meeting, but their activities assured the success of that mission.

ASGSB is fortunate to have been selected to have the SLS-2 final results symposium as part of our 1994 annual meeting in San Francisco. The 1994 meeting looks like an exciting one with three full days of activities and a fourth and final day (Sunday) for the SLS-2 symposium. For those of you who requested copies of my presidential speech, it follows. . .

"ASGSB has just completed its first decade as an entity. On Wednesday, October 13, 1983 at the 8th Annual Space Biology Meeting in Arlington, Virginia, Bob Cleland conducted a session to discern interest in establishing a Space Biology Society. At the request of the attendees, an organizing group was appointed. At the subsequent symposium in 1984 (November 7) at Harper's Ferry, West Virginia, ASGSB was officially organized. The first newsletter was published in April 1985. Our first annual meeting as a society was in Niagara Falls in 1985. Our society continues to "mature."

We are just 30 years younger than the discovery of the genetic code and some 20 years younger than the first satellite launch. Thus, our society was organized when incredible changes were occurring in research and lifestyles,

(continued on next page)

Mark Your Calendars Now!!

San Francisco 1994

ASGSB 10th Annual Meeting

President's Letter Continued

and changes continue. If we could be assured that spaceflights will continue and allow for meaningful research, then we could be comfortable with the future. However, with shrinking budgets and trying times, the few available space resources may become ever more precious. We need to work with all space agencies to assure maximum utilization of flight opportunities.

Maximum use does not imply a head count on a single mission, but instead means assuring the best possible science at every opportunity. Space is an unpredictable laboratory when the unexpected is usually the rule. To do meaningful space research requires adaptable scientists who can make split second decisions to change anticipated protocols and still get good data. It also requires a tremendous amount of patience, and a sense of humor certainly helps. Interest in space life sciences research is increasing, particularly with the recent push of innovation and technology, and the direction and significance of the research to be done rests on our shoulders. We must lobby for funds to provide the tools and resources necessary for exploratory basic research, both ground- and space-based. The lack of such lobbying could be disastrous.

Yesterday we had an incredible day on the Hill. Many visits were made to Congresspersons with many insights gained, and education occurred on both sides. You began to realize that everyone is interested in politically correct issues, resulting primarily from decreasing resources and so many lobbying groups. The emphasis on technology or applied research is perturbing. I am not against technology, but I do realize that without a focused long term exploratory basic research program NOW, there will be no future technology. And without risk, no progress will be made.

One of my favorite editorials appeared in the November 2, 1990 issue of *Science* and was entitled "The Willingness to Risk Failure," by Harold Shapiro. I'd like to quote a few lines from that editorial.

"The willingness to risk failure is an essential component of most successful initiatives. The unwillingness to face the risks of failure—or an excessive zeal to avoid all risks—is, in the end, an acceptance of mediocrity and an abdication of leadership. Successful change depends



Emily Holton, 1993-1994 ASGSB President

on experimentation with uncertain results. When 10,000 experiments with a storage battery failed to produce results, Thomas Edison said, 'I have not failed, I've just found 10,000 ways that won't work.'

As we begin to prepare for the challenges that will face humanity in the 21st century, we know that we need new ideas and a renewed determination. If we approach these challenges with a grim determination to avoid risk, we will sentence ourselves to the status quo—or worse. American society has become too risk averse for its own good. As individuals become more risk averse in their own lives, they seem to become less and less tolerant of the risks taken by those in leadership positions. Let me be clear, I do not recommend failure. Nor am I attracted to the idea that failure builds character. But a willingness to accept the risk of failure is one of the costs of leadership and, therefore, the price of all success."

A most intuitive editorial.

So, I leave you to ponder your own risks and close this talk by quoting James Watson's five rules for success. First, to succeed in science, you have to avoid dumb people. Second, to make a huge success, a scientist has to be prepared to get into deep trouble. Third, be sure you always have someone up your sleeve who will save you when you find yourself in deep trouble. Fourth, never do anything that bores you. And, finally, if you can't stand to be with your real peers, get out of science.

Let's work together to make ASGSB an aggressive, progressive, proactive, risk-taking, superbly scientific Society."

Emily Holton
1993-1994 ASGSB President

Disks Now Required to Submit Abstracts for ASGSB's 10th Annual Meeting

The tenth annual ASGSB meeting will be held at the Holiday Inn on Union Square in San Francisco, California on October 20-24, 1994. Marc Tischler, Editor of the Program and Abstracts Issue of the *ASGSB Bulletin*, will continue compiling this issue. It is prepared on computer and produced on a laser printer so that it can be submitted camera-ready to the printer.

Consequently, we no longer will use camera-ready abstracts submitted by meeting participants. Instead, abstracts must be submitted on computer disks. Submitters will no longer have to print the abstract into a fixed-size box; specific formats will be provided to accommodate either 10 pt or 12 pt font size and either Mac or IBM-compatible submissions. The variety of word processing programs that will be acceptable should accommodate everyone. For instance, submitters will be able to use the Mac programs MacWrite, Microsoft Word, WordPerfect "Mac," Works WP, and WriteNow. For IBM compatible systems, we can accommodate WordStar, Word 4.0, DisplayWrite, and WordPerfect.

The postmark deadline for abstract submission is **July 1, 1994**. **If an abstract cannot be submitted on disk, the postmark deadline will be June 20, 1994**, to provide additional time for retyping the abstract.

Figures or tables to be included in the abstract need to be provided camera-ready at a 70% reduced size to fit into the final printed abstract form. This is necessary since tables do not convert well when changing programs and font sizes. Also keep in mind that each submitter will only be allowed to be the first author on one abstract, but can be a co-author on an unlimited number of abstracts. This policy will avoid future confusion in scheduling and referencing abstracts. Detailed information regarding format sizes, etc. will be provided in the next *ASGSB Newsletter*.

The ASGSB appreciates the cooperation of its members in this endeavor—which will allow everyone to contribute to producing a high-quality *ASGSB Bulletin* issue while keeping costs at a minimum.

OLMSA Has Its Own GopherHole

NASA's Office of Life and Microgravity Sciences and Applications (OLMSA) now has its own GopherHole, which is accessible through Internet Gopher. The exact organization of the menus, the folder contents, and the services provided are subject to change. The OLMSA Gopher will serve as an outreach server, providing customers—the international life sciences community—with electronic access to the most recent information available on Life Sciences, Microgravity Sciences, Gravitational Biology, Biotechnology, and Space Biomedical research efforts.

The OLMSA Gopher will carry announcements of upcoming ground-based and flight research announcements and Announcements of Opportunity in the space life and microgravity sciences. There will also be an up-to-date listing of office organization, staffing with assigned titles, and office telephone numbers under the OLMSA organization structure.

The "OLMSA Events" calendar maintains the listing of current and relevant meetings, Congressional hearings, and programmatic items that are of interest to space-based laboratory researchers.

OLMSA Gopher contact is dkeefe@gm.olmsa.hq.nasa.gov. To submit material for inclusion in the OLMSA Gopher, simply E-Mail it to OLMSAGopher@gm.olmsa.hq.nasa.gov. For further information, get online and try it!

“Retroscope” ASGSB Afternoon on the Hill

Summary of the first organized approach to Congressional Education by ASGSB members

Twenty-five teams of ASGSB members visited 68 Congressional offices on Thursday afternoon, October 21, 1993. Most of the Representatives or Senators that we visited were seen in person, although in several offices the interaction was with legislative assistants or aides.

The overall reaction was positive! ASGSB members found that they could meet and interact with their elected representatives and that those representatives and their staff were willing to listen. The visits were two-way educational activities—first, to educate Congressmembers about Gravitational and Space Biology and its relevance to our Nation’s overall Space Life Science research programs; secondly, to educate Society members on ease of access and how to approach members of Congress. For “first timers,” it was an enlightening exposure to government in action.

Some specific comments were that, on the whole, neither members of Congress nor their staffs were knowledgeable about Gravitational and Space Biology. They were, without exception, willing to listen, even though they might disagree about the importance and relevance of Gravitational and Space Biology. We must keep in mind that Congressmembers develop positions based on input from constituents and from their staff. If they have never heard of a program, it is easy to dismiss it as irrelevant.

Congressmembers were very receptive to examples of successful basic science, and expressed interest in learning about Earth benefits or spinoffs from both flight and ground-

based research. Members and aides from several Congressional offices requested broad, but brief, overview writeups from space life scientists that could help them “sell” NASA programs and decide how particular voting issues might affect their districts.

Not all aspects of the visits were perfect, but it was a first try for all of us in organizing such a venture. Some things that will need to be done differently if we have a repeat in the fall of 1995 include—better directions on how to get to the meetings, more time for METRO travel, increased attempts to get individuals to their own representatives, and background provided on Congressmembers’ voting records regarding NASA issues. Another consideration is the “timing” of ASGSB Congressional visits, especially since appropriations discussions have been concluded before the Annual Meeting in the fall.

In conclusion, the majority of participants felt the visits to the Hill were worthwhile and that they should be repeated and expanded by having more Society members become active Congressional Educators at the next Washington DC meeting, or anytime ASGSB members are in the Nation’s Capitol. A higher visibility profile by ASGSB and its members could lead to testimony by space life scientists at Congressional hearings and committee meetings that are important to our lives and to the life of NASA.

Robert W. Phillips
1993 Annual Meeting
Program Chair

Cary A. Mitchell
1992-1993 ASGSB President

Huntoon Named Johnson Space Center Director *Goldin Appoints Other New Center Directors*

NASA administrator Daniel S. Goldin announced in January new directors for four of the agency's centers, as part of a number of management appointments and organizational changes.

"These appointments and realignments will enhance and strengthen the agency's programs and institutions," Goldin said. "The appointments and the emphasis they bring to their respective areas of expertise are in keeping with the president's goal to make government less expensive and more efficient, and to reinvigorate NASA."

Dr. Carolyn Huntoon has been appointed Director of the Johnson Space Center, Houston, TX. She has served as the Director of Space and Life Sciences at the Johnson Space Center since 1987. Previously she was the Associate Director of the center, assisting the Director and Deputy Director in its management. Huntoon joined the Johnson Space Center in 1970 as a Senior Research Physiologist and was responsible for conducting research programs in the area of medical endocrinology and biochemistry. She is a pioneer in human life science research, having created and supervised projects in the Apollo, Skylab, Apollo-Soyuz, and Space Shuttle programs. She is the author of many publications and a fellow of the Aerospace Medical Association and the American Astronautical Society.

Huntoon is a recipient of the Arthur S. Fleming Award, the National Civil Service League Career Achievement Award for her work as a federal civil servant, and numerous other awards.

Dr. Ken K. Munechika has been appointed Director of the Ames Research Center, Mountain View, CA. He has been serving as the Executive Director of the Office of Space Industry of the State of Hawaii. He previously held a number of key management and technical positions during a distinguished 31-year Air Force career.

Effective March 1, 1994, the Dryden Flight Research Facility will be established as a separate entity, and will no longer be a part of the Ames Research Center. **Kenneth J. Szalai**, who currently heads Dryden as a deputy director of Ames, has been appointed the new director of Dryden.

G.P. (Porter) Bridwell has been appointed Director of the Marshall Space Flight Center, Huntsville, AL. Bridwell served most recently as Deputy Manager of the Space Station Redesign Team and as a leader of the U.S.-Russian Space Station feasibility study this past summer. He has had a distinguished career with NASA since 1962. He previously served as Manager of the Shuttle Projects Office.

Donald J. Campbell has been appointed Director of the Lewis Research Center, Cleveland, OH. Campbell currently serves as Director of Science and Technology in the Office of the Assistant Secretary of the Air Force for Acquisition in Washington, D.C., an appointment he has held since April 1992. He was responsible for monitoring the Air Force science and technology program.

IML-2 News from Ames Research Center

Approximately 250 members of Payload Experiment Development (PED) and Principal Investigator (PI) teams began training February 8-13, 1994 at Marshall Space Flight Center, Huntsville, Alabama, to support experiments that will fly on the second International Microgravity Laboratory mission (IML-2). The contingent from Ames Research Center's (ARC) Space Life Sciences Payloads Office included principal investigators **Dorothy Spangenberg** of the Eastern Virginia Medical School in Norfolk, who will study the effects of microgravity on *Aurelia* (jellyfish) ephyra behavior and development, and **Michael Wiederhold** of the University of Texas Health Science Center in San Antonio, who will study early development of the gravity-sensing otolith organs in newts. The other team members included Payload Manager **Christopher Maese**, Payload Scientist **Ronald L. Schaefer**, and Flight Operations Specialist **Justine Grove**.

Training is conducted at the Payload Operations Control Center to familiarize PED and PI teams in communicating with the crew and Marshall Cadre team members on voice loops via the computerized Spacelab Operations Management Information System (OMIS). The OMIS systems provides the means for computer interaction among all mission team members during real-time mission operations and simulations.

The expertise of team members was tested in the first PI/Cadre simulation, which occurred on February 15-17. Marshall selected a 56-hour segment of the mission timeline that contained simulated malfunctions to force contingency planning. The simulation also provided an opportunity for the ARC PIs to meet with their international PED teams to receive hardware and experiment status, as well as allowing the PIs to interact with all the personnel who will be responsible for monitoring their respective experiments inflight.

Three more simulations, the last two of which will include Johnson Space Center, are scheduled before IML-2 flies. IML-2 is currently scheduled to launch aboard Columbia on STS-65 on July 8, 1994.

Ronald L. Schaefer, Lockheed Engineering & Sciences Co., Space Life Sciences Payloads Office, NASA Ames Research Center

NASA's Life Support Technologies Combined within Life and Biomedical Sciences and Applications Division

NASA's advanced life support programs have been consolidated into a single organization within the Office of Life and Microgravity Sciences and Applications (OLMSA). The Physical/Chemical Life Support System Program and the Extravehicular Activity (EVA) Systems Program have been transferred from the Office of Advanced Concepts and Technology to the Life and Biomedical Sciences and Applications Division (LBSAD) within the OLMSA. The Controlled Ecological Life Support System (CELSS) Program, which already resides in the LBSAD and concentrates on developing a bioregenerative life support system, will also be merged into the new organization.

For the first time, all activities concerned with the human element of missions beyond Earth orbit, both intravehicular activity and EVA systems, will be concentrated in the same Headquarters office. Dr. **Guy C. Fogleman** is Acting Chief of the newly created Environmental Systems and Technology Branch, with Dr. **Mel Averner** managing the Advanced Life Support (ALS) Program.

The overall purpose of bringing the programs under a single organization aegis, Dr. Averner explains, is "to create an integral program rather than an integrated one, so that all aspects of advanced life support can be consolidated, prioritized, and implemented in a seamless manner. A consolidated program will also allow a 'unified' advocacy within the Agency." He added that the consolidation should fill present technology gaps in the program and eliminate duplication.

The new ALS program plan calls for technology development from conception through ground and/or flight validation of engineering

prototypes. Elements of space medicine, human factors, basic research, and engineering will be combined in a synergistic research and technology development effort. Along with providing air, water, and food on spacecraft, the concept of life support addresses habitability and environmental health issues, such as fire suppression and safety, thermal control, radiation protection, and noise reduction.

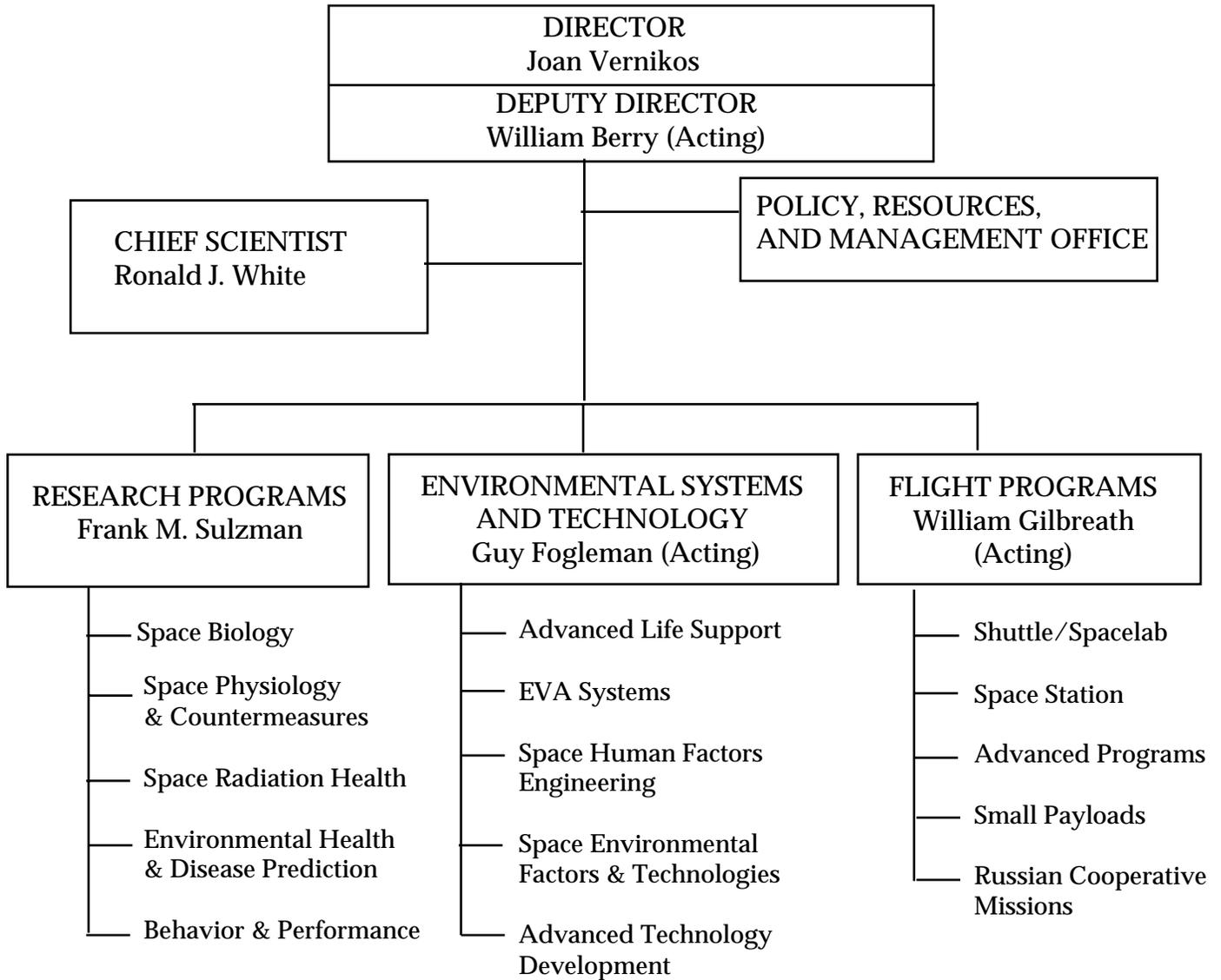
New technologies will be required for air revitalization, water reclamation, solid waste management, contaminant control, and food production. Regeneration and self-sufficiency are among the principal guiding concepts for future in-space technologies. The ALS goal is to integrate all program elements into autonomous, cost-effective systems that operate with absolute reliability over long periods of time.

NASA will be examining life support technologies that could come into use over the next 30 years—from Space Station to the first human missions to Mars. "The intent of this long view," Dr. Averner said, "is to seek near-term benefits and accomplish near-term goals while keeping the door open for missions of exploration..."

The concept of near-term benefits involves the transfer of advanced technologies that promote economic competitiveness, quality-of-life improvements, and environmental management to the private sector. The ALS Program calls for mechanisms to smooth the transition from research to application, both within and outside NASA. There is enormous potential for utilizing in-space life support technologies on Earth—in agriculture, water purification, waste processing, and protection from hazardous environments.

Excerpts from *NASA Space Life Sciences Newsletter*
Fall 1993

NASA Life and Biomedical Sciences and Applications Division



February 1994

Life Sciences News from Kennedy Space Center

Breadboard Project Activities

During 1993, the KSC-CELSS Breadboard Project continued to evaluate the feasibility of a large-scale bioregenerative system. Three separate growouts were conducted in the Biomass Production Chamber (BPC) with wheat, potato, and lettuce. The recently completed lettuce growout tested the effects of nutrient recycling by growing plants on the effluent from an aerobic bioreactor containing inedible wheat residue. Ancillary plant growth studies examined 1) nutrient recycling with wheat and potato, 2) storage root formation in sweet potato, 3) cultivar comparisons in soybean, and 4) photoperiod and light intensity effects on white potato.

The resource recovery research group developed and operated the aerobic bioreactors used in all of the plant nutrient recycling studies, including a large scale aerobic reactor for use with BPC studies. In addition, work began on aerobic biological conversion of inedible plant material. Analysis of volatile trace gases, including ethylene, were an important component of all the BPC growouts. Work continued on development of rapid methods for monitoring microbial communities both in plant growth and waste recycling systems.

Research in 1994 will focus on evaluating long-term plant growth using continuous production and nutrient recycling in the BPC. Work will continue on developing alternative approaches for waste recycling, including secondary production of alternative food sources using fish or single cell protein. Mixed cropping on common nutrient solutions will also be started.

Plant Space Biology

Dr. **Howard Levine** has joined the Plant Space Biology Laboratory from the State University of New York at Stony Brook. He adds a valuable dimension of flight development experience to the research. Dr. Levine worked with Dr. **Abraham D. Krikorian** on the CHROMEX-01, -02, and -04 spaceflight experiments.

Research efforts include studying the impact of gravity, microgravity, and spaceflight environmental conditions on plant metabolism and gene expression. Studies also continue on the porous tube plant nutrient delivery system — The Microgravity Plant Nutrient Experiment—which has been manifested for STS-73 in September 1995, and on the possible use of light emitting diodes as an illumination source for space-based plant culture systems.

Flight Experiment Support

The KSC Life Sciences Payload Group is preparing for four flights in the summer of 1994.

- **PEMBSIS**—The Proembryogenesis in Space Experiment is manifested aboard IML-2 (launch scheduled for July 8). Dr. **Abraham Krikorian** (SUNY-Stony Brook) will be investigating carrot cell development in spaceflight using NASDA (National Space Development Agency of Japan) hardware.

- **BRIC-01**—Biological Research in Canisters-01 is the first flight of this series of simple, passive payloads. It is scheduled for launch aboard STS-68 in August. Dr. **Dora Hayes** (US Department of Agriculture) will employ this system to investigate the effects of spaceflight on diapause in gypsy moth larvae.

- **CHROMEX-05**—Chromosome Development in Space-05 will use the Plant Growth Unit to investigate spaceflight effects on plant development. It is scheduled for launch aboard STS-68 in August. Dr. **Mary Musgrave** (Louisiana State University) is the investigator for this experiment.

- **BRIC-02**—Biological Research in Canisters-02 is manifested to fly aboard STS-64 in September. The investigator for this experiment is Dr. **Bob Conger** (University of Tennessee).

Tom Dreschel
Kennedy Space Center



Millie Hughes-Fulford and Marc Tischler



Bob Phillips and Cary Mitchell

**ASGSB
Reception on the Hill
October 21, 1993**

The ASGSB Reception on the Hill was held in the Cannon Caucus Room on the evening of October 21, after a full day of visits to Congressmembers by ASGSB teams. The reception was sponsored in part by Boeing Defense & Space in Huntsville, AL and McDonnell Douglas, Huntington Beach, CA.



Michael Wiederhold, Frank Paris, and Martin Schreiberman



*Clifford Gabriel, AIBS Executive Director
and Don Beem, ASGSB Executive Director*



ASGSB Student Members



Brian Spooner and Marc Tischler

1993 ASGSB Annual Meeting



Joan Vernikos, Director of NASA's Life and Biomedical Sciences & Applications Division

Attendance at the ninth annual meeting of the ASGSB was among the highest and most diverse ever! Two hundred and forty people participated in the meeting and over 160 poster presentations were made. The opening night "Reception on the Hill" in the Cannon Caucus Room provided the opportunity for meeting participants and others, such as congressional staffers, to drop in and learn more about our society.

The meeting opened with presentations by **Harry Holloway**, NASA Associate Administrator of the Office of Life and Microgravity Sciences and Applications; **Joan Vernikos**, Director of the Life and Biomedical Sciences and Applications Division; and **Marty Kress**, Deputy Director of Space Station.

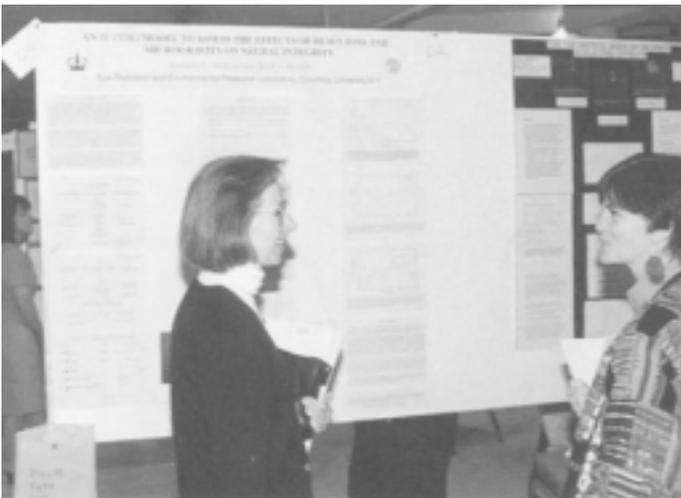
A highlight of this meeting was the ASGSB member visits to Congress. Member teams were formed and visits targeted new congressmembers who had not decided their positions regarding NASA and representatives and senators on key Congressional committees. **Cary Mitchell** and **Bob Phillips** coordinated this effort and report on this successful endeavor on page 4.



Bethney Ward explains Spaceline, a NASA-NLM collaborative database, to Norman Lewis. Spaceline will be available in late 1995.



Betty Musacchia, Sue Beem, and Johniece Brooks



1993 ASGSB Annual Meeting



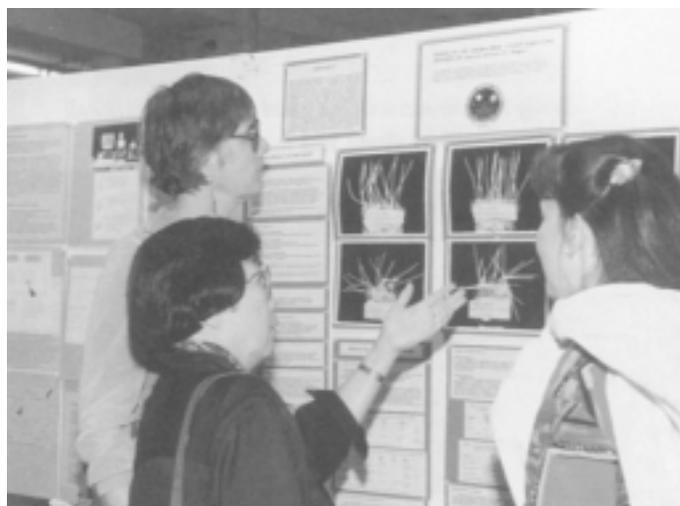
Melanie Mankamyer shows Allan Brown McDonnell Douglas' life sciences developments



Marian Lewis explains her poster

Two excellent symposia were conducted—"Gene Expression and Mutation" and "The Extracellular Matrix." Concurrent animal and plant oral scientific sessions were also held—"Animal Flight Results," "Animal Ground Results," "Plant Ground Results," "Plant Flight Results," "Plant Physiology," "Animal Physiology," and "Cell Biology." In addition, poster sessions were held on the topics: Animal Physiology and Gravity Sensing; Animal Structural Systems and Muscle Physiology; Biotechnology/Instrumentation; Cell Biology; Plant Development, Growth and Genetics; Plant Gravity Perception; Controlled Ecological Life Support Systems; and Spaceflight Experiment Results.

Student competition was also held in concurrent poster sessions on "Plants/Biotechnology" and "Animals."



Barbara Pickard (left) and Jane Shen-Miller (center)



Kennedy Space Center's Biomass Production Chamber



1993 ASGSB



Emily Holton receives the gavel from Cary Mitchell

Cary Mitchell, outgoing ASGSB President, welcomed everyone to the 1993 ASGSB business meeting at the Hyatt Regency Crystal City, Virginia.

The ASGSB *Founders Award*, for distinguished contributions to the science of gravitational and space biology, was presented to **Abraham D. Krikorian**, Professor of Biochemistry at the State University of New York at Stony Brook. Abe played a major role in the founding of the ASGSB in 1984, and has served as President of the Society.

The *Orr E. Reynolds Distinguished Service Award* was presented to **Pat Russell**, to honor her years of distinguished service to the Society. Our successful annual meetings, especially the fun parts, are the result of Pat's great organizational skills!

Cary Mitchell described plans for the 1994 meeting, which will begin on October 20 at the Holiday Inn Union Square in San Francisco. Symposia topics in the works include effects of gravity on selected systems, molecular basis of plant gravitropic response, and cellular basis of communication. An optional tour of Ames Research Center is planned for October 19 before the meeting and a NASA-sponsored SLS-2 flight results symposium is scheduled for October 24, for those who can stay after the meeting.

Secretary-Treasurer **Peter Kaufman** announced the results of the ASGSB President-Elect and Governing Board member elections, which were held during the business meeting. **Stanley Roux** was elected President-Elect by the ASGSB members attending the meeting. Elected to the Board for three-year terms were **Dan Cosgrove**, **Mary Musgrave**, and **Marian Lewis**. Continuing on the Board until Fall 1994 will be **Jay Buckey**, **Keith Cowing**, **Dorothy Spangenberg**, and **Gerald Sonnenfeld**. **Millie Hughes-Fulford** and **Brian Spooner** will serve until Fall 1995.

Cary Mitchell summarized the business of the Governing Board meeting. Future growth possibilities for



Business Meeting

ASGSB include reaching out to the biomedical community and getting NSCORTs and contractors involved. **Don Beem** has been charged with looking into the possibilities of earning more interest on our funds. **Tom Scott** has been appointed as the ASGSB representative to the AIBS, with **Bob Phillips** serving as alternate. The Education Committee will be setting up a display booth at the 1994 meeting with books, brochures, and videos. The Committee may be able to make an ASGSB video to be distributed to schools and universities on space life sciences. The 1996 ASGSB annual meeting will go back to Cocoa Beach; the 1988 annual meeting was held there with great success. The ASGSB committees are now required to meet at least once a year. The Program Committee will make sure that rooms are available for committee meetings during the annual meeting, and committee members will be informed of their committee's meeting at least one month in advance.

Cary proceeded to talk about his year as ASGSB President. *Advocacy* was his most important job. NASA is always in the public eye—both the good and the bad. We have to help NASA help us—*educating* through newspaper interviews, CNN, PBS, and visits to congress. Our member visits to Capitol Hill were very successful. Even though our visit with Congressman Roemer (Indiana) won't change his mind about Space Station, he was very interested in Earth benefits and spin-offs from space research. Mitchell concluded with passing the gavel to **Emily Holton**, 1993-94 ASGSB President.

Emily emphasized that we should work with all space agencies to maximize opportunities. We need to do meaningful science—flexible science to make changes when necessary—expect the unexpected—have patience (it took 15 years to get SLS-2 off the ground)—and have a sense of humor. We can work together—being aggressive and proactive—to accomplish our goals!



Stan Roux and Emily Holton



ASGSB Past, Present, and Future

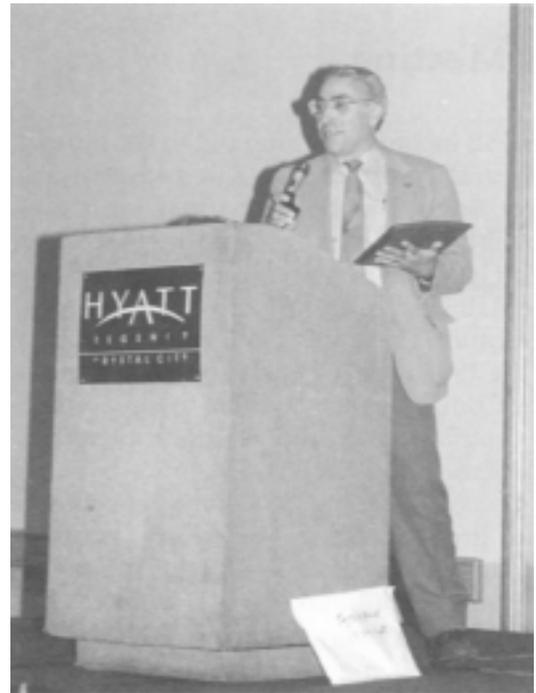


Bob and Nancy Phillips and Pat Russell



Pat Russell (right) receives her Orr E. Reynolds Distinguished Service Award from Cary Mitchell

**1993
ASGSB
Awards**



Abe Krikorian receives the 1993 Founders Award

Founders Award
Abraham D. Krikorian

Orr E. Reynolds Distinguished Service Award
Patricia Russell

Outstanding Student Awards

Animal Studies

First Place: Jason Armstrong

Second Place: David Chang

Honorable Mention: Mike Voorhees

Plant/Biotechnology Studies

First Place: Emmanuel Hilaire

Second Place: Nicole Gerber

Honorable Mention: Tracy Ohler



Student Award Winners Tracy Ohler, Mike Voorhees, Nicole Gerber, Emmanuel Hilaire, and Jason Armstrong (not pictured—David Chang)

Student Awards at 1993 Annual Meeting

Once again the students excelled in the Student Competition. Thirty-five students competed in the revised poster presentation format of two concurrent sessions, "Plants/Biotechnology Studies" and "Animal Studies."

Martin Marietta Services, Inc. in Moffett Field, California, sponsored the student awards this year, with **Marianne Steele** presenting the awards. **Jason Armstrong** (Kansas State University) was the winner in the Animals session for his paper entitled "Effect of antiorthostatic suspension on bone marrow macrophage development." Armstrong also won the Student Competition last year.

In the Plants/Biotechnology session, **Emmanuel Hilaire** (Kansas State University) won top honors for his presentation on "Effects of clinostat rotation and microgravity on sweet clover columella cells treated with cytochalasin D." Each received a certificate and check for \$100.

In the Animals session, second place honors were awarded to **David Chang** (NASA Ames Research Center) for "Cutaneous microvascular flow in the foot during Earth, Mars, Moon, and microgravities." He received \$50 and a certificate. Honorable Mention was awarded to Mike Voorhees (University of Colorado) for "Microgravitationally and thermally induced metabolic acceleration in the miniature wasp *Spalangia endius*."

Second place honors in the Plants/Biotechnology session went to **Nicole Gerber** (SUNY Buffalo) for the presentation on "Alterations in the gravity vector modify differentiation of *Chara australis* rhizoids." She received a certificate and \$50 check. Honorable Mention was awarded to **Tracy Ohler** (Purdue University) for "Manipulation of harvest parameters to optimize yield rate and harvest index of cowpea for use in a bioregenerative life support system."



Marianne Steele presents 2nd Place Plants/Biotechnology Award to Nicole Gerber



ASGSB Financial and Membership Report
October 22, 1993
Arlington, Virginia

Funds

Cash balance through 9/30/93	\$106,580.59
Interest income through 9/30/93	<u>1,503.11</u>
Cash balance 9/30/93	\$108,083.70
Cash deposits October 1-11, 1993	<u>10,831.00</u>
Cash balance 10/11/93	\$118,914.70

Membership

Membership in the Society has the potential of 520 members. Through October 15, 1993, there are 409 active members, 90 inactive members, and 21 newly approved members.

The member categories and numbers are:

<u>1993 Members ('93 dues paid)</u>	<u>1992 Members ('93 dues not yet paid)</u>	<u>Approved Members (approved but dues not paid)</u>
Members 350	Members 61	Members 18
Student Members 50	Student Members 29	Student Members 3
<u>Emeritus Members 9</u>	<u>Emeritus Members 0</u>	<u>Student Members 3</u>
Total 409	Total 90	Total 21

Total Number of Records 520*

Membership statistics for past years are:

<u>Category</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993**</u>
Member	198	260	274	343	302	341	328	350
Student	23	26	40	61	36	57	59	50
Emeritus	-	-	3	3	4	6	6	9
Inactive member	10	11	31	3	105	83	102	61
Inactive student	1	0	6	4	29	19	27	29
Inactive emeritus	-	-	-	-	-	-	1	-
New member	5	7	16	22	19	2	7	18
<u>New student</u>	<u>2</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>2</u>	<u>1</u>	<u>3</u>
Potential	239	309	373	440	500	510	531	520

* Potential membership if all '92 renew and all new pay '93 dues

** To date

Donald R. Beem
 Executive Director, ASGSB

ASGSB In the News

Carolyn Huntoon has been appointed Director of NASA's Johnson Space Center in Houston. She previously served there as Director of Space and Life Sciences. See article on page 5.

Joan Vernikos (Director, NASA Life and Biomedical Sciences and Applications Division, Washington, DC) and **Dolores O'Hara** (NASA Ames Research Center) were presented the *1994 Jeffries Medical Research Award* by the American Institute of Aeronautics and Astronautics. The award was given to Vernikos and O'Hara for outstanding contributions to the advancement of aerospace medical research using head-down bedrest to understand the mechanisms of prolonged exposure to microgravity.

Scott Parazynski has been selected as mission specialist on STS-66, the third Atmospheric Laboratory for Applications and Science (ATLAS-03). It is scheduled to fly in Fall 1994 aboard the shuttle Atlantis. Parazynski received his doctorate in medicine from Stanford Medical School and was selected for the astronaut corps in March 1992.

Gerald Sonnenfeld has relocated from the University of Louisville to North Carolina as Director of Research Immunology and Senior Scientist at the Carolinas Medical Center in Charlotte. The NASA Space Biology Research Associates Program has moved with him, and he continues to serve as Director of the Program. **Linda Barber** continues to serve as Project Coordinator.

Howard Levine is now in the Plant Space Biology Laboratory at Kennedy Space Center after working many years with **Abe Krikorian** at the State University of New York at Stony Brook.

Earl H. Wood has returned to the Mayo Clinic, Rochester, Minnesota, after 8 months of work on the human centrifuge at the Defence and Civil Institute of Environmental Medicine, Toronto, Canada.

During July 1993, **Andreas Sievers** (Botanisches Institut, Bonn, Germany) was selected as a member of the Deutsche Akademie der Naturforscher Leopoldina. The "Leopoldina," as the academy is called, was founded in 1652 and had the famous name "Sacri Romani Imperii Academia Caesarea Leopoldino-Carolina Naturae Curiosorum" until the 19th century.

V. Reggie Edgerton (UCLA) received the *1993 Space Life Sciences Lecture Award* from the American Physiological Society.

Brian Masterson accepted a position as Mental Health Director for Solid Organ Transplantation and Staff Physician, Department of General Internal Medicine, Wilford Hall Medical Center, San Antonio, TX, after completing his residency in internal medicine and psychiatry at the University of Iowa Hospitals. Masterson was recognized as a Distinguished Graduate of the US Air Force Flight Surgeon School, Brooks AFB, Texas.

Kathleen O'Hagan has moved from the Medical College of Wisconsin to the Department of Physiology at Midwestern University, Downers Grove, Illinois.

Victor Convertino is now with the Armstrong Laboratory at Brooks Air Force Base, Texas. He was formerly at the Kennedy Space Center, Florida.

At the 1993 Annual Meeting of the Aerospace Medical Association in Toronto, Canada, **Roberta Bondar** (Canadian Space Agency) received the *28th Annual Harry G. Armstrong Lecture Award*. She gave the annual Armstrong Lecture on "Space-Qualified Humans—The High Five."

Laurie Anne Aten has joined the Medical Operations and Research Branch at NASA Johnson Space Center in Houston. She serves as the Senior Environmental Health Scientist. She was Acting Director of the Consortium for Space Life Sciences at the University of Alabama, Huntsville.

Opportunities

Changes in Life and Biomedical Sciences and Applications Division Proposal Submissions

NASA Research Announcement (NRA) 93-OLMSA-07 was released in December to solicit proposals to participate in Ground-Based and Small Payloads Research in Space Life Sciences. This is a broad-based announcement that solicits research proposals for all of the major programs of the Life and Biomedical Sciences and Applications Division. The specific programs (and their Science Program Managers) included are Space Physiology and Countermeasures (Dr. F.M. Sulzman), Space Biology (Dr. T. Halstead), Environmental Health (Dr. G. Fogleman), Space Radiation Health (Dr. F.M. Sulzman), Space Human Factors and Engineering (Dr. G. Fogleman), Advanced Life Support (Dr. M. Averner), Advanced Technology Development (Dr. G. Fogleman), Data Analysis (Dr. R.J. White), and Small Payloads Program (Ms. C.M. Martin). The announcement will be the primary solicitation used to obtain proposals that will be funded during Fiscal Year 1995 either for new research or for the continuation of research beyond the term specified in a previously funded proposal.

This is a departure from past practice, in that previous research acquisitions in the space life sciences research areas were primarily through the acceptance and evaluation of investigator-initiated unsolicited proposals. Instead, it is planned to update and reissue this NRA on an annual basis and to use this mechanism for determining funding in any of the Division's program areas. In general, unsolicited proposals will be held until the next annual review period.

A Letter of Intent is requested by March 1, 1994; however, proposals may be submitted at any time up to **April 29, 1994**. Further information may be obtained from the appropriate Science Program Manager noted above at the following address: UL/Life and Biomedical Sciences and Applications Division, NASA Headquarters, 300 E Street SW, Washington, DC 20546; phone 202-358-2530, fax 202-358-4168.

NRC Associateship Programs

The National Research Council has announced the 1994 Resident, Cooperative, and Postdoctoral Research Associateship Programs to be conducted on behalf of federal agencies or research institutions. Approximately 350 new associateships will be awarded for research in: space and planetary sciences; chemistry; earth and atmospheric sciences; engineering and applied sciences; biological, health, and behavioral sciences and biotechnology; mathematics; and physics. Most programs are open to US and non-US nationals and recent PhD degree recipients as well as senior investigators. Annual stipends range from \$30,000 to \$45,000, depending on experience and the sponsoring laboratory. Applications must be post-marked by **April 15** and **August 15, 1994**, for awards to be announced in July and November. Further information and application materials may be obtained from the Associateship Programs (TJ 2094/D2), National Research Council, 2101 Constitution Avenue NW, Washington, DC 20418; fax (202) 334-2759.

Postdoctoral Research Positions

The Division of Biology at Kansas State University is accepting applications for postdoctoral research positions. The procedure requires an initial submission of letter of application, curriculum vitae, statement of research interests and career goals, transcripts from graduate training, and three letters of reference (including major professor). For further information or to apply, contact: The Center for Gravitational Studies in Cellular and Developmental Biology, Kansas State University, Division of Biology, Ackert Hall, Manhattan, KS 66506-4901.

Life Sciences Calendar

- April 24-29, 1994 *Experimental Biology '94* (78th Annual Meeting of the Federation of American Societies for Experimental Biology), Anaheim, CA. Further information: FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814. (301) 530-7010.
- May 3-5, 1994 *American Institute of Aeronautics and Astronautics (AIAA) Annual Meeting and International Aerospace Exhibit*, Crystal City, VA. Further information: AIAA Meetings Department, 370 L'Enfant Promenade SW, Washington, DC 20024. (202) 646-7463.
- May 8-12, 1994 *65th Annual Scientific Meeting of the Aerospace Medical Association*, San Antonio, TX. Further information: Aerospace Medical Association, 320 S. Henry Street, Alexandria, VA 22314. Fax: (703) 739-9652.
- May 15-24, 1994 *19th International Symposium on Space Technology and Science*, Yokohama, Japan. Further information: H. Sakurai, 19th ISTS Secretariat, c/o Institute of Space and Astronautical Science, 6-1, Komaba 4-chome, Meguro-ku, Tokyo 153, Japan.
- May 19-20, 1994 *Spacebound '94*, Montreal, Canada. Further information: Michelle Marsh, (514) 926-4782; fax (514) 926-4766.
- May 20-22, 1994 *Twelfth Annual Southwestern Developmental Biology Conference*, Houston, TX. Further information: P. Jackie Duke, Department of Craniofacial Growth and Development, P.O. Box 20068, Houston, TX 77225. (713) 794-1082; fax (713) 794-1861.
- May 27-30, 1994 *13th Annual International Space Development Conference (ISDC)*, Toronto, Canada. Further information: National Space Society Headquarters, (202) 543-1900 or Canadian Space Society, (416) 626-0505.
- June 19-24, 1994 *4th International Congress of Plant Molecular Biology*, Amsterdam, The Netherlands. Further information: Secretariat 4th ICPMB, c/o RAI Organisatie Bureau Amsterdam by Europaplein 12, 1078 GZ Amsterdam, The Netherlands. 31-20-549-1212; fax 31-20-646-4469.
- June 20-23, 1994 *24th Annual International Conference on Environmental Systems (ICES)* of the Society of Automotive Engineers (SAE), Friedrichshafen, Germany. Further information: Reginald Machell, (713) 244-4098.
- July 17-22, 1994 *Gordon Research Conference on Gravitational Effects on Living Systems*, New London, NH. Further information: Stan Roux, Department of Botany, University of Texas, Austin, TX 78713. (512) 471-4238; fax (512) 471-3878.
- July 30-August 3, 1994 *1994 American Society of Plant Physiologists (ASPP) Annual Meeting*, Portland, OR. Further information: ASPP 1992 Annual Meeting, 15501 Monona Drive, Rockville, MD 20855. (301) 251-0560.
- September 26-29, 1994 *42nd International Congress of International Academy of Aviation and Space Medicine*, New Delhi, India. Further information: Secretariat, 42nd ICASM, Air Force Central Medical Establishment, Subroto Park, New Delhi 110 010, India.
- September 27-29, 1994 *1994 AIAA Space Programs and Technologies Conference*, Huntsville, AL. Further information: AIAA, 370 L'Enfant Promenade SW, Washington, DC 20024. (202) 646-7451.
- October 5-8, 1994 *American Physiological Society Conference: Mechanotransduction and the Regulation of Growth and Differentiation*, Sarasota, FL. Further information: APS Conference Office, 9650 Rockville Pike, Bethesda, MD 20814. (301) 530-7165.
- October 9-14, 1994 *45th International Astronautical Federation Congress*, Jerusalem, Israel. Further information: Mireille Gerard, (202) 646-7563.
- October 20-23, 1994** ***Tenth Annual Meeting of the American Society for Gravitational and Space Biology (ASGSB)*, San Francisco, CA. Further information: D. Beem, Executive Director, ASGSB, P.O. Box 12247, Rosslyn, VA 22219. (202) 628-1500.**
- November 13-18, 1994 *24th Annual Meeting of the Society for Neuroscience*, Miami, FL. Further information: Society for Neuroscience, 11 Dupont Circle NW, Suite 500, Washington, DC 20036.
- January 9-12, 1995 *33rd AIAA Aerospace Sciences Meeting and Exhibit*, Reno, NV. Further information: AIAA Meetings Department, 370 L'Enfant Promenade SW, Washington, DC 20024. (202) 646-7463.

**APPLICATION FOR MEMBERSHIP
AMERICAN SOCIETY FOR GRAVITATIONAL AND SPACE BIOLOGY**

NAME _____

POSITION/AFFILIATION _____

ADDRESS _____

PHONE: (VOICE) _____ (FAX) _____ (EMAIL) _____

TYPE OF MEMBERSHIP _____ MEMBER (\$48)

APPLIED FOR: _____ STUDENT MEMBER (\$20)

(PAYMENT WITH CREDIT CARD REQUIRES AN ADDITIONAL \$2.00)

DUES SHOULD NOT BE SUBMITTED WITH THE APPLICATION FOR MEMBERSHIP.
DUES WILL BE ASSESSED UPON ACCEPTANCE INTO THE SOCIETY.

QUALIFICATIONS (EDUCATION/RESEARCH EXPERIENCE) _____

SPECIAL INTERESTS _____

SIGNATURE _____ DATE _____

CRITERIA FOR MEMBERSHIP:

Members: Experience and education in Society-related research areas.

- Doctorate
- Masters with 2 years experience
- Bachelors with 4 years experience

Student Members: College student actively enrolled in an academic curriculum leading toward a career related to the Society's purposes.

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AND SPACE BIOLOGY
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