Invitation to the 2005 ASGSB Annual Meeting

Dear Friends and Colleagues:

ASGSB will be holding its 2005 annual meeting in Reno, Nevada on November 1-4. The preliminary program is printed in this newsletter (p. 9), but here I would like to emphasize some of its features.

You will note that our symposia are based on the President’s vision for space exploration, and its associated problems will be the focus of space-based research for the foreseeable future! In pursuit of this vision, several questions arise. For example, for long duration flight, what is the most appropriate technology to be employed for advanced life support? Which medical problems are

(continued on p. 2)
of the greatest concern and have the potential to inhibit long duration human presence in space? When we reach Mars, how will we live there? Could we alter the planet in ways, which would support long-term habitation? We hope these symposia will provide a foundation for new thought and new research ideas.

Lunch meetings are planned to provide you with new information that you cannot get anywhere else. First, we are planning to have a Q&A session with a representative from NASA to discuss the events of the last year. All questions will be on the table and open for discussion. Second, we are planning a lunchtime session entitled “Alternative sponsorship for basic plant gravitational biology.” Our thoughts are to have representatives from NSF, USDA, and perhaps DOE, to give briefings on their programs relevant to our members in this area.

As you can see, we have packed a lot of science into a few days, but there will always be time to enjoy some of Reno’s unique offerings. Our banquet will be held at the Harrahs Automotive Museum. The Hilton Hotel in Reno is a new, modern hotel with a pleasant staff and excellent meeting and banquet accommodations. There are 9 distinct restaurants located in the hotel, as well as a casino. The Sierra Nevada Mountains will be looming off to the west, and they may be covered in snow. Lake Tahoe, one of the emerald jewels of the West, is just up the hill from Reno, about a forty-minute drive. It will be a beautiful time to be in Reno and we look forward to helping you fully enjoy your visit.

Chuck Fuller
Program Chair
2005 ASGSB Annual Meeting

Housing Information

The 21st ASGSB annual meeting will be held at the Reno Hilton in Reno, Nevada. Meeting dates are Tuesday, November 1, 2005 through Friday, November 4, 2005. The hotel is offering the exceptional room rate of $79.00 plus tax per night. The cost per extra person per room will be $10.

You can find the hotel web site under “Reno Hilton” (http://www.caesars.com/Hilton/Reno/Hotel/). It is in the shadow of the Sierra Nevada mountains and is located near the Reno/Tahoe International Airport which all major airlines serve, and is a short drive from Lake Tahoe. Nine restaurants are located in the hotel.

Reno Hilton
2500 East Second Street
Reno, Nevada 89595
1-800-501-2651; 775-789-2000

Make your reservations directly with the hotel by October 2, 2005. Rates and availability cannot be guaranteed after that date.

For information on Reno and surrounding areas, check out Reno through their visitor web site: http://www.cityofreno.com/vis/.

Student Travel Awards

ASGSB Student Travel Award Opportunity

This year the ASGSB has again received funding to support student travel stipend awards. The 2005 Program Committee encourages students who would like to present a poster at this year’s meeting in Reno to apply for this support.

Applications are welcome from both graduate and undergraduate students. Individual awards will be $250, and will be presented by check at registration. Students will be notified of their award status by August 22nd in order to meet early registration deadlines for the meeting.

To apply, check the appropriate box on the student poster abstract submission form on the ASGSB website.
NASA’s bold exploration efforts have created both opportunities and challenges for space biologists in the United States and abroad. As a result, the Exploration Life and Medical Sciences (ELMS) Coalition has been formed to actively engage the scientific community and supporters in the public policy process.

The ELMS Coalition is broadly inclusive: its founding organizations are composed of life science organizations representing scientists from the US and other countries, space entrepreneurs, and public advocates. Founding organizations are the American Society for Gravitational and Space Biology (ASGSB), American Institute of Aeronautics & Astronautics (AIAA) Life Science Technical Committee, Aerospace Medical Association (AsMA), and American Society of Plant Biologists (ASPB). The combined grassroots membership of the new coalition now numbers over 10,000. Other organizations have expressed interest in joining.

According to Dr. Chris Brown, President of the American Society for Gravitational and Space Biology, “the Vision for Space Exploration is exciting and it is exactly what NASA should be doing. However, we must make sure that the agency supports the basic biological research that is foundational to its long-term success and sustainability.”

The ELMS Coalition’s central focus for 2005 is to assure the realization of the national vision to complete and utilize the International Space Station (ISS) for space biology research.

Dr. Russell Rayman, M.D., Director of the Aerospace Medical Association, notes, “if we are to ensure the safety of our astronauts on long duration missions, it is essential that we have effective countermeasures as well as an autonomous system of in-flight medical care. These will require an aggressive and well-funded research program.”

In addition, ELMS supports a return on the taxpayer investment in ISS, via medical benefits for the public. According to Kathleen Connell, incoming Chair of the American Institute of Aeronautics and Astronautics Life Sciences Technical Committee, “the biotechnology revolution can now be taken into space, and may provide new insights into medical issues confronting the earth’s population. We have a national opportunity to return new knowledge that may help solve both space exploration and terrestrial challenges. The completion of the Centrifuge Accommodation Module (CAM) will provide a facility that the research community and biotech industry can utilize to generate new insights into human health from space.”

Leading space biology systems experts, concerned with the need for space exploration sustainability, have also joined the ELMS coalition. Dr. Roger Hangarter, President, American Society of Plant Biologists, emphasizes that, “it is critical for us to maintain a lead in biology research since it yields many of the scientific discoveries that are essential to the core of our economic growth and for enhancing Americans’ quality of life. Moreover, long-term human missions in space cannot afford to proceed without understanding the impact of the space environment on the biology of astronauts and the plants needed to sustain them.”

ELMS founding members recognize the importance of creative entrepreneurship, which helps drive mission-enabling space biology research and technology. According to Tom Crabb, Co-Founder of ORBITEC, “small business technology development and innovation has been a flagship in providing necessary capabilities in space and for the International Space Station, particularly in the safe and controlled management of biological specimens and controlled environment systems.

NASA’s small business commercialization activities from the Small Business Innovative Research program provide unique biological test capabilities. This technology is pivotal to investigating and resolving human health issues for the Vision for Exploration.”

ELMS supporters are not only finding their voice in Washington and in the states, but are also listening carefully to Congress and NASA. Leaders in Congress have become watchful of science on the space station. At a recent hearing of the Senate Commerce and Space Sub-Committee, Senator Kay Bailey Hutchinson (R-TX) and Senator Bill Nelson (D-FL) both made it clear that maintaining scientific research on the station should be a priority. Senator Hutchinson also proposed turning the space station, ISS, into a Federal Laboratory. Others in the Senate have also expressed their interest in maintaining ISS as a space biology research platform. Senator Diane Feinstein (D-CA) offers this view: “Many fundamental questions remain concerning the human health and physiological impacts of long-term space travel. The ISS is an invaluable tool in facilitating this nation’s lead in space life sciences research, and provides the actual

(continued on next page)
ISS: An Extraordinary Environment for Research

by Allen Wessels

* Reprinted with permission from the April 18, 2005 issue of Space News.

Does anyone know why we would spend $30 billion (so far) to build the international space station (ISS), then cancel all the U.S. programs that might want to use it? When I asked these questions of my friends in NASA, those that didn’t immediately try to change the subject mumbled something about needing the money for exploration and implementation of the president’s vision - then quickly talked about something else. This was so entertaining that I decided to press further.

I recently learned that the ISS user programs that NASA’s Exploration Mission Systems Directorate (ESMD) have cut include Space Biology - whose spinoffs in microelectromechanical systems alone would pay for the Mars Exploration Program - and Cellular Biotechnology, which sponsored discoveries on Mir and shuttle that piqued the interest of at least three Nobel Prize winners. These are the programs that were supposed to bring the biotech revolution to space.

But, hey - aside from transforming the biological sciences on Earth and spawning an extraordinary series of life-saving and wealth-generating products in an incredibly short period of time - what good is the biotech revolution?

Well, you might want to use the tools from the biotech revolution in space to confirm data suggesting that long-duration space flight provides important insights on the aging process. In her new book, “The G-Connection: Harness Gravity and Reverse Aging,” world class researcher Joan Vernikos points out very convincingly that space research, especially long-duration research on animals on the ISS, can accelerate advances to let us live longer, healthier lives. I don’t know about you, but that sounds pretty interesting to me.

The demographic is aging. NASA is answerable to a constituency marked by experience and time on their hands to express highly motivated concerns about health and quality of life as they age. We will want answers and will not be sympathetic to politicians who failed to plant the seeds for the breakthroughs that could help us live longer and better.

I’ll be nearing retirement about the time our Mars mission is en route. I’ll be watching, and my own health issues and quality of life will be daily reminders of the choices made today regarding space biology on the ISS. Even if the space research on aging doesn’t pan out, the extremely expensive ISS is flying right now. Shouldn’t we at least take a look before killing the capability to investigate something that could benefit so many in such an important way?

Like most non-ISS enthusiasts, I was persuaded by the kicking around that ISS got from the non-biological science community. Little did I realize at the time that the phrase uttered by those colleagues who said, “ISS science is not good science” actually meant “ISS science is not my science - gimme their money.”

So I did some homework and was fairly astonished to discover that a stellar array of Nobel laureates and world-class scientists were most interested in using the ISS for discoveries in biotech. They point out that ISS provides long-duration exposure to microgravity, an environmental force that has never been encountered in Earth’s history.

Extraordinary environments reveal extraordinary biologies, which is why top biotech companies worldwide sprint to every hellish environment on Earth to harvest the buff life forms that manage to thrive there. Revenue from these critters is in the billions of dollars and their products have saved countless lives.

Space is the unexplored country for biology, and Earth orbital space presents the extreme environment of very low gravity. Everyone who has studied it agrees that the biological responses seen in space are unique and have spawned products that more than repay the taxpayers’ investments over the years.

But NASA - where the biologist population is so low that they should be protected under the Endangered Species Act - apparently has decided that superiority in the space biosciences should reside in other countries. NASA is so magnanimous that it seems to be willing to empower other countries to get rich off the next generation. ELMS argues that this is a key to assuring that America remains competitive in space.

Keeping the US international space partnerships in place is also on the ELMS Agenda. Recently, JAXA, the Japanese Space Agency, expressed strong concerns about the displacement of the centrifuge and other biological research facilities on ISS, mirroring concerns of US researchers.

ELMS looks forward to opening a fresh dialog with the new NASA Administrator, Mike Griffin, about the essential role of space biology in the Exploration quest. In Chris Brown’s view, “it’s great to have a scientist like Mike Griffin leading NASA at such a critical time. He will understand that basic, exploratory research is critical in such a bold mission as putting humans onto the surface of Mars. He will also understand that we cannot afford a hiatus in support for space biology research, if we are to meet the aggressive timelines of the Vision. We are eager to work with him in defining the role of space biology within NASA.”
space station that our taxpayers have built. As one of those taxpayers, I’m having quite a bit of trouble with this notion.

On the other hand, just to show they’re no softies, NASA has dissed the Japanese by considering not bringing the centrifuge module into space. Basically this means that the device that could tell us the most about living on other worlds before we get to them - and remember we are cutting these programs so that we can live on other worlds - will not fly. Nor will there be a biolab on ISS because the centrifuge module is not a device, it is the whole biological research laboratory for the space station.

Let’s ponder this a moment. NASA is not bringing into space a device that will tell us how the most likely technology for mitigating zero gravity will function on the Mars mission?

The savings these cannibalistic program cuts will produce is miniscule compared to the financial commitments that have been made to finish the ISS, which will then achieve no productive function - at least for the United States. As my grandparents often said, that is penny-wise, pound foolish.

I guess you have to be a pretty sophisticated rocket scientist to follow the logic trail that NASA’s ESMD has blazed.

Speaking of rocket scientists in the ESMD at NASA headquarters - are there any? Some space friends and I had a scavenger hunt through the NASA headquarters organization chart to find someone in a senior decision-making capacity in ESMD who ever built or fielded a large spacecraft system. We couldn’t find any.

We could find people who had ridden in rockets in senior positions, but not those who had built them. Apparently, these personnel assignments were made with the idea that if you can buy a car or drive a car, you can direct the building of a car. Adding to the fun is that the current head of the NASA Biomedical Research Programs is a physicist. I wonder if NASA’s next move is to appoint a botanist as Chief Engineer?

But let’s move on, the fun isn’t over.
The Space Biology program (which NASA just killed) is the U.S. organization with the expertise to use animal models in space for research that is pretty important for removing the biological risks to exploration. You see, the biological barriers to human exploration of the planets reside deep in the cells and tissues of astronauts.

Not surprisingly, most astronauts resist being dissected. So if NASA doesn’t use animal models in space to understand space medicine problems, they have only noninvasive or minimally invasive techniques for resolving the biomedical issues of human exploration. This is sort of like trying to figure out why your car won’t start by staring at the hood.

Considering that NASA is about to ask for a lot of money to send people, which are living organisms, to the Moon and Mars, wouldn’t you think one of the science objectives would be to study the only life in the universe we know in its first generations on another world? After NASA goes to all that trouble (at the taxpayers expense) to build life support systems and habitats and other life-sustaining features on the Moon and Mars, wouldn’t it be good to send a few other critters up there for a few generations just to see what happens?

The cost is so miniscule in comparison to all the other costs, that the decision not to study Earth life for the first time on other worlds almost defies logic by any thinking creature. After all, it might be kind of interesting to learn what biological costs - and opportunities - are inherent in living on the Moon and Mars over life cycles and ultimately over generations. This sort of research has paid off handsomely in the past with far poorer tools than we have today. In fact, someone you love might be alive because of it.

So NASA has decided to send human animals into space but has decided not to learn how animals (which have pioneered so much of contemporary biology and medicine) live, grow and age in space? If we’re going to send people to Mars, two years away from the next medical facility, don’t we owe them the basic research over the next 20 years to establish the ground rules that life operates under in space?

At worst, we will learn unique new information about the workings of life that we most likely would not find in any other environment, and information like that has always paid off.

So, let’s see what we have to work with. There is a space station overhead for which we paid a lot. There are launch vehicles lying fallow on the ground. There is a whole laboratory of space biology research hardware bought and paid for and ready to fly and make discoveries. During the 1990s, NASA fought like a tiger against politicians who wanted to kill the ISS before the money was spent ... and NASA has decided to cancel the use of ISS now?

Here’s an idea ... let’s put it all back together, bring back the space biosciences programs, invest in the nation’s universities and research institutions, and bring the biotech revolution to space - now.

Come on NASA, provide some payback to the hardworking taxpayers who wrote the check for the ISS. Let’s get our country a piece of the sky - now. Frankly, NASA, you have a credibility problem. Who is going to believe that you can deliver an exploration program worth doing on the Moon and Mars if you can’t deliver one in low Earth orbit with all the pieces already in place now?

It isn’t enough to go there and plant the flag. If we aren’t accomplishing material goals (as opposed to political gestures and grand programs hearkening to the Kennedy-era space program), then we need to rethink things. Otherwise this is just a lot of industrial complex pork and political gravy. The taxpayer is looking for healthier fare.

Allen Wessels is a systems engineer and a member of the Silicon Valley Space Club.
Call for ASGSB Award Nominations

As we begin to anticipate the rest and relaxation that comes with summer vacations, it is time once again for our thoughts to turn to, yes—those colleagues whose contributions to the fields of gravitational and space biology and to the ASGSB deserve special note. The Awards Committee is actively soliciting from the membership at large nominations for the awards listed below. Please take a moment to review the categories, think about a deserving candidate, and send your nomination!

1. **Halstead Young Investigator Award**: This award is made to a member of the Society, generally under the age of 40, for excellence and outstanding contributions to research in microgravity life sciences and space biology. The award, established in 1994, is dedicated to Dr. Thora Halstead in recognition of the years she spent encouraging young scientists to enter Space Biology research. It is also intended to recognize in a young investigator, someone who exemplifies Thora’s drive and enthusiasm for science. Previous recipients: Jay Buckey (1994), Mary Musgrave (1995), John Kiss (1996), Edwin Miller (1997), Simon Gilroy (1998), Gloria Muday (1999), Volker Kern (2000), Brenda Klement (2001), Markus Braun (2002), David Klaus (2003), and April Ronca (2004).


The final recipients of these awards are chosen by the Awards Committee, in consultation with the current President and the Executive Director. Nominations from the Society’s membership are very strongly encouraged and may be submitted to any member of the Awards Committee or to the Executive Director. Nominations should be accompanied by the name and professional address of the candidate, along with a paragraph outlining why the candidate is particularly deserving of the award. An accompanying short *Curriculum Vitae* is helpful but not required. The most direct mechanism for submissions is by e-mail (djw3@columbia.edu) or fax (212-305-6084) to Dr. Debra Wolgemuth, Chair, Awards Committee. The deadline for receiving nominations is October 1, 2005.
Call for Papers

The American Society for Gravitational and Space Biology is pleased to issue a call for papers for its 21st Annual Meeting. The meeting will take place November 1-4, 2005 at the Reno Hilton, Reno, Nevada. A summary program may be found on page 9.

You are invited to submit an abstract electronically no later than

July 8, 2005

using one of the abstract forms found on the ASGSB website, http://www.asgsb.org. Please be sure to follow carefully the abstract submission instructions found at the website.

Abstracts will be compiled and published in a volume of Gravitational and Space Biology, to be distributed at the meeting.

TOPICS FOR ANNUAL MEETING

Advanced Life Support
Animal Development, Growth and Genetics
Animal Gravity Sensing and Neurophysiology
Animal Regulatory Physiology
Animal Structural Systems/Muscle Physiology
Astrobiology/Exobiology
Biotechnology/Instrumentation
Cell Biology
Education
Plant Development, Growth and Genetics
Plant Gravity Perception/Transduction
Plant Physiology
Space Biomedical Research
Spaceflight Experiment Results
Student Poster Competitions

The Program Committee will select from the submitted abstracts those to be included in the oral sessions. Students participating in the competitions will present their papers as POSTERS. All other abstracts are assigned to an appropriate poster session based on the authors’ selected topic areas. Abstracts scheduled for poster sessions will be assigned poster board space. The area allotted for each poster will be approximately 44" x 44" [111 cm x 111 cm].

ASGSB membership is not required for presentation of papers or posters. Due to publication deadlines, the Program Committee may be unable to include an abstract submitted later than the date indicated above.
ASGSB 2005 Meeting
Electronic Submission of Abstracts

Meeting participants are encouraged to submit their abstract for the 2005 ASGSB meeting using the electronic abstract submission system, which was implemented for the 2004 annual meeting. With this system, you will not need to email your abstract, mail disks, or FAX submission forms. The online system streamlines the submission process for you and for the Program Committee.

STEP 1: Preparation of the Abstract

The new process in the electronic submission of abstracts is designed to be convenient for members submitting abstracts and to assist the Program Committee in preparation of the program and abstract edition of *Gravitational and Space Biology*, which will be distributed at the annual meeting.

The first step of the process is to prepare your abstract. The preparation of the abstract is similar to the procedures of past years. Go to the ASGSB website

http://www.asgsb.org

and click on the link to “Electronic Submission of Abstracts,” which takes you to STEP 1. Follow carefully the instructions for preparation of the abstract, which also include information on hardcopy dimensions and a sample of a finished abstract in the boxes used for publication in the program and abstract edition of *Gravitational and Space Biology*.

STEP 2: Submission of the Abstract

Once you have prepared your abstract, you are then ready to submit it. Members and other non-student presenters should click on the “Member” button to submit your abstract. All students (graduate students, undergraduate students, and high school students) should click on the “Student” button; student poster presentations are eligible for a variety of awards. Then complete the requested information on these electronic forms.

The online form will allow the author to upload the abstract as a file from the author’s computer to the server using a file upload script built into the ASGSB webpage (a “browse” button on the form allows the author to browse their computer to find/select the file to upload; abstract would be prepared as a word processing document as in the past). For student abstracts, the scripts will automatically send an email request to the faculty sponsor for confirmation.

The Publications Committee thanks Tim Mulkey for his work on the abstract submission system.

Abstracts are due on Friday, July 8, 2005.
21st Annual Meeting

American Society for Gravitational and Space Biology
November 1-4, 2005

Preliminary Program*

Tuesday, November 1

Noon Registration Begins
7:00 p.m. Board Meeting

Wednesday, November 2

7:30 a.m. Registration Opens
8:00-8:30 a.m. Opening Remarks and Welcome
8:30 a.m.-12:30 p.m. Symposium I: Biological Advanced Life Support Systems
   Chairs: J. Kiss and C. Barnes
12:30-2:00 p.m. Lunch, ASGSB Committee Meetings
2:00-3:30 p.m. Concurrent Posters I
3:30-5:00 p.m. Concurrent Posters II
6:30-9:30 p.m. Reception

Thursday, November 3

8:30 a.m.-12:30 p.m. Symposium II: Astronaut Health: From the Bench to Flight Across the Gravity Continuum
   Chair: C. Wade
12:30-2:00 p.m. Lunch and Committee Meetings
2:00-4:00 p.m. Concurrent Oral Sessions I and II
4:00-5:30 p.m. Concurrent Posters III
6:30-9:00 p.m. Banquet
   Keynote Speaker and Business Meeting
9:30 p.m. Student Mixer

Friday, November 4

7:00-8:30 a.m. ASGSB Governing Board Meeting
8:30 a.m.-12:30 p.m. Symposium III: Planetary Biology and Terraforming
   Chair: P. Todd
12:30-1:30 p.m. Lunch
1:30-3:30 p.m. Concurrent Oral Sessions III and IV
3:30-5:30 p.m. Concurrent Posters IV

*Note: Workshops and other events may be added.
   Among those being planned, with dates to be arranged, are:
   1) Luncheon with NASA Headquarters. Informal question and answer period.
   2) Luncheon session on alternative sponsorship for basic plant gravitational biology research.

Check for updates at http://www.asgsb.org
21st ASGSB Annual Meeting Registration Form
November 1–4, 2005, Reno, Nevada

Name (for badge): ________________________________________________________________________

Affiliation (for badge; up to 32 characters and spaces):_________________________________________

Address ______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Phone: _____________________________________ FAX ____________________________________
E-mail ________________________________________________________________________________

Early registration deadline: Friday, September 23
Please note: There will be a $50 surcharge for on-site registration at the meeting.
Member registration fee includes program and abstracts, reception, banquet, and coffee breaks.

REGISTRATION FEES:
Mark the appropriate box(es):

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Total Enclosed (US dollars only)

*Non-member registration fees include new 2005–06 ASGSB membership (dues of $100 for members, $35 for students).

Refund policy: Requests for cancellation with refund will be honored if received by Monday, Oct. 17. A $40 processing fee will be deducted from the refund, which will be made by check.

Special dietary needs or disabilities: _______________________________________________________

Student interested in room-sharing: Check here to have ASGSB distribute your name and e-mail address to other students interested in room-sharing. □

Payment Method: □ Visa □ MasterCard □ Check, payable to ASGSB

Credit card no. ____________________________ Expiration __________
Cardholder name ____________________________________________
Credit card billing address: __________________________________

Please print and complete this form and either (1) FAX it with your credit card payment or (2) mail it with your check to
919-806-3076 or ASGSB Please do not use a FAX cover sheet.
c/o 5712 Loyal Ave Durham, NC 27713

Registration questions? Contact ASGSB membership services at asgsb@unc.edu
ASGSB 21st Annual Meeting Elections

ASGSB Elections at 2005 Annual Meeting

At this year’s meeting in Reno, the ASGSB membership will be electing a new President-Elect and four new Governing Board members from the slate of candidates listed below. Full nomination statements will be available at the Annual Meeting.

Candidates for President-Elect for Fall 2005

William J. Landis, Ph.D., is a Professor of Microbiology, Immunology, and Biochemistry at the Northeastern Ohio Universities College of Medicine in Rootstown, OH. He has been an ASGSB member since 1990, recently served on its Governing Board (2002-2005), and serves on the new Editorial Board of *Gravitational and Space Biology*. He has been an ad hoc grant reviewer for the American Institute of Biological Sciences and NASA (1990-1992) and a member of the Baylor College-Harvard-MIT consortium for the National Space Biomedical Research Institute (1997-1999). His principle research interests concern the mechanism of mineralization and the effect of space flight and hypergravity on bone formation. He has held long-standing funding as PI from NASA and the NIH and has been involved in two shuttle missions and HyFaCC (cell culture hypergravity) studies at NASA/Ames. He is a member of the editorial board of six scientific journals, including *Biological Sciences in Space* (Japan).

Kenneth A. Souza, M.S., is a Senior Researcher with the SETI Institute. He is currently on assignment to NASA's Ames Research Center where he serves as Senior Staff Scientist to the Human Health and Performance Project Integration Office. Prior to joining SETI, he spent 35 years with NASA as a scientist, Project Manager, and in a variety of senior management positions. He is a charter member of the ASGSB and has served on the Governing Board, as Chair of the Finance Committee, and as Secretary/Treasurer. He has published articles in the areas of Astrobiology and Space Biology. He participated in the Amphibian Development experiments on Gemini and US Biosatellites, and was the PI for the Spacelab-J Frog Embryology Experiment, which demonstrated vertebrate ovulation, fertilization, and development to free swimming larvae could occur in microgravity. He has led flight project teams that flew payloads on US and Russian biosatellites, Shuttle/Spacelabs, Mir, and the ISS. He has received national and international awards for his management and scientific achievements including the Society’s Orr Reynolds Distinguished Service Award and the Founder’s Award.

Candidates for ASGSB Governing Board for Fall 2005

Elison B. Blancaflor, Ph.D., is Principal Investigator and Head of the Cellular Imaging Laboratory at the Samuel Roberts Noble Foundation, Ardmore, Oklahoma. He has been an active member of ASGSB since 1993. In addition to his duties as head of a multi-user Bio-Imaging facility, Dr. Blancaflor carries out research on the cytoskeleton and its involvement in plant gravity responses, root development, and plant-microbe interactions. He has published his work in multiple journals including *Plant Physiology*, *Plant Cell*, and *Plant Journal*. Research and cell imaging services conducted in Dr. Blancaflor’s lab have been funded by the Noble Foundation, NASA, NSF, and DOE.

Luis Cubano, Ph.D., is Assistant Dean for Research and Graduate Studies at the Universidad Central del Caribe School of Medicine. He joined ASGSB in 1996. His research focuses on the effects of microgravity and hypergravity on the immune system and the cytoskeleton. He has been involved in six space shuttle missions and has received funding from NASA and NIH. He holds a masters rating in aerospace education from the Civil Air Patrol and is actively engaged in outreach and educational programs for 4-12K students. Dr. Cubano is an active member of the ASGSB Publications Committee and is involved in the annual student poster competition.
Richard Mains is President and Principal Scientist of Mains Associates, a company that provides science communication and information systems services to NASA space life sciences programs, private sector, and university R&D clients (http://www.mainsgate.com). He has co-authored numerous papers on space research in the areas of gravitational cardiopulmonary physiology, animal habitat requirements for the ISS, animal space bioinstrumentation, and strategies for conducting life sciences research beyond low Earth orbit. He was formerly a research physiologist at the UC Berkeley Environmental Physiology Lab and scientist/manager of a NASA ARC onsite contract in support of US/Russian biosatellite (Bion) missions. He is a founding member of ASGSB and has served on the Education and Publications committees and is currently Chair of the Public Affairs Committee.

Patrick Masson, Ph.D., is a Professor in the Department of Genetics, University of Wisconsin-Madison. He is committed to basic research aimed at understanding the molecular mechanisms that govern root-growth behavior in response to mechanical stimuli, including gravity and touch. His current NASA-funded projects focus on a proteomic and molecular genetic analysis of early phases of gravity signal transduction in roots, and on the molecular characterization of a group of proteins that modulate anisotropic cell expansion and root growth behavior on hard surfaces. Additionally, NSF-funded research concentrates on the role played by J-domain proteins in early phases of gravity signal transduction in plant statocytes.

Anna-Lisa Paul, Ph.D., is an Associate Scientist (Research Faculty) at the University of Florida, Department of Horticultural Sciences in Gainesville, Florida. She is a molecular geneticist whose research interests focus on the regulation of plant gene expression in response to abiotic stress and extreme environments, with a particular interest in the role of chromatin structure in gene regulation. The utilization of transgenic plants engineered with stress-induced reporter genes plays a central role in her research. She has been associated with NASA as a PI and CoPI on several NASA-funded grants (both flight and ground-based) and as a Flight PI in the NASA-KSC educational outreach program SLSTP (1999-2004). Paul joined ASGSB in 1997 and has served on the Editorial Board of Gravitational and Space Biology.

Danny A. Riley, Ph.D., is a Professor of Cell Biology, Neurobiology & Anatomy at the Medical College of Wisconsin in Milwaukee, WI, and joined the ASGSB in 1985. As a cell biologist, he has examined over the past 30 years the effects of space flight on nerve and muscle cells. He has served on committees, including the ASGSB Governing Board (1997-2000), National Academy of Sciences, National Research Council Space Studies Board’s Committee on Space Biology and Medicine (1997-1999), National Space Biomedical Research Institute External Advisory Council (1997-2002), Space Medicine and Life Science Research Center at Morehouse School of Medicine External Advisory Committee (1977-present), and National Space Biomedical Research Institute Board of Scientific Councilors (2002-present).

David J. Thomas, Ph.D., is an Associate Professor of Biology at Lyon College in Batesville, Arkansas, and is a member of the Arkansas Space Grant Consortium. Dave actively pursues research in astrobiology, and is interested in the origin, early evolution, and distribution of life on Earth and elsewhere in the Universe. During a brief sojourn into industry, Dave helped to develop the water recycling system for the International Space Station. He has worked at summer programs at NASA’s Ames and Kennedy Space Centers, and he is a volunteer for JPL’s Solar System Ambassador program. Currently, Dave is a co-investigator on a NIAC project to simulate the planetary engineering of Mars. Dave has served on the ASGSB Education Committee since 2001. He also edits and publishes Marsbugs: The Electronic Astrobiology Newsletter.

Sarah Wyatt, Ph.D., is an Assistant Professor in the Department of Environmental and Plant Biology at Ohio University. She has been a member of ASGSB since 1996 when she was a postdoctoral fellow with the NASA Specialized Center of Research and Training at North Carolina State University. She has been active in both the Education and Public Affairs committees and is on the editorial board of the society’s new journal, Gravitational and Space Biology. She has served on the Plant Biology peer review panel for NASA. During her postdoc, she identified a new group of Arabidopsis mutants that are defective in gravitropic signal transduction. Using these mutants to uncover the molecular components of signal transduction is the focus of her current research.
American Society for Gravitational and Space Biology
Governing Board Meeting **
March 15-16, 2005
Washington, DC

Board members present: Chris Brown (President), Paul Todd (President-Elect), David Chapman (Secretary-Treasurer), John Kiss (Immediate Past President), Tom Scott (Executive Director), Robert Ocampo (President, Student Association), David Klaus, Peter Lee, Howard Levine, Ronald Schaefer, Jack van Loon, Joan Vernikos

Board members absent: Simon Gilroy, Eberhard Horn, April Ronca, Nancy Searby, Wenonah Vercoutere, Charles Wade

Others present: Susan Dakin (ASGSB Executive Secretary)

March 15, 2005

ASGSB board members came to Washington, DC, on Tuesday, March 15, to represent the Society in visits to Capitol Hill. Before visiting offices of key senators and representatives, they were briefed on the status of biological research at NASA and on legislative issues by four NASA representatives: Ms. Helen Rothman, Office of Legislative Affairs; Dr. Charles Barnes, Research Manager, Bioregenerative Life Support; Dr. Beverly Girten, Human Health and Performance; and Dr. Terri Lomax, Acting Deputy Associate Administrator for Research within the Exploration Systems Mission Directorate.

March 16, 2005

The meeting was called to order at 8:13 a.m. by President Chris Brown.

General Discussion of 3/15 Visits to Capitol Hill
The board agreed that Richard Mains (Public and Legislative Affairs Committee Chair) would prepare a list of people who were visited and topics discussed, to provide to Terri Lomax, along with the “one-pager” (a sheet of information about the Society and its requests to Congress), to demonstrate the extent of the Society’s activities. Other possible follow-up activities were discussed, such as e-mails from the ASGSB membership, letters to the chairs of the House Subcommittee on Science, State, Justice and Commerce, and the Senate Subcommittee on Science and Space, or “Dear Colleague” letters.

Joan Vernikos circulated a list of pertinent subcommittees and members, on which board members were to indicate which ones they had visited. An executive session was held for more detailed discussion of possible follow-up activities. Action: Richard Mains will prepare a summary of ASGSB visits to Capitol Hill for Terri Lomax.

Approval of Fall Board Meetings Minutes
The minutes of the November 9 and 12, 2004 board meetings were accepted as submitted.

Society Management
Tom Scott expressed the hope that Susan Dakin would continue as Executive Secretary and might be available to provide additional assistance in the coming year. He also asked the board for travel and discretionary funds for the Executive Director during the 2005-06 year. John Kiss moved that the board approve funds for these expenses for the Executive Director, and Joan Vernikos seconded the motion. The motion carried unanimously.

Financial Report
David Chapman reported on income and expenses for the periods January through November 2004 and November 2004 through February 2005. Chapman noted that the 2004 Annual Meeting expenses were much greater than usual (about 2.5 times the cost of the 2003 meeting), resulting in a reduction of our reserve. He stated that we hope to get a grant from NASA to help pay for the 2005 Annual Meeting. Chris Brown said that he would prepare an unsolicited proposal asking for support for specific costs related to the meeting, including costs related to students and education, symposia, and publications. He noted that April Ronca had provided some model wording for student travel grant requests, which he will work into the proposal to NASA. Joan Vernikos suggested that a panel grant from the U.S. Department of Agriculture might be sought for meeting support. Howard

** EDITOR’S NOTE: The minutes published here have been excerpted and/or edited from the draft version of the March 2005 ASGSB Governing Board meeting minutes. Final approval of the complete draft minutes will be given at the next Board meeting, during the November annual meeting. Revisions/corrections may be made before final approval.

(continued on next page)
Levine said that he would follow up on cooperative programs in education with the USDA. Tom Scott asked the board members to actively recruit corporate members. Chris Brown said that we need a brochure explaining benefits to corporate members, such as access to students and researchers. John Kiss offered to share, as an example, a booklet from the American Society of Plant Biologists (ASPB), which lists specific opportunities for corporate sponsorship (such as student travel and fellowships). Scott noted that our corporate membership levels and categories need to be reconsidered. Joan Vernikos suggested that as Student Association President, Robbie Ocampo could formulate a letter to nonprofit foundations seeking grants for student travel funds or Annual Meeting fees. Chapman and Scott will periodically check with board members on progress in recruiting corporate members.

Chapman reported that membership currently stood at 416 (including corporate representatives and student and retired members). Susan Dakin noted that paid memberships had increased by 39% over 2003, due mainly to more aggressive solicitation of members by e-mail. Chris Brown suggested that we challenge ASGSB members each to recruit one new member. 

**Action:** Howard Levine will get information on cooperative programs with the USDA. 

**Action:** John Kiss will share with Tom Scott the ASPB booklet on corporate sponsorship. 

**Action:** Tom Scott will work on developing a brochure, based on the model from the ASPB, explaining the benefits of corporate membership and listing sponsorship opportunities. 

**Action:** Robbie Ocampo will draft a letter that can be used to seek funds for student support from nonprofits.

**Future Annual Meetings**

**2005 Meeting in Reno, Nevada**

Tom Scott reported that the 2005 Annual Meeting will be held at the Reno Hilton, from November 1-4. The room rate will be $79 plus tax per night. There will be no student discount, because the room rate was negotiated down on the basis of our large attendance by student and retired members. It was clarified that the symposium chairs are responsible for arranging peer review of the manuscripts. The choice of speakers will be up to the organizers; however, it was suggested that travel costs be considered. Chris Brown said that he would try to recruit Howard McCurdy (professor of public affairs and chair of the public administration department at American University) to speak at the banquet on the history and culture of NASA. John Kiss suggested as an alternative, if McCurdy is not available, getting an astronaut to speak. Robbie Ocampo suggested that the student mixer be scheduled for some time other than right after the banquet. Tom Scott will consult with Ocampo on scheduling of the mixer.

**Action:** Chris Brown will ensure that the meeting location and dates are announced in the winter newsletter, and Tom Scott and Susie Dakin will send an e-mail announcement to the membership. 

**Action:** The symposia will be organized by John Kiss, Charlie Wade, and Paul Todd. 

**Action:** Chris Brown will recruit a speaker for the banquet. 

**2006 Meeting**

John Kiss reported that Washington, DC, is being considered as the location for the 2006 Annual Meeting. He would like to have the location and dates set by the time of the 2005 Annual Meeting, so that they can be announced to the membership at the meeting. Kiss also would like to have the board decide on the symposia at its November 2005 meeting. Tom Scott is already looking into hotels in the DC area. He noted that hotel room rates in the DC area are high, but would be lower if the 2006 meeting were held from Thursday through Sunday (November 2 through 6), rather than on four weekdays. Board members agreed that this would be acceptable and stressed the importance of having a hotel within walking distance of restaurants or near a Metro stop. The Air and Space Museum was suggested as a possible reception venue.

**2007 Meeting**

Chris Brown reported that Denver is being considered as the location for the 2007 Annual Meeting. He and Tom Scott have already investigated Denver hotels; the Denver Marriott City Center is available at $115 per night on weekdays, and a number of interesting reception venues are available. David Klaus will help organize activities locally.

**2008 Meeting**

Paul Todd reported that he has assembled a committee (including Chris Brown, Jack van Loon, and John Kiss), which has looked into organizations with which to have a joint meeting in Western Europe. Van Loon has done a lot of the legwork. Contact has been made with the European Space Agency (ESA) and the European Low Gravity Research Association.
(ELGRA). Chris Brown sent a letter to Marc Heppener (Head of the ISS Utilisation and Promotion Division of ESA’s Directorate of Human Spaceflight, Microgravity and Exploration), who expressed interest in a joint meeting.

Paul Todd asked the board to consider the number and character of organizations to be involved. Other potential collaborations might be with the International Conference on Environmental Systems (ICES, sponsored by the Society of Automotive Engineers), the International Society for Gravitational Physiology (ISGP), and the Habitation Conference (sponsored by the American Institute for Aeronautics and Astronautics and NASA), usually led by Charlie Barnes. He noted that it might be necessary to compromise on the timing of the meeting in order to engage other organizations. Cost is a consideration and will depend on the city and the time of year. John Kiss said he hoped we could keep the meeting in the fall, to avoid conflicts with other meetings our members attend in the summer. Jack van Loon noted that both ESA and ELGRA are flexible in the timing of their meetings. Chris Brown suggested setting a three-month range during which we would be willing to schedule the meeting. Joan Vernikos noted the importance of holding the meeting at a location with activity in gravitational biology, to help obtain sponsorships.

Jack van Loon will raise the issue of a joint meeting at the next ELGRA board meeting. It was noted that ESA and ISGP are having a Joint Life Sciences Symposium in June 2005 in Cologne, and that the timing for a joint meeting with ASGSB would be right. The meeting of the Committee on Space Research (COSPAR) of the International Council for Science would be too large, and its 2008 meeting probably will be in North America.

Chris Brown asked whether the board was ready to commit to another expensive meeting. John Kiss noted that attendance was not hurt by the cost of the Brooklyn meeting, and Paul Todd noted that the cost to the Society would be shared by co-sponsoring organizations. The consensus was to authorize the committee to proceed with planning for a 2008 meeting in Western Europe. The committee will communicate frequently by e-mail and will include Tom Scott in the loop.

**Action:** Paul Todd’s committee will proceed with planning for a 2008 Annual Meeting to be held in Western Europe, jointly with another organization(s). Jack van Loon will discuss the issue with ELGRA and will check on availability and costs of Amsterdam hotels.

**ASGSB Web Site**

John Kiss reported that Stan Roux has volunteered to update the slide sets on the ASGSB Web site, which are frequently downloaded for use in teaching and research. Stan has requested a $3,000 stipend for two graduate students to organize the material and create new slide sets. Ron Schaefer moved that $3,000 be allocated for this purpose. Chris Brown asked how our slide sets fit in with the materials available at SpaceBio.net, an on-line educators’ resource, organized by Richard Mains, which provides whole lectures, not just slides. John Kiss said that there was some overlap, but that our slides are primarily from our membership, are frequently used, might attract members, and bring recognition to the Society. Ron Schaefer noted that SpaceBio.net acknowledges ASGSB as a sponsor. Paul Todd suggested that we might recruit a corporate sponsor to cover the cost of updating the slide sets. The motion to allocate the funds was seconded by Joan Vernikos and carried unanimously.

Chris Brown will ask Richard Mains to look into getting a link posted to the chapter “Life Sciences in Space,” written by Joan Vernikos for *Exploring the Unknown*, in the NASA History Series. An executive session was held for further discussion of the ASGSB Web site. Ron Schaefer agreed to chair a committee on Web-site refurbishment, consisting of Dave Chapman, Jack van Loon, Richard Mains, Tim Mulkey, and Susie Dakin.

**Action:** Stan Roux will update the slide sets for the ASGSB Web site; he is authorized to pay stipends totalling $3,000 to two graduate students to assist him.

**Action:** Chris Brown will work with Richard Mains to try to post a link to Joan Vernikos’s chapter, “Life Sciences in Space,” on the ASGSB Web site.

**Action:** Ron Schaefer will chair a committee to consider refurbishment of the ASGSB Web site, to be implemented by June 2005.

**Nominations**

Paul Todd asked that the board suggest a long list of potential candidates, from which the Nominations Committee would put together a slate. He requested that the Nominations Committee consist of Chuck Fuller, Stan Roux, Tom Dreschel, and Karl Hasenstein. An executive session was held for suggestion of potential candidates for the board and the presidency.

Paul Todd raised the question of whether the
presidency should cycle among the subdisciplines represented in the Society. This led to discussion of the need to recruit members from the leadership of certain subdisciplines, which in turn will attract more members in these areas. Chris Brown stressed the need to remind potential candidates that this is a working board, and that serving entails an obligation. 

**Action:** Paul Todd will assemble the Nominations Committee, which will consider the names recommended by the board and propose a slate.

**Strategic Plan**

David Klaus suggested that it is time to revisit the Society’s mission, vision, and objectives, to determine whether they are still valid and aligned with NASA’s new statement of purpose. He volunteered to coordinate this process, which could be conducted by e-mail. The board authorized him to proceed. 

**Action:** Over the coming months, David Klaus will coordinate a process of reviewing the Society’s mission, vision, and objectives.

**Constitution**

Paul Todd reported on the effort to revise the constitution. The extant constitution contains what appear to be two different versions of some articles, some of which appear to be obsolete. He is willing to create a coherent, linearly organized version of the constitution in MS Word with tracked changes. It may be necessary to amend the constitution to remove obsolete sections. Todd noted that the constitution contains two conflicting versions of how to amend the constitution, one authorizing the board to amend the constitution and the other requiring the approval of the membership. Chris Brown asked that Todd proceed and present a cleaned-up version to the board, with comments. Once the board agrees on a cleaned-up version, it can be submitted to the membership for ratification.

**Action:** Paul Todd will create a revised version of the constitution and circulate it to the board.

**Student Association**

Robbie Ocampo reported that the Student Association’s two main goals are to continue outreach activities and to continue to develop the Web site. The Web site was completely revamped less than a month ago. The goal is to design it as a resource for students who want to do research in gravitational and space biology. In particular, it can be a place to find research opportunities. Ocampo reported that Peter Lee had suggested talking with the ASGSB membership to find out who has research opportunities and would be interested in working with ASGSB student members. A form could be handed out at registration for the Annual Meeting on which interested investigators could briefly describe their research, and this information could be used to create a database of summer or graduate student research opportunities. Chris Brown suggested also asking members whether they would be willing to talk with students about career paths. Members who do not have active research programs could offer career guidance, especially for nonacademic careers. Ocampo commented that student membership is continually in flux, with students often joining for a year and then disappearing. He noted that the Web site, especially the message board, is a good way to connect with student members. He asked the board for other suggestions for trying to get student members to maintain their memberships and continue as regular members. David Klaus said that offering advice on career paths could help in this regard, though some students would inevitably go elsewhere.

**Action:** Robbie Ocampo will collect information from members at the Annual Meeting from which to create a database of members who can provide research opportunities or career guidance to students.

**Gravitational and Space Biology Summer Undergraduate Research Fellowship**

Tom Scott reported that the program is on hold until we raise the necessary funding. Dave Chapman said that Terri Lomax indicated that this would be a valid request for NASA funding. He offered to write a proposal for this purpose. Howard Levine suggested proposing that we ask NASA for matching funds. Chris Brown felt that because of the Society’s financial position, we should ask NASA for the funding, with ASGSB providing the program management. Scott suggested also stating that we are seeking corporate funding to sustain the program in future years. Brown asked Chapman to draft a proposal and run it by Tom Dreschel (Education
Committee Chair; Brown also is willing to review it. Brown suggested asking for funding for a four- or five-year program, supporting two students the first year and four or five thereafter.

Action: Dave Chapman will take the lead in writing a proposal to NASA to fund the program.

Membership Drive
Susie Dakin reported that the membership form is being updated, in consultation with Tom Scott and Chris Brown. Scott said that members will be sent an e-mail encouraging them to recruit new members.

Paul Todd suggested that board members should make a special effort to recruit particular individuals who should be members. He has made a “list of lists” of sources of potential members. For example, participants in the NASA Astrobiology Institute do not necessarily have an organizational “home”; some belong to the American Astronomical Society or the American Institute of Physics, but these societies do not have a biological focus. Even the relevant journals (such as Astrobiology) do not represent a society. Todd is willing to make use of available astrobiology mailing lists to recruit members. Chris Brown suggested in particular recruiting astrobiologists to attend the Annual Meeting. Todd identified three other groups of people who ought to belong to ASGSB: radiation health contractors, people at Johnson Space Center involved in biomedical research, and the NASA cell investigators working group (co-chaired by Nancy Searby and Neal Pellis), which held its final meeting last month and no longer has an organization.

To attract cell investigators, Todd suggested that the Annual Meeting include a large simultaneous session on cell biotechnology and a poster category. Many people in this area are looking for a forum and will likely attend, now that there will be no NASA PI meeting. The board authorized Todd to contact the four groups of potential members listed above and invite them to join the Society and attend the Annual Meeting.

Action: Susie Dakin will work with Tom Scott to send an e-mail to members encouraging them to recruit new members.

Action: Paul Todd will provide mailing lists of astrobiologists, radiation health contractors, JSC biomedical researchers, and cell investigators for recruitment.

Other Business
Chris Brown reported that Nancy Searby is working on a guide for new board members. He will ask her to circulate a topic list to the board. Chris Brown suggested that new members should receive something more than a receipt for their dues payment to acknowledge their membership. The feasibility of providing a “welcome” packet or membership cards was discussed. It was suggested that new members be sent the issue of the newsletter containing the membership directory.

David Klaus suggested that the categories for the student poster competition be expanded beyond “plants” and “animals,” as some students’ work (e.g., on bacteria) does not fit into these categories. Paul Todd suggested that the definitions of the subdisciplines for the Society as a whole also need to be revised. He proposed four categories: gravitational biology (whether in space or on the ground), space biology (whether gravitational or radiation), astrobiology, and gravitational biophysics.

Chris Brown noted that having four categories for the student competition would double the number of awards and need for judges. Todd suggested that four categories could be split in two ways for the purpose of the competition (e.g., astrobiology and gravitational biophysics vs. gravitational and space biology). Peter Lee volunteered to look at the abstracts for the past several years and suggest categories that would provide a reasonable split. Tom Scott stated that John Kiss would organize the competition and judging for the 2005 Annual Meeting.

Action: Chris Brown will ask Nancy Searby to circulate to the board a list of topics to be covered in the guide for new board members.

Action: Susie Dakin will work with Tom Scott to provide an appropriate welcome message to new ASGSB members and to see that they are sent the directory issue of the newsletter.

Action: Peter Lee will develop recommended categories for the student poster competition.

The meeting was adjourned at 12:43 p.m.

Respectfully submitted,
Susan Dakin
Executive Secretary
NASA Selects Student Experiments to Fly on Sounding Rocket

NASA has selected students from nine schools around the country to prepare and fly their experiments on a NASA sounding rocket.

During the month of May, students and their teachers will work with engineers and technicians from NASA's Goddard Space Flight Center, Wallops Flight Facility, Wallops Island, Va., to prepare their experiments for flight. The student experiments will be flown on a NASA suborbital Orion sounding rocket on June 8.

The students will study the effects of the flight environment, such as radiation and high gravitational forces, on a variety of materials as the rocket flies to an altitude more than 25 miles above Earth.

“Sounding rockets provide the opportunity for students to fully experience the thrill of developing their own experiment and have hands-on involvement in a NASA rocket project,” said Phil Eberspeaker, chief of the Sounding Rocket Program Office at Wallops. “We hope this experience shows them the cool stuff NASA does and that they will want to come be a part of the team as we explore the universe,” he added.

The nine teams were competitively selected to participate in the national program. Four of the teams were selected as part of the NASA Student Involvement Program (NSIP) while the other five were selected as part of the FreeSPACE program.

The NSIP program is a national program of six investigations and design challenges for grades K-12 that link students directly with NASA's exciting missions of exploration and discovery.

The FreeSPACE project offers students an opportunity to fly secondary experiments on NASA Sounding Rocket Program missions. The five schools participating in the FreeSPACE project were selected through the NASA Explorer Schools (NES) program.

The schools represent 5 of the 100 NASA Explorer Schools in the program at the present time. The schools partner with NASA over a three-year period to increase student interest, performance, and participation in science, mathematics, and technology fields of study and careers.

The winning entrees in the NSIP flight opportunities competition are: North Carolina School of Science and Mathematics, Durham, NC; Columbus High School, Columbus, GA; Susan E. Wagner High School, Staten Island, NY; Glenbrook North High School, Northbrook, IL.

The FreeSPACE schools are: Greencastle-Antrim High School, Greencastle, PA; North Ridge Elementary School, Moreno Valley, CA; Key Peninsula Middle School, Lakebay, WA; Waimea Middle School, Kamuela, Hawaii; Wendover High School, Wendover, Utah.

For information about NASA education programs on the Internet, visit: http://education.nasa.gov

NASA Announces New Explorer Schools

NASA announced in May the 50 new 2005 Explorer Schools. The NASA Explorer Schools are the heart of a unique education program that reaches elementary-to-high-school students in all 50 states, Puerto Rico, and Washington.

The NASA Explorer Schools (NES) program is one of four major agency educational initiatives. Since its inauguration in 2003, the NES has established three-year partnerships annually with 50 schools. The partnerships include students, teachers, and education administrators serving grades four through nine, from diverse communities across the country.

Schools in the program are eligible to receive grants up to $17,500 over the three-year period to support student engagement in science and mathematics.

During the three-year partnership, NES teams work with NASA personnel and other partners to develop and implement strategic plans for staff and students. The plans promote and support the use of NASA content and programs to address the teams’ local needs in mathematics, science, and technology education. Students participate in authentic NASA science and technology experiences. They have access to unique NASA resources and materials to help them learn about agency careers in mathematics, science, engineering, and technology.

Each summer teachers participate in one-week professional development workshops at one of 10 NASA Field Centers. They also receive $500 stipends for both summer and school year activities. The NES program also reaches out to the students’ families and communities by providing access to interactive Web NASA learning adventures and other special opportunities.

In cooperation with the European Space Agency, the Dutch Ministry of Education, Culture and Science, NASA's Explorer Schools concept traveled overseas to the Netherlands. Called the Delta Researchers School Program (DRS), it is patterned after NES. It focuses on children nine to 12 years-old. DRS emphasizes human space flight, the International Space Station, and other international cooperative projects.

For a list of NASA Explorer Schools on the Internet, visit: http://explorerschools.nasa.gov and go to the 2005 Team Directory.
NASA Establishes Exploration Systems Advisory Committee

NASA has chartered the Exploration Systems Advisory Committee (ESAC). Committee members include leading experts from government, academia and industry who will provide advice and recommendations to NASA's Associate Administrator for Exploration Systems.

The committee's input will relate to plans, policies, programs, and other matters pertinent to the Exploration Systems Mission Directorate's responsibilities. The committee will meet quarterly to discuss such topics as technology, requirements, systems integration, and capability development.

Retired U.S. Air Force Gen. Lester L. Lyles will chair the committee. Lyles served as commander of the Air Force Materiel Command. He has extensive experience managing large, high-technology organizations involving aeronautical and astronautical research, development, acquisition, and logistics.

Other committee members include:
- Dr. Kenneth M. Baldwin, Professor, Department of Physiology and Biophysics, University of California, Irvine, Calif.
- Jeff “Skunk” Baxter, Missile Defense Analyst, Beverly Hills, Calif.
- Retired Air Force Col. Larry Graviss, Vice-President of Sverdrup Technology, Inc., Tullahoma, Tenn.
- Dr. Amy Kronenberg, Program Leader for Radiation Biology at the Lawrence Berkeley National Laboratory, Berkeley, Calif.
- Barry Zilin, President and Chief Executive Officer of Practical Innovations, Inc., Woodbridge, Va.

As part of the NASA Advisory Council, the committee operates under the jurisdiction of the Federal Advisory Committee Act (FACA). The public is invited to meetings, which are announced 15 days in advance in the Federal Register. The first meeting was May 19-20 at NASA Headquarters.

The committee’s charter authorizes establishment of subcommittees in areas requiring standing advisory groups and task forces to conduct special studies.

For more information about the Exploration Systems Mission Directorate on the Web, visit: http://exploration.nasa.gov

NASA Announces New Centennial Challenge

NASA, in collaboration with the Florida Space Research Institute (FSRI), today announced on May 19 a new Centennial Challenges prize competition.

The MoonROX (Moon Regolith Oxygen) challenge will award $250,000 to the first team that can extract breathable oxygen from simulated lunar soil before the prize expires on June 1, 2008.

For the MoonROX challenge, teams must develop hardware within mass and power limits that can extract at least five kilograms of breathable oxygen from simulated lunar soil during an eight-hour period. The soil simulant, called JSC-1, is derived from volcanic ash. The oxygen production goals represent technologies that are beyond existing state-of-the-art.

NASA’s Centennial Challenges promotes technical innovation through a novel program of prize competitions. “The use of resources on other worlds is a key element of the Vision for Space Exploration,” said NASA’s Associate Administrator for the Exploration Systems Mission Directorate, Craig Steidle. “This challenge will reach out to inventors who can help us achieve the Vision sooner,” he added.

“This is our third prize competition, and the Centennial Challenges program is getting more and more exciting with each new announcement. The innovations from this competition will help support long-duration, human and robotic exploration of the moon and other worlds,” said Brant Sponberg, NASA’s Centennial Challenges program manager.

“Oxygen extraction technologies will be critical for both robotic and human missions to the moon,” said FSRI Executive Director Sam Durrance.

The Centennial Challenges program is managed by NASA’s Exploration Systems Mission Directorate. FSRI is a state-wide center for space research. It was established by Florida’s governor and legislature in 1999.

For more information about Centennial Challenges on the Internet, visit: http://centennialchallenges.nasa.gov
Space Biology Class Succeeds As Part of Science

By Motoshi Kamada¹, Fumiaki Tanigaki², and Muneo Takaoki²

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There has been some concern in Japan that young students have been losing their incentives and scholastic abilities in the natural sciences. In response to this, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been sponsoring programs that encourage schools to cooperate with universities, research institutions, and industry in order to heighten their students’ avid interest in the natural sciences. The Science Partnership Program (SPP) and the Super Science High-School (SSH) are among such efforts.

In SPP, high-school administrators plan how they will collaborate with such institutions and file an application with MEXT. The Japanese Aerospace Exploration Agency (JAXA) is one of the most popular institutions for these projects. 72 high schools from all over the country have been chosen as SSH by MEXT and are eligible for intensive science education. We collaborate with several of these schools to give lectures and provide instructions for student-initiated research plans.

A series of educational programs on space biology for high-school students and teachers was carried out as part of the International Space Station (ISS) utilization-promotion activities at JAXA. We also guide similar experiments to be carried out in their homes and help to construct 3-D clinostats and other instruments for gravitational science.

**SPP Plant Gravitropism Course**

Our typical short SPP course consisted of an introductory lecture on space biology in general and a brief laboratory practice for observing plant gravitropism. A group of about 20 people, either high-school teachers or students, visited Tsukuba Space Center, 50 km northeast of Tokyo. Soon after their arrival in the morning, the participants placed plant seedlings in various gravitational directions and on clinostats, so they would be able to observe the results that afternoon. The morning lecture covered radiation biology; gravitational effects on vestibular, musculoskeletal and cardiovascular systems; and plant gravitropism.

The afternoon laboratory practice included the dissection of seedlings to observe the plant graviperception sensor, amyloplasts, detection of related gene expression by RT-PCR and gel-electrophoresis, as well as the evaluation of gravitropism in seedlings.

**SSH Microgravity Science Course**

In our 2004 SSH program, high school students witnessed various natural phenomena under microgravity.
The special course consisted of lectures given by a researcher and an astronaut, a facility tour at the Tsukuba Space Center, and their own microgravity experiments. We built a 2.5m Mini-Drop Tower for this purpose. It provides 0.7 seconds of free-fall. We allowed students to design unique experiments that would have a great appeal to students younger than themselves, and to assemble suitable laboratory devices. They set their devices inside a Drop Box in which a wireless CCD camera captured images during free-fall. About 20 experiments were conducted. For example, the red balloon with water bounced higher than the green balloon with air in microgravity. An astronaut figure successfully returned to the shuttle in the free-fall experiment, as a small magnet had been mounted on each of them. The students learned many things about mass, weight, convection, and surface tension.

**SPP reports at a school festival**

Students reported their research results at the annual school festival. This plan was designed to further enhance the entire learning experience by having the students summarize and report their own research results.

**SUMMARY**

Space biology and microgravity science classes are popular with students, despite the absence of flight experiments. We believe the students were able to recognize relationships between their own experiments and actual space flight. We were also able to demonstrate to them that their knowledge is not merely theory, but that it has very practical applications. Space biology is a great topic in science class, since it integrates mathematics, physics, chemistry, and many other subjects that students might think are uninteresting.
NSBRI Postdoctoral Fellowship Program Solicits Applications

HOUSTON—(April 18, 2005)

The National Space Biomedical Research Institute (NSBRI) is soliciting applications for its Postdoctoral Fellowship Program. Two-year fellowships are available in any U.S. laboratory carrying out space-related biomedical or biotechnological research that supports the NSBRI’s goals. NSBRI research addresses and seeks solutions to the various health concerns associated with long-duration human space exploration.

Applicants must submit proposals with the support of a mentor and institution, and all proposals will be evaluated by a peer-review panel. The program is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions.

Detailed program and application submission information is available on the NSBRI Web site at http://www.nsbri.org/Announcements/rfp05-01.html. Letters of intent and applications must be submitted through the NSBRI’s electronic proposal submission system. Letters of intent are due May 11, 2005 (but are not required), and the application deadline is June 28, 2005.

Questions may be directed to Gerald Sonnenfeld, Ph.D., Program Director, NSBRI Postdoctoral Fellowship Program, E-mail: postdoc@www.nsbri.org, Telephone: 607-777-4818.

Submit Your Articles for the Fall 2005 ASGSB Newsletter

Thanks to all the contributors to this issue of the ASGSB Newsletter. All members and readers are invited to submit any items, such as articles, news, meeting notices, which they feel will be of interest to ASGSB. The Fall issue will be distributed at the annual meeting in Reno.

Please submit all materials to ASGSB Publications Chair Stan Roux at e-mail: sroux@uts.cc.utexas.edu

The deadline for input to the Fall issue is September 15, 2005.

NASA Roadmap for the Robotic and Human Exploration of Mars

NASA released on May 26 the NASA Roadmap for the Robotic and Human Exploration of Mars. From the document,

“In December 2004, NASA established a number of strategic roadmap teams to provide guidance and priorities for achievement of the nation’s space exploration objectives. This was partly in response to the Vision for Space Exploration, as well as to the Presidential Commission on Implementation of United States Space Exploration Policy (the “Aldridge Commission”). This is the report of the team chartered to study the robotic and human exploration of Mars.

The Mars Roadmap Committee met three times—in January, February, and March 2005. All of the strategic roadmap committees were requested by NASA to terminate their activities and provide their best-effort reports by May 2005; consequently, this document has not undergone the level of detailed editing, production, and printing that would normally have been expected. Nonetheless, the Committee feels that it has reached important conclusions about the priorities for the Mars exploration program, and has created a framework for the key decisions that will one day lead to human exploration of Mars. This document articulates those priorities and recommendations.”


News  and  Opportunities
### Life Sciences Calendar

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<td><strong>June 16-18, 2005</strong></td>
<td><strong>Undersea and Hyperbaric Medical Society 2005 Annual Scientific Meeting</strong>, Las Vegas, NV.</td>
<td>Further information: <a href="http://www.uhms.org/">http://www.uhms.org/</a></td>
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<td><strong>July 11-14, 2005</strong></td>
<td><strong>35th International Conference on Environmental Systems (ICES) and European Symposium on Space Environmental Control Systems</strong>, Rome, Italy.</td>
<td>Further information: SAE Headquarters, E-mail: <a href="mailto:meetings@sae.org">meetings@sae.org</a>; <a href="http://www.sae.org/events/ice/">http://www.sae.org/events/ice/</a></td>
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<td><strong>October 24-26, 2005</strong></td>
<td><strong>43rd Annual SAFE Symposium</strong>, Salt Lake City, UT.</td>
<td>Further information: <a href="http://www.safeassociation.org">http://www.safeassociation.org</a></td>
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<td><strong>November 1-4, 2005</strong></td>
<td><strong>21st ASGSB Annual Meeting</strong>, Reno, NV.</td>
<td>Further information: ASGSB, P.O. Box 2581, Chapel Hill, NC 27515-2581; Email: <a href="mailto:asgsb@unc.edu">asgsb@unc.edu</a>; <a href="http://www.asgsb.org">http://www.asgsb.org</a></td>
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<td><strong>February 5-8, 2006</strong></td>
<td><strong>Habitation 2006</strong>, Orlando, FL.</td>
<td>Further information: <a href="http://HABITATION2006.us">http://HABITATION2006.us</a></td>
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<td><strong>February 16-20, 2006</strong></td>
<td><strong>2006 American Association for the Advancement of Science (AAAS) Annual Meeting</strong>, St. Louis, MO.</td>
<td>Further information: <a href="http://www(aaas.org/">http://www(aaas.org/</a></td>
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How to Join the American Society for Gravitational and Space Biology

ASGSB welcomes members interested in space biomedical research, plant and animal gravitational biology, cell and developmental biology, biotechnology/biophysics, space flight technology, advanced life support, and astrobiology. Membership information may be found and applications completed online at [http://www.asgsb.org](http://www.asgsb.org); or obtained from ASGSB, P.O. Box 2581, Chapel Hill, NC 27515-2581.

ASGSB 21st Annual Meeting
Reno, NV
November 1-4, 2005
updates at [http://www.asgsb.org](http://www.asgsb.org)

American Society for Gravitational and Space Biology
P.O. Box 2581
Chapel Hill, NC 27515-2581
USA

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