AIAA HOUSTON SECTION
Horizons
American Institute of Aeronautics and Astronautics
Volume 25 Number 5 www.jsc.nasa.gov/aiaa June 2001

Congressional Visits Day, 2001

Texas delegation with Senator Kay Bailey Hutchinson during Congressional Visits Day

Becoming an AIAA member

Are you interested in becoming a member of the AIAA or renewing your membership? You can fill out a membership application online by going to the AIAA membership website at www.aiaa.org/information.

August 15 Input Deadline for the Next Edition of *Horizons*

Contributions can be submitted by email to John Keener at john.keener@lmco.com.

Features

In Every Issue

Publications Chair
John Keener

Editor
John Keener

Contributing Authors
Dr. Garland Bauch
Larry Friesen
John Bendle
Nichole Mullins
Edward Jablonski
Jeff M. Bingham
Sophia Bright
Joy Conrad

Horizons is the monthly newsletter (except for the months of July and August) of the Houston Section of the American Institute of Aeronautics and Astronautics. It is created by members of the Houston Section and reproduced at the Houston Offices of Lockheed Martin. Opinions expressed herein, other than by elected Houston Section Officers, are those of the authors and do not necessarily represent the position of AIAA or the Houston Section. Please address all correspondence to the Houston Section Chairman, Garland Bauch. Phone 281-483-1309; e-mail garland.t.bauch1@jsc.nasa.gov.

Chairman's Corner

By Dr. Garland Bauch, Chairman

Greetings to the Houston Section membership!

This June the Section will be transitioning to the newly elected officers for the year 2001-2002. You are all invited to attend the Honors and Awards banquet where we will recognize those dedicated members who have served the Section well this last year. This year our members have worked hard to plan, sponsor or co-sponsor dinner meetings, workshops, congressional visits days, student activities, lunch and learns, and conferences. And we did this at a time when everyone was working long hours for their employers to ensure success in aerospace.

Because of the better, faster, cheaper environment in which we live, I feel that we must communicate pro-actively with our stakeholders in order to best serve the needs of the membership. So I am recommending that we continue to organize the Advisory Board for Stakeholder Executives that will provide advice to the Executive Council (EC). This Board would meet bi-annually in July and January to provide advice on programs and activities to the EC and help us set priorities.

Courtesy visits to the stakeholders are planned between now and July. To date, lessons learned from the visits for Section program direction are emphasize Professional Development, improve networking opportunities, encourage student interest in space, obtain political support for human space flight and aerospace technology, and ensure aerospace labor force availability.

Section activities such as Physics is Fun, Student Scholarships, Congressional Visits Day, Student Paper Competition, Annual Technical Symposium, Future City Competition, Mars Settlement Design, WAR/Innovation, Young Professional Workshop, National Engineers' Week, and Student Chapters appear to be in-line with suggestions from the Stakeholder Executives during the Courtesy Visits.

A primary benchmarking model is the Young Professional Career Planning and Development Workshop (YPCPDW) held at the USA training facility. This workshop was a "grass roots" effort by some of our young professionals. Career enhancing topics included financial planning, managing change, presentation skills, conflict management, career mapping and performance appraisal, customer focus (NASA-Contractor Relationships), Texas Board of Engineering Certification Process, Empowerment tools – Mission and Vision, Team Charters and Rewards, and an open forum with local professional organizations. A motivational speaker, Glynn Lunney, Apollo-era flight director, spoke at a luncheon immediately following the workshop. I feel we should model our future professional conferences/workshops after the (YPCPDW).

Areas to emphasize in the future are professional development, political support and citizen support for the aerospace industry, commercial development, technical excellence, professional workforce development and maintenance, healthy pipeline of students entering space industry, student interest in space enhancement, leadership opportunities to employees, networking, work ethics, and community and government education on benefits of space industry. Also, the Section should build a phone tree to reach out communicate and encourage members who have not participated in Section activities in a long while.

Other recommendations are to increase our cooperation with other professional groups, have more dinner meetings at company facilities, focus speakers on a theme for the year, make dinners self-supporting in terms of costs, work on many small projects that require small investments in time and money rather than one large project, and work more closely with the local stakeholders. I encourage all of you to support the new Executive Council for the year 2001-2002. Thank you for giving me the privilege to serve as your Chair.

Congressional Visits Day 2001

By John Bendle, Public Policy Chair

A delegation of AIAA Houston Section members recently attended Congressional Visits Day in Washington, D.C. The annual event, organized by AIAA National, is a traditional grassroots outreach effort during which AIAA members meet with those members of Congress that represent the Section's interests. The event, held March 21 and 22, was attended by Jorge Molina-Acosta (Vice Chair - Operations), John Bendle (Public Policy Chair), Sophia Bright (Membership Chair), William Atwell (Councilor), Stepheni Stephenson (Member), and Matthew Barry (Member).

The activities began with a welcome address and orientation presented by AIAA National Public Policy representatives Ali de Jongh and Paul Looney. Followed by a lighthearted look at the individual's role in Washington politics entitled "How we can

keep the 'Land of Opportunity' by participating in grassroots legislative advocacy here in Washington and in the 50 state capitols" presented by political journalist Patrick Haggerty. Primarily a motivational speaker, Mr. Haggerty delivered a very dynamic speech about the history and evolution of democracy in America.
Next followed brief summaries of AIAA's stance on key issues in the areas of Aeronautics (Carol Cash), Astronautics (Phil Hattis) and Defense (Rich Mercadante).
The evening concluded with a short planning session in preparation for the following day's events and a welcome reception.

The second day of the event is when the delegations have the opportunity to interface with members of Congress and discuss those issues important to AIAA and its members. The day began with a presentation from long time space supporter Congressman Dana Rohrbacher (CA). In addition to praising recent advances in the aerospace industry, Mr. Rohrbacher pointed out some of the shortcomings stressing the need to continually strive to maintain America's world leadership role in aerospace.

The first meeting the Houston section had was with Senator Kay Bailey Hutchison's legislative assistant Michael Gerber. The team, along with AIAA members from other Texas sections, spoke with Mr. Gerber regarding Senator Hutchison's primary concerns regarding the aerospace industry. Senator Hutchison is very interested in the areas of next generation launch vehicles, Space Shuttle upgrades, and utilization of the International Space Station including how will we be able to return the crew safely to Earth once the ISS is fully manned. The Senator then stopped by briefly to greet the delegation and take a photograph.

The second meeting was with Representative John Culberson's legislative assistant John Seale. The delegation addressed the four main issues that pertained most to the Houston Section. On the topic of Education & Technical Labor force, Mr. Seale indicated that if we wanted to retain the foreign labor we would need H1 visas to do this. He conveyed that this was something that they were not in support of doing. But that the chairman of the science committee is acutely aware of the overall labor force problem. Mr. Seale also indicated that Mr. Culberson met with industry lobbyist regarding the export issues regarding non-sensitive projects (less export controls for commercial satellites). Mr. Seale emphasized that Mr. Culberson is a space enthusiast and will continue to encourage projects that promote growth at the Johnson Space Center.

The next meeting was with Representative Tom DeLay, the House Majority Whip and his legislative assistant Juliane Carter. Mr. DeLay was interested in hat needs to be done to lower costs to continue our endeavors in space. He was also very interested in the delegation's opinions about the benefits of establishing a National aerospace vision.

The lunch speaker was Steve Isakowitz of the Office of Management and Budget. He walked through the NASA portion of the recently released budgetary blueprint.

Lunch was followed by a very brief meeting with Representative Nick Lampson.

The next meeting was with Representative Kevin Brady's legislative assistant Drake McGraw. Mr. McGraw asked the delegation several pertinent questions about current aerospace events. He indicated that Mr. Brady and his office supports the station, but stressed they feel that it is important that NASA get control or put some perspective on their actual budget. Mr. McGraw also addressed retention and training. He indicated that the Science Committee had tried to bring some change in the K-12 region emphasizing the need to increase the number of future mathematicians and scientists. This appeared to still be an important item for Mr. Brady.

The group next met with Representative Ken Bentsen's legislative assistant Andrew Wallace. The delegation addressed the Houston Section's concern regarding the recent proposed cuts in the space station project. Mr. Wallace indicated that the Mr. Bentsen and the other Texas Members are trying to obtain a meeting with the president or administration to discuss their own concerns regarding this subject matter. Mr. Wallace stressed that an area of importance to Mr. Bentsen is Education and Academic research in aerospace. Having key people in NASA headquarters to work with the administration to get these changes in effect is an important issue.

The group's final meeting was with Senior Counsel Joe Mondello for the Senate Commerce, Science and Transportation Subcommittee on Aviation. Mr. Mondello discussed the current state of the Crew Return Vehicle and what the ramifications would be to the ISS should its funding not continue. Mr. Mondello also had questions for the delegation regarding the Space Launch Initiative and the projected shortages in the technical labor force.

Congressional Visits Day was then concluded with a reception on Capitol Hill. In summary, the event was very successful for the Houston Section. The delegation was able to present our message to several

members of Congress from Texas and stress our role as resource for information on any aerospace issues. For more information on Congressional Visits Day or any other Public Policy issues please contact John Bendle at 281-244-4762.

Texas delegation with Senator Kay Bailey Hutchinson

Career Planning and Development Workshop

Honors & Awards Committee Nichole Mullins

The Houston AIAA Young Professionals hosted a Career Planning and Development Workshop for young professionals and university students in the NASA JSC community on March 31, 2001.

The workshop offered courses in financial planning, presentation skills, the professional engineering licensing process, conflict management, business etiquette, and customer focus. A panel of three local managers discussed Career Mapping with the attendees and shared experiences and advice.

Local professional organizations such as Toastmasters, National Management Association, American Society of Mechanical Engineers, National Society of Black Engineers, Hispanic Society of Professional Engineers, and American Business Women's Association had displays, as well as AIAA. Attendees were able to visit each of the organizations booths and hear about each society's purpose and objectives.

Glynn Lunney, Apollo-era flight director and manager of the Apollo-Soyuz test project and National Space Transportation System (Space Shuttle) program, spoke to the young professionals about his experiences in his career. Glynn was such a dynamic speaker and offered excellent advice. There was so much positive energy shared between the attendees and the speakers, and many people said that they would recommend the workshop to other people and even attend another similar workshop themselves! The workshop was definitely a success and another one is being tentatively planned for the end of the summer.

The planning committee for the Young Professional Career Planning and Development Workshop poses with Glynn Lunney. From left to right: Kristina Gaboury, Michelle Kelley, Nicole Mullins, Kevin Butler, Glynn Lunney, Sophia Bright, David Lechner, and Michael Gaboury.

A Great Success this Year!
WAR 2001 and INNOVATIONS 2001

Edward Jablonski

A recent Friday, April 27th, was a busy day for AIAA at the Gilruth Center, JSC. The activities of the annual Workshop on Automation and Robotics filled the morning, with a transitional Luncheon next, concluding with the interdisciplinary sessions of the INNOVATIONS Symposium throughout the afternoon. These sessions were a great opportunity for local technical professionals to do some learning in fresh fields, and to publicize their recent efforts.

Workshop on Automation and Robotics 2001

The proceedings were opened with a fresh-coffee-and-doughnuts welcome by our own Dr. Garland Bauch, AIAA Houston Section Chairman. The attendees next enjoyed a series of robotics tutorials from a team chaired by Dr. Robert Burridge(SKE/ER-2) of the JSC Robotics and Expert Systems Division. Dennis Wells gave an excellent presentation on the “Pneumatic Transporter”, a very capable terrain mobility system prototype that was built and tested here at JSC. Kris Verdeyen spoke on the topic of the “Robonaut”, an aid for EVA tasks in space. Finally, Robert Burridge spoke at length on overcoming the difficulties and current progress in developing an effective human-robot team interface in his presentation on the “Robotic Assistant”.

The WAR ‘01 was concluded and highlighted by a very interesting “field trip” to JSC’s outdoor Mars/Lunar surface simulant "Rock Pile" (near building 268) for a live (!) demonstration of the “Robotic Assistant” prototype in action. More than 20 people braved the blazing Houston midday sun to watch Dr. Robert Burridge’s human-robot team perform. *The accompanying picture shows Dr. Burridge explaining the inner workings of their robot to onlookers*.

The Workshop on Automation and Robotics, WAR, is an annual event sponsored by the AIAA Houston Section Automation and Robotics Technical Committee, chaired by Dr. Zafar Taqvi. It is a unique event started by the A&R committee 16 years ago, focusing on the latest automation and robotics technologies. This years WAR was Co-sponsored by the Instrument Society of America, Robotics and Expert Systems Division. JSC's Robotics, Automation, and Simulation Division supported the event.

INNOVATIONS 2001 Symposium

INNOVATIONS 2001 kicked off with a hearty Luncheon and panel discussion in the Gilruth upstairs dining hall. Attendees of the luncheon were addressed by representatives of several of the local professional technical societies such as ISA, INCOSE, and of course, AIAA! Our own Houston Section Vice Chairman (Technical), Glenn Jenkinson/Boeing welcomed the visitors, and was given the opportunity to speak about the benefits of AIAA membership. This years INNOVATIONS General Chairman, Edward Jablonski/Dynacs, gave a short welcome speech, mentioning some of the many great advances in technology that have occurred by combining interdisciplinary solutions. The luncheon proceedings concluded with a panel discussion with the WAR tutors who had presented earlier that day (see above).

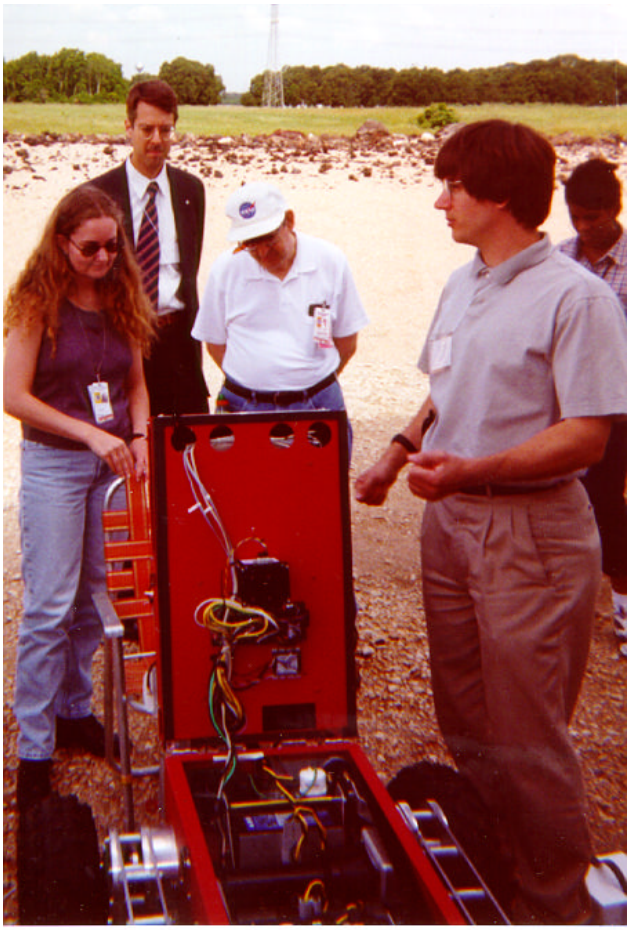
Right on schedule, the three INNOVATIONS tracks began simultaneously, with the Session chairs and Presenters from business, government, and academia all working smoothly together. Throughout the afternoon, the attendees were switching rooms constantly to hear their preferred presentations. The Session chairs kept everyone on schedule, every presenter attended as scheduled (or provided someone to present their paper), without any technical, facility, or administrative problems. The presentations offered various topics such as planetary science, medicine, quantum computing, and mathematical analysis. All in all, it was a flawless, interesting, and most enjoyable conference.

The INNOVATIONS 2001 conference was sponsored by the Clear Lake Council of Technical Societies, for the JAIPCC Board, in cooperation with the CLCTS member organizations, including the AIAA Houston Section.

In conclusion, attendance was up from last year, and the many experienced volunteers made it a smooth event. Several of the attendee Session Chairs were particularly pleased with the event, and expressed their desire to help this be expanded as a forum for presentation of additional university research next year.

The JAIPCC Board is looking for volunteers for the positions of General Chair and session organizers for INNOVATIONS 2002. Those interested may contact Dr. Zafar Taqvi/Dynacs (281-244-4436, Zafar.Taqvi@sw.boeing.com), or Edward Jablonski/Dynacs (281-336-4294) edward.j.jablonski@boeing.com

See you there next year!
Edward J. Jablonski
INNOVATIONS 2001 General Chairman
Dynacs Engineering Co. Inc.



Dr. Robert Burridge and his teammates demonstrate the "Robot Assistant" at the April 2001 Workshop on Automation and Robotics" (WAR) at the Lunar/Mars Surface Simulator, JSC

The following article, by Jeff M. Bingham of NASA, was originally published in Space Times, January-February 2001 issue. Mr. Bingham served many years on the legislative affairs staff at NASA working on International Space Station (ISS) Issues. Mr. Bingham is currently the Acting Associate Administrator for Legislative Affairs.

Space and the Millennial Presidency

By Jeff M. Bingham

Questions of space policy, not surprisingly, did not become issues during the 2000 Presidential campaign. For one thing, they almost never are points of contention in our elections. In fact, the only presidential candidate making the conquest of space a visible part of his presidential campaign was John F. Kennedy in 1960. Science and space were two of the "New Frontiers" he described in his speech accepting the nomination for President on July 13, 1960, and he referred to the challenges of space exploration in at least two major addresses during the campaign.

Another reason space issues did not emerge in the 2000 presidential campaign s that both candidates had records of support for the space program. Vice President Gore, of course, had been more deeply involved with space issues at the federal level. He served as Chairman of NASA's authorizing subcommittee in the Senate in the immediate post-*Challenger* period, and played an active role as Vice President, particularly in fostering the participation of Russia in the International Space Station.

President-Elect Bush's prior official interest could perhaps have been seen by some as merely parochial, in response to the presence of the Johnson Space Center in his home state. But I recall a meeting with the Governor and JSC officials in 1995, in which he clearly embraced support for the space station in the Congress, and eagerly—almost impatiently—asked that NASA suggest specific courses of action for him to take as Governor. While probably not involved in his father's 1989 call for a mission to Mars, President-Elect Bush clearly carries the hope of many for a renewed look at the prospects beyond low-Earth orbit at the beginning of the new millennium.

It appears likely that that space program enjoy a receptive listener in the Oval Office during the Presidency of George W. Bush. This is critical, for the first decade of the new century is essential to the future of space exploration. Of most immediate importance, we must complete the assembly of the International Space Station (ISS).

Fraught with controversy from virtually the beginning of the project in 1984, by the time that President Clinton entered the Oval Office in 1993, many policymakers wanted to cancel the program. Instead, he took a two-pronged approach to the problem. First, he directed NASA to redesign the program to meet revised cost targets. (None of which, in the end, did they even approximate.) Second, he directed NASA to pursue the inclusion of Russia as a new partner in the program.

Despite being unable to meet the new Administration's cost targets, NASA's space station redesign effort was one of the agency's finest moments. The agency developed new designs for not one, but literally three different space stations in that three-month period. To be sure, in two out of the three designs they relied heavily on existing design concepts and hardware specifications, but NASA also demonstrated the incalculable ability and dedication

of its leadership to responsible fiscal policy and to the political realities of the mid-1990s.

The summer of 1993 did, in fact, prove to be pivotal for the space station program and, by inference, for the whole of manned space exploration. The effort to terminate the space station in the House of Representatives failed by a single vote (technically, by five votes, because the tally was in the Committee of the Whole, where delegate votes were counted, including four which were against the program.) It is not possible to explain fully the basis for congressional votes, but it is almost certain that, in this case, three key factors accounted for the survival of the space station during that eventful summer:

1. The manner in which NASA conducted and completed the redesign effort and made the information available to the Congress,

2. The fact that the selected design preserved at least seventy-five percent of the previous investment in the space station hardware development,

3. The direct involvement of the President and the White House in soliciting support for both the redesigned station and the potential inclusion of Russia as a partner.

NASA and the space station program, of course, have constantly fought criticism and opposition to the present day, and the launch of its first element—from Russia—in November of 1998, almost sixteen years after President Reagan initiated the program, is a remarkable story of government policy.

But, what is the point of this breathless historical overview?

The historical record suggest that successful space initiatives of the scale of Apollo, the space shuttle, the space station, and a possible return to the moon and human exploration of Mars require a combination of presidential leadership, congressional support, and international cooperation.

Underlying all of that is the matter of public support and a sense of vision about the future. The leaders and members of the institutions at both ends of Pennsylvania Avenue are those that have the responsibility, in our federal system, for both ascertaining and leading the needs and desires of the American people. Public support for space exploration at some level has been a constant throughout the Space Age. But the general public is not going to articulate a specific approach to space exploration. They expect their political leadership to do that.

There have been several major attempts in the past forty years to develop a broad consensus on the future of space exploration. Three should be mentioned here. Each was excellent in the breadth, scope and detail of its effort. The first two suffered from tragically unfortunate timing. The first was the 1967 report of the President's Science Advisory Council, which was a comprehensive look at post-Apollo program alternatives. But it was issued just two weeks after the tragic fire that killed Gus Grissom, Roger Chaffee and Ed White, and the policy focus became recovery from that tragedy rather than identifying alternatives for the future. The second, more exhaustive effort was the report of the National Commission on Space. It's report, the result of extensive study and public hearings across the country, was finally issued in March of 1986, in the wake of the *Challenger* accident, when there was great uncertainty about any kind of future for human space exploration. The third was the report of the Synthesis Group on the Space Exploration Initiative. That report was more than simply a description of alternatives for conducting the human exploration of Mars. It envisioned what might be called a "Holistic" approach to space exploration, with a revolutionary partnership between industry and government. Unfortunately, for a variety of reasons that report died along with any prospect of initiating a new program at that point in time.

As a consequence, space exploration has progressed along the lines of major programs, rather than those programs progressing along the lines of a larger long-range vision, because no opportunity has been available for developing a consensus as to what that vision might be.

As President Bush is sworn into office, the first crew orbiting aboard the International Space Station will watch his inauguration. There is much to be done over the next four years to complete the assembly of the space station, but its operational life has begun. No new program initiative is currently under development within NASA, though there is considerable effort being undertaken on technology development that might support follow-on initiatives to the space station.

This appears to be an ideal time to launch an effort to define the nation's space exploration goals at the beginning of the new millennium. Such an effort should determine how the operational space station could contribute to longer term objectives, and not simply be an end in itself, acknowledging that it can also contribute to the human condition by providing extensive scientific capabilities.

Presidential leadership as the sole determinant of space policy—or any policy for that matter in our

federal, divided system of government—may be a myth, as the record of history has shown. But neither can it be said that presidential leadership is not an essential ingredient in the mix of policy formulation and implementation. There would not have been an Apollo program, a space shuttle, or a space station, without presidential leadership, just as there would have been none of them without congressional agreement and support.

The challenge for President Bush, as well as for the next and subsequent Congresses, is to look beyond the simply programmatic approach to our nation's space program, and seek to identify a new "millennial vision" for the next forty to fifty years of space exploration.

. President John F. Kennedy, who announced the decision to land an American on the Moon by the end of the 1960s, visited the Launch Operations Center at Cape Canaveral in 1962 for a briefing on Apollo. Left to right in the front row: NASA Administrator James E. Webb, Vice President Lyndon B. Johnson, Launch Operations Director Kurt Debus, President Kennedy, Commander Atlantic Missile Range Maj. Gen. L. Davis, and Secretary of Defense Robert McNamara. (NASA Photo)

Science and Engineering Fair of Houston Awards

by Joy Conrad, Pre-College Outreach Chair

The AIAA Houston Section gave out 3 awards at this year's Science and Engineering Fair of Houston. This event serves as the regional fair for all public and private junior and senior high school students in the 16-county surrounding area. Major regional fair winners are eligible to compete in the annual international science and engineering fair. This year there were approximately 1,300 student entries from 185 schools. Section members Timothy Dawn, David Lechner, and Rakesh Bhargava spent their Friday night on March 23th in the Astroarena selecting the Best Aerospace in the Junior, Ninth Grade, and Senior Divisions. Congratulations to the following winners:

Junior Division
Project Name: Distribution of Crater Sizes on the Moon
Student Name: Emilia Stepinski
Age: 13
Grade: 7th
School: Webster Intermediate School

9th Grade Division
Project Name: Determining Rock Thickness Using Seismic Wavelet Analysis
Student Name: Austin Battensperger
Age: 15
Grade: 9th
School: The Academy of Science and Technology

Senior Division
Project Name: Orbital Resonance
Student Name: Marcin Lenart
Age: 18
Grade: 12th
School: Taylor High School

A Message From Your Membership Chair

by Sophia Bright

Well this year's Executive Council term is drawing to a close and we will begin transitioning into a new council. There have been several inquiries as to how to join AIAA, renew memberships, upgrade memberships or transfer current memberships to the Houston section. As we transition into a new Executive Council these items will remain unchanged.

If you know anyone who is interested in becoming an AIAA member please direct them to the AIAA National website (http://store.aiaa.org/memberships.cfm). Table 1 also summarizes the available types of membership and their associated fees. Renewing your current membership can also be done via this website and the fees shown in Table 1 are applicable.

Table 1: Membership Type Description

Membership Type	Description	Fee
Student	Persons interested in aeronautics or astronautics whose primary activity is study at a recognized college, university, and secondary schools offering curricula and studies acceptable to the Institute.	$10 (1 February to 30 June) $20 (1 July to 31 January)
Return to Full-time Study	Members are eligible for this dues discount when taking 12 credits or more at a recognized college or university. You retain your professional member status.	$42.50
Associate	Persons interested in the development or application of aeronautics and astronautics.	$85.00
Young Professional	If you meet the qualifications of Member or Associate Member, are within your first five years of professional practice, 35 years of age or younger and have never been a student member, you are eligible to join at half the current dues rate.	$42.50
Professional	Persons shall have achieved a Bachelor degree in science or engineering, or equivalent qualifications through professional practice.	$85.00
Fellow	Fellow Renewal	$100.00
Spouse	When two members, who meet the requirements of Member or Associate member are married to each other, on of the spouses may pay dues at half the current dues rate. Both members will receive full privileges, but only one copy of Aerospace America will be mailed. Spouse name and ID number are required.	$42.50
Retired	Any member in good standing who has fully retired may take advantage of this rate. (excludes Fellows, see Retired Fellows).	$42.50
Retired Fellow	Any Fellow in good standing who has fully retired may take advantage of this rate.	$50.00
Lifetime	Persons shall have achieved a Bachelor degree in science or engineering or equivalent qualifications through professional practice and wishes to make a one-time dues payment.	$1275.00
Unemployed	Any member in good standing may take advantage of this rate. You will have to indicate your status at renewal time.	$42.50

Also if you know any students who would like to upgrade from a student member to professional member, all they need to do is submit a professional membership form and indicate that they are upgrading. This will enable that person to receive their first year of professional membership free.

If you are or know someone who needs to transfer their membership affiliation to the Houston section, please go or direct them to the following website to update membership information, http://www.aiaa.org/Members/index.hfm?memo=2.

Additionally, make sure to keep your membership information current. It is often said that the aerospace industry is the only place where you can have the same job for five years and work for five different companies. That is especially true given the industry wide consolidation that has happened in the last few years. As companies have changed so have the building signs and the business cards – but is your AIAA member record up to date? After reviewing the latest membership database from National Headquarters there are still several folks who are listed as employees of companies that are no longer in the Houston area or have switched employers since they joined AIAA.

If you have any questions regarding any of the items addressed above please feel free to call AIAA National customer service number at 1-800-639-2422 or contact me, Sophia Bright, at 281-461-8012 ext. 234. You can also try e-mailing me at sbright@tietronix.com if that is more convenient.

Local Robot on Winning Team

by Joy Conrad Pre-College, Outreach Chair and Steve King, Councilor

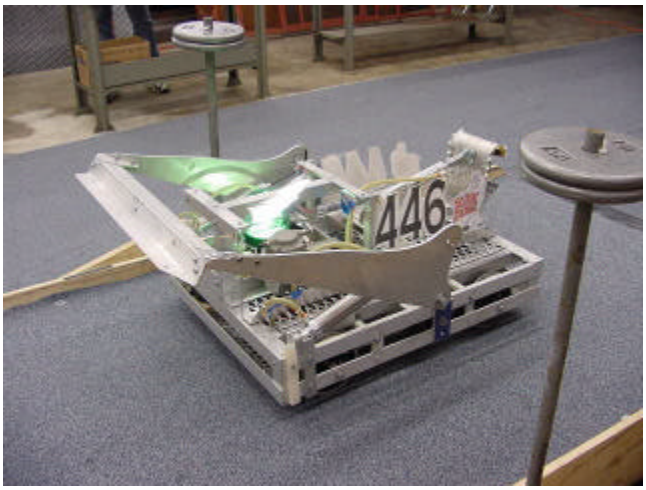
The La Porte High School "Robo Dogs" were members of this year's winning alliance at the Lone Star Regional FIRST Competition on March 17 at Reliant Arena. They also won the Motorola Quality Award, for the most consistent, reliable robot. The La Porte robot was partially funded by the Houston Section and proudly displayed the AIAA logo on its chassis and team member t-shirts.

FIRST (For Inspiration and Recognition of Science and Technology, www.usfirst.org) is a program started in 1989 to excite young people about the fun, accessibility, and importance of science and engineering. It now is a nation-wide program with more than 500 schools participating yearly in the 13 regional competitions and one national competition at Disney World.
The Robotics Competition is a national engineering contest which teams up high school students with engineers from local businesses and universities to get a hands-on, inside look at the engineering profession. In six intense weeks, students, teachers and engineers work together to brainstorm, design, construct and test their "champion robot". This six weeks makes all jobs critical and develop the student's teamwork, communication, decision making, and leadership skills. The teams then compete in spirited, no-holds-barred tournaments complete with referees, cheerleaders and time clocks.

Each year, the competition is different, so returning teams always have a new challenge to look forward to. However, the details are kept secret until the unveiling at a Kick-Off workshop. This year's game required four randomly paired robots to work together in matches lasting no more than 2 minutes to maximize a shared score. Robots had to perform various ball handling, balancing, and object movement tasks during each match. After this year's Kick-Off meeting on January 6th, sixteen La Porte students spent the next six weeks designing the robot and constructing it from sheet metal, a standard parts kit, and other allowed materials with the help of four teachers and ten engineers and machinists.

The Robo Dogs placed 4th place after the qualifying rounds at the NASA Kennedy Space Center Southeast Regional Competition on March 3rd and captained an alliance that finished 4th in the finals. Then a few weeks later at the Lone Star Regional Competition, they were paired with four other robots for the finals and their alliance won first place by scoring the most points in the head-to-head matches.

Congratulations to the La Porte Robo Dogs and all the people who helped. If you would like to help with next year's robot contact Steve King at (281) 483-4359 (steve.king@lmco.com).



Division on Dynamical Astronomy Meeting

By Larry Jay Friesen, Chair - Space Science and Astronomy Technical Committee

April 22-25, I had the opportunity to attend the annual meeting of Division on Dynamical Astronomy (DDA) of the American Astronomical Society (AAS). The meeting was hosted by the Lunar and Planetary Institute (LPI) at the Center for Advanced Space Studies (CASS).

The meeting had sessions on the orbital dynamics of: very small objects (planetary rings, small moons, interplanetary dust, meteoroid streams); very large objects (galaxies, stars in galaxies, black holes); natural satellites, *i.e.* moons; asteroids; artificial objects (artificial satellites and space vehicles); icy outer solar system objects (Kuiper belt objects and comets); and planets in our own solar system and in other systems. There were also sessions on astrometry, astrodynamical reference frames, and the formation of planetary systems. In

addition to the oral presentations, there was one evening session of poster papers.

The session on man-made satellites and space vehicles was probably the one of greatest interest to aerospace engineers. There was a paper on a low-energy sun-assisted technique for transferring from Earth orbit to lunar orbit using less propellant than a Hohmann transfer, another on celestial mechanics aspects of flying satellites in formation, and third suggesting that a small near-Earth "asteroid" discovered just might be an S-4B stage from the Apollo era.

The paper on satellite formations, by K. T. Alfriend and S. R. Vadali of Texas A&M and H. Schaub of Sandia National Laboratory, reminded me of an article on satellite clusters in the November, 2000 issue of *Aerospace America*. A number of groups and agencies are considering plans for flying clusters of small satellites in place of a much larger single satellite. For instance, a cluster of small radar satellites could act as a "virtual" antenna with an effective size (and resolving power) of a single antenna equal in dimensions to the separation between the small satellites, rather than their individual physical size. For many missions, including the radar mission, maintaining satellite formation will be important to accomplishing the mission objectives.

One piece of information Dr. Alfriend provided as he presented the paper quite surprised me. Apparently many of the groups considering such satellite formations do not have any orbital dynamics experts on their teams. [emphasis mine] Lots of people who understand satellite control, but not people who understand orbital mechanics. As a consequence, many groups oversimplify their assumptions: for example, assuming a spherical Earth and not accounting for perturbations by nonspherical effects, such as Earth's oblateness. As a result, if their satellite constellations are actually put into orbit, they will consume propellant much more rapidly than their designers anticipate. This will shorten the effective life of their on-orbit systems, and if their satellites are operating in the commercial world, will cost their owners money from lost revenue.

There were a number of take-home lessons from this paper. One is: set up the initial conditions of a formation's orbit so that orbital dynamics will help you maintain formation. Or as Dr. Alfriend put it: "Use Kepler; don't fight him." Another: use mean orbital elements, not osculating elements, to keep track of your satellites. Mean elements stay constant throughout an orbital revolution; osculating elements don't. People who use osculating elements are likely to put in corrective burns a lot more often than they really need to; again consuming propellant needlessly fast and shortening mission lifetime. But the most important take-home lesson for me was: If you don't have any orbital dynamics experts on your satellite formation team, recruit some.

Calendar of Events

June 2001

6/04 Executive Council Meeting
6/07 Newsletter inputs due
6/15 Fellow and Honorary Fellow nominations due to National
6/20 Honors and Awards Banquet
6/30 Annual Report due to Regional and National
6/30 Award Forms due to Regional and National for Membership, Public Policy, Communication, Young Professionals, Career Enhancement, Newsletter
6/30 Budget and Audit Report due to Regional and National
6/30 2001-2002 Section Officer Roster due to Regional and National
6/30 Mailing Label Request Form due to Regional and National
6/30 Lawrence Sperry Award forms due
TBD Transition Meeting for Officers

July 2001 (new council)

7/13-14 Regional Leadership Conference

October 2001

- Service Vehicles' Conference 10/14-17

October 2002

- World Space Congress, 10/11-20 at the George R. Brown Conv. Ctr., Houston

AIAA
Houston Section
P.O. Box 57524
Webster, TX 77598

Non-Profit Organization
U.S. POSTAGE PAID
PERMIT NO. 1
Webster, Texas

AIAA Horizons

American Institute of Aeronautics and Astronautics

June 2001