

November, 1995



American Institute of Aeronautics and Astronautics

Houston Section

# Horizons

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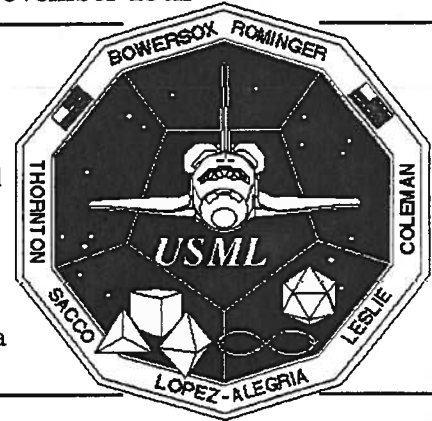
The crew of STS-73, the second flight of the United States Microgravity Laboratory (USML-2). From left, Mission Specialist, Catherine "Cady" Coleman, Ph.D.; Payload Specialist, Al Sacco, Ph.D.; Commander, Ken Bowersox; Pilot, Kent Rominger; Payload Specialist, Fred Leslie, Ph.D.; Mission Specialist, Michael Lopez-Alegria and Payload Commander, Kathy Thornton, Ph.D. STS-73 is a sixteen day mission dedicated to microgravity research with a focus on fluid physics, materials science, biotechnology and combustion science.

*Read more on 'The Cover' text block on the next page.*

Inputs for December's Horizons due no later than November 13th

## The Cover

The crew patch of STS-73, the second flight of the United States Microgravity Laboratory (USML-2), depicts the Shuttle Columbia, in the vastness of space. In the foreground are the classic regular polyhedrons that were investigated by Plato and later by Euclid. The Pythagoreans were also fascinated by the symmetrical three-dimensional objects whose sides are the same regular polygon. The tetrahedron, the cube, the octahedron, and the icosahedron were each associated with the "Natural Elements" of that time: fire (on this mission, combustion science), earth (crystallography), air and water (fluid physics). An additional icon shown as an infinity symbol was added to further convey the discipline of fluid mechanics. The shape of the emblem represents the fifth polyhedron, a dodecahedron, which the Pythagoreans thought to correspond to a fifth mysterious element - the cosmos.



## Editor's Note

-by Mike Sanni, Horizons Editor

It has been said that, "Once a newspaper touches a story, the facts are lost forever, even to the protagonists." As the new editor of the "Horizons" newsletter, I'll do my best to be as accurate as I can be with the articles that you submit. There have been times, however, when I've been pressed against those seemingly ever-present and unforgiving deadlines. In those instances, "the facts" have, at the very least, been misspelled.

I have discovered over the years of doing this sort of thing, that the more people you have reviewing the document, the fewer errors will get through. I've also come to realize over the years, that no matter how many other eyes get to review the final document, there will always be that one typo or grammatical error that escapes undetected. To that there is only one recourse - my apologies.

I'd also like to extend my thanks and respect to Lou Livingston who preceded me as the editor here. Although this job is gratifying, I know that it takes a lot of time and perseverance to put out a newsletter. So I appreciate the amount of energy and dedication Lou contributed to this newsletter. Thanks go to him for keeping the AIAA members informed and in touch with each other for the past five years.

I look forward to working with as many of you as possible. As a staff artist for Lockheed Martin, my usual focus is the illustrations and brochures that I do for the company. From time to time, however, I do get the opportunity to do some creative writing which I enjoy tremendously. So, with the members permission, I will include in this newsletter some prose of a rather "lite-hearted" style which I hope you will enjoy.

Finally, it takes more than one person to produce a good newsletter. It takes people who will contribute good articles and good ideas. I'll do my best to make this newsletter an interesting, informative, and enjoyable communication vessel for the AIAA members - but I'll need your help. Each month, on the inside front page, I will print the next due date for material for the *Horizons*. I've found that this works well with "visual" people like me who use those subconscious schedules that are never written down or documented anywhere. If you see the date, it sticks with you. I hope that will help a bit.

Thanks again for giving me this opportunity to publish your newsletter and be a part of the Houston Section of the AIAA.



Horizons is the monthly newsletter 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 Section officers, are those of the authors and do not necessarily represent the position of AIAA or of the Houston Section. Please address all correspondence to the Chairman, Don Probe, LMES/B14.

## Chairman's Corner

-by Don Probe, Chairman

### Section Direction/ Status

An overview of the Houston Section at this point in the operational year (July 1 through June 30) would show an organization fully staffed (see page 8) and operating close to full capacity; possessing an adequate, stable financial situation; and steadily progressing toward achieving all the goals of an excellent AIAA Section. I, personally, believe it is, but let's put it to the test.

Are we fulfilling our mission statement? Are we sufficiently addressing our goals as indicated in last year's Section Annual Report? Maybe you haven't seen and don't know what they are. Our mission and goals are listed below.

### AIAA Houston Section Mission Statement

The mission of the Houston Section of the AIAA is to promote the advancement of the aerospace profession, with special emphasis

on the following tasks:

- To provide the membership with opportunities for continuing education, professional growth, and recognition for their accomplishments.
- To stimulate the exchange of information within the scientific and technical community.
- To provide support and encouragement for students in learning math, science, and engineering.
- To assist the general public in understanding the benefits of aerospace systems and technology.

### Three Priority Goals for Next Year from the Section Annual Report (From the Section Annual Report)

- Increase membership by 10 percent by soliciting support from senior management of local aerospace contractors.
- Expand the use of computers, including e-mail, the World

Wide Web, and other applications.

- Continue to build on relationships with NASA, industry, and the technical community, through co-sponsorship of technical conferences and workshops.

I would like the membership to do three things:

1. Read and evaluate how you think the section is fulfilling its mission and meeting its goals.
2. Establish whether or not you believe these goals are the most important items our organization should focus on.
3. Contact Don Probe or other council members by phone, e-mail, or otherwise with your opinions. (Addresses are enclosed on the wallet card pages.)

Are we progressing toward meeting the goals of an excellent AIAA section? In next month's Horizon, the chairman will express his opinion.

### Comments from Members

Section member John C. Harcinske

submitted a fax indicating that he joined the AIAA because he thought the organization would help him find a job. He indicated that he was surprised to find that the "services" supplied by the national office were not free to members.

The AIAA, in consideration for unemployed members, does offer reduced dues (\$25 per year), a booklet which is a job-hunting guide entitled, "9 Steps to Success," a resume referral service in the bulletin section of "Aerospace America," and bulletin boards at AIAA technical meetings. In addition, local sections of the AIAA can offer AIAA-sponsored workshops on job-finding at either a nominal charge or possibly no charge at all.

The section chairman is looking into Mr. Harcinske's experience to see if the process, if necessary in the future, can be more productive.

- continued next page

## Newsletter Situation

The section newsletter will be produced by a new editor/assembler, Mr. Mike Sanni. As the Horizons deadline for the November issue neared, there were three volunteers for editing. They are Ms. Frances Mount, Mr. Mike Sanni, and Mr. Bob Barnstable. Mr. Sanni, a new AIAA member, was selected because he had ready access to the publishing facilities.

Production of the November issue is running late, but we are in production again.

*Thank you, volunteers!*

## Events and Meetings

A joint dinner meeting was held with the American Astronomical Society (AAS) on September 21, 1995, at Space Center Houston. The meeting was commemorating 100 U.S. manned spaceflights (see page 7).

The October meeting is scheduled to be a presentation of ballooning technology and a demonstration of balloonar hardware. It will be held October 26,

1995, at the Gilruth soccer field, with dinner in the Gilruth Center.

The International Conference on Micro - Nanotechnology for Space Applications will be held from October 30 to November 3, 1995, at the South Shore Harbor Hotel. This is a conference sponsored jointly by AIAA, NASA, and Aerospace Corporation.

Our November dinner meeting at the Gilruth, will feature former astronaut, Mike Lounge, Spacehab, Inc., speaking about commercial space activities.

## Wallet Cards

Last month's Horizon had wallet member list cards that were slightly mixed up. This issue offers an easier-to-assemble wallet card (see page 10).

## Updated Organization Chart

This issue contains an updated organization chart with telephone numbers of the members (see page 8).



## Space Business Roundtable November Luncheon Features Houston Chronicle's Jim Barlow as Keynote Speaker

Jim Barlow, business columnist of the Houston Chronicle will be the featured speaker at the next Space Business luncheon on Thursday, November 30, 1995 at the Hess Building, 3121 Buffalo Speedway. He will speak on "The Future for High Technology for Business in Houston." The luncheon will begin promptly at 11:30 A.M.

The luncheon is opened to all who wish to attend. The cost for members is \$12.00 and the cost for non-members is \$15.00. Reservations are required and should be made by Monday, November 27, with Phyllis Thompson of Metrica, Inc. at (713) 333-2209.

The Space Business Roundtable was established in the

Clear Lake Area in 1983 to provide an opportunity for the business community to interact with the space community and to facilitate communication and utilization between the two interests until it was moved to Washington, D.C. a few years later.

The Space Business Roundtable was re-established in Houston, April, 1995, with Dr. Jill D. Fabricant, Director of the Enterprise Center, serving as president. With the increased emphasis on the commercialization of space, Dr. Fabricant and other Houston space and business leaders felt the time was right to re-establish the Houston Space Business Roundtable in 1995.



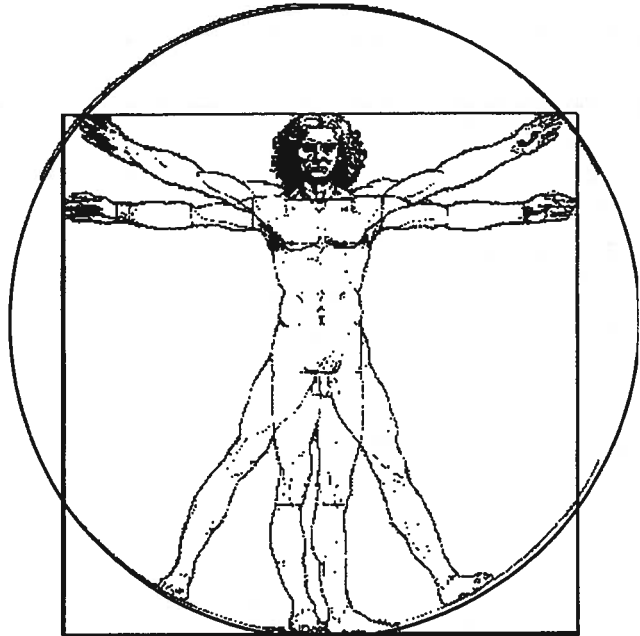
# Committee News

## *AIAA Life Science and Human Factors Technical Committee Update*

-by Jon Zelon

The Life Science and Human Factors TC is planning to begin a series of bi-monthly Lunch & Learn sessions. We are currently in the planning stages. To date, this TC has identified a number of potential topics including status updates on the International Space

Station Crew Health Care and Human Research Facilities; overview of the design activities related to current and future space suits and life support systems; and a status of the NASA Life Science consortium development activities.



We are looking for more inputs from interested members prior to finalizing our program. Those interested should

contact either Jon Zelon (Rockwell, 282-5325) or Karen Loftin (Krug, 212-1434).



# *In Space Imaging and Astronaut Observations Committee*

-by Kam Lulla

The Technical Committee, In Space Imaging and Astronaut Observations has held two seminar meetings already this year.

Dr. Kamlesh Lulla, Chair of Technical Committee In Space Imaging and Astronaut

Observations of the AIAA Houston Section, organized a seminar by Dr. Kazimierz Furmanczyk, of the Laboratory for Remote Sensing and Marine Cartography, Szczecin University, Poland and currently a Fullbright Fellow at the University of

Florida, Gainesville, Florida.

Dr. Furmanczyk spoke on the topic of "Polish Coastal Development: the Use of Remote Sensing Methods to Detect Changes" on October 13, 1995 (Friday the 13th) at 3:00 p.m. at JSC Building 31. Over twenty people

attended this seminar.

Our first meeting was a seminar given by Jennifer Kimball from the University of Alaska on "The Use of Space Shuttle Photography for Auroral Studies" on September 11, 1995. Over fifteen people attended this seminar.



## September Dinner Meeting A Huge Success



- by Steve Scheer

The September dinner meeting was held in the Silver Moon Cafe at Space Center Houston. The meeting, "A Celebration of 100 Manned Space Flights", was held in conjunction with the Southwest Section of the American Astronautical Society.

The panel discussion was opened by the moderator, Mr. Joe Luftus. Each of the the Astronaut speakers was provided five to ten minutes to discuss the U.S. Manned Spaceflight Programs in which they participated.

Mr. Aldrin discussed the Gemini and Apollo programs as well as providing his views on future spaceflight. Mr. Musgrave discussed the Skylab missions for which he trained as a backup. He discussed NASA's efforts to continue moving forward from Apollo. Mr. Brand discussed his

experiences with the Apollo-Soyuz Test Project and international spaceflight. Mr. Brandenstein discussed the Space Shuttle Program emphasizing the shuttle's capabilities, its history and its future. Ms. Dunbar discussed the past, present and future aspects of international spaceflight. She has participated in three international shuttle missions giving her an excellent background for this discussion.

Following the initial presentations, questions were taken from the audience for approximately fifteen minutes after which the meeting was officially closed. Members were invited to talk further with panel speakers.

Additionally, a large group of about fifty students from Clear Lake High School, Houston, Texas, attended the panel discussion as part of a class assignment.



## Membership Membership

- by G. Janson

Look at the newsletter! New style, new format. Our new newsletter chairman is Mike Sanni, a member of the Lockheed Martin staff as Illustrator-Graphic Support. As a new member and a member of the Board, he'll hear news first hand - - - but can't hear everything.

Send your stories, articles, pictures, or trip reports for the next *Horizons* issue. Let's not forget the great work of Lou Livingston on all the past publications. Thanks Lou!



## The Search for Former Members

- by G. Janson

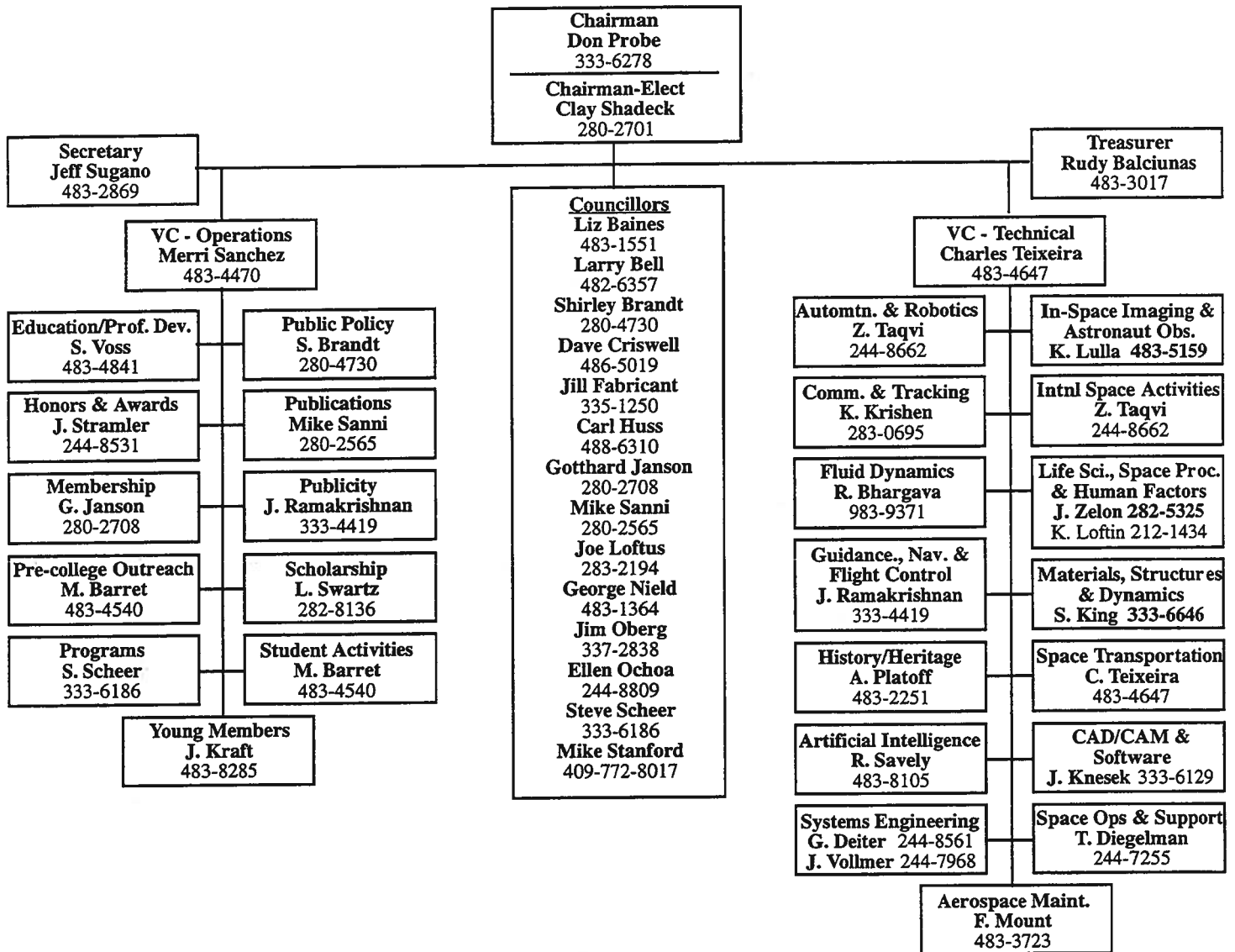
The local Section supported a Headquarters initiative to locate former members. This telemarketing program addressed a host of people in the Houston area who had gotten "out of touch". As a consequence of the calls, several former members signed up again. In other instances, addresses had changed, the individuals appreciated the contact and would reconsider their membership. Others had moved. Personal

telephone inquiries afforded a moment for the Section to brag about its activities and successes. Those contacted thanked the Section for the interest.



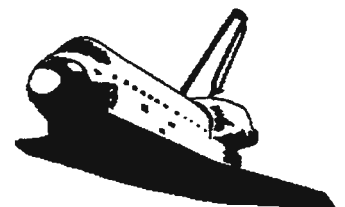
*No one can make  
you feel inferior  
without your consent*  
- Eleanor Roosevelt

# AIAA Houston Section Organization - 1995-96



*When asked what are the desirable qualifications for any young man who wishes to become a politician, Sir Winston Churchill replied:*

*It is the ability to foretell what is going to happen tomorrow, next week, next month, and next year. And to have the ability afterwards to explain why it didn't happen.*





## AIAA Calendar

The AIAA Calendar is intended to encompass all Houston Section events and significant dates. This includes Executive Council meetings, which are open to interested members, and Horizons deadlines. It will also include committee meetings, Lunch & Learns and similar events if Horizons hears about them in time for inclusion. Please send pertinent details to Don Probe, LMES/B14.

### October

16 - Monday  
Horizons inputs for  
November due COB.

19 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

26 - Thursday  
"Hot Air Ballooning",  
Steve Lombardi  
Demonstration balloon  
on exhibit 5:00 - 6:00  
PM at the Gilruth  
Center Soccer Field.  
Social at 6:00 PM,  
dinner at 6:45 PM and  
program at 7:45 PM in  
the upper room at the  
Gilruth Center.  
Program TBD.

30-Nov. 3:  
Monday-Friday  
AIAA/NASA/  
Aerospace Corp.  
International  
Conference on  
Integrated Micro/  
Nanotechnology for  
Space Applications.  
South Shore Harbour  
Resort and Conference  
Center.

### November

9 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

13 - Monday  
Horizons inputs for  
December due COB.

16 - Thursday  
Monthly dinner  
meeting.  
Program TBD.

30 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

### December

14 - Thursday  
Monthly dinner  
meeting.  
Director's Reception.  
Gilruth Center, 5:30/  
6:30/7:30.

18 - Monday  
Horizons inputs for  
January due COB.

### January 1996

18 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

22 - Monday  
Horizons inputs for  
February due COB.

25 - Thursday  
"The First Manned  
Lunar Landing  
Spacecraft: Its Design,  
Manufacture, Ground  
Test and Mission",  
Ross Fleisig at the  
Gilruth Center.  
Social at 5:30 PM,  
Dinner at 6:30 PM and  
Program at 7:30 PM.

### February

15 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

22 - Thursday  
Monthly dinner  
meeting.  
Program TBD.  
Gilruth Center, 5:30/  
6:30/7:30.

26 - Monday  
Horizons inputs for  
March due COB.

### March

21 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

25 - Monday  
Horizons inputs for  
April due COB.

28 - Thursday  
Monthly dinner  
meeting.  
Program TBD.  
Gilruth Center, 5:30/  
6:30/7:30.

TBD  
Student Paper  
Competition.

### April

18 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

22 - Monday  
Horizons inputs for  
May due COB.

25 - Thursday  
Monthly dinner  
meeting.  
Program TBD.  
Gilruth Center, 5:30/  
6:30/7:30.

### May

16 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

23 - Thursday  
Monthly dinner  
meeting.  
Program TBD.  
Gilruth Center, 5:30/  
6:30/7:30.

28 - Tuesday  
Horizons inputs for  
June due COB.

TBD  
Annual Technical  
Symposium.

### June

20 - Thursday  
Executive Council  
meeting.  
5:00 PM, Center for  
Advanced Space  
Studies.

27 - Thursday  
Monthly dinner  
meeting.  
Honors and Awards  
Banquet.  
Gilruth Center, 5:30/  
6:30/7:30.





The attached wallet card to the right, contains updated names, addresses, telephone, fax and e-mail information for Houston Section officers, councillors and committee chairmen. It's a handy and quick reference for AIAA members. Cut on solid lines then fold on the dotted lines.

## THE ORIGIN OF "TAPS"

It all began in 1862, during the Civil War, when a Union Army Captain, Robert Ellicombe, was with his men near Harrison's Landing, in Virginia. The Confederate Army was on the other side of this narrow strip of land. During the night, Captain Ellicombe heard the moan of a soldier who lay mortally wounded on the field. Not knowing if it was a Union or Confederate soldier, the Captain decided to risk his life and bring the stricken man back for medical attention. Crawling on his stomach through the gun fire, the captain reached the stricken soldier and began pulling him toward his encampment. When the Captain finally reached his own lines, he discovered it was actually a Confederate soldier, but the soldier was dead.

The captain lit a lantern. Suddenly, he caught his breath and went numb with shock. In the dim light, he saw the face of the soldier. It was his own son! The boy had been studying music in the South when the war broke out. With-

out telling his father, he had enlisted in the Confederate Army.

The following morning, the heart-broken father asked permission of his superiors to give his son a full military burial despite his enemy status. His request was partially granted.

The Captain asked if he could have a group of army band members play a funeral dirge for the son at the funeral. That request was turned down since the soldier was a Confederate. Out of respect for the father, they did say they could give him only one musician. The Captain chose a bugler to play a series of musical notes he had found on a piece of paper in the pocket of the dead youth's uniform.

This wish was granted. That music was the haunting bugle melody we now know as "TAPS" used at all military funerals.

*The above article is extracted from Doug Storer's Encyclopedia of Amazing But True Facts, published by Signet.*



# *Houston Section Wins National Awards*

*-by Dr. George C. Nield*

Each year the American Institute of Aeronautics and Astronautics reviews the activities and accomplishments of the individual AIAA Sections and then selects a few of the Sections to receive special awards. I am pleased to announce that the Houston Section has been chosen to receive several of these awards for the 1994-95 year. The awards are given in five different size categories. With almost 1000 members, the Houston Section is considered a Large Section, and competes with Sections in Atlanta, Baltimore, St. Louis, San Diego, Philadelphia and a number of other cities.

We received third place honors for the Membership Award, which is presented for increasing the Section's membership by planning and implementing

effective new member recruitment and retention campaigns. Considering the difficult economic times that this area has been experiencing lately, I am especially pleased about this award. Thanks go to Dr. Clay Shadeck, last year's Membership Chairman.

We also took third place for the Public Policy Award, which is presented to Sections for stimulating public awareness of the needs and benefits of aerospace research and development, particularly on the part of government representatives, and for educating its members in the value of public policy activities. We appreciate the great work that Shirley Brandt has done in this area as our Public Policy Chairman.

Perhaps the most significant recognition we received was our selection as the first

*-continued on next page*

- continued from page 11

place winner for the Outstanding Section Award, which is presented to Sections based on their overall activities and contributions throughout the year. Obviously, being selected for an award like this is a reflection of a lot of work being done by a lot of different people, including our officers and Councilors, committee chairmen, and the many individual Section members who devoted so much of their time and energy to helping us have such a successful year.

The awards will officially be presented at the AIAA Aerospace Sciences Meeting in Reno, Nevada, in January. In addition to the prestige of being selected for these honors, we will also receive \$400 for the Outstanding Section Award, and \$100 for each of the third place awards. Thanks again to all of the folks who have been doing such

a fantastic job in keeping the Section running so smoothly. We are certainly fortunate to have such a talented team of people who are involved in our Section activities. Keep up the great work everybody!



On behalf of the Houston Section, I thank George for the dedicated and excellent leadership which brought the First Place Section Award for 1994-95 year to this Section.  
- Don Probe



*Half our life is spent trying to find something to do with the time that we have rushed through life trying to save.*

- Will Rogers



## October Cruncher

A straight piece of timber, square in cross section, is placed on and at right angles to a horizontal log so as to make a seesaw. The cross-section of the log is such that, as the timber rocks back and forth, it remains perfectly balanced. In other words, the center of gravity of the timber is always vertically above the point of contact with the log.

What is the equation of the curve describing the shape of the log, and what common name is given to this curve?

### Solution

Place the origin of the coordinate system at the top of the log with the Y-axis downward (see figure). The slope of the curve at the point of contact is  $dy/dx = \tan f$ .

The timber can be in equilibrium only if the height of the c. g. remains constant. If  $h$  is half the depth of the timber,

$$y = h/\cos f - h = h (\sec f - 1)$$

$$dy = h \sec f \tan f df$$

$$dx = dy/\tan f = h \sec f df$$

$$\text{Integrating, } x = h \ln (\sec f + \tan f) + C$$

$$C = 0 \text{ because } f = 0 \text{ at } x = 0$$

$$y/h + 1 = \sec f$$

$$\tan f = (\sec^2 f - 1)^{.5} = [y/h (y/h + 2)]^{.5}$$

$$x/h = \ln [y/h + 1 + (y/h (y/h + 2))^{.5}]$$

$$e^{x/h} = y/h + 1 + [y/h (y/h + 2)]^{.5}$$

$$[e^{x/h} - y/h - 1]^2 = y/h (y/h + 2)$$

$$e^{2x/h} + 1 = 2e^{x/h} (y/h + 1)$$

$$.5 (e^{x/h} + e^{-x/h}) = y/h + 1$$

$$y = h (e^{x/h} + e^{-x/h})/2 - h = h [\cosh (x/h) - 1], \text{ a catenary.}$$

To verify that no slippage occurs, the arc length from the center is

$$ds = [1 + (dy/dx)^2]^{.5} dx$$

$$= (1 + \tan^2 f)^{.5} dx$$

$$= \sec f dx$$

$$= h \sec^2 f df$$

$$s = h \tan f$$

Thus the arc length is the same as the corresponding length of timber.



Non-Profit Organization  
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Webster, Texas

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



# Horizons

American Institute of Aeronautics and Astronautics *Houston Section*

## NEWSLETTER

NEWSLETTER

# IIOTZOTS

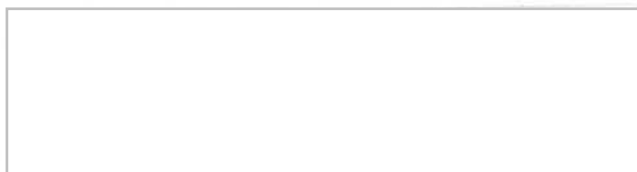
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DON PROBE  
CHAIRMAN 1995-96

## American Institute of Aeronautics and Astronautics

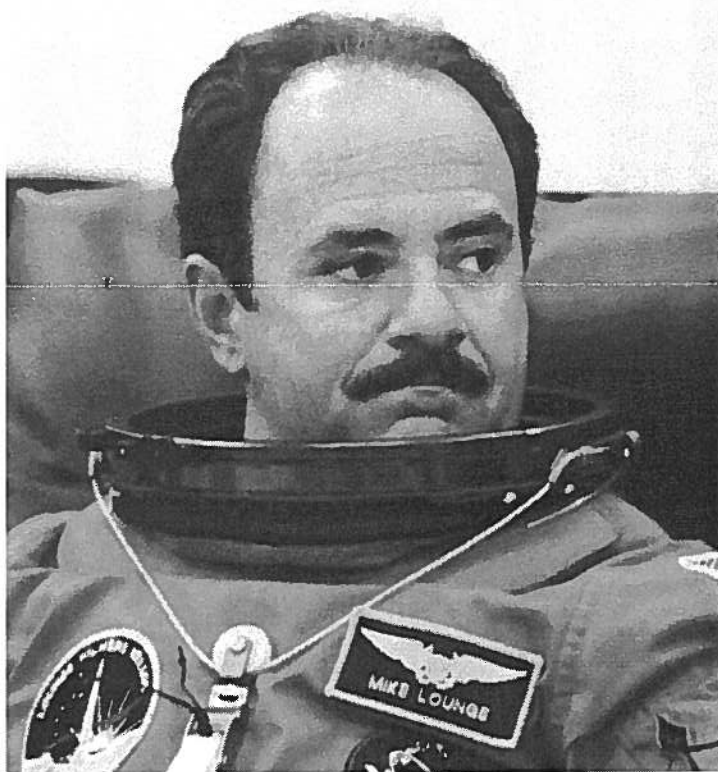
HOUSTON SECTION P.O. BOX 57524 WEBSTER, TEXAS 77598

### PRESENTER

Thursday, November 16, 1995

### COMMERCIAL SPACE ACTIVITIES

JOHN M. "MIKE" LOUNGE  
Director of Flight Operations  
Spacehab, Inc.



Mr. Lounge entered on active duty with the U.S. Navy following graduation from the U.S. Naval Academy in 1969 and spent nine years in a variety of assignments. This included a 9-month Southeast Asia cruise aboard the USS Enterprise while with the 142 Fighter Squadron where he participated in 99 combat missions. He resigned his regular Navy commission in 1978 and came to work at JSC with the Payload Operations Division. Selected as an astronaut candidate in 1980, he completed a one year training and evaluation period, and became an astronaut in August 1981. He served as a member of the launch support team at KSC for the STS-1, -2, and -3 missions. Mike was a mission specialist on STS 51-L on August, 1985 where his duties included deployment of the Australian AUSSAT communication satellite and operation of the Remote Manipulator System (RMS). He next flew as a mission specialist on STS-26, the first flight to be flown after the Challenger accident. During the four day mission, the crew successfully launched the TDRS-C. His third flight into space occurred in December 1990 on STS-35. He served as flight engineer and Space Shuttle Operator for that 9-day flight which was dedicated to astronomy. Mike resigned from NASA in June, 1991 and he is currently with Spacehab, Inc.

### DINNER MEETING

SOCIAL: 5:30  
DINNER: 6:30  
PROGRAM: 7:30

### MENU: BAKED HAM

MEMBERS & SPOUSES	\$10.00
NONMEMBERS	\$11.00
STUDENTS/YOUNG MEMBERS	\$ 5.00
UNEMPLOYED MEMBERS	\$ 5.00

ROBERT R. GILRUTH RECREATION CENTER  
JOHNSON SPACE CENTER

TANYA BRYANT  
483-1175  
NASA

MISTY ARMSTRONG  
333-4419  
DYNACS

BARBARA WEEMS  
333-6276  
LOCKHEED MARTIN

CALL ONE OF THE ABOVE FOR RESERVATIONS.

NOTE: RESERVATION DEADLINE IS MONDAY, NOVEMBER 13, AT NOON.

ANY CANCELLATIONS ARE REQUIRED PRIOR TO DEADLINE. NO-SHOWS WILL BE BILLED.

ALL ARE WELCOME

DINNER RESERVATIONS ARE NOT REQUIRED FOR ATTENDING THE PROGRAM ONLY.