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## Mars Settlement Design Competition

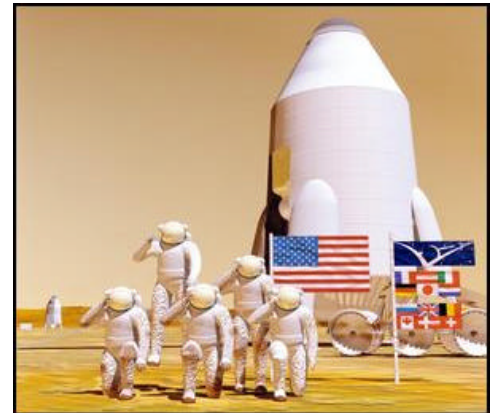
*By Steve King, Publicity Chair*

**O**n February 11-13, NASA-JSC, The Boeing Company, the Clear Creek Independent School District, and the AIAA Houston Section hosted its second annual Mars Settlement Design Competition for 144 enthusiastic and bright high school students at JSC.

Most of the students came from high schools in Houston and Southeast Texas, but six traveled from Iowa. They, along with 18 teachers/chaperones, were organized into four "company" teams and worked against a deadline to design, develop, and present concepts for a human community on the Red Planet that could support 12,000 residents in the year 2035.

Each team was given 21 hours (assuming no one slept) to design their settlement, specify vehicles used for transportation, determine sources of electrical power and water, design computer and robot systems, specify allocation of interior space, show concepts of community design, and provide estimated costs and schedules for completion of the project. All this submitted in a written proposal limited to 50 pages.

Beyond the exciting experience of learning more about Mars



and futuristic design, the competition also gave the students an opportunity to gain skills that will help them in life. They all got first hand experience developing their leadership, team building, communication, and time management skills.

All four team's presentations showed great creativity. It was a tough choice selecting a winning team, but Vulture Aviation came out on top and was as excited as a tired group of kids could be. They were led by CEO Ramesh Khatri from USA.

The competition's great success can be directly attributed to the long hours and dedication of Norm Chaffee, project coordinator for the event. Other AIAA volunteers were: Joy Conrad (registration & librarian), Steve King (structural engineering trainer & judge), and Mike Oelke (treasurer).

The students enjoyed themselves immensely! Maybe we will see some of them live on Mars one day.

## Stay Informed with AIAA E-mails

*By Darby Cooper*

As a service to our members, the Houston Section periodically sends out e-mail notices on upcoming events of interest. If you are an AIAA member and would like to be added to our distribution list, please contact Michael Begley at (281) 244-4741, or send a note to [begley@pat.mdc.com](mailto:begley@pat.mdc.com)

## April 12 Deadline for the Next Edition of *Horizons*

Thanks to everyone who contributed to this edition of *Horizons*! The deadline for next month's issue is just around the corner. Please submit all articles to John Keener by Wednesday, April 12, 2000!

Contributions can be submitted by email to John Keener at [john.keener@lmco.com](mailto:john.keener@lmco.com).

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## Chairman's Corner

*By Dr. Merri Sanchez, Chairman*

**A** IAA is going to have a busy month this April. We will be hosting the Region IV Student Paper Competition concurrently with our Annual Technical Symposium on April 6 and 7 in the Bayou Building at the University of Houston - Clear Lake campus. I hope to see many of you there, both supporting the events and presenting papers!

The Houston Section will also be hosting the Region IV RAC meeting. This is a

quarterly meeting supported by all of the Region IV officers and the chairpersons of the sections in Region IV. If you are interested in becoming more involved at the Regional level, please feel free to come by. We will be meeting at the Ramada Inn on Saturday April 8 from about 9 am to 3 pm.

Our March dinner meeting with AIAA Distinguished Lecturer Dr. Seth Shostak was a smashing success. We had over 100 people in

attendance. Seth's talk on the "Search for Extraterrestrials" was both entertaining and technically informative. You missed a good one if you didn't attend!

Our April dinner meeting plans have undergone a change. We will now be meeting on Monday, April 10 at the Nassau Bay Hilton. Our speaker will be former Senator Jake Garn.

*... See Chairman on Page 4*

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## Help AIAA Help You - Update Your Member Records!!

*By Darby Cooper, Membership Chair*

**I**t 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? A recent review of the Houston Section membership roster revealed almost 100 members working for companies that have changed (such as McDonnell Douglas and Rockwell Space Operations Company). Knowing where our members are working is vital to the Houston Section in obtaining corporate support for local AIAA activities (such as our monthly dinner meeting). Take a few minutes and visit the AIAA website at <http://www.aiaa.org/service/address.html> to update your member information or call customer service at 1-800-639-2422.

## AIAA 2000 Annual Technical Symposium and Region IV Student Paper Conference

*By John Vollmer, Vice-Chair Technical*

**T**his year the symposium is being held at the University of Houston Clear Lake (UHCL) and combines our Annual Technical Symposium (ATS) with the AIAA Region IV Student Paper Conference (SPC). We have combined these two annual events with the intent of bringing together aerospace professionals with the some of the best college talent in the nation. Because AIAA is interested in fostering the professional development of individuals in Aerospace and associated technical disciplines, this symposium/conference represents a unique opportunity for increased interaction between industry and academia that is beneficial to both.

Last year Russ Filler and myself had the opportunity to attend the SPC in Albuquerque, NM. It was a great event and there were some

*... See ATS and Student Conference on Page 4*

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## News from the Space Science and Astronomy Technical Committee

By Dr. Larry Friesen, Space Science and Astronomy Technical Committee Chair

**W**e have organized two upcoming "Lunch and Learns" – one for April and one for May. See the details below and look for flyers on both of these events. Pack up a lunch and join us there. We'd love to see you.

### Upcoming "Lunch and Learns"

#### April: "Cosmic Pinball"

Date: Wednesday, April 19, 2000  
Time: 12:00 noon - 1:00 pm  
Location: JSC Building 31, Conference Room 129  
Speaker: Dr. Carlton Allen of JSC  
Topic: The book "Cosmic Pinball" was written by Dr. Allen and Dr. Carolyn Sumners of the Burke Baker Planetarium. The book deals with the science of comets, meteors, and asteroids, and their potential impact hazard to Earth.

#### May: "Mars Spectroscopy"

Date: Tuesday, May 30, 2000  
Time: 12:00 noon - 1:00 pm  
Location: Center for Advanced Space Studies (CASS), also known as the Lunar and Planetary Institute (LPI), 3600 Bay Area Boulevard, Hess Room  
Speaker: Dr. Laurel Kirkland of LPI  
Topic: Dr. Kirkland will discuss some of the things that spectroscopy can tell us about the surface and atmosphere of Mars.

### Planetary science tidbit of the month

Around Thanksgiving of last year, the Galileo spacecraft discovered a large volcanic lava fountain on Io. Rather like fire fountains that Hawaii's volcanoes sometimes display – much larger, though. This was a curtain of hot lava shooting up more than a kilometer from a fissure 25 kilometers long.

If you've given any thought to joining the Space Science and Astronomy Committee or taking part in its activities, we'd like to hear from you. Contact me at (281) 334-5268, or by e-mail at [lfriesen@genie.idt.net](mailto:lfriesen@genie.idt.net).

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## Chairman

*Continued from Page 3*

I also wanted to take a moment and encourage each of you to vote in the upcoming section elections. We will be mailing ballots out in April for the officer and councilor positions for next year. Please return your ballot promptly. We have been working very hard to find a good slate of candidates and your vote counts!

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## ATS and Student Conference

*Continued from Page 3*

very good papers presented on cutting edge subjects. Additionally, there was some excellent individual and group design projects presented. But, what was most valuable was meeting and talking to such a high caliber set of students.

The result of our experience last year with the SPC served as the seed for pulling this event and the ATS together this year. If you can make time available I think you will find this a very worthwhile event.

I look forward to seeing you there!



## Project Starshine

### An Opportunity for K - 12 Students to Participate in the Construction of a Real Satellite

By Jean Hill

**S**TARSHINE 2 is an opportunity for K - 12 students and individuals from around the world to participate in the construction and tracking of a real satellite. This project is intended to provide students with a hands-on experience that will spark their interests in the fields of optical astronomy, orbital dynamics, space and atmospheric physics, and mathematics without resorting to expensive techniques or tools.



*Project Director Gil Moore holding a full-scale mockup of the STARSHINE satellite. Sunlight is reflected from a single mirror in the image on the right. Photo by Kerry Kirkland.*

#### What is STARSHINE 2?

STARSHINE 2 is the second satellite in a series of eleven satellites that will be deployed once each year over an eleven-year solar cycle. STARSHINE 1 was deployed on STS-96 on June 5, 1999. It was constructed from a 19" diameter aluminum sphere with 878 1" diameter aluminum mirrors covering its surface. STARSHINE 2 consists of a 36" aluminum sphere with approximately 3600 1" diameter aluminum mirrors placed on its surface.

#### How do I participate in the STARSHINE 2 project?

Mirror kits are sent to those who request them. Two mirrors (you get to keep one) are sent in each kit to a teacher or individual, polished by the participant(s), and sent back to the Project STARSHINE Director, R. Gilbert Moore. The mirrors are secured on the aluminum shell, the completed 'disco ball' is loaded into a canister on the Space Shuttle, and the satellite is ejected from the payload bay. Students then have the opportunity to track



*One of STARSHINE 2's 3600 1" diameter aluminum mirrors is shown here after polishing. Photo by Charlie Elms.*

STARSHINE's orbital decay using on-line software.

The mirror kits are intended for delivery in the beginning of the 2000 - 2001 school year, but you can apply on-line for a kit today.

For more information pertaining to Project STARSHINE and to fill out a School Participation Request form for STARSHINE 2, please refer to the Official Project STARSHINE homepage. <http://www.azinet.com/starshine/>. Please include a comment in the "Comments" section if you are requesting multiple kits.

For additional information or questions, please contact Project STARSHINE Director, Gil Moore by email at [gilmoore12@aol.com](mailto:gilmoore12@aol.com).

## Thank You HSTE Workshop Volunteers

By Steve King, Publicity Chair

**T**he Houston Section and myself would like to thank Dr. Larry Friesen, Gretchen Letvin, and Gary Spexarth who helped with setup and registration at the Human Space Transportation & Exploration Workshop held at the Moody Gardens Hotel in Galveston, Texas, February 28 - March 1. Thanks also go to Glenn Jenkinson for his webpage advertisement of the workshop.

The 150 or so workshop attendees from industry, government, and academia left with a better understanding as to where human space transportation architecture is headed over the next two decades, how government and industry forces are shaping it, and what challenges and opportunities might be ahead. The event had a diversified agenda, which included:

- An opening keynote address by Joe Rothenberg, NASA Office of Spaceflight.
- Panel discussions on "Is the United States showing adequate leadership today in the human space program?", "What lessons learned need to be considered in planning new human missions and human space transportation systems?", and Space Transportation Architecture Studies. Members of these panels included such notable as: Vance Brand,

Gary Payton, Mike Coats, Tom Rogers, Jim Oberg, and Bruce McCandless, to name a few.

- Papers on a wide range of transportation and exploration topics.
- A video taped address by US representative Dana Rohrabacher.
- Several breakout sessions for everyone to participate in transportation and exploration topics of their interest.
- And an insightful luncheon presentation by Art Stephensen, NASA-MSFC Director.

The workshop provided several opportunities for attendees to mingle and share ideas. Some of the most interesting discussions came about over lunch and at the workshop's paddlewheel cruise on Tuesday evening. Hats off to AIAA for helping make this workshop a success and Lockheed Martin's hosting of the event. Please contact Steve King at (281) 333-6646 or [steve.king@lmco.com](mailto:steve.king@lmco.com) if you are interested in seeing the official proceedings once published within the next few weeks.

## Engineer's Week Visit

By Joy Conrad, Pre-College  
Outreach Chair

**T**o commemorate National Engineer's Week, I visited Ms. Bright's 5<sup>th</sup> grade class at Wedgewood Elementary in Friendswood on the afternoon of February 25. I was just one of the many AIAA members that volunteered through the NASA/JSC program. I spent an hour discussing engineering and physics and gave them an idea of what people do in different jobs. I also talked about astronauts and space and brought the AIAA vacuum pump to simulate the outer space environment. They were pretty impressed with the expanded balloon and the crushed aluminum can, but they liked the marshmallows the best.

The students were quite inquisitive, and I spent most of the time answering questions. They were especially interested in black holes and what it would be like to live on Jupiter. After their imaginations ran wild for a while, I steered them back to reality and talked about the underlining schoolwork that is needed for space work.

The visit was a lot of fun, and I think when I left they had a little more of an idea of what 'Engineering' really means.



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## *Dinner Meeting with Michael L. Coats* The Challenges and Demands of a Spacefaring Race



*By Steve King, Publicity Chair*

**M**r. Michael L. Coats is currently the Vice President of Reusable Space Transportation Systems for Lockheed Martin Astronautics. Mike was an astronaut from 1979 until he joined Lockheed Martin in 1991. He was the pilot of the STS-41D shuttle flight in 1984 and spacecraft commander of STS-29 in 1989 and STS-39 in 1991. Mr. Coats is a retired Navy captain who graduated from the Naval Academy in 1968. He served as a test pilot and a flight instructor at the Naval Test Pilot School.

Mr. Coats gave his perspective on the future of the space program at the dinner meeting was held on February 28<sup>th</sup>, at a new venue for the section, the Walter Hall Park pavilion in League City.

Ten students traveled from Texas A&M to attend. Some of the students who had the opportunity to listen to the presentation include: Larry Chien, Darren Hartl, Corbett Hoenninger, Nathan Howard, Vinod Kumar, Ryan Morris, and Ayman Wafai.

Mike started out by relating some of his experiences talking to grade school students and made the observation that he enjoyed talking to fourth through sixth graders the most, as they ask the best questions. They are old enough to formulate intelligent questions

and young enough not to be intimidated!

In Mike's opinion three factors must be present to have a space program, which achieve great results: technical, political and physiological.

### Technical Factor

The technology must be largely available to carry out the plans envisioned by the leaders. In the instance of a manned mission to Mars, a large portion of the technology is available although with some breakthroughs – in propulsion for example to shorten the trip time – some of the other difficulties would be easier to handle.

### Political Factor

Even if the means are available unless the political will is present, the project will fail. The government and the voters must be willing to back the project and perhaps for the long term. Space is not an easy (or cheap) frontier.

### Physiological Factor

We need to understand how to protect humans in space, which is a very unforgiving environment. Bone density loss and other long term effects of micro-gravity need to be better understood before long duration space missions can take place. There is also the required protection from radiation.

# WAR' 2000

*Workshop on Automation  
and Robotics*

Robot Helpers for Space Explorers

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Wednesday, May 24<sup>th</sup>, 2000

Gilruth Recreation Center, JSC/NASA

*Presented by the Automation and Robotics Technical Committee  
Of American Institute of Aeronautics and Astronautics (AIAA) Houston Section*

<u>Program</u>	8:00 am	Registration
	8:30 am	Presentation of three papers on the theme: Robot Helpers for Space Explorers
	10:30 am	Panel Discussion
	11:30 am – 1:00 pm	Lunch <i>(Combined lunch for attendees of INNOVATION'2000 and WAR'2000)</i>

## Registration Information

Registration is required.

Registration Deadline Tuesday May 16th, 2000

Workshop Cost Free

Lunch \$7.50

## Contact Information

For WAR'2000, Innovation'2000 and lunch reservations, contact Sheryl at (281) 483-8243.

## General Chairman

Dr. Gary Funk, Foxboro

*Co-sponsored by the Instrument Society of America, Robotics and Expert Systems Division*

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# INNOVATIONS' 2000

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Wednesday, May 24<sup>th</sup>, 2000

Gilruth Recreation Center, JSC/NASA

*Organized by The Clear Lake Council Of Technical Societies in cooperation with CLCTS member organizations*

<u>Program</u>	11:30 am	Registration
	12:00 Noon	Lunch ( <i>Combined lunch for attendees of INNOVATIONS'2000 and WAR'2000</i> )
	1:15 – 2:00 pm	Technical Sessions (A) Parallel sessions organized by the member
	2:05 – 2:50 pm	Technical Sessions (B) Parallel sessions organized by the member
	2:55 – 3:35 pm	Technical Sessions (C) Parallel sessions organized by the member
	3:35 – 4:00 pm	Reception Hosted by local Aerospace Companies

Individual sessions of INNOVATIONS'2000 are organized by member organizations of CLCTS. Each session will consist of 3 to 4 papers.

## Registration Information

Registration is required; the deadline is Tuesday May 16th, 2000

Lunch Only	\$7.50
Innovations '2000 Only	\$5.00
Full Day Program	\$12.00 ( <i>Includes WAR'2000, INOVATIONS'2000 and Lunch</i> )

## Contact Information

For WAR'2000, Innovation'2000 and lunch reservations, contact Sheryl at (281) 483-8243.

For any additional information on the conference, please contact General Chairman Dr. Michael Stanford at [Michael.Stanford@hotmail.com](mailto:Michael.Stanford@hotmail.com) or Program Chairmen Zafar Taqvi at (281) 244-4436 or [Z.Taqvi@ieee.org](mailto:Z.Taqvi@ieee.org).

## Abstract Submittal

*Deadline for submission of Abstracts is Friday April 7<sup>th</sup>, 2000.*  
Please submit your abstracts to your society officers – AIAA, CASS, IEEE, ISA, ISSA, or INCOSE.

*INNOVATIONS' 2000 is sponsored by the JAIPCC Executive Board.*

## Calendar of Events

### April 2000

- 4/6-7 Student Paper Competition
- 4/6-7 Annual Technical Symposium
- 4/8 Region IV RAC at the Ramada Inn,  
9 am – 3 pm
- 4/10 Dinner Program with former Senator  
Jake Garn, Nassau Bay Hilton
- 4/12 Newsletter Inputs Due
- 4/13 Executive Council Meeting
- 4/19 Lunch and Learn: "Cosmic Pinball" with  
Dr. Carlton Allen, 12:00 noon to  
1:00 pm, Building 31, Room 129

- 5/4 Space Day 2000
- 5/10 Newsletter Inputs Due
- 5/10-12 Global Air and Space 2000 International  
Business Forum and Exhibits in  
Washington, D.C.
- 5/18 Dinner Program
- 5/24 Workshop on Automation and Robotics,  
8:00 am to 1:00 pm, Gilruth Center
- 5/24 Innovations 2000, 11:30 am to 4:00 pm,  
Gilruth Center
- 5/30 Lunch and Learn: "Mars Spectroscopy"  
with Laurel Kirkland, 12:00 noon to  
1:00 pm at CASI, 3600 Bay Area Blvd.,  
Hess Room

### May 2000

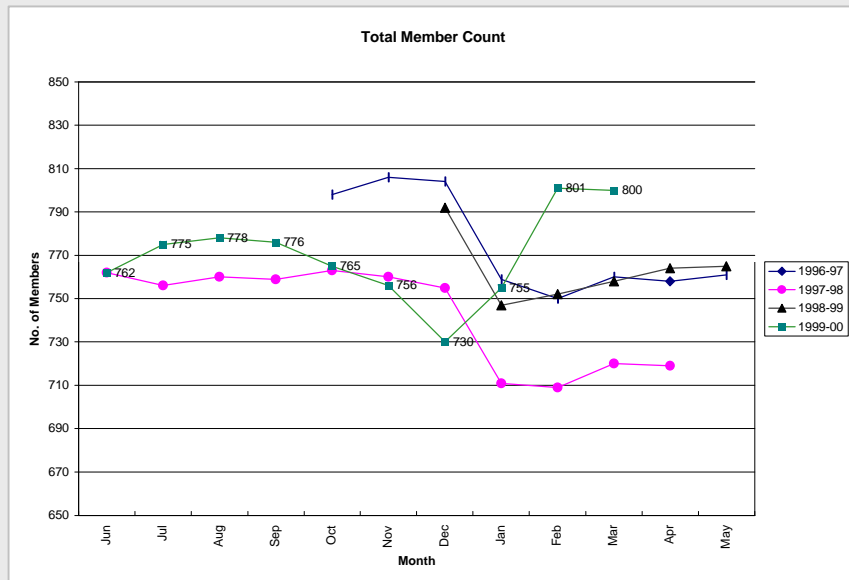
- TBD Clear Lake City Technical Societies  
Annual Awards Banquet
- 5/1 Houston Section Spirit of Apollo  
Scholarship Applications Due
- 5/4 Executive Council Meeting

### June 2000

- TBD Lunch and Learn
- 6/1 Executive Council Meeting
- 6/7 Newsletter Inputs Due
- 6/22 Honor and Awards Banquet

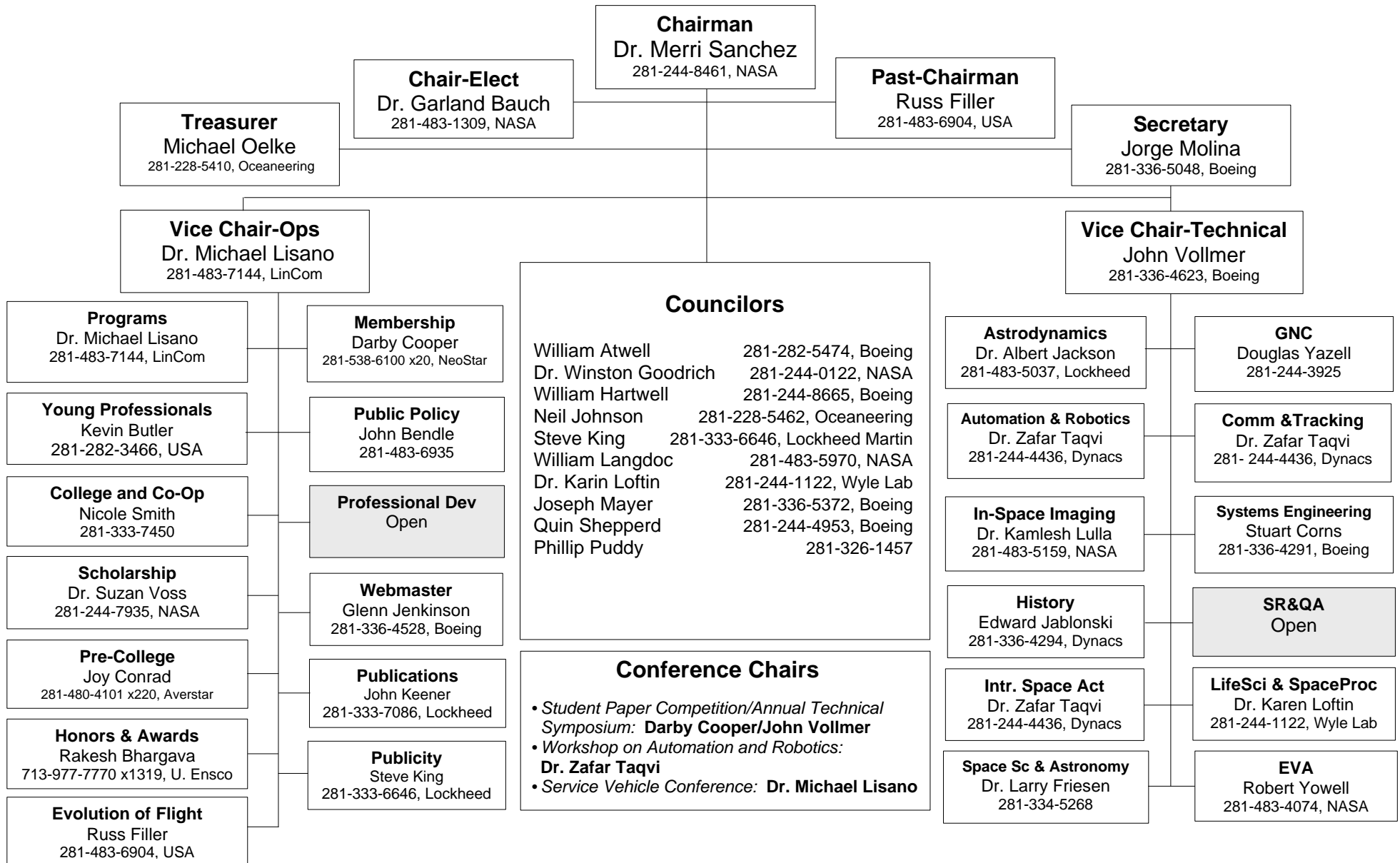
## Houston Membership Remains Strong

*Our March membership continues to remain strong following the successful membership campaign!*





# 1999-2000 Houston Section *Executive Council* as of 1/31/00





**Houston Section**

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**March 2000**

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