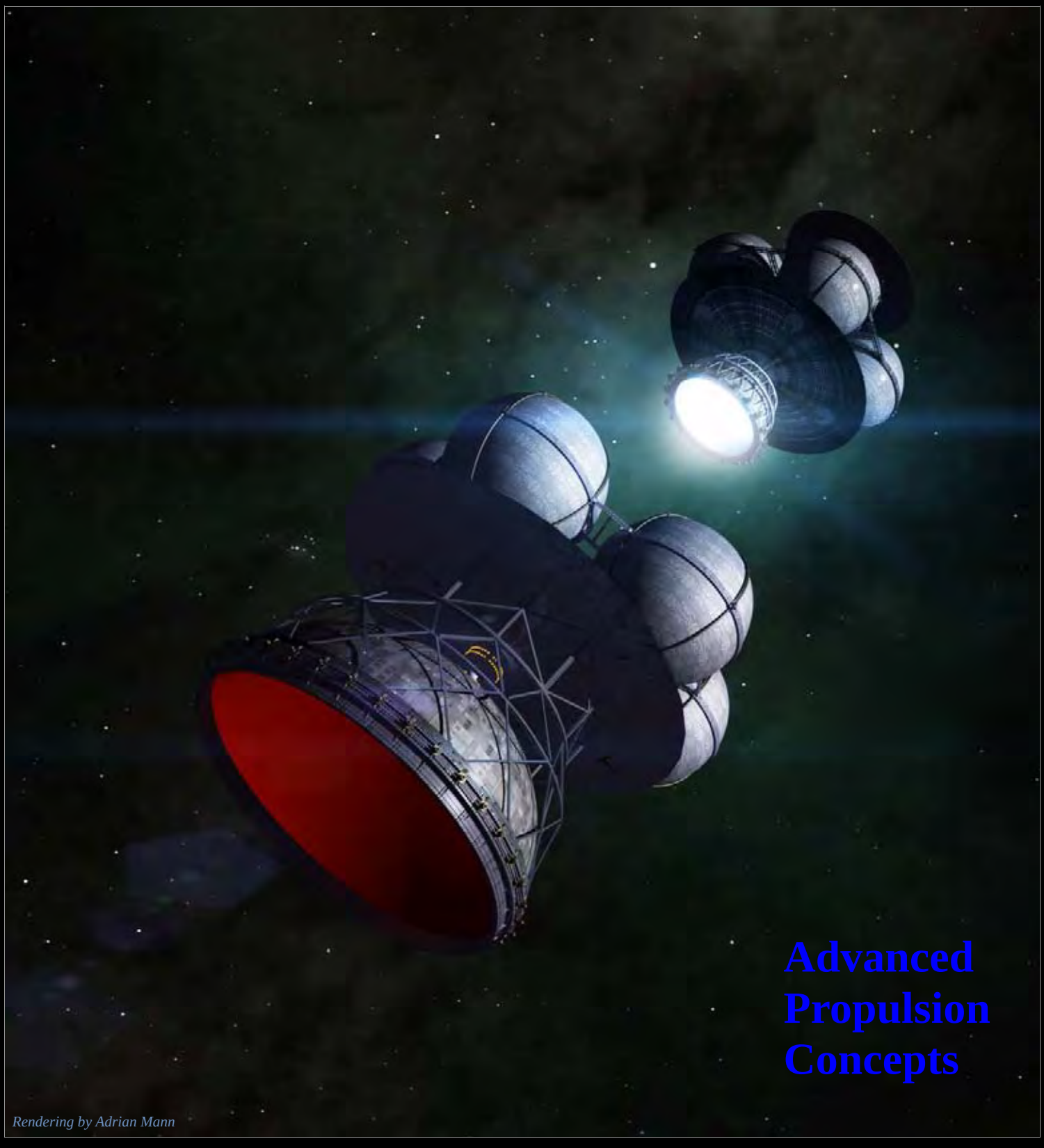
Horizons

Volume 32, Issue 1 AIAA Houston Section **www.aiaa-houston.org** **Winter 2006/7**



Advanced Propulsion Concepts

Rendering by Adrian Mann

("DoD Experiments ...", Continued from page 21)

ing ways to incorporate new technologies onto the unique vehicle. The STS-4 launch in June 1982 carried the first STP shuttle payloads to space and since then, has carried over 200 STP payloads including 11 primary DoD payloads. STP conducted experiments aboard the Russian Mir space station and boasts the first ISS internal experiment and the first ISS external experiment. These experiments provide the technologies for the future of military space. A grand example is STP's launch of an atomic clock in the 1960s and that experiment evolved into today's DoD Global Positioning System. ▲

(Rockets, the Mach Effect, and Mach Lorentz Thrusters, continued from page 11)

We are therefore looking at the dawning of the true golden age in human space flight if the MLTs can be developed to these foreseen performance levels.

We explored the possibilities of what a first generation 0.5-to-1.0 N/W MLT propelled spacecraft, powered with fuel cells & batteries, could provide in the way of payload and range of operation. It was found that it could carry a crew of two people with a payload of 2-metric tonnes from the surface of the Earth to the surface of the Moon, accelerating at 1.0 E-g during the first half of the course segment and decelerating the last half, and back again; all in under 12-hours *without refueling* the WarpStar-1's fuel cells. While on the Moon, the WarpStar-1 could provide heavy lift crane services to Moon-based astronauts that could lift up to 175 lunar metric tonnes. This ~26,500 kg MLT propelled spacecraft would be a major advancement over any known spacecraft design to date, and should be an inducement to push the development of these devices towards the 1.0 N/W specific power class Mach-Lorentz Thrusters needed to make it happen.

With this 1.0 N/W MLT technology in hand, we could send our planetary scientists to walk on distant worlds. We could send groups of explorers to the Moon in less than 3 hours, to Mars in under 5 days, to the asteroid belt in 6 days, to Jupiter's moons Io, Europa, Ganymede and Callisto in 7 days, or to Titan and Saturn's rings in 9 days. In fact, this 1.0 E-g constant acceleration transport technology could easily prove to be so inexpensive to operate that we find ourselves compelled to build permanent outposts on all these worlds in our solar system. And when we finally find ourselves at the solar system's boundary with interstellar space, Woodward's "Wormhole term" may provide the keys to viable interstellar travel as well. ▲

Conference Presentations/Articles by Houston Section Members
(Cont'd.)

(Upcoming Conference Presentations, Continued from page 20)
Johnson Space Center, Houston, TX

Impact to Space Shuttle Trajectory from Temporal Changes in Low Frequency Winds
R. Decker, NASA Marshall Space Flight Center, Huntsville, AL; D. Puperi, United Space Alliance, Houston, TX; and R. Leach, Morgan Research, Huntsville, AL

Toward a General Solution Verification Method for Complex PDE Problem with Hands Off Coding
M. Garbey and C. Picard, University of Houston, Houston, TX

Planar Measurements of Supersonic Boundary Layers with Curvature Driven Favorable Pressure Gradients
I. Ekoto and R. Bowersox, Texas A&M University, College Station, TX

Experimental Analysis of Supersonic Boundary Layers with Large Scale Periodic Surface Roughness
I. Ekoto and R. Bowersox, Texas A&M University, College Station, TX; T. Beutner, DARPA, Arlington, VA

Microgravity Phase Separation Near the Critical Point in Attractive Colloids
P. Lu, Harvard University, Cambridge, MA; M. Foale, E. Fincke, L. Chiao, W. McArthur, and J. Williams, NASA Johnson Space Center, Houston, TX; M. Hoffmann, NASA Glenn Research Center, Cleveland, OH; W. Meyer, National Center for Space Exploration Research, Cleveland, OH; C. Frey and A. Krauss, ZIN Technologies, Brook Park, OH; J. Owens, National Center for Space Exploration Research, Cleveland, OH; M. Havenhill, Science Applications International Corporation, ; R. Rogers, NASA Glenn Research Center, Cleveland, OH; S. Anzalone, Science Applications International Corporation, ; G. Funk, ZIN Technologies, Brook Park, OH; and D. Weitz, Harvard University, Cambridge, MA

Numerical Study of Massively Separated Flows
M. Olsen, NASA Ames Research Center, Moffett Field, CA; R. Lillard, NASA Johnson Space Center, Houston, TX; N. Chaderjian and T. Coakley, NASA Ames Research Center, Moffett Field, CA; and J. Greathouse, NASA Johnson Space Center, Houston, TX

Journal of Spacecraft and Rockets
Boundary Layer/Streamline Surface Catalytic Heating Predictions on Space Shuttle Orbiter, Vol. 43, No. 6 issue of *JSR* (Nov/Dec, 2006)
Jeremiah Marichalar, William Rochelle, Benjamin Kirk, and Charles Campbell

Harper's Magazine, November 2006
Starship Trooper, Mars, the Ultimate Suicide Mission
James C. McLane III

The Space Review
Will Mars challenge the "prime directive"?
http://www.thespacereview.com/article/771/1
James C. McLane III

International Conference on Bond Graph Modeling (Co Sponsored by AIAA)
International Space Station Centrifuge Rotor Models: A Comparison of the Euler-Lagrange and the Bond Graph Modeling Approach
Louis H. Nguyen (NASA Johnson Space Center), Jayant Ramakrishnan (ARES Corporation), Jose J. Granda (Department of Mechanical Engineering California State University Sacramento)

International Space Activities Committee (ISAC)

Section News

The current membership list for AIAA Houston Section ISAC (please look us up and join us: www.aiaa-houston.org/tc/isac):

1. Ludmila Dmitriev-Odier, United Space Alliance, Chair
2. George Abbey, Jr., United Space Alliance
3. Linda Andruske, NASA/KSC
4. Dr. Albert Jackson, Jacobs, FBIS (Fellow, British Interplanetarty Society), Visiting Scientist, Lunar Planetary Institute - http://www.lpi.usra.edu/lpi/jackson
5. David Jih, NASA/JSC
6. Michael Kezirian, Engineer - The Boeing Company, Adjunct Professor - University of Southern California
7. James McLane III
8. Padraig Moloney, NASA/JSC
9. Dr. Zafar Taqvi, Barrios
10. Chris Taylor
11. Dr. Gary Turner, Odyssey Space Research
12. Douglas Yazell, Honeywell

Above: After enjoying our section's lunch-and-learn by Dr. Albert A. Jackson a few months ago (attendance 130 in a NASA auditorium), James McLane III looked for and found some of his photos which he took more than 40 years ago when von Braun visited Texas A&M University at College Station. The year was probably 1966. This was taken at a reception following a speech about Apollo plans. The teenage girl in the background is von Braun's daughter Iris. Jim took this with available light using 35 mm Kodak tri-X pan and printed it himself on high-contrast enlarging paper.

Left to right: Retired Colonel Richard (Dick) Cole of the Doolittle Raiders with ISAC and Chinese sister section member James McLane III

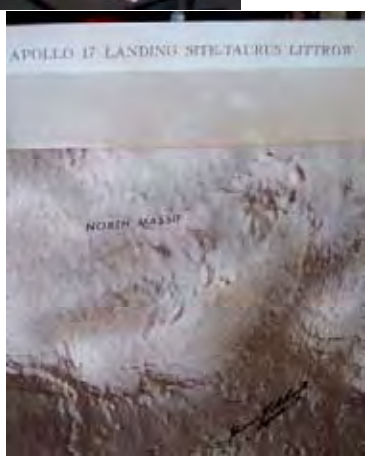
Odds and Ends

SPECIAL EVENTS, PICTORIALS, ETC.

Above at right: Houston Chapter of the Experimental Aircraft Association
www.eaa12.org
Led this year by Richard Sessions
Photo from Houston EAA e-mail note...

EAA Chapter 12 Meetings for 2007 -2008:

4 May 2008 – Chapter Party – Hanger Location TBD – Likely Pearland Regional (Old Clover Field)
7 May 2008 – Builder Visit – TBD – Volunteers?
4 June 2008 – Surviving Oshkosh, Neil Northington, Location: Southwest Services, Ellington Field
2 July 2008 – Oshkosh Arrival Procedures, David Staten, Location: Southwest Services, Ellington Field



Past AIAA Houston Section Chair (1971-1972) James C. McLane, Jr., has a unique souvenir of his Apollo-era career. This lunar map of the Apollo 17 landing site was used for astronaut training. This map was signed by the last person to step onto the Moon, Harrison Schmitt, when Mr. Schmitt inaugurated the Space Center Lecture Series on March 13, 2008 (www.SpaceCenterLectureSeries.com), co-sponsored by AIAA Houston Section.

(Continued from page 14)
passerby. Most of these students have never left China and have studied English within China from non-native English speakers but they still have a firm grasp of the English language and their accent is comprehensible.

AIAA Sister Sections

AIAA Houston Section has an International Space Activities Committee (ISAC, see www.aiaa-houston.org/tc/isac) whose creation dates back to sometime between 1962 and 1987. AIAA member and former section chair (1971-1972) James C. McLane, Jr. was the leader in starting a sister section relationship with the Shanghai Astronautical Society (SAS) in 1987. This sister section relationship was most active from 1987 to 1992, and in 2003 or 2004, AIAA Houston Section member and programs chair Chris Taylor enjoyed dinner at a restaurant with SAS members in Shanghai. In 1988 and 1992, Houston delgations visited China for about 3 weeks at a time, hosted by SAS, visiting tourist sites and space facilities around the country. In 1990, a Chinese delegation visited Houston in the spirit of citizen-to-citizen diplomacy. A 1992 Houston delegation member gave our section 270 of his very professional snapshots from that visit to China, on a DVD with high resolution such that some photos have a file size as high as 10 megabytes. He scanned these photos in 2008 and delivered the DVD to me and others in our section in May of 2008.

Several more AIAA Houston Section sister sections around the world came and went since 1987. Starting this past December of 2007, we have a new sister section in Toulouse, France, l'Association Aeronautique et Astronautique de France, Toulouse – Midi-Pyrenees branch, AAAF TMP. We exchanged a few newsletter articles and section chair Douglas Yazell and his wife will visit them June 24-28, 2008. A feasibility study is in progress related to having a conference in Toulouse the second half of 2010. In order to be of service to our profession by working with Russians in Houston and elsewhere, our section supported travel by our new ISAC chair Ludmila Dmitriev-Odier to see the Soyuz launch in Baikonur on October 10, 2007, where she had a VIP pass as a part of a group of cosmonaut family and friends. Mila later invited Congressman Lampson to be our section's dinner speaker, and she arranged for several guests of honor at that dinner, including four Russians, one a worldwide opera star who appeared in La Boheme at the Houston Grand Opera, Mr. Nikolay Didenko. After Mr. Lampson's dinner speech, Mr. Didenko sang two songs, a Russian folk song and an Italian song. Mila volunteers to chair ISAC again next year for the 12 months starting July 1, 2008.

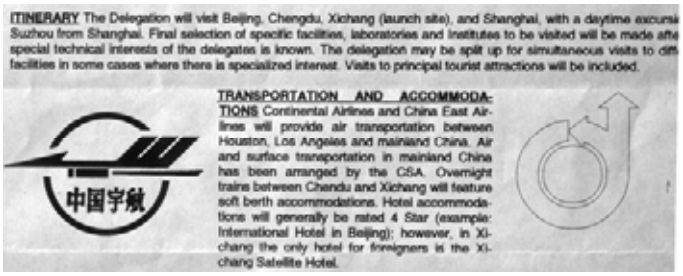
Houston Section will continue working with SAS in the coming year in addition to creating

(Continued on page 16)

Feature Article

Above: Logos for AIAA Houston Section and our French sister section
Below: A few snapshots & documents from the 1992 visit: an AIAA Houston Section delegation visiting China hosted by our Chinese sister section, the Shanghai Astronautical Society of the Chinese Society of Astronautics


International Space Year
Commemorative Tour of
Chinese Space Facilties
Jointly Sponsored By The
HOUSTON SECTION
AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS
and the
CHINESE SOCIETY OF ASTRONAUTICS
DEPARTING HOUSTON MAY 1, 1992 - RETURNING MAY 15, 1992


ITINERARY The Delegation will visit Beijing, Chengdu, Xichang (launch site), and Shanghai, with a daytime excursi Suzhou from Shanghai. Final selection of specific facilities, laboratories and institutes to be visited will be made afte special technical interests of the delegates is known. The delegation may be split up for simultaneous visits to diff facilities in some cases where there is specialized interest. Visits to principal tourist attractions will be included.
中国宇航
TRANSPORTATION AND ACCOMMODATIONS Continental Airlines and China East Airlines will provide air transportation between Houston, Los Angeles and mainland China. Air and surface transportation in mainland China has been arranged by the CSA. Overnight trains between Chendu and Xichang will feature soft berth accommodations. Hotel accommodations will generally be rated 4 Star (example: International Hotel in Beijing); however, in Xichang the only hotel for firmigners is the Xichang Satellite Hotel.

Right: launch site in Xichang (1992 visit by AIAA Houston Section delegation)

Feature Article

(Continued from page 15)

a new sister section in Beijing. We can begin by contacting ISU alumni who work for the Chinese space program in Beijing. We can also exchange newsletters between the Chinese and American sister sections (ours is free to all, quarterly, and online only). Information exchanged will be within the bounds allowed by both governments. As the contact person for our Chinese sister sections, I will work to visit Beijing, China this year (November 24-28, 2008 are penciled in as travel dates) in this capacity, and we will work on having Chinese sister section members visit Houston next year. Our goal is to create citizen-to-citizen diplomacy, cultural interchanges, professional contacts, and more that will be of service to the aerospace profession.

International Space University

My trip to China was made possible by ISU (see www.isunet.edu). ISU describes itself as a university that "provides graduate-level training to the future leaders of the emerging global space community". This university has a two-month Summer Session Program that meets in a different location every year and a year long Masters degree program that is located at the permanent campus in Strasbourg, France. Students may participate in either the summer session or the Masters program or both. ISU prides itself on being Interdisciplinary, International and Intercultural or the 3I's as ISU fondly refers to it. The curriculum consists of lectures in several core areas – space science, space engineering, systems engineering, space policy and law, life sciences, business and management, and space and society. In addition to core lectures students participate in a team project. This project not only works to solve a problem but strives to teach the participants how to work in an international and intercultural team. During the summer of 2006 I was a student at the Summer Session Program that was held in Strasbourg, France and during the summer of 2007 I was a staff member at the Summer Session in Beijing, China. The missions of ISU and AIAA are very similar. Both organizations have a global outreach. I am working with AIAA Houston Section's ISAC to partner with ISU alumni from around the world to enhance the education and international outreach of our members.

China's Past and Future

China is arguably the oldest continuous civilization on the planet. The Chinese are credited with inventing rockets, fireworks, paper, the compass and moveable type. Having such a rich technical history upon which to draw, it will be amazing to see what they contribute to world civilization and space programs in the near future.

Membership

LISA VOILES, MEMBERSHIP CHAIR

Please welcome our newest AIAA Houston Members!

As of May 1, 2008:
MEMBERS:
Kent Adams
Mary Arszulowicz
Anousheh Ashouri
Lawrence Baitland
Sharm Baker
Perakath Benjamin
John Brewer
Jaime Bustamante
Marc Church
James Clutter
Ansley Collins, Councilor for a 2-year term starting July 1, 2008
Alan Deluna
Michael Ferullo
Doyle Hensley
Don Kulba, Assistant editor for Horizons
Christopher Leslie
Glenn Stromme
Elliott Potter

STUDENT MEMBERS:
Mark Anderson
Selcuk Belek
Marco Cienega
Mandakh Enkh
Kristen Holmstrom
Adam Johnson
Atilla Kilicarslan
Natalie Pilzner
David Schrock
Mithun Singla
Chad Smith
Brock Spratlen
Matthew Stephens
Keenan Turner
John Walters
Michael Yager

EDUCATOR ASSOCIATES:
Edith Cruz

As of June 1, 2008:
MEMBERS:
George Abbey, Jr., member of our section's International Space Activities Committee (ISAC): see www.aiaa-houston.org/tc/isac
Amy Brzezinski
Nathaniel Clark
Michaela Benda, former lecturer at our section's Annual Technical Symposium (solar sails)
Gary Cooper
Matt Dennis
Roberto Egusquiza
James Engle
Marlo Graves, our section's contact person for Chinese sister sections, member of our section's International Space Activities Committee (ISAC): see www.aiaa-houston.org/tc/isac
Joe Hammond
Neal Hammond
Caris Hatfield
Richard Hieb
Juniper Jairala
William O'Keefe
Michael Raftery
Larry Roberts
Brian Salinas
Robert Scheid
Daryl Schuck
Justin Thomas
George Watts
Melanie Williams-Vail
Ross Winn

STUDENT MEMBERS:
Melissa Caldwell
Alberto Rivas-Cardona

Update Your Records

Please verify your AIAA member record is up to date. 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, workshops, etc.). Please take a few minutes and visit the AIAA website at http://www.aiaa.org/ to update your member information or call customer service at 1-800-NEW-AIAA (639-2422).

You may always contact us at membership@aiaa-houston.org.

The membership total from May1, 2008, was 1153, which included 839 professional members, 227 student members, and 87educator associates. As of June 1,2008, there are 1158 members 849 professional members, 222 student members, and 87 educator associates.

Not a member? See the end page.

To nominate someone for AIAA's top awards, please see www.aiaa.org. These relate to service to AIAA or the professions of aeronautics and astronautics.

From the lunch-and-learn of May 29, 2008:
Left to right:
Michael Zhang of the Asian-American Engineering Society (120 members in Houston)
New member Marlo Gravees, contact person for AIAA Houston Section Chinese sister sections
(In back): Ken Young, Houston space program veteran since the days of the Mercury program (still working half-time)
James C. McLane III, AIAA Houston Section International Space Activities Committee (ISAC) member
James C. McLane, Jr., former Chair (1971-1972) of AIAA Houston Section, leader of the team that created the sister section relationship between the Shanghai Astronautical Society and our section, a relationship that is still going strong today, 21 years later.

Lunch-and-Learn Summary
www.aiaa-houston.org/tc/isac

The Rise of China's Space Program: The International Space University Beijing Session & AIAA Houston Section Sister Sections

DOUGLAS YAZELL, ACTING EDITOR

This lunch-and-learn drew a crowd of 49 people on May 29, 2008, at NASA Johnson Space Center's Gilruth Center. Appetizers and iced tea were compliments of AIAA Houston Section.

From our publicity flyer:

"In October 2003, China launched its first human space mission with astronaut Yang Liwei. This milestone made China only the third nation in history capable of independently putting a human into space. In October 2005, China launched two more astronauts into space, Fei Junlong and Nie Haisheng on a five day mission. China's space ambitions include sending people to the Moon. This summer, AIAA members Marlo Graves & Stephen (Brad) Abrams participated in the International Space University (ISU) Summer Session Program'07 (SSP07) held in Beijing, China. They were able to hear lectures and panel discussions from Chinese and other international space experts as well as visit major Chinese space facilities such as the Chinese Mission Control Center. During this Lunch & Learn they will share their experiences in Beijing and the plans AIAA Houston Section has to create a sister section in Beijing and continue the section's 22-year-old tradition (since 1986, thanks to James C. McLane, Jr.) of maintaining our sister section relationship with the Shanghai Astronautical Society (SAS), whose current contact person in Shanghai is the SAS Secretary General Wu Wenxuan.

Top: part of the artwork used by ISU to advertise the 2007 summer session in Beijing

Right: Marlo Graves (at right) and fellow ISU students and personnel in China for the 2007 summer session

Bottom: Photo by Marlo Graves in 2007: Chinese Academy of Launch Vehicle Technology

Lunch-and-Learn Summary

www.aiaa-houston.org/tc/isac

Marlo Graves has worked in the space industry since January 1998. She currently works for The Boeing Company in the Space Shuttle Systems Integration Group. During the summer of 2006, Ms. Graves was a student at ISU for the session that was held in Strasbourg, France. During the summer of 2007, she was an ISU staff member for the session in Beijing, China. Ms. Graves is currently learning Chinese and is leading AIAA Houston Section's work to create a sister section in Beijing. Her educational background is in aerospace. She received a BSE in Mechanical & Aerospace Engineering from Princeton University in 1995 and an MS in Space Architecture from the University of Houston in 2004.

"Stephen (Brad) Abrams grew up in San Antonio, Texas. From an early age he was tinkering in the garage and showing interest in science and engineering. Brad attended Tufts University in Medford, Massachusetts for his Bachelor of Science in Mechanical Engineering. After graduation, Brad was employed by Lockheed Martin, working on small hardware projects for both the Space Shuttle and International Space Station programs. He then left Lockheed to join Boeing in 1998, where he performed as a test engineer for the Space Station's Active Thermal Control System. After two years, he began project engineering and management, where he continues to support three of Boeing's contracts - Space Shuttle, Constellation (Ares), and Secure Border Initiative (SBI)."

Someone in our audience asked if a space race is possible in the near future, similar to the space race of the 1960's, which was won when Neil Armstrong and Buzz Aldrin walked on the Moon and returned home safely. Brad answered that he is not the right person to ask, but in his humble opinion, we are already in a space race with the Chinese and the American space program leaders don't know it yet.

Top right: James C. McLane, Jr., Brad Abrams, Marlo Graves, and Douglas Yazell
Top left: An ISU souvenir from the 2007 summer session in Beijing
Left: Opening ceremonies in Beijing for the ISU summer session of 2007
Bottom: A crowd of 49 people at the Gilruth Center Lonestar room at NASA/JSC in Houston, for this lunch-and-learn of May 29, 2008.

Lecture Summary

X-Prize at JSC

MICHAEL FROSTAD

Be sure to check out the review of this talk in Justin Kugler's blog at the Houston Chronicle website also. Go to http://blogs.chron.com/sciguy/ then look for COSMO.SPHERE on the right. You can find his discussion in the August archives.

After a long day of work and meetings a good cross section of the JSC population made their way to Building 30's Auditorium here at NASA JSC. The reason? X Prize Foundation Chairman and Founder, Dr. Peter Diamandis was in town and the Advanced Planning Office asked him to give a talk about his inspiring ventures.

Dr. Diamandis is involved with many exciting space ventures and he probably has even more exciting plans for the future. Some of his best known ventures are the X Prize Foundation, Space Adventures, Zero-G Corp., and now the RRL (Rocket Racing League).

If you are unfamiliar with his ventures, The X-Prize foundation and its $10 million Ansari X PRIZE for private spaceflight led to Space Ship One's flight, a first for pure commercial interests. Space Adventures has allowed multiple people to stay in space, the most famous being Dennis Tito, the first commercial space traveler, and Anousheh Ansari, the first female space traveler and the person who funded the $10 million X prize. The Zero-G corporation is a commercial parabolic flight service where people experience 15 parabolas of microgravity on a Boeing 727-200. They fly out of KSC, Las Vegas, and now JSC (Ellington Field)! Finally, the Rocket Racing League, the newest venture using NASA developed technology, is just getting started and will combine the excitement of NASCAR and flying to give the public a whole new experience while driving technology development.

So what advice did Dr. Diamandis have for those seeking it?

- Never give up. Determination and persistence, even in the face of failure, can get big results. An idea is crazy one day, and a breakthrough the next.
- Looking at recent history who were those that were making things happen? The internet and .com explosion? People in their 20's. The manned program of the 60's? People in their 20's. Make sure you are giving them the chances and responsibilities where they can excel and use their creative energy. All generations can learn from each other.
- Did you know Lindbergh flew across the Atlantic for a $25,000 prize? New prizes and different contracting set ups may drive future feats. (Dr. Diamandis is now focused on building the X Prize Foundation into a world-class prize institute whose mission is to bring about radical breakthroughs for the benefit of humanity. The X Prize is now developing in fields such as Genomics, Automotives, Education, Medicine, Energy, and Social arenas.)
- For NASA, things like the COTS program are essential to building commercial capability from which NASA can then expand.

In summary, Dr. Diamandis gave an insightful and inspiring speech. He showed activities that he has undertaken to push commercial space and technology development, as well as giving those who attended some things to think about, always key to a good presentation.

Below: Dr. Peter Diamandis (holding sword) with Arthur M. Dula (left), Kristen Diamandis, and astronaut Buzz Aldrin upon receipt of the half million dollar Heinlein Prize for Space Commercialism on July 7, 2006. (photo by AIAA Houston section member Jim McLane III)

Odds and Ends

SPECIAL EVENTS, PICTORIALS, ETC.

Author Celeste Graves kindly sent us a color photograph of one of the WASP (Women Airforce Service Pilots). Only the black and white version was published in her book A View from the Doghouse of the 319th AAFWFTD. *WASP trainee Marion Flosheim is the subject of this photograph. She was in the first class of WASP trainees, and they trained at what is now Hobby Airport. Marion did not graduate with the WASP for medical reasons. From the book, "She was a New Yorker and preferred to live alone, so she shared an apartment in the Warwick Hotel with the two Afghan hounds she brought with her. She was a lovely redhead and was quite a picture exercising her hounds each day... Later she took up interior decorating and was a member of the National Committee of the National Society of Interior Designers who redid the International Reception Room at the White House for President and Mrs. Eisenhower - and again refurbished it for President and Mrs. Kennedy... Marion spent her time between living in New York and France."*

Above: Photo from 1992 Shanghai visit by delegates from AIAA Houston section, led by James C. McLane, Jr. and Li Furong. (Photo by delegate Tuyen Hua)

Below: Chad Brinkley (Chair, AIAA Houston Section), Ellen Gillespie (Chair Elect), Dr. Gary Turner (College and Co-op Chair), and Professor Andrew Meade visit during a July 2008 meeting at Rice University

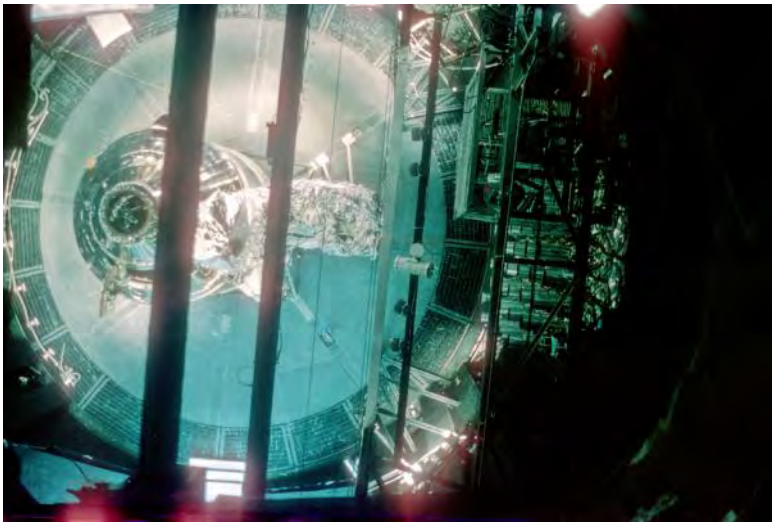
JSC 1968

Five Photos from the McLane Archives

JAMES C. MCLANE III

In the course of going through old slides, I came across some photos I took in the summer of 1968 at JSC (then the Manned Spacecraft Center). These pictures show the inside of Building 32 during a peak of activities related to Apollo testing. In the summer of _68 manned testing of the Apollo Capsule and the Lunar Module were carried out at about the same time inside two large vacuum chambers in the Space Environment Simulation Laboratory.

(Continued on page 13)



Above: a view of the test setup looking down from a porthole near the top of chamber A. The beams that crisscross the chamber served as attachment points for sensors.

Above: a view into Chamber A through its open 40 foot diameter door. An Apollo Command and Service Module is mounted vertically. Astronauts Joe Kerwin, Vance Brand and Joe Engle spent about a week living inside the 2 TV-1 spacecraft while the chamber provided the high vacuum and severe thermal loads expected during the mission. The tests were supported by contractor personnel from Rockwell.

Below: the Apollo Command Module

Photo Credits: James C. McLane III

Five Photos from the McLane Archives

JSC 1968

JAMES C. MCLANE III

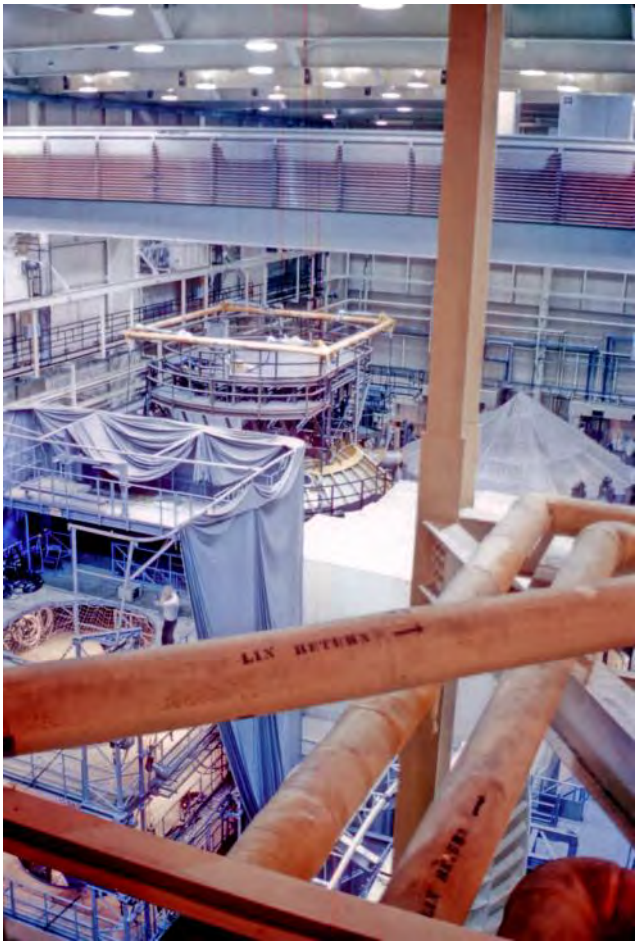


Photo Credits: James C. McLane III

Left: a view looking out over the Building 32 high bay. The drapes at left enclose fixtures used to set up the Apollo 2 TV-1 test. In the center can be seen the reinforced, dish-shaped top of Chamber B and its lifting fixture. The top of the chamber had been removed so the Lunar Module test item (LTA-8) could be inserted into the chamber (located on the right of the photo under a protective cone-shaped tent). The thermal vacuum test of the Lunar Module involved Astronaut Jim Irwin and Grumman test pilot Gerry Gibbons. The LM tests were supported by contractor personnel from Grumman.

Below: James C. McLane, Jr., the Chief of the Space Environment Test Division, standing in the ACE (Automatic Checkout Equipment) control room for Chamber A. There were two ACE rooms in Building 32, one for Chamber A and one for Chamber B. Mr. McLane was our AIAA Houston Section 1971-1972 Chair .

(Continued from page 12)

In recognition of the critical role they played in the Apollo moon landing program, these two space environment simulation chambers were designated as National Historic Landmarks by the Department of the Interior. The Lunar Module used in these tests (LTA-8) can currently be seen hanging from the ceiling in Space Center Houston.

From Caves to Space

JAMES C. MCLANE III

Apollo engineers imitate cave exploring equipment to make safety falling restraints.

Right:: 1968 photo of author Jim McLane holding Jumar rope ascender.
Below: Cave explorer climbing a rope out of Mexican pit Sotono De Las Huahuas. The photo shows part of the 482 foot drop into the first chamber. This is followed by a 502 foot free drop down into a lower room. (Photo credits: Greg Passmore).

Back in the 1960s, my hobby was cave exploring. Like many Texas "cavers," I would travel to Mexico where very thick limestone contained deep pits. Ten or so years earlier, French explorers had set cave depth records in Europe by linking together long strings of cable ladders. Sometimes, these dangerous ladders would hang down hundreds of feet. However, a new method of descending deep pits had appeared and American cavers were in the forefront of this technology. The technique was based on descending and then climbing back out of the pit on a single length of 7/16" diameter nylon rope.

In the 1950s, the Swiss began to market a device that would enable roped-together mountain climbers to rescue themselves if they fell into a crevasse. These rope climbing clamps were called Jumar ascenders. They consisted of an aluminum handle enclosing a toothed-cam that would slide up a rope, but would not slide back downward. A climber could attach one of these clamps to each leg by a short tether and then basically walk up the hanging rope. http://en.wikipedia.org/wiki/Ascender_%28climbing%29

Cavers usually descend pits by sitting in a harness and repelling down a single rope. The new Swiss Jumars became indispensible for climbing back up. Such climbs could easily span hundreds of feet with the rope hanging completely free from the rock walls. The record for a Mexican pit is a 1,350 foot vertical drop! Descending and then climbing back out of a cave like that is a great adventure. Perhaps a couple of hours are needed to climb from bottom to top, all the while hanging from a single slim rope in the dark.

For a couple of months in the summer of 1968, the Space Environmental Simulation lab (SESL) in JSC's building 32 was the focus of America's efforts to place humans on the Moon. The lab's two largest test chambers, A and B, were designed to allow astronauts to live inside a functioning spacecraft under simulated deep space conditions of vacuum, heat and cold. Crews that were sealed inside the chambers would practice an entire mission to the Moon and back. The tests were risky; if there was an emergency, it

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would take considerable time to repressurize the chambers back to sea level atmospheric conditions and evacuate the astronauts. During manned testing, a rescue team (man lock observers) always stood by, breathing pure oxygen in an airlock held at a partial vacuum so they could enter the main chamber and render assistance even before it was fully repressurized.

Chamber B was designed to test the Grumman-made Lunar Module (LM), the two-man vehicle that would land on the Moon. SESL received a flight-like production item — designated LTA-8 — directly off the assembly line. The testing of LTA-8 would be performed by astronaut Jim Irwin (later to be the eighth person to walk on the Moon) and Grumman test pilot Gerry Gibbons.

My father, James C. McLane Jr., was Chief of the Space Environment Test Division. He had ultimate authority over the lab and the success of the test program. He was especially concerned about one potential safety issue. The Apollo Space Suit, (even versions that had been modified to use breathing umbilicals instead of on-board oxygen) was very heavy. After all, it was designed to be worn in the low gravity of the Moon, so on earth it weighed six times more. When testing the LM inside Chamber B, the astronaut would have to ascend and descend stairs on the side of the Lander. If a crewman wearing the heavy and awkward backpack should lose his balance, he might fall off the stairs with disastrous results.

The 13.5 foot high stairway and associated equipment were items of ground support equipment built by Grumman. A foldable slide could be deployed on top of the stairway to extract an incapacitated astronaut. The official report referenced at the end of this article states:

> *The stairway and platform that were used to provide access from the manlock door to the LTA-8 forward hatch are shown in figures 1 and 10. The I/E stand consisted of a stairway, handrails, restraint assemblies, a foldable slide assembly (for emergency egress), and the ingress platform.*

This hardware was subjected to one of the stranger qualification tests ever performed at NASA. It needed to be shown that the equipment would work under the extremely cold temperatures experienced inside the Space Simulation chamber. There were worries that during a chamber emergency a heavy load of ice (from the fire suppression system) could form on the cold ladder and the escape slide might not unfold properly.

An open-top wooden tank the size of a small room was constructed on a concrete apron outside Building 32. The tank was filled with hundreds of gallons of liquid nitrogen. The stairs were immersed in the cryogenic liquid, removed when cold, and the folding mechanism was evaluated. A test safety officer insured that no one stood downwind as the nitrogen gas boiled off the huge vat. This unusual sight drew a lot of attention. No one had ever looked down into hundreds of gallons of -320 degree F liquid nitrogen.

My father was familiar with the Jumar Ascender rope clamps that I used to climb out of caves. He thought that a safety device for the manned LTA-8 tests might be based on this same principle. He took one of my Jumar clamps to Grumman, and their engineers designed rail camps based on the same concept. These hand-operated mechanisms would slide up and down a slim steel tube rail mounted beside the stairway. Inside the housing, a lever was attached to a spring loaded, serrated cam. If the astronaut were to begin to fall, the clamp would instantly grab the tube and hold him securely on the ladder. There were clamps on either side of the crewman and he would slide them up (or down) as he ascended (or

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Above: Jumar ascender (left) compared to Grumman designed falling restraint (right)

(Image credits: NASA)

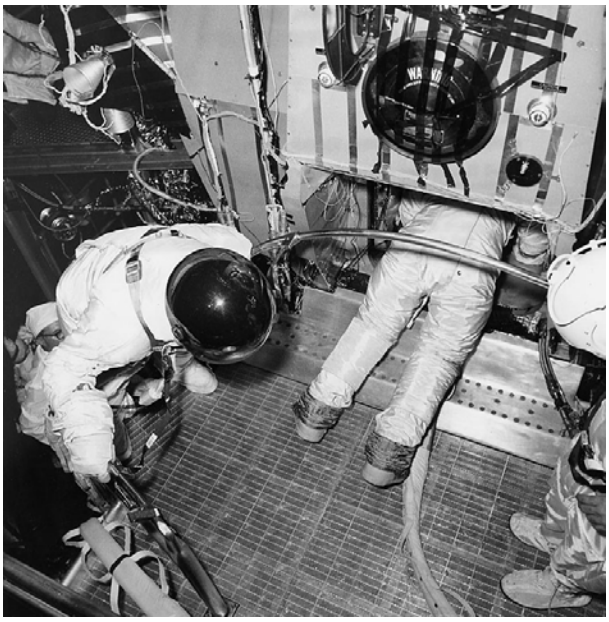
Below: Crewman attached to falling restraints.

descended) the stairs. The new safety restraints were successfully used during the important tests performed that summer in SESL. These manned vacuum tests of the Lunar Module involved over 600 people and enabled humans to land on the Moon just one year later.

Notes:

The testing of LTA-8 is described (including an overview of the crew falling restraints) in NASA Technical Note TN 0-5760 "Manned Operations For The Apollo Lunar Module In A Simulated Space Environment" by O.L. Pearson and P.R. Gauthier.

This report can be read online at: http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19700024466_1970024466.pdf



Crewmen and rescue personnel practice with falling restraints. On far right, wearing pressure suit, Lee Pearson, a Space Environmental Test Division engineer evaluates the emergency evacuation slide. (Image credits: NASA)

More Photos from the McLane Archives

JSC 1968

James C. McLane III

According to FloridaToday.com and other sources, Transformers 3 *will be filming at KSC for about eight days in September, including depictions of the shuttle launch pad, crawler, and Vehicle Assembly Building..*

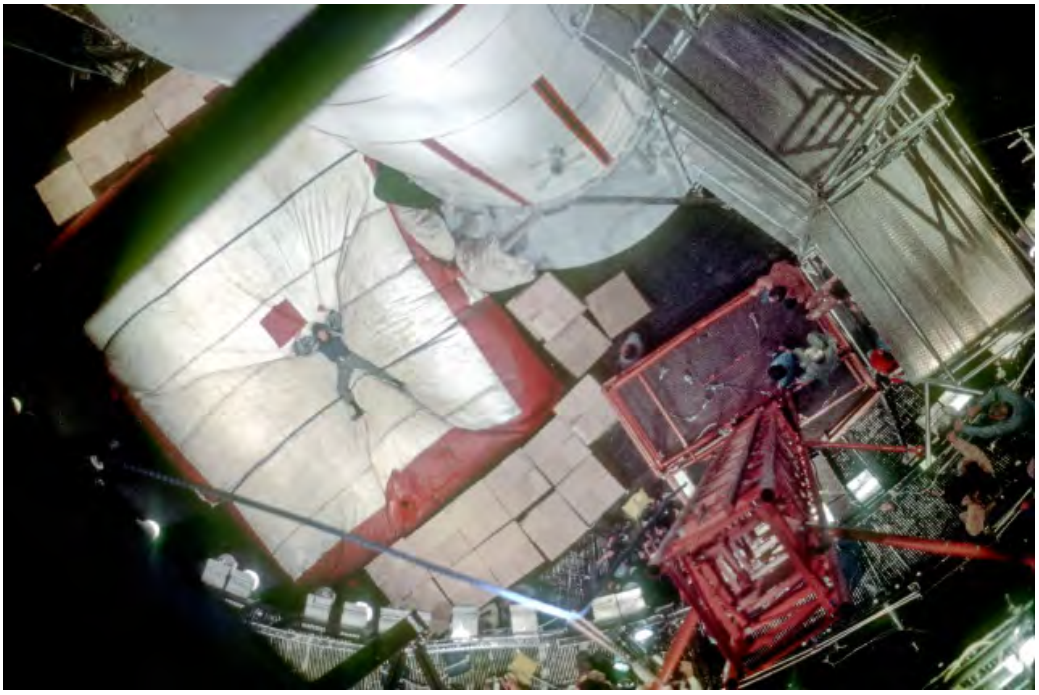
History repeats itself.

After the end of the Moon-landing program, a cash-strapped NASA allowed movies to be filmed at JSC.

*One in particular (*Future World*, staring Peter Fonda) made heavy use of the giant space chambers in Building 32. I went out to watch the filming and saw a stunt man make $10,000 by taking a dive off a platform and falling over 100 feet into an air bag.*

I took the attached photos in 1976 during the filming.

- Jim McLane III



Feature

An Astronaut Takes a Slow Flight

JAMES C. MCLANE III

Right: Talking to the Goodyear representative (in the cowboy hat)

Image credits: James C. McLane III

In the early days of the manned space program many firms made special efforts to show their support for NASA. For example in the summer of 1964 Goodyear sent a blimp to Texas as a promotional gesture to welcome the Manned Space Craft Center (now named Johnson Space Center) to Houston. A temporary Blimp base was established in Clear Lake City on a large mowed open field on the northeast side of El Camino Real. Only a year earlier that street had been a rough dirt road. The site was close to where the Clear Lake City fire station is situated and located about where Hercules Avenue runs today.

Goodyear sent invitations to certain NASA folks to take a ride. On the first morning of the event our family (my father, mother and I) went to the rough field where a temporary mooring mast had been erected. The famous Goodyear blimp Columbia (tail number N2A) was moored to the top of the small tower. I'd never seen one of these things up close so I was fascinated. We met the local Goodyear representative. He wore a Stetson cowboy hat, as indeed many Texans sported back then. We also met astronaut Dick Gordon and his family (who would be riding with us). The Gordon's lived on our street in Clear Lake City, just a few houses from us, so we were neighbors.

The blimp could carry perhaps 6 passengers. My

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Right: From left to right, astronaut Dick Gordon and family, James McLane Jr. and wife Dorothy with Goodyear representative (wearing the cowboy hat)

Feature

Left: Waiting to board. Astronaut Dick Gordon's family at left, James McLane, Jr. and Dorothy McLane at right.

(Continued from page 16)

mother and father plus astronaut Gordon and a couple of his kids boarded for the first flight. Gordon's wife and their remaining three kids would ride with me on the second trip. It was all very interesting. The crew and passenger pod rested on one large single wheel with a pneumatic tire. We boarded by stepping up a short ladder below a door on the right. The cabin was roomy and bus-like, with big windows offering a terrific 360 degree view. No one, not even the pilot had a seat belt. The two piston engines were inside pods, one on each side of the cabin. They were quite noisy. These were

(Continued on page 18)

Image credits: James C. McLane III

Left: Walking to the blimp

Feature

Right: Blimp Columbia attached to temporary mast

(Continued from page 17)

Image credits: James C. McLane III

pusher type installations with propellers near the aft end of the passenger compartment. The single landing wheel was also located to the rear of the passenger compartment under the engines.

Rather than moving a central control yoke as in a convent.ional airplane, the Blimp pilot steered the vehicle with large wheels positioned vertically, one next to each side of his seat. These wheels looked something like those on a hospital wheelchair. Manually rotating one wheel pulled on cables that extended back to the tail elevator to control vehicle pitch. The other wheel worked cables that moved the rudder to affect yaw. These were totally manual controls (not boosted) that worked very large surfaces. In flight the pilot was continuously rotating the two

(Continued on page 19)

Right: A steep takeoff

Feature

Left: Climbing out with the Webster power station in distance

(Continued from page 18)

wheels with his arms and hands –a lot of exercise! The main gas bag was full of helium, but since there had to be way for the gas to expand during the heat of the day (they didn't vent the expensive gas overboard) inside the main envelop a variable size compartment held ordinary air. This compartment was inflated by air scoops resembling tubes situated behind the propellers. The prop blast kept the internal expansion compensator expanded. The vehicle seemed to have a slight negative buoyancy, so in order to climb the pilot would apply power, start moving ahead and then point the nose up. It was possible to point the nose up at a very sharp angle, say 30 degrees or more and the machine would climb away steeply, but slowly and majestically with its loud engines racing.

The sensation for passengers was quite different than being in a conventional airplane. The blimp's noisy mo-

(Continued on page 20)

Image credits: James C. McLane III

Left: Blimp disappearing to the east

Feature

Right: Approaching Highway 3 (Old Galveston Road). Webster is to the right.

Image credits: James C. McLane III

Below: Webster electric generating station. This is now gone.

(Continued from page 19)

tors were a distraction, but the ride was smooth. We passed over deer and cattle that remained grazing and seemed unperturbed by our presence. We flew south along Texas HY#3 and near Clear Lake before transiting the Manned Spacecraft Center at low level. The term airship is very accurate because the handling seemed ponderous and slow like a ship. When the blimp would encounter an uprising thermal of warm air its nose would be pushed upward. Then when the tail of the ship got into the same thermal it would also be pushed up and briefly we would be flying level again.

The opposite would happen when we exited the thermal. So the nose constantly bobbed slowly up and down in a series of gentle oscillations.

Passing over the new NASA center I took photos of the massive construction that was is full swing. We flew directly over Building 32. From

(Continued on page 21)

Feature

Left: Pilot steers the Goodyer blimp Columbia around Clear Lake

Image credits: James C. McLane III

(Continued from page 20)

the air I could see the huge space environmental Chamber A in building 32 being built.

Back in Clear Lake City our landing was smooth and uneventful. However, the Texas wind started kicking up and soon all blimp flights had to be cancelled. Because of the windy weather very few folks ever got to go up, so I consider myself quite fortunate.

I didn't really think about our neighbors, the Gordons again until a couple of years later. One morning I went out to collect the newspaper from the front yard and saw a long line of cars and news vans parked along our street and people standing

(Continued on page 22)

Below: NASA building 32 space chamber A takes shape under a red metal frame

Feature

Right: Low level flying

Image credit:
James C. McLane III

(Continued from page 21)
around everywhere. Dick Gordon was up in space on Gemini XI. He later flew to the moon as Command Module Pilot on Apollo 12.

Article ends on next page.

Feature

Left: Approaching to land with the NASA Manned Spacecraft Center in the distance

Image credits: James C. McLane III

Below: Ground crew leads the blimp to its mooring mast

Conference

Impressions of the 42nd Lunar and Planetary Science Conference (LPSC)

JAMES C. MCLANE III P. E., AIAA ASSOCIATE FELLOW, HOUSTON, 3/17/11

From March 7 through 11 it was my pleasure to attend the annual conference of the Lunar and Planetary Science Institute held in the Woodlands north of Houston. From modest beginnings four decades ago this event has grown into a world-class exposition on all extraterrestrial things circling our sun. The conference had a major corporate sponsor, Northrop Grumman, and there were exhibition booths with representatives from big aerospace companies, private commercial entities, universities, think tanks and government labs. About 1,600 people attended and many presented oral papers and displayed fascinating posters on imaginative and often surprising investigations and projects. The affair had a very international flavor. I spoke with European visitors who were enjoying the balmy Houston weather. Some attendees were college graduate students, and many were in their first technical jobs after school. A large contingent came from Japan. The Japanese were celebrities since their Hayabusa space probe successfully returned samples from the asteroid Itokawa. A glance around the floor indicated that cosmology, space science and astrogeology are attracting women. It's likely that more than 40 percent of the attendees were female.

Since I occasionally attend other major annual technical conferences in Houston (e.g., the Offshore Technology Conference [OTC]), it's interesting to compare OTC to the LPSC. The OTC is far larger and also features technical paper sessions, but the real attraction is the hundreds of floor displays, hardware demos and booths by suppliers to that lucrative industry. The OTC attracts a mostly male audience of engineers and sales representatives. Attendees to the LPSC are mostly scientists, and there are lots of females. The focus is not on displays of hardware, but rather on hearing some astonishing papers and the chance to swap notes with some of the world's greatest scientific minds.

Oral presentations at the LPSC were managed in an efficient, professional manner, with strict attention to time limits -15 minutes for each talk, including any questions. The Woodlands Convention facility is a modern venue with several large presentation halls and numerous smaller meeting rooms. All the talks I attended had good sound systems, and visual aids included huge screens. Lighting in the presentation halls was balanced so one could take notes and still see the bright screens.

Right: Planetary scientist Steven Squyres at LPSC. Image credit: LPSC

I found myself wondering about the motivations of the speakers. Most of the talks, and even the posters resulted from collaborative efforts of several people, often from institutions located in different ends of the country or even different countries. Most presenters seemed passionate about their work and highly motivated to be recognized as the first to discover or point out some obscure new bit of information. Foreigners delighted in highlighting concepts pioneered in their own countries decades ago. Some presentations supported hypotheses (e.g., about the formation of the Moon) that contradicted hypotheses put forward in other presentations. I enjoyed such lively conflict.

In general, things related to our Sun or other stars were not covered, nor was there much that was applicable to manned space flight. A few presentations and posters described desert studies on Earth

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that might help support future human missions to the moon or Mars. Virtually all the planets and minor objects in our solar system were the subject of multiple papers. A link to the synopsis of all papers is located at:

http://www.lpi.usra.edu/publications/absearch/?meeting=335&keywords_all=&submit.search=Search

Tuesday and Thursday afternoons featured a massive Poster Session in a cavernous hall. Attendees stood along hundreds of feet of movable partitions to talk to passers-by about their pet projects. The range of ideas was tremendous. Some folks have developed complex hardware, like chambers to simulate the environment on Venus or to test the strength of ice under conditions that might exist on a Jovian moon. Other projects involved software or computer modeling.

Photos of conference activities can be viewed at the following web site (search for "LPSC 2011 Royalty Free Images"):

http://www.lpi.usra.edu/meetings/lpsc2011/?view=press

I spoke with an enthusiastic man from Hungary who heads a team competing for the Google Lunar X-prize, a private effort to land a rover on the moon. I also heard many novel theories. One attendee had an astonishing presentation on her idea that observations of an increasing rate of expansion of the universe are not due to some mysterious dark energy, but rather to the possibility that the speed of light in a vacuum is decreasing over time.

I talked to a lady from Goddard Space Flight Center attending because she obtained project grant money, without which her NASA project probably could not spare funds for her travel. I spoke with a Chinese graduate student from a school in Florida and his Japanese friend. I talked to old NASA hands who left the Clear Lake area after working on Apollo, but still retain an interest in space. I met someone from Glenn Research Center developing a rocket to bring a small sample of Mars rocks back to earth. He said the rocket was so small that it was like something a hobbyist might make.

There was a significant panel discussion by experts on near-earth objects. Like many conference presentations, it was streamed out over the internet. Since a collision with such an object could well terminate life on earth, it's a serious subject where space technology can play a critical roll. Current surveys of threatening objects are hampered by an inability to look between the earth and the sun. Identification of all major threats will probably require that a new detection spacecraft be placed in space trailing Venus. There are major questions about what actions might be taken and who would be in charge of the response effort if Earth were threatened.

A conference highlight was the release of a study by a prestigious committee of the National Research Council with recommendations for prioritizing unmanned programs to solar system objects over the next 10 years. This so-called Planetary Decadal Survey forms the basis for long range planning by the government and NASA, and it was eagerly anticipated. A link to the report (recorded videos) is located at:

http://www.livestream.com/2011lpsc/video?clipId=pla_18e48f98-4a78-4acc-ad2a-

Left: Womens' breakfast at LPSC. Image credit: LPSC

Conference

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Perhaps the largest contingent of attendees at this convention came from the Jet Propulsion Laboratory (JPL), a major player in the unmanned space exploration game. One of the more bizarre meetings was an informal presentation on the history of a lawsuit filled by JPL employees to try to prevent Caltech and NASA from undertaking open-ended, unconstrained background investigations for the purpose of rebadging. The lawsuit took over three years to wind its way up to the US Supreme Court. At issue was the right of the federal government to require private employers to investigate an individual's personal history without a compelling reason to do so. The scientists lost when the Supreme Court ruled that the Constitution doesn't guarantee a right of privacy. More information about the case can be found at: http://hspd12jpl.org/

Right: A speaker at LPSC in the Woodlands. Image credit: LPSC

Right: The Hayabusa team, first to return samples from an asteroid to Earth. Image credit: LPSC

Right: A poster session at LPSC. Image credit: LPSC

As one walked the halls of the convention center, there was the constant buzz of conversation between experts discussing problems. This is the real benefit of such a conference, to see your colleagues and compare notes. It was refreshing to experience the enthusiasm of the conference attendees. It reminded me of the infectious excitement present in the manned space program back during the Apollo era. There is a renaissance occurring at this time in planetary science akin to the exciting time 500 years ago when the first explorers brought back news to Europe about the New World. Our recent space probes have returned massive amounts of fresh data, and even information collected decades ago is being revisited with new computer tools. There is so much data that huge opportunities exist for a researcher to find something entirely new. After seeing the amenities and experiencing the efficient organization, I think the conference registration fee ($205 for professionals, $100 for students) is a real bargain. The programs went on non-stop, and the dilemma was choosing which of the fascinating presentations one might want to attend next.

Feature

Just For the Record

JAMES C. MCLANE III

When I read historical interviews with folks who took part in the Apollo program, I'm immediately struck by how many of them mention building and flying model airplanes when they were kids. A few (like my father) started flying models in the 1930's when aviation was in its exciting infancy. For some of these modelers, this passion carried over into their adult years.

I built my first radio control (RC) plane when I was about 13 years old. My Dad made the vacuum tube radio receiver and transmitter for me from an electronics kit. The rudder and elevator on my model were moved by a mechanical escapement powered by a wound-up rubber band. The radio equipment and batteries were so heavy the plane could barely fly, so the possibility of crashing made each flight very exciting. That was back in the 1950's. By the 1960's transistorized gear and printed circuits came into use, and in the 1970's the integrated circuit and tiny electric actuator motors (servos) made radio control equipment reliable and relatively cheap. The model planes were a lot easier to fly since the newer hardware allowed the pilot to move the control surfaces incrementally rather than choosing only neutral, full up or full down.

In the 1960's an RC model airplane club was formed by employees at NASA's new Manned Spacecraft Center. The club flew their planes on an antenna test range used for the Apollo program. A long paved runway extended out into a pasture west of the Space Center's anechoic chamber building. By the mid 1970's the runway was no longer active with any

(Continued on page 11)

Below: (Left to Right) Unknown participant, Maynard Hill (kneeling) Owen Morris, John Kiker, Unknown flyer holding conventional aircraft used to test timing system. Image credit: James C. McLane III

Feature

(Continued from page 10)

NASA projects so JSC allowed the RC club virtually unlimited access to the area. Arrangements were made for folks who were not NASA or contractor employees to park near the flying site, even though their cars didn't have NASA visitor permits. Most of the models flew slowly, perhaps 30 miles per hour, but there were special racing planes that might approach 100. One club member had a very fast plane powered by a small pulse jet engine (like the old German V-1 buzz bombs), but most flying out at the antenna test range was low and slow. More about the early club can be found at this web site. http://www.jscrcc.com/history.html

The club conducted flying contests and was always casting about for activities that could bring members together. They became enthusiastic over the idea of sponsoring an attempt to set a world's speed record. Since 1905 all formal aviation record trials are conducted under strict rules and regulations established by the Federation Aeronautique Internationale (FAI). This world governing body for air sports, based in Lausanne Switzerland sanctions flying records, even those of model aircraft.

The RC club arranged for the official speed record trials to be held over a weekend in the fall of 1976. The date was set far enough in advance for club members to design, build and test special super-fast RC planes, and several members did just that. The official FAI sanctioned event attracted modelers from other states (more about that later). In spite of advance warning some folks showed up at the event with brand new planes they had never tried to fly!

It doesn't take an aerospace engineer to realize that the dense, humid Houston air was not the best place to attempt a world's speed record, but nevertheless that didn't discourage the club from sponsoring the effort. My memory is fuzzy on this matter, but I seem to recall that the speed record at that time stood at something slightly higher than 200 miles/hour.

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Below: Model resting on its wire space-frame takeoff dolly. Aircraft features thin, sharp wings and tail, cowling on engine and long, tuned exhaust pipe. Wire loop near front dolly wheel could be used for catapult assisted take off. Note the nearly invisible, minimal size control surfaces. Builders/flyers names are written on the wing. Image credit: James C. McLane III

Feature

(Continued from page 11)

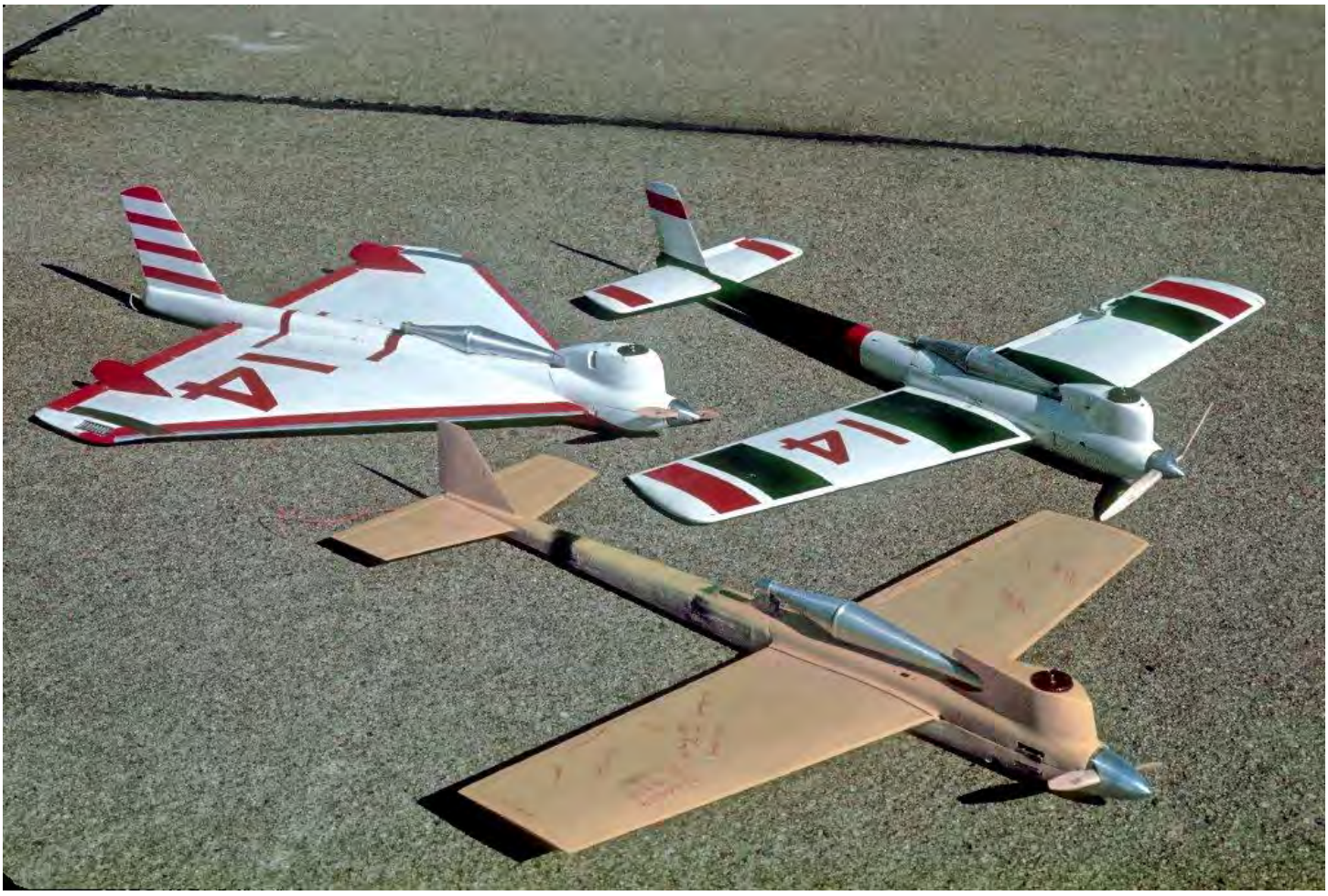
FAI rules limited the little two stroke reciprocating model engines to a certain maximum size, but I don't think there were significant restrictions on the shape of the models. The planes would be timed as they flew along a special measured course very close to the ground. Any arrangement set up for model airplanes could also be used for helicopters so the club decided to try to set a world's speed record for those models at the same event. In 1976 RC helicopters were in a very primitive state of development so the existing record was very low (say 20 miles/hour).

By November 1976 all was in readiness. The RC Club had permission to use an auxiliary runway at Ellington Air Force Base for the entire weekend and the weather was great, with clear skies, mild temperatures and light winds.

Out at Ellington volunteers marked off a precisely measured segment of runway, probably something like a 200 foot trap, but I can't recall the exact length. An unusual method was used to determine the model's ground speed. In 1976 there were no such things as hand held police radar guns or laser speed detectors or other inexpensive high tech ways to sense the speed of a flying object. The technique chosen was to erect two tall poles (maybe 15-20 feet high) on each side of the runway. The speed trial would begin when the plane raced across an imaginary portal in space between these two poles. The speed run would end when the model crossed another imaginary portal marked by poles erected 200 feet or so down the runway. The problem was just how to detect when the model crossed those spots.

A clever human-based timing system was used. Several volunteers sat in a line of lawn chairs placed perpendicular to the runway in such a manner that the people were facing the poles. Each person in a chair could see both poles at the same time, one directly in line behind the other. The

(Continued on page 13)



Below: Models skid in for landing on reinforced bottoms, risking a broken propeller. Image credit: James C. McLane III

Feature

(Continued from page 12)
volunteers held push buttons that were electrically connected to a central timing recorder. The volunteers (typically 5 or so on each end of the measured speed trap) stared at the poles and when they saw the model flash by, they pushed their timing button. Down the runway at the far end of the speed trap a similar group of volunteers watched and pushed buttons when the model crossed between their poles. A custom built electronic system (remember this was before the advent of the Personal Computer) averaged the readings from the push buttons (to remove the element of variable human response reaction) and presented a transit time that would translate into a model speed.

Making RC planes go real fast has never been a typical goal because it's no fun flying something that's constantly trying to scoot out of sight. Few modelers had any experience with models where all design features focused on speed. Compared to the typical RC airplane the special planes built for this record attempt could barely get airborne and flew poorly. Their propellers had a very steep pitch that was only effective at high speed. At take off and slow speeds the props were mostly paddle blades providing little thrust. The models did not have conventional wheels, but instead rested on take-off dollies that dropped away when the plane rose up from the runway. Once off the ground, the planes would slowly claw their way into the sky with a low rate of climb. Most models featured a long ~~–t~~uned" exhaust pipe extending back along the top of the fuselage. The engines were tuned for a very high RPM (which they could never reach on the ground or during their climb to altitude).

Left: 14 must have been a lucky number. Image credit: James C. McLane III

The strategy for setting the speed record was as follows:

After a long roll down the runway the pilot would decide that flying speed had been reached and direct the plane to pull
(Continued on page 14)

Feature

Below: Master modeler Maynard Hill from Maryland. Aircraft shows damage to its single (only) aileron. Rubber balloon contains fuel. Hook and cord attached to front of dolly is part of catapult system that pulls the plane up to take off speed. Image credit: James C. McLane III

(Continued from page 13)

up off the dolly into the air. Then the model would circle around and around as it slowly climbed up to perhaps 1000 or so feet altitude. It would be a tiny object in the sky. The operator would then command the model to pitch over and point its nose at the ground. In a near vertical dive, the model would rapidly gain speed. The high pitch propeller would come into its own, and the sound of the motor would drastically change as engine RPM's suddenly increased. The tuned exhaust pipe would begin to resonate and on the ground we would hear a distant shriek increasing in pitch with Doppler affect as the plane came nearer and nearer. We could tell the plane was in a dive and getting close without even looking up.

If one did look up, there was the worrisome sight of a missile coming rapidly down out of the sky that seemed to be pointed directly at us! The operator would pull the model out of its dive a few feet above the ground just in time to fly between the poles, roar down the measured section of runway, and then pull up when it passed the poles at the far end of the speed run. Usually enough fuel was carried for a few attempts. When the fuel ran out, the model would glide down to a risky belly landing in the grass.

I was helping with this effort. As I mentioned, it was very exciting for those of us on the ground to hear and see one of these things screaming straight down out of the sky. We were praying the wings and tail would stay attached during the high-G pull out at the bottom of the long dive. Over the weekend there were some failures and crashes. These sleek planes were not designed with stability in mind and I saw one aircraft lose radio contact, wander away out of control and be destroyed in a crash.

I watched a man flying a very large home-built helicopter. The chopper was hovering about 3 feet off the ground with the operator standing too close when a gust of wind caused it to suddenly drift

(Continued on page 15)

Feature

(Continued from page 14)
over into him. The heavy spinning blades chopped up his legs so badly he had to leave the site for medical attention.

That weekend a model helicopter did manage to set a world's speed record, but none of the fast planes came even close.

I took a few photos at the event which are reproduced here.

In the middle of the group photo of the men holding their models are famous NASA engineers Owen Morris and John Kiker. Both were especially critical to the success of the Apollo and Space Shuttle programs. Owen was Manager of the Lunar Module and Apollo Spacecraft Program office. After leaving NASA he formed locally-based Eagle Engineering and in spite of being seriously injured in a home built airplane crash in 1998 he is still active in the space program and still flies RC models.

http://www.jsc.nasa.gov/history/oral_histories/MorrisOG/OGM_6-30-99.pdf.

John Kiker was the engineer who promoted the idea that the Space Shuttle orbiter could ride on top of a Boeing 747. He received a Presidential citation for perfecting this concept and proving its practicality by flying a radio controlled model of the piggy back combination. John was a serious aviation enthusiast who owned an airplane before he ever owned a car! He died in 2005.

http://www.jsc.nasa.gov/history/oral_histories/KikerJW/JWK_BIO.pdf

Maynard Hill is the kneeling person holding the futuristic delta wing model below Owen and John. He brought his speed planes down from Maryland for the meet. Maynard had a passion for setting model airplane records that he got by competing with the Russians during the Cold War. He set several international records for altitude and flight

(Continued on page 16)

Below: Engines have acoustically tuned exhaust pipes. Image credit: James C. McLane III

Feature

(Continued from page 15)

duration. As he entered his 70's his eyesight began to fail, but he kept on building models. Late in life he set a goal that was almost impossibly high.

History records that on August 9, 2003 the now legally-blind Maynard Hill poured one gallon of Coleman lantern fuel into the gas tank of an RC plane he had designed and built. This aircraft was one of a series of similar models he had made over the previous few years, but all the others had crashed or been lost at sea. He started the little engine, ran a few steps and threw the 11 pound aircraft into the air. Beyond a couple hundred feet he could no longer see it, so a friend took over radio control. The little plane headed east over the Atlantic Ocean off Cape Fear Newfoundland, guided by a tiny autopilot. 39 hours and nearly 1900 miles later, right on schedule and at the correct location a dot appeared in the sky off the coast of Ireland. A man on the ground flipped a switch on his radio control transmitter to take control of the little airplane and lead it down to a smooth landing. Maynard's model had flown across the Atlantic Ocean all by itself! In spite of blindness Hill had seen his dream become a reality. This achievement was the model airplane world's equivalent of the Apollo 11 moon landing. Maynard Hill on died June 22, 2011 at the age of 83.

(Continued on page 17)

Below: Starting a helicopter with an electric motor. Wind is apparent in bent grass. Image credit: James C. McLane III

(Continued from page 16)

More about Maynard Hill can be read here:

http://www.modelaircraft.org/mag/mhill/hillindex.htm

http://www.telegraph.co.uk/news/obituaries/technology-obituaries/8573491/Maynard-Hill.html

http://online.wsj.com/article/SB10001424052702304778304576377930613461572.html

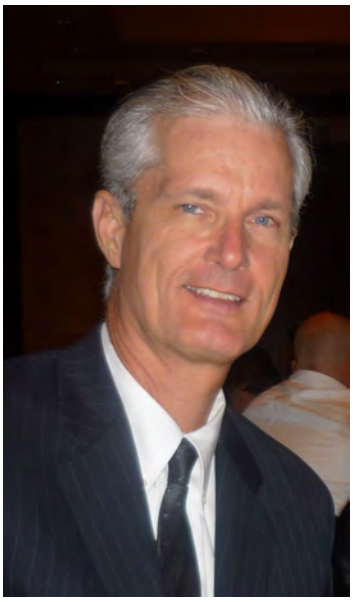
The End

Feature

Left: Jim McLane (the author) in about 1948 with a gas model Gee Bee. Image credit: James C. McLane III

Left: Jim McLane (the author) in 2009 with a larger model Gee Bee. Image credit: James C. McLane III

From the Editor



E-mail: editor-in-chief "at" aiaa-houston.org

New Technology, New Directions

DOUGLAS YAZELL, EDITOR

NASA human space flight is aiming high with a mission sending astronauts to an asteroid. The team starting NEEMO 15 (NASA Extreme Environment Mission Operations) training soon includes planetary scientist Dr. Steven Squyers, a well-known member of the team from the Mars Exploration Rovers (MER) program (using the famous robot rovers Spirit & Opportunity). That fits well with the flexible path recommended by the Augustine Committee, provided that it is fully funded and uses international partners in the critical path. News reports now talk about NASA's interest in using the European Space Agency's (ESA's) Automated Transfer Vehicle, in a modified form, for the Service Module planned for use with the Orion Crew Exploration Vehicle (CEV), now called the Orion Multi-Purpose Crew Vehicle (MPCV). As for funding, Robert F. Thompson reminded us that the NASA budget was never more than 1% of the national budget except during the early years (Apollo, etc.). As long as NASA funding is based on realistic plans, things should go as well as possible given that we hold national elections on a regular basis. The current NASA budget is probably about 0.5% of the national budget.

NASA recently released a Global Exploration Strategy (GES). This international team of space agencies had two questions in mind, "Why are we returning to the Moon?", and "What are we planning to do when we get there?" This ongoing study now focuses on two paths for the next 25 years, "Asteroid Next" and "Moon Next."

The Department of Defense's (DoD's) Defense Advanced Research Projects Agency (DARPA) led a 100-Year Starship Symposium in Orlando (September 30 - October 2, 2011), related to a study starting in the fall of 2010 and ending on 11/11/11. DARPA will award $500,000 to a winning team to plan things for sending humans to another solar system within the next century without any more government funding.

Until next issue, happy landings!

Dates	Location	Description
Nov. 14-16, 2011	San Diego, Ca.	Human Space Exploration Community Workshop on the Global Exploration Roadmap
May 22-24, 2012	Washington, D.C.	Global Space Exploration Conference

Right: Upcoming NASA events for the Global Exploration Strategy. Image credit: NASA, http://www.nasa.gov/exploration/about/isecg/

Right: From the Wings Over Houston airshow this year (October 15, 2011), a souvenir from James C. McLane, Jr., a former AIAA Houston Section Chair. Mr. McLane was a WW II P-51D fighter pilot in 1945. In that same Legends & Heroes tent, I visited Celeste Graves (author, A View from the Doghouse, about the WASP) and Captain A.J. High, author of Meant to Fly, and a volunteer at the 1940 Air Terminal Museum. Image credit: Nick King (airplane silhouette).

Mike Moses Moves to Virgin Galactic

Staying Informed

PRESS RELEASE FROM VIRGIN GALACTIC

October 11, 2011

Virgin Galactic Appoints Former NASA Executive as Vice President of Operations Virgin Galactic is pleased to announce the appointment of former NASA executive Michael P. Moses as the Vice President of Operations. Just days prior to the dedication of the company's operational headquarters at Spaceport America in New Mexico, Virgin has named the highly respected human space flight leader to oversee the planning and execution of all operations at the site of the company's commercial suborbital spaceflight program.

Following a distinguished career in NASA's recently-retired Space Shuttle Program, Moses brings to Virgin Galactic a proven record of safe, successful and secure human spaceflight missions, spaceport operations, and human spaceflight program leadership. He served at the NASA Kennedy Space Center in Florida as the Launch Integration Manager from 2008 until the landing of the final Shuttle mission in July 2011. He was responsible for supervising all Space Shuttle processing activities from landing through launch, and for reviewing major milestones including final readiness for flight.

He also served as chair of the Mission Management Team and provided ultimate launch decision authority for the final 12 missions of the Space Shuttle Program, directly overseeing the safe and successful flights of 75 astronauts.

Moses will develop and lead the team responsible for Virgin Galactic spaceship operations and logistics, flight crew operations, customer training, and spaceport ground operations, with overall operational safety and risk management as the primary focus.

"Bringing Mike in to lead the team represents a significant investment in our commitment to operational safety and success as we prepare to launch commercial operations," said Virgin Galactic President and CEO, George Whitesides. "His experience and track record in all facets of spaceflight operations are truly unique. His forward-thinking perspective to bring the hard-won lessons of human spaceflight into our operations will benefit us tremendously."

Prior to his most recent NASA role, Moses served as a Flight Director at the NASA Johnson Space Center where he led teams of Flight Controllers in the planning, training and execution of all aspects of Space Shuttle missions. Before being selected as a Flight Director in 2005, Moses had over 10 years experience as a Flight Controller in the Shuttle Propulsion and Electrical Systems Groups.

Left: Mike Moses. Image credit: Virgin Galactic

Moses said, "I am extremely excited to be joining Virgin Galactic at this time, helping to forge the foundations that will enable routine commercial suborbital spaceflights. Virgin Galactic will expand the legacy of human spaceflight beyond traditional government programs into the world's first privately funded commercial spaceline."

Moses holds a bachelors degree in Physics from Purdue University, a masters degree in space sciences from Florida Institute of Technology and a masters degree in aerospace engineering from Purdue University. He is a two-time recipient of the NASA Outstanding Leadership Medal as well as other NASA commendations and awards.

Virgin Galactic press release.
Tara Hyland, MCC, ASA, Virgin Galactic Accredited Space Agent (ASA), Director, Leisure Marketing - US at CWT Vacations, Houston, Texas USA

Below: A letter to the editor.

Dome of an Idea

James C. McLane III suggests putting a space shuttle orbiter in the Astrodome, along with the Saturn V rocket from Rocket Park at NASA/JSC. His letter appeared in the Houston Chronicle of October 8, 2011. Here is a link to that letter: http://www.chron.com/opinion/letters/article/NASA-and-other-space-concerns-2208398.php

Editor: James later said it is probably feasible to display the entire space shuttle stack (solid rocket boosters, external tank, and a real orbiter) depicting a realistic ascent at an angle in the Astrodome.

See page 29 for news about the new NASA Space Launch System (SLS).

Aviation

The Fog of War Obscures a Great Aerial Dogfight (Speculation)

JAMES C. MCLANE III

Recently KUHF radio in Houston featured Dr. John Lienhard's "Engines of our Ingenuity" episode #1995 about the P-40 aircraft.

http://www.uh.edu/engines/epi1995.htm

The radio program reminded me of a story I'd heard from my father, longtime AIAA member and former AIAA Section Chair James C. McLane Jr.

During WW2 my dad (now 89 years old) was a fighter pilot. He trained in the Curtiss P-40 Warhawk, and spent much of 1944 serving as an instructor for those single seat aircraft. He transitioned to the much more advanced P-51 Mustang after joining the 357th Fighter Group in England.

In July 1945 his Group moved into a former German air base at Neubiberg near Munich. There was speculation about whether they might eventually have to tangle with the Russians in disputes over the post-war division of Europe. To help prepare for this possibility, the US Army sent a couple of recently surrendered German aviators to discuss combat tactics with the pilots of the 357th. The two German aces were almost legendary, each having each shot down more than 200 enemy aircraft.

Right: James C. McLane Jr. (center–right) and P-40 with other pilots of "A" Flight, Squadron "T", Punta Gorda Army Air Field, Florida, Feb 7, 1945. Image credit: James C. McLane III.

An American pilot asked one of the visitors to describe his toughest aerial combat. The German, with luck and great skill had survived countless dogfights, perhaps more than any living aviator. The listening audience included pilots who had wanted to shoot this man and his Luftwaffe brothers down, so they were very interested in his response. Maybe he would describe an encounter with one of the notable American aces in that very room, a group that included Kit Carson, one of the US's top scoring fighter pilots. The German's answer would surprise his audience.

The Luftwaffe ace said his most memorable combat occurred early in the war. He was flying a Messerschmitt Bf-109 on a patrol over North Africa. Flying high up in the empty blue sky over the desert, the war seemed a remote abstraction. The air was crystal clear and visibility was excellent. It was cool up here, unlike the stifling hot conditions that prevailed on the ground. This was a fine day to be in the Luftwaffe instead of Rommel's Afrika Korps, choking on dust, crawling around somewhere down below on the blistering Sahara desert.

Habitually scanning the sky, he saw a tiny speck in the far

(Continued on page 21)

(Continued from page 20)

distance and instantly veered over in that direction for a better look. The speck was a lone Curtiss P-40 Warhawk painted brown in British camouflage colors. The war had once again become a personal matter. The German knew he was there to make just such a discovery. Nevertheless, for an instant before deciding on a course of action he resented how much the impending encounter would interfere with his enjoyment of the beautiful day. Barring a mechanical failure on his trusty Messerschmitt, the outcome of this chance meeting with the enemy was inevitable. He was an expert, flying the world's fastest front-line fighter plane. He would score another easy victory by downing the plodding, semi-obsolete P-40. Experience had taught him that any pilot in a P-40 with the bad luck to meet his fully armed Bf-109 would soon be another casualty of war. Such an encounter held little of the danger and excitement of strafing targets on the ground, or the personal satisfaction of escorting the slow, vulnerable troop transports that carried dozens of fellow German soldiers. He wasn't nervous as he methodically cinched his shoulder harness tighter, advanced the throttle, glanced one last time at the instrument panel and banked the lethal little Messerschmitt into a curving path designed to intercept the track of the P-40 and put him in a firing position behind his opponent.

(Continued on page 22)

Left: Instructor pilot McLane in P-40. Image credit: James C. McLane III.

Aviation

(Continued from page 21)

But the Warhawk pilot was alert and he would not be taken unaware.

A P-40 could accelerate very rapidly in a dive, so to escape the situation the British pilot headed toward the ground as steeply as possible. But, the air was clear and there were no clouds below to dive into and hide. Perhaps down near the desert the mottled tan camouflage on the Warhawk would make him hard to see. At least that was one remote possibility.

The fast Bf-109 headed down too, following in the distance behind the P-40. The resulting pursuit continued as both aircraft spiraled closer and closer to earth. The German was tenacious, but couldn't close the distance separating him and his now fast flying enemy. Pulling high G's both planes flattened out near the ground without shedding necessary parts, like wings or tails, or rendering their pilots unconscious. The cockpits began to take in the hot air that one associates with the desert. In a short while flying outfits, designed for the cold of 20,000 feet became uncomfortable and the pilots began to sweat. Behind tight fitting goggles, sweat could sting the eye and obscure vision. Now the German sought a rapid end to this contest. It had already proven more inconvenient than he expected. This had become a classic match of two planes and their pilots, knights of the sky engaged in a close-in fight that almost certainly would end in a death.

After pulling out of its steep dive, by chance the P-40 found itself flying at rooftop level above a North African city. The Messerschmitt was not far behind. The subsequent dog fight happened inside the town. The planes chased each other down streets and between buildings and houses, their wing tips and propellers barely clearing obstacles. Panic-stricken people, animals and livestock scattered. The planes were so low that their propeller tips may have touched the dirt as they roared down the roads. Clouds of dust hung in the air in their wake.

Right: James McLane Jr. and a P-40 Warhawk. Image credit: James C. McLane III.

The very low altitude meant there could be no chance to bail out with a parachute if your plane was fatally shot. The extreme high-G maneuvers, the banking and the constant, hard over, knife edge turns did not offer any chance for the Bf-109 to use its ability to go fast. Close proximity to the ground made it impossible to dive. A climb would slow you down and make you an easy target, so the normal three dimensional environment of flight was reduced to moving in only two dimensions, a condition that greatly handicapped the faster Messerschmitt.

It must have been frightening for the two pilots. Horrifying would be a better term. This was the stuff of a nightmare. The experience was so scary that three years later the German could still remember every detail. Following close behind the P-40 pebbles and dirt struck his windshield as he occasionally lost sight of his enemy in the dust. On the ragged edge of a high speed stall the tight turning P-40 would try to cut inside the German's circle. For an instant each pilot might find himself in an advantageous

(Continued on page 23)

(Continued from page 22)
position and perhaps get off a few shots, but neither could stay in a favorable orientation long enough for a kill.

After an agonizing time engaged in this risky low level flying, it was plain that the match was going nowhere. Neither aviator could gain sufficient advantage over the other to prevail. Flying crazy like this, low in an unfamiliar city, would ultimately end in disaster. For the pilots, the tension, like the heat in the cockpit, was almost unbearable. Throwing the aircraft into one extreme maneuver after another at the very limit of controllability was physically exhausting.

As suddenly as this desperate life or death struggle began, the combatants broke it off, each frightened by the flying ability and tenacity of the other. They had both met their match and knowing so, with mutual relief they departed the city in separate directions.

In the spring of 2012, news reports began to filter out of Egypt announcing the discovery of a crashed P-40 aircraft. An oil exploration crew had found a well preserved wreck in the desert. There were bullet holes in the airplane and indications that the pilot had survived the emergency landing. Identification tags made it possible to trace the wreck. Official military records showed that on June 28, 1942 this aircraft and its pilot, 24-year-old British Flight Sergeant Dennis Copping, had completely vanished.

On that fateful day, did Flight Sergeant Copping, flying alone without escort, encounter a German ace and fight a desperate aerial dance of death? We'll probably never know, but it's indeed a fascinating possibility. If this is true, then Copping's dogfight might rank among the great examples of aerial combat. Could he, against all odds, while piloting an obsolete aircraft, have successfully battled a noted German ace to a draw, only to later die alone of thirst and exposure in the desert? If so, he never got to tell his remarkable story or be recognized for his skill and bravery.

Those who might discount the P-40 as a fighter aircraft should take note. In the hands of the right pilot it could be formidable.

Left: P-40 training in Florida – 1944. Image credit: James C. McLane III.

Links about lost 1942 P-40 found in 2012 (Since we plan to print Horizons on paper on occasion, we present the entire links):
Daily Mail: http://www.dailymail.co.uk/news/article-2142300/Crashed-plane-Second-World-War-pilot-Dennis-Copping-discovered-Sahara-desert.html
National Geographic:
http://news.nationalgeographic.com/news/2012/05/pictures/120524-world-war-ii-plane-egypt-desert-science-p-40-lost/
Video 1 of 2 (1\2): http://www.youtube.com/watch?v=CFe8CsOdoG8
Video 2 of 2 (2\2): http://www.youtube.com/watch?v=KmTNXcGB3Fo
British Forces News: http://www.youtube.com/watch?v=G6m7vkqGS5g

Upcoming Annual Awards Banquet Featuring a Talk on the NASA Warp Drive!

DANIEL NOBLES, CHAIR

On the evening of June 13th, the Houston Section will hold our Annual Awards Banquet in memory of Mr. James C McLane, Jr. (1923-2012). Mr. McLane held the position of AIAA Houston Section Chair from 1971-1972, during which the Johnson Space Center flew Apollo Mission 15 and 16. He was the second person in South Carolina to build a gasoline-powered model airplane, and attended Clemson University. He joined the Army Air Corps, and flew as a combat pilot over Germany as a member of the 357th fighter group. From there, he worked for the National Advisory Committee for Aeronautics in Langley, VA, and then designed wind tunnels in Tullahoma, TN. He also led the design of the Lunar Receiving Laboratory, and was a Division Chief for the Space Environmental Simulation Lab. On a more personal note, Mr. McLane was a dear friend to many of us here in the Houston Section, and still regularly attended dinner meetings whenever possible, and we looked forward to speaking with him. His passing has been felt by many of us, and we will be holding this year's Awards Banquet in his memory.

Dr. Sonny White holds a Ph.D. in physics from Rice University, and a vast amount of experience in engineering here at the NASA Johnson Space Center, where many of us best remember his meritorious service to the Engineering Robotics Division. He has been awarded a Silver Snoopy and a NASA Spaceflight Awareness Award, both of which are prestigious awards. Currently, he holds a post as the Advanced Propulsion Theme Lead for the NASA Engineering Directorate and is the JSC representative to the Nuclear Systems Working Group. I cannot wait to hear his perspective of how we can achieve faster than light travel. For more information, check out this link at Space.com: "Warp Drive May Be More Feasible Than Thought, Scientists Say."

We will also present various awards and introduce our executive council for next year.

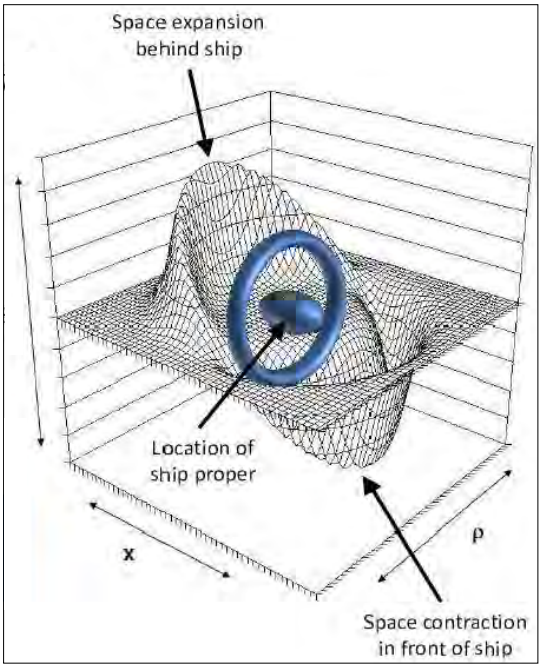
From the Chair

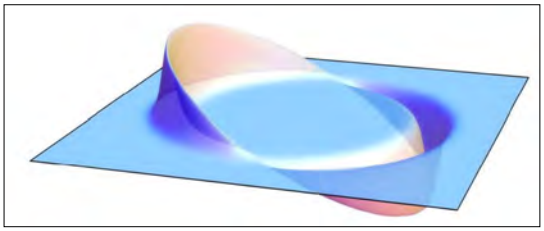
chair2012@aiaahouston.org
(Daniel A. Nobles)
Links:
https://people.nasa.gov

I hope to see you there.

For more information about this dinner meeting, visit our website's event page via this link or email Jennifer Wells at: honors2012@aiaahouston.org

Thank you for your continued support of the AIAA Houston Section.





Above: Photo from a 1972 Section meeting in the Holiday Inn on NASA Road 1. Chairman James C. McLane, Jr. (standing) is introducing the speaker, Major General Douglas T. Nelson, Program Director for the B-1 supersonic bomber. The guest on the right (seated) is Gemini/Apollo astronaut and Air Force test pilot James A. McDivitt. Image credit: James C. McLane III.

Above right: Sheriff Foster B. McLane, Abbeville, South Carolina, circa 1900.

Left: Images from the January / February 2012 issue of Horizons from an article starting on page 26 reporting on our Section's lunch-and-learn by Dr. Harold "Sonny" White. Image credits: Harold White.

Section News

Left: James C. McLane, Jr. (1923-2012), our 1971-1972 AIAA Houston Section Chair. In 1987, he co-founded our sister section relationship with the Shanghai Astronautical Society (SAS). This page shows McLane at left at NASA / Johnson Space Center in 1972. More images of McLane are in this issue on the next page and the back cover page. Image credits: James C. McLane III.

The 2013-2014 Executive Council will consist of:

Chair: Michael Frostad
Chair-Elect: Michael Martin
Vice-Chair, Technical: Clay Stangle
Vice-Chair, Operations: Eryn Beisner
Secretary: Shen Ge
Treasurer: Jennifer Wells
Councilor: Irene Chan (Two year Term, 2013-15)
Councilor: Robert Plunkett (Two year Term, 2013-15)

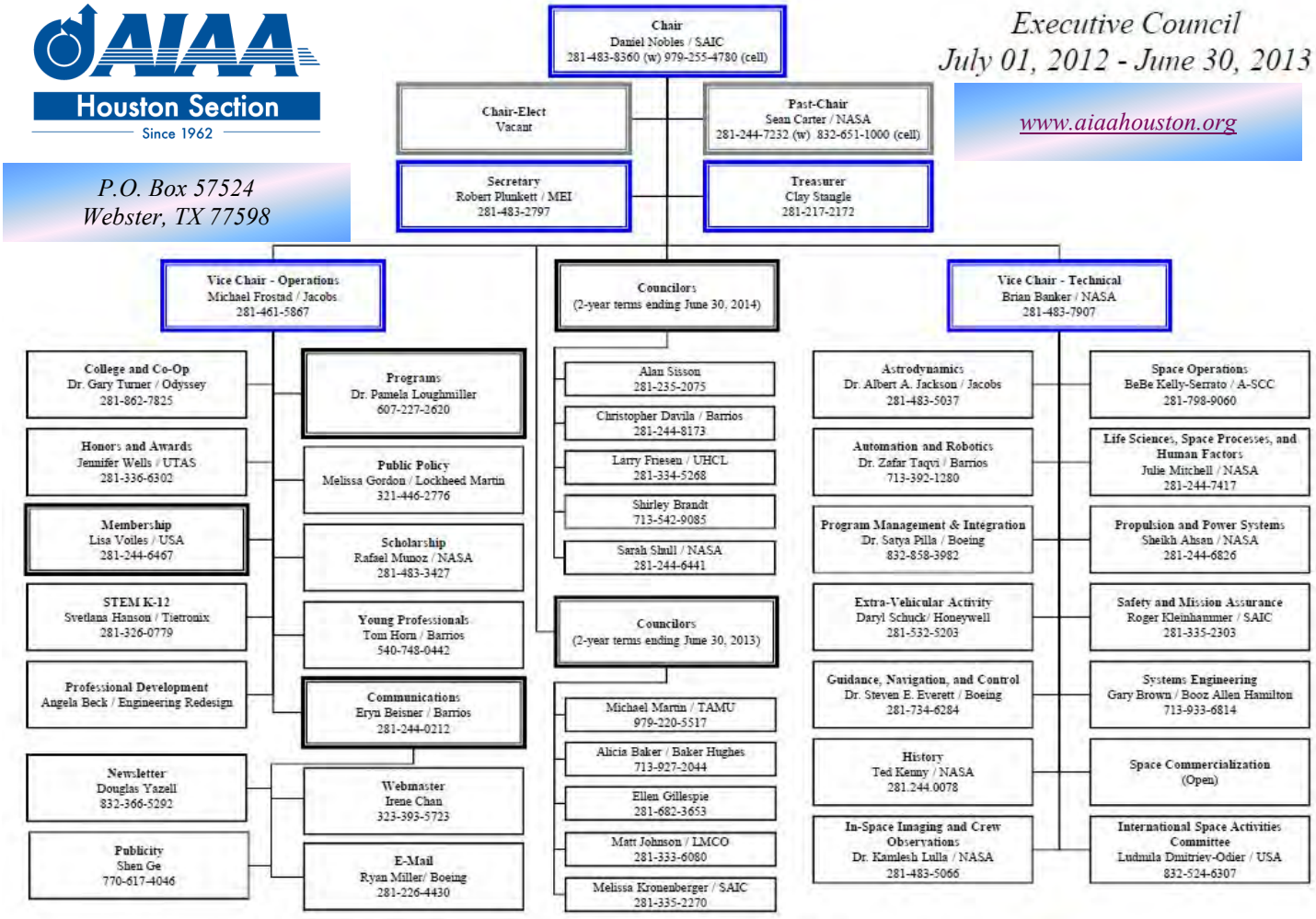
The American Institute of Aeronautics and Astronautics (AIAA)

AIAA Houston Section
Since 1962

P.O. Box 57524
Webster, TX 77598

Executive Council
July 01, 2012 - June 30, 2013

www.aiaahouston.org

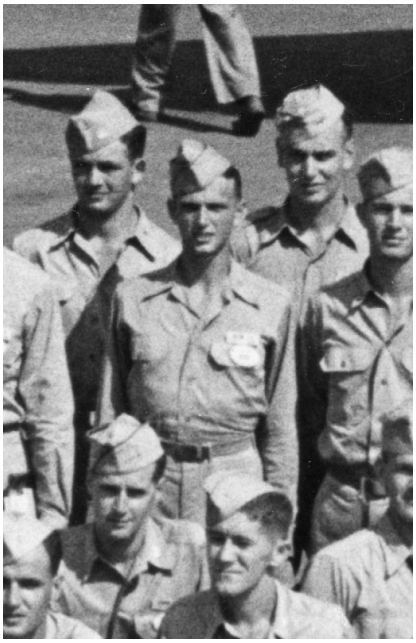


Downloaded February 17, 2013

Executive Council Voting Members (20) are identified by:

Section News

This page: James C. McLane, Jr. (1923-2012), our 1971-1972 AIAA Houston Section Chair. In 1987, he co-founded our sister section relationship with the Shanghai Astronautical Society (SAS). This page shows McLane in basic training in Macon, Georgia. More images of McLane are in this issue on the preceding page and the back cover page. Image credits: James C. McLane III.



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Webster, TX 77598

The American Institute of Aeronautics and Astronautics

James C. McLane, Jr. (1923-2012), was our 1971-1972 AIAA Houston Section Chair and co-founder (in 1987) of our sister section relationship with the Shanghai Astronautical Society (SAS). The current contact person in Houston for that work in Marlo Graves. She traveled to China on behalf of our Section a few years ago. She is a graduate of the 2006 Space Studies Program (SSP) of the International Space University (ISU) in Strasbourg, France, a nine-week course. She worked for ISU during the 2007 SSP in Beijing.

From James C. McLane III, March 2013 (More McLane photos are on two other pages in this issue in our Section News pages.):
"While emptying out a closet in my father's house I found hundreds of great old photos. Most I had never seen so I will be busy scanning for the next year or so. The biplane shots were basic training in Macon Ga. The parade (below) was one my Dad organized when he was Cadet Commander in Aviation Cadet training. He is standing second from left. The color shot is from a 1972 NASA photo (my father: standing on left).

AIAA Mission & Vision Statement

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Our Section's Annual Awards Dinner Meeting

Section News

MICHAEL FROSTAD, CHAIR-ELECT AND ELLEN GILLESPIE, COUNCILOR

Our Section's annual awards dinner meeting, dedicated to the late James C. McLane, Jr. this year, attracted a crowd of more than 150 attendees at the NASA / JSC Gilruth Center Alamo Ballroom on June 13, 2013.

James C. McLane III delivered a presentation about his father's NASA career, service to AIAA, and related activities.

AIAA Houston Section Chair Daniel Nobles and Honors and Awards Chair Jennifer Wells presented service awards for five people in attendance. These awards are presented for service anniversaries of 25, 40, 50, or 60 years. Nobles and Wells presented several kinds of awards as the evening began. One award was for Dr. Myron Diftler, NASA / JSC Principal Investigator for the Robonaut team. That Robonaut 2 (R2) team won the national AIAA Space Automation and Robotics award for 2013.

Our Section also awarded almost $8,000 to the Houston Museum of Natural Science Challenger Learning Center,

(Continued on page 30)

Above: Jennifer Wells (left) and Daniel Nobles (right) present 25-year membership service awards to (left to right) William D. Eatwell, Thomas R. Hatfield, and Wendell W. Mendell. Image credit: Michael Frostad.

Above: Jennifer Wells (left) and Daniel Nobles (right) present 50-year membership service awards to (left to right) Eleuterio ("Teyo") de la Garza and Chester A. Vaughan. Image credit: Michael Frostad.

Above: The Section's annual awards dinner meeting was dedicated to the late James C. McLane, Jr. His son James C. McLane III delivered a presentation about his father's NASA career. Image credit: Michael Frostad.

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

The American Institute of Aeronautics and Astronautics

Above: The late James C. McLane, Jr., is shown at left in this photograph of February 16, 1965. This is the Space Simulation Working Group. This was the second gathering of this organization whose annual technical convention continues to this day. The group now includes representatives from eight countries. Image credit: James C. McLane, III. James C. McLane, Jr. was our 1971-1972 AIAA Houston Section Chair.

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Address to AIAA Houston Section about the late James C. McLane, Jr., Part 1 of 6

JAMES C. MCLANE III

James C. McLane, Jr.
1923 - 2012

June 13, 2013

First I want to say that the many of you here tonight who knew my dad realize that he was a modest person who would be surprised, but pleased to see that his memory honored at this meeting. He had a long and busy life and I'm going to mention some unusual facts rather than those things many of you might already know.

He became active in the American Institute of Aeronautics and Astronautics (AIAA) in 1962 shortly after coming to Houston to work for NASA. I believe his interest in technical societies may have stemmed from a paper on the design of large butterfly valves that he presented at the 1961 ASME Aviation Conference in Los Angeles. Over the next 50 or so years as a member and later an associate fellow he served the AIAA in many capacities. He 1972 he was our local Section Chairman. He also served as a Regional Director. He was proud that he co-founded the AIAA Space Simulation Working Group which still is quite active and has annual meetings at various places around the world. I find it remarkable that he co-founded this particular organization with the help of Dr. Bernhard Goethert, the famous German aerodynamicists who designed the near supersonic Messerschmitt ME-262 jet. This is curious since during WW2 my dad was an Air corps pilot flying around Europe in a P-51 Mustang trying to shoot down ME-262's.

My Dad was responsible for the local AIAA Section sponsoring a number of very memorable dinner meetings. My all time favorite was a joint presentation featuring Georgia Tech professor Alan Pope who spoke about his WW2 experiences designing the shell for the first atom bombs. At the very same meeting a man named Kermit Behan talked about his job as the bombardier on the plane that dropped the Atom bomb on Nagasaki. Kermit was probably the most historical person to ever speak to the AIAA. This man, whose finger pushed a button that ended WW2, was a technician at NASA. He lived a quiet life in Clear Lake City.

My Dad promoted a number of local and national AIAA initiatives. For example he helped persuade the Houston Section to hold an annual technical mini-symposium designed to give local engineers and scientists some experience presenting technical papers. He persuaded the national AIAA to formulate a professional ethics policy and he headed a program which promoted career development in the fickle aerospace industry. He obtained support for the AIAA from local NASA contractors, civil servants, technical societies and nearby universities. In particular he encouraged a close relationship between the Houston AIAA chapter and the student chapter at Texas A&M. For many years this even included trips to A&M for tours of their aerospace facilities and a football game.

Many significant names in the space program have served the AIAA in one capacity or another, in part due to the solicitation and encouragement of my father.

[Continued next issue.]

"When he was just 14 years old, without any technical guidance or help, he built and flew one of the first gasoline-powered model airplanes, first in South Carolina and later a second plane in Georgia. This was so remarkable that it was covered in the newspapers." McLane and his Corben Ace in 1937 in Newberry, South Carolina. Image credits: James C. McLane III family photographs.

Address to AIAA Houston Section about the late James C. McLane, Jr., Part 2 of 6

JAMES C. MCLANE III

James C. McLane, Jr.
1923 - 2012

June 13, 2013

His years in the society were marked by many curious developments. But I am most proud of his efforts to establish a liaison, back in the early 1990's between the AIAA Houston Section and the Shanghai Astronautical Society, possibly China's closest technical match to the AIAA. I'll try to explain how this relationship came about.

The current restrictions on technical interfaces with foreigners are especially clear to those of us who got to experience the relatively open exchange of information and technology during the early days of NASA. Current limitations have made fraternal contacts with foreign entities more difficult than ever. The AIAA and many other technical associations have had to learn to function under strict rules regarding technology transfer to foreign countries. This has hindered efforts to foster international cooperation in human space flight. An exception has been NASA's special technical exchange relationship with the Russians which has enabled us to build the successful International Space Station. The Station is a great example of how technology exchanges can benefit the international community and serve the interest of the US at the same time. This US/Russian arrangement was pioneered by the Apollo Soyuz test project of the mid 1970's, a program that developed a trust between two countries who were at the time engaged in ruthless and inefficient competition. My father was very involved in Apollo Soyuz – but more about that later.

A brush with cancer convinced my Dad to retire early at the age of 60. He and my mother took up world travel. They went on a number of commercial tours to places like Europe and the Middle East. My father happened to be a member of the American Vacuum Society. This organization supported educational foreign trips under the "People to People" initiative, a program begun in the 1950's by President Eisenhower. These exchanges involved visiting host countries and meeting with people there who were in your own professions. In that capacity my parents were able to travel extensively in Russia, Japan and China where they met engineers and toured industrial and scientific facilities.

My folks really liked China, which at that time was definitely a "third world" country, but a place with great aspirations and enthusiasm, especially in regards to Space. Some Chinese engineers my father met invited him to return to lecture on space environment simulation. China at that time was so backward that my father's travel expenses were paid by a United Nations grant to developing nations. His lectures were patterned after a series that he had already presented at the University of Tennessee Space Institute. It took quite a while for the US State Department to approve the venture, but the trip was made and was very successful. By that time my father had become well acquainted with senior engineers in the Chinese space program and he thought it was a good time to explore a formal relationship between the AIAA and a parallel Chinese technical entity.

A sister section arrangement between the local AIAA section and the Shanghai Astronautical Society was the eventual result of that idea. The agreement resulted in exchanges of society newsletters and hosting of visitors by the society members in the respective countries. All together my parents made five trips to China, trips which included visits to rocket and satellite fabrication facilities and launch sites. I recall my dad said that one plant they visited made big boosters in one area and washing machines in another! There are probably some folks in this audience who traveled to China with my parents on trips hosted by the Chinese engineers.

The Chinese Sister Section relationship, as indeed many associations with foreign entities, became much more challenging after 911 and the increasing restrictions on information exchanges with foreigners imposed by ITAR rules that restrict sharing of technical, information.

Above: Jim & Dorothy McLane and space scientists from the Shanghai Astronautical Society, on November 3, 1994, at the McLane home, 1702 Fairwind Road, Houston. The interpreter is Kylin Lee. Image credits: James C. McLane III.

Address to AIAA Houston Section about the late James C. McLane, Jr., Part 3 of 6

JAMES C. MCLANE III

James C. McLane, Jr.
1923 - 2012

NASA's Relationship with Russia is an Exception

As far back as the early 1970s the Apollo-Soyuz Test Project (ASTP) had required the exchange of technical experts and information between two countries who were serious enemies. Perhaps 100 Russians were stationed in Houston for several months. My father was involved, since he was the Chief of the Space Environment Test Division. The ASTP docking adapter was tested in his NASA/JSC Building 32 space chambers. At the time I was living with my parents and working downtown for Brown and Root, the world's largest engineering and construction firm. My group was competing to win a contract with the Soviet Union to build a pipeline in Siberia to deliver natural gas to Europe. No western firm was doing business with the Soviets, so this would be a pioneering job. We had hired an elegant young Texas lady with a Master's degree in Russian language to handle translation.

The ASTP was nearing an end so my father invited the head Russian representative, Air Force General Kolodkov, to come to our house for a backyard barbeque cookout. I brought Brown and Root's Russian-speaking secretary. The General showed up with a man he identified as an engineer, but the man did not seem to know anything technical. I believe he was a KGB secret agent who kept an eye on the Russians assigned to Houston. The General spoke excellent English because during WW2 he was stationed on Long Island in the state of New York working with Bell Aircraft to ship P-39 fighter airplanes to Russia. At the cookout, the General and the KGB man often said that it was not possible that the lady was really a secretary. I think they suspected she was some sort of intelligence agent. Many years later I did some research and found that the General eventually served as head of all Soviet ICBM forces. I'm glad we gave him a good impression of the USA.

Above: Family snapshots provided by James C. McLane III. Moving clockwise from the top left, we recognize Mr. and Mrs. James C. McLane, Jr., Dorothy and James McLane. These images might fit well with this article and its description of a McLane backyard barbecue during the era of the 1975 Apollo-Soyuz Test Program (ASTP). McLane's WW2 fighter airplane was named Dainty Dotty in honor of his wife Mrs. Dorothy McLane.

Address to AIAA Houston Section about the late James C. McLane, Jr., Part 4 of 6

James C. McLane, Jr.
1923-2012

James C. McLane III, from the Presentation of June 13, 2013

I want to say a little about my dad's approach to life. He had a wide range of interests and when he became interested in something he could not be just casually involved. When he was just 14 years old without any technical guidance or help he built and flew one of the first gas powered model airplanes, first in South Carolina and later a second plane in Georgia. This was so remarkable that it was covered in the newspapers.

He liked aviation so much that he became a WW2 Fighter pilot. He was interested in music and in the early 1950's he built a tube type hi-fi stereo. Back then hi-fi was so new you couldn't buy the equipment, you had to make it! He even made the record turntable. When I was a kid my dad didn't drive to work in an ordinary car, he had an unreliable little MG convertible that previously had been a race car. He liked photography so he outfitted a complete color darkroom inside his house. In the 1970's, way before the advent of the IBM PC, he owned a Kapro personal computer with a little 6-inch screen. With his own hands he constructed additions to two houses. He was fanatical about family history and made special trips to acquire genealogical information.

My father grew up in the South during the great depression. One of his grandfathers was a sheriff and for a while my dad lived in the city jail in Abbeville, South Carolina, a creepy place that featured a tall windowless room where they conducted hangings.

His father was born in 1900 and had an eighth grade education (typical for the time), but his mother attended college and could even read and write Latin. His father was a superintendent for highway construction companies. In the early 1930's the family lived in Chile in South America, where his father built the first asphalt road in that country. My dad grew up in a family environment that emphasized hard work and supported personal initiative.

Above: James C. McLane, Jr. is two years old in Daytona Beach, Florida in his mother's arms. That is a 1925 photograph wtih his mother Martha L. McLane. Five photographs show James and his sister Alice on the ship to Chile. The date on the newspaper clipping is February 17, 1938.

James C. McLane, Jr. 1923-2012

Address to AIAA Houston Section about the late James C. McLane, Jr., Part 5 of 6

James C. McLane III, from the Presentation of June 13, 2013

After serving as a fighter pilot in WW2 he went back to Clemson College on the GI bill to get a degree in Civil Engineering. One grandfather had lost a lot in the depression and always admired a neighbor who had a steady job and retirement because he worked for the Post Office. He advised my dad to look for a government job. This was very good advice!

So in 1948 my father applied for work at Langley Field near Hampton Virginia where the NACA operated a cluster of great wind tunnels. In those days NACA employed dozens of engineers to manually digest the data from their test runs. The work was tedious and my father hated it. He did get to design some equipment, including one item I can see in photographs of that era, a glass-walled operator's room inside the huge low speed wind tunnel, big enough to hold a full size airplane.

When he reported for his first day at work at Langley, the interviewer looked over my father's paper work. He said "Hey! I see you have an instructor pilot rating and you flew P-51 Mustangs. How about instead of the engineering job you hire in as a Test Pilot? We have a couple slots open right now!"

My Dad was excited, but realized that my mother would not have any of that. The man who had originally introduced my parents to each other had become a test pilot for McDonald aircraft and was killed in a crash. There is no way my mother would let my dad take a test pilot job. Interestingly, a while later NACA hired Neil Armstrong for one of these test pilot positions.

The work at NACA was militarily important so my dad was excused from the call up of experienced fighter pilots during the Korean War. Later the fact that he once worked at Langley helped him secure a job in Houston at the Manned Spacecraft Center. As you know Bob Gilruth's Space Task Group that put man in space with project Mercury all came from Langley.

In 1951 my father left Langley and relocated the family to Tullahoma, Tennessee, where the Air Force ran a large wind tunnel facility named Arnold Engineering Development Center. At the end of WW2 the allies had boxed up a German supersonic wind tunnel and shipped it to middle Tennessee where there was a surplus of electric power to run it. Along with the tunnel they relocated dozens of captured German scientists and engineers. The German wind tunnel was obsolete by the time it was running so the Air force built a far more ambitious facility which is still in use. Blowing air through supersonic wind tunnels takes a massive amount of electrical power (One tunnel at Arnold center was driven by a single 300,000 horsepower electric motor.) and the Tennessee Valley Authority (TVA) dams provided the juice. At Tullahoma my







Dad shared an office with a German rocket scientist named Guenther Delmeier, a man who, just a few years earlier, had been bombed while working for Werner Von Braun. So just ten years after he had been flying around Germany looking for things to shoot, he was now sharing an office with one of his former targets!

At Arnold Center my father's last job was to design a very sophisticated space simulation chamber, the Mark 2 Facility. This vacuum chamber was designed to be able to test nuclear powered spacecraft. The Air Force spent many millions of dollars developing the technology, but in the end the chamber was just too expensive to build. The project was top secret, but one day an artist's conception appeared in Aviation Week magazine! Many years later one of the Russian engineers temporarily assigned to Houston for the Apollo Soyuz Test project showed my dad a Russian text book about space simulation. The Russian book included a drawing and description of his old Mark 2 facility, as if it had been built and was currently in use. Apparently the Russians thought it was fully operational.

It was his work on the design of the Mark 2 chamber that positioned him to later be in charge of the Space Environment Simulation Lab here at JSC.

My father was recruited to come to Houston by *Aleck Bond*, and initially he worked under Alec in various capacities. His most important early assignment was to coordinate the design of the Lunar Receiving laboratory. This was a tough job since another major government agency, the United States Geological Survey (USGS) wanted to place the lab in Denver and run it themselves. I recall my mother hosting receptions in our home for Nobel Prize winning scientists and geologists who wanted to handle the Moon rocks. The many distinguished scientists who would be analyzing the Moon rocks argued forever about what facilities they wanted. To expedite things my Dad just decided on the specifications and had the laboratory built as quickly as possible because the feuding scientists could never reach a consensus. My dad wrote an important paper that was published in 1967 in Science magazine about this unique Moon rock lab

At that same time another significant test facility was being built at the Manned

James C. McLane, Jr.
1923-2012

Spacecraft Center – the Space Environment Simulation lab. Building 32 would house a cluster of high tech space simulation chambers. Some were sophisticated enough to conduct long-duration manned tests of complete spacecraft. The largest of the chambers is Chamber A, shaped somewhat like a vertical foot ball it is 90 feet high, 50 feet in diameter and has a single 40 foot diameter round door shaped like a porthole. Manned testing inside the chambers was very risky because if there was an emergency, it would take a very long time to let the air back into the chamber and rescue the astronauts. In reality, the high fidelity manned tests performed inside these chambers duplicated the conditions of outer space and even some of the risk of being there. ■

James C. McLane, Jr. 1923-2012

Address to AIAA Houston Section about the late James C. McLane, Jr., Part 6 of 6

James C. McLane III, from the Presentation of June 13, 2013

The Chamber A Door Disaster

The first time the air was pumped out of Chamber A, its huge 40-foot diameter door bent and buckled off its mountings. The structure had failed due to bad design. Fortunately, the damage was minimized by halting the test before there was a more dramatic collapse of the entire facility. Chamber A was unique and it was needed for testing of the Apollo Command and Service Module. The door was hurriedly repaired and beefed up with extra braces. Finally, the facility was ready for manned tests. By this time my dad was the Chief in charge of the Space Simulation Division, one of the largest parts of the Manned Spacecraft Center.

The repairs to the chamber had cost a lot of money and the failure resulted in lawsuits. The chamber had been built by Chicago Bridge and Iron Company (CB&I) and the design engineering firm was Bechtel. CB&I had just begun to market those now-familiar water tanks shaped like giant golf balls on tees. Bechtel engineers had used a CB&I computer program to analyze stresses on the giant dish door and its frame, and it was those parts that had failed. NASA had overseen all the engineering and approved of the design approach. So exactly who was responsible?

Finally a visiting federal judge came out to my dad's office in Building 32 and convened a sort of portable court. Representatives and lawyers from all parties were present. Evidence and arguments were presented, the portable court rendered a judgment, and the government recovered some of the cost of repairs.

Secret Stuff

One day my dad was called to the Center Director's office for a special meeting. Somebody (I assume it was a government agency, but I never learned.) wanted to test something secret in JSC's giant space simulation Chamber A. Back then, a fair number of NASA employees had security clearances because military rockets had been used for Mercury and Gemini, and the upcoming Space Shuttle was being designed to carry military payloads.

However, no one at NASA Johnson Space Center (JSC), up to and including the Center Director, had a high enough security clearance to even talk to these folks about what they wanted to test in daddy's chamber.

The first order of the day was for my father to have a background check so he could get the required special security clearance to talk to these people. I know this involved interviewing our neighbors since they mentioned it to us.

My father never discussed this project with me except to mention some of the peculiar aspects of the test setup. The chamber was scheduled to be used for a week. While it took dozens of people to

operate the chamber, most of these folks did not need to have security clearances. The chamber windows were blanked shut and the operators of the valves and controls could not see inside.

One day the world's largest airplane, a Lockheed C5A Galaxy flew into Ellington Field. The heavily draped test object was carried by flatbed truck up Highway 3 (Old Galveston Road) and into the back gate at JSC. My dad said that security guards forced the car of one frustrated commuter into the ditch on Highway 3 when the commuter attempted to pass the convoy. After a week of tests, the object was returned to Ellington Field, loaded back on the C5A, and flown away. The top secret exercise was soon forgotten.

Years later my father became interested in the Chinese space program. He communicated with and was close to many Chinese engineers and he visited China five times. Occasionally, a lady would park her car a block away from our house and walk down the street to visit my father. I met her once. Apparently she was from a national agency that accumulated intelligence, and she came to ask my father questions about China. He was always happy to oblige his "secret sister," as he called her. But, he could only provide information on what he saw as a space program tourist, and he had absolutely no inclination to be involved in geopolitics.

In the late 1970's, when I worked for Brown and Root, my group was building an oil tanker dock in Basra Iraq. Every person who returned from Iraq would have to report downtown to a room in the Rice Hotel, where they would be interviewed about what they saw in that rather mysterious country. I guess my dad's visit by his "secret sister" was that sort of thing.

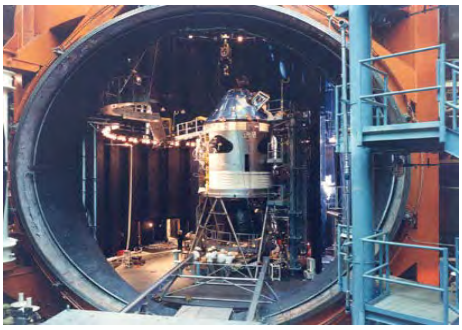
Experts say that the United States of America beat the Soviets to the Moon because we spent five times what they spent on ground testing. There is no doubt that problems discovered during space chamber testing at JSC would have been catastrophic if they had happened during an actual mission.

The importance of such testing has not been lost on current engineers who plan to use Chamber A to test the new James Webb Space Telescope.

I was studying aerospace engineering at college during the 1960's, but I was often home on weekends and in the summer. My father took me to see a lot of the work that went on at JSC. It was a special time and there was tremendous enthusiasm in the air. The Manned Spacecraft Center was at the core of a great human endeavor that everyone understood would be historic. I am very proud that my father played a part in that effort. My dad kept excellent files on his work that I may eventually use as a basis for stories and articles. There are literally a thousand and one stories I could tell about his experiences. I appreciate this group giving me the time to recite a few.

Thank you,
Jim McLane ■

James C. McLane, Jr.
1923-2012



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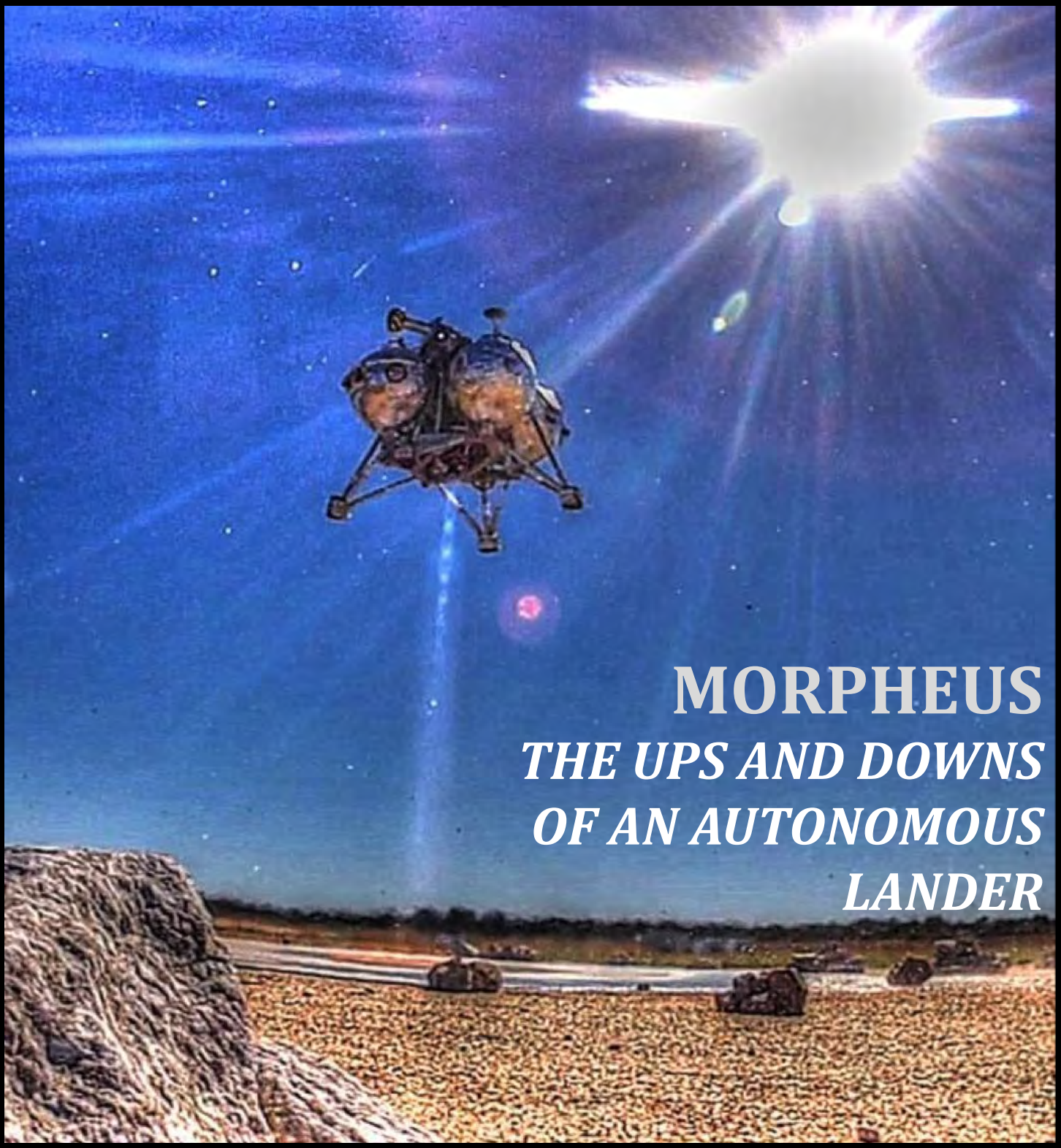

MORPHEUS

THE UPS AND DOWNS OF AN AUTONOMOUS LANDER