

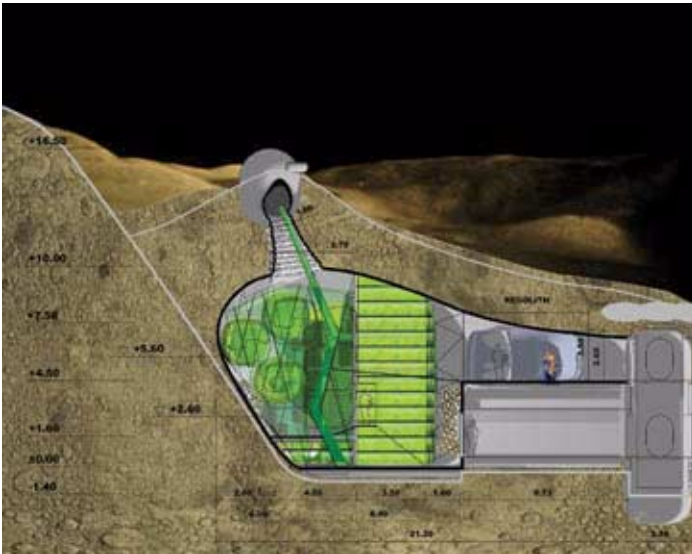
# AIAA SAN FRANCISCO SECTION



## IN4M-LETTER

VOLUME XLV, NUMBER 6  
MAY-JUNE 2004

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS SAN FRANCISCO SECTION  
P.O. BOX 1548, MOUNTAIN VIEW, CA 94042 <http://www.aiaa-sf.org>



**Above:** Conceptual design of subterranean lunar habitat. Source: MoonFront, LLC

**Thursday, May 27, 2004**  
**Ramada Inn, Sunnyvale, CA**

### Lunar Base Architecture

**Susmita Mohanty**  
**MoonFront, LLC**  
**San Francisco, CA**

This talk is inspired by the renewed international interest in returning to the Moon. Japan, Europe, India, China, United States and Russia have all expressed plans to send orbiters and eventually manned missions to the Moon.

The talk will begin with an introduction to the different genres in aerospace architecture – Genre One [Voyagé d'Esprit], Genre Two [Man-in-a-Can] and Genre Three [Trans-Gravity]. The need for and characteristics of these genres will be discussed briefly.

The speaker will then present the highlights of the 'blue-sky phase' of the first International Lunar Base Design Workshop held at ESTEC-European Space Agency in the Netherlands, in the summer of 2002. The objective of this Workshop was to propose new design concepts for human and robotic exploration of the Moon and move beyond the outdated 'man-in-a-can' genre of space architecture. It adopted a multidisciplinary and multicultural approach to design, as compared to the traditional engineering-centric approach. It generated experimental concepts for sustainable, advanced, user-oriented architectures for future lunar

*Lunar Base Architecture, continued on page 2*



**Above:** Challenger accident, January 28, 1986, after launch as seen from 70mm tracking camera near Pad 39B. Leading the plume is one of the solid rocket boosters. Photo credit: NASA Johnson Space Center.

**Tuesday, June 15, 2004**  
**Hiller Aviation Museum, San Carlos, CA**

### Lessons from Challenger

(Editor's note: Mr. Allan McDonald will give his talk as part of the AIAA San Francisco Section banquet at the Hiller Aviation Museum. Banquet details are on page 3.)

#### Abstract

In a time of great successes and failures in space flight, no one takes it for granted. Yet twenty years ago, to underscore the safety and reliability of human space flight, NASA chose Sharon Christa McAuliffe to be the first teacher in space, serving as a payload specialist aboard the space shuttle Challenger. The launch on January 28, 1986, followed a night in which frost gripped the launch pad. Some of the engineers advised against launch, but were overruled. A minute into the flight, their worst fears were realized.

Allan J. McDonald was the Director of the Space Shuttle Solid Rocket Motor Project at the time, and he was in the Launch Control Center at Kennedy Space Center on the day of the Challenger launch.

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*Lunar Base Architecture, continued from page 1*

bases — derived from bold, innovative and unconventional thinking.

**About the speaker**

**Susmita Mohanty** is a woman space entrepreneur who has set out to shape the future of space on her own terms. In 2001, she launched *MoonFront*, an aerospace consulting firm based in San Francisco. In 2003, she co-founded *Liquifer*, an aerospace architecture and design firm based in Vienna, Austria. In 2005, she hopes to launch her next venture, codenamed *Spaceships That Think*, based out of Bangalore, India. With it, she dreams of launching the human space exploration program for India. Prior to taking the entrepreneurial plunge, Ms. Mohanty worked on space habitability projects at NASA's Johnson Space Center and worked in international business development for the space station program at Boeing.



Ms. Mohanty's love affair with human space exploration began early. She sent her first idea to NASA when she was in high school, and has since never looked back. Educated in India and in

Conceptual designs of lunar habitats. **Above left:** surface habitat. **Directly above:** mobile habitat. Source: Moonfront, LLC.

France, she has a Bachelor's in Electrical Engineering from Gujarat University and a Master's in Industrial Design from the National Institute of Design in Ahmedabad, India. She also has a Master's in Space Studies from the International Space University (ISU) in Strasbourg, France. Her work and passion have found her many mentors worldwide. Among them is the legendary science fiction writer Sir Arthur C. Clarke who personally sponsored her education at ISU.

**Short Notes**

- The **San Jose State University student branch** of AIAA began a short, but concentrated series of talks covering a wide range of aerospace topics. The series is aimed at both students and professionals. More info is on-line at <http://www.aiaa-sf.org/educ/sjsu/2004q2-speakers.html>
- As part of the seminar course, **Stanford University AA 294 Case Studies in Aircraft Design** has invited external speakers dealing with the Wright Brothers, the Concorde and the F-117 Stealth Fighter. The seminars are open to the Bay area aerospace community. More info is on-line at <http://www.aiaa-sf.org/educ/stanford/2004q2-AA294.html>
- Two AIAA technical committees, the **Computer Systems Technical Committee (CSTC)** and **Software Systems Technical Committee (SSTC)**, will meet at the NASA Ames Conference Center, Moffett Field, on May 26-28, 2004. The two committees work closely together on a number of topics, and hope to interact with Bay area organizations that have similar interests. More info will be published on-line at <http://www.aiaa-sf.org/tech/tc/cstcsstc.200405.html>
- *AIAA Congressional Visits Day* converged on Capitol Hill, April 19-21, 2004. Among the participants was **Kay Sundaram** of the AIAA San Francisco Section Council. Key issues discussed can be found on-line at <http://www.aiaa.org/about/index.hfm?abo=280>.

**In this issue**

**Lunar Base Architecture** ----- **Page 1**  
 Woman space entrepreneur Susmita Mohanty describes new styles for human habitats on the moon.

**Lessons from Challenger** ----- **Page 1**  
 AIAA Fellow Allan McDonald talks about the attempt to delay the ill-fated launch of Challenger.

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**AIAA SF Banquet Details** ----- **Page 3**

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**NOTE:** this newsletter and many back issues are available in PDF form at: <http://www.aiaa-sf.org/newsletter>

Mr. McDonald will speak on his involvement in attempting to delay the launch of the Challenger and the lessons learned from his experiences with the media, the Presidential Commission and the US Congress investigating the accident.

### About the speaker

**Allan J. McDonald** is newly retired as the Science and Engineering Deputy and Technical Director for Thiokol Propulsion. Mr. McDonald was the Director of the Space Shuttle Solid Rocket Motor Project at the time of the Challenger accident in 1986 and later the Vice President of Engineering for Space Operations during the redesign and requalification of the solid rocket motors in the return to flight program for the US Space Shuttle. He has held various engineering and management assignments during his 42-year career at Thiokol.

Mr. McDonald received a BS degree from Montana State University in Chemical Engineering in 1959, an MS degree in Engineering Administration from the University of Utah in 1967, and an Honorary Doctor of Engineering degree from Montana State University in 1986.



He is a member of several technical and honorary societies and is a 1992 elected Fellow of the American Institute of Aeronautics and Astronautics (AIAA). He is a past-Chairman of the Utah Section of AIAA, the AIAA Solid Rocket Technical Committee, and the AIAA Space Transportation Technical Committee, and is a current member of the International Academy of Astronautics Advanced Propulsion Working Group and the International Astronautics Federation Space Propulsion

Committee and Space Transportation Committees. He has received numerous awards in recognition of his professional activities, most notably, the Utah Engineers Council, Utah Engineer of the Year and the National Association of State Universities and Land Grant Colleges selection for the Distinguished Centennial Alumnus of Montana State University in 1987, the NASA Public Service Medal, NASA Astronauts Silver Snoopy Award, and Design News Special Achievements Awards in 1988, the AIAA Wyld Propulsion Award in 1993, and he was awarded a medal from the Propulsion Commission of the Association of Aeronautics and Astronautics of France in 1996. He is listed in *Who's Who in Science and Engineering* and *Who's Who in the World*. He serves on the College of Engineering Advisory Boards for Utah State University and Montana State University and is a Director of the Rocky Mountain NASA Space Grant Consortium. He is a member of the Board of Directors of Orbital Technologies Corporation in Madison, Wisconsin.

Mr. McDonald has been issued several patents related to solid rocket propulsion and pyrotechnic systems. He has published over 70 technical papers and made many presentations to various technical societies and universities.

He has authored and/or co-authored papers on solid propulsion systems and technology and environmental issues related to rocket launches that have been presented in the United States, Canada, Germany, Sweden, Norway, France, Israel, Japan, and The Netherlands.

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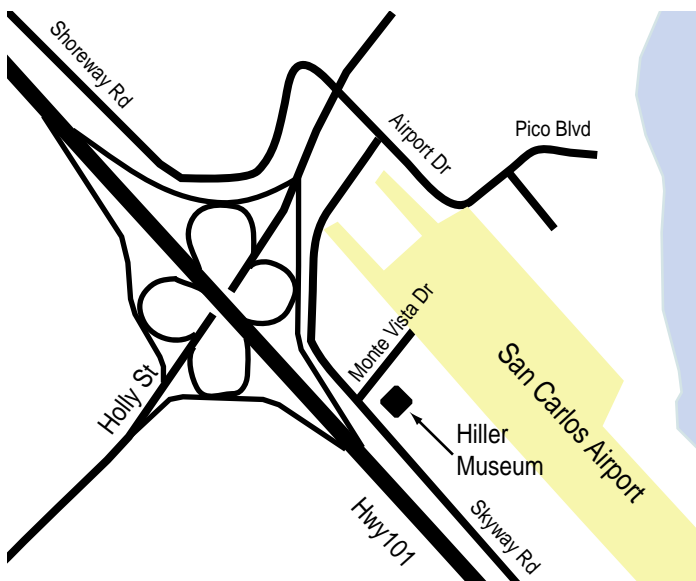
## AIAA SF Banquet Details

The AIAA San Francisco Section will hold a special banquet at the Hiller Aviation Museum, featuring AIAA Fellow Allan J. McDonald, speaking on *Lessons from Challenger*. (See article above.) In addition, the banquet will honor winners of the Galileo Memorial Scholarship, and members with special anniversaries, and mark the installation of new section officers.

### Additional Information and Reservations

- Location: Hiller Aviation Museum, 601 Skyway Road, San Carlos, CA 94070
- Reservations on-line at <http://www.aiaa-sf.org>

For more information on this program, see "Calendar" on page 4, or contact: Prasad Gogineni at [programs@aiaa-sf.org](mailto:programs@aiaa-sf.org).



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The **AIAA SAN FRANCISCO SECTION IN4M-LETTER** is a publication of the San Francisco Section of the American Institute of Aeronautics and Astronautics, a non-profit society whose primary purpose is to advance the arts, sciences, and technology of aeronautics and astronautics and to foster and promote the professionalism of those engaged in these pursuits.

**Section Officers and Council:** A complete directory of the section council can be found at <http://www.aiaa-sf.org>.

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**AIAA SF Communications Committee staff:** Rick Kwan, Corky Lakin.

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# Calendar

## AIAA SF Section Events

- Thursday, May 15, 2004, 6:30-9:00pm: Susmita Monhanty on *Lunar Base Architecture* – Ramada Inn Silicon Valley, 1217 Wildwood Ave, Sunnyvale, CA [Tel: 408-245-5330] Cost: AIAA members and guests - \$20, students - \$15, non-members - \$25. Cash or check only. (Related article on page 1.)
- Tuesday, June 15, 2004, 6:30-9:00pm: Allan J. McDonald on *Lessons from Challenger* and *AIAA SF Section Banquet* – Hiller Aviation Museum, 601 Skyway Road, San Carlos, CA [Tel: 650-654-0200] Cost: AIAA members and guests - \$50, students - \$30, non-members - \$65. Cash or check only. (Related articles on page 1 and page 3.)

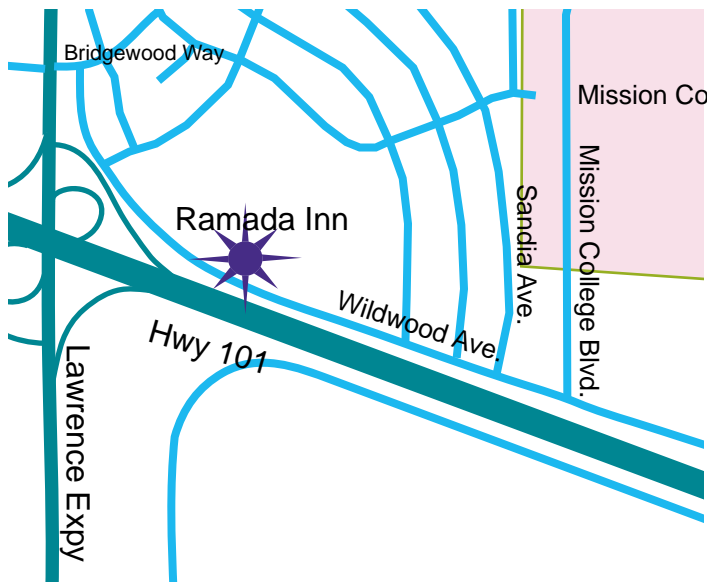
## AIAA National Programs

Below are selected conferences, workshops, and other programs sponsored or organized by AIAA, including upcoming Region VI meetings.

- *22nd AIAA International Communications Satellite Systems Conference & Exhibit 2004 (ICSSC)*, Monterey, CA - May 9-12, 2004.
- *23rd International Conference on Incineration and Thermal Treatment Technologies*, Phoenix, AZ - May 9-14, 2004.
- *24th AIAA Aerodynamic Measurement Technology and Ground Testing Conference; 2nd AIAA Flow Control Conference; 34th AIAA Fluid Dynamics Conference and Exhibit; 35th AIAA*

*Plasmadynamics and Lasers Conference; 37th AIAA Thermophysics Conference*, Portland, OR - Jun. 28-Jul. 1, 2004.

Additional details may be found on the national AIAA website at <http://www.aiaa.org/calendar>.



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San Francisco Section**

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