

September 2005

# The Roadrunner



## Modern Airships & the Evolution of Lighter-than-Air Systems

*Mike Voorhees*

*President and Chief Engineer  
Quantum Aerostatics Inc.*

Quantum Aerostatics Inc. is an Albuquerque based airship design, engineering, and manufacturing company. Quantum Aerostatics' mission is to leverage its designs in geodesic structures, advanced control systems, buoyancy regulation, and modular fabrication technology, as well as a host of state of the art systems and components, to produce modern rigid airships. The geodesic airship, or GeoShip™, will provide reliable, efficient, heavy lift to passenger, cargo, military airlift, and other special use markets. It will feature substantially lower operational costs in terms of Cost per Ton Mile and Cost per Passenger Mile and be produced at a lower per unit cost than competing conventional modes of air transportation, while simultaneously offering unmatched capabilities.

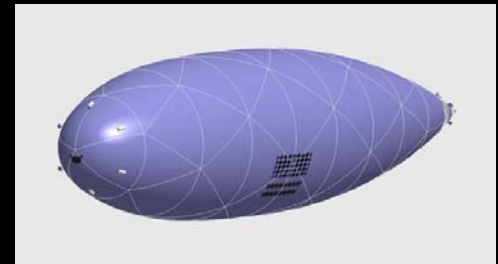
### *Speaker Biography*

A Senior Member of the AIAA, Mr. Voorhees earned a Masters degree in Aerospace Engineering Sciences and a Bachelors degree in Geography from the University of Colorado, Boulder. Early in his career, while at BioServe Space Technologies, a NASA Center of the Commercial Development of Space, he served as principal investigator on seven Space Shuttle microgravity experiments flown on STS-50, 54, 57, 60, & 62. He then worked as Manager of Advanced Programs for EER Systems (acquired by L-3 Communications), Southwest Account

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### *September Program*



Date: Thursday, September 20  
5:30pm to 8:00pm

Location: Twisters  
2912 Juan Tabo NE  
(Juan Tabo and Candelaria)

Cost: cost of meal

Agenda: 5:30 social & dinner  
6:30 speaker

R.S.V.P. by Monday, Sep. 19  
to Bob Uebelacker, 846-6100,  
ruebelacker@comcast.net

### **Special Points of Interest**

From *Columbia* to *Discovery*  
at Los Alamos: page 3



# September 2005

## AIAA Schedule of Events

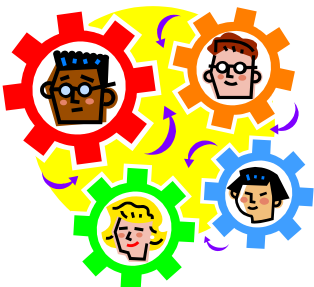
### September 2005

Partnership for Air Transportation Noise and Emissions Reduction (PARTNER): Graduate Research Initiative Report & Under Graduate Research Paper, 25-28 Sep, Arlington, VA

11th Ka and Broadband Communications Conference and 23rd AIAA International Communications Satellite Systems Conference (ICSSC) 2005 (organized by IIC), 25-28 Sep, Rome, Italy

AIAA 5th Aviation, Technology, Integration, and Operations Conference (ATIO) 16th Lighter-Than-Air Systems Technology Conference and Balloon Systems Conference, 26-28 Sep, Arlington, VA

Infotech@Aerospace, 26-29 Sep, Arlington, VA



SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5 Labor Day	6	7	8	9	10
11	12	13	14	15 Officers Meeting	16	17
18	19	20 Section Meeting	21	22	23	24
25	26	27	28	29	30	

## AIAA Schedule of Events for Future Months

### October 2005

International Powered Lift Conference, 3-6 Oct, Grapevine, TX

2005 Joint Conference on Satellite Communications (JC-SAT 2005), 13-14 Oct, Nagoya, Japan

56th International Astronautical Congress, 17-21 Oct, Fukuoka, Japan

AIAA 4th Biennial National Forum on Weapon System Effectiveness, 18-20 Oct, Austin, TX

Digital Avionics Systems Conference, 28 Oct-5 Nov, Arlington, VA

Aircraft Survivability 2005 - Air Vehicle Survivability Against New Global Threats, 31 Oct-3 Nov, Monterey, CA

### November 2005

COBEM 2005 – 18th International Congress on Mechanical Engineering, 6-11 Nov, Ouro Preto, Brazil

CEAS-ASC Conference on Active Control of Aircraft Noise – Concept to Reality, 10-11 Nov, Stockholm, Sweden

### December 2005

U.S. Air Force T&E Days, 6-8 Dec, Nashville, TN

### AIAA Events Schedule

Visit the Bulletin section of Aerospace America or go to the URL below to view upcoming conferences and abstract submittals sponsored by AIAA.

<http://www.aiaa.org/content.cfm?pageid=1>

## From *Columbia* to *Discovery*: Understanding the Impact Threat to the Space Shuttle

Dr. James D. Walker, Staff Scientist, Southwest Research Institute  
Friday, Sep. 23, Los Alamos National Labs, Physics Auditorium



The loss of the space shuttle *Columbia* in 2003 was caused by the impact of foam insulation on the leading edge of the wing. The foam strike created a hole in reinforced carbon-carbon panel 8 that led to excessive heating during re-entry, loss of the integrity of the left wing, and subsequent loss of the vehicle and crew. In the two and a half years following the accident there was a concerted effort to understand the impact threat to the space shuttle system, before the launch of space shuttle *Discovery* on July 26, 2005. The effort was a large one, and was essentially comprised of five integrated parts: 1) identifying the debris that can be shed by the external tank and solid rocket boosters; 2) determining the impact speeds and angles that debris can strike the orbiter; 3) quantifying the amount of damage to the thermal protection system caused by those strikes; 4) estimating the temperature rise in the damaged regions during re-entry; and 5) deciding whether the temperature rise is sufficient to affect structural integrity. The presentation reviews the extensive experimental and modeling efforts related to impact in the return to flight program and includes test and simulation videos. Finally, impact related results from STS-114 are presented: ice formation on the pad during the first launch attempt, the on-orbit inspection, the tile gap fillers, the torn fabric blanket, and the post-flight inspection of the Orbiter upon its safe return August 9, 2005.

### Speaker Biography

Dr. James D. Walker has worked at Southwest Research Institute in San Antonio, Texas, for 17 years. He was educated at the University of Utah and his primary field today is impact physics: he addresses the question of “How do projectiles go through armors?” As part of the *Columbia* investigation, he authored the chapter “Impact Modeling,” contained in Volume 2 of the *Report of the Columbia Accident Investigation Board*.

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### **Modern Airships & the Evolution of Lighter-than-Air Systems**

*(Continued from page 1)*

Executive & Systems Engineer for Analytical Graphics, and served as a consultant to Correa Enterprises (acquired by ASRC) supporting AFOTEC. A commercial balloon pilot and flight instructor, he designed the balloon flight simulator “Hot Air Pilot 2000” which is featured at the Balloon Fiesta’s Balloon Discovery Center.

Mr. Voorhees previously served on the Board of Directors of the Professional

Aerospace Contractors Association, and as Founding President of InfraGard New Mexico, an industry/FBI collaboration to promote security initiatives for the Nation’s critical infrastructure. He is a member of the Lighter-than-Air Society, the Airship Association, the Naval Airship Association, the Association of Balloon and Airship Constructors, the Balloon Federation of America, and the Albuquerque Aerostat Ascension Association.

## Annual Honors & Awards Banquet

This past May was held the Albuquerque Section annual Honors & Awards Banquet. The banquet was well attended with excellent food and service provided by Scalo's restaurant. Several honors and awards were bestowed on Section members and students in our community. Members receiving anniversary membership certificates and pins included Bob Uebelacker (25 yrs), Lester Byington (25 yrs), Michael Dugan (25 yrs), Ken Cole (40 yrs), and Pater Tennan (50



*Banquet Attendees*



*Fred Blottner (right)*

yrs). A Sustained Service Award in recognition of sustained, significant service and contributions to AIAA by members of the institute was presented to Frederick Blottner. Four local school students, Katie Browning, Chris Morrison, Adam Christon, and Jourdan Beaumont were awarded \$200 savings bonds for their outstanding science and engineering project presented at the New Mexico Regional Science Fair this past March. The Section annual scholarship of \$1,500 was awarded to Payman Soltan-Mohammadi a

University of New Mexico Mechanical Engineering student. The banquet was topped off with a presentation by an AIAA Distinguished Lecturer, Thomas Morgenfeld. Tom flight tested the F-117 and YF-22A aircraft, was the chief test pilot on the Joint Strike Fighter (JSF) program, and performed the first flight test on the X-35. During the course of the JSF program Mr. Morgenfeld tested all three versions of the airplane and shared many of his X-35 test experiences with banquet attendees.



*Tom Morgenfeld*

You haven't  
seen a tree  
until you've  
seen its shadow  
from the sky.

—*Amelia Earhart*

### Update Your AIAA Email Address

Still receiving this newsletter via snail mail? We're trying to be as close to "paperless" as possible with the AIAA Albuquerque Section newsletter. In order to help us in that goal, we need you to update your email address with the AIAA.

You can do this online via the address below, or you can call AIAA Customer Service at 1-800-639-2422. To use the online membership information, you will be asked for your last name and AIAA membership number.

<http://www.aiaa.org> and then click on "AIAA Membership".

Please contact your Membership Officer, Basil Hassan, [bhassan@sandia.gov](mailto:bhassan@sandia.gov), 844-4682, with any questions.



## Chairman's Contrail, Bob Uebelacker

Now that summer is almost over, vacations completed, and kids in school it is time to plan for AIAA Albuquerque Section activities covering the next nine months. To help with pulling together a viable activities schedule is a new slate of Officers elected this past May. Several of the Officers have been shuffling from one position to another over the years, but this past election has seen an influx of new blood that should bring some new ideas on how to make our Section even better. We still have two officer vacancies to fill in the areas of education and career enhancement. If you want to make a difference and are interested in any one of those positions let me know and you will be welcomed into the fold.

Our first general membership meeting is scheduled for 20 September with Mike Vorhees, President and Chief Engineer of Quantum Aerostatic to discuss the history and future of dirigibles. Many believe dirigibles are only used to cover sporting events, but there is a renewed interest in dirigibles for communications, national defense, homeland security, etc. Dr. Larry Crumpler is tentatively scheduled for our October meeting to give us a Mars Exploration Rover Update. We are in the process of arranging for two AIAA distinguished lectures for meetings after the New Year. We hope to firm up a general membership meeting schedule ASAP so that you can keep your calendar open for these upcoming events. Come out and see what others are doing in aeronautics and astronautics in and outside of New Mexico.

We look forward to an exciting and successful year as we continue to pursue the purpose of AIAA, espoused for over 70 years: to advance the arts, sciences, and technology of aeronautics and astronautics, and to promote the professionalism of those engaged in these pursuits.



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## Albuquerque Section Membership

Welcome to all of our “new” and “transferred in” members. We are happy that you are with us!

### July New and Transferred In:

Arthur Gianneti	
Mark Kerr	SMPC Architects
Rex Kiziah	Air Force Research Lab
Alan Lowell	Air Force Research Lab
Gyuhae Park	Los Alamos National Lab
Dave Shore	
Sam Yoon	Sandia National Labs

### August New and Transferred In:

Richard Engstrom	Orion Int'l Technologies
Ruth Moser	
Daniel Nebel	General Dynamics
Amol Palekar	University of New Mexico
Michael Cline	
Lewis DeSandre	Air Force Research Lab
Robert Greendyke	Air Force Research Lab
Jill Meyers	Eclipse Aviation

## Senior Member Upgrades

Members are encouraged to apply for Senior Member grade and may do so at any time. Senior Members shall be persons who have demonstrated successful professional practice in the arts, sciences or technology of aeronautics and astronautics for the equivalent of at least eight years. Additional information and nomination form can be found at <http://www.aiaa.org/content.cfm?pageid=183>. Any questions, or need references? Contact Terry Jordan-Culler, [tmjorda@sandia.gov](mailto:tmjorda@sandia.gov), 844-2324 or Basil Hassan, [bhassan@sandia.gov](mailto:bhassan@sandia.gov), 844-4682.

# Your AIAA Officers

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Chairman	Bob Uebelacker Robert.Uebelacker@afotec.af.mil	Air Force Operational Test and Evaluation Center (AFOTEC)	846-6100	846-3427
Vice-Chairman	Yvonne DesLauriers Yvonne.DesLauriers@kirtland.af.mil	HQAF/XOS/NWCA/CT	853-0795	853-0914
Treasurer	Robert Malseed RMalseed@comcast.net	R.A.M. Computer Consulting	265-1842	
Secretary	Terry Caipen tcaipen@ara.com	Applied Research Associates	883-3636	872-0794
Newsletter Editor	Peter Dunn pdunn@ara.com	Applied Research Associates	883-3636	872-0794
Membership	Basil Hassan bhassan@sandia.gov	Sandia National Laboratories	844-4682	
Programs	Larry Grimes lawrence.grimes@kirtland.af.mil	Air Force Research Lab/DETA	846-4828	853-6610
Public Policy	Joe Friel Joseph.Friel@kirtland.af.mil	Air Force Research Lab/DETA		
Young Professionals	Edward Caicedo recaice@sandia.gov	Sandia National Laboratories	844-0387	845-9319
Honors & Awards	Scott Beatty SCOTT.M.BEATTY@saic.com	SAIC		
Career Enhancement	vacant			
Education	vacant			
Precollege Outreach	Christina Doolittle Christina.Doolittle@kirtland.af.mil	Air Force Research Lab/VSES	853-4759	853-4760
Corporate Liaison	Stephen Seiffert seiffert@flash.net	Schafer Corporation	338-2848	242-9975
Student Branch Advisor	Randy Truman truman@unm.edu	University of New Mexico/ME	277-6296	277-1571



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