

Calendar of Events 2000

- o **25-29 May (Memorial Day Weekend) – International Space Development Conference**, details below
- o **3 June – Education Outreach Meeting** at Pima Air & Space Museum, 9 AM to 12 Noon (details on last page)
- o **Date TBA – Tucson Industry Forum**, details TBA
- o **Date TBA – 2000-2001 Kickoff Meeting**, awards ceremony, details TBA

International Space Development Conference

by Tom Jaquish

Apollo 11 Astronaut Buzz Aldrin, second man to walk on the Moon, will welcome all to the 19th Annual International Space Development Conference, with "The Return: Your Space Vision." Hugh Downs, former host of ABC's 20/20 program will give awards. The conference is hosted by the Tucson Space Society, and is being supported by the Tucson and Phoenix AIAA sections. The conference will land in Tucson, May 25 - 29 at the Holiday Inn City Center, at Broadway and Granada, downtown.

Speakers and events will focus on human habitation and development of space including propulsion, launch technologies, orbital transfer, harvesting asteroids and use of other space materials, bio-engineering, solar energy, terra-forming planets, space tourism, medicine, piracy, social, political and economic aspects. A full schedule of child care, family events and bus tours are planned.

One may register for the entire conference or for each day. For information see www.tucson2000.org or call 797-3834 or 622-7856.

Chair's Corner

by Kevin Kremeyer

WOW!!!

The dinner meeting was a smashing success, and already, elections are upon us!

This year-end meeting (centered around Jim Harford's talk) was our most encouraging event to date. It really showed us that some life is being breathed into Tucson's aerospace community, and especially into our local section.

One area of especially strong interest to our aerospace community will be addressed by the business forum we're organizing with several economic development offices in town. Our collective goal is to strengthen the collaborative industrial base here in Tucson, and help make this a more competitive location for aerospace-related work. It's amazing to see the strong emphasis our city government is putting on the invigoration of Tucson's technology base.

The second emphasis of our section is the K-12 outreach and continuing education. We are currently planning collaborations with several organizations to help leverage our investments of time and money to make the strongest impact on developing our children as well as our existing workforce.

We'll have more details on both of these efforts in future newsletters. In the mean time, please come forth, if you or your company has any interest in participating in either of these exciting programs. We're looking for interest and participation not only in collaborations and economic development, but also in developing K-12 classroom projects, or in simply visiting a classroom once a year.

Participation is welcome at any level, and it's your participation that makes this organization healthier, more stable, and so very enriching.

Thank you again for the wonderful turnout at the last meeting, and we're looking forward to seeing even more of you! Keep your eyes on the schedule of upcoming events.

An Evening of Russian Space History

by Jerry Felmley

The dinner meeting on 27 April was great fun for a wide range of Tucson Section AIAA members and their guests. Jim Harford's presentation was a solid history lesson on what-might-have-been vs. what-really-was. All of us who attended were treated to vivid descriptions and photos of, and anecdotes about, numerous Russian space program participants -- from design bureau engineers to Politburo budgeteers.



Jim Harford (left) and Kevin Kremeyer

We heard again of numerous Russian "firsts" across a wide spectrum of space activity that preceded NASA's accomplishments. We "met" Sergei Korolev's comrades who achieved so much with sparse government support and funding and we learned details of austere command module design that were scary just in the listening. The desire to learn more after Jim's presentation resulted in sales of 13 copies of his biography of Korolev...even the author had a good evening!

Three AIAA members who are old friends and former co-workers of Jim Harford showed up to add a little "once-upon-a-time" flavor to the evening.

There is absolutely no doubt the 50 members, guests and Student Branch members who attended our 27 April Meeting had a thoroughly enjoyable evening. We hope YOU and YOUR guests will be at our next event...

Design/Build/Fly Competition

by Frank Manning

It's easy to design a flying machine that looks good on paper.

It's not quite so easy to physically implement a design and demonstrate that it works. That's the value of an activity like the AIAA Student Design/Build/Fly (DBF) Competition, in my humble opinion (see article at right).

Traditionally, college students in engineering get plenty of experience in two activities -- (1) listening to professors lecture in front of classrooms, and (2) solving problems with pencil and paper.

The DBF contest makes things a bit more interesting. As the name implies, paper design is still important, but it's not enough. As Dwight Eisenhower once said, "farming looks mighty easy when your plow is a pencil and you're a thousand miles from the cornfield."

Prior to the inaugural DBF contest in 1997, UA students participated from time to time in an earlier cargo lifting competition involving air vehicles powered by piston engines.

I think the DBF's key innovation -- to AIAA's credit -- has been the use of electric motors instead of piston engines. Granted, compared to typical fuels like gasoline or methanol, batteries have the well-known problem of low specific energy (*energy* divided by mass).

But it's also true that batteries have more than enough specific power (*power* divided by mass) to power an air vehicle, the benefit being that electric systems tend to be easier to manage and have a better fit with academic lab environments. For example, it's easy to test motors indoors without requiring special ventilation for exhaust products.

Not that electric power is without challenges when you're stressing components to their limits. The UA student team found that out the hard way the week before the contest -- they accidentally vented a battery, and later burned out an expensive brushless motor controller. And the MIT team managed to go through not one but *five* controllers, according to Matt Angiulo, our Student Branch President.

Fortunately, the UA team had spare cells and was able to borrow a controller from Robert Wagoner, our webmaster, who cannibalized a controller from one of his own airplanes. Robert also generously supported the team with substantial discounts on hardware. The team was at least able to make takeoff attempts at the contest, although they didn't make qualifying flights.

All in all, I think the DBF contest is a good experience for students, and one I hope the Section will continue to support. Certainly fundraising for next year's contest has started off with a bang. As of T minus 12 months, the Section has raised \$2000 from an anonymous donor. Last year the Section hadn't reached the \$2K point until T minus 5 months.

Competition web site:

<http://amber.aae.uiuc.edu/~aiaadb/>

Tucson Section Officer Roster 1999-2000

Chair: Kevin Kremeyer
Secretary/Treasurer: Kelly Sinnock
Membership: Rina Shivashankara
Webmaster: Robert Wagoner
UA Faculty Advisor: Larry Scott
Education Chair: Rajka Corder
Military Liaison: Ed Palanek
Newsletter Editor: Frank Manning
Support Staff: Jason Blauert

Web site: <http://www.aiaa.org/sections/ts/>

Aircat2000 Project

by Matthew Angiulo

Now that the 1999/2000 AIAA Student Design/Build/Fly competition is completed, the student group is taking some well deserved time off. Until the 2001 competition rules are posted in about a little over a month, it seems most of our members are struggling to find what they used to do with free time. After dedicating so much time and effort into the Aircat2000 project, it's difficult to move on. Nonetheless, we are very excited to start work on next year's competition.



Pre-contest flight test in Tucson

This coming year, we are going to make an effort to get more students involved with our project. Currently, we appeal to a small group of about ten to fourteen Aerospace Engineering students. Ultimately, I hope to see the organization grow in membership with engineering students from various departments and disciplines.



At the contest in Wichita

Left to right - Geoff Hill, James Harader,
Matthew Angiulo, Patrick Haley

With the experiences and lessons learned over this past year, I expect the new plane to show a great improvement over Aircat2000. We are very excited to get started, and we appreciate your continued support. Thank you very much.

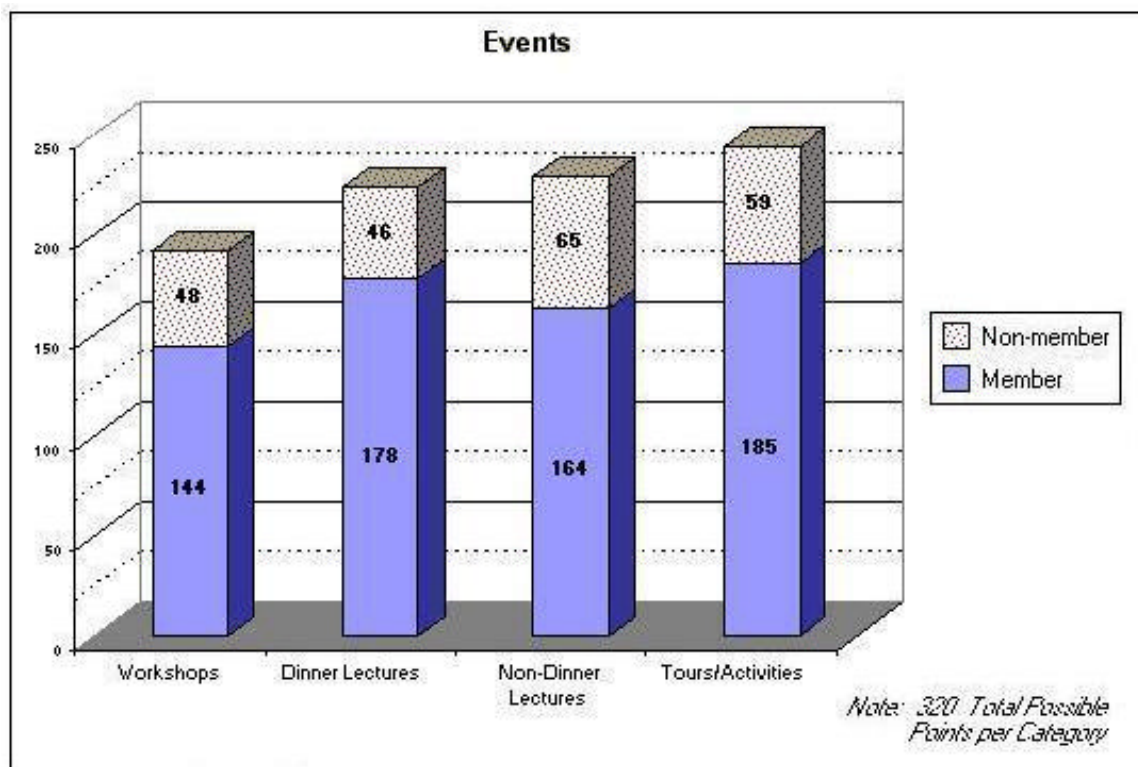
Survey Results

by Kelly Sinnock

Here are the statistics I'm sure you all have been waiting for: the results from the interest survey we sent out in your November 1999 newsletter. Out of nearly 200 surveys mailed to members, 49 surveys were returned. In addition, we received 15 surveys from non-members who attended some of our recent events. After compiling the results, we've tried to gear things toward your interests. Following is a synopsis of the top winners of each category based on member responses. (In addition, one plot has been included to satisfy your analytical cravings.)

Top Results of Ranked Categories (Members Only)

Events:	Tours/Activities and Dinner Meetings
Topics:	Space and Aerodynamics
Tours:	AMARC (boneyard)
Activities:	Flying



In addition to the ranked categories, we also received some write-in suggestions that will be used for near-future activities:

Sample of write-in Suggestions

Events: - Working with kids & schools - Group travel to airshows & AIAA meetings
 - Technical Training - Co-meetings with other societies
 - Design Projects - Plane Restoration

Topics: - Tech Management - Guidance, Navigation & Control
 - JPL/NASA activities - Space Biology
 - Missiles - Avionics
 - Aero History - Flight simulation
 - Wind tunnel testing - Strategy & tactics in recent conflicts
 - Manned Space Mission Planning - Aviation & Pilots

Tours: - U of A labs - R/C fields
 - ATC at DMAFB - Tower at Tucson International Airport
 - Ft. Huachuca - Raytheon
 - JPL & NASA & Edwards AFB - Evergreen or Bombardier facilities

Activities: - Joint meetings w/Phoenix Section - Engineering student support/recognition

Thank you to everyone who returned his or her survey! We will try and gear future activities toward what you voted on or suggested. If you have any other suggestions or comments, please feel free to email us at tucson_aiaa@yahoo.com or call Kevin at 882-7349.

Educational Outreach

by Rajka Corder

On June 3rd, we'll be meeting with the Pima Air and Space Museum (PASM) to delineate our joint approach to K-12 outreach. Anyone interested in listening or participating is welcome to attend. Any ideas for little demonstration kits will be extremely welcome. These kits will either travel to schools, or reside permanently at the Museum. We are looking for something that lasts about 8 minutes and demonstrates some scientific phenomenon.

Despite our obvious aerospace tendencies, demonstrations of anything related to science, math, or engineering will serve this program well. The meeting will be held at the Pima Air and Space Museum on Saturday, June 3rd from 9AM until noon (they'll direct you at the front desk).

We may also be appending a short meeting at the end for continuing education and technical workforce development. Again, everyone is welcome to join, and if you'd like to make some suggestions via email, please send your comments to tucson_aiaa@yahoo.com.

National Position in Student Programs

by Kevin Kremeyer

The AIAA National Headquarters are looking for a full-time staff member to coordinate their student programs. Recent involvement in an AIAA student section is required, as well as a degree in aerospace or aeronautical engineering.

Immediate relocation to Virginia will be necessary, and the position will involve a great deal of travel. Interested parties should be referred to Karen Thomas at karent@aiaa.org or (703)264-7520.



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