

4 Outreach and Interaction

4.1 Technical Outreach

Meetings with the Rocket Industry

A number of critical interactions have continued during the sixth year of the CSAR program. Most significant among industrial/government laboratory meetings in the past year was our participation in the AIAA/ASME/SAE/ASEE Joint Propulsion Conference in Huntsville, Alabama. This followed equally successful programs in Indianapolis (2002), Salt Lake City (2001) and Huntsville, Alabama (2000).

Our relationship with NASA, the Air Force, and the rocket industry continues to grow. Based on our Space Act Agreement with NASA (the NASA equivalent of a DOE CRADA), we have been able to acquire several new solid rocket motor designs to use as validation tests for GENx. The SAA enables CSAR to receive sensitive, unclassified data from NASA, and other government agencies and their industrial contractors, that can be used for validation of our simulations. The SAA will be renewed in May 2004.

NASA and Thiokol teamed to provide the Center with the *Design Data Book for Space Shuttle Reusable Solid Rocket Motor*. The document contains a detailed description and discussion of the components that comprise the reusable solid rocket motor.

External Advisory Board

The fifth annual meeting of the CSAR External Advisory Board (EAB) was held 9 October 2002. The EAB membership is drawn from the DOE DP laboratories and academia, as well as from the commercial rocket industry, the high-performance computer industry, and other relevant companies. The Board reviewed research studies, was invited to make research recommendations, and continues to provide expertise for translating research findings into practice. The purpose of the EAB is several-fold: assure that the CSAR research program remains aggressive and forward-thinking; gain commercial rocket industry perspective; accelerate high-level technical exchange; catalyze long-term visits; and explore other funding opportunities. Current members of the Board include:

EAB Member	Organization	Title
David H. Bailey	Lawrence Berkeley National Laboratory	Chief Technologist, NERSC Division
Andy Baldi	Lockheed-Martin Missiles & Space	Director, FBM Propulsion and Controls
Felix F. Chen	Aerojet	Technical Principal, Engineering
Fred Culick	Caltech	Professor of Mechanical Engineering and Jet Propulsion
Gary Flandro	University of Tennessee Space Institute	Boling Chair Professor of Advanced Propulsion
Robert L. Glick		Consultant
Robert Keenan	Aerojet	Program Manager, Advanced Programs
Fred S. Blomshield	Naval Air Warfare Center, China Lake	Head, Propulsion Research Branch
I. Lee Davis	Thiokol Corporation	Senior Research Scientist
Robert Garcia	NASA Marshall Space Center	Group Lead, Applied Fluid Dynamics Analysis

Robert L. Geisler	Geisler Enterprises	Senior Rocket Scientist Consultant
Kent Hennessey	Atlantic Research Corporation	Manager, Thermal Design
Grant B. Hodson	Alliant Techsystems	Technical Manager, Air Force Projects
Taras Jarymowycz	Lockheed-Martin Missiles & Space	
David Kassoy	University of Colorado	Associate Vice President for Technology
Suresh Kulkarni	Thiokol Corporation	Vice President, Systems Engineering
David Mann	Army Research Office	Associate Director, Mechanics and Environmental Sciences Division
Paul Nielan	Sandia National Laboratory	Manager, Distributed Systems Research Department
Gregory A. Ruderman	Air Force Research Laboratory	Mechanical Engineer
John F. Sparks	Atlantic Research Corporation	Director of Engineering Research

Technical Conferences

The Center provides travel funds to investigators to participate in conferences in core areas to enhance their technical expertise and to build global awareness of the ASCI/ASAP simulation program. Especially important to the technical community has been CSAR's annual participation in the AIAA/ASME/SAE/ASEE Joint Propulsion Conferences (JPC) from 2000 to 2003.

4.2 NNSA/ASCI Interaction

Center personnel have traveled extensively and were involved in a large number of technical and informational meetings. These included meetings intended to explore rocket science and technology, identify technical collaborators, describe the ASCI/ASAP program, and establish relationships among Center investigators, DOE lab scientists, and industry leaders. Individual CSAR senior investigators and technical staff have traveled to DOE/NNSA DP labs to serve on ASCI/ASAP panels, to participate in ASAP-wide workshops (materials and computational environment), to offer research seminars and technical interaction, to receive training on the ACSI computational resources, and to discuss ASCI resource issues with the CRT. A special feature of 2002 was a visit by ten CSAR senior investigators to Lawrence Livermore and Sandia-Livermore to hold the Annual TST Meeting off site. In mid-February 2003, a group of nearly twenty CSAR faculty members, staff and students visited LANL and Sandia-Albuquerque to discuss research results in technical presentation and poster session formats.

4.3 CSAR Students and Staff Hired by DOE/NNSA DP Labs

CSAR has been very successful in encouraging student-lab interactions. Leading opportunities for UIUC graduate and undergraduate student interactions with the NNSA/DP laboratories include:

- Summer student interns at DOE Labs
- Joint research
- Undergrads hired in CSAR labs performing collaborative research with NNSA/DP scientists

Former CSAR/CSE Students Now at DOE/NNSA Labs

- Zhiqun Deng, PNNL (PhD, Theoretical and Applied Mechanics, 2003)
- Nathan Crane, SNL (PhD, Civil Engineering, 2002)
- Ali Pinar, LBNL (PhD, Computer Science, 2002)

- Thomas Hafenrichter, SNL (MS, Mechanical Engineering, 2002)
- Michelle Duesterhaus, SNL (MS, Mechanical and Industrial Engineering, 2001)
- Eric Draeger, LLNL (PhD, Physics, 2001)
- Jason Hales, SNL (PhD, Civil and Environmental Engineering, 2001)
- Jack Yoh, LLNL (PhD, Theoretical and Applied Mechanics, 2001)
- Benjamin T. Chorpene, SNL-L (PhD, Mechanical Engineering, 2000)
- Burkhard Militzer, LLNL (PhD, Physics, 2000)
- Christopher D. Tomkins, LANL (PhD, Theoretical and Applied Mechanics, 2000)
- Jeff J. Murphy, SNL-L (PhD, Mechanical Engineering, 1999)
- Jin Yao, LLNL (PhD, Theoretical and Applied Mechanics, 1999)
- Donald Siegel, SNL (PhD, Physics, 1999)
- Steven F. Wojtkiewicz, SNL (PhD, Aero and Astro Engineering, 1999)
- Boyana Norris, ANL (PhD, Computer Science, 1999)
- Jeffrey C. Grossman, LLNL (PhD, Physics, 1998)
- Arne Gullerud, SNL (PhD, Civil Engineering, 1998)
- Michael Ham, LANL (MS, Computer Science, 1998)

Former CSAR Employees Now at DP Labs

- Jeffrey Vetter, LLNL
- James Quirk, LANL
- Dennis Parsons, LLNL