SPARTAN First Stage Rocket Motor Successfully Demilitarized

by Ms. Joan Gustafson, Anniston Defense Munitions Center, Alabama

After nearly four years of intensive planning and pre-testing, risk assessment and establishment of Standard Operating Procedures (SOPs), the disposal process for the first of the twenty-two (22) SPARTAN First Stage rocket motors was accomplished June 8, 2007, at the Anniston Defense Munitions Center (ADMC), Anniston, Alabama. A team of personnel from the Propulsion and Structures Directorate of the Aviation and Missile Research, Development, and Engineering Center (AMRDEC) at Redstone Arsenal were instrumental in performing analysis, and developing risk mitigation technology to facilitate disposal.

The SPARTAN rocket motors, which have been in storage for over 30 years (Fig. 1), were originally part of the SAFE-GUARD Anti-Ballistic Missile system that was decommissioned in 1973. Each motor weighs approximately 12,000 pounds and is stored in a container assembly designed for transportation. In the summer and fall of 2004, the AMRDEC team

Welcome back, NASA Endeavour!

NASA Administrator Michael Griffin, center, and other NASA managers give a thumbs up to the crew of the space shuttle Endeavour shortly after touchdown on Tuesday, Aug. 21, 2007, at the Kennedy Space Center.
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**TECHNICAL INQUIRIES**
- OSHA Permissible exposure limits (PELs) for HF, HNO3, 100% H2O2, Hydrazine, UDMH and MMH. (Req. 25379)
- Information on RP-2 kerosene, replacement for RP-1 (Req. 25383).
- Review of thermobaric munitions, enhanced blast, metal augmented charges and oxidation of metal powders (Req. 25276).
- Humidity effects on HTPB composite propellants (Req. 25310).

**BIBLIOGRAPHIC INQUIRIES**
- Bonding agents for composite propellants (Req. 25315).
- Seminal papers on recession/regression rates of gun propellants (Req. 25515).

**CPIAC PUBLICATIONS INQUIRIES**

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**Recent CPIAC Products and Publications**

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The Bulletin Board

Various meetings and events of interest are listed below. We welcome all such announcements so that the propulsion community can be better served with timely information. For information on additional industry meetings, visit CPIAC’s calendar of Meetings & Symposia, available at http://www.cpia.jhu.edu/templates/cpiacTemplate/meetings/. The JANNAF Meeting Calendar appears on the back page.

4th EFEE (European Federation of Explosives Engineers)  
9-11 September 2007  
Vienna, Austria  
POC: http://members.efee-web.eu

International Symposium on Special Problems in Chemical Propulsion  
17-21 September 2007  
Kyoto, Japan  
POC: www.7-isicp.jp

SPACE 2007 Conference & Exposition  
18-20 September 2007  
Long Beach, CA  
POC: www.aiaa.org/Space2007

High Energy Materials, Performances and Civil Applications (AAAF)  
(The official language for the symposium will be English.)  
1-3 October 2007  
Arcachon, France  
POC: m.aude@club-internet.fr

Spacecraft Design and System Engineering (UCLA Short Course no. Eng. 839.83)  
10-12 October 2007  
Los Angeles, CA  
POC: Ph. 310-825-3344 or Web: uclaextension.edu/shortcourses

NDIA Insensitive Munitions/Energetic Materials Technology  
15-18 October 2007  
Miami, FL  
POC: www.ndia.org

5th AIAA Biennial National Forum on Weapon System Effectiveness  
16-18 October 2007  
Huntsville, AL  
POC: www.aiaa.org/events/wse

Introduction to the Technology of Explosives  
22-26 October 2007  
Carmel, CA  
POC: Ph. 410-532-3260 or e-mail compmechanics@verizon.net

7th International Autumn Seminar on Propellants, Explosives and Pyrotechnics  
23-26 October 2007  
Xi’an, China  
POC: www.iaspep.com.cn

45th SAFE Association Symposium  
29-31 October 2007  
Reno, NV  
POC: www.safeassociation.com
performed a safety and condition assessment of the stored assets and identified elements that indicated motor deterioration and the need for destruction. This finding presented certain technical risks that required mitigation in order for the motors to be demilitarized in a safe and environmentally sound manner.

Working in concert with the ADMC Commander, LTC Garry W. McClendon, and the AMCOM G-3 Office, represented by Mr. Larry Gunter, the AMRDEC undertook the tasks that would eventually lead to this successful disposal effort. It was determined, however, that an even larger number of personnel from ADMC, specializing in logistics, transportation, safety, ammunition surveillance, and explosive ordnance disposal would be necessary to bring the project to fruition. Dr. Robert Little, Chief of the Missile Sustainment Function in Propulsion and Structures Directorate, stressed the importance of contributions made by the Redstone subject matter experts: “Early on, there was a lot of misinformation regarding the SPARTAN motors being circulated amongst the technical community. So much so, that our team had to perform the safety and condition assessment just to demonstrate that some of the perceived risks did not exist. Because the Army

Figure 2. AMRDEC Team Lead Jeff Lee (left) inspects final seal placement as Team Member Mike McDonald initiates the water fill operation in preparation of the SPARTAN rocket motor’s transport to the disposal pit.

missile Command was the original sponsoring agency, the team had access to engineering drawings, records, reports, and configuration data which could be used to evaluate safety for handling and transportation, and for the development of an appropriate means for demilitarization.”

Because the rocket motor propellant grains were deteriorating, there was concern that the motor could initiate and react violently if transported. Therefore, the AMRDEC team designed, fabricated, and installed an Aft Closure Seal (ACS) assembly (Fig. 2), which allowed the motor bore cavity to be filled with water. This desensitization process helped to prevent sources of ignition due to friction or electrostatic discharge. On the morning of the event, the desensitization team double-checked the aft closure seal and the retainer assembly that had been installed the day before, and began to fill the motor with water. The weight of the motor and container after the water fill measured 20,000 pounds.

Next, the AMRDEC team sealed the container and moved the motor onto the apron of the storage magazine for transport, using a group of specially designed omni-roller assemblies. According to Mr. Steve Caudill, Propulsion and Structures Directorate, “the demilitarization of this obsolete rocket motor would require an exceptional level of dedication and support by everyone involved. The camaraderie enjoyed by what became known as ‘TEAM SPARTAN’ at Anniston Defense Munitions Center, Anniston Army Depot and the AMRDEC, Redstone Arsenal, was essential in order for this momentous event to take place.”

The ADMC transportation team was charged with moving the SPARTAN motor from the magazine apron with a 30K forklift onto the configured transport vehicle trailer. The transport vehicle then carried the motor to the disposal area (Fig. 3), traveling at speeds between three and ten miles per hour, with an escort provided by AMRDEC. The vehicle was tracked via computer throughout the transport operation by a Global Positioning System (GPS). During this phase of the effort, personnel from the ADMC Command and Control Center, Anniston Army Depot (ANAD) Emergency Services, and the Meteorological support team were in constant radio contact to ensure a successful move. As one precautionary measure, LTC McClendon had con-
ceived and implemented radio communications codes, with emergency code words correlated to specific checkpoints and mission areas along the route, so that each team and its members knew their mission and had practiced emergency actions in the case of any unplanned event.

Upon arrival at the disposal site, the demilitarization pit team unloaded the motor from the transport vehicle and placed it into a specially constructed berm. This motor disposal was performed by using flexible linear shaped charges placed onto the motor case in order to cut a large opening, then subjecting the propellant grain to a controlled burn at ambient pressure, so that all of the energetic material could be consumed without build up of thrust. AMRDEC personnel supported container opening at the pit so that the ADMC explosive ordnance disposal team could place the shaped charges for disposal. The charges were connected to a remote firing system, which was monitored by a closed circuit camera in a reinforced bunker approximately 400 yards from the disposal site. After the last safety and weather checks were made, the demilitarization team moved to the bunker to begin the initiation phase.

The firing sequence was initiated at 10:37 hours, and the resulting fire and controlled burn lasted a total of approximately 8 minutes (Fig. 4). The most spectacular portion of this event took place during the combustion of the solid propellant grain, which weighed approximately 9,928 pounds and took about 30 seconds to be consumed in entirety. During this time, a large plume of smoke was produced, and the sound was significant enough as to be “felt” by a host of VIPs who had traveled to Anniston to witness the event from a safely stationed viewing center nearly one mile away.

Because of the intensity of the fire – reaching temperatures between 3,500-5,000°F – no one could enter the disposal area until mid-morning on Saturday, June 9th. At that time, the re-entry team determined that all of the propellant in the motor had been completely demilitarized and the casing was almost totally destroyed by the intense heat. What remained of the debris still possessed enough integrity to be handled for proper disposal (Fig. 5).
Upon completion of the successful disposal of the first SPARTAN rocket motor, all of the team members reassembled for a post brief by LTC McClendon, who extended his thanks and appreciation to everyone for their contributions to the safe event, a job that he stated was exceedingly well done. LTC McClendon added that this mission could not have been accomplished without external support. He then recognized the AMRDEC team as well as Sandia National Laboratories for weather forecasting, Lawrence Livermore National laboratories for plume analysis and the Defense Ammunition Center (DAC) for technical and video graphic support. The outstanding support received from ADMC was recognized by all team members, but the dedication of the demolition crew was said to be especially noteworthy.

Mike McDonald, one member of the AMRDEC team, expressed his excitement about the experience when he quipped, “I have never been so happy to see all my hard work go up in smoke!” Jeff Lee, the team lead at AMRDEC for the Tier II demilitarization program, was much more reserved. “Despite the fact that this event represents a culminating milestone, it is clear we have much work left to do. There are twenty-one of the motors which remain in storage at Anniston, and another twenty-four in storage at Red River Army Depot, Texarkana, Texas. In the near future, the AMRDEC team will travel to RRAD on a fact-finding mission in order to start the process there, as well.”

Editor’s Note: As of August 11, 2007, a total of 17 units have been successfully demilitarized. During the month of June, the AMRDEC team performed two operations per week; during July, they were able to process up to three units per week. The five motors which remain are those that were not stored in containers. In order to process these remaining units, the SOP will first need to be updated to reflect an additional crane lifting operation in which the motors will be placed into refurbished containers for transport. The target date for the demilitarization of all 22 SPARTAN rocket motors is August 30, 2007.

This article has been approved in its entirety for public release and unlimited distribution.

Get Published in the CPIAC Bulletin

Do you have a propulsion-related article that you would like to submit for publication in the Bulletin? The Bulletin staff welcomes suggestions that may be of interest to our readers in the propulsion community. Guidelines for submitting a technical article are available at http://www.cpia.jhu.edu/media/TechArticle_Guidelines.pdf. For more information, contact Rosemary Dodds, Editor, at 410-992-1905, ext. 219 or by e-mail to rdodds@cpiac.jhu.edu.
July Interruption in the JANNAF Web site

For a period of approximately one week in mid-July, the JANNAF Web site was out of operation. This network disruption was the result of miscommunication and resulting contractual issues between CPIAC, the hosting company for the JANNAF.org domain name, and the company that held administrative control over the JANNAF.org domain name. The outage was due to a very complex set of circumstances. At no time whatsoever did JANNAF lose the JANNAF.org domain name. Please be assured that all of us at CPIAC were well aware of the outage and that restoration of service was indeed the IT Department’s top priority. The JANNAF Web site was fully operational the evening of July 20. Throughout the duration of the outage, CPIAC implemented alternative means of supplying and providing access to JANNAF-related information and resources. We appreciate your understanding concerning this matter.

The JANNAF Journal of Propulsion and Energetics provides a forum for the propulsion community to recognize scientists and engineers conducting significant work through refereed review of limited-distribution and export-controlled manuscripts. Don’t miss this opportunity to have your achievements published and archived in The JANNAF Journal.

For preparation and submission instructions, visit the JANNAF Web site at: http://www.jannaf.org/pdfs/Author_Guide.pdf.

Authors may request a preliminary review of their manuscripts by contacting Editor-in-Chief Bill Hufferd at hufferd@jhu.edu or Assistant Editor-in-Chief Ron Fry at rs_fry@jhu.edu.

For additional information, contact Managing Editor Rosemary Dodds at rdodds@jhu.edu.

All of us at CPIAC extend our condolences to the families, friends, and co-workers of those who died and were injured in the tragic accident at Scaled Composites.
The JANNAF 34th Propellant and Explosives Development and Characterization Subcommittee (PEDCS) and 23rd Safety and Environmental Protection Subcommittee (SEPS) joint meeting was held at the Circus Circus Hotel and Air National Guard 152nd Airlift Wing in Reno, Nevada, with attendance of 151. A total of 65 papers were presented in 15 technical sessions. PEDCS also presented a classified specialist session on improvised explosive devices (IEDs), which included seven technical presentations. SEPS also presented a specialist session on lessons learned in the hazards community, which included two technical presentations.

The PEDCS program consisted of 11 regular paper sessions, one specialist session, and seven subcommittee panel meetings. The papers that were presented covered topics associated with the areas of new propellant and explosive ingredients and formulations, propellants for guns and gas generators, reactivity and compatibility of liquid propellants, and propellant processing. The improvised explosive devices specialist session featured presentations from the Joint Improvised Explosive Device Defeat Organization (JIEDDO) and the Army Research, Development and Engineering Center. Topics included the importance of planning and intelligence; technology for safe detection, neutralization and destruction of IEDs; and lessons learned from past IED incidents.

The SEPS program consisted of two regular paper sessions in which 15 technical papers were presented, one specialist session, and three panel meetings. Topics of these sessions included demilitarization, reclamation and reuse of energetic materials and munitions, occupational health, and toxicology. The specialist session on lessons learned in the hazards community featured presentations by contractor organizations on risk analysis of a reusable launch vehicle and hazard analysis of a space shuttle thermal protection system.

In addition to the above sessions, two joint PEDCS/SEPS sessions were conducted. The first of these was a keynote address, “Meeting DoD’s Emerging Contaminant Challenges,” by Ms. Shannon E. Cunniff, who is Director, Emerging Contaminants, Office of the Deputy Undersecretary of Defense for Installations and Environment. Ms. Cunniff discussed the work of the Materials of Emerging Regulatory Interest Team (MERIT), the process by which an emerging contaminant is identified and methods for dealing with it are developed, assessment of the impact of future restrictions on the use of a material, some examples of emerging contaminant monitoring, the importance of determining the true origins of an environmental contaminant, and the role of environmental management in assuring sustainability. Two other joint sessions, in which six technical papers were presented, addressed the topics of low-level detection of energetic materials, “green” energetic materials, and protection from adverse environmental effects of energetics.

continued on page 9
Panel meetings covered discussion of a great variety of possible topics for future workshops and specialist sessions. Topics included test methods for propellant surveillance and aging, variability in HTPB properties (including stability), propellants for space exploration vehicles, high-temperature properties of energetics as related to conditions of storage and usage in Iraq, effects of combining humidity and temperature aging, emerging environmental/safety/health (ESH) concerns regarding nanomaterials, design of “green” energetic materials, tutorial sessions for personnel new to the propulsion community, foreign developments in the field of energetics, DOE energetic material databases, standardization of liquid propellant test methods, reactive materials’ state of the art, and propulsion implications of space commercialization.

Other concerns and interests expressed during panel meetings included how to improve communication of ESH regulatory changes to the propulsion community, how to prioritize ESH concerns, how to promote the use of recycled energetic materials, development of an online spectroscopic database of energetics, getting the electronic version of CPIA Publication 394 online in order to facilitate updates, how to improve the manner in which liquid propellant compatibility data are presented and utilized, how to increase participation of explosives R&D personnel at JANNAF meetings, and the possibility of round-robin testing to better understand variability of HTPB and HTPE propellants. At least some of these are, or will ultimately become, panel tasks.

The unclassified proceedings of the PEDCS/SEPS meeting will be published as a CD-ROM. For ordering information, contact CPIAC Customer Service at 410-992-7305, ext. 212.

2nd JANNAF Workshop on Pulse Detonation Combustion for Propulsion

by Mr. Joseph Doychak, Office of Naval Research

The JANNAF Airbreathing Propulsion Subcommittee sponsored the 2nd Workshop on Pulse Detonation Combustion for Propulsion on 16 August 2007 in Reno, NV. The workshop was cohosted by the Air National Guard 152nd Airlift Wing in conjunction with the 34th Propellant and Explosives Development and Characterization Subcommittee (PEDCS)/23rd Safety and Environmental Protection Subcommittee (SEPS) Joint Meeting. In June 2005, the Pulse Detonation Combustion Working Group (PDC WG) held their first workshop. Since then, the PDC WG delivered a white paper describing consensus performance benefits, a technology development plan from a propulsion perspective and an implementation and management plan to support the technology development. The objectives of the 2nd workshop were to provide details of the performance analysis and to update the PDC WG on the status of plans to further develop and assess the technology as described in the white paper.

Attendees at the workshop were Industry and Government members of the PDC WG as well as participants from the 34th PEDCS/23rd SEPS Joint Meeting. The primary technical focus of the workshop was on performance and systems analysis. Navy, Air Force and NASA representatives presented details of their respective consensus performance benefits analyses. Industry PDC WG representatives who participated in the exercise also provided details of their analyses to a Government-only audience. Finally, this 2nd workshop afforded an opportunity to showcase results of earlier systems analyses.

In addition to the technical presentations, discussions were held providing a status of the PDC WG’s progress towards implementing further technology development and assessment activities. An essential first step is considered to be the creation of a Pulse Detonation Combustion (PDC) Consortium. Lastly, the PDC WG conducted a self-assessment determining that there is value in continuing to operate as a JANNAF-sponsored entity, and that there is a growing need to leverage the intellectual property dissemination and protection faculties afforded by JANNAF and CPIAC.

An Executive Summary of the workshop will be submitted to the Advanced Engine Cycles Panel, Airbreathing Propulsion Subcommittee. Details of the workshop will be presented at the next Combustion Subcommittee (CS)/Airbreathing Propulsion Subcommittee (APS)/Propulsion Systems Hazards (PSHS) Joint Meeting to be held Spring 2008.
JANNAF Executive Committee Welcomes New Chairman

Mr. James L. Taylor, Jr., Manager of the Flight and Integrated Test Office for the Exploration Launch Office (ELO) at the NASA Marshall Space Flight Center, became Chairman of the JANNAF Executive Committee (EC) at the close of the 54th JANNAF Propulsion Meeting held May 14-18 in Denver, succeeding Mr. Parker L. Buckley of the Air Force Research Laboratory. The JANNAF EC is the governing body of JANNAF in accordance with the Agreement and Charter of the JANNAF Interagency Propulsion Committee. It is responsible for establishing and modifying subcommittees, monitoring subcommittee activities, and establishing guidelines for their operation.

The Exploration Launch Projects Office has overall responsibility for developing the Ares I crew launch vehicle and Ares V cargo launch vehicle – keys to the Vision for Space Exploration and NASA’s future exploration mission goals. Named to his current position in 2006, Mr. Taylor is responsible for leading and directing all project activities that culminate in a series of development and orbital flight tests for NASA’s next generation launch vehicles. Mr. Taylor also is responsible for developing technical alliances across NASA, industry and academia in support of related spaceflight and testing events. Previously, Mr. Taylor served as deputy manager of Vehicle Integration in the Exploration Launch Projects Office.

From 2004 to 2005, Mr. Taylor was manager of the Exploration and Transportation Systems Office in Marshall’s Space Transportation Programs and Projects Office where he managed and led studies that resulted in the development of the launch architecture for the Constellation Program. From 2001 to 2004, Mr. Taylor was chief engineer of the Advanced Space Transportation Program at Marshall. He provided critical technical guidance in NASA’s efforts to investigate and develop advanced propulsion technologies.

Mr. Taylor was deputy manager of program planning and development in the Space Transportation Directorate from 2000 to 2001, responsible for leading the formulation of Marshall program plans for the implementation of the Integrated Space Transportation roadmap. From 1996 to 2000, he served in various engineering and management capacities in the Propulsion Test Directorate at NASA’s Stennis Space Center near Bay St. Louis, Miss.

Mr. Taylor’s previous experience also includes assignments at the NASA Resident Office at Pratt & Whitney Rocketdyne in West Palm Beach, Florida, and in the Office of Space Flight at NASA Headquarters. Mr. Taylor began his NASA career in 1988 as project manager in the Facilities Office at the Marshall Center. Prior to coming to NASA, he worked in the construction industry for four years.

Mr. Taylor earned a bachelor’s degree in civil engineering in 1984 from Mississippi State University in Starkville. In 1997, he received a master’s degree in engineering management from the University of Alabama in Huntsville.

Mr. Taylor and his wife, Lori, reside in Madison, Alabama. They have three sons.
**Propulsion News Highlights**

**NASA Awards $1.8 Billion Contract to Develop and Support Test Flights for NASA’s Ares I Crew Launch Vehicle First Stage**

Source: Alliant Tech Systems

13 August 2007

The National Aeronautics and Space Administration (NASA) announced today that Alliant Techsystems has received a $1.8 billion contract for the design, development, test and evaluation (DDT&E) of the first stage of the agency’s next-generation human space flight vehicle - the Ares I. The multi-year development contract extends through June 2013 and includes flight tests beginning in 2009. Follow-on human flights are scheduled for no later than 2014, and production hardware for those flights will be developed under a separate contract expected after 2010. Ares I is a major element of the new space transportation infrastructure being developed by NASA to carry out the next steps in America’s space exploration roadmap. It will replace the Space Shuttle as NASA’s human spaceflight workhorse and will launch a new generation of human explorers to the International Space Station (ISS), the Moon, and eventually to Mars. Full press release: http://atk.mediaroom.com/index.php?s=press_releases&item=739

**Lockheed Martin Delivers 500th PAC-3 Missile to the U.S. Army**

Source: Lockheed Martin

16 August 2007

Lockheed Martin recently recognized delivery of the 500th PAC-3 Missile to the U.S. Army during a celebration at the PAC-3 Missile production facility in Camden, AR. PAC-3 Missiles have been delivered and deployed around the world with U.S. forces and U.S. allies. The PAC-3 Missile is currently the world’s only fielded pure kinetic energy air defense missile. Production of all equipment is done at Lockheed Martin manufacturing facilities in Dallas and Lufkin, TX, Chelmsford, MA, and the PAC-3 All-Up Round facility in Camden, AR. “Our highest priority is ensuring that U.S. Warfighters and our allies around the world receive a missile defense system that they can depend on,” said Richard McDaniel, director of PAC-3 Programs at Lockheed Martin Missiles and Fire Control. “This important production milestone was made possible through the commitment of the PAC-3 Production team at Lockheed Martin and all of the 225 suppliers and subcontractors across approximately 25 States that remain focused on delivering this combat proven missile to our customers. The PAC-3 Missile offers the Warfighters confidence and dependability. Its legacy speaks for itself.” Full press release: http://www.lockheedmartin.com/wms/findPage.do?dsp=fec&ci=18526&rsbci=0&fti=111&ti=0&sc=400

**US Army Awards Contracts to Develop Truck-mounted Laser Interceptor**

Source: BBC, Boeing, Northrop Grumman

20 August 2007

The US Army is developing a truck-mounted laser weapon to destroy rockets, artillery shells and mortars (known as RAM projectiles.) Boeing Inc. and Northrop Grumman have each been awarded independent contracts to support the first phase of the project - to develop and complete a preliminary design of a rugged beam control system. The solid state laser weapon would eventually be mounted on a 10-tonne, eight-wheel-drive tactical truck. The American military has several programmes underway to develop battlefield lasers. Full press release: http://news.bbc.co.uk/1/hi/sci/tech/6917041.stm

These excerpts have been taken from press releases that have been approved for public release.
The 43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference (JPC) was held at the Duke Energy Center in Cincinnati, Ohio, from 8-11 July 2007. The conference was organized by AIAA, and sponsored by General Electric Company. The theme for this year’s JPC was “Advancing Propulsion Technologies and Celebrating our Aerospace Heritage.” The meeting keynote was given by the Honorable Michael Wynne, Secretary of the Air Force.

True to form and tradition, the meeting enjoyed excellent attendance by the breadth of the propulsion industry, and hosted 122 technical sessions: Airbreathing Propulsion (16); Advanced Propulsion Concepts (2); Energetic Components and Systems (3); Education (3); Electric Propulsion (24); Ground Testing (3); History (1); Hybrid Rockets (3); Hypersonic and Combined Cycle Propulsion (9); In-Space Propulsion Technologies (2); Liquid Propulsion (21); Nuclear and Future Flight Propulsion (6); Propellants and Combustion (10); Systems Concepts (8); Solid Rockets (10); and Space and Earth-to-Orbit Vehicles (3). Of particular note was the strong showing of student and university activities supporting the NASA Constellation University Institutes Project (CUIP) – with 22 papers on combustion and injectors from six different universities.

The JPC also included exhibits that were set up by a number of organizations to highlight various propulsion topics, including air breathing, liquid, solid, nuclear, electric, engines, environmental controls, ground support, software, testing, research and development, management, propellant tanks, thermal products, noise and vibration, and simulation. The newly designed CPIAC booth weathered its second year quite well, and drew outstanding attendance, from friends old and new alike. The traditional (and much coveted) ‘Rocket Scientist’ T-shirt drawing was won by Michael Jones, from General Dynamics of Gilbert, Arizona.

Participants enjoyed the relaxing Sunday evening opening reception, as well as a riverboat social event, which took place on Tuesday aboard the Belle of Cincinnati. The Moog hospitality suite drew a record number of enthusiasts throughout the week. The 2008 JPC will be held 20-23 July 2008 at the Connecticut Convention Center, Hartford, Connecticut.
Johns Hopkins Chemist Receives AIAA’s Martin Summerfield Graduate Student Award for Combustion and Propellants Research

Johns Hopkins chemist Andrej Grubisic has won the American Institute for Aeronautics and Astronautics’ Martin Summerfield Graduate Student Award for Research in Combustion and Propellants for his fundamental work on aluminum hydride-based high energy density materials that could potentially serve as rocket fuel.

Named for rocket pioneer Summerfield, one of the founding members of Aerojet who invented regenerative cooling for liquid rocket engines, the $5,000 award is funded through individual memorial gifts and the AIAA Foundation. “The award came as a great surprise. We knew we were onto something potentially very important for propulsion technology, but since its application is possibly as much as 10 or 20 years down the road, I kept my hopes down when waiting for the announcement,” said Grubisic, who will use the funds to upgrade one of his laboratory’s instruments. “Being recognized by the institute is not only a wonderful tribute to our work and the great promise it holds, but also to AIAA for its foresight and willingness to embrace scientific frontiers.”

Grubisic was part of a research team (led by scientists at both Johns Hopkins and Virginia Commonwealth University) that discovered a new class of aluminum-hydrogen compounds with a unique chemistry. These compounds may one day have applications as high energy density materials in solid fuel rockets and as materials for storing hydrogen. An article about this research was published in the Jan. 19 issue of the journal Science.

The compounds’ relative stability may hold the key to their future uses, including in the development of rocket fuel with more thrust, said Kit Bowen, the E. Emmet Reid Professor in the departments of Chemistry and Materials Science at Johns Hopkins.

“It’s tough to predict how things will play out in the future, but our research finding is interesting enough for me to be willing to say that this synthesis may have the potential for some possibly very useful future applications,” Bowen said. “Before we reach that point, however, there are many bridges to cross.” Scientists at the University of Konstanz and the University of Karlsruhe, both in Germany, also collaborated on the research. The work was supported by the U.S. Air Force Office of Scientific Research, the U.S. Department of Energy and Deutsche Forschungsgemeinschaft.

This article is an excerpt of Headlines@Hopkins News Release, 2 August 2007.
JANNAF Meeting Calendar

2008

JANNAF Propulsion Meeting/Combustion Subcommittee/Airbreathing Propulsion Subcommittee/Propulsion Systems Hazards Subcommittee/Exhaust Plume Technology Subcommittee/SPIRITS Users Group

Date: Tentative for April-May 2008
Location: Tentative for Boston, MA

For more information on the above meeting, contact Meeting Planner Pat Szybist at 410-992-7305, ext. 212, or by e-mail to pats@jhu.edu.

Visit the JANNAF Web site at www.jannaf.org for meeting updates.

Attendance Requirements at JANNAF Meetings for Non-Government Attendees: Attendance at JANNAF Meetings for non-government employees is restricted to US citizens only and whose organizations are 1) registered with the Defense Logistics Information Service (DLIS) AND 2) have a government contract registered with the Defense Technical Information Center (DTIC). If the government contract is not registered with DTIC, the attendee’s registration form can be certified by a sponsoring government official from one of the participating JANNAF agencies. Additional information concerning registrations with DLIS and DTIC can be obtained by contacting DLIS at (800) 352-3572 (www.dlis.dla.mil/jcp/) or DTIC at (800) 225-3842 (www.dtic.mil/dtic/registration/index.html).

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