

**CALL FOR
PAPERS**

Abstract Deadline
4 June 2008

Advancing the Science of Flight Technology

www.aiaa.org/events/asm

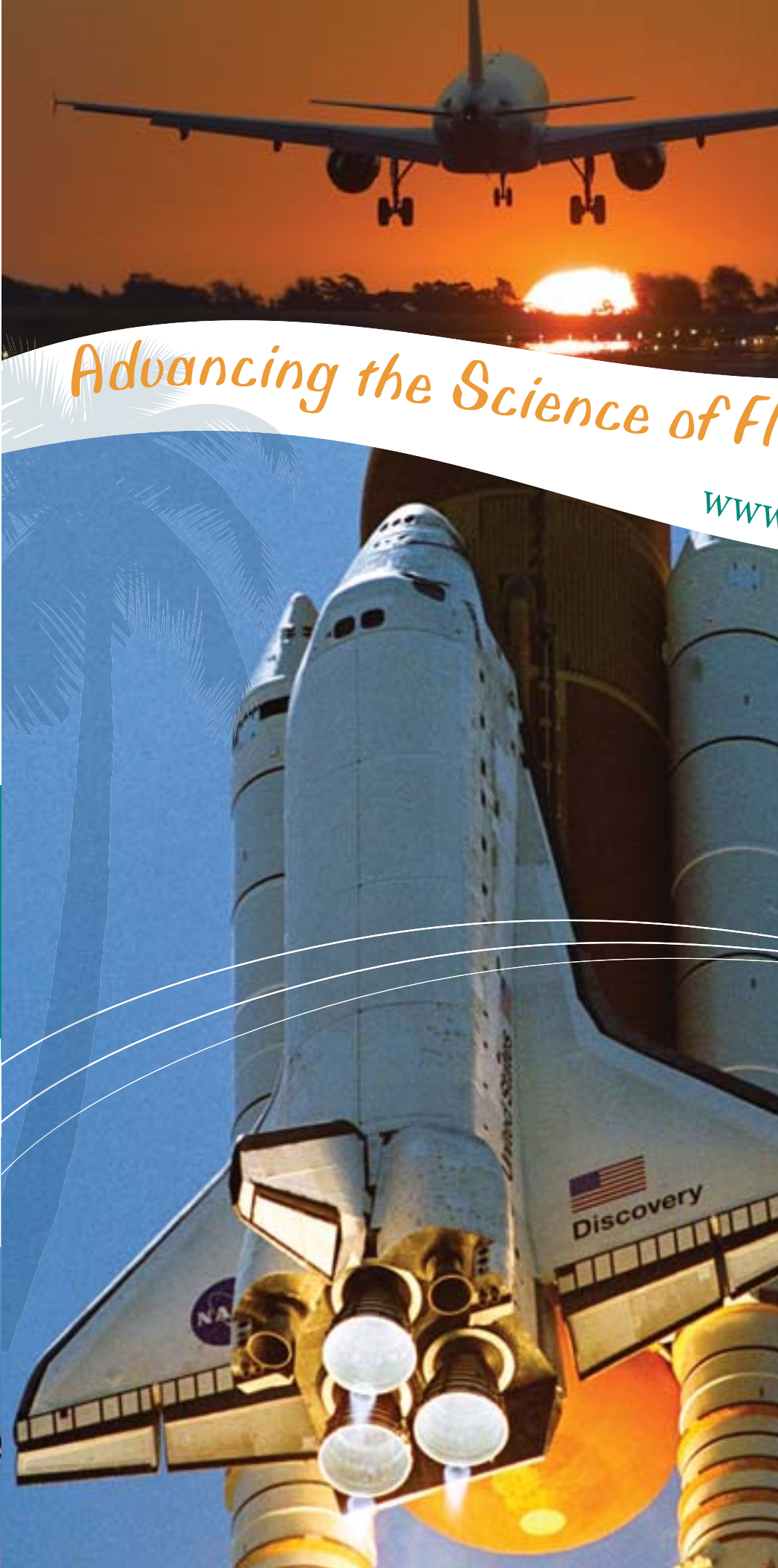
**47th AIAA
Aerospace
Sciences
Meeting**

Including
**The New
Horizons Forum
and Aerospace
Exposition**
5-8 January 2009

Orlando World Center Marriott
Orlando, Florida



AIAA
The World's Forum for Aerospace Leadership



The AIAA Aerospace Sciences Meeting and Exhibit is the first major multidisciplinary event of the year for aerospace scientists and engineers from around the world. It provides an ideal forum for scientists and engineers from industry, government, and academia to share and disseminate scientific knowledge and research results with a view toward new technology for aerospace systems.

This meeting has traditionally been built around excellent technical paper presentation sessions. Plenary Sessions that focus attention on program areas of current interest will start some sessions followed by technical papers providing additional discussion of these topics. Distinguished lectures and informal evening events fill out the remainder of the program throughout the week.

The contributed papers for this meeting are chosen by a competitive selection process based on peer review (as described below). In addition, invited papers of the highest quality review major trends and accomplishments within or across various aerospace disciplines. To facilitate simultaneous sessions, papers will begin on the hour and half hour. Six to eight 30-minute papers per session are planned (20 minutes for presentation with 10 minutes for questions and discussion), but session organizers are encouraged to include one-hour survey papers where appropriate.

Listed below are the technical committees sponsoring this meeting, the areas in which papers are solicited, and the names and addresses of the meeting organizers to whom abstracts should be submitted. Every

effort will be made to provide uniformly rigorous evaluations and acceptance rates for all sessions.

This is a "paperless" meeting with papers included in the online proceedings and the after-meeting CD-ROM. There will not be a papers room, nor will any papers be sold individually at the meeting. Individual papers may be purchased at www.aiaa.org.

General inquiries concerning the program, format, or policies of the meeting and suggestions for special high-interest information presentations should be directed to the **Conference General Chair:**

Abdi Khodadoust

The Boeing Company

714.235.7746

E-mail: abdollah.khodadoust@boeing.com

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Procedures for Abstract Submission

Abstract submissions for the conference will be accepted electronically through AIAA's Web site at www.aiaa.org/events/asm.

This Web site will be open for abstract submittal through **4 June 2008 at 2359 hrs EST**. The electronic submission process is as follows:

1. On the right-hand side, click on "Submit a Paper."
2. Click on "View Call for Papers or Begin a New Submission."
3. From the conference Call for Papers screen, identify the topic to which the prospective paper is best correlated, and click the "Select" link next to that topic.
4. Verify the topic selection and click "Select" again, then verify the rules and regulations on the subsequent page.
5. Answer the prompts to enter paper title, author information (including e-mail address), and A/V requirements.
6. When this information is complete, authors will be prompted to upload the abstract in any one of five formats: MS Word (version 2003 or lower), WordPerfect, Text, RTF, or PDF.

Authors having trouble submitting abstracts electronically should e-mail AIAA technical support at paper_tech_support@aiaa.org. Questions about manual abstract submissions or full draft manuscripts themselves should be referred to the appropriate Technical Chair.

Authors will be notified of paper acceptance or rejection on or about **27 August 2008**. Instructions for preparation of final

manuscripts will be provided by AIAA for accepted papers only. Authors must submit their manuscripts electronically to AIAA Headquarters for publication no later than **29 December 2008**.

Rules for Abstract/Manuscript Submission

Abstracts are to be submitted subject to the following general rules:

- Abstracts must be received by **4 June 2008**. A typical abstract should have a total length of 5 - 10 pages including figures and tables. Draft papers are encouraged. The extended abstract or draft paper should clearly describe the purpose and scope of the work to be included in the full paper, methods used, key results, and contributions to the state of the art. This submittal should include illustrations and data that support the results and contributions asserted.
- Both abstracts and final manuscripts must adequately address the accuracy of results. Abstracts will be reviewed and selected based on technical content, originality, importance to the field, clarity of presentation, accuracy validation, and the potential to result in a quality final paper. Note that all abstracts are chosen by a competitive process based on anonymous peer review using the above criteria. The review and acceptance process will be weighted in favor of authors submitting more relevant documentation of their proposed papers. The length of the paper should be appropriate for a conference paper—not a major project, final report, or final thesis.

- The abstract should not be submitted to more than one technical program organizer. If an author is unsure which organizer is most appropriate, it is the author's responsibility to communicate with the technical program organizers in question well before the abstract submission deadline to determine where to send the abstract. There is too little time in the review process for an abstract rejected by one technical program chair to be forwarded for review to another.

- Early submissions are encouraged. Abstracts submitted after **4 June 2008** will be rejected without review.

- Authors will be notified of paper acceptance by **27 August 2008**. An Author's Kit, containing detailed instructions and guidelines for submitting papers to AIAA, will be made available to authors of accepted papers, and is also available at www.aiaa.org by clicking "Conferences and Events," then "Submit/Edit a Paper."

- Final manuscripts are due at AIAA by **29 December 2008**.

- A "No Paper, No Podium" Policy is in effect for this conference. If a written paper is not submitted by the final manuscript deadline, authors will not be permitted to present the paper at the conference. In addition, it is the responsibility of those authors whose papers or presentations are accepted to ensure that a representative attends the conference to present the paper.

- Additional guidelines and exceptions to the aforementioned guidelines (except for deadlines) can be made at the discretion of each technical program organizer.



Young Professionals

Young professionals are encouraged to participate in the Young Professionals Presentation program that provides young professionals under the age of 35 with the opportunity to present their work at a national AIAA technical conference. This program integrates young engineers into the regular sessions and allows them to give presentations covering continuing and in-process design or research works, in addition to completed projects. The Young Professionals Presentation program allows for oral presentations only; published papers are not required. Please note that the Young Professionals Presentation program does not violate the "no paper, no podium" policy; the program is fully supported by the Technical Activities Committee.

Presentation topics for the Aerospace Sciences Meeting Young Professionals Presentation program can derive from either aeronautics or astronautics, but should be work with which the presenting engineer is engaged or intimately familiar. When submitting your abstract through the Web site to the appropriate Technical Chair, please note that this is a Young Professionals Presentation.

Warning—Technology Transfer Considerations

Prospective authors are reminded that technology transfer guidelines have extended considerably the time required for review of abstracts and completed papers by U.S. government agencies. Internal (company) plus external (government) reviews can consume 16 weeks or more. Government review, if required, is the responsibility of the author. Authors should determine the extent of approval necessary early in the paper preparation process to preclude paper withdrawals and late paper submittal.

International Traffic in Arms Regulations (ITAR)

AIAA speakers and attendees are reminded that some topics discussed in the conference could be controlled by the International Traffic in Arms Regulations (ITAR). U.S. Nationals, which are U.S. Citizens and Green Card Holders, are responsible for ensuring that technical data they present in open sessions to non-U.S. Nationals in attendance or in conference proceedings are not export-restricted by the ITAR. U.S. Nationals are likewise responsible for ensuring that they do not discuss ITAR export-restricted information with non-U.S. Nationals in attendance.

Aeroacoustics

Papers are solicited that address novel computational, experimental, and analytical results and techniques in all areas related to aeroacoustics and structural acoustics. Specific areas of interest include but are not limited to:

- Jet noise (subsonic and supersonic with flight effects)
- Jet screech
- Broadband shock noise
- Jet noise suppression, cavity tones and their suppression
- Turbo-machinery noise
- Combustor and other core noise
- Propeller noise (ducted and un-ducted)
- Rotorcraft noise, airframe noise
- Duct acoustics
- Atmospheric sound propagation/sonic boom
- Computational Aeroacoustics
- Statistical energy analysis methods
- Modal analysis and synthesis
- Community noise and metrics
- Interior noise, sonic fatigue, active noise control
- Vibration control techniques

Also welcome are program overviews (especially full-scale ground and flight test demonstrations), in-depth reviews, and surveys. Typical applications range from civilian aircraft and community noise issues to sonic fatigue and acoustic impact issues in fighters, bombers, and high-speed missiles.

Please direct questions to:

Vladimir Golubev

Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900
386.226.6752 • 386.226.6747 fax
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Aerodynamic Measurement Technology

Papers are solicited on topics related to advanced and novel aerodynamic measurement techniques for ground-based or flight applications. Submissions are encouraged for all flow speed ranges, from incompressible to hypersonic and all thermodynamic conditions including those at high enthalpy and with combustion. Topics of particular interest include, but are not limited to:

- Techniques applied to micro-flows and flow property measurements near surfaces
- Advances in spectroscopic methods including laser-induced fluorescence, absorption, Rayleigh, and Raman techniques
- Flow velocimetry and velocity field mapping

- Planar and three-dimensional flow visualization and temporally resolved imaging
- Holographic and interferometric methods
- Thermal anemometry and measurements of temperature, density, sound and acoustic array technology, pressure, or species concentration fields
- Techniques for boundary layer transition, skin friction, heat transfer, and surface temperature and pressure (including temperature- and pressure-sensitive paint techniques)
- Advanced diagnostics utilized as sensors in flow control applications and microelectromechanical systems (MEMS) based measurement approaches and technology
- Aerodynamic data acquisition, processing, and display
- Aerodynamic probe miniaturization
- Techniques for acquiring multiple properties
- Techniques for measuring plasma flow interactions
- Novel diagnostics applied in harsh environments such as those found in gas turbine engines and those involving cryogenic, high-G, in-flight, or high-temperature applications

Also, papers are solicited emphasizing detailed uncertainty and error analysis of advanced diagnostic techniques; novel calibration and data processing methodologies; measurement of vorticity, property space or time derivatives; and property correlations. To be included in an Aerodynamic Measurement Technology session, papers should emphasize advancements or innovations in the measurement technique itself, rather than the particular fluid dynamic problem to which the technique is applied.

Papers are also solicited jointly with the Sensor Systems Technical Committee on topics related to sensor systems technologies for airborne and ground-based applications. Topics of particular interest include:

- Sensors, sensing systems, and sensing technologies utilized for acquisition and interpretation of remote sensing
- In situ measured imagery or other data forms

- Detection and evaluation of physical parameters and fields associated with terrestrial, oceanographic, atmospheric, or extraterrestrial phenomena and effects
- Detection and evaluation of environmental parameters associated with the vehicle and its parts and components, as well as with the media in which they operate
- Detection, recognition, tracking, and remote control of airborne objects
- Measurement and evaluation of the environmental impact of airborne vehicles
- In-flight measurement and definition of aerospace vehicle airflow parameters
- In-flight measurements for evaluation and improvement of vehicle performance
- In-flight vehicle health monitoring
- In-flight vehicle control
- Airborne applications of measurement techniques used at ground test facilities
- Measurement and acquisition of inertial sensing data

In addition, papers are solicited on novel applications of advanced MEMS devices as primary sensors in the sensor systems defined above and in other related technology areas.

Please direct questions regarding Aerodynamic Measurement papers to:

Mark Sheplak

University of Florida
231 MAE-A Building, P.O. Box 116250
Gainesville, FL 32611-6250
352.392.3983 • 352.392.7303 fax
E-mail: sheplak@ufl.edu

Please direct questions regarding Sensor Systems papers to:

Matt Nixon

Boeing-SVS
4411 The 25 Way, NE, Suite 350
Albuquerque, NM 87109
505.449.4687
E-mail: matthew.d.nixon@boeing.com

Air Breathing Propulsion

Papers are solicited that address the design, integration, flow-field physics, chemistry, and thermodynamics of air breathing propulsion. Topics include, but are not limited to:

- Experimental results pertaining to inlets, ducted and unducted fans, compressors, combustors, turbines, augmentors, and nozzles
- Techniques for the advancement of engine component technologies, such as design, manufacturing, materials, testing, diagnostics, and instrumentation
- Analytical/computational methods applicable to engine components including fluid, thermal, and structural analysis

- Advances in propulsion systems including turbojets, ramjets, scramjets, pulse detonation engines, combined cycles (including rocket and turbine based), nonchemical air breathing engines, systems integration, and propulsion aircraft integration
- Papers comparing engine flight testing with ground test and CFD simulation results

Papers on topics not included here that relate to air breathing propulsion technologies are also invited.

Please direct questions to:

D. R. Reddy

NASA Glenn Research Center
21000 Brookpark Rd., M.S. 5-3
Cleveland, OH 44135
216.433.8133
E-mail: dreddy@grc.nasa.gov

Aircraft Design

Papers are sought on all aspects of aircraft airframe and systems design. Review papers are especially sought that describe recent developments and trends in aircraft design:

- Acoustics
- Advanced systems integration (all-electric, energy-optimized, silent aircraft, etc.)
- Aerodynamics
- Aircraft/aerospace history, trends, and policies
- Aircraft systems
- Computational fluid dynamics
- Cost effectiveness
- Design synthesis and optimization
- Environmental impact
- Innovative aircraft concepts/configurations
- Innovative aircraft systems concepts
- Missions and mission effectiveness
- Propulsion integration
- Safety

Please direct questions to:

Charlie Svoboda

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E-mail: charles.svoboda@boeing.com

Applied Aerodynamics

The Applied Aerodynamics Technical Committee solicits papers on topics related to aerodynamic design, vehicle aerodynamics, and aerodynamic phenomena to include, but not limited to:

- Wind-tunnel and flight testing aerodynamics
- Unsteady aerodynamics

- Vortical/vortex flow
- High angle of attack and high lift aerodynamics
- Transonic, supersonic, hypersonic aerodynamics
- Low speed, low Reynolds number aerodynamics
- Airfoil/wing/configuration aerodynamics
- Weapons carriage and store separation
- Innovative aerodynamic concepts/designs
- Aerodynamic design methodologies
- Ground-to-flight scaling methodology and correlation
- Active flow control
- Unmanned aerial vehicle designs/tests
- Missile/projectile/guided-munition aerodynamics
- Aerodynamic-structural dynamics interaction
- Applications of CFD to unique configurations with validations against experimental data
- Propeller/rotorcraft aerodynamics
- VSTOL/STOL aerodynamics
- Icing effects on vehicle aerodynamics
- Applied CFD in engineering
- Optimization methods in applied aerodynamics

Please direct questions to:

Rob Vermeland

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Kelly Johnson Engineering Center, MZ 1114
1011 Lockheed Way
Palmdale, CA 93599
661.572.3776
E-mail: rob.vermeland@lmco.com

Atmospheric Flight Mechanics

Papers are solicited that present new theoretical, computational, or experimental results in atmospheric flight mechanics. Topics of interest include recent simulation and flight test evaluation of a variety of vehicle configurations, including X-vehicles, unmanned aerial vehicles, and missiles. Papers covering advanced technologies to meet challenging atmospheric flight problems during ascent/abort and reentry flight phases of launch vehicles are welcome. Interesting and novel flight mechanics problems or lessons learned during the development and testing of these vehicles would be of particular interest. Specific areas of relevancy include, but are not limited to:

Aerodynamic Prediction Methods: This technology area covers the prediction of aerodynamic forces and moments acting on all types of atmospheric flight vehicles. Of particular interest is the integration of a variety of methods such as computational aerodynamics, advanced dynamic testing techniques, and unique flow-field measurement methods into unified approaches for



the prediction of aerodynamic loads and flight simulation in subsonic, transonic, supersonic, and hypersonic flight environments, at steady and unsteady conditions, and at low and high angles of attack.

Aircraft Flight Dynamics, Handling Qualities, and Performance: This topic area includes aircraft stability, control response, handling qualities, and response to atmospheric disturbances. Subtopics of interest include determination of stability and control derivatives, manned and unmanned vehicle handling qualities, high-angle-of-attack control, nonlinear modeling, rotorcraft handling qualities with and without slung loads, trajectory optimization, effects of icing and turbulence on flight dynamics and control, flow-field effects, departure prevention, and spin characteristics.

Launch Vehicle, Missile, and Projectile Flight Dynamics: This area pertains to the application of analytical or experimental methods for the analysis and prediction of the flight dynamics of expendable and reusable launch vehicles, missiles, and projectiles. The advanced technology areas include performance, stability, and control; adaptive guidance, control reallocation, and re-configurable flight control methods during ascent/abort and reentry phases of the mission to improve safety and operability of second-generation reusable launch vehicles. Topics of interest include high-angle-of-attack aerodynamics, determination of dynamic stability derivatives, component and store-to-store interference effects, projectile launch and flight dynamics, incorporation of predictions into trajectory simulations, trajectory flight dynamics affecting the impact accuracy of missiles and projectiles, and analysis of flight test data.

Small/Mini/Micro Aerial Vehicles: Presently there is great interest in very small flight vehicles for a variety of purposes. Such small vehicles pose new challenges for the design engineer. Low flight speeds, hovering flight, low-inertia vehicles, unconventional designs all present challenges for development. Papers are therefore requested relating to the unique flight mechanics and handling qualities of small/mini/micro aerial vehicles. Topics include low Reynolds number aeroprediction, flight mechanics for low-inertia vehicles, effects of flexible vehicle structure on flight mechanics, flight mechanics in the very low speed flight regime, and transi-

tion between forward and hovering flight. Additionally, topics relating to the flight mechanics of unconventional small/mini/micro flight vehicles (e.g., ornithopters, flapping wing vehicles, rotorcraft, etc.) are requested.

Planetary Entry and Aeroassist Technology: Papers are requested relating to the entry dynamics into the Earth's or a celestial body's atmosphere. Topics include hypersonic flight performance, optimization of reentry vehicle configurations, trajectory optimization, and trans-atmospheric vehicles. Papers are also requested in the area of aerogravity assist orbit transfer vehicles. Topics include planetary aero-braking and aerocapture, low-density atmospheric flight mechanics, and atmospheric maneuvering to effect orbital transfer.

Papers in other areas related to atmospheric flight mechanics are also welcome.

Please direct questions to:

Michael A. Weaver
The Aerospace Corporation
P.O. Box 92957 M4-964
Los Angeles, CA 90009-2957
310.336.7860 • 310.336.0492 fax
E-mail: Michael.A.Weaver@aero.org

Atmospheric and Space Environments

Papers are sought that provide the aerospace (ground operations, aviation, rockets, launch vehicles, and spacecraft) community with scientific and technical information concerning interactions between aerospace systems and the atmospheric/space environment. In addition, new or refined information improving the basic understanding of the atmosphere, space, or their applications to aviation and aerospace vehicle design and operations issues is solicited. Atmospheric and Space Environments includes the areas of:

- Aircraft icing
- Aircraft wake vortex technology
- Atmospheric dynamics
- Aviation weather accident prevention
- Meteorological applications to aerospace operations
- Satellite and ground-based measurement systems
- Environment standards
- Meteoroid and debris environment

- Space environment
- Planetary and lunar surface environments
- On-orbit spacecraft-environment interactions

Potential ASE contributors should be advised that the ASE technical committee voted to hold the first annual Atmospheric and Space Environments Conference in June of 2009 co-located with other AIAA conferences held annually in the summer. The creation of this conference will help eliminate direct conflicts with other meetings held on or about the same time as the Aerospace Sciences Meeting. The ASE technical committee envisions that the move to a summer conference will eliminate some of these conflicts and increase the participation and content of its technical sessions. Potential attendees should note these changes and be alert to the future call for papers for the June 2009 conference.

Please direct questions to:

Dale Ferguson
NASA Marshall Space Flight Center
EM50
Huntsville, AL 35812
256.544.8316 • 256.544.5103 fax
E-mail: dale.c.ferguson@nasa.gov

Computer Systems

Abstracts are solicited on a wide range of topics in aerospace-related applications of computer systems. Areas of interest include:

- High-performance computing and computational simulation
- Computer architecture
- Network architecture
- Distributed computing
- Embedded systems
- Real-time systems
- Object-oriented programming
- Visualization
- Mission critical software
- Digital avionics
- Aerospace-related information systems
- Applications of MEMS and nanotechnology in computing systems
- Applications of commercial off-the-shelf systems (COTS)

In addition, high-performance computing (HPC) grand challenge problems are of particular interest. Authors are encouraged to submit their manuscripts, either before or after the meeting, to the *Journal of Aerospace Computing, Information, and Communication* for publication.

Please direct questions to:

Chiping Li
Aerojet
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Education

Aerospace engineering is both the most specialized and the most diversified of fields, thus challenging the aerospace community to effectively educate engineering students to meet a dynamic environment. As the complexity of our field continues to increase, the multidisciplinary aspects of the aerospace curriculum must be strengthened while maintaining or improving the more traditional fundamentals of engineering science. For this year's meeting, papers are especially encouraged that address these issues, including but not limited to:

- New, more effective pedagogies for improving understanding of the fundamentals of engineering science and subdisciplines such as aerodynamics and propulsion
- Curricular development addressing the multi-disciplinary nature of aerospace system analysis and design
- Novel teaching approaches that incorporate nontraditional methods
- Best practices for ABET assessment
- Broader innovative collaboration of industry and academia in engineering education
- Papers and/or topics for open forums:
 - Innovations on the horizon — new directions in research and development by industry and educational institutions
 - Translating the effects of globalization and green engineering practices from industry to the classroom
 - Better preparing graduates for a rapidly evolving work environment

Please direct questions to:

Dolores S. Krausche
Florida Center for Engineering Education
 P.O. Box 271
 Gainesville, FL 32602
 352.378.1304
 E-mail: dsk@atlantic.net



Energetic Components and Systems

The science of energetic materials is critical to the aerospace community. Energetic components, both explosive and pyrotechnic, provide critical performance attributes to aeronautical and astronautical missions. The successful engineering and application of the controlled use of the energetic materials in these components is a result of fundamental understanding of the scientific phenomena that govern the performance of these materials. Papers relating to the science of energetic materials and devices are sought for sessions at the ASM 2009 Conference. Paper topics are solicited in the following, non-inclusive list of study areas:

- Energetic materials synthesis/characterization
- Energetic materials compatibility/aging/surveillance
- Analytical method development for analysis of energetic materials
- Testing and diagnostics of energetic materials events
- Numerical simulation of energetic materials/components
- Nano-scale phenomenon of energetic material performance
- Reduced toxicity energetic materials

Please direct questions to:

Karl K. Rink
University of Idaho, Mechanical Engineering
 Moscow, ID 83844-0902
 208.885.9447 • 208.885.9031 fax
 E-mail: karlrink@uidaho.edu

Fluid Dynamics

Papers are solicited in the areas of experimental, theoretical, and computational fluid dynamics relevant to aerospace applications, including basic research and development, applied research, and advanced technology development. Papers that present new insight into flow physics, introduce innovative applications, address emerging technical areas, or combine experimental, computational, and/or theoretical approaches are strongly encouraged. Authors who have recognized expertise in a particular area and who are interested in writing a comprehensive review are encouraged to contact the conference organizer.

Potential subject areas include, but are not limited to:

- Integrated theoretical/experimental/computational studies on fluid flow problems
- Transition & turbulence: experiments, modeling, simulations, applications
- CFD methodology: algorithms, structured/unstructured grids, higher-order discretizations, low-dissipation schemes

- CFD applications including optimization
- Flow control: active, passive, and closed-loop flow control; flow control actuators
- Cross-disciplinary fluids dynamics involving aero-optics, aeroacoustics, fluid/structure interactions, combustion, multi-material and multi-phase flows
- Uncertainty estimates in experiment and computation
- Innovative flow measurement technologies and resultant observations
- Low Reynolds number flows for biomechanical applications
- Unsteady flows
- Internal flows (e.g., turbomachinery)
- Micro/nano-fluidics
- Non-continuum flows
- Zero-gravity flows
- Non-deterministic (e.g., stochastic) fluid dynamics
- Extension of aerospace-related fluid dynamics concepts, tools, and processes to non-aerospace fields (e.g., automotive, materials processing, and electronics cooling)

With your submission, please indicate your preferred session topic, choosing from the bulleted topic areas listed above.

Please direct questions to:

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 2354 Fairchild Dr., Suite 6H27
 HQ USAFA/DFAN
 U.S. Air Force Academy, CO 80840
 719.333.2613
 E-mail: tom.mclaughlin@usafa.edu

Ground Testing

Ground Testing papers are solicited on unclassified topics related to all aspects of aerodynamics, propulsion, and space systems ground testing and related facilities. Topics of interest include, but are not limited to:

- Test simulations for all aerodynamic flow regimes, propulsion (including propellant conditioning), and outer space environments
- Design, development, and performance of new, modified, or unique ground test facilities, subsystems, and components thereof
- Advances in test techniques, experimental uncertainty, and integration of computation with experiment, for reduced risk in predicted flight characteristics
- Emerging requirements for aerospace ground testing that exceed current capabilities
- Issues focused on Computational Fluid Dynamic comparisons with wind tunnel and flight test data, including code development, validation, and verification

- Integration and use of computing equipment for real-time test control, data acquisition, processing, validation, and presentation
- Development, application, and validation of flow diagnostics in ground testing facilities, with special emphasis on pressure sensitive paints, temperature sensitive paints, video model deformation, infrared imaging, and optical diagnostics
- All aspects of increasing "knowledge per test," including new test techniques, instrumentation, automation, design of experiments, and experimental uncertainty
- Unique or innovative uses of existing facilities
- Improvements in the quality of wind tunnel testing and reduction of the cost and cycle times for these tests, with emphasis on test article design, fabrication, and usage, testing productivity, and test program management
- Ground and flight test integration
- Expert systems, artificial intelligence, and neural networks related to ground test issues
- Knowledge capture for ground test related facilities, systems, and techniques
- Development of educational and continuing education/career path opportunities in experimental testing for new students, technicians, and engineers

In addition, timely surveys and reviews of these topics are sought. The Ground Test Technical Committee will also conduct a program to recognize "Outstanding Papers" presented in the Ground Test sessions.

Please direct questions to:

David A. Dress

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757.272.9367 • 757.864.8194 fax
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History

As we complete the centennial of the Aerospace Industry, we can learn from the experiences of those who came before. In 2009, we celebrate the centennial events of Blériot crossing the English Channel and the First International Aviation Competition in Rheims, France, won by Glenn Curtiss, as well as the Jubilee year of the seven Project Mercury astronauts. This year's history sessions will remind us of the early accomplishments of AIAA, its members, and the industry. Papers are sought covering significant advancements of flight, both in air and in space. All papers on the history of aeronautics and space flight will be considered.

Please direct questions to:

Kevin Burns

Wyle Laboratories, Aerospace Group
1550 Hotel Circle North, Suite 425
San Diego, CA 92108
619.543.1700
E-mail: kevin.burns@wylelabs.com

Homeland Security Program Committee

Homeland Security depends critically on a number of research areas, encompassing the full range of AIAA technical committees and beyond. We strongly encourage submission of abstracts for the relevant sessions, including examples such as:

- Fluid dynamics and multi-phase flow relating to atmospheric dynamics, climate, oceans, and water supplies
- Unmanned sensor platforms
- Space assets and capabilities/limitations
- Sensors and intelligent systems
- Manned assets/operations
- C2I, communications, and interoperability
- Human factors and dynamics
- Biometrics
- Economic and legal considerations/impact
- Air traffic and operations
- Energy, lasers, directed energy, and non-lethal counter-asset/counter-personnel technologies
- Modeling/simulation in any pertinent areas

The above list is simply to suggest possibilities. All papers relating to Homeland Security will be considered.

Please direct questions to:

Kevin Kremeyer

PM&AM Research
1665 E. 18th St.
Tucson, AZ 85719
520.903.2345 • 520.903.2346 fax
E-mail: kremeyer@physics-math.com

Intelligent Systems

Papers are sought that describe the application of Intelligent System (IS) technologies and methods to aerospace systems, and the verification and validation of these systems. The systems of interest include both military and commercial aerospace systems, and those ground systems that are part of test, development, or operations of aerospace systems. Technologies which enable safe and reliable operation of complex aerospace systems or sub-systems with minimal or no human intervention (autonomy), or with collaborative synthetic-human agent teams are of interest. These include, but are not limited to:

- Autonomous and expert systems
- Discrete planning/scheduling algorithms
- Intelligent data/image processing
- Learning and adaptive techniques
- Data fusion and reasoning
- Knowledge engineering

Intelligent Systems technology domains that are of interest include:

- Knowledge-based systems
- Heuristic search
- Qualitative simulation and model-based reasoning
- Neural networks
- Fuzzy logic
- Evolutionary (genetic) algorithms
- Learning systems
- Autonomy

Papers should include either a new technique with sample applications or successful applications of existing techniques to problems of current interest to aerospace professionals.

Please direct questions to:

Ella Atkins

University of Michigan, Department of
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1320 Beal Ave.
3009 FXB Building
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734.615.7456
E-mail: ematkins@umich.edu

Meshing, Visualization, and Computational Environments

The Meshing, Visualization, and Computational Environments TC solicits papers describing tools and techniques that facilitate simulation of real-world problems using CFD, CAA, CSM, and CEM. Although not limited to these topics, papers that describe advanced techniques and extreme applications in the following areas are particularly encouraged:

- Computational geometry, including CAD-CAE interoperability
- Meshing, including surface and volume grids, grid adaptation, and moving/deforming meshes
- Grid quality metrics, especially for real-world configurations
- Post processing, including multi-dimensional and transient visualization, feature detection, knowledge capture, and engineering animation
- Collaborative environments, including user interfaces, Internet technology, virtual reality, and linkages to design optimization and advanced engineering environments

Authors are encouraged to submit their manuscripts, either before or after the meeting, to the *Journal of Aerospace Computing, Information, and Communication* for publication.

Please direct questions to:

Balu Sekar

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Multidisciplinary Design Optimization

Multidisciplinary Design Optimization (MDO) is a computational technology for the discovery and exploitation of interactions among disparate disciplines to improve performance, lower cost, and shorten the product/system design cycle, through the application of optimization algorithms. The influence of MDO reaches diverse phases of a product or system life, including manufacturability, operability and serviceability.

Papers are sought on the development or application of multidisciplinary analysis and optimization methods. Papers are also sought on the development or application of computational frameworks, and on related technologies, such as visualization techniques and uncertainty quantification, that inherently support MDO. Papers incorporating more than one discipline or technology should explain the nature and benefit of interdisciplinary synergies at the system level. Papers limited to single discipline optimization should emphasize aspects of the optimization process such as sensitivity analysis, approximation or visualization. MDO applications of interest address aeronautical and mechanical systems that may incorporate any number of enabling technologies.

Core topics of interest include:

- Multidisciplinary analysis and optimization methods and applications
- Uncertainty quantification and non-deterministic design optimization
- Modeling and simulation methods
- Shape and topology optimization
- Computational design frameworks

Please direct questions to:

Samy Missoum

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Plasmadynamics and Lasers

Papers describing basic and/or applied research and development results in the areas of plasmadynamics and lasers and related topics are solicited. Efforts combining contemporary theoretical/computational analyses with experimental verification/validation and which represent notable advancements in the aerospace sciences are especially encouraged. Special consideration will be given to works reporting milestone R&D and/or engineering achievements related to aerospace system application of plasma and laser technologies. Survey papers on the current state of the art and historical perspectives are also desired. Specific topics of interest include, but are not limited to:

- Plasma and Laser Physics: Including fundamental processes, laboratory plasma generation and characterization, experimental research or methods, plasma chemistry and kinetics, non-equilibrium reacting flows, properties, and advances in theory and/or computational simulation methods.
- Space Plasma Physics and Applications: Including spacecraft-plasma interactions, space laser applications, and space experiments.
- Laser Devices and Systems: Including the physics, engineering, and application of high-energy lasers, chemical lasers, electric lasers, laser material interaction, laser optics, and fluid-optic interactions.
- Highly Energetic Plasma Systems: Including the physics, engineering, and application of high-power gas discharge and plasma generation devices, arc-heater technology, explosively generated plasma applications, compact pulse power, and high temperature systems and environments.
- Magnetohydrodynamics (MHD): Including MHD power generation and propulsion technologies, terrestrial and aerospace systems applications, combustion plasma methods, innovative non-equilibrium plasma techniques, nuclear MHD systems, electromagnetic-fluid interaction and characterization, fundamental processes, and theoretical and/or computational simulation methods.
- Plasma and Laser Propulsion: Including innovative and efficient plasma formation and acceleration approaches, high power thruster concepts, electrode erosion issues, electrodeless discharge mechanisms, modeling of fundamental processes, experimental performance characterization, and beamed energy propulsion.
- Plasma Materials Processing and Environmental Applications: Including

exhaust gas treatment, remediation, and hazardous materials disposal.

- Advanced Diagnostics: Including the development and utilization of laser-based diagnostics, flow field characterization methods, and plasma diagnostics.
- Weakly Ionized Plasma Physics and Aerospace Applications.

Papers concerning dual-use technologies, which address non-aerospace issues of major public concern, such as energy, environment, and medicine are strongly encouraged. Suggestions for invited papers and joint sessions are also welcome.

Please direct questions to:

Ron J. Litchford

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Propellants and Combustion

The Propellants and Combustion Technical Committee solicits papers from all areas of propellants and combustion relevant to aerospace sciences, technologies, and applications. New developments in all areas of analytical, numerical, or experimental contributions as well as review papers pertinent to propellants and combustion are of interest. Following the meeting, one paper will be selected for the Best Paper Award in the propellants and combustion area. Potential topics of interest include, but are not limited to:

- Rocket and Air-Breathing Combustion: This area covers design and analysis issues for practical combustors such as rockets, gas turbines, turbojets, ramjets, and other hybrid engines. Topics of interest include combustion instabilities, thermo-acoustic interactions, active and passive combustion control, plume characteristics, fuel flexibility, and other fundamental combustion processes related to conventional propulsion systems.
- Detonations, Explosions, and Supersonic Combustion: Topics of interest include fundamental research in detonation and supersonic combustion as well as combustion dynamics involving scramjets, pulse detonation engines, oblique detonation engines, ram accelerators, and other unconventional propulsion systems.
- Spray and Droplet Combustion: Topics of interest include liquid jet break-up processes, atomization, vaporization, mixing, and their impact on spray flame characteristics as well as droplet

combustion, supercritical combustion, and other related topics.

- **Combustion Chemistry:** Topics of interest include development and application of reduced kinetic mechanisms, surrogate fuels, NO_x and SO_x chemistry, soot formation and oxidation, flow-chemistry interaction, and other related physical and chemical processes affecting reaction kinetics.
- **Micro-Combustion and Micro-Propulsion:** Topics of interest include micro-scale combustion for power generation, micro-IC engines, micro-propulsion engines, and micro-thrusters.
- **Combustion Diagnostics:** Topics of interest include development and application of advanced diagnostic or sensing techniques for understanding and controlling combustion phenomena.
- **Heterogeneous Combustion and Propellants:** Topics of interest include fundamental aspects of combustion of solid fuels, propellants, and fuel additives, as well as propellant synthesis and related topics.
- **Turbulent Combustion:** Topics of interest include fundamental aspects of turbulent reacting flows and combustion dynamics involving premixed, partially-premixed, and non-premixed turbulent flames linked to rockets, air-breathing combustors, and others.
- **Laminar Flames:** Topics of interest include fundamental aspects of laminar flames along with their ignition, extinction, stabilization, instabilities, and interactions with laminar flow processes.
- **Advanced Combustion Concepts, Fuel Technology, and Environmental Impact:** This is a special area of interest, covering combustion-related topics of environmental technology, which may reduce pollution or conserve natural resources. In particular, papers are especially welcomed in the areas of flameless combustion, alternative fuel, bio-fuel, hydrogen technologies, and other combustion-related environmental technologies, as well as papers on the associated environmental impact.
- **Other topics in combustion and propellant research,** such as fire research, high-energy fuels, endothermic fuels, novel propellants, and in situ propellant production for planetary missions are also of interest.

Please direct questions to:

Ken H. Yu

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Space Exploration, Resources, and Colonization

The nation's Vision for Space Exploration encompasses robust human and robotic exploration missions beyond low Earth orbit towards realizing a robust civil space program and the eventual development of space settlements on the Moon and Mars. The exploration goals include learning about our past, improving life on Earth, and shaping our future, through scientific scrutiny, exploration, sound judgment, planning, and management. While the Apollo era shaped by the space race was widely popular and successful, the present environment presents unique challenges for the space program to be relevant and to captivate the next generation. Experience in space has shown that operations outside the atmosphere and on extraterrestrial surfaces frequently encounter serious and unique challenges. These include radiation effects on materials and humans, electrical charging, pervasiveness of lunar dust, hard vacuum, and significant thermal loads. New exploration strategies and technologies must be developed to address these challenges and support mission logistics for human and robotic exploration, power generation, and resource utilization. The yearning of people to travel into space, even in short sub-orbital flights, is an important first step towards future space colonization by humans. Space tourism represents an important commercial aspect of this endeavor as we develop technologies, measurable successes, and strong advocacy, to permanently move to new residences elsewhere in the solar system, hopefully within this century. Papers are invited that address the following specific topics in the wide Space Exploration and Colonization portfolio:

- Lunar and planetary environment and challenges to exploration
- Exploration strategies and mission logistics

- Surface mobility — robotic and human exploration
- Research enabled by lunar and martian environments
- Value proposition for the space program — applied space research tailored to present and future problems
- Space resource utilization — in situ resource utilization on lunar and martian bases
- Space tourism/adventure
- Space colonization
- Promising lunar commercialization
- Space land rights

Please refer questions to:

Narayanan (Ram) Ramachandran

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Systems Engineering

Papers in all areas of Systems Engineering are encouraged. All types of papers will be considered, including case studies, developmental work and technical analysis. Topics include but are not limited to Systems Engineering applications, integrated disciplines and technology, future trends and predictions in Systems Engineering, Systems Engineering education and research, and Systems Engineering life cycle processes and systems effectiveness.

Please direct questions to:

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Space Operations and Support

Papers are requested for all topic areas of space operations and ground support. Topics include but are not limited to original space operations research and reports in the areas of new technology, technology trends, operations procedure and practices, human factors, the space environment, standards, space policy/law, communications, and ground support.

Please direct questions to:

Jeff Laube

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Terrestrial Energy Applications of Aerospace Technology

The Terrestrial Energy Systems Technical Committee is sponsoring sessions on the use of aerospace technology in ground-power systems. Papers are solicited on development and application of technology common to the aerospace and terrestrial-energy communities. Experimental, computational, and theoretical papers dealing with fundamental and applied energy conversion technologies will be considered for presentation. Topics include, but are not limited to: combustion modeling and measurement; active and passive combustion control; unwanted combustion, fires and explosions, control of liquid and gaseous environmental pollution; typical energy power systems; alternative energy sources such as solar, wind, fuel cells, batteries, heat pumps, thermionic and thermoelectric devices; waste minimization and treatment including materials recovery and thermal destruction of solid and liquid waste; nano-energetic materials; alternative fuels; biofuels; fuel transformation to clean and high energy density fuels; power-system efficiency and economics; and global and national energy and environment issues.

Please direct questions to:

Suresh K. Aggarwal

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Thermophysics

The Thermophysics Technical Committee solicits papers on topics in thermophysics and heat transfer. Papers are solicited on topics related to all aspects of thermal energy transfer and aerospace applications therein. Contributions based on analytical, numerical and/or experimental studies are welcomed. Scientific and technical contributions are emphasized, rather than status reports on work in progress. Areas of specific interest include, but are not limited to:

- Aircraft/spacecraft thermal management
- Ablation
- Aerothermodynamics
- Cryogenics and cryogenic systems
- Direct simulation Monte Carlo methods
- Electronic and microelectronic avionics cooling
- Electronic thermal management
- Heat pipes, loop heat pipes, and innovative heat pipe designs
- Heat exchangers

- Heat transfer: computational, conduction, convection (free and forced), phase change, and radiation
- Heat transfer and cooling in turbomachinery
- High-speed flows
- Historical perspectives in thermophysics research
- Hypersonic and low density facilities
- Microgravity effects on high power two-phase thermal management systems
- Microgravity testing for aerospace applications
- Missiles thermal management
- Nonequilibrium flows
- Nonequilibrium radiation
- Nonintrusive diagnostics
- Particle-laden flow modeling and measurement
- Rocket plumes
- Propulsion
- Power systems
- Radiation analyses (surface properties)
- Radiators and heat rejection systems
- Spacecraft contamination
- Space environmental effects
- Spacecraft thermal management and modular spacecraft
- Surface catalysis
- Thermal contact conductance
- Thermal control
- Thermal protection systems
- Thermophysical properties

Emerging Topics:

- Integrated and multidisciplinary modeling and simulation
- Minimization of entropy production
- Micro-scale heat transfer and microfluidics
- MEMS and nanotechnologies
- Multiphase flows and heat transfer continuum methods for transition-to-rarefied flows
- Wireless thermal measurements

With your submission, please indicate your preferred session topic, choosing from the bulleted topic areas listed above. Each year, the Thermophysics Technical Committee has offered a Best Paper Award in both the Professional and Student Categories (with the student receiving a monetary award). Student submissions are strongly encouraged. Also, timely survey and review articles on the above topics are solicited. Authors are encouraged to submit their manuscripts, either before or after the meeting, to the *AIAA Journal of Thermophysics and Heat Transfer* for possible publication.

Please direct questions to:

Ab Hashemi

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11th Weakly Ionized Gases Workshop

The 11th Weakly Ionized Gases (WIG) Workshop will be held concurrently with the AIAA Aerospace Sciences Meeting & Exhibit. The workshop will consist of technical papers and invited presentations. Technical papers will be integrated into a series of eight to ten workshop sessions to be held throughout the week. Papers are solicited on broad topics related to the study of flight interactions with weakly ionized gases. Subject material for papers can range from basic R&D to applied and advanced technology. Papers regarding contemporary experiments, analytical and computational methods, new theory, results, test data, and conclusions are desired. Interdisciplinary papers and those that combine theory and analysis with experimental validation, with results and conclusions that can be directly applied, are of special interest. Survey papers and those that are of a historical perspective are also sought. Topics of interest include:

- Air/fuel plasma properties and interactions
- Internal and external plasma aerodynamics
- Non-equilibrium thermal and chemically reacting flows, including combustion
- Methods of on-board plasma generation
- Plasma-based drag reduction and flow control
- Shock attenuation in plasma flows
- Electromagnetic (EM) and magnetohydrodynamic (MHD) interactions and applications, including flow control and energy extraction
- Systems applications

Please direct questions to:

Campbell D. Carter

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23rd Symposium on Gravity-Related Phenomena in Space Exploration

The 23rd Symposium on Gravity-Related Phenomena in Space Exploration is being organized for January 2009 to explore gravity-related phenomena in technologies supporting human and robotic space exploration. The purpose of the symposium is to address specific technical problems associated with gravity-related phenomena that cross traditional science and technology discipline lines. The symposium organizers solicit papers describing specific technologies or technology development efforts in which gravity-related phenomena such as non-isothermal fluids, multi-phase fluids,

reacting systems, systems involving phase changes, etc. are involved. Technology areas may include cryogenic fluid systems, propulsion and power systems, life support and extra-vehicular activity systems, in-situ resource utilization and surface mobility systems, and other technologies that may be deployed in partial-gravity environments of lunar and planetary surfaces or the near-zero gravity environment of cis-lunar or interplanetary space. The organizers welcome papers from the traditional fundamental science disciplines of combustion, fluid physics, materials science, biotechnology, and fundamental physics in which gravity plays a role. Papers are solicited from academic, commercial, and governmental institutions including international contributions.

A Best Paper and Best Student Presentation will be selected by the Microgravity and Space Processes Technical Committee from among the participants in the symposium.

Please direct questions to:

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28th ASME Wind Energy Symposium

Papers are solicited for a broad range of topics related to wind energy conversion, both land-based and offshore, as well as ocean energy conversion. Topics of interest include, but are not limited to:

- Aeroacoustics
- Airfoil, blade, and wake aerodynamics
- Atmospheric physics and inflow
- Hybrid and off-grid systems, including wind-hydrogen concepts and systems
- Field and laboratory testing, including non-destructive testing
- Power and structural controls
- Structural dynamics, loads, and response
- Turbine design and development
- Design loads and certification
- Fatigue, failure and reliability
- Innovative components and subsystems
- Materials and manufacturing processes
- Site-specific design and optimization
- Utility and grid integration

Please direct questions to:

Maureen Hand

National Renewable Energy Laboratory
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Golden, CO 80401
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Society and Aerospace Technology

The Society and Aerospace Technology Committee examines the societal benefits of aerospace technologies, past, present and future. The **Delta Forum** provides a multi-disciplinary perspective on current issues challenging the aerospace industry and their effect on society. The **Interactions With Society** series reveals the aerospace-enabled society, unwrapping the societal benefits of aerospace technologies. The **Astrosociology** series examines the challenges of building a spacefaring society. Three sessions of invited presentations and technical papers are planned for the following topics:

The Delta Forum: Environmental Considerations for "Green" Aerospace

Papers are solicited that examine how recent and emerging environmental considerations for emissions control, noise control, and related legal and business changes have affected and will affect the aerospace industry. Topics of interest include noise pollution, emissions control, waste management, ecosystem impacts, orbital debris, climate monitoring, and environmental security. Papers should examine one or more of the engineering and technology management aspects of these issues, such as multidisciplinary design considerations, economic and legal considerations, programmatic issues for integrating environmental concerns into aerospace systems engineering, and societal benefits and impacts related to aerospace environmental considerations. Of particular interest are case studies that show how technical or management problems related to environmental considerations, such as emissions trades, are being addressed and resolved, in a commercial, civil, or military setting.

Please direct questions to:

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E-mail: timothy.howard@noaa.gov

Interactions With Society: Aerospace and the First Responder

Papers are solicited that examine how aerospace technologies and systems are used to support First Responders, such as law enforcement, fire and rescue, homeland security, and marine search and rescue. Topics of interest include aerospace vehicles and

systems to support First Response, tools and equipment that derive their heritage from aerospace materials and concepts, integrated disaster management using aerospace resources such as aircraft, helicopters, UAVs, and satellites, threats from new materials to combat aviation fires, and improvements to enhance human survivability in aircraft crashes. Of particular interest are case studies showing the application of aerospace technologies to recent emergency events. Papers are especially welcome from authors outside the traditional aerospace disciplines.

Please direct questions to:

John A. Christian

The University of Texas at Austin, Aerospace Engineering & Engineering Mechanics
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Astrosociology: First Response in a Spacefaring Society

Papers are solicited that examine theory and research of space and society, space travel, and settlements, related to the ability to conduct emergency response, rescue, fire response, and law enforcement in the context of an interplanetary society. Topics of interest include the operational considerations affecting First Response in space, or in a Moon-Mars base setting, equipment design, integrating human-safety considerations into space systems, innovations in equipment, new technologies needed, and the logistics of an interplanetary rescue scenario. Of particular interest are case studies that provide insight into safety and rescue considerations of past and current space programs, and how they may evolve over the next 50 years and across the solar system. Papers are especially welcome from authors outside the traditional aerospace disciplines.

Please direct questions to:

Marilyn Dudley-Flores

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