AHS International
65th Annual Forum & Technology Display
May 27-29, 2008
Gaylord Texan Convention Center • Grapevine, TX

Call for Papers

Galloping Towards New Vertical Flight Advancements

The AHS 65th Annual Forum & Technology Display will take place May 27 – 29, 2009 at the Gaylord Texan Convention Center and Resort, Grapevine, Texas. The theme of next year's conference is "Galloping Towards New Vertical Flight Technology."

The Forum is the premiere event to present and discuss advances in every area of vertical flight technology, design and its applications. Technical sessions will be sponsored by each of the Society's Technical Committees.

The Forum Technical Chair for this event is Professor Farhan Gandhi, The Pennsylvania State University, (814) 865-1164; fax: (814) 865-7092; e-mail: fgandhi@engr.psu.edu The Forum Deputy Chair is Dr. Ashish Bagai, Sikorsky Aircraft Corp., (203) 386-5193; fax: (203) 386-5925; e-mail: abagai@sikorsky.com

Abstracts must be received no later than Tuesday, September 30, 2008. Late submittals will be difficult or impossible to include in the evaluation process. Abstracts are to be submitted to the web site http://www.miracd.com/AHS2009. Abstracts may not be larger than 2MB and should be submitted in PDF format (the web site can convert most files to PDF). They should be approximately 1,000 words, present the status of the background data to be used, summarize figures and illustrations to be used (with samples), and include a summary of important conclusions. Please note that several technical committees have guidelines for abstracts, so authors should read and follow the guidelines noted under the technical area of interest.

Abstracts will be accepted in a variety of technical disciplines including: **Acoustics; Advanced Vertical Flight; Aerodynamics; Aircraft Design; Avionics & Systems; Crash Safety; Crew Stations & Human Factors; Dynamics; Flight Simulation; Handling Qualities; History; HUMS/CBM; Operations; Product Support; Propulsion; Structures & Materials; Systems Engineering; Test & Evaluation;** and **Uninhabited VTOL Aircraft & Rotorcraft.**

Submittal of an abstract is a professional commitment: if the abstract is accepted, the author commits to prepare a final paper, attend the Forum and make a presentation based on that final paper. If an author finds that he or she will be unable to make the presentation, then it is incumbent upon him or her to find a substitute presenter. Abstract acceptance will be based in part on the submitter's prior history in following through with their previous commitments. Papers presented previously are not eligible for consideration. This ineligibility includes papers or presentations (or facsimiles thereof) that are submitted for presentation at a national meeting of any professional organization at any time prior to the Forum. Authors may not be the presenter on more than two papers at the Forum.

Other Important Dates in the Process:

Authors will be notified of paper selection by Friday, November 14, 2008.

Papers must be submitted electronically to the Mira web site by Wednesday, March 4, 2009.

The AHS Forum is open to an international audience. As such, it is the policy of the AHS that all papers submitted for inclusion in the Proceedings and all presentations made at the Forum are completely unrestricted. That is, they are not allowed to contain any proprietary, sensitive, classified, or otherwise controlled information. Authors should make note of this policy when submitting abstracts. It is the author's responsibility to obtain appropriate clearances, which sometimes takes several weeks (or even months), of their abstract, paper, and presentation in order to meet all deadlines.

Alfred Gessow Forum Best Paper Award

TThe author(s) of the best paper presented at the Annual Forum, as determined by the Committee Chairs, Session Chairs and the Technical Council will receive inscribed plaques(s). To be considered, the paper must be submitted to the Mira web site by the final deadline for the AHS Forum Proceedings. The winning author is invited to present his or her paper at the European Rotorcraft Forum (ERF). The ERF organizers provide complimentary registration and accommodations to the presenting author, as well as a copy of the ERF Proceedings.

No Paper – No Podium Rule

A general "No Paper – No Podium" policy will be in effect for all contributed papers. Any paper received after the final submittal date will not be included in the official printed or CD-ROM version of the AHS 65th Annual Forum Proceedings. Any authors who do not submit their paper by the Proceedings deadline must submit a PDF of the paper to AHS International headquarters and to their session chairs at least 21 days prior to the start of the conference (May 6, 2009) in order to be allowed to make their presentations at the Forum. These papers will not be included in the official CD-ROM nor in the printed Proceeding and thus are NOT eligible for consideration for the Alfred Gessow Forum Best Paper Award. Authors will not be scheduled to speak if their paper has not been properly submitted for the Proceedings or to AHS headquarters at least 21 days (May 6, 2009) prior to the Forum.

Registration

Presenters of all papers to be delivered at technical sessions, both regular and special sessions, are eligible to pay reduced Forum speaker registration fees, whether members or non-members of AHS.

Annual Forum Technical Sessions

Acoustics

Papers are invited addressing recent advancements in the study of internal and external rotorcraft noise generation, propagation and control (active and passive). Topics of interest include, but are not limited to: current research contributing to a basic understanding of fundamental aerodynamic noise sources such as rotor harmonic noise, impulsive noise and broadband noise as well as interaction between various rotorcraft noise sources for both manned and unmanned rotorcraft. Appropriate topics include rotorcraft component and full system noise prediction methodology development and validation, wind tunnel and full scale flight test acoustics measurements, new procedures

for acoustic data acquisition, reduction or analysis, active and passive rotor noise reduction techniques and noise abatement flight operations, acoustic propagation models and psychoacoustics analysis of rotorcraft noise. Papers dealing with the development or implementation of national or international civil noise regulations are also encouraged. Appropriate interior noise topics include the application of finite element and statistical energy analysis based techniques to predict the complex noise field inside rotorcraft cabins, active noise control applications for rotorcraft cabins and crew stations, and concepts in engine and transmission noise reduction.

Session Chair: Thomas Zientek, The Boeing Co.; (610)) 591-2402; e-mail: Thomas.a.zientek@boeing.com; *Session Co-Chair:* Randolph Cabell, NASA Langley Research Center; (757) 864-5266; e-mail: Randolph.H.Cabell@nasa.gov

Advanced Vertical Flight

Papers are sought that focus on advanced vertical flight concepts beyond the conventional helicopter to include the tilt wing, tilt rotor, and slowed/stopped rotor concepts, as well as non-rotorcraft systems such as lift fans, lift engines, lift or lift/cruise vectoring nozzles, thrust augmentation devices, and attitude (reaction) control systems. Of special interest are papers that treat piloted flight simulation and full and model-scale ground, wind tunnel and flight-testing of these vehicles. Also of interest are papers that address conceptual air vehicle design, flight systems, systems integration, and flight path control for advanced vertical flight systems. In addition, papers are encouraged that concentrate on requirements, related emerging and enabling technologies, and operations and maintenance of such aircraft.

Session Chair: Dr. Mark A. Couch, Institute for Defense Analysis, (703) 845-2530; e-mail: mcouch@ida.org; *Session Co-Chair*: Kevin Lewelling, Lockheed Martin Aeronautics; (661) 572-2423; e-mail: kevin.w.lewelling@lmco.com.

Aerodynamics

Papers are invited that address recent accomplishments in all areas of rotorcraft and vertical and/or short take-off and landing (V/STOL) aerodynamics. Topics of interest include, but are not limited to: computational fluid dynamics techniques, analytical methodology, experimental aerodynamic and/or flight test results, flow visualization methods and results, correlation, aerodynamic design methods for components or complete aircraft, unique aerodynamic modeling, interactional aerodynamics, low Reynolds number aerodynamics, aerodynamic flow control for components or complete aircraft, and computations or measurements of high angle of attack, unsteady, or vortex flows. Abstracts exceeding 5 pages (10 pt., single-spaced, 1 inch margins, all-inclusive) will not be evaluated. **Abstracts that fail to adhere to these format criteria will not be reviewed.**

Session Chair: Dr. Gloria Yamauchi, NASA Ames Research Center, (650) 604-6719; e-mail: gyamauchi@mail.arc.nasa.gov; *Session Co-Chair*: Dr. Mahendra Bhagwat, U.S. Army, Ames Research Center, (650) 604-2893, e-mail: bhagwat@merlin.arc.nasa.gov

Aircraft Design

Papers are invited from industry, government, academia, and operators on all aspects of rotary wing or vertical flight aircraft designs, manned and unmanned, including, but not limited to: design and fabrication of dynamic systems or components, airframe components, or entire vehicles; conceptual, preliminary or product design development tools and processes; and analytical modeling leading to advanced rotary wing or vertical flight technologies. Papers addressing improvements to aircraft/component performance, mission capabilities, safety, affordability, and/or cost effectiveness are encouraged.

Session Chair: Dr. Richard Markiewicz, dstl, (44) 1252-451792; e-mail: rhmarkiewicz@dstl.gov.uk; *Session Co-Chair:* Dr. Martin Sekula, NASA Langley Research Center, (757) 984-1269; e-mail: martin.k.sekula@nasa.gov

Avionics & Systems

The AHS Avionics & Systems Technical Committee calls for papers that address the following:

- techniques which improve the efficiency of developing complex software intensive avionics systems;
- partitioned architecture of fielded mission and cockpit management systems, and the success or challenge associated with integrating such systems after aircraft deployment;
- evolving definitions and options for defining network structures that will provide high bandwidth, worldwide, connectivity to serve as the information backbone for net-centric, tactical information sharing;
- descriptions of applications where commercial off-the-shelf hardware and software have been successfully employed in tactical helicopters with minimal modification;
- sensors and systems that provide true 'see-through' capability in sand, dust, rain, and other obscurants – airborne examples of field trials and operational solutions are of particular interest;
- the current status and future expectations for manned and unmanned surveillance and weapons platforms, especially as interfaced at higher modes to and from helicopters;
- methods to achieve harmonization of certification requirements which results in systems solutions acceptable to FAA, EASA and military regulators;
- fly-by-wire and fly-by-light flight control system architectures and the critical requirements imposed upon the supporting avionics systems and sensors;
- weapons systems fire control architectures, software and electronics.

Session Chair: Ryland Barlow, Technology Applications Program Office (TAPO), (757) 878-0730 X233, e-mail: ryland.barlow@us.army.mil; *Session Co-Chair*: Allen Walker, U.S. Army Applied Technology Directorate, (757) 878-2516, e-mail: allen.d.walker@us.army.mil

Crash Safety

Papers are invited for all aspects of crashworthiness and aviation safety relating to rotorcraft, UAVs, and other V/STOL aircraft. This applies to military, civil, emergency medical services, and law enforcement applications. Emphasis is given to the recent development of new safety concepts; minimizing occupant post-crash injuries and fatalities; new design criteria development; system integration analyses that enhance occupant safety while minimizing aircraft systems cost and weight effects and to computational techniques that have the potential to provide low cost design validation. Crashworthiness topics of interest include, but are not limited to, advancements relating to energy absorbing systems such as landing gears, composite airframe structures, seats and internal/external inflatable devices; restraint systems, human tolerance and injury criteria; post-impact flotation; crashworthy fuel systems to include range extension tanks; modeling and simulation considering water, soil, and rigid impact surfaces; testing and validation; and methods of accident investigation data retrieval, collection and analyses. Other safety topics of interest include, but are not limited to, use of accident investigation data to define crash safety technology deficiencies and to support system safety analyses.

Session Chair: David S. Friedmann, U.S. Army Aviation Applied Technology Directorate (AATD), (757) 878-2159; e-mail: david.friedmann@us.army.mil

Crew Stations & Human Factors

Papers are invited for all aspects of human factors engineering relating to rotorcraft, unmanned aerial vehicles, and other V/STOL aircraft, including crew systems design, pilot vehicle interface, maintainer interfaces and accessibility, ground support, and air traffic control. Areas of interest range from concept formulation through design, development and evaluation. Other man-machine interfaces including mission crew member roles, maintainer roles, ground support, equipment design, air traffic control, and cost of ownership considerations are also crucial factors in delivering safe and effective products to the customer and provide fertile ground for human factors engineering applications. Suggested topics include the role of crew systems integration within the concurrent engineering environment; use of front-end analysis defining user roles, functional allocations and measures of effectiveness; integrated crew station design; innovative control and display concepts; effective mission management techniques; aural, visual and kinesthetic display concepts; prototyping of conceptual designs; virtual reality displays; synthetic vision; tactical decision aids and associated systems; information management; and the interface of crew systems with other

vehicle subsystems. Computer aided/assisted tools which support the design or analysis in any of the above functions are also of considerable interest. Papers may emphasize analytical, laboratory, simulation, operational or flight test results. Experimental results along with attendant conclusions or recommendations for crew station design are particularly encouraged.

Session Chair: Margaret (Meg) MacIsaac, Sikorsky Aircraft Corp., (203) 386-7760; e-mail: mmacisaac@sikorsky.com; *Session Co-Chair:* Roy Wagner, Lockheed Martin Systems Integration; (607) 751-2117; e-mail: roy.wagner@lmco.com

Dynamics

Papers are invited in all areas related to rotorcraft dynamics and aeroelasticity, including rotor response and stability, dynamics of coupled rotor/airframe systems, load prediction, vibration reduction, analytic modeling techniques, and experimental measurements. Papers reporting on the development of rotorcraft dynamic or aeroelastic analyses and experimental validation, using model or full-scale test databases, are especially encouraged. New experimental results, when supported by sufficient documentation, are also of particular interest, as are advances in dynamics technology and design methodologies. Papers discussing dynamics aspects of emerging technologies such as on-blade controls, UAV/MAVs, heavy lift, and unconventional V/STOL aircraft are also welcome. Priority will be given to completed programs where significant conclusions are substantiated and the results contribute to advancing state-of-the-art rotorcraft design and analytical modeling. Please indicate in your abstract the current status (completed versus ongoing work).

Session Chair: Dr. Hyeonsoo Yeo, U.S. Army Aeroflightdynamics Directorate, (650) 604-6168; e-mail: hsyeo@mail.arc.nasa.gov; *Session Co-Chair*: Claudio Monteggia, AgustaWestland, (39) 0331-225057, e-mail: claudio.monteggia@agustawestland.com

Flight Simulation

The AHS Flight Simulation Technical Committee is looking for papers and authors who would like to:

- Advance and demonstrate the use of simulation as an essential foundation for rotorcraft and Vertical Take-Off and Landing engineering disciplines;
- Determine the overall simulator/component fidelity and system/subsystem fidelity and pilot cueing requirements for specific air vehicle configurations and /or mission tasks;
- Focus on safety and demonstrate commercial or military flight operations quality assurance;
- Explore advanced or novel simulation technologies, especially in-flight and real time and hypertime simulation; Explore the use of simulation to evaluate advanced or novel rotorcraft concepts and applications in stand alone of distributed environments;
- Address applications using ADS-33D/E, FAA 120-63, or JAR-STD 1H guidelines and issues related to rotorcraft simulation certification;
- Apply simulation to UAVs, slung loads, urban operations, and shipboard operations;
- Address specialized topics relating to verification and validation methodologies;
- Demonstrate quantitative cost savings using simulation compared to traditional approaches toward design, flight-testing and training; or
- Demonstrate the use of simulation to support virtual engineering life-cycle concepts.

Session Chair: Rick Simmons, FAA, (817) 222-5178; e-mail: rick.simmons@faa.gov; *Session Co-Chair*: Mark Dreier, Bell Helicopter Textron, Inc., (817) 280-5890, e-mail: mdreier@bellhelicopter.textron.com

Handling Qualities

Papers are invited that address all factors of rotorcraft and V/STOL handling qualities from research through engineering design and development to civil certification and military qualification. Handling Qualities encompasses aircraft characteristics which govern the ease and precision with which a pilot is able to perform tasks in support of an aircraft mission. This includes basic vehicle stability and control/response characteristics and the pilot-cockpit-vehicle interface. Papers are encouraged on topics that address significant results from flying qualities, applications of mathematical modeling to rotorcraft design, development and use of handling qualities flight test data, rotorcraft component integration, operational needs and experience, safety considerations, night and adverse weather requirements, terminal area operations, the impact of handling qualities on safety considerations, and development of advanced flight control systems.

Session Chair: Joseph Horn, Penn State University, (814) 865-6434; e-mail: joehorn@psu.edu,; *Session Co-Chair*: Dave Miller, The Boeing Co., (610) 591-5882, e-mail: david.g.miller@boeing.com

Health and Usage Management Systems (HUMS) – Condition Based Maintenance (CBM)

Papers are solicited in the following topics within the area of rotorcraft health and usage management and condition based maintenance: advanced monitoring technologies, including structural health monitoring, sensors, algorithms, processing methods, data fusion and mining; life and usage assessment; open system interfaces and system architectures; integration into autonomous logistics; tools and models; implementation and certification of HUMS for maintenance credits; diagnostic and prognostic validation methodology for health and usage algorithms; approaches to reduce HUMS weight and costs; and comparisons of HUMS benefits and costs, operational quality and maintenance savings.

Session Chair: Mark Davis, Sikorsky Aircraft Corp., (203) 386-7638; e-mail: madavis@sikorsky.com; *Session Co-Chair:* Mike Augustin, Bell Helicopter Textron, Inc., (817) 280-8719; e-mail: maugustin@bellhelicopter.textron.com

History

The AHS History Committee seeks scholarly papers and first-hand accounts that facilitate the preservation and understanding of vertical flight history. Of particular interest are papers documenting important but not well-known developments in vertical flight technologies or vehicles, rediscovery of forgotten pioneers, or events involved in understanding specific phenomena. Personal involvement in the subject matter or extensive research and documentation are highly desirable. Exceptions can be made from the no-paper/no-podium policy for first-hand accounts.

Session Chair: Bruce Charnov, Hofstra University, (516) 463-5326; e-mail: mgbbhc@hofstra.edu

Integrated Manufacturing Process & Control Technology

Papers are invited which cover one or more of the following areas: innovative (advancing or state-of-the-art) manufacturing methods and technologies, new or unusual quality assurance and reliability applications or procedures, productivity improvements, environmental issues, and cost reduction techniques. Papers from industry, government and academic institutions are solicited.
Session Chair: Charles W. Hughes, Jr., The Boeing Company, (480) 891-6363; e-mail: charles.w.hughes-jr@boeing.com

Operations

Papers are invited that address military and civil rotorcraft operations and technological solutions in the following areas: concepts of operations, tactics, techniques, procedures, tools, technologies and methodologies, rotorcraft survivability, vulnerability and operational effectiveness analysis, electronic decision aiding to operators, command, control, communications techniques, intelligence and data gathering applications, supportability techniques, and extreme weather operations techniques.

Session Chair: Rupert Seals, The Boeing Co., (610) 591-3092; e-mail: rupert.seals@boeing.com; *Session Co-Chair:* Suzan DeGarmo, Sikorsky Aircraft Corp., (203) 383-5858; e-mail: Suzan.DeGarmo@sikorsky.com

Product Support

Papers are invited addressing all aspects of rotorcraft supportability. The Product Support Charter is "to influence the industry to implement product support enhancements by recognizing the diversity of requirements in new and existing fleets. The Committee will promote compatible design concepts that will contribute to the operator's supportability, safety and economy of operation."

Papers may be presented from the perspective of the V/STOL manned and unmanned air vehicle, powerplant, ground support equipment or mission equipment manufacturer. Some of the supportability

considerations in product introduction may be entirely new to the user and/or manufacturer, requiring new and innovative support concepts. Key elements are Performance Based Logistics (PBL), Condition Based Maintenance (CBM), Soldier Focused Logistics (SFL), Contractor Logistics Support (CLS), site activation, pre-operational support planning, service center support, training facilities, lessons learned from previous fieldings, environmental conditions, support within budgetary constraints, pre-production prototyping and field evaluation programs. Because of the nature of the subjects presented during the Product Support Technical Session of the AHS Forum, written papers are encouraged but are not mandatory to support your presentation.

Presenters are reminded that they must submit written papers for publication in the AHS Forum Proceedings in order to be eligible for the Alfred Gessow Forum Best Paper Award.

Session Chair: John M. Guasto, The Boeing Co., (610) 591-2252; e-mail: john.m.guasto@boeing.com; *Session Co-Chair:* Ty Genteman, Aviall, (972) 586-1585; e-mail: tgenteman@aviall.com

Propulsion

The AHS Propulsion Committee invites papers that present new information on propulsion for rotorcraft and other vertical flight aircraft, including unique propulsion challenges of UAVs. Recommended topics include turbo-shaft engines, rotorcraft drive systems, other propulsion and power generation concepts, propulsion system integration, and related airframe/engine technologies. Of specific interest are papers addressing recent approaches to improved safety, improved propulsion systems performance and operational characteristics, advanced power concepts, reduced operating costs, weight or management requirements, integrated/advanced electronic control systems (to include sensors), installation concepts, integration considerations, environmental impacts and requirements, the use of simulation to enhance propulsion systems and subsystems, starting systems, fuel systems, hydraulic systems, pneumatic systems, etc. We also request papers that detail design tools that support the above technologies as well as innovative validation/testing methods aimed at reductions in development/qualification costs. Papers focusing on innovative configurations for V/STOL aircraft, gear and bearing technology, shafting advancements, analysis materials and processing, and new technology to reduce weight, cost, noise and maintenance to improve reliability for both engines and drive systems are requested. Variable speed/2-speed concepts are also encouraged. Vibration monitoring and control, health and life usage monitoring technologies for engine and drive train are of interest.

Session Chair: Sam Spring, GE Aircraft Engines, (781) 594-8545; e-mail: samuel.spring@ae.ge.com; *Session Co-Chair:* William Storey, Goodrich Pump Engine Control Systems, (860) 523-2219; e-mail: bill.storey@goodrich.com

Structures & Materials

Papers are invited that address the development, design, analysis, testing, service experiences, or novel application of structures and materials applicable to manned and unmanned rotorcraft, powered lift and fixed-wing V/STOL aircraft. Topics of interest are durability and damage tolerance, fatigue and fracture mechanics, advanced metallic and composite materials and structures, probabilistic and reliability methods, repair concepts and methodology, diagnostic/prognosis of remaining useful service life, stress and finite element analysis, and structural design criteria. In general, related topics on affordability, weight reduction, and stress prediction accuracy improvements are desirable. Papers on practical applications of high strain, high durability, or "smart" materials to advanced structural concepts for improved performance or affordability are also solicited.

Session Chair: Tim Davis, U.S. Army Aviation Applied Technology Directorate, (757) 878-4035; e-mail: tim.davis3@us.army.mil; *Session Co-Chair:* Dr. Suresh Moon, L-3 Communications, (301) 863-2209, e-mail: suresh.moon@l-3com.com

Systems Engineering

The AHS Systems Engineering Technical Committee is inviting papers that will promote the advancement of the practice of system design, development, integration and management, across the multiple disciplines and specialty areas associated with the engineering of systems within the AHS technical community. Papers of interest can range from understanding and documenting of customer requirements and design, through manufacturing and field support.

Specific areas for consideration may include:

- Requirements development and management
- System architecture, especially at the system-of-system level
- System modeling and simulation
- System Verification and Validation
- Systems reliability
- Program/project management for system-of-systems
- Risk management
- Systems engineering processes
- Systems engineering quality management
- Systems engineering education and training
- "Systems thinking" benefits

Session Chair: Dr. Daniel P. Schrage, Georgia Institute of Technology, (404) 395-4456; e-mail: Daniel.schrage@ae.gatech.edu; *Session Co-Chair:* Bruce D. Oestreich, The Boeing Company. (610) 591-3410; e-mail: bruce.d.oestreich@boeing.com

Test & Evaluation

Papers are invited that address all aspects of rotorcraft, V/STOL and UAV testing, including evaluation of components and subsystems, as well as those specifically discussing flight and wind tunnel testing. Papers showing new and insightful ways of innovative flight procedures, new test techniques, and novel control systems are highly desirable. The Test & Evaluation Committee strongly encourages papers submitted covering the operational and environmental area of low-speed flight and inherent problems associated with rotary wing platforms.

Session Chair: Philip Alldridge, Sikorsky Aircraft Corp., (561) 775-5179; e-mail: palldridge@sikorsky.com; *Session Co-Chair:* Ronald Barry Walden, NAVAIR, (301) 342-0285; e-mail: Ronald.walden@navy.mil

Uninhabited VTOL Aircraft & Rotorcraft

The Uninhabited VTOL and Rotorcraft Aerial Vehicle Committee continues to focus on new technologies for VTOL and Rotary Wing UAV systems with a balanced consideration of five broad areas: Autonomy and Operability; Reliability and Robustness; Payloads, Sensors and Data Links; Performance; and Survivability. Papers are invited in any or all of these areas. Topics of interest include, but are not limited to, UAV guidance, navigation and control, obstacle avoidance, fault tolerant and reconfigurable control, autonomous operation and control, architectures for autonomy, collaboration and communication between multiple UAVs, manned/unmanned teaming, multiple UAV data collection and data fusion, modeling and simulation, control oriented vehicle designs, etc. These and other aspects associated with VTOL and Rotary Wing Micro Air Vehicles are also of interest.

Session Chair: Chris Mentzer, Southwest Research Institute, (210) 522-4240; e-mail: cmentzer@swri.org; *Session Co-Chair:* Joerg Dittrich, DLR, 0531 295-2982; e-mail: joerg.dittrich@dlr.de