

40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit

11 - 14 Jul 2004 Broward County Convention Center Fort Lauderdale, Florida

Monday Morning / 12 July 2004

0800 - 0900

Plenary Session: Keynote Address

Floridian Ballroom

The 2004 Joint Propulsion Conference Keynote Address will be given jointly by: Walter Bylciw, President, Pratt & Whitney Space Propulsion and Russian Operations; James Kennedy, Director, NASA John F. Kennedy Space Center; and George Ebbs, President, Embry-Riddle Aeronautical University.

Monday Morning / 12 July 2004

0900 - 1100

Shuttle Return to Flight – Status and Implementation Plans

Floridian Ballroom

As the safe return of the Space Shuttle Program to flight approaches, the world continues to closely monitor its progress. This panel session will bring together a NASA Space Shuttle Program Deputy, an astronaut, a U.S. Senator (invited) and industry officials to discuss their perspectives on the resumption of shuttle flights. Aviation Week & Space Technology Senior Editor Craig Covault will moderate this panel session and bring burning issues to the forefront.

Panelists:

Michael C. Kostelnik (ret. Air Force Major General), NASA, Deputy Associate Administrator for Shuttle and International Space Station Programs
Bob Crippen, Former Astronaut and Former Director of Kennedy Space Center
Howard DeCastro, United Space Alliance, Vice President, Program Manager
U.S. Senator Bill Nelson (invited)

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3408>.

Monday Morning / 12 July 2004									
Session 1-ABP-1				Air Breathing Propulsion for High Speed Flight					316
Chaired by: J. DATKO, Air Force Research Laboratory, Wright-Patterson AFB, OH, and L. BURNS, Universal Technology Corporation, Springboro, OH									

Monday Morning / 12 July 2004								
Session 2-ABP-2				Engine Systems - Analysis & Test				317
Chaired by: C. ARANA and B. KIEL, Air Force Research Laboratory, Wright-Patterson AFB, OH								
0900 AIAA-2004-3306 Experimental Investigation and Numerical Simulation of Secondary Chamber Flow in SDR J. Hu, National University of Defense Technology, Changsha, China (prc)	0930 AIAA-2004-3307 Computational and Experimental Study of NOx Formation in Hydrogen- Fueled Pulse Detonation Engines S. Yungster, Ohio Aerospace Institute, Cleveland, OH	1000 AIAA-2004-3308 Heat Exchanger Influence on Off- Design Performances of Regenerative Jet Engines R. Andriani, Polytechnic of Milan, Milan, Italy	1030 AIAA-2004-3310 Technology Demonstration of ATR with a Ramjet Test Facility Y. Shimada, Technical Research and Development Institute, Japan Defense Agency, Tachikawa, Japan	1100 AIAA-2004-3311 Performance Cycle Analysis of a Two-Spool, Separate-Exhaust Turbofan with Interstage Turbine Burner K. Liew, Michigan Technological University, Houghton, MI				

Monday Morning / 12 July 2004							
Session 3-ABP-3		Propulsion System Development I					318
Chaired by: R. BRUCKNER, NASA Glenn Research Center, Cleveland, OH, and J. SHEELEY, Aerospace Testing Alliance/AEDC, Arnold AFB, TN							
0900 AIAA-2004-3314 Optimum Propulsion System Selection for Long Range Civil Transport Aircraft S. Sane, Indian Institute of Technology, Bombay, Mumbai, India	0930 AIAA-2004-3315 Initial Development and Calibration of a Design Guide for Jet Noise Reduction J. Stone, Modern Technologies Corporation, Middleburg Heights, OH	1000 AIAA-2004-4227 Technological Developments in European Programs Aimed at Reducing Air Transport Noise and Emissions A. Coutrot, Snecma Group, Paris, France	1030 AIAA-2004-4189 A Propulsion System Analysis of Oil Free Turbomachinery for Aviation Turbofan Engines R. Bruckner, NASA Glenn Research Center, Cleveland, OH	1100 AIAA-2004-4204 Development of Mixing Analogy for Investigation of Injectant Mixing in Supersonic Flow A. Gonor, Hampton University, Hampton, VA	1130 AIAA-2004-4208 A Study on New Ramp Injectors with Slotted Nozzle for Improvement of Supersonic Mixing K. Inoue, Kyushu University, Fukuoka, Japan		

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3045>.

Monday Morning / 12 July 2004**Session 4-ECS-1****Energetic Component Performance****209**

Chaired by: B. NEYER, PerkinElmer Optoelectronics, Miamisburg, OH, and R. SAULSBERRY, White Sands Testing Facility, Las Cruces, NM

0900
AIAA-2004-3318
Exploding Pyrotechnic
Myths Part I: Reliable
SMDC Energy Transfer

J. Glass, PSEMC,
Hollister, CA

Monday Morning / 12 July 2004**Session 5-EDU-1****University Propulsion Programs****304**

Chaired by: R. FREDERICK, University of Alabama in Huntsville, Huntsville, AL, and R. SANTORO, Pennsylvania State University, University Park, PA

0900
AIAA-2004-3322
University Propulsion
Programs at Penn State

R. Santoro ,
Pennsylvania State
University, University
Park, PA

0930
AIAA-2004-3323
University Propulsion
Programs at the
University of Alabama in
Huntsville

C. Hawk, University of
Alabama in Huntsville,
Huntsville, AL

1000
AIAA-2004-3324
Propulsion Educational
Programs and Facilities
at Purdue University

S. Heister, Purdue
University, West
Lafayette, IN

1030
AIAA-2004-3326
University Propulsion
Programs at Auburn
University

W. Foster, Auburn
University, Auburn, AL

1100
AIAA-2004-3325
University Propulsion
Programs at Georgia
Tech

J. Jagoda, Georgia
Institute of Technology,
Atlanta, GA

Monday Morning / 12 July 2004**Session 6-EP-1****Electric Propulsion Overview****Palm A & B**

Chaired by: F. WILSON, Aerojet, Redmond, WA

0900
AIAA-2004-3328
An Overview of Electric
Propulsion Activities at
NASA

J. Dunning, NASA
Glenn, Cleveland, OH

0930
AIAA-2004-3329
Electric Propulsion in
ESA

G. Saccoccia, European
Space Agency,
Noordwijk, The
Netherlands

1000
AIAA-2004-3330
Overview of Electric
Propulsion Activities in
Russia

S. Tverdokhlebov,
TSNIIMASH, Moscow,
Russia

1030
AIAA-2004-3331
Overview of Major U.S.
Industrial Electric
Propulsion Programs

R. Myers,
Aerojet-Redmond,
Redmond, WA

1100
AIAA-2004-3332
Review of the EP
Activities of US
Academia

L. King, Michigan
Technological
University, Houghton, MI

1130
AIAA-2004-3334
A Critical History of
Electric Propulsion: The
First Fifty Years (1906-
1956)

E. Choueiri, Princeton
University, Princeton, ,
NJ

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3308>.

Monday Morning / 12 July 2004**Session 7-HIS-1****Space and Aviation History****220**

Chaired by: J. BLANTON, GE Aircraft Engines, Cincinnati, OH, and I. HALLIWELL, Modern Technologies Corporation, Middleburg Heights, OH

0900 AIAA-2004-3335 The Persistent Occurrence of Number Three in the History of Space Mechanics M. Ananthasayanam, Indian Institute of Science, Bangalore, India	0930 AIAA-2004-3337 The Long and Illustrious Life of the Aerobee Rocket - From Probing the Earth's Atmosphere to the Edge of Space to Evaluating Underwater Launch Concepts C. Ehresman, Purdue University, West Lafayette, IN	1000 AIAA-2004-3339 Leading Russian Liquid Rocket Engines Company (to 75th Anniversary of NPO Energomash) B. Katorgin, NPO Energomash, Khimki, Russia	1030 AIAA-2004-3336 The History of Hurricane Mesa Test Facility H. McSpadden, Goodrich/UPCO, Phoenix, AZ	1100 AIAA-2004-4228 A Brief History of Rolls-Royce in the United States D. Jensen, Rolls-Royce Heritage Trust, Indianapolis, IN			
---	---	--	---	--	--	--	--

Monday Morning / 12 July 2004**Session 8-HYP-1****Ramjet/Scramjet Engine System Analysis Design & Test****223**

Chaired by: R. MERCIER, Air Force Research Laboratory, Wright-Patterson AFB, OH, and R. FAULKNER, Pratt & Whitney Space Propulsion, West Palm Beach, FL

0900 AIAA-2004-3341 Gas- sampling Survey from Exhaust Flows in Scramjet Engines at Mach- 6 Flight Condition T. Hiraiwa, Japan Aerospace Exploration Agency, Kakuda, Japan	0930 AIAA-2004-3343 Scramjet Optimization for Maximum Off-Design Performance R. Starkey, University of Maryland, College Park, MD	1000 AIAA-2004-3344 LEA Flight Test Program - Status in 2004 F. Falempin, MBDA, Chatillon, France	1030 AIAA-2004-3345 Ground Testing of the HyShot Supersonic Combustion Flight Experiment in HEG and Comparison with Flight Data A. Gardner, DLR, German Aerospace Center, Göttingen, Germany				
--	--	--	---	--	--	--	--

Monday Morning / 12 July 2004**Session 9-ISP-1****Tether and Plasma Propulsion****305**

Chaired by: J. BONOMETTI, NASA Marshall Space Flight Center, Huntsville, AL, and B. GILCHRIST, University of Michigan, Ann Arbor, MI

0900 AIAA-2004-3501 Review of the ProSEDS Electrodynamic Tether Mission Development J. Vaughn, NASA Marshall, Huntsville, AL	0930 AIAA-2004-3351 Increasing Launch Site Capability Using a Motorized Momentum Exchange Tether C. Draper, University of Glasgow, Glasgow, Great Britain	1000 AIAA-2004-3352 Assessing the Motorized Momentum Exchange Tether's Operational Lifetime: The Multi-Dimensional Casualty Area Concept C. Draper, University of Glasgow, Glasgow, Great Britain	1030 AIAA-2004-3502 Numerical Study on Thrust Production Mechanism of a Magnetoplasma Sail R. Asahi, University of Tsukuba, Tsukuba, Japan	1100 AIAA-2004-3495 Electron Emission for Electrodynamic Tether Systems in Space K. Fuhrhop, University of Michigan, Ann Arbor, MI			
---	--	--	---	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3060>.

Monday Morning / 12 July 2004							
Session 10-LP-1				Booster and Main Engines I			221
Chaired by: R. BALLARD, NASA Marshall Space Flight Center, Huntsville, AL, and W. ANDERSON, Purdue University, West Lafayette, IN							
0900 AIAA-2004-3353 Snecma High Thrust Cryogenic Engines for the Next 20 Years J. Couteau, Snecma Moteurs, Vernon, France	0930 AIAA-2004-3354 Development and Flight- Testing of Liquid Propellant Aerospike Engines E. Besnard, California State University, Long Beach, CA	1000 AIAA-2004-3356 A Comparison Between Two Possible Thermodynamic Schemes for Reusable LOX/LCH4 Engines L. Boccaletto, Centre National d'Etudes Spatiales, Evry, France	1030 AIAA-2004-3358 Using Pressure- Fed Propulsion Technology to Lower Space Transportation Costs S. Chakroborty, Microcosm Inc., El Segundo, CA				

Monday Morning / 12 July 2004								
Session 11-LP-2				Liquid Rocket Engine Combustion Devices				222
Chaired by: J. CALVIGNAC, Northrop Grumman Space Technology, Redondo Beach, CA, and B. GORIN, ARDE Inc, Gaithersburg, MD								
0900 AIAA-2004-3359 Cold Flow Analysis of a Vortex Chamber Engine for Gelled Propellant Combustor Applications M. Anderson, University of Wisconsin - Madison, Madison, WI	0930 AIAA-2004-3360 Liquid Film Cooling Using Swirl in Rocket Combustors Y. Yu, Purdue University, West Lafayette, IN	1000 AIAA-2004-3363 Development of Fuel Rich Gas Generator for 10 ton f Liquid Rocket Engine S. Kwon, Konkuk University, Seoul, South Korea	1030 AIAA-2004-3364 Stability Rating Tests of KSR- III Baffled Chamber Using Pulse Gun H. Kim, Korea Aerospace Research Institute, Daejeon, South Korea					

Monday Morning / 12 July 2004								
Session 12-LPCS-1		Yesterday's Methods, Today's Materials, and Tomorrow's Spacecraft						203/204
Chaired by: K. RATHGEBER, Honeywell, Las Cruces, NM, and M. MCPHERSON, Aerojet, Sacramento, CA								

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3367>.

Monday Morning / 12 July 2004**Session 13-PC-1****Fundamental Combustion Processes I****207**

Chaired by: Y. JU, Princeton University, Princeton, NJ, and P. PENKO, NASA Glenn Research Center, Cleveland, OH

0900 AIAA-2004-3370 A Shock- Tube Study of the Oxidation of C ₂ H ₆ /O ₂ /AR and C ₂ H ₆ /SiH ₄ /O ₂ /AR Mixtures J. deVries, University of Central Florida, Orlando, FL	0930 AIAA-2004-3371 Flammability Limits of Hydrogen and Oxygen in Confined Spaces Y. Villegas, University of Alabama in Huntsville, Huntsville, AL	1000 AIAA-2004-3373 A Model for Thermal Decomposition of Hydrogen Peroxide J. Corpening, Purdue University, West Lafayette, IN	1030 AIAA-2004-3374 Oxygen- Enhanced High Temperature Laminar Coflow Flames Z. Cheng, Vanderbilt University, Nashville, TN	1100 AIAA-2004-3375 Simulation of Flame Spread and Turbulent Separated Flows in Solid Rockets V. R.Sanalkumar, Andong National University, Andong, South Korea	1130 AIAA-2004-3372 Combustion of Periodic Laminate Propellants R. Fitzgerald, University of Illinois at Urbana-Champaign, Urbana, IL		
--	---	---	---	---	--	--	--

Monday Morning / 12 July 2004**Session 14-PC-2****Spray Combustion****208**

Chaired by: M. ANAND, Rolls-Royce, Indianapolis, IN, and H. MONGIA, GE Aircraft Engines, Cincinnati, OH

0900 AIAA-2004-3378 Measurements of Spray Characteristics Produced by Effervescent Atomizers A. Mostafa, Cairo University, Cairo, Egypt	0930 AIAA-2004-3379 Characteristics of Sprays Produced by a High Shear Atomizer A. Mostafa, Cairo University, Cairo, Egypt	1000 AIAA-2004-3381 LES of Supercritical Combustion in a Gas Turbine Engine N. Tramecourt, Georgia Institute of Technology, Atlanta, GA	1030 AIAA-2004-3382 Effect of Variable Properties in Modeling the Spray Droplet Burning in Mixed Convective Environment V. Raghavan, Indian Institute of Technology Madras, Chennai, India	1100 AIAA-2004-3383 Controllable Injection for Supercritical Combustion M. Lal, nGImat Co., Atlanta, GA			
--	---	--	---	--	--	--	--

Monday Morning / 12 July 2004**Session 15-SR-1****Solid Rocket Technologies****301/302**

Chaired by: S. WALLACE, ATK Tactical Systems Co LLC, Rocket Center, WV, and J. CLARKE, Lockheed Martin, Mansfield, TX

0900 AIAA-2004-3384 Unsteady CFD Calculation for Validation of a Multi-Vane Thrust Vector Control System P. Rainville, Laval University, Quebec, Canada	0930 AIAA-2004-3385 Advanced Materials and Processes for Boost Phase Nozzles R. Hickman, Plasma Processes Inc., Huntsville, AL	1000 AIAA-2004-3386 Design and Performance Evaluation of Components of Micro Solid Propellant Thruster J. Lee, Korea Advanced Institute of Science and Technology, Daejeon, South Korea	1030 AIAA-2004-3387 On the Development and Testing of a 120 mm Caliber Double Pulse Motor (DPM) S. Schilling, Bayern-Chemie/Protac, Aschau, Germany	1100 AIAA-2004-3388 Experimental Study of the Surface Regression Rate to the Heat Transfer T. Lee, Agency for Defence Development, Daejeon, South Korea			
--	---	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3349>

Monday Morning / 12 July 2004**Session 16-VS-1****Air Collection and Enrichment Systems (ACES): The Gryphon Concept****315**

Chaired by: W. ESCHER and J. HUNT, Science Applications International Corporation, Huntsville, AL

0900 AIAA-2004-3389 Comparison of Gryphon HTHL RLV to Shuttle on Key Figures of Merit A. Crocker, Andrews Space Inc., Seattle, WA	0930 AIAA-2004-3390 Cryogenic Composite Tank Design for Next Generation Launch Technology G. Abumeri, QSS Group Inc, Cleveland, OH	1000 AIAA-2004-3391 Gryphon: A Feasible Horizontal Takeoff Next Generation Architecture Concept G. Sadler, NASA Glenn, Cleveland, OH	1030 AIAA-2004-3392 Investigation of Enhanced Vortex Tube Air Separators for Advanced Space Transportation A. Crocker, Andrews Space Inc., Seattle, WA	1100 AIAA-2004-3394 Structural Sizing of a Horizontal Take- off Launch Vehicle with an Air Collection and Enrichment System D. McCurdy, QSS Group Inc., Cleveland, OH		
---	---	---	--	---	--	--

Monday Afternoon / 12 July 2004**1300 - 1500****Air Breathing Propulsion – The Future Awaits****Palm A & B**

Gas turbine technology continues to advance as new generations of engines are being conceived. This session will aim to better define ongoing technical activities and opportunities for gas turbine technology development. Aviation Week & Space Technology Assistant Managing Editor Stanley Kandebo will moderate this session that includes leading worldwide industry and U.S. government propulsion representatives.

Panelists:

Simeon Austin, Pratt & Whitney, Director of Advanced Programs
 Alain Coutrot, Snecma, Vice President, Technology Strategy and Partnerships
 Art Morrish, DARPA, Director, Tactical Technology Office (invited)
 Richard Christiansen, NASA Glenn Research Center, Deputy Director
 James Engle, Air Force Science, Technology and Engineering, Deputy Assistant

Monday Afternoon / 12 July 2004**Session 17-ABP-4****Engine Systems: PDE I****316**

Chaired by: B. SEKAR, Air Force Research Laboratory, Wright-Patterson AFB, OH, and M. MAWID, Engineering Research and Analysis Company, Dayton, OH

1300 AIAA-2004-3395 Deconstructing Detonation: Analytical Calculation of Unsteady Thrust in a PDE T. Scott, Saint Louis University, Saint Louis, MO	1330 AIAA-2004-3396 Thermal Load Considerations for Detonative Combustion- Based Gas Turbine Engines D. Paxson, NASA Glenn Research Center, Cleveland, OH	1400 AIAA-2004-3397 Studies of Overdriven Detonation Wave Transition in a Gradual Area Expansion for PDE Applications C. Conrad, Pennsylvania State University, University Park, PA	1430 AIAA-2004-3398 Thrust Augmentation Measurements for a Pulse Detonation Engine Driven Ejector R. Shehadeh, Pennsylvania State University, University Park, PA	1500 AIAA-2004-3400 Design Methodology for a Pulse Detonation Engine as a Ramjet Replacement P. Harris, DRDC Valcartier, Val-Belair, Canada	1530 AIAA-2004-3401 Liquid Hydrocarbon Detonation Branching in a Pulse Detonation Engine K. Panzenhagen, Air Force Institute of Technology, Wright-Patterson AFB, OH	1600 AIAA-2004-3402 Performance Trends for a Product Scale Pulse Detonation Engine S. Anderson, Pratt & Whitney, Bellevue, WA
---	--	---	--	---	--	---

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3274>.

Monday Afternoon / 12 July 2004**Session 18-ABP-5****Inlets****317**

Chaired by: P. ORKWIS, University of Cincinnati, Cincinnati, OH, and L. CHENAULT, Ohio Aerospace Institute, Beavercreek, OH

1300 AIAA-2004-3403 Intake Performance During Rolling Take-off in Natural Crosswind C. Hall, Cambridge University, Cambridge, Great Britain	1330 AIAA-2004-3404 CFD Methods for Computing the Performance of Supersonic Inlets J. Slater, NASA Glenn Research Center, Cleveland, OH	1400 AIAA-2004-3405 Corrected Waverider Design for Inlet Applications M. Chauffour, University of Maryland, College Park, MD	1430 AIAA-2004-3406 Computational Study of the Aerodynamic Performance of Subsonic Scarf Inlets J. Abbott, NASA Glenn Research Center, Cleveland, OH	1500 AIAA-2004-3407 Multi- Row Disk Arrangement Concept for Spike of Axisymmetric Air Inlet Y. Maru, University of Tokyo, Sagamihara, Japan	1530 AIAA-2004-3408 Effects of Engine Intake and Nozzle Design on the Performance of a Low- Signature Reconnaissance UAV M. Wallin, Chalmers University of Technology, Gothenburg, Sweden	1600 AIAA-2004-3409 Research on Inlet Precooling for Mini- Turbojet Engines F. Buysschaert, Royal Military Academy of Belgium, Brussels, Belgium	
--	---	---	--	---	---	--	--

Monday Afternoon / 12 July 2004**Session 19-ABP-6****Turbomachinery Technology - Gas Turbine Performance and Modeling****318**

Chaired by: G. ZHA, University of Miami, Coral Gables, FL, and F. KAUSER, California State University, Pomona, Pomona, CA

1300 AIAA-2004-3412 A Semi- Viscous Method for Compressor Performance Prediction M. Attia, Embry Riddle Aeronautical University, Daytona Beach, FL	1330 AIAA-2004-3413 Development of a Transient Viscous Flow Solver Based on Conservation Element- Solution Element Framework B. Venkatachari, University of Alabama at Birmingham, Birmingham, AL	1400 AIAA-2004-3414 Influence of Axial Velocity Density Ratio in Cascade Testing of Supercritical Compressor Blades B. Song, Virginia Tech, Blacksburg, VA	1430 AIAA-2004-3415 Integrated Simulations for Multi- Component Analysis of Gas Turbines:RANS Boundary Conditions S. Kim, Stanford University, Stanford, CA	1500 AIAA-2004-3416 Gas Turbine Compressors Mid and Aft Stage Radial Clearance Control J. Burge, AGILIS Group, Jupiter, FL	1530 AIAA-2004-3417 Coupled RANS- LES Computation of a Compressor and Combustor in a Gas Turbine Engine J. Schluter, Stanford University, Stanford, CA		
---	--	--	---	---	--	--	--

Monday Afternoon / 12 July 2004**Session 20-ECS-2****Energetic Component Test Methods****209**

Chaired by: J. BURCHETT and M. SAWCHAK, Naval Surface Warfare Center, Indian Head, MD

1300 AIAA-2004-3419 Uses and Abuses of Accelerated Age Testing of Pyrotechnic Devices J. Glass, Pacific Scientific Energetic Materials Company, Hollister, CA	1330 AIAA-2004-3420 Satisfying Temperature Firing Requirements for Ordnance Devices D. Jackson, Lockheed Martin, Littleton, CO	1400 AIAA-2004-3421 A Study on Closed- Bomb Method of Validating Energetic Components H. Lee, Scot Inc, Downers Grove, IL	1430 AIAA-2004-3422 Determination of Practical Lower Limits on Frequency and Lower- Frequency Acceleration Amplitude for Ordnance- Excited Pyrotechnic Shock Testing W. Ramm, Ensign-Bickford Aerospace & Defense Company, Simsbury, CT	1500 AIAA-2004-3423 Testing of Minuteman II Safety and Arming Device with Improved Testing Techniques L. Yang, Northrop Grumman, San Bernardino, CA	1530 AIAA-2004-3424 FAI and the Pyro Detective's Toolkit J. Glass, PSEMC, Hollister, CA		
---	--	--	--	---	--	--	--

Monday Afternoon / 12 July 2004**Session 21-EP-2****Cathode Technology & Characterization****113**

Chaired by: G. SOULAS, NASA Glenn Research Center, Cleveland, OH, and J. HAAS, Air Force Research Laboratory, Edwards AFB, CA

1300 AIAA-2004-3425 On the Operational Status of the ISS Plasma Contactor Hollow Cathodes C. Carpenter, QSS Group Inc., Cleveland, OH	1330 AIAA-2004-3427 Testing of Carbon Nanotube Field Emission Cathodes C. Gasdaska, Busek Co., Natick, MA	1400 AIAA-2004-3429 Centrosazio Progress on MPDT Hollow Cathodes P. Rossetti, Centrosazio, Pisa, Italy	1430 AIAA-2004-3430 Hollow Cathode and Keeper- Region Plasma Measurements Using Ultra- Fast Miniature Scanning Probes D. Goebel, Jet Propulsion Laboratory, Pasadena, CA	1500 AIAA-2004-3431 Lithium- Fed Hollow Cathode Theory L. Cassady, Princeton University, Princeton, NJ	1530 AIAA-2004-3432 Measurement of Ion Energy Distributions Produced within an NSTAR Discharge Chamber C. Farnell, Colorado State University, Fort Collins, CO		
--	--	---	---	---	---	--	--

Monday Afternoon / 12 July 2004**Session 22-EP-3****Electric Propulsion Flight Programs****114**

Chaired by: D. LICHTIN, Lockheed Martin, Denver, CO

1300 AIAA-2004-3433 Status of the Dawn Ion Propulsion System J. Brophy, Jet Propulsion Laboratory, Pasadena, CA	1330 AIAA-2004-3435 The Smart- 1 Electric Propulsion Subsystem In Flight Experience C. Koppel, Snecma Moteurs, Moissy Cramayel, France	1400 AIAA-2004-3436 SMART1 Electric Propulsion Operations D. Milligan, European Space Agency, Darmstadt, Germany	1430 AIAA-2004-3437 Charge- Exchange Plasma Contamination on SMART- 1: First Measurements and Model Verification M. Tajmar, ARC Seibersdorf Research, Seibersdorf, Austria	1500 AIAA-2004-3438 Flight Status of Cathode- Less Microwave Discharge Ion Engines Onboard HAYABUSA Asteroid Explorer H. Kuninaka, Japan Aerospace Exploration Agency, Sagamihara, Japan	1530 AIAA-2004-3439 Microthrust Propulsion for the LISA Mission J. Ziemer, Jet Propulsion Laboratory, Pasadena, CA	1600 AIAA-2004-3440 Propulsion Options for the LISA Mission E. Cardiff, NASA Goddard, Greenbelt, MD	
--	---	---	---	---	---	--	--

Monday Afternoon / 12 July 2004**Session 23-EP-4****Electric Propulsion Special Test & Material Topics****118/119**

Chaired by: K. DIAMANT, The Aerospace Corporation, Los Angeles, CA, and C. KOPPEL, Snecma, Vernon, France

1300 AIAA-2004-3441 Thrust Stand for Electric Propulsion Performance Evaluation T. Markusic, NASA Marshall Space Flight Center, Huntsville, AL	1330 AIAA-2004-3444 A Microscale Quadrupole Mass Spectrometer for Ion Species Analysis S. Deshmukh, Aerophysics Inc., Calumet, MI	1400 AIAA-2004-3445 Plasma Jet Velocimetry by Cross- Correlation of Plasma Emission Oscillations Z. Li, University of Alabama in Huntsville, Huntsville, AL	1430 AIAA-2004-3446 Preliminary Sputter-Erosion Characterization of Multiwalled Carbon Nanotubes L. King, Michigan Technological University, Houghton, MI				
---	--	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3142>

Monday Afternoon / 12 July 2004**Session 24-EP-5****Project Prometheus I****122**

Chaired by: S. OLESON, NASA Glenn Research Center, Cleveland, OH, and J. FISHER, Aerojet, Redmond, WA

1300 AIAA-2004-3449 Electric Propulsion Technology Development for the Jupiter Icy Moon Orbiter Project S. Oleson, NASA Glenn Research Center, Cleveland, OH	1330 AIAA-2004-3450 An Overview of the Nuclear Electric Xenon Ion System (NEXIS) Activity T. Randolph, Jet Propulsion Laboratory, Pasadena, CA	1400 AIAA-2004-3453 An Overview of the High Power Electric Propulsion (HiPEP) Project F. Elliott, NASA Glenn, Cleveland, OH	1430 AIAA-2004-3452 Power Processing for a Conceptual Project Prometheus Electric Propulsion System J. Scina, ZIN Technologies Inc., Brook Park, OH	1500 AIAA-2004-3812 The High Power Electric Propulsion (HiPEP) Ion Thruster J. Foster, NASA Glenn, Cleveland, OH			
---	--	--	---	--	--	--	--

Monday Afternoon / 12 July 2004**Session 25-EP-6****Pulsed Plasma Thruster I****123**

Chaired by: N. GATSONIS, Worcester Polytechnic Institute, Worcester, MA, and E. PENCIL, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3455 Overview of NASA's Pulsed Plasma Thruster Development Program E. Pencil, NASA Glenn Research Center, Cleveland, OH	1330 AIAA-2004-3458 Evaluation of Pulsed Plasma Thruster Micropulsing L. Arrington, QSS Group Inc., Cleveland, OH	1400 AIAA-2004-3460 A Pulsed Plasma Thruster Using Water as the Propellant H. Koizumi, University of Tokyo, Tokyo, Japan					
---	---	--	--	--	--	--	--

Monday Afternoon / 12 July 2004**Session 26-EP-7****Pulsed Plasma Thruster II****124**

Chaired by: R. BURTON, University of Illinois at Urbana-Champaign, Urbana, IL

1300 AIAA-2004-3462 Effects of Post- Pulse Surface Temperature on Micro- Pulsed Plasma Thruster Operation E. Antonsen, University of Illinois at Urbana-Champaign, Urbana, IL	1330 AIAA-2004-3463 Canted Current Sheet Mass Leakage and its Impact on Pulsed Plasma Thruster Performance E. Choueiri, Princeton University, Princeton, NJ	1400 AIAA-2004-3464 Prospects of Plasma Flow Modeling and Control for Micro Pulsed Plasma Thrusters N. Gatsonis, Worcester Polytechnic Institute, Worcester, MA	1430 AIAA-2004-3465 Pulsed Plasma Thruster Based Moon Orbiter Propulsion System H. Wagner, University of Stuttgart, Stuttgart, Germany	1500 AIAA-2004-3466 Slug Model and Snowplow Model for Pulsed Plasma Thruster Description H. Wagner, University of Stuttgart, Stuttgart, Germany			
--	---	---	---	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3144>.

Monday Afternoon / 12 July 2004**Session 27-EP-8****Very High Power I****125**

Chaired by: M. LAPOINTE, NASA Glenn Research Center, Cleveland, OH, and H. WAGNER, University of Stuttgart, Stuttgart, Germany

1300 AIAA-2004-3467 High Power MPD Thruster Performance Measurements M. LaPointe, Ohio Aerospace Institute, Cleveland, OH	1330 AIAA-2004-3468 Fundamental Scaling Laws for Electric Propulsion Concepts - Part 2: MPD Thrusters M. Andrenucci, Centrosazio, Pisa, Italy	1400 AIAA-2004-3469 Self- consistent Electrode Model for Magnetoplasmdynamic Thrusters S. Roy, Kettering University, Flint, MI	1430 AIAA-2004-3470 System- Level Models of Self- and Applied- Field MPD Thrusters J. Gilland, Ohio Aerospace Institute, Brookpark, OH	1500 AIAA-2004-3471 Three- Dimensional Simulations of High- Power Magnetoplasmdynamic Thrusters Using the MACH3 Code P. Mikellides, Arizona State University, Tempe, AZ	1530 AIAA-2004-3473 Kink Instabilities in a Magnetoplasmdynamic Thruster With and Without External Magnetic Field F. Paganucci, Centrosazio, Pisa, Italy		
--	--	---	---	---	--	--	--

Monday Afternoon / 12 July 2004**Session 28-HR-1****Hybrid Rockets I****207**

Chaired by: M. CHIAVERINI, Orbitec, Madison, WI, and G. STORY, NASA Marshall Space Flight Center, Huntsville, AL

1300 AIAA-2004-3474 Inviscid Models of the Classic Hybrid Rocket J. Majdalani, University of Tennessee Space Institute, Tullahoma, TN	1330 AIAA-2004-3475 Rotational Axisymmetric Mean Flow for the Vortex Injection Hybrid Rocket Engine J. Majdalani, University of Tennessee Space Institute, Tullahoma, TN	1400 AIAA-2004-3477 Modular Solutions for Very High Energy Solid Propellants R. Lo, Aerospace Institute, Berlin, Germany	1430 AIAA-2004-3479 Effects of Swirling Liquid Oxygen Flow on Combustion of a Hybrid Rocket Engine K. Kitagawa, Tokyo Metropolitan Institute of Technology, Hino, Japan				
---	--	--	---	--	--	--	--

Monday Afternoon / 12 July 2004**Session 29-HYP-2****Hypersonic Engine Component Design Evaluation & Test****223**

Chaired by: H. CIKANEK, NASA Glenn Research Center, Cleveland, OH, and G. MACK, Pratt & Whitney Space Propulsion, West Palm Beach, FL

1300 AIAA-2004-3480 Performance of Supersonic Combustors with Fuel Injection in Diverging Section S. Tomioka, Japan Aerospace Exploration Agency, Kakuda, Japan	1330 AIAA-2004-3481 An Aerodynamic Redesign of the SR- 71 Inlet with Applications to Turbine Based Combined Cycle Engines J. Colville, University of Maryland, College Park, MD	1400 AIAA-2004-3482 Performance of a Dual- Mode Combustor with Multi- Staged Fuel Injection K. Kobayashi, Japan Aerospace Exploration Agency, Kakuda, Japan	1430 AIAA-2004-3483 Optimization of Microwave Air Plasma Apparatus for Hydrocarbon Combustion Enhancement Experiments K. Fisher, Pennsylvania State University, University Park, PA	1500 AIAA-2004-3484 Experimental Verification of Ultra- High- Performance, Advanced Propulsion Heat Exchangers G. Michna, University of Illinois at Urbana-Champaign, Urbana, IL	1530 AIAA-2004-3485 Performance of a Supersonic Model Combustor Using Vaporized Kerosene Injection X. Fan, Chinese Academy of Sciences, Beijing, China (prc)	1600 AIAA-2004-3486 Enhancing Heavy Lift Booster Performance by Exploiting Zeotropic Condensation of Air K. Brown, University of Illinois at Urbana-Champaign, Urbana, IL	1630 AIAA-2004-3487 Investigation of Hydrocarbon Fuels Combustion in Supersonic Combustor A. Mathur, The Boeing Company, Huntington Beach, CA
---	---	---	--	--	---	--	---

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3136>.

Monday Afternoon / 12 July 2004**Session 30-ISP-2****Advanced Chemical and Materials I****304**

Chaired by: C. GUERNSEY, Jet Propulsion Laboratory, Pasadena, CA, and F. LU, Aerojet, Redmond, WA

1300 AIAA-2004-3834 A Comparison of Transportation Systems for Human Missions to Mars B. Thomas, Gray Research Inc., Huntsville, AL	1330 AIAA-2004-3488 Advanced Space Storable Propellants for Outer Planet Exploration D. Thunnissen, User Technology Associates Inc., Pasadena, CA	1400 AIAA-2004-3491 Preliminary Experimental Studies of Water- Energy- Cycle Space Propulsion System Y. Hashimoto, Japan Aerospace Exploration Agency, Kanagawa, Japan	1430 AIAA-2004-3494 Advanced Chemical Propulsion Study G. Woodcock, Gray Research, Huntsville, AL	1500 AIAA-2004-4195 Modeling of Spacecraft Advanced Chemical Propulsion Systems M. Benfield, Science Applications International Corporation, Huntsville, AL		
---	--	--	--	--	--	--

Monday Afternoon / 12 July 2004**Session 31-ISP-3****Space Tethers Propulsion****305**

Chaired by: J. BONOMETTI, NASA Marshall Space Flight Center, Huntsville, AL, and B. GILCHRIST, University of Michigan, Ann Arbor, MI

1300 AIAA-2004-3496 Poisson- Vlasov Modeling of Parallel Cylinders in Ionospheric Plasmas E. Choiniere, University of Michigan, Ann Arbor, MI	1330 AIAA-2004-3497 Electron Emission for Electric Propulsion: Reducing Power by Mitigating Space Charge Limits D. Morris, University of Michigan, Ann Arbor, MI	1400 AIAA-2004-3498 Field Emission Cathodes used in the FEGl Get- Away- Special Shuttle Mission C. Deline, University of Michigan, Ann Arbor, MI	1430 AIAA-2004-3499 Cold- Cathode Electron Field Emission of Boron Nitride Thin Film with a MEMS- based Gate for Space Applications H. Goldberg, University of Michigan, Ann Arbor, MI			
---	--	---	---	--	--	--

Monday Afternoon / 12 July 2004**Session 32-LP-3****Liquid Propellant Feed Systems & Tankage I****208**

Chaired by: I. BALLINGER, IAB Consulting, Rugeley, Great Britain, and K. PUGMIRE, Spincraft/Standex International, Huntington Beach, CA

1300 AIAA-2004-3504 Designing and Testing a Lighter, Simpler, Less Expensive Liquid Propellant Pump A. Knight, Andrew Knight Space Propulsion, Arlington, VA	1330 AIAA-2004-3505 Development of a Composite Wrapped Propellant Tank M. Debreceni, Pressure Systems Inc., Commerce, CA	1400 AIAA-2004-3506 Finite Element Analysis of a Composite Overwrapped Pressure Vessel D. Gray, Abaqus South Inc., Flower Mound, TX	1430 AIAA-2004-3507 Design and Manufacture of a Composite Overwrapped Elastomeric Diaphragm Tank W. Tam, Pressure Systems Inc., Commerce, CA	1500 AIAA-2004-3508 New Design of Composite/Metal Gas Storage Vessels and Propellant Tanks A. Cherevatsky, Shafir Productions System, Modiin, Israel	1530 AIAA-2004-3511 Design Modification of a Diaphragm Propellant Tank for a Pressurant Tank Application J. Benton, Pressure Systems Inc., Commerce, CA	
--	---	--	---	--	---	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3167>

Monday Afternoon / 12 July 2004**Session 33-LP-4****Liquid Rocket Engine & Propulsion System Modeling I****220**

Chaired by: G. MAGGIO, Science Applications International Corporation, New York, NY, and M. NARAGHI, Manhattan College, Riverdale, NY

1300 AIAA-2004-3514 REDTOP- 2: Rocket Engine Design Tool Featuring Engine Performance, Weight, Cost, and Reliability J. Bradford, SpaceWorks Engineering Inc., Atlanta, GA	1330 AIAA-2004-3515 A Methodology to Rapidly and Effectively Assess the Reliability of Conceptual Advanced Rocket Engines G. Maggio, Science Applications International Corporation, New York, NY	1400 AIAA-2004-3516 On Nonlinear Combustion Instability in Liquid Propellant Rocket Engines G. Flandro, University of Tennessee Space Institute, Tullahoma, TN	1430 AIAA-2004-3517 Studies of High Frequency Combustion Instabilities with the Method of Pattern Dynamics W. Zhao, National University of Defense Technology, Changsha, China (prc)	1500 AIAA-2004-3518 High Frequency Combustion Instabilities Associated with Collective Interactions in Liquid Propulsion C. Rey, Laboratoire EM2C, Chateauf-Malabry, France	1530 AIAA-2004-3519 Controlling Factors of Pressure- Coupled Combustion Responses in a High Pressure Combustion Chamber G. Lee, Yonsei University, Seoul, South Korea		
---	--	---	---	--	--	--	--

Monday Afternoon / 12 July 2004**Session 34-LP-5****Liquid Rocket Engine Injectors & Ignition I****221**

Chaired by: B. GORIN, ARDE Inc, Gaithersburg, MD, and K. KREINER, Boeing Satellite Systems, Los Angeles, CA

1300 AIAA-2004-3521 The Characteristics of Swirl Coaxial Injector Under Varying Geometric and Environmental Conditions D. Kim, Seoul National University, Seoul, South Korea	1330 AIAA-2004-3522 Effect of Chamber Pressure Variation on High- Frequency Hydrodynamic Instability of Shear Coaxial Injector B. Kim, University of Illinois at Urbana-Champaign, Urbana, IL	1400 AIAA-2004-3524 Oxidizer- Rich Staged Combustion Cycle Preburner and Main Chamber Injector Testing at Purdue University M. Long, Purdue University, West Lafayette, IN	1430 AIAA-2004-3525 A Computational Characterization of the Supersonic Coherent Jet M. Jeong, Andong National University, Andong, South Korea	1500 AIAA-2004-3526 Breakup Characteristics of Laminar and Turbulent Liquid Sheets Formed by Impinging Jets in High Pressure Environments K. Jung, Seoul National University, Seoul, South Korea			
---	--	---	--	---	--	--	--

Monday Afternoon / 12 July 2004**Session 35-LP-6****Upper-Stage Rocket Engines****222**

Chaired by: K. COSTE, The Aerospace Corporation, Los Angeles, CA, and P. HOAR, FAA - Commercial Space Transportation, Washington, DC

1300 AIAA-2004-3527 CADB and Pratt & Whitney: A Decade of Cooperation Y. Demiyanko, CADB, Voronezh, Russia	1330 AIAA-2004-3528 Hot Firing Tests of Liquid Rocket Engine Using LOX/LNG Y. Cho, Rotem Co., Yongin, South Korea	1400 AIAA-2004-3529 RL60 - The Next Step in the Evolution of Upperstage Engines J. Santiago, Pratt & Whitney, West Palm Beach, FL	1430 AIAA-2004-3530 Development Status of the Vinci Engine for the Ariane 5 Upper Stage P. Alliot, Snecma Moteurs, Vernon, France	1500 AIAA-2004-3531 Status of the Vinci Combustion Chamber Vacuum Ignition Tests W. Oechslein, EADS Space Transportation GmbH, Munich, Germany	1530 AIAA-2004-4210 Conceptual Investigations for a Methane- Fueled Expander Rocket Engine C. Brown, Pratt & Whitney, West Palm, FL	1600 AIAA-2004-3532 Thermodynamic Analysis of a Cryogenic Upper Stage Supercritical Tank H. Nguyen, The Boeing Company, Huntington Beach, CA	
---	--	--	--	---	--	---	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3372>.

Monday Afternoon / 12 July 2004**Session 36-NFF-1****Fusion Propulsion****203/204**

Chaired by: T. KAMMASH, University of Michigan, Ann Arbor, MI

1300 AIAA-2004-3533 Engineering Challenges in Inertial Confinement Fusion Propulsion B. Cassenti, Pratt & Whitney, East Hartford, CT	1330 AIAA-2004-3534 Application of Recommended Design Practices for Conceptual Nuclear Fusion Space Propulsion Systems C. Williams, NASA Glenn Research Center, Cleveland, OH	1400 AIAA-2004-3535 Tool for Sharing and Assessing Models of Fusion- Based Space Transportation Systems S. Carpenter, Engineering Design Environments, Cupertino, CA	1430 AIAA-2004-3536 The Role of Ambipolar Potential in the Propulsive Performance of the GDM Thruster T. Kammash, University of Michigan, Ann Arbor, MI	1500 AIAA-2004-3537 The Finite Transition Layer in Bounded Current- Carrying Plasmas J. Siegel, Novatia Inc., Folsom, CA	1530 AIAA-2004-3538 Plasma Instabilities in the Gasdynamic Mirror Propulsion Experiment W. Emrich, NASA Marshall Space Flight Center, Huntsville, AL		
---	--	---	---	---	---	--	--

Monday Afternoon / 12 July 2004**Session 37-PC-3****Arthur H. Lefebvre Memorial Session (Invited)****301/302**

Chaired by: D. BALLAL, University of Dayton, Dayton, OH, and A. GUPTA, University of Maryland, College Park, MD

1300 AIAA-2004-3539 Arthur H. Lefebvre (1923- 2003)—A Tribute D. Ballal, University of Dayton, Dayton, OH	1330 AIAA-2004-3540 Fuel Atomization Effects on Combustor Performance N. Rizk, Rolls-Royce Corporation, Indianapolis, IN	1400 AIAA-2004-3541 The Behavior of an Ultra- Compact Combustor (UCC) Based on Centrifugally- Enhanced Turbulent Burning Rates J. Zelina, Air Force Research Laboratory, Wright-Patterson AFB, OH	1430 AIAA-2004-3543 Combustion Efficiency and the Theta- Parameter in the Design and Development of Gas Turbine Combustors D. Lilley, Oklahoma State University, Stillwater, OK	1500 AIAA-2004-3544 Combining Lefebvre Correlations with Combustor CFD H. Mongia, GE Aircraft Engines, Cincinnati, OH	1530 AIAA-2004-3545 Characterization of Flameholding Tendencies in Premixer Passages for Gas Turbine Applications G. Samuelson, University of California, Irvine, Irvine, CA	1600 AIAA-2004-3546 Combustor Stability & Lean Blowout D. Ballal, University of Dayton, Dayton, OH	1630 AIAA-2004-4198 Water Injection of Commercial Aircraft to Reduce Airport Emissions D. Daggett, Boeing Commercial Airplanes, Seattle, WA
--	---	--	---	---	---	---	---

Monday Afternoon / 12 July 2004**Session 38-SCP-1****Sensors and Measurement Technology****210**

Chaired by: J. WRBANEK, NASA Glenn Research Center, Cleveland, OH, and M. PALMER, Luna Innovations, Blacksburg, VA

1300 AIAA-2004-3547 Validation of Stream Thrust Probes for Direct- Connect Turbine Engine Testing R. Hiers, Aerospace Testing Alliance, Arnold AFB, TN	1330 AIAA-2004-3548 Sensor Requirements to Monitor the Real Time Performance of a Gas Turbine Engine Undergoing Compressor Blade Erosion S. Scala, Concurrent Technologies Corporation, Largo, FL	1400 AIAA-2004-3549 Development of Thin Film Ceramic Thermocouples for High Temperature Environments J. Wrbanek, NASA Glenn Research Center, Cleveland, OH	1430 AIAA-2004-3550 Effect of Rotor Solidity on Stall Inception and Growth in Axial Flow Fan S. Sane, Indian Institute of Technology Bombay, Mumbai, India	1500 AIAA-2004-3551 Skin Friction Measurements in a Duct in the X3 Superorbital Expansion Tube T. Silvester, University of Queensland, Brisbane, Australia	1530 AIAA-2004-4190 High- Frequency, Fiber- Optic Total Temperature Sensors for Air Breathing Propulsion Inlet Distortion Characterization M. Palmer, Luna Innovations, Blacksburg, VA		
--	---	---	---	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3277>.

Monday Afternoon / 12 July 2004								
Session 39-SR-2		Mars Exploration Rover (MER) Propulsion (Joint ASME and AIAA Special Session)					Floridian Ballroom	
Chaired by: D. LINNE, NASA Glenn Research Center, Cleveland, OH, and C. CARR, Alliant Techsystems, Elkton, MD								

Monday Afternoon / 12 July 2004							
Session 40-VS-2		Earth-to-Orbit Vehicle Reusability					315
Chaired by: R. SACKHEIM, NASA Marshall Space Flight Center, Huntsville, AL							
1300 AIAA-2004-3559 Human Space Transportation and Logistic Activities at ESA M. Caporicci, European Space Agency, Noordwijk, The Netherlands	1330 AIAA-2004-3561 Propulsion Economic Considerations for Next Generation Space Launch C. Taylor, Jupiter Research & Development, Houston, TX	1400 AIAA-2004-3562 Launch Vehicle Design Features for Minimum Cost R. Portz, University of Florida, Gainesville, FL	1430 AIAA-2004-3563 Human Spaceflight of Next Generation P. Morgan, Lockheed Martin Space Systems Company, Denver, CO				

Monday Afternoon / 12 July 2004			
1500 - 1700		On Orbit Servicing – An Untapped Opportunity	
Extending satellite-service life impacts millions of dollars on the bottom line for space-based service businesses. The potential market for on-orbit servicing is a prime untapped opportunity to explore. Space News Deputy Editor Warren Ferster will moderate a session with government and industry leaders to find out the likelihood that this opportunity will ever be realized on a large scale and the logistics required to make it happen.			Palm A & B
Panelists: Ron Sega, U.S. Department of Defense, Director, National Aerospace Initiative Stephen Wax, DARPA, Director, Defense Science Office (invited) Thomas B. McDonald, Vice President, Transformational Space Systems, The Boeing Company (invited) Walt Anderson, CEO, Orbital Recovery Corporation			

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3283>.

Monday Afternoon / 12 July 2004**Session 41-NFF-2****Future Flight I****Palm A**

Chaired by: M. LAPOINTE, Ohio Aerospace Institute, Cleveland, OH

1900 AIAA-2004-3567 Beamed- Momentum LightSails for Interstellar Missions: Mission Applications and Technology Requirements R. Frisbee, Jet Propulsion Laboratory, Pasadena, CA	1945 AIAA-2004-3568 The Interstellar Ramjet B. Cassenti, Pratt & Whitney, East Hartford, CT					
---	---	--	--	--	--	--

Tuesday Morning / 13 July 2004**0800 - 1000****Humans Beyond Low-Earth Orbit (LEO) - Defining the Vision****Palm A**

The future of space exploration was reinvigorated in January when President Bush outlined his new space initiative of going back to the moon and beyond. Defining how to effectively and affordably meet the goal of going beyond low-Earth orbit has become a hot topic. Join some of the experts from the US and Europe as they offer their views of the future of human space exploration to our moon and our neighbor Mars. Flight International Editor Graham Warwick will moderate this session.

Panelists:

Pete Aldridge, Aldridge Report on the Future of Space Exploration (invited)

Gary Martin, NASA, Chief Architect for Space Exploration

Marco Caporicci, ESA, Head of Human Transportation and Re-entry Division

Charlie Precourt, NASA, Deputy Program Manager, International Space Station

NASA Code T Representative

Tuesday Morning / 13 July 2004**Session 42-ABP-7****Numerical Propulsion System Simulation (NPSS) Panel Session****Palm B****0800 - 1200**

Chaired by: I. HALLIWELL, Modern Technologies Corporation, Middleburg Heights, OH

This panel session will provide an overview of the Numerical Propulsion System Simulation (NPSS) Program and its uses for aeronautics and space transportation applications. The NPSS vision is to develop an advanced engineering analysis system that enables high-fidelity, multi-disciplinary, full propulsion system simulations to be performed early in the design process. Managers & engineers from the NASA Glenn Research Center, industry and academia will describe NPSS and specific contributions & applications to air breathing & rocket engines. NPSS will be placed in the context of propulsion systems modeling and future hopes & plans will be outlined.

Panel: J. Lytle - Engineering Manager - NASA Glenn Research Center , M. Turner - Professor - University of Cincinnati, E. Butzin - - Wolverine Ventures Inc., S. Sirica - Manager - Operability Analysis/High Fidelity Operations - Pratt & Whitney, R. Plybon - Manager, Propulsion System Simulation - GE Aircraft Engines, K. Olson - - Pratt & Whitney, J. Schluter - - Stanford University, C. Naiman - - NASA Glenn Research Center

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3278>.

Tuesday Morning / 13 July 2004**Session 43-ABP-8****Turbomachinery Component Technology - Gas Turbine Engine Hot Section Research****318**

Chaired by: D. JOHNSTON, Wright State University, Dayton, OH, and C. CROSS, Air Force Research Laboratory, Wright-Patterson AFB, OH

0800 AIAA-2004-3570 Parameterization of Boundary Layer Control Dimples on a Low Pressure Turbine Blade J. Casey, Air Force Institute of Technology, Wright-Patterson AFB, OH	0830 AIAA-2004-3571 Experimental Evaluation of a Turbine Blade with Potassium Evaporative Cooling J. Townsend, Massachusetts Institute of Technology, Cambridge, MA	0900 AIAA-2004-3574 Boundary Layer Control with Atmospheric Plasma Discharges G. Font, US Air Force Academy, Colorado Springs, CO	0930 AIAA-2004-3577 The Impact of Blade- to- Blade Flow Variability on Turbine Blade Cooling Performance D. Darmofal, Massachusetts Institute of Technology, Cambridge, MA	1000 AIAA-2004-3572 Labyrinth Seal Design Change to Reduce Rim Seal Coolant D. Choi, Texas A&M University, College Station, TX		
---	--	--	---	---	--	--

Tuesday Morning / 13 July 2004**Session 44-APC-1****Unique Propulsion Systems I****207**

Chaired by: J. ROBINSON, The Boeing Company, Seal Beach, CA, and J. MARTIN, Boeing Phantom Works, Huntington Beach, CA

0800 AIAA-2004-3578 The Sonic Double-Flutter Aircraft D. Brasoveanu, Computer Sciences Corporation, Washington, DC	0830 AIAA-2004-3579 The Sonic Double Flutter Aircraft C. Sandu, SC Turbomecanica SA, Bucharest, Romania	0900 AIAA-2004-3580 The Sonic Double Flutter Aircraft – Design and Operation C. Sandu, SC Turbomecanica SA, Bucharest, Romania	0930 AIAA-2004-3581 Feasibility Study of Integrating Four- Port Wave Rotors into Ultra-Micro Gas Turbines (UMGT) F. Iancu, Michigan State University, East Lansing, MI	1000 AIAA-2004-3585 Analytical Study on Flight Performance of an Air-Breathing RP Laser Launcher H. Katsurayama, University of Tokyo, Tokyo, Japan		
---	--	---	---	---	--	--

Tuesday Morning / 13 July 2004**Session 45-ECS-3****Energetic Component Development****209**

Chaired by: J. FRITZ, Ensign-Bickford Aerospace & Defense Company, Simsbury, CT, and S. BEN-SHMUEL, The Aerospace Corporation, Los Angeles, CA

0800 AIAA-2004-3587 Reduction of Visible Flash from the RR- 170 Chaff Round P. Ostrowski, Energetic Materials Technology, Alexandria, VA	0830 AIAA-2004-3590 Laser Ignitability Programs Being Conducted at the Indian Head Division, NSWC T. Blachowski, Naval Surface Warfare Center, Indian Head, MD	0900 AIAA-2004-3591 Detonation Transfer of Insensitive High Explosive Assemblies Through a Bulged Closure Disc D. Jackson, Lockheed Martin, Denver, CO				
---	---	---	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3056>.

Tuesday Morning / 13 July 2004**Session 46-EP-9****Colloid Thruster Development****113**

Chaired by: J. BLANDINO, Worcester Polytechnic Institute, Worcester, MD, and V. HRUBY, Busek Company, Natick, CA

0800 AIAA-2004-3592 The NASA GSFC MEMS Colloidal Thruster E. Cardiff, NASA Goddard, Greenbelt, MD	0830 AIAA-2004-3594 An Experimental Colloid Thruster Package for Nano Satellites B. Kent, Rutherford Appleton Laboratory, Didcot, Great Britain	0900 AIAA-2004-3595 Two- Dimensional Microfabricated Colloid Thruster Arrays L. Velasquez-Garcia, Massachusetts Institute of Technology, Cambridge, MA	0930 AIAA-2004-3597 Power Processing and Control of DRS Colloid Thrusters W. Connolly, Busek Co. Inc., Natick, MA				
---	--	---	--	--	--	--	--

Tuesday Morning / 13 July 2004**Session 47-EP-10****Hall Thruster Development I****114**

Chaired by: R. JANKOVSKY, NASA Glenn Research Center, Cleveland, OH

0800 AIAA-2004-3600 NASA's 2004 Hall Thruster Program D. Jacobson, NASA Glenn Research Center, Cleveland, OH	0830 AIAA-2004-3602 Efficiency Analysis of a High- Specific Impulse Hall Thruster R. Hofer, QSS Group Inc., Cleveland, OH	0900 AIAA-2004-3603 4.5 KW Hall Thruster System Qualification Status K. de Grys, Aerojet, Redmond, WA	0930 AIAA-2004-3604 PPS- 1350- G Qualification Status P. Dumazert, Snecma Moteurs, Villaroche Nord, France	1000 AIAA-2004-3605 Stretching the Operational Envelope of the PPS®X000 Plasma Thruster O. Duchemin, Snecma Moteurs, Moissy-Cramayel, France	1030 AIAA-2004-3607 PPS- 1350G in an Extended Operation Domain: Comparison Between Experimental and Simulation Results V. Vial, Orleans University, Orleans, France		
---	--	--	---	---	--	--	--

Tuesday Morning / 13 July 2004**Session 48-EP-11****Ion Test & Characterization I****118/119**

Chaired by: M. PATTERSON, NASA Glenn Research Center, Cleveland, OH, and A. HOSKINS, Aerojet, Redmond, WA

0800 AIAA-2004-3608 An Overview of the Results from the 30,000 Hr Life Test of Deep Space 1 Flight Spare Ion Engine A. Sengupta, Jet Propulsion Laboratory, Pasadena, CA	0830 AIAA-2004-3609 An Evaluation of the Discharge Chamber of the 30,000 Hr Life Test of the Deep Space 1 Flight Spare Ion Engine C. Garner, Jet Propulsion Laboratory, Pasadena, CA	0900 AIAA-2004-3610 Post- Test Analysis of the Deep Space 1 Spare Flight Thruster Ion Optics J. Anderson, Jet Propulsion Laboratory, Pasadena, CA	0930 AIAA-2004-3612 NSTAR Extended Life Test Discharge Chamber Flake Analyses K. de Groh, NASA Glenn Research Center, Cleveland, OH	1000 AIAA-2004-3613 Experimentally Determined Neutral Density and Plasma Parameters in a 30 CM Ion Engine A. Sengupta, Jet Propulsion Laboratory, Pasadena, CA	1030 AIAA-2004-3614 Performance Evaluation of 8- cm Diameter Ion Optics Assemblies Fabricated from Carbon- Carbon Composites S. Rawal, Lockheed Martin, Denver, CO	1100 AIAA-2004-3615 Fabrication and Vibration Results of 30- cm Pyrolytic Graphite Ion Optics M. De Pano, Boeing Electron Dynamic Devices Inc., Torrance, CA	
---	---	--	--	---	---	---	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3138>

Tuesday Morning / 13 July 2004**Session 49-EP-12****Micropropulsion Development I****122**

Chaired by: R. WIRZ, Jet Propulsion Laboratory, Pasadena, CA

0800 AIAA-2004-3617 Long- Term Performance of Vacuum Arc Thrusters A. Gerhan, Alameda Applied Sciences Corporation, San Leandro, CA	0830 AIAA-2004-3618 Magnetically Enhanced Vacuum Arc Thruster (MVAT) M. Au, Alameda Applied Science Corp, San Leandro, CA	0900 AIAA-2004-3619 MEMS Indium FEEP Thruster: Manufacturing Study and First Prototype Results M. Tajmar, ARC Seibersdorf Research, Seibersdorf, Austria	0930 AIAA-2004-3620 Indium FEEP Multiemitter Development and Test Results A. Genovese, ARC Seibersdorf research, Seibersdorf, Austria	1000 AIAA-2004-3621 Development and Modeling of a Microwave- Excited Microplasma Thruster Y. Takao, Kyoto University, Kyoto, Japan	1030 AIAA-2004-3622 Micro Pulsed Plasma Thruster Technology Development D. Simon, Johns Hopkins University, Applied Physics Laboratory, Laurel, MD		
---	--	--	---	---	--	--	--

Tuesday Morning / 13 July 2004**Session 50-EP-13****Project Prometheus II****123**

Chaired by: I. KATZ, Jet Propulsion Laboratory, Pasadena, CA, and J. MONHEISER, Aerojet, Redmond, WA

0800 AIAA-2004-3624 Conceptual Design of the Nuclear Electric Xenon Ion System (NEXIS) J. Monheiser, Aerojet, Redmond, WA	0830 AIAA-2004-3627 Life- limiting Trends of High- Specific Impulse Ion Optics G. Williams, NASA Glenn, Cleveland, OH	0900 AIAA-2004-3628 Evaluation of Sub- Scale NEXIS Ion Optics and Strategies for Performing Accelerated Wear Testing R. Martinez, Colorado State University, Fort Collins, CO	0930 AIAA-2004-3629 Structural Analysis of Pyrolytic Graphite Optics for the HIPEP Ion Thruster N. Meckel, Aerojet, Redmond, WA	1000 AIAA-2004-3630 Characterization of High- Specific Impulse, High- Power Ion Optics G. Williams, NASA Glenn, Cleveland, OH	1030 AIAA-2004-4203 NEXIS Reservoir Cathode 2000 Hour Life Proof- of- Concept Test J. Vaughn, NASA Marshall Space Flight Center, Huntsville, AL		
--	---	--	--	---	--	--	--

Tuesday Morning / 13 July 2004**Session 51-EP-14****Systems Engineering & Spacecraft Interactions****124**

Chaired by: V. KHAYMS, Lockheed Martin, Sunnyvale, CA, and D. OH, Jet Propulsion Laboratory, Pasadena, CA

0800 AIAA-2004-3632 3- D Computation of Plasma Thruster Plumes A. Passaro, Aerospace Division - CPR, Pisa, Italy	0830 AIAA-2004-3633 Development of the DRACO Code for Modeling Electric Propulsion Plume Interactions L. Brieda, Virginia Tech, Blacksburg, VA	0900 AIAA-2004-3635 Comparison of Numerical Simulation to Hall Thruster Plume Shield Experiment S. Cheng, Massachusetts Institute of Technology, Cambridge, MA	0930 AIAA-2004-3636 Analysis of Microwave Communication Signal Degradation Induced by Thruster Plumes G. Hallock, University of Texas, Austin, TX	1000 AIAA-2004-3637 Studies on the Interaction of the Terrestrial Planet Finder Spacecraft with Thruster Plumes M. Celik, Massachusetts Institute of Technology, Cambridge, MA			
--	--	---	--	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3130>

Tuesday Morning / 13 July 2004								
Session 52-EP-15						Very High Power II		125
Chaired by: F. GULCZINSKI, Air Force Research Laboratory, Edwards, CA, and M. ANDRENUCCI, Universita di Pisa, Pisa, Italy								
0800 AIAA-2004-3639 Ion Cyclotron Heating Results in the VASIMR VX- 10 T. Glover, NASA Johnson, Houston, TX	0830 AIAA-2004-3640 Pulsed Inductive Thruster: Flight- Scale Proof of Concept Demonstrator J. Poylio, Northrop Grumman Space Technology, Redondo Beach, CA	0900 AIAA-2004-3641 Effects of Propellant Injection, Material and Electrode Geometry on the Performance of a Two- Stage Pulsed Plasma Accelerator J. Cassibry, University of Alabama in Huntsville, Huntsville, AL	0930 AIAA-2004-3642 Experimental Investigation of the Plasma Jet Generated by ATTILA H. Böhrk, University of Stuttgart, Stuttgart, Germany	1000 AIAA-2004-3643 Controllability of Large SEP for Earth Orbit Raising G. Woodcock, Gray Research, Huntsville, AL	1030 AIAA-2004-3644 Comparison of Conventional and Electromagnetic Gun Launch E. Schmidt, US Army Research Laboratory, Aberdeen Proving Ground, MD			

Tuesday Morning / 13 July 2004							
Session 53-HYP-3			Combined Cycle Engine Analysis, Design & Test				223
Chaired by: P. BARTOLOTTA, NASA Glenn Research Center, Cleveland, OH, and R. KAZMAR, Pratt & Whitney Space Propulsion, West Palm Beach, FL							
0800 AIAA-2004-3646 Probabilistic Analysis of Turbine- Based Combined Cycle Space Vehicles F. Villeneuve, Georgia Institute of Technology, Atlanta, GA	0830 AIAA-2004-3647 An Analysis of the Ejector- Ram Rocket Engine D. Pastrone, Politecnico di Torino, Torino, Italy	0900 AIAA-2004-3648 Component Matching for the Air Turborocket J. Clough, University of Maryland, College Park, MD	0930 AIAA-2004-3649 Turbine Based Combination Cycle (TBCC) Propulsion Subsystem Integration L. Snyder, Allison Advanced Development Company, Indianapolis, IN	1000 AIAA-2004-3650 Ducted Rocket with Simultaneous Mixing and Combustion Direct- Connect Testing K. Miller, Purdue University, West Lafayette, IN	1030 AIAA-2004-3651 Variable Area Ejectors for Increasing the Compression Factor of an RBCC Engine J. Etele, University of Toronto, Toronto, Canada	1100 AIAA-2004-3652 Design and Preliminary Analysis of Variable Geometry SCRAM Jet / Rocket J. Moss, Embry-Riddle Aeronautical University, Daytona Beach, FL	

Tuesday Morning / 13 July 2004							
Session 54-HYP-4			Hypersonic Propulsion Experiments and Other Related Topics				317
Chaired by: J. TAYLOR, NASA Marshall Space Flight Center, Huntsville, AL, and J. HAYES, Pratt & Whitney Space Propulsion, West Palm Beach, FL							
0800 AIAA-2004-3653 PTAH- SOCAR Fuel-cooled Composite Materials Structure for Dual- Mode Ramjet and Liquid Rocket Engines M. Bouchez, MBDA, Chatillon, France	0830 AIAA-2004-3654 Surface and Gas-Phase Temperatures Near a Film- Cooled Wall C. Cruz, University of Maryland, College Park, MD	0900 AIAA-2004-3655 Mixing in High- Speed Flows with Thick Boundary Layers R. Portz, University of Florida, Gainesville, FL	0930 AIAA-2004-3656 Measurement of Vortices and Shock Waves Produced by Ramp and Twin Jets S. Koike, Tohoku University, Sendai, Japan	1000 AIAA-2004-3657 Investigations on Function of Cavity in Supersonic Combustion Using OH PLIF M. Li, National Univ. of Defence Technology, Changsha, China (prc)	1030 AIAA-2004-3658 T- Range: The Navy's Sea- Level Engine and Aerothermal Test Facility W. Jaul, Naval Air Warfare Center, China Lake, CA	1100 AIAA-2004-3660 Blowout Limits of Supersonic Cavity-Stabilized Flames C. Rasmussen, Univ. of Michigan, Ann Arbor, MI	

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3137>.

Tuesday Morning / 13 July 2004**Session 55-LP-7****Liquid Propellant Feed Systems & Tankage II****220**

Chaired by: B. WINTERS, Orbital Sciences Corporation, Dulles, VA, and D. JAEKLE, PMD Technology, North Andover, MA

0800 AIAA-2004-3661 Estimation of Launch Vehicle Propellant Tank Structural Weight Using Simplified Beam Approximation V. Hutchinson, Georgia Institute of Technology, Atlanta, GA	0830 AIAA-2004-3663 Unsteady Analyses of Valve Systems in Rocket Engine Testing Environments J. Shipman, CRAFT Tech Inc., Pipersville, PA	0900 AIAA-2004-3665 Flow Modeling of the Galaxy XII Dual Mode Bipropellant Propulsion Subsystem J. Molinsky, Orbital Sciences Corporation, Dulles, VA	0930 AIAA-2004-3666 Pressure Transient Characterization Test for Star- 2 Propulsion System Fuel Manifold M. Morgan, Orbital Sciences Corporation, Dulles, VA	1000 AIAA-2004-3667 Forward Looking Pressure Regulator Algorithm for Improved Modeling Performance Within the Generalized Fluid System Simulation Program P. Schallhorn, NASA Kennedy, Kennedy Space Center, FL	1030 AIAA-2004-3668 Impact of Liquid Density Omission in Chen's Two- Phase Heat Transfer Correlation J. Pasch, University of Florida, Royal Palm Beach, FL		
---	--	--	---	--	---	--	--

Tuesday Morning / 13 July 2004**Session 56-LP-8****Liquid Rocket Engine & Propulsion System Modeling II****221**

Chaired by: J. WEISS, Jet Propulsion Laboratory, Pasadena, CA, and C. ENGELBRECHT, Johns Hopkins University, Laurel, MD

0800 AIAA-2004-3670 Influence of Time Dependent Effects on the Estimated Life Time of Liquid Rocket Combustion Chamber Walls J. Riccius, DLR, German Aerospace Research Center, Hardthausen, Germany	0830 AIAA-2004-3672 A Study on the Cooling Mechanism in Liquid Rocket Engine P. Han, Hyundai Mobis, Yongin, South Korea	0900 AIAA-2004-3675 On the Bidirectional Vortex and Other Similarity Solutions in Spherical Geometry J. Majdalani, University of Tennessee Space Institute, Tullahoma, TN	0930 AIAA-2004-3676 Hot Flow Model of the Vortex Cold Wall Liquid Rocket D. Fang, University of Tennessee Space Institute, Tullahoma, TN				
---	--	--	---	--	--	--	--

Tuesday Morning / 13 July 2004**Session 57-LP-9****Liquid Rocket Engine Nozzles I****222**

Chaired by: S. FORDE, Aerojet, Sacramento, CA, and G. HAGEMANN, EADS-ST, Munich, Germany

0800 AIAA-2004-3677 The Volvo Aero Laser Welded Sandwich Nozzle R. Rydén, Volvo Aero Corporation, Trollhättan, Sweden	0830 AIAA-2004-3678 Experimental Evaluation of Side- Load Characteristics on TP, CTP and TO Nozzles T. Tomita, Japan Aerospace Exploration Agency, Kakuda, Japan	0900 AIAA-2004-3679 Numerical Analysis of Flow Characteristics and Side Load Generation in Rocket Nozzles Y. Xia, AOES, Leiden, The Netherlands	0930 AIAA-2004-3680 Transient Two-Dimensional Analysis of Side Load in Liquid Rocket Engine Nozzles T. Wang, NASA Marshall, Huntsville, AL	1000 AIAA-2004-3681 Transient Three-Dimensional Analysis of Side Load in Liquid Rocket Engine Nozzles T. Wang, NASA Marshall, Huntsville, AL	1030 AIAA-2004-3682 Transpiration Cooling Applied to C/C Liners of Cryogenic Liquid Rocket Engines O. Haidn, DLR, German Aerospace Research Center, Lampoldshausen, Germany	1100 AIAA-2004-3684 Flow Separation and Heat Transfer in High Area Ratio Nozzles G. Hagemann, EADS Space Transportation GmbH, Munich, Germany	
--	---	--	---	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3366>.

Tuesday Morning / 13 July 2004							
Session 58-LP-10				Liquid Rocket Engine Turbomachinery I			304
Chaired by: P. SGARLATA, Concepts - NREC, Woburn, MA, and J. GARVEY, Garvey Spacecraft Corporation, Huntington Beach, CA							
0800 AIAA-2004-3685 Boost Turbopump Assemblies for Hydrogen- Oxygen Liquid Propellant Rocket Engines Y. Demiyanenکو, CADB, Voronezh, Russia	0830 AIAA-2004-3686 Engineering and Testing of a Main Oxidizer Turbopump Assembly for the RL60 Engine Y. Demiyanenکو, CADB, Voronezh, Russia	0900 AIAA-2004-3687 Turbopump Turbines Developed by Volvo S. Trollheden, Volvo Aero Corp., Trollhattan, Sweden	0930 AIAA-2004-3688 Development and Testing of a Fluid Film Bearing LH2 Turbopump Demonstrator E. Edeline, Snecma Moteurs, Vernon, France	1000 AIAA-2004-3689 Investigation of the Performance of a Thrust Balance Device for a Centrifugal Pump Rotor Y. Demiyanenکو, CADB, Voronezh, Russia			

Tuesday Morning / 13 July 2004							
Session 59-LP-11		Spacecraft Engines and Propulsion Systems I					305
Chaired by: K. KREINER, Boeing Satellite Systems, Los Angeles, CA, and S. MILLER, Aerojet, Redmond, WA							
0800 AIAA-2004-3690 Bipropellant Micro-Rocket Engine P. Miotti, Mechatronic GmbH, Villach, Austria	0830 AIAA-2004-3693 Injector Design Verification Testing for a High Performance Bipropellant Rocket Engine D. Krismer, Aerojet, Redmond, WA	0900 AIAA-2004-3694 Off- Limit Testing of the Model R- 4D 110 LBF (490 N) Bipropellant Rocket Engine C. Stechman, Aerojet, Northridge, CA	0930 AIAA-2004-3695 In- Flight Propulsion System Characterization for Both Mars Exploration Rover Spacecraft T. Barber, Jet Propulsion Laboratory, Pasadena, CA	1000 AIAA-2004-3696 Liquid Rocket Propulsion for Atmospheric Flight in the Proposed ARES Mars Scout Mission C. Kuhl, NASA Langley Research Center, Hampton, VA	1030 AIAA-2004-3697 Numerical and Experimental Study of Small Thruster Plume G. Cai, Beijing University of Aeronautics and Astronautics, Beijing, China (prc)		

Tuesday Morning / 13 July 2004							
Session 60-NFF-3			Future Flight II			203/204	
Chaired by: D. PELACCIO, Science Applications International Corporation, Littleton, CO							
0800 AIAA-2004-3699 Can Conventional Warp Drive Avoid Temporal Paradox? A. Goff, Novatia Inc., Folsom, CA	0830 AIAA-2004-3700 Guidelines for a Space Propulsion Device Based on Heim's Quantum Theory W. Dröschner, IGW Leopold-Franzens Univ., Innsbruck, Austria	0900 AIAA-2004-3702 Possible Experimental Evidence of Direct Matter- to- Antimatter Conversion D. Schaefer , Bellbrook, OH	0930 AIAA-2004-3705 A Comparison of Antimatter Driven Interstellar Propulsion Systems L. Coreano, Pratt & Whitney, East Hartford, CT	1000 AIAA-2004-3706 Things to do While Coasting Through Interstellar Space D. Andrews, Andrews Space, Seattle, WA			

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3363>.

Tuesday Morning / 13 July 2004**Session 61-PC-4****Fundamental Combustion Processes II****208**

Chaired by: C. BRUNO, University of Rome, Rome, Italy, and C. CADOU, University of Maryland, College Park, MD

0800 AIAA-2004-3707 Numerical Study of the Effect of Microwave Discharge on the Premixed Methane- air Flame Y. Ju, Princeton University, Princeton, NJ	0830 AIAA-2004-3708 Measurement of Burning Velocities of Dimethyl Ether and Air Premixed Flames at Elevated Pressures X. Qin, Princeton University, Princeton, NJ	0900 AIAA-2004-3709 Laminar Flame Speeds of Preheated iso-Octane/Air and n-Decane/Air Flames Using Digital Particle Image Velocimetry J. Freeh, NASA Glenn Research Center, Cleveland, OH	0930 AIAA-2004-3711 Mixing Dynamics of a Channel Type Microcombustor M. Ahmed, University of Texas at El Paso, El Paso, TX	1000 AIAA-2004-3712 Numerical Study of Detonation Stabilization by Finite Length Wedges M. Walter, PUC-Rio, Rio De Janeiro, Brazil	1030 AIAA-2004-3713 Microwave Techniques for the Combustion Enhancement of Laminar Flames D. Sullivan, Research Support Instruments, Princeton, NJ	1100 AIAA-2004-3714 Effect of Changing Methane/Oxygen Coaxial Injector Configuration on Diffusion Flame Stability J. Moore, Pennsylvania State University, University Park, PA	1130 AIAA-2004-3376 High Pressure LOx/H2 Combustion and Flame Dynamics J. Smith, DLR German Aerospace Center, Hardthausen, Germany
---	--	--	---	---	---	---	---

Tuesday Morning / 13 July 2004**Session 62-SCP-2****Advanced Seal Technology I****210**

Chaired by: B. STEINETZ and P. DUNLAP, NASA Glenn Research Center, Cleveland, OH

0800 AIAA-2004-3715 Latest Developments in Wear Prediction of Strip Seals Through Conductance N. Turnquist, GE Global Research Center, Niskayuna, NY	0830 AIAA-2004-3716 Relative Axial Displacement Leakage Effects on Straight-Through Labyrinth Seals with Rub Grooves D. Rhode, Texas A&M University, College Station, TX	0900 AIAA-2004-3718 Effect of Rub- Groove Shape on the Leakage of Abradable Stepped Labyrinth Seals J. Xu, Texas A&M University, College Station, TX	0930 AIAA-2004-3720 A Microwave Blade Tip Clearance Sensor for Active Clearance Control Applications J. Geisheimer, Radatec Inc., Atlanta, GA	1000 AIAA-2004-3721 Hydrodynamic Lift of Brush Seals In Oil Sealing Applications M. Aksit, Sanvanci University, Niskayuna, NY			
---	---	---	--	--	--	--	--

Tuesday Morning / 13 July 2004**Session SR-8****Vega SRM Technologies****Floridian Ballroom**

Chaired by: F. BLOMSHIELD, Naval Air Warfare Center, China Lake, CA, and M. FRIEDLANDER, Aerojet, Gainesville, VA

0800 AIAA-2004-4212 Vega Launch Vehicle Propulsion Systems - An Overview of the 2004 Development Status S. Bianchi, ESA, Rome, Italy	0830 AIAA-2004-4213 Damage Tolerance Approach to SRM Composite Cases P. Perugini, Avio, Rome, Italy	0900 AIAA-2004-4214 A New Static Firing Test Bench for Zefiro SRM A. Neri, Avio, Rome, Italy	0930 AIAA-2004-4215 Design and Development of a Carbon Rope- Based Thermal Interface for VEGA SRMs E. Fazio, Avio, Colleferro (Rome), Italy	1000 AIAA-2004-4216 Design and Development of a Supported Thermal Protection (PTS) for Vega Solid Rocket Motors E. Fazio, Avio, Colleferro (Rome), Italy	1030 AIAA-2004-4217 A FEM Approach to the Dynamic Model of the Vega SRMs P. Perugini, Avio, Rome, Italy	1100 AIAA-2004-4219 VEGA Program - The P80 FW SRM Nozzle E. Gautronneau, Snecma Solid Propulsion, Bordequex, France	1130 AIAA-2004-4220 P80 FW SRM - New Technologies for Solid Rocket Motor - Status of Development M. Biagioni, Europropulsion, Paris, France
---	--	---	--	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3351>.

Tuesday Morning / 13 July 2004**Session 63-SR-3****Motor Combustion Instability and Ignition****301/302**

Chaired by: J. FURFARO and J. MCMILLIN, ATK Thiokol Propulsion Corporation, Brigham City, UT

0800 AIAA-2004-3722 Acoustic Particle Damping of Propellants Containing Ultra- Fine Aluminum F. Blomshield, Naval Air Warfare Center, China Lake, CA	0830 AIAA-2004-3723 Pulse- Echo Measurements of Pulsed Propellant Deflagration R. Di Salvo, CFD Research Corporation, Huntsville, AL	0900 AIAA-2004-3724 Pressure Regulating Mechanism of a Self- Quenching Solid- Propellant Motor M. Tanaka, National Defense Academy, Yokosuka, Japan	0930 AIAA-2004-3725 Behavior of Sulfur in Pyrolant for Micro Rocket Motor H. Abe, Nihon University, Funabashi, Chiba, Japan	1000 AIAA-2004-3726 Numerical Transient Burning Rate Model for Solid Rocket Motor Simulations D. Greatrix, Ryerson University, Toronto, Canada	1030 AIAA-2004-3727 Combustion and Ignition Characteristics of Zr in Solid Fuel of Ducted Rockets T. Suzuki, Nihon University, Funabashi, Japan		
--	--	---	--	--	---	--	--

Tuesday Morning / 13 July 2004**Session 64-VS-3****Advanced Space Transportation Concepts****315**

Chaired by: W. ESCHER, Science Applications International Corporation, Huntsville, AL, and J. OLDS, Georgia Institute of Technology, Atlanta, GA

0800 AIAA-2004-3728 Aztec: A TSTO Hypersonic Vehicle Concept Utilizing TBCC and HEDM Propulsion Technologies T. Kokan, Georgia Institute of Technology, Atlanta, GA	0830 AIAA-2004-3729 StarRunner: A Single- Stage- to- Orbit, Airbreathing, Hypersonic Propulsion System P. Biltgen, Georgia Institute of Technology, Atlanta, GA	0900 AIAA-2004-3730 The Flock Booster Architecture - Low Cost Access to LEO via Sustained Fueling A. Goff, Novatia Inc., Folsom, CA	0930 AIAA-2004-3731 The Formulation of a Near Term Stepping Stone to a Low Cost Earth- to- Orbit Transportation System Based on Legacy Technology R. Chase, ANSER, Arlington, VA	1000 AIAA-2004-3734 Shuttle Variations and Derivatives That Never Happened – An Historical Review C. Ehrlich, , Calabasas, CA	1030 AIAA-2004-3735 Centurion: A Heavy- Lift Launch Vehicle Family for Cis- Lunar Exploration D. Young, Georgia Institute of Technology, Atlanta, GA		
--	---	--	--	--	--	--	--

Tuesday Morning / 13 July 2004**Session 65-VS-4****Space Tourism Vehicles****316**

Chaired by: E. RICE, Orbitec, Madison, WI

0800 AIAA-2004-3736 Selling Space to Tourists: Lessons Learned by an Adventure Pioneer J. Reifert, Incredible Adventures, Sarasota, FL	0830 AIAA-2004-3742 Reusable Rocket Propulsion for Space Tourism Vehicles D. Jones, XCOR Aerospace, Mojave, CA						
---	--	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3085>.

Tuesday Morning / 13 July 2004**1000 - 1200 Humans Beyond Low-Earth Orbit (LEO) - Propulsion Needs and Capabilities Palm A**

The ability to reach beyond low-Earth orbit hinges on the right propulsion to reach Low Earth Orbit and to propel us beyond. Some of the world's leading government and industry experts in this area will be on hand to discuss the needs and capabilities for future propulsion to meet this far-reaching goal. Aviation Week & Space Technology Senior Editor Craig Covault will facilitate the discussion and lead a question and answer portion.

Panelists:

Garry Lyles, NASA, Director of Crew Exploration
 John Karas, Lockheed Martin, Vice President of Space Exploration
 General Robert S. Dickman, SAF/US, Deputy, Military Space
 Byron Wood, Rocketdyne, Vice President and General Manager
 Doug Young, Northrop Grumman, Director, Space Systems
 Steve M. Francois, NASA, Expendable Launch Vehicle Program Manager

Tuesday Afternoon / 13 July 2004**Session 66-ABP-9 Engine Systems - PDE II 317**

Chaired by: F. SCHAUER, Air Force Research Laboratory, Wright-Patterson AFB, OH, and J. HOKE, Innovative Scientific Solutions Inc, Dayton, OH

1300 AIAA-2004-3744 Single- Tube Two-Dimensional Evaluation of a Pulse Detonation Engine as a Ramjet Replacement P. Harris, DRDC Valcartier, Val-Belair, Canada	1330 AIAA-2004-3745 Multi- Tube Two-Dimensional Evaluation of a Pulse Detonation Engine as a Ramjet Replacement P. Harris, DRDC Valcartier, Val-Belair, Canada	1400 AIAA-2004-3746 Investigation of Flame Acceleration Enhancement for a Pulse Detonation Engine Initiation System G. Ciccarelli, Queen's University, Kingston, Canada	1430 AIAA-2004-3747 Shock Reflection Detonation Initiation Studies for Pulse Detonation Engines B. deWitt, Queen's University, Kingston, Canada	1500 AIAA-2004-3749 Performance of a Valveless Air Breathing Pulse Detonation Engine A. Prigent, Roxel France, Le Subdray, France	1530 AIAA-2004-3750 Design, Fabrication, and Testing of a Miniature Impulse Turbine Driven by Compressed Gas D. Holt, Rochester Institute of Technology, Rochester, NY		
---	--	--	--	--	---	--	--

Tuesday Afternoon / 13 July 2004**Session 67-ABP-10 Turbomachinery Component Technology - Unsteady Aerodynamics and Aeromechanics of Gas Turbine Engines I 318**

Chaired by: M. BAKHLE and G. STEFKO, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3751 Experimental Investigation of Geometric Uncertainty Effects on Blade Forced Response R. O'Hara, Air Force Research Laboratory, Wright-Patterson AFB, OH	1330 AIAA-2004-3752 A Study on Active Vibration Control for Stator Vanes in a Research Compressor R. Angelucci, University of Kentucky, Lexington, KY	1400 AIAA-2004-3753 Maximum Mistuned Bladed Disk Forced Response with Frequency Veering J. Kenyon, Air Force Research Laboratory, Wright-Patterson AFB, OH	1430 AIAA-2004-3754 Steady Flow Simulation of Rotor- Stator Interactions with a New Unsteady Flow Model D. Charbonnier, Ecole Centrale de Lyon, Ecully, France	1500 AIAA-2004-3755 Mistuning for Minimum Maximum Bladed Disk Forced Response K. Jones, U.S. Air Force Academy, USAF Academy, CO	1530 AIAA-2004-3757 Computational Investigation of IGV-Rotor Interaction in Turbomachinery R. Darbe, Oklahoma State University, Stillwater, OK	1600 AIAA-2004-3758 Data Analysis of Periodic Unsteady Pressure Signals from an Airfoil Cascade C. Ford, University of Kentucky, Paducah, KY	
--	--	---	---	---	---	---	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3416>.

Tuesday Afternoon / 13 July 2004**Session 68-APC-2****Unique Propulsion Systems II****207**

Chaired by: J. ROBINSON, The Boeing Company, Seal Beach, CA, and U. SHUMLAK, University of Washington, Seattle, WA

1300 AIAA-2004-3759 The Cosmic Matrix Displacement Model (An Explanation for Gravity and Inertia) T. Davis, Davis Design Group, Jupiter, FL	1330 AIAA-2004-3760 Concept for the Efficient Transfer of External Power to and from High-Speed Flows D. Riggins, University of Missouri-Rolla, Rolla, MO	1400 AIAA-2004-3762 Transient Shutdown Simulations of a Realistic MEMS Supersonic Nozzle J. Kujawa, University of Vermont, Burlington, VT	1430 AIAA-2004-3763 Modeling of Catalyzed Hydrogen Peroxide Decomposition in Slender Microchannels with Arrhenius Kinetics X. Zhou, University of Vermont, Burlington, VT	1500 AIAA-2004-3766 Quasi One- Dimensional Performance Analysis of a Magnetoplasma Jet Engine B. Parent, Seoul National University, Seoul, South Korea	1530 AIAA-2004-3765 Preliminary Performance Assessment of a Combined Rocket - Magjet Engine B. Parent, Seoul National University, Seoul, South Korea		
--	--	--	--	---	---	--	--

Tuesday Afternoon / 13 July 2004**Session 69-EP-16****Hall Thruster Development II****113**

Chaired by: R. SPORES, Air Force Research Laboratory, Edwards, CA, and B. BEAL, Aerojet, Redmond, WA

1300 AIAA-2004-3767 Performance Characteristics of a Cluster of 5 kW Laboratory Hall Thrusters M. Walker, University of Michigan, Ann Arbor, MI	1330 AIAA-2004-3768 Development of a Vaporizing Liquid Bismuth Anode for Hall Thrusters D. Massey, Michigan Technological University, Houghton, MI	1400 AIAA-2004-3771 Development of a Double Stage Hall Thruster for Advanced Telecom, Remote Sensing and Scientific Space Missions G. Matticari, Laben Proel Technologie Division, Campi Bisenzio, Italy	1430 AIAA-2004-3772 High- Frequency Instabilities and Low-Frequency Dynamics in Hall Thruster Plasma A. Lazurenko, Orleans University, Orleans, France	1500 AIAA-2004-3773 Control of the Ceramic Erosion by Optical Emission Spectroscopy: Parametric Studies of SPT- 100ML D. Pagnon, Centre National de la Recherche Scientifique, Orsay, France			
--	---	---	---	---	--	--	--

Tuesday Afternoon / 13 July 2004**Session 70-EP-17****Hall Thruster Physics and Modeling I****114**

Chaired by: N. FISCH, Princeton University, Princeton, NJ, and B. POTE, Busek Company, Natick, MA

1300 AIAA-2004-3774 On the Near- anode Region of the Hall Thruster Discharge E. Ahedo, ETSI Aeronáuticos, Madrid, Spain	1330 AIAA-2004-3775 A 90 GHz Phase- Bridge Interferometer for Plasma Density Measurements in the Near Field of a Hall Thruster M. Cappelli, Stanford University, Stanford, CA	1400 AIAA-2004-3776 Non- Intrusive Characterization of the Hall Thruster Azimuthal Drift Current C. Thomas, Stanford University, Stanford, CA	1430 AIAA-2004-3777 Kinetic Study of Wall Effects in SPT Hall Thrusters K. Sullivan, Massachusetts Institute of Technology, Cambridge, MA	1500 AIAA-2004-3779 Anode Fall Formation in a Hall Thruster L. Dorf, Princeton Plasma Physics Laboratory, Princeton, NJ	1530 AIAA-2004-3781 Boundary Conditions for a 2- D hybrid Stationary Plasma Thruster Model J. Koo, University of Michigan, Ann Arbor, MI		
--	--	--	--	--	---	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3332>

Tuesday Afternoon / 13 July 2004**Session 71-EP-18****Ion Physics & Modeling I****118/119**

Chaired by: D. GOEBEL, Jet Propulsion Laboratory, Pasadena, CA, and P. WILBUR, Colorado State University, Fort Collins, CO

1300 AIAA-2004-3782 Numerical Simulation of Two- Grid Ion Optics Using a 3D Code J. Anderson, Jet Propulsion Laboratory, Pasadena, CA	1330 AIAA-2004-3783 Whole Ion Optics Simulations of a Subscale Gridlet Using a Hybrid- Grid IFE- PIC Code R. Kafafy, Virginia Tech, Blacksburg, VA	1400 AIAA-2004-3784 Computational Ion Optics Design Evaluations S. Malone, NASA Glenn Research Center, Cleveland, OH	1430 AIAA-2004-3785 Three- Dimensional Divergence Characteristics of Ion Beamlets in an Ion Thruster Y. Okawa, Japan Society for the Promotion of Science, Chofu, Tokyo, Japan	1500 AIAA-2004-3786 Progress In NEXT Ion Optics Modeling J. Emhoff, University of Michigan, Ann Arbor, MI	1530 AIAA-2004-3787 Evolution of Extraction Grid Erosion with Operation Time M. Tartz, Institute for Surface Modification, Leipzig, Germany	1600 AIAA-2004-3788 Differential Sputtering Behavior of Pyrolytic Graphite and Carbon- Carbon Composite Under Xenon Bombardment J. Williams, Colorado State University, Fort Collins, CO	1630 AIAA-2004-3789 Further Investigation of Low- Energy Ion Sputtering in Ion Thrusters M. Nakles, Virginia Tech, Blacksburg, VA
--	---	---	---	--	--	---	--

Tuesday Afternoon / 13 July 2004**Session 72-EP-19****Ion Test & Characterization II****122**

Chaired by: J. WILLIAMS, Colorado State University, Fort Collins, CO, and K. GOODFELLOW, Jet Propulsion Laboratory, Pasadena, CA

1300 AIAA-2004-3790 Single- String Integration Test Measurements of the NEXT Ion Engine Plume A. Snyder, NASA Glenn, Cleveland, OH	1330 AIAA-2004-3791 NEXT Ion Engine 2000 Hour Wear Test Results G. Soulas, NASA Glenn Research Center, Cleveland, OH	1400 AIAA-2004-3792 NEXT Ion Engine 2000 Hour Wear Test Plume and Erosion Results H. Kamhawi, NASA Glenn Research Center, Cleveland, OH	1430 AIAA-2004-3794 Discharge Chamber Plasma Structure of a 30 cm NSTAR- type Ion Engine D. Herman, University of Michigan, Ann Arbor, MI	1500 AIAA-2004-3795 Characterization of Near Field Plasma Environment of a Hollow Cathode Assembly E. Fossum, Michigan Technological University, Houghton, MI			
---	---	--	--	--	--	--	--

Tuesday Afternoon / 13 July 2004**Session 73-EP-20****Micropropulsion Development II****123**

Chaired by: M. CAPELLI, Stanford University, Palo Alto, CA, and J. ZIEMER, Jet Propulsion Laboratory, Pasadena, CA

1300 AIAA-2004-3797 Solid Propellant Microthruster Using Laser- Assisted Combustion A. Kakami, Kyushu Institute of Technology, Kitakyushu-city, Japan	1330 AIAA-2004-3798 The Design, Development and in-flight Operation of a Water Resistojet Micropropulsion System D. Gibbon, Surrey Satellite Technology Ltd, Guildford, Great Britain	1400 AIAA-2004-3799 Experimental Investigation of a Chemically- Augmented, Diode Laser Thruster for Microspacecrafts M. Nakano, Tokyo Metropolitan College of Aeronautical Engineering, Tokyo, Japan	1430 AIAA-2004-3803 FEEP Dynamic Characterization with Flight- Standard Power Control Unit D. Nicolini, European Space Agency, Noordwijk, The Netherlands				
--	--	---	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3152>.

Tuesday Afternoon / 13 July 2004**Session 74-EP-21****Mission & Systems Analysis****124**

Chaired by: R. BAGGETT, NASA Marshall Space Flight Center, Huntsville, AL, and F. WILSON, Aerojet, Redmond, WA

1300 AIAA-2004-3804 Application of Solar Electric Propulsion to a Comet Surface Sample Return Mission M. Cupples, Science Applications International Corporation, Huntsville, AL	1330 AIAA-2004-3805 Trade- off Between Payload and Trip- Time for EP Interplanetary Trajectories L. Casalino, Politecnico di Torino, Turin, Italy	1400 AIAA-2004-3806 Deep Space Mission Applications for NEXT: NASA's Evolutionary Xenon Thruster D. Oh, Jet Propulsion Laboratory, Pasadena, CA	1430 AIAA-2004-3807 Chemical and Solar Electric aPropulsion Systems Analyses for Mars Sample Return Missions B. Donahue, Boeing Phantom Works, Huntsville, AL	1500 AIAA-2004-3808 The AFRL DSX Flight Experiment G. Spanjers, Air Force Research Laboratory, Kirtland AFB, NM	1530 AIAA-2004-3811 Application of Micronewton Thrusters for Control of Multispacecraft Formations in Earth Orbit B. St. Rock, Worcester Polytechnic Institute, Worcester, MA		
---	--	--	--	--	--	--	--

Tuesday Afternoon / 13 July 2004**Session 75-EP-22****Project Prometheus III****125**

Chaired by: J. CASSADY, Aerojet, Redmond, WA, and J. DUNNING, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3813 Discharge Chamber Performance of the NEXIS Ion Thruster D. Goebel, Jet Propulsion Laboratory, Pasadena, CA	1330 AIAA-2004-3815 Ultra High Voltage Propellant Isolators and Insulators for JIMO Ion Thrusters B. Banks, NASA Glenn Research Center, Cleveland, OH	1400 AIAA-2004-3816 A High Power Ion Thruster Plume Model I. Mikellides, Jet Propulsion Lab, Pasadena, CA	1430 AIAA-2004-3817 Theoretical Model of a Hollow Cathode Insert Plasma I. Mikellides, Jet Propulsion Lab, Pasadena, CA	1500 AIAA-2004-3818 Numerical Simulation of HiPEP Ion Optics C. Farnell, Colorado State University, Fort Collins, CO	1530 AIAA-2004-3819 Operation of a Microwave Electron Cyclotron Resonance Cathode H. Kamhawi, NASA Glenn Research Center, Cleveland, OH	1600 AIAA-2004-4224 NEXIS Cathode Measurements at the Species Level M. Crofton, The Aerospace Corporation, Los Angeles, CA	
---	--	--	--	---	--	---	--

Tuesday Afternoon / 13 July 2004**Session 76-HR-2****Hybrid Rockets II****220**

Chaired by: S. CLAFLIN, The Boeing Company, Canoga Park, CA, and N. SERIN, TubitakSage, Ankara, Turkey

1300 AIAA-2004-3821 Characterization of Nano- Sized Energetic Particle Enhancement of Solid- Fuel Burning Rates in an X- Ray Transparent Hybrid Rocket Engine B. Evans, Pennsylvania State University, University Park, PA	1330 AIAA-2004-3822 Overview of a 4- inch OD Paraffin- Based Hybrid Sounding Rocket Program D. VanPelt, Lockheed Martin, Sunnyvale, CA	1400 AIAA-2004-3823 LOX/HTPB/AIH3 Hybrid Propulsion for Launch Vehicle Boosters M. Calabro, , Villennes, France	1430 AIAA-2004-3824 Ballistic Properties of Mixed Hybrid Propellants R. Frederick, UAH Propulsion Research Center, Huntsville, AL	1500 AIAA-2004-3825 An Experimental Study of Hybrid/Liquid Rocket Engine Applied Rockt Grade Hydrogen Peroxide N. Tsujikado, Tokai Univ., Hiratsuka, Japan			
---	---	--	--	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3133>.

Tuesday Afternoon / 13 July 2004**Session 77-HYP-5****URETI I****223**

Chaired by: K. BOWCUTT, The Boeing Company, Huntington Beach, CA, and C. MEYER, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3826 Experimental and Numerical Studies of Mixing and Combustion in Scramjet Combustors S. Menon, Georgia Institute of Technology, Atlanta, GA	1330 AIAA-2004-3827 Critical Issues in TBCC Modeling A. Marshall, University of Maryland, College Park, MD	1400 AIAA-2004-3828 Propulsion Research Conducted at the University of Maryland - University of Michigan Space Vehicle Technology Institute J. Driscoll, University of Michigan, Ann Arbor, MI	1430 AIAA-2004-3829 Design, Construction and Operation of a Combustor Emulator for Short- Duration High-Pressure Turbine Experiments C. Haldeman, Ohio State University, Columbus, OH	1500 AIAA-2004-3831 Flameholding Analyses in Supersonic Flow A. Thakur, University of Florida, Gainesville, FL	1530 AIAA-2004-3832 Understanding Isolator Performance Operating in the Separation- Shock Mode A. Nedungadi, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1600 AIAA-2004-3990 Wireless Ceramic Sensors Operating in High Temperature Environments E. Birdsell, Georgia Institute of Technology, Atlanta, GA	
--	---	---	--	---	---	--	--

Tuesday Afternoon / 13 July 2004**Session 78-ISP-4****Advanced Chemical and Materials II****304**

Chaired by: C. GUERNSEY, Jet Propulsion Laboratory, Pasadena, CA, and F. LU, Aerojet, Redmond, WA

1300 AIAA-2004-3835 Design and Development of a Dynamic Reactor with Online Analysis for the Catalytic Decomposition of Monopropellants P. Esteves, University of Poitiers, Poitiers, France	1330 AIAA-2004-3836 Reciprocating Pump Systems for Space Propulsion J. Whitehead, Lawrence Livermore National Lab, Livermore, CA	1400 AIAA-2004-3837 Results of an Advanced Development Zero Boil-Off Cryogenic Propellant Storage Test D. Plachta, NASA Glenn, Cleveland, OH	1430 AIAA-2004-3838 Thermodynamic Vent System Test in Low Earth Orbit Simulation T. VanOverbeke, NASA Glenn, Cleveland, OH	1500 AIAA-2004-3492 Chemical Propulsion Systems for Low Cost Mars Sample Return A. Baker, Surrey Satellite Technology Ltd., Guildford, Great Britain			
---	---	---	---	---	--	--	--

Tuesday Afternoon / 13 July 2004**Session 79-ISP-5****Aeroassist and Aerocapture****305**

Chaired by: M. MUNK, NASA Marshall Space Flight Center, Huntsville, AL, and R. BAILEY, Jet Propulsion Laboratory, Pasadena, CA

1300 AIAA-2004-3842 Neptune Aerocapture Mission and Spacecraft Design Overview R. Bailey, Jet Propulsion Laboratory, Pasadena, CA	1330 AIAA-2004-3843 Mission Trades for Aerocapture at Neptune M. Noca, Jet Propulsion Laboratory, Pasadena, CA	1400 AIAA-2004-3844 Atmospheric Models for Aerocapture C. Justus, Computer Sciences Corporation, Huntsville, AL	1430 AIAA-2004-3847 Aerobraking Using Planetary Ionosphere: Electrostatic Augmentation of the Aerodynamic Forces J. Wang, Virginia Polytechnic Institute & State University, Blacksburg, VA	1500 AIAA-2004-3848 Computational Hypervelocity Aerodynamics of a Caret Waverider T. Silvester, Centre for Hypersonics, Brisbane, Australia			
--	---	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3313>.

Tuesday Afternoon / 13 July 2004**Session 80-LP-12
1300 - 1700****Apollo Propulsion (Invited)****Palm B**

Chaired by: K. PUGMIRE, Spincraft/Standex International, Huntington Beach, CA, and S. FISHER, Rocketdyne, Canoga Park, CA

Hear the Apollo Propulsion development stories from the people that actually worked the numerous propulsion systems that put men on the moon and returned them safely to earth. Each propulsion expert will provide an overview of the development of the propulsion system he worked on. Following these presentations will be an open question and answer session. Don't miss this unique opportunity to listen to and talk with some of the Apollo program propulsion experts.

F-1 Booster Engine - Robert Biggs, Rocketdyne

J-2 Saturn V Second and Third Stage Engine - Paul Coffman, Rocketdyne

Attitude Control Engines - Carl Stechman, Marquardt (Aerojet Redmond Operations)

SE-7 (S-IVB Stage APS Ullage Control) & SE-8 (Apollo Command Module RCS) Engines - Tim Harmon, Rocketdyne

AJ10-137 Apollo Service Module Engine - Clay Boyce, Aerojet (retired)

Lunar Descent Engine - Jerry Elverum, TRW (retired)

Lunar Ascent Engine - Tim Harmon, Rocketdyne

Each presenter had direct participation and responsibility with engine development and implementation and will share some of the learning experiences of the program. Following the individual presentations all participants will provide a forum for audience questions. No formal written papers will be presented, however, copies of the visual materials will be available post conference from the AIAA Liquid Propulsion Technical Committee.

Tuesday Afternoon / 13 July 2004**Session 81-LP-13****Liquid Rocket Engine & Propulsion System Modeling III****221**

Chaired by: B. WANG, The Aerospace Corporation, El Segundo, CA, and D. PERRY, The Boeing Company, Huntington Beach, CA

1300 AIAA-2004-3849 The Application of ITAPS for Evaluation of Propulsion and Power at the System Level C. Joyner, Pratt & Whitney Space, North Palm Beach, FL	1330 AIAA-2004-3850 Transient Analysis of the LE- 7A Rocket Engine Using the Rocket Engine Dynamic Simulator (REDS) N. Yamanishi, Japan Aerospace Exploration Agency, Tsukuba, Japan	1400 AIAA-2004-3851 Progress in the Development of a Computational Model for the Army's Impinging Stream Vortex Engine M. Nusca, Army Research Lab, Aberdeen Proving Ground, MD	1430 AIAA-2004-3852 A Model for Design and Analysis of Regeneratively Cooled Rocket Engines M. Naraghi, Manhattan College, Riverdale, NY			
--	---	--	---	--	--	--

Tuesday Afternoon / 13 July 2004**Session 82-LP-14****Liquid Rocket Engine Component Technology****222**

Chaired by: M. MEYER, NASA Glenn Research Center, Cleveland, OH, and C. ENGELBRECHT, Johns Hopkins University, Laurel, MD

1300 AIAA-2004-3858 The RL60 DEMO Program - An Opportunity to Validate New Valve Technologies J. Murray, Techspace Aero, Milmort, Belgium	1330 AIAA-2004-3859 Cryosat Cold Gas System and Component Development P. Smith, Polyflex Space Ltd, Cheltenham, Great Britain	1400 AIAA-2004-3860 Performance Analysis of the Thrust Chamber in Liquid Rocket Engine Using Liquefied Natural Gas as a Fuel P. Han, Hyundai Mobis, Yongin, South Korea	1430 AIAA-2004-4201 Hydrogen Peroxide Self Pressurizing Storage Tank Test and Analysis M. Lydon, U.S. Air Force Academy, USAF Academy, CO	1500 AIAA-2004-4211 Bi- Propellant Propulsion System Improvement for Telecommunication Satellites P. Garnero, Alcatel Space, Cannes La Bocca, France		
--	--	---	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3365>

Tuesday Afternoon / 13 July 2004**Session 83-NFF-4****Nuclear Thermal Propulsion****203/204**

Chaired by: S. BOROWSKI, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3863 TRITON: A TRImodal capable, Thrust Optimized, Nuclear Propulsion and Power System for Advanced Space Missions C. Joyner, Pratt & Whitney Space, North Palm Beach, FL	1330 AIAA-2004-3864 LANTR Engine System Integration M. Bulman, Aerojet, Sacramento, CA	1400 AIAA-2004-4230 Review of Nuclear Fuel Options for NEP and Bi-modal Concepts W. Carmack, BWXT, Lynchburg, VA	1430 AIAA-2004-3867 Current Status of Hot Hydrogen Test Facilities at BWXT to Support Future Nuclear Propulsion Research and Development W. Carmack, BWX Technologies Inc, Lynchburg, VA	1500 AIAA-2004-3868 Status of Assessing the Indirect Nuclear Propulsion Concept C. White, NASA Marshall Space Flight Center, Huntsville, AL		
---	---	---	---	--	--	--

Tuesday Afternoon / 13 July 2004**Session 84-PC-5****Combustion Modeling****208**

Chaired by: T. NGUYEN, Aerojet, Sacramento, CA, and G. HAGEMANN, EADS Space Transportation, Munich, Germany

1300 AIAA-2004-3870 Modeling Multi- Phase Effects in the Combustion of HMX and RDX E. Washburn, Naval Air Warfare Center, China Lake, CA	1330 AIAA-2004-3874 CFD Simulations of a 3-D Scramjet Flameholder Using Reduced Chemical Kinetic Mechanisms C. Montgomery, Reaction Engineering International, Salt Lake City, UT	1400 AIAA-2004-3875 Upwind Schemes of Non- Premixed Equilibrium Combustion Calculations E. Perrell, Embry-Riddle Aeronautical University, Daytona Beach, FL	1430 AIAA-2004-3876 Numerical Investigation on Effect of Inlet Dump Angle on Ramjet Combustor Performance R. Thangadurai, Defence Research and Development Laboratory, Hyderabad, India	1500 AIAA-2004-3877 LES of Supersonic Combustion of H ₂ / Vitiated Air E. Giacomazzi, University of Rome, Rome, Italy	1530 AIAA-2004-3878 Application of CFD-based Analysis Tool to the PS- 90A/A2 Combustors to Achieve Low NO Emission Level I. Koutsenko, JSC Aviadvigatel, Perm, Russia	
---	--	--	--	---	--	--

Tuesday Afternoon / 13 July 2004**Session 85-PC-6****Hydrocarbon Fuels****209**

Chaired by: C. SUNG, Case Western Reserve University, Cleveland, OH, and C. LEE, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3879 History of Sulfur Content Effects on the Thermal Stability of RP- 1 Under Heated Conditions S. Irvine, Air Force Research Laboratory, Edwards AFB, CA	1330 AIAA-2004-3882 Water Calorimetry Using Heat Flux Generation Methods R. Wills, Air Force Research Laboratory, Wright-Patterson AFB, OH	1400 AIAA-2004-3883 Combustion Characterization of Fluorinated Polymers N. Lerma, University of Florida, Gainesville, FL	1430 AIAA-2004-3885 Fischer- Tropsch Jet Fuels - Characterization for Advanced Aerospace Applications T. Edwards, Air Force Research Laboratory, Wright-Patterson AFB, OH	1500 AIAA-2004-3886 Update on the Development of JP- 8+100 T. Edwards, Air Force Research Laboratory, Wright-Patterson AFB, OH	1530 AIAA-2004-4207 Importance of Surrogate JP- 8/Jet- A Fuel Composition in Detailed Chemical Kinetics Development M. Mawid, Engineering Research & Analysis Company, Dayton, OH	
--	---	---	--	---	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3276>.

Tuesday Afternoon / 13 July 2004**Session 86-SCP-3****Advanced Seal Technology II****210**

Chaired by: B. STEINETZ and P. DUNLAP, NASA Glenn Research Center, Cleveland, OH

1300 AIAA-2004-3887 Further Investigations of Hypersonic Engine Seals P. Dunlap, NASA Glenn Research Center, Cleveland, OH	1330 AIAA-2004-3888 Hypersonic Airframe and Propulsion Seal Preload Device Development for 2300°F Service E. Paquette, Refractory Composites Inc, Glen Burnie, MD	1400 AIAA-2004-3889 Modeling and Evaluation of Canted Coil Springs as High Temperature Seal Preloading Devices J. Oswald, Case Western Reserve University, Cleveland, OH	1430 AIAA-2004-3890 Evaluation of High Temperature Knitted Spring Tubes for Structural Seal Applications S. Taylor, Case Western Reserve University, Cleveland, OH	1500 AIAA-2004-3891 On the Development of a Unique Arc Jet Test Apparatus for Control Surface Seal Evaluations J. Finkbeiner, NASA Glenn Research Center, Cleveland, OH	1530 AIAA-2004-3892 A Simple Model for Wear of Metal Cloth Seals M. Aksit, Sabanci University, Niskayuna, NY		
---	--	---	---	--	---	--	--

Tuesday Afternoon / 13 July 2004**Session 87-SR-4****Segmented Large Booster Special Session****301/302**

Chaired by: J. SAMBAMURTHI, NASA Marshall Space Flight Center, Huntsville, AL, and M. BERDOYES, SNECMA Propulsion Solide, Le Maillan, France

1300 AIAA-2004-3893 Large Solid Propulsion for Future Heavy Launchers D. Boury, Snecma Propulsion Solide, Le Haillan, France	1330 AIAA-2004-3894 Ariane 5 SRM Upgrade D. Boury, Snecma Propulsion Solide, Le Haillan, France	1400 AIAA-2004-3895 A Review of ETM- 03 (A Five Segment Shuttle RSRM Configuration) Ballistic Performance J. McMillin, ATK Thiokol Propulsion Corp., Brigham City, UT	1430 AIAA-2004-3896 Real- Time Measurements of Aft Dome Insulation Erosion on Space Shuttle Reusable Solid Rocket Motor B. McWhorter, ATK Thiokol Propulsion Corp., Brigham City, UT	1500 AIAA-2004-3897 Verification of RSRM Nozzle Thermal Models with ETM- 3 Aft Exit Cone In- depth Temperature Measurements J. Maw, ATK Thiokol Propulsion, Brigham City, UT	1530 AIAA-2004-3898 Pressure Oscillations and Structural Vibrations in Space Shuttle RSRM and ETM- 3 Motors D. Mason, ATK Thiokol Propulsion, Brigham City, UT	1600 AIAA-2004-3899 Liquid and Solid Propulsions : Comparison and Application Areas B. Broquere, Snecma Propulsion Solide, Bordeaux, France	1630 AIAA-2004-3900 Large SRM Propellant Facility at the European Space Center "CSG" F. Lillo, AVIO, Rome, Italy
---	--	--	---	---	---	--	---

Tuesday Afternoon / 13 July 2004**Session 88-VS-5****Responsive Spacelift****315**

Chaired by: A. WILLIAMS, Booz Allen Hamilton, Colorado Springs, CO, and J. NICHOLS, US Air Force, Los Angeles, CA

1300 AIAA-2004-3903 Two- Stage- to- Orbit Reusable Launch Vehicle Propulsion Performance Study M. Brock, Air Force Institute of Technology, Wright-Patterson AFB, OH	1330 AIAA-2004-3901 The Feasibility of an Earth Orbiting Tether Propulsion System S. Stasko, University of Tennessee Space Institute, Tullahoma, TN	1400 AIAA-2004-3905 Space Exploration Technologies' Falcon I Launcher: Towards Operationally Responsive Spacelift G. Shotwell, Space Exploration Technologies, El Segundo, CA	1430 AIAA-2004-3906 Propulsion System Design for the Peregrine Launch System J. Andrews, Andrews Space, Seattle, WA	1500 AIAA-2004-3907 Optimization of ETO Launch Systems for Airplane- like Safety and Reliability D. Andrews, Andrews Space, Seattle, WA			
---	--	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3064>.

Tuesday Afternoon / 13 July 2004**Session 89-VS-6****Shuttle Derived/ Upgrade (SLEP) Concepts****316**

Chaired by: D. SAUVAGEAU, ATK Thiokol Propulsion, Brigham City, UT, and L. MCKINNEY, McKinney Associates, St Louis, MO

1300 AIAA-2004-3908 Status of the Space Shuttle Service Life Extension Program R. Lightfoot, NASA, Washington, DC	1330 AIAA-2004-3909 Shuttle Derived Launch Vehicles S. Horowitz, NASA Johnson, Houston, TX	1400 AIAA-2004-3911 A GPS Receiver Upgrade for the Space Shuttle - Rationale and Considerations J. Goodman, United Space Alliance, Houston, TX	1430 AIAA-2004-3912 Advanced Health Management System for the Space Shuttle Main Engine M. Davidson, The Boeing Company, Canoga Park, CA	1500 AIAA-2004-3913 Space Shuttle Automation Adds Operational Flexibility for Space Transportation Planning E. Henderson, NASA Johnson, Houston, TX		
--	---	---	---	--	--	--

Wednesday Morning / 14 July 2004**0800 - 1000****Exploring Mars – Recent Successes and Future Plans for Robotic Missions****Palm A**

With staggering images and information coming back from the Red Planet, there is a great deal of information to discuss regarding the Rovers' successes. This also opens the door to what the future holds for robotic missions. Join James Garvin, Lead Scientist for NASA Mars Exploration Programs, as he navigates the U.S. and European Mars exploration efforts and discusses the present and future with an array of experts in the field.

Panelists:

Mars Exploration Overview - James Garvin, NASA HQ, Mars Exploration Programs

MER Mission Development Overview - Jim Erickson, NASA JPL

MER Surface Operations Testing Overview - Jessica Collisson, NASA JPL

MER Science Results - NASA JPL Representative

European Mars Exploration Activities - Marcello Coradini, European Space Agency Science Directorate

Wednesday Morning / 14 July 2004**Session 90-ABP-11****Engine Systems - PDE III****316**

Chaired by: N. KUPROWICZ and G. BRUENING, Air Force Research Laboratory, Wright-Patterson AFB, OH

0800 AIAA-2004-3914 The Effect of Transient Nozzle Flow on Detonation Tube Impulse M. Cooper, California Institute of Technology, Pasadena, CA	0830 AIAA-2004-3915 Multi- Cycle Analysis of an Ejector- Cooled Pulse Detonation Device K. Ajmani, Taitech Inc, Cleveland, OH	0900 AIAA-2004-3916 The Thermodynamic and Fluid Dynamic Functions of a Pulsed Detonation Engine Nozzle T. Kaemming, The Boeing Company, St. Louis, MO	0930 AIAA-2004-3917 Turbulent Flow Effects on DDT Run- up Distance for a Pulse Detonation Engine R. Farinaccio, DRDC Valcartier, Val-Belair, Canada	1000 AIAA-2004-3918 Flight Experiments Regarding Ethylene- Oxygen Single- Tube Pulse Detonation Rockets J. Kasahara, University of Tsukuba, Tsukuba, Japan	1030 AIAA-2004-3919 Detonation Initiation via Imploding Shock Waves S. Jackson, California Institute of Technology, Pasadena, CA	1100 AIAA-2004-4191 Metallized Gelled Propellants Combustion Experiments in a Pulse Detonation Engine B. Palaszewski, NASA Glenn Research Center, Cleveland, OH	1130 AIAA-2004-3873 Numerical Studies of Pulse Detonation Rocket Engines T. Fontfreyde, ONERA, Chatillon, France
---	--	--	--	---	---	--	---

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3267>

Wednesday Morning / 14 July 2004**Session 91-ABP-12****Exhaust Systems****317**

Chaired by: R. WILLS and D. BUCKWALTER, Air Force Research Laboratory, Wright-Patterson AFB, OH

0800 AIAA-2004-3920 Coupling of Twin Jets of Complex Geometry: Nozzle Orientation Effects R. Joshi, Illinois Institute of Technology, Chicago, IL	0830 AIAA-2004-3921 Nozzle Aftbody Drag Reduction Using Fluidics E. Gamble, Spiritech Advanced Products Inc., Jupiter, FL	0900 AIAA-2004-3922 The Isentropic Mach Number for Arbitrary Nozzle Area Ratio M. Olles, University of Tennessee Space Institute, Tullahoma, TN	0930 AIAA-2004-3923 Nozzle Selection and Design Criteria E. Gamble, Spiritech Advanced Products Inc., Jupiter, FL	1000 AIAA-2004-3924 Inverse Problems for Advanced Nozzle Design M. Ferlauto, Politecnico Di Torino, Torino, Italy	1030 AIAA-2004-3925 Tactical Missile Exhaust Plume at Angle of Attack K. Kennedy, U.S. Army Research Development and Engineering Command, Redstone Arsenal, AL	1100 AIAA-2004-4192 Development Needs for Advanced Afterburner Designs J. Lovett, Pratt & Whitney, East Hartford, CT	
--	--	--	--	--	---	---	--

Wednesday Morning / 14 July 2004**Session 92-ABP-13****Turbomachinery Component Technology - Unsteady Aerodynamics and Aeromechanics of Gas Turbine Engines II****318**

Chaired by: J. KENYON and C. CROSS, Air Force Research Laboratory, Wright-Patterson AFB, OH

0800 AIAA-2004-3927 A PIV Study of Pulsed Vortex Generator Jets K. Moore, Wright State University, Dayton, OH	0830 AIAA-2004-3928 Design of the Secondary Flow System for a Co-Flow Jet Cascade C. Paxton, University of Miami, Coral Gables, FL	0900 AIAA-2004-3929 Numerical Simulation of Rotating Stall in a Subsonic Compressor N. Gourdain, ONERA, Chatillon, France	0930 AIAA-2004-3933 Modeling and Simulation of Dynamic Inlet Flow Distortion Generation K. Savage, University of Tennessee Space Institute, Tullahoma, TN	1000 AIAA-2004-3934 CFD Study of the Flow Through a Transonic Compressor Rotor with Large Tip Clearance L. Merz, University of Cincinnati, Cincinnati, OH			
--	---	--	--	--	--	--	--

Wednesday Morning / 14 July 2004**Session 93-EDU-2
0800 - 1200****Education, Research and Service Through the National Institute of Aerospace****Palm B**

Chaired by: R. FREDERICK, University of Alabama in Huntsville, Huntsville, AL, and W. O'BRIEN, Virginia Polytechnic Institute & State University, Blacksburg, VA

This panel, led by Walter O'Brien, will bring together a unique group of panelists representing Academia, NASA and Industry. The panel will highlight how the National Institute of Aerospace operates as a new model of cooperation between the various institutions to advance Aerospace Engineering and Atmospheric Science.

Panelists and Topics:

The National Institute of Aerospace (NIA) - Concept, Vision and Mission - Walter F. O'Brien, J. Bernard Jones Professor of Mechanical Engineering, Virginia Tech, Blacksburg, VA

The Research and Educational Program of the NIA - Bernard Grossman, Vice President, Education and Outreach, NIA, Hampton, VA

NASA Langley Research Center Activities with the NIA - Dave Reubush, NASA Langley Research Center, Hampton, VA

A Resident Graduate Student's View of the NIA Program - Janet Convery, NIA Rising Star Fellow, Hampton, VA

Multi-University Research Cooperation under the NIA Program - Ari Bonanas, Graduate Research Assistant, Virginia Tech, Blacksburg, VA

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3179>.

Wednesday Morning / 14 July 2004**Session 94-EP-23****Advanced Concepts I****113**

Chaired by: E. CHOUERI, Princeton University, Princeton, NJ, and C. HAWK, University of Alabama in Huntsville, Huntsville, AL

0800 AIAA-2004-3935 Feasibility Study of Electroless Magnetoplasmdynamic Acceleration K. Toki, Japan Aerospace Exploration Agency, Sagamihara, Japan	0830 AIAA-2004-3936 The Performance and Plume Characterization of a Laboratory Gridless Ion Thruster with Closed Electron Drift Acceleration P. Peterson, QSS Group Inc., Cleveland, OH	0900 AIAA-2004-3937 Discharge Characteristics of Laser-Electric Hybrid Thrusters H. Horisawa, Tokai University, Hiratsuka, Japan	0930 AIAA-2004-3938 Density Measurements During Ion Cyclotron Heating in VASIMR C. Davis, University of Michigan, Ann Arbor, MI	1000 AIAA-2004-3939 Small Helicon Plasma Source Experiments J. Gilland, Ohio Aerospace Institute, Brookpark, OH	1030 AIAA-2004-3940 Faraday Accelerator with Radio- frequency Assisted Discharge (FARAD) E. Choueiri, Princeton University, Princeton, NJ	1100 AIAA-2004-3942 Active Electrospray Ionization for Efficient Electric Thrusters W. Song, The Boeing Company, Snohomish, WA	
--	--	---	--	--	--	---	--

Wednesday Morning / 14 July 2004**Session 95-EP-24****Hall Thruster Development III****114**

Chaired by: K. DEGRYS, Aerojet, Redmond, WA, and J. HAAS, Air Force Research Laboratory, Edwards, CA

0800 AIAA-2004-3944 Development and Preliminary Characterization of a Low Power Hall Thruster Prototype L. Biagioni, Alta S.p.A., Ospedaletto, Italy	0830 AIAA-2004-3946 Optical Diagnostics Options for Bismuth Hall Thrusters D. Scharfe, Stanford University, Stanford, CA	0900 AIAA-2004-3948 Evaluation of a Magnetically Filtered Faraday Probe for Measuring the Ion Current Density Profile of a Hall Thruster J. Rovey, University of Michigan, Ann Arbor, MI	0930 AIAA-2004-3949 Two Ways to Evaluate the Xe+ Ion Flow Velocity in a Hall Effect Thruster S. Mazouffre, Laboratoire d'Aerothermique, Orleans, France				
---	---	---	--	--	--	--	--

Wednesday Morning / 14 July 2004**Session 96-EP-25****Hall Thruster Physics and Modeling II****118/119**

Chaired by: A. GALLIMORE, University of Michigan, Ann Arbor, MI, and B. BEAL, Aerojet, Redmond, WA

0800 AIAA-2004-3951 A Comparison of 2- D Hybrid Hall Thruster Model to Experimental Measurements M. Allis, Stanford University, Stanford, CA	0830 AIAA-2004-3952 Hall Thruster Plume Simulation Using a Detailed Hybrid Model I. Boyd, University of Michigan, Ann Arbor, MI	0900 AIAA-2004-3953 Predicting Hall Thruster Operational Lifetime D. Manzella, NASA Glenn Research Center, Cleveland, OH	0930 AIAA-2004-3954 Particle Simulation of Plasma Dynamics Inside an Anode- Layer Hall Thruster K. Komurasaki, University of Tokyo, Tokyo, Japan	1000 AIAA-2004-3955 Fulfillment of the Bohm Condition on the 'HPHALL' Fluid- PIC Code E. Ahedo, ETSI Aeronáuticos, Madrid, Spain	1030 AIAA-2004-3957 Plume Divergence in the Hall Thruster A. Fruchtmann, Holon Academic Institute of Technology, Holon, Israel	1100 AIAA-2004-4103 Electron Transport and Ion Acceleration in a Low- Power Cylindrical Hall Thruster A. Smirnov, Princeton Plasma Physics Laboratory, Princeton, NJ	
---	--	---	---	---	---	---	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3134>.

Wednesday Morning / 14 July 2004**Session 97-EP-26****Ion Test & Characterization III****122**

Chaired by: R. COHEN, The Aerospace Corporation, Los Angeles, CA, and T. GREIBEL, NASA Glenn Research Center, Cleveland, OH

0800 AIAA-2004-3958 Near Discharge Cathode Assembly Plasma Potential Measurements in a 30- cm NSTAR- type Ion Engine Admist Beam Extraction D. Herman, University of Michigan, Ann Arbor, MI	0830 AIAA-2004-3959 Performance Characterization and Vibration Testing of 30- cm Carbon- Carbon Ion Optics J. Snyder, Jet Propulsion Laboratory, Pasadena, CA	0900 AIAA-2004-3961 Ion Engine Grid Gap Measurements G. Soulas, NASA Glenn Research Center, Cleveland, OH	0930 AIAA-2004-3962 Development of Laser- Spectroscopic Techniques on Xenon for RIT- Ion Thruster Plume Investigations N. Semenova, University of Stuttgart, Stuttgart, Germany	1000 AIAA-2004-3963 Laser- induced Fluorescence Velocimetry of Xe II in the 30- cm NSTAR- type Ion Engine Plume T. Smith, University of Michigan, Ann Arbor, MI	1030 AIAA-2004-4110 Sputtering Yields of Ion Thruster Materials at Oblique Incidence R. Kolasinski, California Institute of Technology, Pasadena, CA		
---	--	--	--	--	---	--	--

Wednesday Morning / 14 July 2004**Session 98-EP-27****Ion Thruster Development I****123**

Chaired by: A. HOSKINS, Aerojet, Redmond, WA, and J. FOSTER, NASA Glenn Research Center, Cleveland, OH

0800 AIAA-2004-3966 Overview of Ion Propulsion System Development at Aerojet Redmond F. Wilson, Aerojet, Redmond, WA	0830 AIAA-2004-3969 Status of the 150- mN Ion Engine Research at JAXA Y. Hayakawa, Japan Aerospace Exploration Agency, Chofu, Tokyo, Japan	0900 AIAA-2004-4209 Barium Source Material Development for Reservoir Hollow Cathodes N. Hill, Georgia Tech, Atlanta, GA	0930 AIAA-2004-3967 Boeing EDD Electric Propulsion Programs Overview J. Christensen, Boeing EDD, Torrance, CA				
---	---	--	--	--	--	--	--

Wednesday Morning / 14 July 2004**Session 99-EP-28****Power Processing & Feed Systems****124**

Chaired by: L. PINERO, NASA Glenn Research Center, Cleveland, OH, and J. FISHER, Aerojet, Redmond, WA

0800 AIAA-2004-3973 Multi- Kilowatt Power Module for High Power Hall Thrusters L. Pinero, NASA Glenn Research Center, Cleveland, OH	0830 AIAA-2004-3974 Development Status of the NEXT Propellant Management System R. Aadland, Aerojet General Corporation, Redmond, WA	0900 AIAA-2004-3976 The Development of a Micro Machined Xenon Feed System J. Bejhed, Uppsala Universitet, Uppsala, Sweden	0930 AIAA-2004-3977 Robust Pressure Regulation System for the SMART- 1 Electric Propulsion Sub- System C. Koppel, Snecma Moteurs, Moissy Cramayel, France				
--	---	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3126>.

Wednesday Morning / 14 July 2004**Session 100-EP-29****Nuclear Electric Propulsion Mission Analysis****125**

Chaired by: R. MYERS, Aerojet, Redmond, WA, and D. FIEHLER, QSS Group, Inc., Cleveland, OH

0800 AIAA-2004-3978 Neptune Orbiters Utilizing Solar and Radioisotope Electric Propulsion D. Fiehler, QSS Group Inc., Cleveland, OH	0830 AIAA-2004-3981 Nuclear Electric Propulsion Application: RASC Mission Robotic Exploration of Venus M. McGuire, NASA Glenn Research Center, Cleveland, OH	0900 AIAA-2004-3982 REACTIONN: A Nuclear Electric Propulsion Mission Concept to the Outer Solar System A. Charania, SpaceWorks Engineering Inc., Atlanta, GA					
--	--	---	--	--	--	--	--

Wednesday Morning / 14 July 2004**Session 101-HYP-6****URETI II****223**

Chaired by: C. MEYER, NASA Glenn Research Center, Cleveland, OH, and M. GRUBER, Air Force Research Laboratory, Wright-Patterson AFB, OH

0800 AIAA-2004-3983 Aerodynamics for Optimal Engine- Integrated Airbreathing Launcher Configurations M. Lewis, University of Maryland, College Park, MD	0830 AIAA-2004-3984 Active Compressor Stability Management and Impact on Engine Operability M. Dhingra, Georgia Institute of Technology, Atlanta, GA	0900 AIAA-2004-3985 Computational Modeling of Cavitation for Liquid Rocket Applications W. Shyy, University of Florida, Gainesville, FL	0930 AIAA-2004-3986 Large Scale Computation- Facilitated Design Optimization for Propulsion Components W. Shyy, University of Florida, Gainesville, FL	1000 AIAA-2004-3987 Enabling Technologies For Complex CFD Applications B. Soni, University of Alabama, Birmingham, AL	1030 AIAA-2004-3988 Comparison of HTHL and VTHL Airbreathing and Rocket Systems for Access to Space A. Dissel, University of Maryland, College Park, MD	1100 AIAA-2004-3989 A Method for Modeling System- Driven Uncertainty During Probabilistic Part Life Analyses J. Wallace, ExxonMobil Upstream Research Company, Houston, TX	
---	--	---	---	--	---	---	--

Wednesday Morning / 14 July 2004**Session 102-ISP-6****Solar Sail Propulsion****305**

Chaired by: S. MONTGOMERY, NASA Marshall Space Flight Center, Huntsville, AL

0800 AIAA-2004-3841 NASA's In- Space Propulsion Technology Program: Overview and Update L. Johnson, NASA Marshall Space Flight Center, Huntsville, AL	0830 AIAA-2004-3996 A Study of Possible Solar Sail Applications for Mars Missions T. Percy, Science Applications International Corporation, Huntsville, AL						
---	--	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3154>.

Wednesday Morning / 14 July 2004**Session 103-LP-15****Booster and Main Engines II****209**

Chaired by: J. GARVEY, Garvey Spacecraft Corporation, Huntington Beach, CA, and S. FORDE, Aerojet, Sacramento, CA

0800 AIAA-2004-3997 Reliability Enhancement of H- IIA Propulsion System A. Sato, Mitsubishi Heavy Industries Ltd, Nagoya, Japan	0830 AIAA-2004-3998 RD- 180 Engine Production and Flight Experience M. Popp, Pratt & Whitney Space Propulsion, West Palm Beach, FL	0900 AIAA-2004-3999 Size Effects on the Transition in Dual- Bell Nozzles E. Martelli, University of Rome "La Sapienza", Rome, Italy	0930 AIAA-2004-4001 Simulation of Flight Conditions During Lift off for Rocket Engine Testing K. Schäfer, DLR, German Aerospace Research Center, Hardthausen, Germany	1000 AIAA-2004-4002 Uncertainty Analysis of Staged Combustion LOX/LH2 Rocket Engine Hot Firing Tests D. Lineberry, University of Alabama in Huntsville, Huntsville, AL	1030 AIAA-2004-4003 Experimental Simulation of Turbine- Exhaust Oxygen Recovery J. Clark, Pratt & Whitney, Jupiter, FL		
--	---	--	--	---	---	--	--

Wednesday Morning / 14 July 2004**Session 104-LP-16****Liquid Rocket Engine Injectors & Ignition II****220**

Chaired by: W. ANDERSON, Purdue University, West Lafayette, IN, and G. LANGEL, EADS Space Transportation, Munich, Germany

0800 AIAA-2004-4011 Influence of Injection Temperature on the Preflow Phase During Start- up of an Upper- Stage Rocket Engine R. Schmehl, ESA/ESTEC, Noordwijk, The Netherlands	0830 AIAA-2004-4004 Experimental Study on a Laser Ignited Thruster Made of Si3Ni4 A. Kumakawa, Japan Aerospace Exploration Agency, Kakuda, Japan	0900 AIAA-2004-4005 Experimental Investigation on LOX/CH4 Ignition F. Cuoco, DLR German Aerospace Research Center, Hardthausen, Germany	0930 AIAA-2004-4006 Technology Demonstration for Low Cost Gas Generator J. Lonchard, Snecma Moteurs, Vernon, France	1000 AIAA-2004-4007 Global Sensitivity and Trade- Off Analyses for Multi- Objective Liquid Rocket Injector Design R. Vaidyanathan, University of Florida, Gainesville, FL	1030 AIAA-2004-4009 Physical and Chemical Processes Controlling Fuel Droplet Ignition T. Pourpoint, Purdue University, West Lafayette , IN		
--	---	--	--	--	---	--	--

Wednesday Morning / 14 July 2004**Session 105-LP-17****Liquid Rocket Engine Nozzles II****221**

Chaired by: M. MEYER, NASA Glenn Research Center, Cleveland, OH, and M. ROLER, Sverdrup Technology Inc, Arnold AFB, TN

0800 AIAA-2004-4013 A Brief Overview on some Resonance Phenomena in Nozzle Flows H. Wong, European Space Agency and Atosorigin, Noordwijk, The Netherlands	0830 AIAA-2004-4014 LE- 7A Engine Nozzle Flow Separation Phenomenon and the Possibility of RSS Suppression by the Step Inside the Nozzle Y. Watanabe, Japan Aerospace Exploration Agency, Kagoshima-ken, Japan	0900 AIAA-2004-4015 Simulation of Unsteady Three Dimensional Separation Behaviour in Truncated Ideal Contour Nozzles D. Perigo, ESA, Noordwijk, The Netherlands	0930 AIAA-2004-4016 Multidimensional Unstructured- Grid Liquid Rocket Engine Nozzle Performance and Heat Transfer Analysis T. Wang, NASA Marshall, Huntsville, AL	1000 AIAA-2004-4017 Analytical Optimisation of an Inviscid Flow Linear Plug Nozzle Boattail M. Wisse, Delft University of Technology, Delft, The Netherlands	1030 AIAA-2004-4018 Numerical Investigations of the Side Fence Effect on Linear Plug Nozzle Performance T. Ito, Japan Aerospace Exploration Agency, Ibaraki, Japan	1100 AIAA-2004-4019 Advanced Ceramic Matrix Composite Materials for Current and Future Propulsion System Applications S. Beyer, EADS Space Transportation GmbH, Munich, Germany	
---	---	--	--	---	---	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3379>.

Wednesday Morning / 14 July 2004**Session 106-LP-18****Liquid Rocket Engine Turbomachinery II****222**

Chaired by: A. CROCKER, Andrews Space & Technology, Seattle, WA, and G. MAGGIO, Science Applications International Corporation, New York, NY

0800 AIAA-2004-4020 Numerical Simulations of Vortex Shedding in Hydraulic Turbines D. Dorney, NASA Marshall, Huntsville, AL	0830 AIAA-2004-4021 Thermal Effects on Cavitation Instabilities in Helical Inducers E. Rapposelli, Centrospazio/alta, Pisa, Italy	0900 AIAA-2004-4022 Relation Between Geometries of Inducer Inlet and Backflow and Vortex Structures T. Kimura, Japan Aerospace Exploration Agency, Kakuda, Japan	0930 AIAA-2004-4023 Simulations of Cavitating Cryogenic Inducers A. Hosangadi, Craft Tech, Pipersville, PA	1000 AIAA-2004-4024 Numerical Simulation of Cavitating Flow in Inducers H. Ugajin, Ishikawajima-Harima Heavy Industries, Yokohama, Japan	1030 AIAA-2004-4025 An Interpretation of Transfer Function Data for a Cavitating Pump S. Rubin, Rubin Engineering Co., Sherman Oaks, CA	1100 AIAA-2004-4026 A Study on Cavitation Interaction Between Inducer and Impeller in Turbopump K. Lee, Rotem Company, Yongin, South Korea	
--	--	---	---	---	--	---	--

Wednesday Morning / 14 July 2004**Session 107-PC-7****Active Combustion Control and Low-Emissions Technology****207**

Chaired by: A. ATESHKADI, Pratt & Whitney, East Harford, CT, and E. GUTMARK, University of Cincinnati, Cincinnati, OH

0800 AIAA-2004-4027 Application of a Transient Plasma Generator for Gas Turbine Combustor Control G. Li, University of Cincinnati, Cincinnati, OH	0830 AIAA-2004-4028 Validation of an Adaptive Combustion Instability Control Method for Gas-Turbine Engines G. Kopasakis, NASA Glenn Research Center, Cleveland, OH	0900 AIAA-2004-4029 Control of Instabilities in Liquid Fueled Combustor by Modification of the Reaction Zone Using Smart Fuel Injector T. Conrad, Georgia Tech, Atlanta, GA	0930 AIAA-2004-4031 Onset of Severe Combustion Instabilities During Transition to Supercritical Liquid Fuel Injection in High Pressure Combustors E. Lubarsky, Georgia Institute of Technology, Atlanta, GA	1000 AIAA-2004-4032 Experimental Study of the Dynamics of a LPP Injection System D. Galley, Laboratoire EM2C, Chatenay-Malabry, France	1030 AIAA-2004-4034 Dynamics and Control of a High Frequency Fuel Valve and Its Applications to Active Combustion Control T. Yi, University of Cincinnati, Cincinnati, OH	1100 AIAA-2004-4035 Nonlinear Flame- Flow Transfer Function Calculations: Flow Disturbance Celerity Effects . Preetham, Georgia Institute of Technology, Atlanta, GA	
--	--	--	--	---	--	---	--

Wednesday Morning / 14 July 2004**Session 108-PC-8****Solid Propellants****208**

Chaired by: M. SMOOKE, Yale University, New Haven, CT, and D. MANN, U S Army Research Office, Research Triangle Park, NC

0800 AIAA-2004-4036 Modeling and Simulation of Combustion of Solid Propellant Ingredients Using Detailed Chemical Kinetics M. Beckstead, Brigham Young University, Provo, UT	0830 AIAA-2004-4037 Green Rocket Propulsion by Reaction of Al and Mg Powders and Water T. Miller, Pennsylvania State University, State College, PA	0900 AIAA-2004-4038 Techniques in Cryostabilized Additive Concentration S. Bates, Thoughtventions Unlimited LLC, Glastonbury, CT	0930 AIAA-2004-4039 Numerical Simulation of Heterogeneous AP/HTPB Propellant Combustion S. Groult, ONERA, Palaiseau, France	1000 AIAA-2004-4041 Modeling of Aluminized Composite Solid Propellants X. Wang, University of Illinois at Urbana-Champaign, Urbana, IL	1030 AIAA-2004-4042 An Aluminum Injection Model Based on Random Packs for Solid Propellant Rocket Motor Simulations T. Jackson, University of Illinois at Urbana-Champaign, Urbana, IL	1100 AIAA-2004-4043 Response of a Burning Heterogeneous Propellant to Acoustic Disturbances J. Buckmaster, University of Illinois at Urbana-Champaign, Urbana, IL	
---	---	---	--	---	---	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3364>.

Wednesday Morning / 14 July 2004**Session 109-SCP-4****Aerospace Systems Condition Monitoring****210**

Chaired by: D. MALLOY, Aerospace Testing Alliance, Arnold AFB, TN, and R. BICKFORD, Expert Microsystems Inc, Orangevale, CA

0800 AIAA-2004-4044 Engine Variability Impact on Reduced Order Thrust Estimation Filters M. Henriksson, Chalmers University of Technology, Göteborg, Sweden	0830 AIAA-2004-4045 Functional Aspects of, and Trade Considerations for, an Application- Optimized Engine Health Management System (EHMS) J. Larkin, Pratt & Whitney Space Propulsion, West Palm Beach, FL	0900 AIAA-2004-4046 PCA- based Fuzzy Classification of Turbine Blade Fatigue Modes S. Dai, New Jersey Institute of Technology, Newark, NJ	0930 AIAA-2004-4047 A Foreign Object Damage Event Detector Data Fusion System for Turbofan Engines J. Turso, NASA Glenn Research Center, Cleveland, OH	1000 AIAA-2004-4049 Modernizing Systems Through Data Integration: A Vision for EHM in the United States Air Force C. Holtz, Air Force Research Laboratory, Wright-Patterson AFB, OH			
--	---	--	---	--	--	--	--

Wednesday Morning / 14 July 2004**Session 110-SR-5****Modeling Rocket Motor Combustion Instability I****203/204**

Chaired by: H. KRIER, University of Illinois at Urbana-Champaign, Urbana, IL, and G. FLANDRO, University of Tennessee Space Institute, Tullahoma, TN

0800 AIAA-2004-4051 Higher Flowfield Approximations for Solid Rocket Motors with Tapered Bores O. Sams, Marquette University, Milwaukee, WI	0830 AIAA-2004-4052 Computational Study of Turbulence in a Subscale Solid Rocket Motor S. Gallier, SNPE Matériaux Energétiques, Vert Le Petit, France	0900 AIAA-2004-4053 Volume- to- Surface Transformations of Rocket Stability Integrals S. Fischbach, University of Tennessee Space Institute, Tullahoma, TN	0930 AIAA-2004-4054 Nonlinear Rocket Motor Stability Prediction: Limit Amplitude, Triggering, and Mean Pressure Shift G. Flandro, University of Tennessee Space Institute, Tullahoma, TN				
--	--	---	---	--	--	--	--

Wednesday Morning / 14 July 2004**Session 111-SR-6****Solid Rocket Investigations****301/302**

Chaired by: A. DOKHAN, Jacobs Sverdrup-Naval Systems Group, Lancaster, CA, and F. CAUTY, ONERA, Palaiseau Cedex, France

0800 AIAA-2004-4056 Ratiocinative Approach to Ignition Transient Modeling in Solid Rockets V. Sanalkumar, Vikram Sarabhai Space Centre, Trivandrum, India	0830 AIAA-2004-4057 The Ultrasound Waves: A Measurement Tool for Energetic Material Characterization F. Cauty, ONERA, Palaiseau, France	0900 AIAA-2004-4058 Aging in Composite Propellant Grains G. Reeling Brouwer, TNO-PML, Rijswijk, The Netherlands	0930 AIAA-2004-4060 Analytical and CFD Approximations for Tapered Slab Rocket Motors O. Sams, Marquette University, Milwaukee, WI	1000 AIAA-2004-4061 Acoustic Instability of the Slab Rocket Motor S. Fischbach, University of Tennessee Space Institute, Tullahoma, TN			
--	--	--	--	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3046>

Wednesday Morning / 14 July 2004**Session 112-VS-7****Expendable Launch Vehicles****304**

Chaired by: L. PRICE, Lockheed Martin, Denver, CO

0800 AIAA-2004-4062 Atlas V Evolved Expendable Launch Vehicle: Evolutionary Development for Revolutionary Capability T. Gillespie, Lockheed Martin, Littleton, CO	0830 AIAA-2004-4064 A Partially Reusable Launch Vehicle for Delivering 65 Metric Ton Payloads to Low Earth Orbit B. Donahue, The Boeing Company, Huntsville, AL	0900 AIAA-2004-4065 Development Status of a Nanosat Launch Vehicle J. Garvey, Garvey Spacecraft Corporation, Huntington Beach, CA	0930 AIAA-2004-4202 Development and Testing of a High Altitude Sounding Rocket at the USAF Academy M. Lydon, U.S. Air Force Academy, USAF Academy, CO				
---	---	---	--	--	--	--	--

Wednesday Morning / 14 July 2004**Session 113-VS-8****Space Vehicle Systems****315**

Chaired by: J. MARTIN, Boeing Phantom Works, Huntington Beach, CA, and J. ROBINSON, The Boeing Company, Seal Beach, CA

0800 AIAA-2004-4068 Architecting Rapid Growth in Space Logistics Capabilities J. Snead, Air Force Research Laboratory, Wright-Patterson AFB, OH	0900 AIAA-2004-4069 Mars Ascent Propulsion Trades with Trajectory Analysis J. Whitehead, Lawrence Livermore National Lab, Livermore, CA	0930 AIAA-2004-4073 Optimal Control of Gradual Tripropellant Engine for SSTO T. Jianguo, National University of Defense Technology, Changsha, China (prc)				
--	--	---	--	--	--	--

Wednesday Afternoon / 14 July 2004**1200 - 1400****Awards Luncheon****Floridian Ballroom**

Florida Lieutenant Governor Toni Jennings will deliver the luncheon address and provide Florida's unique view on innovation and aerospace. The Honorable Ms. Jennings also serves as chair of the Board of Supervisors for the Florida Space Authority and helps to guide the state's multibillion-dollar space industry. Florida, regarded as the "gateway for space", is an integral part of the space industry poised to hold a large stake in the journey back to the moon. During the program, AIAA President Donald W. Richardson will bestow numerous industry awards. Please join us for an exciting, informative presentation and to honor this year's award recipients.

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3266>

Wednesday Afternoon / 14 July 2004**1400 - 1600****Hypersonic Airbreathing Propulsion – Looking to the Future, Building from the Past****Palm A**

Building on the success of the highly publicized X-43A flight this year, hypersonics technology is nearing mainstream application. Get the insight from some of the leaders in this emerging field about past and current programs and what the future holds. This session, which features industry, government and international representatives, will be moderated by Charles McClinton, Technology Manager, Hyper X Program Office.

Panelists:

Tom Curran, Retired Director of AFRL/PR, Universal Technology Corporation Technical Director, Engineering
 Vince Rausch, NASA Langley Research Center, Program Manager, Hyper X Program
 George Orton, Program Manager, Hypersonic Design and Applications, Boeing Phantom Works
 Michael Richman, Office of DUSD (S&T), Associate Director for Aerospace Technology
 Francois Falempin, Deputy Head of Flight Dynamics and Propulsion, MBDA, France

Wednesday Afternoon / 14 July 2004**Session 114-ABP-14****Engine Systems: Operability & Performance****316**

Chaired by: C. MURAWSKI, Air Force Research Laboratory, Wright-Patterson AFB, OH, and G. ZHA, University of Miami, Coral Gables, FL

1400 AIAA-2004-4075 Investigations of Transverse Liquid Injection in Confined Supersonic Flow over Cavities G. Anavaradham, Defense Research & Development Laboratory, Hyderabad, India	1430 AIAA-2004-4077 Work Transfer Analysis of Turbojet and Turbofan Engines B. Roth, Georgia Institute of Technology, Atlanta, GA	1500 AIAA-2004-4078 Ram Jet Engine Characteristics at Different Operating Conditions R. Andriani, Polytechnic of Milan, Milan, Italy	1530 AIAA-2004-4079 A Work Transfer Perspective of Propulsion System Performance B. Roth, Georgia Institute of Technology, Atlanta, GA	1600 AIAA-2004-4194 Mixing in Confined Supersonic Flow Past Strut Based Cavity and Ramps S. Obla Jeyaparakash, Indian Institute of Technology, Chennai, India			
--	--	---	---	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 115-ABP-15****Propulsion System Development II****317**

Chaired by: D. JENSEN, Rolls-Royce Corporation, Indianapolis, IN, and R. STARKEY, University of Maryland, College Park, MD

1400 AIAA-2004-4080 Shifted Cross- Wire for Supersonic Jet Control L. Pinnam, Indian Institute of Technology Kanpur, Kanpur, India	1430 AIAA-2004-4081 Optimization Of Integrally Woven SiC-SiC Ceramic Combustor Liner Thermal Parameters J. Mehta, TK Engineering, Cincinnati, OH	1500 AIAA-2004-4082 Simulation of 3D Flows of Propulsion Systems Using an Efficient Low Diffusion E- CUSP Upwind Scheme Z. Hu, University of Miami, Coral Gables, FL	1530 AIAA-2004-4084 Real Time Engine Thrust Calculation For Modern Fighter Aircraft T. Van, Lockheed Martin, Fort Worth, TX	1600 AIAA-2004-4196 Performance Prediction and Design of a Ducted Fan System J. Ahn, Sejong University, Seoul, South Korea			
---	---	---	--	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3420>

Wednesday Afternoon / 14 July 2004**Session 116-EDU-3****University Propulsion Projects****304**

Chaired by: R. FREDERICK and J. EMENS, University of Alabama in Huntsville, Huntsville, AL

1400 AIAA-2004-4085 Development of a Turbojet Engine Lab For Propulsion Education C. Leong, Western Michigan University, Kalamazoo, MI	1430 AIAA-2004-4086 Enhanced Counter Air Projectile B. Hartlage, University of Alabama in Huntsville, Huntsville, AL	1500 AIAA-2004-4088 Universal Equations for Saturation Vapor Pressure J. Clark, Pratt & Whitney, Jupiter, FL	1530 AIAA-2004-4089 High Reynolds Number Thermal Stability Experiments J. Emens, University of Alabama in Huntsville, Huntsville, AL	1600 AIAA-2004-4090 Small Air Rocket Design, Build, and Fly Program for Aerospace Engineering Education and Outreach E. Fleeman, Georgia Institute of Technology, Atlanta, GA		
---	--	--	---	--	--	--

Wednesday Afternoon / 14 July 2004**Session 117-EP-30****Advanced Concepts II****113**

Chaired by: M. BIRKAN, Air Force Office of Scientific Research, Burke, VA, and A. BOUCHOULE, Orleans University, Orleans, France

1400 AIAA-2004-4091 Pulsed Inductive Thruster, Part 1: Modeling, Validation and Performance Analysis P. Mikellides, Arizona State University, Tempe, AZ	1430 AIAA-2004-4092 Pulsed Inductive Thruster, Part 2: A Two- Temperature Thermochemical Model For Ammonia D. Allison, Arizona State University, Phoenix, AZ	1500 AIAA-2004-4094 Magnetic and Langmuir Probe Measurements on the Plasmoid Thruster Experiment (PTX) S. Koelfgen, University of Alabama in Huntsville, Huntsville, AL	1530 AIAA-2004-4095 Excitation and Propagation of Electrostatic Ion Cyclotron Waves in rf- Sustained Plasmas of Interest to Propulsion Research R. Spektor, Princeton University, Princeton, NJ			
---	--	---	---	--	--	--

Wednesday Afternoon / 14 July 2004**Session 118-EP-31****Hall Thruster Physics and Modeling III****114**

Chaired by: D. MANZELLA, NASA Glenn Research Center, Cleveland, OH, and R. AADLAND, Aerojet, Redmond, WA

1400 AIAA-2004-4097 High Voltage Plume Measurements and Internal Probing of the BHT- 1000 Hall Thruster Y. Azziz, Massachusetts Institute of Technology, Cambridge, MA	1430 AIAA-2004-4098 Investigation of a Segmented Electrode Hall Thruster K. Diamant, The Aerospace Corporation, Los Angeles, CA	1500 AIAA-2004-4099 Development of the Top Hat Electric Propulsion Plume Analyzer (TOPAZ) A. Victor, University of Michigan, Ann Arbor, MI	1530 AIAA-2004-4100 A Suppression Method of Discharge Current Oscillations in a Hall Thruster N. Yamamoto, Univ. of Tokyo, Tokyo, Japan	1600 AIAA-2004-4101 Effect of Segmented Anodes on the Beam Profile of a Hall Thruster A. Kieckhafer, Michigan Tech, Houghton, MI		
--	--	---	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3388>

Wednesday Afternoon / 14 July 2004**Session 119-EP-32****Ion Physics & Modeling II****118/119**

Chaired by: J. MONHEISER, Aerojet, Redmond, WA, and J. POLK, Jet Propulsion Laboratory, Pasadena, CA

1400 AIAA-2004-4104 Plasma Surface Interaction Studies for Next- Generation Ion Thrusters G. Tynan, University of California, San Diego, La Jolla, CA	1430 AIAA-2004-4105 Discharge Chamber Primary Electron Modeling Activities in 3- Dimension T. Stueber, QSS Group Inc., Cleveland, OH	1500 AIAA-2004-4106 Limits on High Specific Impulse Ion Thruster Operation P. Wilbur, Colorado State University, Fort Collins, CO	1530 AIAA-2004-4107 2- D Discharge Chamber Model for Ion Thrusters R. Wirz, Caltech, Pasadena, CA	1600 AIAA-2004-4108 Model of the Plasma Potential Distribution in the Plume of a Hollow Cathode I. Mikellides, Jet Propulsion Laboratory, Pasadena, CA	1630 AIAA-2004-4109 Computational Study of Primary Electrons in the Cusp Region of an Ion Engine's Discharge Chamber S. Deshpande, Wright State University, Dayton, OH		
---	---	--	--	--	---	--	--

Wednesday Afternoon / 14 July 2004**Session 120-EP-33****Ion Thruster Development II****122**

Chaired by: S. BENSON, NASA Glenn Research Center, Cleveland, OH, and R. AADLAND, Aerojet, Redmond, WA

1400 AIAA-2004-4111 Development of a Prototype Model Ion Thruster for the NEXT System A. Hoskins, Aerojet-General Corp., Redmond, WA	1430 AIAA-2004-4112 Development of a Ground Based Digital Control Interface Unit (DCIU) for the NEXT Propulsion System J. Monheiser, Aerojet, Redmond, WA	1500 AIAA-2004-4114 Investigation of Sputter Behaviour of Ion Thruster Grid Materials M. Tartz, Institute for Surface Modification, Leipzig, Germany	1530 AIAA-2004-4115 Miniature Ion Thruster for Precision Formation Flying R. Wirz, Jet Propulsion Laboratory, Pasadena, CA	1600 AIAA-2004-4116 Temperature Distributions in Hollow Cathode Emitters J. Polk, Jet Propulsion Laboratory, Pasadena, CA			
--	---	---	---	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 121-EP-34****Micropropulsion Physics & Modeling****123**

Chaired by: J. SCHEIN, Alameda Space Sciences, San Leandro, CA, and M. MARTINEZ-SANCHEZ, Massachusetts Institute of Technology, Boston, MA

1400 AIAA-2004-4117 Modeling of a Magnetically Enhanced Vacuum Arc Thruster J. Schein, Alameda Applied Sciences Corp., San Leandro, CA	1430 AIAA-2004-4119 Optimization Issues for a Micro- Pulsed Plasma Thruster M. Keidar, University of Michigan, Ann Arbor, MI	1500 AIAA-2004-4120 Images of Ground State Xenon Density in the Near Field of a Low Power Hall Thruster M. Cappelli, Stanford University, Stanford, CA	1530 AIAA-2004-4121 Computational Modeling of Ion Beam- Neutralizer Interactions in Two and Three Dimensions A. Wheelock, Air Force Research Laboratory, Hanscom AFB, MA				
---	--	---	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3153>.

Wednesday Afternoon / 14 July 2004**Session 122-EP-35****Microwave & RF Thrusters****124**

Chaired by: P. TURCHI, Air Force Research Laboratory, Kirtland AFB, NM, and M. MICCI, Pennsylvania State University, University Park, PA

1400 AIAA-2004-4122 A 300 W Microwave Thruster - Design and Performance Testing D. Sullivan, Research Support Instruments, Princeton, NJ	1430 AIAA-2004-4124 Development and Chamber Testing of a Miniature Radio-frequency Ion Thruster for Microspacecraft V. Mistoco, Pennsylvania State University, University Park, PA	1500 AIAA-2004-4125 Spectroscopic Emission Thermometry of the Microwave Arcjet Chamber Oxygen Plasma S. Chianese, Pennsylvania State University, University Park, PA	1530 AIAA-2004-4126 Endurance Test of Microwave Engine S. Kim, Advanced Technology Institute Ltd., Sapporo, Japan				
---	---	---	--	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 123-HYP-7****Hypersonic Propulsion CFD, Plasma & MHD****223**

Chaired by: T. JACKSON, Air Force Research Laboratory, Wright-Patterson AFB, OH, and D. MESSITT, Aerojet, Sacramento, CA

1400 AIAA-2004-4127 Analysis of a Kerosene-Fueled MHD SCRJ Cruiser Performance H. Bottini, University of Rome, Rome, Italy	1430 AIAA-2004-4128 CH Production in a Pulsed- DC Discharge for Ignition Enhancement Studies M. Brown, Innovative Scientific Solutions Inc., Dayton, OH	1500 AIAA-2004-4129 Plasma Aerodynamic Flow Control for Hypersonic Inlets D. Van Wie, Johns Hopkins University Applied Physics Laboratory, Laurel, MD	1530 AIAA-2004-4130 Flow Starting in High Compression Hypersonic Air Inlets by Mass Spillage S. Molder, Ryerson Polytechnic University, Toronto, Canada	1600 AIAA-2004-4131 CFD Capabilities for Hypersonic Scramjet Propulsive Flowpath Design R. Ungewitter, Combustion Research and Flow Technology Inc., Pipersville, PA	1630 AIAA-2004-4132 LES of Supersonic Combustion of Hydrocarbon Spray in a SCRAMJET F. Genin, Georgia Institute of Technology, Atlanta, GA		
---	--	--	--	---	---	--	--

Wednesday Afternoon / 14 July 2004**Session 124-ISP-7****Solar Thermal Propulsion****305**

Chaired by: J. PEARSON, SRS Technologies, Huntsville, AL, and W. WONG, NASA Glenn Research Center, Cleveland, OH

1400 AIAA-2004-4137 Results of a Microscale Solar Thermal Engine Ground Test Campaign at the Surrey Space Centre F. Kennedy, Surrey Space Centre, Guildford, Great Britain	1430 AIAA-2004-4138 Solar Thermal Propulsion for Small Spacecraft T. Nakamura, Physical Sciences Inc., San Ramon, CA	1500 AIAA-2004-4139 Solar Power Propulsion System: Adaptation to Ariane 5 and Preliminary Development Plan D. Firot, EADS Space Transportation, Les Mureaux, France	1530 AIAA-2004-3764 Solar Thermal Propulsion System for Microsatellites Orbit Transferring H. Sahara, University of Tokyo, Tokyo, Japan				
---	---	--	--	--	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3129>

Wednesday Afternoon / 14 July 2004**Session 125-LP-19****Liquid Rocket Engine & Propulsion System Modeling IV****220**

Chaired by: R. WOJNAR, Millennium Engineering, Arlington, VA, and B. WANG, The Aerospace Corporation, El Segundo, CA

1400 AIAA-2004-4140 Space Based Missile Interceptor Sizing Methodology D. Morris, Boeing-Rocketdyne, Canoga Park, CA	1430 AIAA-2004-4142 Acoustic Stability Analysis of Liquid Propellant Rocket Combustion Chambers S. Kim, Korea Aerospace Research Institute, Daejeon, South Korea	1500 AIAA-2004-4144 Analysis on Nozzle Plume and Performance of the Engine using Liquefied Natural Gas as a Fuel H. Namkoun, Rotem, Yongin, South Korea					
---	---	---	--	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 126-LP-20****Non-Toxic Propulsion****221**

Chaired by: S. MILLER, Aerojet, Redmond, WA, and D. PRECLI, EADS-ST, Munich, Germany

1400 AIAA-2004-4145 ADN- Based Propulsion for Spacecraft, - Key Requirements and Experimental Verification T. Grönland, Swedish Space Corp., Solna, Sweden	1430 AIAA-2004-4146 Field Handling of Hydrogen Peroxide M. Ventura, General Kinetics Corp, Lake Forest, CA	1500 AIAA-2004-4147 State of the Art High Performance Hydrogen Peroxide Catalyst Beds E. Wernimont, General Kinetics Corp, Lake Forest, CA	1530 AIAA-2004-4148 Development of a 250 lbfv Kerosene - 90% Hydrogen Peroxide Thruster E. Wernimont, General Kinetics Corp, Lake Forest, CA				
--	--	---	--	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 127-LP-21****Spacecraft Engines and Propulsion Systems II****222**

Chaired by: C. ENGELBRECHT, Johns Hopkins University, Laurel, MD, and J. WEISS, Jet Propulsion Laboratory, Pasadena, CA

1400 AIAA-2004-4149 Causes and Mitigation of Fuel Valve Pilot Seal Extrusion in Space Shuttle Orbiter Primary RCS Thrusters J. Waller, White Sands Test Facility, Las Cruces, NM	1430 AIAA-2004-4150 Thrust Characterization of Cryosat Cold- gas Propulsion System D. Nicolini, European Space Agency, Noordwijk, The Netherlands	1500 AIAA-2004-4151 Ground Testing of Compression Mass Gauge S. Green, Southwest Research Institute, San Antonio, TX	1530 AIAA-2004-4152 Verification Test Program for Simultaneous Operation of Dual Seal Torque Motor with the EADS 10N Bipropellant Thruster G. Schulte, EADS Space Transportation, Moeckmuehl, Germany	1600 AIAA-2004-4153 Visualization for a Voided Catalyst Bed of Hydrazine Thruster in Microgravity K. Kajiwar, Japan Aerospace Exploration Agency, Tukuba, Japan			
---	---	---	---	---	--	--	--

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:

<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3375>

Wednesday Afternoon / 14 July 2004									
Session 128-LPCS-2				The Good, the Bad, the Difficult to Measure					203/204
Chaired by: M. MCPHERSON, Aerojet, Sacramento, CA, and K. RATHGEBER, Honeywell, Las Cruces, NM									

Wednesday Afternoon / 14 July 2004							
Session 129-PC-9		Combustion Diagnostics					207
Chaired by: L. RIBAROV and M. LEONG, United Technologies Research Center, East Hartford, CT							
1400 AIAA-2004-4162 Nonlinear Longitudinal Mode Instability in Liquid Propellant Rocket Engine Preburners G. Flandro, University of Tennessee Space Institute, Tullahoma, TN	1430 AIAA-2004-4163 Control of Temperature Nonuniformity Based on Line- of- Sight Absorption T. Palaghita, Georgia Institute of Technology, Atlanta, GA	1500 AIAA-2004-4164 Kinetics of OH Chemiluminescence in the Presence of Hydrocarbons J. Hall, University of Central Florida, Orlando, FL	1530 AIAA-2004-4165 Hydroxyl Tagging Velocimetry (HTV) Method Optimization: Signal Intensity and Spectroscopy L. Ribarov, United Technologies Research Center, East Hartford, CT	1600 AIAA-2004-4166 Investigation of the Combustion Process in a Scramjet Model Combustor with a Sampling Probe System H. Ciezki, DLR Space Propulsion Institute, Hardthausen, Germany	1630 AIAA-2004-4167 Simultaneous Temperature, Species and Velocity Measurements via Combined Raman Spectroscopy and HTV S. Hu, Vanderbilt University, Nashville, TN		

Wednesday Afternoon / 14 July 2004								
Session 130-PC-10				Combustor Diffusers				208
Chaired by: O. HAIDN, DLR Lampoldshausen, Hardthausen, Germany, and D. BULZAN, NASA Glenn Research Center, Cleveland, OH								
1400 AIAA-2004-4168 Combustor Diffuser Modeling Part I: Inlet Profiles & 2- D Calculations H. Mongia, GE Aircraft Engines, Cincinnati, OH	1430 AIAA-2004-4169 Combustor Diffuser Modeling Part II: Inlet Profiles & 3- D Calculations H. Mongia, GE Aircraft Engines, Cincinnati, OH	1500 AIAA-2004-4170 Combustor Diffuser Modeling Part III: Validation w/ Typical Separating Single Passage Diffusers Combustor Diffuser Modeling H. Mongia, GE Aircraft Engines, Cincinnati, OH	1530 AIAA-2004-4171 Combustor Diffuser Modeling Part IV: Effect of Cowling Geometry, Mixer Size and Nozzle Blockage H. Mongia, GE Aircraft Engines, Cincinnati, OH	1600 AIAA-2004-4172 Combustor Diffuser Modeling Part V: Validation with a Three Passage Diffuser Rig Data H. Mongia, GE Aircraft Engines, Cincinnati, OH	1630 AIAA-2004-4173 Combustor Diffuser Modeling Part VI: Validation with a Four Passage Diffuser Rig Data H. Mongia, GE Aircraft Engines, Cincinnati, OH			

Due to formatting reasons, this version of the program lists only the first contributing author of each meeting paper. For a complete and up-to-date listing, please visit:
<http://www.aiaa.org/agenda.cfm?lumeetingid=946&dateget=all#session3347>.

Wednesday Afternoon / 14 July 2004**Session 131-SCP-5****Control and Analysis of Propulsion Systems****210**

Chaired by: A. BEHBAHANI, Air Force Research Laboratory, Wright-Patterson AFB, OH, and R. MILLAR, NAVAIR Propulsion and Power Engineering, Patuxent River, MD

1400 AIAA-2004-4174 A Matlab- Based Graphical User Interface for Simulation and Control Design of a Hydrogen Mixer H. Richter, NASA Stennis, Stennis Space Center, MS	1430 AIAA-2004-4175 A Numerically Efficient Method for Transient Gas Turbine Performance Estimation T. Grönstedt, Chalmers University of Technology, Göteborg, Sweden	1500 AIAA-2004-4176 A Study on the Requirements for Fast Active Turbine Tip Clearance Control Systems J. DeCastro, QSS Group Inc., Cleveland, OH					
--	--	--	--	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 132-SR-7****Modeling Rocket Motor Combustion Instability II****301/302**

Chaired by: F. BLOMFIELD, Naval Air Warfare Center, China Lake, CA, and J. FRENCH, Software & Engineering Associates Inc, Carson City, NV

1400 AIAA-2004-4179 Transient Chamber Flowfield Simulation of a Rod- and- Tube Configuration Solid Rocket Motor J. Weaver, Carleton University, Ottawa, Canada	1430 AIAA-2004-4181 Improvements to the Linear Standard Stability Prediction Program (SSP) J. French, Software Engineering Associates Inc., Carson City, NV	1500 AIAA-2004-4182 Incorporation of Nonlinear Capabilities in the Standard Stability Prediction Program G. Flandro, University of Tennessee Space Institute, Tullahoma, TN	1530 AIAA-2004-4183 An Investigation of Propulsion- Structure Interaction in Solid Rocket Motors K. Dotson, The Aerospace Corporation, El Segundo, CA				
---	---	---	---	--	--	--	--

Wednesday Afternoon / 14 July 2004**Session 133-VS-9****Demonstrator Vehicles****315**

Chaired by: D. HAYS, The Boeing Company, Huntington Beach, CA, and A. ROENNEKE, EADS Space Transportation, Bremen, Germany

1400 AIAA-2004-4184 Military Spaceplane Flight Demonstration Concepts J. Sponable, Air Force Research Laboratory, Wright-Patterson AFB, OH	1430 AIAA-2004-4186 The Development of the X- 37 Re- Entry Vehicle C. Paez, The Boeing Company, Huntington Beach, CA						
--	--	--	--	--	--	--	--