

Monday, August 11, 2003 Technical Session I

New Ways to Get to Orbit with Near-Term Scheduled Launches

Chair: Col. James Neumeister, USAF-SMC Det-12

- 3:00 pm** **Rapid Access Small Cargo Affordable Launch (RASCAL) Program**
Preston Carter—DARPA
- 3:15 pm** **The Falcon Launch Vehicle**
Hans Koenigsmann, Gwynne Gurevich, Elon Musk—Space Exploration Technologies
- 3:30 pm** **Flight Tests of Xcor's Ez-Rocket and Progress Toward a Microgravity and Microspacecraft Launcher**
Jeff Greason—XCOR Aerospace; Joan Horvath—Takeoff Technologies, LLC
- 3:45 pm** **The Inexpensive Injection of Mini-Satellites into Geo**
Gerry Webb, N. Pestmal—Commercial Space Technologies, Ltd.; A. Fadeev—Centre for Ground Space Infrastructure
- 4:00 pm** **A New Space Launch Vehicle: Low-Cost Access to Space Using Surplus Peacekeeper ICBM Motors**
Scott Schoneman, Lou Amorosi, Mark Chadwick, Ron Willey, Mike Laidley—Orbital Sciences Corp.
- 4:15 pm** **Global Space League Upcoming Ride-Along Opportunities**
Joan Horvath—Takeoff Technologies LLC; Charlie Chao, Christopher Kitts—Santa Clara University; Jeff Patterson—Frederick, OK Aerospace Committee; Ron Phillips—Digital Radiance Inc.; Rex Ridenoure—Ecliptic Enterprises Corporation; Donna Shirley—University of Oklahoma; Randy Stewart—HighShips
- Alternates** **Exoterra, a Revolutionary Approach to Space Launch Research and Development**
Terrance V. Yee—Exoterra
- Access to Space via Atlas V Secondary Payload Systems—Development Status**
Kevin Cope—Lockheed Martin Space Systems Company

Tuesday, August 12, 2003 Technical Session II

Current Ways to Get to Orbit—Secondary and Tertiary Payload Accommodations on Existing Launch Vehicles

Chair: Warren Frick, Orbital Sciences Corporation

8:30 am **Affordable Access to Space Using a Russian Launch Vehicle**

Dino Lorenzini—SpaceQuest, Ltd.

8:45 am **SHERPA: A Flexible, Modular Spacecraft for Orbit Transfer and On-Orbit Operations**

Aaron Rogers, Paul Gloyer—AeroAstro, Inc; Lt. Arnold Nowinski—AFRL/VS; Steve Buckley—TRW

9:00 am **ESPA from Concept to Flight Hardware**

Joseph R. Maly, Greg Sanford, Paul Wilke—CSA Engineering, Inc; Lisa Berenberg—The Aerospace Corporation; Peter Wegner—AFRL

9:15 am **Launching Small Satellites on the H-IIA Rocket**

Soichiro Asada, Naohiko Abe—Mitsubishi Heavy Industries, Ltd. (MHI); Koichi Andoh—AeroAstro, Japan; Rick Fleeter—AeroAstro, Inc.

9:30 am **Responsive, Low-Cost Access to Space with ELVIS—an Expendable Launch Vehicle with Integrated Spacecraft**

Richard Van Allen, James R. Wertz, Thomas Bauer, L. Jane Hansen, Sonya Collier, Paul Graven, Shyama Chakroborty—Microcosm

9:45 am **Low-Cost, Reliable Spacelift for Small Satellites Using a Peacekeeper ICBM Derived Space Launch Vehicle and Multi-Payload Adapters**

Major Kenneth D. Sebek, Captain Horst D. E. Knorreck, First Lt. Mitchell W. Elson—USAF SMC Det-12 RSLP; Steven J. Buckley—Northrop Grumman-RSLP

Alternates **Designing for ESPA: The Challenges of Designing a Spacecraft for a Launch Accommodation Still in Development**

Bob Minelli, Steve Haase, Jay Borges, Mark Barton—AeroAstro, Inc.

Launching Small Satellites in the FSU

Gerry Webb—Commercial Space Technologies, Ltd.

Tuesday, August 12, 2003 Technical Session III

Making Space Accessible—Policies, Practices, or Methods to Enhance Low-Cost Space Access

Chair: Dave Bearden, The Aerospace Corporation

10:45 am New Technology in Space—Is the U.S. Losing Ground?
 Brian J. Horais—Schafer Corporation

11:00 am Affordable Access to Space—Getting There
 Max Meerman, Andy Currie, Martin Sweeting—Surrey Space Centre

11:15 am Practical Microsat Launch Systems: Economics and Technology
 Matt Bille—Booz Allen Hamilton; Robyn Kane—MITRE Corp; Erika Lishock

11:30 am Principles for Space Experimentation Success
 Perry Ballard—DOD Payloads Office

11:45 am JPL University Microsatellite Program
 Robert Shotwell—JPL

12:00 pm Prospects for Affordable Access to Space for Small Payloads, 2003–2013
 Jeff Foust, Max Engel, Phil Smith—Futron Corporation

Alternates Modularity as an Enabler for a More Efficient Commercial Small Satellite Program
 Jenny Kingston—Cranfield University

PCSAT2: Synergy in the Amateur Satellite Service
 B. Bruninga, C. Otero, H. Evans, T. Kolwicz, M. Silver, E. Henry, D. Jones—
 US Naval Academy Satellite Lab

Tuesday, August 12, 2003 Technical Session IV

Extending On-Orbit Life—Maneuver, Replenish, and Repair to Enhance Mission Payoff

Chair: Kirt Moser, AFRL

2:00 pm **XSS-10 Micro-Satellite Demonstration Program**
Thomas Davis—Air Force Research Laboratory

2:15 pm **Orbital Express—On-Orbit Satellite Surveillance Demonstration**
Major James Shoemaker—DARPA; Melissa Wright, Sanj Sivapiragasam—SRS

2:30 pm **The Development of a Family of Resistojet Thruster Propulsion Systems for Small Spacecraft**
Dave Gibbon, Adam Baker, Martin Sweeting—Surrey Space Centre; David Nicolini—ESTEC, Noordwijk, The Netherlands

2:45 pm **The Bandit: An Automated Vision—Navigated Inspection Spacecraft**
Michael Swartwout—Washington University

3:00 pm **A Small Satellite Concept for On-Orbit Servicing of Spacecraft**
Pat Malaviarachchi, Tim Reedman, Andrew Allen—MD Robotics; Doug Sinclair—Sinclair Interplanetary

3:15 pm **MXER Tether Technology for Small Satellites**
Kirk Sorensen—NASA/MSFC

Alternates **Escort™—A Microsatellite for On-Orbit Inspection of Space Assets**
Aaron Jacobovits—AeroAstro, Inc.

Flight Results from a Novel Magnetic Actuator on the LatinSat Spacecraft
Doug Sinclair—Sinclair Interplanetary

Tuesday, August 12, 2003 Technical Session V

The Year in Retrospect—Missions that have been Achieved in the Past Year

Chair: Joel Pedlikin, AeroAstro

4:15 pm **Benchmarking the Small Satellite Industry—Identifying Emerging Trends to Increase Access to Space**

Amanda F. Vaughn—USAF

4:30 pm **Upper Atmosphere Densities Derived from Starshine Spacecraft Orbits**

Gil Moore—Project Starshine; J. Lean, J.M. Picone, S. Knowles, A. Hedin, J. Emmert—Naval Research Laboratory

4:45 pm **CHIPS—The First NASA University Explorer Astronomy Mission**

Ellen Taylor—Design_Net Engineering; Will Marchant, Michael Sholl—University of California—Berkeley

5:00 pm **Jason 1: Lessons Learned from the Development and One Year of In-Orbit Activities**

Thierry Lafon—CNES

5:15 pm **FedSat Launch and Operations**

Stephen Russell—Cooperative Research Centre for Satellite Systems, Vipac Engineers & Scientists Ltd.

5:30 pm **Adaptability of a Catalog Spacecraft Bus to Diverse Science Missions**

David Olschansky—Spectrum Astro

Alternate **Alsat-1 First Year in Orbit**

John Cooksley, Paul Stephens, Lee Boland, Susan Jason, Alex da Silva Curiel, Wei Sun, Martin Sweeting—Surrey Space Centre

Wednesday, August 13, 2003 Technical Session VI

The Year Ahead—Missions that are Planned for Launch in the Coming Year

Chair: Luis Alberto Murgio, University Aeronautics Institute, Center for Applied Research

8:30 am **Affordable, Low-Risk Approach to Launching Research Spacecraft as Tertiary Payloads**

Freddy Pranajaya, Robert Zee—UTIAS Space Flight Lab; Per Lundahl Thomsen—Danish Space Research Institute; Rafael Wisniewski—Aalborg University; Mogens Blanke—Danish Technical University; Lewis Franklin—QuakeFinder, LLC; Jordi Puig-Suari—California Polytechnic State University

8:45 am **Exploring the Mysteries of the Cosmos on the MOST Microsatellite Mission**

Simon Grocott—Dynacon Inc.; Robert Zee—UTIAS Space Flight Lab; Jaymie Matthews—Department of Physics and Astronomy, UBC

9:00 am **Coverage Options for a Low-Cost, High-Resolution Optical Constellation**

Michael Price—QinetiQ

9:15 am **Bilsat—Advancing Smallsat Capabilities**

Luis Gomes, Alex da Silva Curiel, Andy Bradford, Vaios Lappas, Pierre Oosthuizen, Alex Cropp, Martin Sweeting—Surrey Space Centre; Gokhan Yuksel—Bilten Tubitek

9:30 am **Exploring Space on a Small Satellite, STSAT-2: A Test Bed for New Technologies**

Jong-Tae Lim, Myeong-Pyong Nam, Kwangsun Ryu, Kyung-Mo Tahk, Sung-Ho Rhee, Kyung-Hee Kim—SaTReC, KAIST

9:45 am **The DEMETER Program: A Pathfinder to a High Performance Micro-Satellite Line**

Francois Buisson—CNES

Alternate **MACSAT—A Mini-Satellite Approach to High-Resolution Space Imaging**

Eugene D. Kim, B. J. Kim, H. S. Chang, W. K. Park, S. D. Park—SaTReC Initiative Co., Ltd; Maszlan Ismail, Ad. Aziz Ad. Rasheed, Ahmad Sabirin Ashard—Astronautic Technology (M) Sdn. Bhd.

**11th Annual Frank J. Redd Student
Scholarship Competition**

Co-Chair: Doug Freesland, Applied Systems Engineering
Co-Chair: Jeff Ganley, AFRL

10:30 am Accessing the Solar System With a Small Solar Sail
Jeremy S. Neubauer—Washington University in St. Louis

**10:45 am Chimera—A Low-Cost Solution to Small Satellite
Space Access**
John Crowley, Virgil Hutchinson, Alex Keisner, Dave Young—Georgia
Institute of Technology

**11:00 am Design, Modeling and Evaluation of a 2.4GHz FHSS
Communications System for NarcisSat**
Kyle Doerksen, Jean-Francois Levesque, Ignacio Mas—Stanford University

11:15 am nCube: The First Norwegian Student Satellite
E. T. Sæther, J. Otterstad, K. M. Fauske, O. E. N. Eriksen, F. M.
Indergaard, Å. G. Riise, B. C. H. Samuelsen, N. Sokolova—Norwegian
University of Science and Technology, Narvik University College

**11:30 am Opening the Door to Smart Power Management in
Small Satellites**
Patrick Shriver—University of Colorado at Boulder

11:45 am Compact Vector Magnetometer for Pico Satellites
Klaus Krogsgaard—Technical University of Denmark

**12:00 pm An Analysis of Preliminary Test Campaign Results for
a Microscale Solar Thermal Engine**
Fred Kennedy—University of Surrey

Alternate Design of the Local Ionospheric Measurements Satellite
Valérie F. Mistoco, Robert D. Siegel, Brendan S. Surrusco, and Erika
Mendoza—Pennsylvania State University

Wednesday, August 13, 2003 Technical Session VIII

The Horizon—New Small Satellite Missions or Sensors to Broaden Our Understanding of Space: Section I

Chair: Joe Hauser, Naval Research Laboratory

- 2:00 pm** **Progress Toward Miniature Space Weather Stations**
Linda Habash Krause, Francis K. Chun—USAFA; Federico A. Herrero—NASA/GSFC
- 2:15 pm** **Magfliter: A Ground-Based Next Generation Reusable Launch Assist for Low-Cost and Highly Reliable Space Access**
Chan Ham, Jorge Flores, Robert Crabbs—University of Central Florida
- 2:30 pm** **The Reentry Breakup Recorder: A “Black Box” for Space Hardware**
Vinod B. Kapoor—The Aerospace Corporation
- 2:45 pm** **ACE+ Looking at the Horizon—Innovative Atmospheric Sounding Using Active Inter-Satellite Cross-Link Signals**
Sytze Veldman—Swedish Space Corporation
- 3:00 pm** **SCOUT: A Modular, Multi-Mission Spacecraft Architecture for High Capability Rapid Access to Space**
Aaron Rogers, Glen Cameron, Deborah Westley, Susan Kennison—AeroAstro, Inc.
- 3:15 pm** **Rapideye—An Earth Observation Smallsat Constellation for Daily Agricultural Monitoring**
George Tyc, Keith Ruthman—MacDonald-Dettwiler & Associates, Ltd; Manfred Krischke, Michael Oxford—RapidEye AG; Paul Stephens, Alex Wicks, Tim Butlin, Martin Sweeting—Surrey Space Centre
- Alternate** **ROCSAT-3 Constellation Mission**
Chung-Huei Chu (Vicky Chu), A. M. Wu, Paul Chen—National Space Program Office

Wednesday, August 13, 2003 Technical Session IX

The Horizon—New Small Satellite Missions or Sensors to Broaden Our Understanding of Space: Section II

Chair: Bryce Carpenter, Ball Aerospace

- 4:15 pm** **SIMONE: Interplanetary Microsatellites for NEO Rendezvous Missions**
Nigel Wells, Roger Walker—QinetiQ; Simon Green, Andrew Ball—Open University
- 4:30 pm** **The Living with a Star Geospace Missions**
Andrew W. Lewin, Laurence J. Frank—JHU/APL; Robert S. Lebar—NASA/GSFC
- 4:45 pm** **The Multi-Application Survivable Tether (MAST) Experiment**
Robert P. Hoyt, Jeffrey Slostad, Bryan Minor—Tethers Unlimited, Inc; Robert Twiggs—Stanford University
- 5:00 pm** **The Montana Nanosatellite for Science, Engineering, and Technology for the AFRL/NASA University Nanosat Program**
David M. Klumpar, Brian A. Larsen, Michael Obland, William A. Hiscock—Montana State University
- 5:15 pm** **The NMSUSat Mission**
Stephan Horan, C. Boehmer, J. Cecil, G. Garcia, G. Guyer, E. Johnson—New Mexico State University
- 5:30 pm** **Frisbee—A Precursor for a Super-Cluster Small Satellite Mission**
Alex da Silva Curiel, Max Meerman, Doug Liddle, Martin Sweeting—Surrey Space Centre; S. Schwartz—Queen Mary, Univ. of London
- Alternate** **I-Cone for Rapid Response and Low-Cost Access to Space**
Peter Alea, Michael Cully—Swales Aerospace; Nils Gustafsson—Saab Ericsson Space AB

Thursday, August 14, 2003 Technical Session X

The Technology Frontier—Advanced Technologies, Subsystems, and Components for Small Satellites: Section I

Chair: Walter Holemans, Planetary Systems Corporation

8:30 am **Micro/Nanotechnology for Nano/Pico/Femto/Atto/Zeptosatelites**

Siegfried W. Janson—The Aerospace Corporation

8:45 am **Ongoing Miniaturization Efforts for Ion and Neutral Vector Velocity Instruments**

G.D. Earle, Jin Liu, G. B. Zhang, Hao Liu—University of Texas at Dallas

9:00 am **The Packaging of Large Deployable Space Structures on Small Satellites**

Greg Spanjers, Aaron Adler, Brian Engberg—AFRL Space Vehicles Directorate

9:15 am **Solar Cell Measurement System for NPS Spacecraft Architecture and Technology Demonstration Satellite, NPSAT1**

John B. Salmon, Sherif Michael, Ron Phelps, Herschel Loomis—Naval Postgraduate School

9:30 am **Development of an IP-Based Satellite Bus Using Internet Technology**

Richard Slywczak—NASA/Glenn Research Center

9:45 am **Novel Design Aspects of the Space Technology 5 Mechanical Subsystem**

Peter Rossoni—NASA/Goddard Space Flight Center

Alternates **Lightweight, Low-Power Coarse Star Tracker**

Ray Zenick—AeroAstro, Inc; Thomas McGuire, Raymond J. Sedwick—MIT Space Systems Laboratory

A Feasibility Study of Techniques for Interplanetary Microspacecraft Communications

G. James Wells—University of Toronto Institute for Aerospace Studies Space Flight Laboratory

Thursday, August 14, 2003 Technical Session XI

The Technology Frontier—Advanced Technologies, Subsystems, and Components for Small Satellites: Section II

Chair: Chris Stevens, JPL

- 10:30 am Self-Steering Antenna Arrays for Distributed Picosatellite Networks**
Blaine Murakami, Michael A. Tamamoto, Aaron T. Ohta, Grant S. Shiroma, Ryan Y. Miyamoto, Wayne A. Shiroma—University of Hawaii at Manoa
- 10:45 am Star Pattern Recognition for Attitude Determination Using Genetic Algorithms**
Lalitha Paladugu, Brian G. Williams, Marco P. Schoen—Idaho State University
- 11:00 am The eXtended Satellite Transport Protocol: Its Design and Evaluation**
Maged E. Elaasar, Zheyin Li, Michel Barbeau, Evangelos Kranakis—Carleton University, School of Computer Science
- 11:15 am Relative Navigation, Microdischarge Plasma Thruster, and Distributed Communications Experiments on the FASTRAC Mission**
Greg Holt, Shaun Stewart, Thomas Campbell, Mohit Garg, Haytham Elmasri, Philip Eckhoff, E. Glenn Lightsey, L. Laxminarayan L. Raja, Takuji Ebinuma, Chris Wilkinson—The University of Texas at Austin
- 11:30 am Configurable Fault Tolerant Processor for Space-Based Applications**
Dean Ebert, Herschel H. Loomis, Alan A. Ross—Naval Postgraduate School
- 11:45 am Autonomous Telemetry Collection for Single-Processor Small Satellites**
Dave Speer—Northrop-Grumman STS at NASA Goddard Space Flight Center
- Alternates**
- Low-Cost, Good Accuracy—Attitude Determination Using Magnetometer and Simple Sun Sensor**
Stephan Theil, Pontus Appel, Alexander Schleicher—ZARM, University of Bremen
- A Micro-Propulsion System for CubeSats**
Joe Cardin—VACCO Industries, Inc.