

TECHNICAL SESSION I

NEW HARDWARE IN SPACE

Monday, August 23, 1999

1:00 p.m. – 2:45 p.m.

Chair: Amnon Ginati, OHB-System

- SSC99-I-1 **Merlion L & S Band System**
Presenter: T.W. Chua – Nanyang Technological University
- SSC99-I-2 **First In-Orbit Results from the UoSAT-12 Minisatellite**
Presenter: J. Ward – Surrey Satellite Centre
- SSC99-I-3 **MightySat I: In Space**
Presenter: B. Braun – Air Force Research Laboratory
- SSC99-I-4 **SUNSAT - Launch and First Six Month's Orbital Performance**
Presenter: G.W. Milne – University of Stellenbosch
- SSC99-I-5 **Overview of the Naval Postgraduate School Petite Amateur Navy Satellite**
Presenter: D. Sakoda –
Naval Postgraduate School
- SSC99-I-6 **Withdrawn**
- SSC99-I-7 **The Starshine Spacecraft - From Concept To Delivery In Four Months**
Presenter: W.R. Braun – NRL
- SSC99-I-8* **Danish Ørsted Mission In-Orbit Experiences and Status of The Danish Small Satellite Programme**
Presenter: P.L. Thomsen – Danish Space Research Institute

TECHNICAL SESSION IIA

MANAGEMENT, MANUFACTURING, AND RISK MITIGATION

Monday, August 23, 1999

3:15 p.m. – 5:00 p.m.

Location: Business Building, Room 215

Chair: Darby Cooper, neoStar Astronautics

- SSC99-IIA-1 Evaluating Small Satellites: Is the Risk Worth It?**
Presenter: T.J. Mosher – The Aerospace Corp.
- SSC99-IIA-2 30 Years of Commercial Components In Space: Selection Techniques Without Formal Qualification**
Presenter: M. Day – University of Surrey
- SSC99-IIA-4 Management Challenges of Launching Multiple Payloads For Multiple Customers**
Presenter: D. Callen – Orbital Sciences Corp.
- SSC99-IIA-5 AttSim, Attitude Simulation with Control Software in the Loop**
Presenter: H.J. Koenigsmann – Microcosm, Inc.
- SSC99-IIA-6 An Integrated Space Environment Analysis Tool (SEAT)**
Presenter: M. Enoch – SM&A Systems Solutions Group
- SSC99-IIA-7 A Java Framework for Spatial Embedded Systems**
Presenter: L. Apvrille – ENSICA/LAAS-CNRS
- SSC99-IIA-8* Database Applications in Science Data Systems for Low-Cost Satellite Missions**
Presenter: P.L. Mckerracher – JHU/APL

* Alternate

TECHNICAL SESSION IIB

ADVANCED OPERATIONS CONCEPT SYSTEMS

Monday, August 23, 1999

3:15 p.m. – 5:00 p.m.

Location: Eccles Conference Center Auditorium

Chair: William Clapp, Weber State University

- SSC99-IIB-1** **Solar Terrestrial Relations Observatory (STEREO) Mission and Concept of Operations**
Presenter: J. Eichstedt – JHU/APL
- SSC99-IIB-2** **Design of a Satellite Tracking Station for Remote Operation and Multi-User Observation**
Presenter: M. Wilkinson – Utah State University
- SSC99-IIB-4** **Optical Tracking Telemetry and Command (TT&C) for Small Satellites**
Presenter: M. Enoch – SM&A Systems Solutions Group
- SSC99-IIB-5** **The Design and Role of a Low Cost Semi-Automated Mobile Ground Station in the Tracking and Commanding of Low Earth Orbit Satellites**
Presenter: J.A. McQueen – Allied Signal Technical Services Corporation
- SSC99-IIB-7** **A Low-Cost Approach to Small Satellite Control and Data Relay**
Presenter: Z. Zhengan – Beijing Institute of Tracking and Telecommunications Technology
- SSC99-IIB-8** **Knowledge Server Toolkit: Perl-based Automation Tools**
Presenter: D.R. McLean – Allied Signal Technical Services Corporation

TECHNICAL SESSION III

MILITARY USES OF SMALL SATELLITES IN DISTRIBUTED SYSTEMS

Monday, August 23, 1999

6:00 p.m. – 7:45 p.m.

Chair: Matt Bille, ANSER

- SSC99-III-1** **Three Corner Sat Constellation – Arizona State University: Management; Electrical Power System; Structures, Mechanisms, Thermal, and Radiation; Attitude / Orbit Determination and Control; ASU Micropropulsion Experiment; and Integration**
Presenter: B. Underhill – Arizona State University
- SSC99-III-2** **Virginia Tech Ionospheric Scintillation Measurement Mission**
Presenter: C.D. Hall – Virginia Tech
- SSC99-III-3** **University Nanosatellite Distributed Satellite Capabilities to Support TechSat 21**
Presenter: M. Martin – AFRL
- SSC99-III-4** **UW Dawgstar: One Third of ION-F**
Presenter: E. Carlson – University of Washington
- SSC99-III-5** **NavGold – An On-Orbit Test Bed for Experiments in Formation Flight**
Presenter: D. Sipple – University of Colorado
- SSC99-III-6** **A Microsatellite “Space Guard” Force**
Presenter: M.A. Bille – ANSER

TECHNICAL SESSION IV

COMMERCIAL COMMUNICATIONS AND REMOTE SENSING Tuesday, August 24, 1999

10:15 a.m. – 12:00 p.m.

Chair: John Carney, Eastman Kodak Company

- SSC99-IV-1 Three Corner Sat Constellation: C&DH, Stereoscopic Imaging, and End-to-End Data System**
Presenter: E. Hansen – University of Colorado
- SSC99-IV-3 Advanced Fire Observation System (FOS) by Intelligent Infrared Sensors**
Presenter: A. Ginati – OHB-System GmbH
- SSC99-IV-4 Small Satellites Constellations & Networks: Architectures and Technologies**
Presenter: F. Jubineau – Alcatel Space Industries
- SSC99-IV-5 Advanced On-board Image Compression in Conjunction with Cloud Detection for Microsatellite Optical Imaging**
Presenter: P. Hou – University of Surrey
- SSC99-IV-6 On-Orbit Performance of the ORBCOMM Spacecraft Constellation**
Presenter: B. Patel –
Orbital Sciences Corporation
- SSC99-IV-7 Commercial Earth Observation with Small Satellites at OHB-System**
Presenter: A. Ginati – OHB-System GmbH
- SSC99-IV-8* ORCA: A Multi-User Platform for Developing Commercial Communications**
Presenter: D.G. Cooper – neoStar Astronautics

*Alternate

TECHNICAL SESSION V

CONSTELLATIONS FOR SCIENTIFIC AND GLOBAL CHANGE RESEARCH

Tuesday, August 24, 1999

1:00 p.m. – 2:45 p.m.

Chair: Peter Panetta, NASA GSFC

- SSC99-V-1 Constellation Pathfinder: A University Nanosatellite**
Presenter: C.D. Rayburn – Boston University
- SSC99-V-2 Microsatellite Constellation for Disaster Monitoring**
Presenter: J. Ward – Surrey Space Centre
- SSC99-V-3 Developments in Nano-Satellite Structural Subsystem Design at NASA-GSFC**
Presenter: P. Rossoni – NASA GSFC
- SSC99-V-4 The GANDER Microsatellite Constellation for Global Sea State Monitoring**
Presenter: Y. Zheng – Surrey Space Centre
- SSC99-V-5 NASA/DoD University Nano-Satellites for Distributed Spacecraft Control**
Presenter: J. Bristow – NASA GSFC
- SSC99-V-6 Free Flying Magnetometers as a Demonstration of Micro-spacecraft Technologies**
Presenter: J. Willis – Jet Propulsion Laboratory
- SSC99-V-7* ACE - A Canadian Small Science Satellite Mission**
Presenter: H. Dahl – Bristol Aerospace Limited;
- SSC99-V-8* PROBA: ESA's Autonomy and Technology Demonstration Mission**
Presenter: J. Bermyn –
Verhaert Design and Development

*Alternate

TECHNICAL SESSION VI

FORMATION FLYING AND LARGE SCALE INTERFEROMETRY

Tuesday, August 24, 1999

3:15 p.m. – 5:00 p.m.

Chair: Christine Hailey, Utah State University

- SSC99-VI-1** **Micro-Scanning Laser Range Finders and Position-Attitude Determination for Formation Flight**
Presenter: H. Saito – Institute of Space and Astronautical Science
- SSC99-VI-2** **Phase Acquisition and Formation keeping of a New Power Consumption Monitoring Satellite Constellation**
Presenter: M. Aorpimai – Surrey Space Centre
- SSC99-VI-3** **Low-Cost, Minimum-Size Satellites for Demonstration of Formation Flying Modes at Small, Kilometer-Size Distances**
Presenter: J. Collins – Microcosm, Inc.
- SSC99-VI-4** **Discrete Event Command and Control for Formation Flying of Distributed Small Spacecraft Systems**
Presenter: P.A. Stadter – JHU/APL
- SSC99-VI-5** **EMERALD: An Experiment Mission in Robust Distributed Space Systems**
Presenter: C. Kitts – Stanford University
- SSC99-VI-6** **Creating Large Space Platforms From Small Satellites**
Presenter: A. Lewin – Orbital Sciences Corporation
- SSC99-VI-7*** **Three Corner Sat Constellation – New Mexico State University**
Presenter: S. Horan –
New Mexico State University
- SSC99-VI-8*** **The Orion Microsatellite: A Demonstration of Formation Flying in Orbit**
Presenter: Z. Kiraly – Stanford University

*Alternate

TECHNICAL SESSION VII

NEW MISSION OR BUS CONCEPTS I

Wednesday, August 25, 1999

8:00 a.m. – 9:45 a.m.

Chair: Frank Hornbuckle, Swales Aerospace

- SSC99-VII-1** **Novel Missions for Next Generation
Microsatellites: The Results of a Joint AFRL/
JPL Study**
Presenter: R. Moser – The Aerospace Corp.
- SSC99-VII-2** **IMAGE, the First of the NEW
MIDEX Missions**
Presenter: W.C. Gibson –
Southwest Research Institute
- SSC99-VII-3** **Solar Blade Nanosatellite Development:
Heliogyro Deployment, Dynamics, and
Control**
Presenter: R. Blomquist –
Carnegie Mellon Univ.
- SSC99-VII-6** **Mars Micromissions**
Presenter: S. Matousek – JPL
- SSC99-VII-5** **Mars Comm/Nav MicroSat Network**
Presenter: R.C. Hastrup – JPL
- SSC99-VII-4** **Design of Simple Low-Cost Mars
Microlander**
Presenter: T. Svitek – Stellar Innovations, Inc.
- SSC99-VII-7**** **WITTEX: A Constellation of Three Small
Satellite Radar Altimeters**
Presenter: G.H. Fountain – JHU/APL
- SSC99-VII-8*** **Pre-Flight Characteristics of the U.S. Air
Force Academy's FalconSat-1**
Presenter: R. Chari – US Air Force Academy

* Alternate

**Will be presented in Session X

TECHNICAL SESSION VIII

UNIVERSITY STUDENT SCHOLARSHIP COMPETITION

Wednesday, August 25, 1999

10:15 a.m. – 12:00 p.m.

Chairs: Pat Leygraaf, Orbital Sciences Corporation
Jayne Schnaars, Boeing North American

- SSC99-VIII-1** **Geometric Attitude Control of a Small Satellite for Ground Tracking Maneuvers**
Presenters: Barry Goeree, Brian Shucker – University of Arizona
- SSC99-VIII-2** **Operations Planning and Formation Flying: Analyzing Resource Usage in Formation Assembly**
Presenter: Brian Engberg – Stanford University
- SSC99-VIII-3** **The Artemis Project: Picosatellite-Based Missions to Study VLF Phenomenon**
Presenters: Amy Slaughterbeck, Adelia Valdez – Santa Clara University (co-authors: Maureen Breiling, Corina Hu)
- SSC99-VIII-4** **The Florida Space Institute's Photon Satellite Bus**
Presenters: Derek Shannon, Chrishma Singh-Derewa, Sanjay Jayaram – University of Central Florida
- SSC99-VIII-5** **The University Micro/Nanosatellite as a Micropropulsion Testbed**
Presenter: Joyce Wong – Arizona State University
- SSC99-VIII-6** **Progress on Colloid Micro-Thruster Research and Flight Testing**
Presenter: Freddy Mathias Pranajaya – Stanford University
- SSC99-VIII-7*** **Development of Gimbaled Laser Beacon Mechanism**
Presenters: Jennifer Huddle, Anabel Marcos, Badrinarayan Shirgur – University of Central

TECHNICAL SESSION IX

NEW MISSION OR BUS CONCEPTS II

Wednesday, August 25, 1999

1:00 p.m. – 2:45 p.m.

Chair: Fuat Ince, Turkey

- SSC99-IX-1** **INDEX: A Piggy-Back Satellite for Technology Demonstration**
Presenter: H. Saito – Institute of Space and Astronautical Science
- SSC99-IX-2** **Pucksat Payload Carrier**
Presenter: B. Milam – NASA GSFC
- SSC99-IX-3** **Tsinghua Micro/Nanosatellite Research and Its Application**
Presenter: Y. Zheng – Tsinghua Space Research Center
- SSC99-IX-4** **BIRD - A Microsatellite for Hot Spot Detection**
Presenter: I. Walter – German Aerospace Centre
- SSC99-IX-6** **Progress Towards FedSat 2001 A'stralian Space Odyssey**
Presenter: S. Russell – VIPAC Engineers and Scientists Ltd
- SSC99-IX-8** **The 'Bitsy™' Spacecraft Kernel: Reducing Nanosatellite Mission Cost in the MSFC Future-X Program Through Miniaturized Technologies**
Presenter: D.J. Goldstein – AeroAstro Inc.

TECHNICAL SESSION X

NEW APPROACHES TO SPACE LAUNCH

Wednesday, August 25, 1999

3:15 p.m. – 5:00 p.m.

Chair: William E. Cutlip, NASA GSFC

- SSC99-VII-7** **WITTEX: A Constellation of Three Small Satellite Radar Altimeters**
Presenter: G.H. Fountain – JHU/APL
- SSC99-X-1** **Satellite Constellation Launch, Deployment, Replacement and End-of-Life Strategies**
Presenter: S. Cornara – GMV S.A.
- SSC99-X-2** **EELV Secondary Payload Adapter (ESPA)**
Presenter: S. Haskett – US Air Force Space Test Program
- SSC99-X-5** **Opportunities for Small Satellites and Space Research Using the K-1 Vehicle**
Presenter: G. Lai –
Kistler Aerospace Corporation
- SSC99-X-6** **The Wallops Flight Facility Model for an Integrated Federal/Commercial Test Range**
Presenter: B.E. Underwood – NASA GSFC
- SSC99-X-7** **The Sprite Mini-Lift Vehicle: Performance, Cost, and Schedule Projections for the First of the *Scorpius*TM Low Cost Launch Vehicles**
Presenter: R.E. Conger – Microcosm, Inc.

TECHNICAL SESSION XI

ADVANCED SUBSYSTEM OR COMPONENT DEVELOPMENTS I

Thursday, August 26, 1999

8:00 a.m. – 9:45 a.m.

Chair: Neil Dennehy, Draper Laboratory

- SSC99-XI-1** **High Speed, Low Weight
Momentum/Reaction Wheels**
Presenter: L. Brothers – Valley Forge Composite
Technologies, Inc.
- SSC99-XI-2** **New Approach to Achieving Stand Alone GPS
Attitude Determination using Dual Short
Baseline for Small-Satellite**
Presenter: S. Purivigraipong –
Surrey Space Centre
- SSC99-XI-3** **Space Qualification of the Advanced
Instrument Controller**
Presenter: T. Goforth – Maxwell Technologies
- SSC99-XI-4** **An Attitude Control System for a Low-Cost
Earth Observation Satellite with Orbit
Maintenance Capability**
Presenter: W.H. Steyn – Surrey Space Centre
- SSC99-XI-6** **ADCS of THNS-1 Nanosatellite with
Off-Pointing Capability**
Presenter: L. Junfeng – Tsinghua University
- SSC99-XI-7** **Development of a Shape Memory Alloy
(SMA) Actuated Separation Mechanisms for
Spacecraft Release Applications**
Presenter: S.H. Smith – Starsys Research Corp.
- SSC99-XI-8*** **GyroWheel™ - An Innovative New Actuator/
Sensor for 3-axis Spacecraft Attitude Control**
Presenter: G. Tyc – Bristol Aerospace Limited

* Alternate

TECHNICAL SESSION XII

ADVANCED SUBSYSTEM OR COMPONENT DEVELOPMENTS II

Thursday, August 26, 1999

10:15 a.m. – 12:00 p.m.

Chair: Stephen Sandford, NASA LaRC

- SSC99-XII-1** **A Maintenance-Free Battery Charge Control Approach for Nickel-Hydrogen Batteries**
Presenter: A.W. Lewin – Orbital Sciences Corp.
- SSC99-XII-2** **Low Cost Propulsion Development for Small Satellites at The Surrey Space Centre**
Presenter: G.S. Haag – Surrey Space Centre
- SSC99-XII-3** **A Low Power Approach to Small Satellite Propulsion**
Presenter: J.M. Cardin – VACCO Industries
- SSC99-XII-5** **Progress Toward Nontoxic Liquid Micropropulsion**
Presenter: J.C. Whitehead –
Lawrence Livermore National Laboratory
- SSC99-XII-6** **Spacecraft Computers on the SeaStar Satellite**
Presenter: S. Tantiphanwadi – Orbital Sciences Corporation
- SSC99-XII-7** **Design, Construction and Testing of a Voltage-based Maximum Power Point Tracker (VMPPT) for Small Satellite Power Supply**
Presenter: H. Dehbonei – Advance Electronic Research Center
- SSC99-XII-8*** **A Consolidated ACS Flight Software Development Approach for the Earth Observing-1 Spacecraft**
Presenter: K. Blackman –
the Hammers Company, Inc.

*Alternate