

**2nd Responsive Space Conference
Los Angeles, CA • April 19–22, 2004**

RS2

Community Leaders Developing a Critical New Direction in Space

The demand for truly responsive space assets is growing rapidly and becoming officially recognized with documents such as the Air Force “Operationally Responsive Spacelift Mission Needs Statement.” This is the opportunity to find out what your organization can do to participate in making space meet critical national needs in a changing world. This conference will address the vision and needs of DoD, NASA, and the commercial community.

***Sponsored by
the LA and Orange County Sections
and the
Space Systems Technical Committee of the AIAA***

The local host is Microcosm, Inc.

www.ResponsiveSpace.com

speakers



Prof. Sir Martin Sweeting

CEO, Surrey Space Technology Limited *Keynote Speaker, April 20*



Lieutenant General Brian Arnold

Director, Space and Missile Center *Luncheon Speaker, April 21*



Major General Michael Hamel

14th Air Force *Dinner Speaker, April 21*



Major General (ret) Robert S. Dickman

Deputy UnderSecretary AF—Military Space *Luncheon Speaker, April 22*

Executive Panel – April 20, 8:30am–10:15am

Joe Sciabica

Associate Director, AFRL—Moderator

Brigadier General Richard Geraci

National Security Space Architect

CAPT. David G. Markham

USN, Chief of Staff, NRO AS&T

Robert Sackheim

Assistant Director and Chief Engineer of Space Propulsion, NASA MSFC

Tom Wilson

President, Swales Aerospace

Needs & Requirements Panel – April 20, 10:45am–11:50am

Dr. Alok Das

AFRL/VS, Moderator

Jaime Esper

NASA GSFC

Dr. Todd Mosher

Utah state University

LtCol. Tim Thompson

AFSPC

Statement of Purpose

Whether it's the growing market for satellite imagery, communication and navigation or the use of space as a force enabler in the war on terrorism, space has never been more critical. Yet the customers of space-based information and capabilities continue to suffer from a lack of responsiveness. While satellite communications and the Global Positioning System provide a certain level of continuous global capability, there remains a demand for increased SATCOM bandwidth and navigational accuracy. Additionally, current space systems cannot provide near continuous surveillance over a particular point on the earth's surface. Nor can we launch a satellite at a moment's notice and begin receiving information within hours. The current paradigm for space, where a few expensive satellites are launched after years of preparation to provide a highly focused capability, must change. For space systems to provide a highly dynamic and focused response, their development must be based on a new set of rules and new technologies.

Some recent programs have begun to return the space paradigm to its roots—missions that are built and launched in 10 to 30 months at a cost of millions or a few 10's of millions, rather than 5 to 15 years at a cost of hundreds of millions. This process can be continued, and improved, to the point where satellites are launched and data returned to the end user within a day

of the time an immediate need is identified or a payload is delivered to the launch site. Such systems will have an enormous advantage in military, commercial, education, and scientific missions, for example:

- Rapid and continuous battlefield intelligence
- Supplemental communications to handle short-term overload
- Ground-based, rather than space-based spares for communications constellations
- Science observations of transient phenomena
- Educational payloads launched while the student is still a student

Possible solutions to the responsive space question range from deployment on demand to satellites stored on-orbit and moved into position as needed. Each solution has strengths and weaknesses and places unique demands on spacecraft, payload, launch system, and operations. For example, deployment on demand requires the entire system—spacecraft, payload, launch system, ground system, launch and ground operations, and on-orbit check-out—be both responsive and sufficiently low cost to be built in advance of need (i.e., built to inventory). Technical, operational and architectural issues must be discussed and resolved for space to truly become responsive.

Conference Activities

Reception

A reception will be held Monday evening from 5:00 pm to 7:00 pm in the conference hotel. Come and meet the other participants and bring your spouse. A reception will be held on Tuesday, from 5:30 pm to 7:00 pm. After the reception, if you want to have

dinner with old or new colleagues, there are plenty of restaurants within easy walking distance of the hotel. A short reception will be held Wednesday from 6:30 pm to 7:00 pm, before the banquet.

Breakfast Networking

Getting around LA is challenging during morning rush hour. Come early for a continental breakfast and net-

working session from 7:00 am to 8:30 am on Tuesday, Wednesday, and Thursday.

Conference Banquet

Major General Michael Hamel will be the speaker at the banquet on Wednesday from 7:00 pm to 9:00 pm.

The cost is included in the registration. Your spouse or guest is welcome at an additional charge of \$60.00.

Local Tours

Tours are available of several of the local aerospace firms. Visit Microcosm and see the AIAA LA Section Wright Flyer project—a flying replica of the Wright Brothers original 1903 airplane, now almost complete.

It's fascinating to see the plane being built. Come see it—and bring your friends that are interested in the history of aviation or the future of rocketry.

Bring Your Family

The Sheraton Gateway Hotel LAX is an excellent location for the entire family. Boat tours are available of the local area and to Catalina Island. Of course, Disneyland, Knott's Berry Farm, Universal Studio and other Southern California adventures are nearby, as are the Getty and other world-class museums. And within a day's drive are San Diego, Sea World, Tijuana, Palm Springs, Sequoia and King's Canyon National Parks, Death Valley, Santa Barbara, Vandenberg AFB and the Western Test Range, and Route 1 from Morro Bay to Monterey—probably the most scenic coast highway in North America.

Call or E-mail us (see the "For More Information" section) and tell us what sorts of things interest you or your family and we'll make suggestions, let you know whether you need reservations, and the best way to get there. We'll do what we can to make the trip enjoyable for you and your family. Come join us. It's a beautiful time of year in LA. By the way, we'll have morning meetings to give families suggestions and the chance to meet and do things together if they like.

"Responsive Proceedings"

Tired of waiting nine months or a year for the proceedings volume? A CD-ROM with all of the papers presented will be given to all participants on the last

day of the conference. This was a big hit at last year's conference.

Location and Weather



The Responsive Space Conference will be held at the Sheraton Gateway Hotel LAX in Los Angeles, CA. Located near LAX, it is an easy commute to Century City, Marina del Rey, the freeways to downtown Los Angeles, and most recreational attractions such as Disneyland. It's also in the heart of the Southern California space industry, close to SMC, JPL, Aerospace Corp., and many of the nation's leading prime contractors and innovative small businesses.

We recommend booking your rooms well in advance. The conference rate of \$89.00 single or double is available by calling the hotel at 1-800-325-3535 or (310) 642-1111 and mention that you are attending the Responsive Space Conference. Please make your reservations by April 1, 2004 to assure this special rate. By the way, the weather will be great with daytime highs in the 70's and overnight lows in the high 50's. Bring a sweater, as meeting rooms tend to be cool.



Co-sponsors of Responsive Space

The Responsive Space conference is sponsored by the LA and Orange County Sections and the Space Systems Technical Committee of the AIAA. Microcosm is the local host. The industrial co-sponsors are:



2ND RESPONSIVE SPACE CONFERENCE SCHEDULE

■ MONDAY, APRIL 19, 2004

- 3:00 pm – 5:00 pm REGISTRATION, CALIFORNIA FOYER
 4:00 pm – 6:00 pm EXHIBITS OPEN, CALIFORNIA FOYER
 5:00 pm – 7:00 pm HOSTED BAR AND RECEPTION, CALIFORNIA FOYER. Sponsored by Lockheed Martin

■ TUESDAY, APRIL 20, 2004

- 7:00 am – 5:00 pm REGISTRATION, CALIFORNIA FOYER
 7:00 am – 8:00 am CONTINENTAL BREAKFAST AND NETWORKING SESSION, CALIFORNIA FOYER.
 Sponsored by NGST-University Alliance
 8:00 am – 6:00 pm EXHIBITS OPEN, CALIFORNIA FOYER
 8:00 am – 8:30 am WELCOME AND INTRODUCTIONS, GRAND BALLROOM. Dr. James R. Wertz, General Chairman
 8:30 am – 10:15 am EXECUTIVE PANEL, GRAND BALLROOM. Moderator—Joe Sciabica, AFRL
 Brigadier General Richard Geraci, National Security Space Architect
 CAPT. David G. Markham, USN, Chief of Staff, NRO AS&T
 Robert Sackheim, Assistant Director and Chief Engineer for Space Propulsion, NASA MSFC
 Tom Wilson, President, Swales Aerospace
 10:15 am BREAK, CALIFORNIA FOYER. Sponsored by Northrup Grumman Corp.
 10:45 am – 11:50 am NEEDS AND REQUIREMENTS PANEL, GRAND BALLROOM. Moderator—Dr. Alok Das, AFRL/VS
 Lt Col. Tim Thompson, AFSPC
 Jaime Esper, NASA GSFC
 Dr. Todd Mosher, Utah State University
 11:50 am LUNCH, CALIFORNIA BALLROOM. Sponsored by Scitor
 Keynote Speaker: Prof. Sir Martin Sweeting—CEO, Surrey Space Technology Limited
 1:30 pm – 3:30 pm CHALLENGES AND BARRIERS, GRAND BALLROOM. Chair—Gwynne Shotwell, SpaceX
 1:30 pm A) Transforming National Security Space Payloads Ned Jones, Los Angeles AFB SMC/TDE
 1:50 pm B) A Novel Approach to Responsive Space:
 Lessons Learned by the DoD Space Test Program Sabrina Herrin, Space Test Program and
 Eleni Sims, The Aerospace Corp.
 2:10 pm C) Transforming the National Spacelift Architecture Jeremy Noel, Los Angeles AFB SMC/TDE
 2:30 pm D) Responsive Launch Vehicle Cost Model James R. Wertz, Microcosm, Inc.
 2:50 pm E) Responsive Space Requires Responsive Manufacturing Todd Mosher, USU
 3:10 pm F) EYASSAT: Creating a Progressive Space Workforce - Today Obadiah Ng Ritchey, USAFA Student Award Winner
 3:30 pm BREAK, CALIFORNIA FOYER. Sponsored by Broadreach Engineering
 4:00 pm – 5:40 pm MISSION DESIGN, GRAND BALLROOM. Chair—Paul Kolodziejcki, Schafer Corp.
 4:00 pm A) Operational Concept Modeling for
 Responsive Space Herschel Melton, AllySoft, LLC and
 Yvonne Sheets, Sparta
 4:20 pm B) Remote-Sensing Advanced Technology
 Micro-Satellite (RSAT): a Modular,
 Reconfigurable, and Rapid Response
 Space System Architecture Jaime Esper, NASA GSFC
 4:40 pm C) A Modular Design for Rapid-Response
 Telecoms and Navigation Missions Stuart Eves, Surrey Satellite Tech, Ltd.
 5:10 pm D) Orbital Recovery's Responsive Commercial
 Space Tug For Life Extension Missions Dennis Wingo, Orbital Recovery Corp.

5:20 pm E) Using IDOS to Develop EAGLE Into "Real" Flight Software to Support Responsive Missions David Chen, Universal Space Lines LLC

5:40 pm – 7:30 pm **RECEPTION, CALIFORNIA FOYER. Sponsored by Swales Aerospace**

■ **WEDNESDAY, APRIL 21, 2004**

7:00 am – 1:00 pm **REGISTRATION, CALIFORNIA FOYER**

7:00 am – 8:30 am **CONTINENTAL BREAKFAST AND NETWORKING SESSION, CALIFORNIA FOYER. Sponsored by bd Systems**

8:00 am – 6:00 pm **EXHIBITS OPEN, CALIFORNIA FOYER**

8:00 am – 10:00 am **INTEGRATION AND OPERATIONS, GRAND BALLROOM. Chair—John Bystroff, Boeing**

8:00 am A) Responsive Space Operations Architecture Development for the National Security Space Community Patrick Frakes, US Army, Access and Ops Branch

8:20 am B) The Need for Operational Space from an Integrated, Military Effects-Based Operations View Ted Ralston, Boeing

8:40 am C) Transformational Spaceport and Range Technologies Darin Skelly, NASA KSC and Cristina Guidi, NASA KSC

9:00 am D) NASA's Wallops Flight Facility Rapid Response Range Operations Initiative Bruce Underwood, NASA/GSFC/Wallops Flight Facility

9:20 am E) A Conformally-Mounted SATCOM Antenna System to Support STARS Phase-2 Testing William Cooke, EMS Technologies, Inc.

9:40 am F) Remote Anywhere: Web-based Spacecraft Integration and Checkout Greg Hegemann, MicroSat Systems

10:00 am **BREAK, CALIFORNIA FOYER. Sponsored by Michigan Aerospace**

10:30 am – 12:30 pm **SPACE SYSTEMS, GRAND BALLROOM. Chair—Karen Barker, Schafer**

10:30 am A) Real-time Mosaic - Rapid Response High Resolution Imaging from Space Phil Davies, Surrey Satellite Tech, Ltd.

10:50 am B) Plug and Play – An Enabling Capability for Responsive Space Missions Thomas Morphopoulos, Microcosm, Inc.

11:10 am C) TacSat-1 and a Pass to Tactical Space Jay Raymond, OSD Ofc. of Force Transformation and Mike Hurley, NRL

11:30 am D) Leveraging COTS Hardware for Rapid Design and Development of Small Satellites at the USAF Academy Cristin A. Smith, USAFA Student Award Winner

11:50 am E) Optimizing for Responsive Space Design Terrance Yee, MicroSat Systems

12:10 pm F) SSPC & SPSM Providing Responsive Space Mission in 2005 Gerald Murphy, Design_Net Engineering

12:30 pm **LUNCH, CALIFORNIA BALLROOM. Sponsored by EMS Speaker: Lieutenant General Brian Arnold—Director, Space and Missile Center**

2:00 pm – 3:40 pm **TECHNOLOGIES FOR RS-1, GRAND BALLROOM. Chair—Maj Ed Ochoa, AFRL**

2:00 pm A) Guided Self-Assembly for ProtoSAT Combination Gregory Brault, AFRL/VSSE Integrated Microsystem

2:20 pm B) Responsiveness Through Adaptive Avionics Denise L. Lanza, SAIC

2:40 pm C) Potential Strategies for Spaceport Systems Towards Airport-Like Operations Carey McCleskey, NASA KSC

3:00 pm D) R&D Responsive Spaceflight (RRS) Taylor Locker, Pratt & Whitney Space Propulsion

3:20 pm E) Challenges, Enabling Technologies and Maturity for Responsive Space Kevin G. Bowcutt, Boeing

3:40 pm **BREAK, CALIFORNIA FOYER. Sponsored by Northrup Grumman Corp.**

4:10 pm – 5:50 pm	TECHNOLOGIES FOR RS-2, GRAND BALLROOM. Chair—Timothy Sarver-Verhey, NASA GRC	
4:10 pm	A) Highly Operable Propulsion Technologies and Propulsion System Approaches for Operationally Responsive Space Systems	C. Russell Joyner, Pratt Whitney Space Propulsion
4:30 pm	B) High Power All-Electric Power-Actuation Technology for Responsive Space Missions	Eric P. Knight, Lockheed Martin Space and Strategic Missiles
4:50 pm	C) A Status Report on the Development of a Nanosat Launch Vehicle & Associated Launch Vehicle Technologies	John Garvey, Garvey Spacecraft Corporation
5:10 pm	D) Launch Vehicle and Spacecraft System Design Using the Pistonless Pump	Steve Harrington, Flometrics
5:30 pm	F) The Lightband as Enabling Technology for Responsive Space	Walter Holemans, Planetary Systems Corp.
5:50 pm – 7:00 pm	RECEPTION, CALIFORNIA FOYER	
7:00 pm – 9:00 pm	CONFERENCE BANQUET, CALIFORNIA BALLROOM. Sponsored by Spectrum Astr o Speaker: Major General Michael Hamel, 14th Air Force	

■ THURSDAY, APRIL 22, 2004

7:00 am – 8:00 am	CONTINENTAL BREAKFAST AND NETWORKING SESSION, CALIFORNIA BALLROOM. Sponsored by Booz Allen	
8:00 am – 10:00 am	FALCON LAUNCH VEHICLE PROGRAM SESSION, GRAND BALLROOM Lt Col Rick Einstman, SMC	
	Gwynne Shotwell, SpaceX. The FALCON Launch Vehicle: Towards Operationally Responsive Space	
	Mark Ferguson, Orbital Sciences. Concepts for FALCON and Responsive Space Launch	
	Livingston Holder, Andrews Space. A New Vision for Operationally Responsive Space and Force Projection	
	Shyama Chakroborty, Microcosm, Inc. FALCON Microcosm Scorpius Vehicle Family	
	Jim Bray, Lockheed Martin. FALCON SLV: Driving an Operationally Efficient Solution	
	Gary Hudson, Air Launch. QuickReach for Spacelift and Global Strike	
	Tedi Ohanian, Schafer. The Schafer Family of Affordable, Responsive, and Multi-Mission Launch Vehicles	
9:00 am – 2:30 pm	EXHIBITS OPEN, CALIFORNIA FOYER	
10:00 am	BREAK, CALIFORNIA FOYER	
10:30 am – 12:10 pm	LAUNCH VEHICLES & OPERATIONS-II, GRAND BALLROOM Chair—Russ Joyner, P&W	
10:30 am	A) Atlas V Evolved Expendable Launch Vehicle: The Evolution of Responsive Launch	Timothy J. Gillespie, Lockheed Martin Atlas V/EELV Program
10:50 am	B) Hypersonic Freighter Concept, Description, and Capabilities	Dale Jensen, Jentec
11:10 am	C) Responsive Air Launch	Brian Horais, Schafer Corporation
11:30 am	D) Design Trade Space Analysis for Air-Launched Spacelift Vehicles	Paul Eremenko, Booz Allen Hamilton Inc.
11:50 am:	E) RASCAL: A Demonstration of Operationally Responsive Space Launch	Jacob Lopata, The Space Launch Corp. and Burt Rutan, Scaled Composites
	F) Almost There: Responsive Space	Jim Benson, SpaceDev
12:10 pm	LUNCH, CALIFORNIA BALLROOM. Sponsored by Boeing Speaker: Major General (ret) Robert S. Dickman, Deputy Undersecretar y, AF for Military Space	
1:40 pm – 2:40 pm	WRAP-UP PANEL WITH SUMMARIES BY SESSION CHAIRS, GRAND BALLROOM	
1:40 pm	CD-ROM OF ALL PAPERS AVAILABLE TO PARTICIPANTS	

Contact Information

Visit the Conference Website: www.ResponsiveSpace.com
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