

RESPONSIVE SPACE

Conference and Workshop on Rapid Development,
Launch, Deployment, and Operations



April 1–3, 2003
Redondo Beach, CA

See Where the Community is going

Find out How your Organization can Play a Role

Discuss What is Needed and How It can be Achieved
with Key Government and Industry Leaders

Held in Conjunction with NASA Town Meeting

Join Community Leaders to Find Out About 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 Section and the Space
Systems Technical Committee of the AIAA***

The local host is Microcosm, Inc.

Confirmed Speakers

Brigadier General Stephen Ferrell

OSD-ATL (DoD Space Architect).....*Opening Panel, April 1*

Peter G. Wilhelm

Director, Naval Center for Space Technology.....*Opening Panel, April 1*

Major General (ret) Robert S. Dickman

Deputy UnderSecretary AF—Military Space.....*Luncheon Speaker, April 1*

Lieutenant General (ret) Eugene L. Tattini

Deputy Director, Jet Propulsion Laboratory.....*Luncheon Speaker, April 2*

Brigadier General Simon P. “Pete” Worden

Director, Office of Transformation, AF Space and Missile Command.....*Dinner Speaker, April 2*

Dr. Antonio L. Elias

Vice President and General Manger for Advanced Programs, Orbital Sciences Corporation.....*Luncheon Speaker, April 3*

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 no-host bar 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.

(The hotel restaurant is also excellent. With advance arrangements, you can eat a meal prepared just for your group at a table in the kitchen—lots of fun, but there's only 1 table there.) 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

Brigadier General Simon P. "Pete" Worden, Director, SMC Office of Transformation, AF Space and Missile Command 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.

Local Tours

Tours are available of several of the local aerospace firms. Visit Microcosm and see the facility for the Scorpius family of low cost, responsive launch vehicles. Microcosm is also home to 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 Crowne Plaza is an excellent location for the entire family. Seaside Lagoon, directly across the street, offers safe family swimming in a protected area with lifeguards next to (but separated from) the Ocean beaches. The Redondo Beach pier, with fishing, shops, and restaurants is a very short walk. Bicycle's can be rented for trips along the beach-front bike and skate path and kayaks are available for those that want to explore the ocean up close without getting wet (maybe). Boat tours are available of the local area and to Catalina Island, just visible off the tip of the Palos Verdes peninsula. Of course, Disneyland, Knott's Berry Farm, Universal Studio and other Southern California adventures are nearby. 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.

Location and Weather



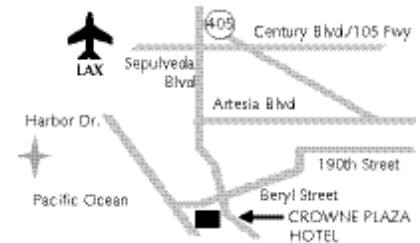
Crowne Plaza Redondo Beach

The Responsive Space Conference will be held at the Crowne Plaza Hotel in beautiful Redondo Beach, CA. It is just a few minutes from LAX (or the much smaller Long Beach airport if you prefer). It's across the street from the beach, the Redondo Beach marina, and Seaside Lagoon where the whole family can enjoy safe and comfortable swimming in a controlled seaside environment. The hotel is about a block from the Redondo Beach Pier and has easy walking access to many restaurants and shops. 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 \$149 single or double is available by calling the hotel at 1-800-368-9760 or (310) 318-8888 and mention that you are attending the Responsive Space Conference. A limited number of government rates are available with appropriate ID. Please make your reservations by March 5, 2003 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.



NASA Town Meeting

A West Coast Town Meeting Forum entitled "Implementing the NASA Vision" and dinner will be held in conjunction with the "Responsive Space Conference" to be held April 3rd at the same location, sponsored by the AIAA Los Angeles Section and National Space Club. A networking social hour followed by a dinner then panel will convene on Thursday, April 3 from 6:30 p.m. to 9:30 p.m. at the Crowne Plaza Hotel. Watch for a specific Flyer and Registration on the Responsive Space web page.

The forum will update California aerospace industry, military, and government lab leaders, plus selected engineering students from local campuses, on the nature of NASA's vision for the future scientific space program, and on what that vision implies for the California aerospace industry and its technical personnel.

Town Meeting Panel Members:

Frederick Gregory (Moderator)
NASA Deputy Administrator

Christopher Scolese
NASA Deputy Associate Administrator, Office of Space Science

Lieutenant General Eugene L. Tattini (USAF, Ret.)
Jet Propulsion Laboratory (JPL) Deputy Director

G. Scott Hubbard
Ames Research Center Director

William Townsend
Goddard Space Flight Center Deputy Director

Be a Co-sponsor of Responsive Space

The Responsive Space conference is sponsored by the LA Section and the Space Systems Technical Committee of the AIAA. Microcosm is the local host. Please join other space industry leaders by being a co-sponsor of this critical event. Contact Bob Conger (310) 726-4100, rconger@smad.com for details.

Exhibit at Two Meetings for the Price of One. Sponsors are welcome to participate in the NASA town meeting as well. The Responsive Space sponsorship exhibits and posters can remain in place and be prominently displayed during the town meeting.

RESPONSIVE SPACE CONFERENCE SCHEDULE

■ MONDAY, MARCH 31, 2003

1:00 pm – 5:00 pm REGISTRATION, CORAL FOYER, CROWNE PLAZA HOTEL
 5:00 pm – 7:00 pm NO HOST BAR AND RECEPTION, CROWNE PLAZA HOTEL

■ TUESDAY, April 1, 2003

7:00 am – 5:00 pm REGISTRATION, CORAL FOYER, CROWNE PLAZA HOTEL
 7:00 am – 8:30 am CONTINENTAL BREAKFAST AND NETWORKING SESSION
 8:30 am WELCOME AND INTRODUCTIONS—James R. Wertz, General Chairman

9:00 am – 10:00 am OPENING PANEL—THE NEED FOR RESPONSIVE SPACE
 BG STEPHEN FERRELL, OSD-ATL
 PETER G. WILHELM, DIRECTOR, NAVAL CENTER FOR SPACE TECHNOLOGY
 GARY MARTIN, NASA SPACE ARCHITECT (Invited)
 DR. RON SEGA, DDR&E (Invited)

10:00 am BREAK

10:30 am – 12:10 pm NEEDS AND REQUIREMENTS (Chair—AFSPC, Invited)

10:30 am	A) DoD Access to Space for Small Satellites: Current Options & Direction	Maj. Mark Mocio, DoD Space Test Program
10:50 am	B) Operationally Responsive Spacelift for the U.S. Air Force	Lt. Col. Tim Thompson, AFSPC
11:10 am	C) Assured Access to Space Revisited: The Dilemma of Responsive Space Launch in the New Millennium	Lawrence A. Cooper, Kepler Research
11:30 am	D) Heritage Schmeritage	Chris McCormick, Broad Reach Engineering
11:50 am	E) Building a Cadre of Space Professionals: Hands-On Space Experience at the USAF Academy	Lt. Col. Jerry J. Sellers, USAF Academy

12:10 pm LUNCH. Speaker: MG (RET) ROBERT S. DICKMAN, SAF/US — MILITARY SPACE

1:40 pm – 3:20 pm ORBITS AND MISSION DESIGN (Chair—Pat Patterson, SDL)

1:40 pm	A) An Elegant Docking Solution for Autonomous Spacecraft Operations	Pete Tchoryk, Michigan Aerospace Corporation
2:00 pm	B) Responsive Delivery of Payloads	Ron Irwin, Scitor Corporation
2:20 pm	C) Developments in Commercial Near-Space Systems	Jerry Knobloch, Space Data Corporation
2:40 pm	D) Operational Concepts and Payoffs for Responsive Space Systems	Mike Borke, Tamarac Technologies
3:00 pm	E) Military Utility of Responsive Space	Lt. Col. C. Marshall, AFSPC

3:20 pm BREAK

3:50 pm – 5:30 pm SPACE SYSTEMS-I (Chair—John Bystroff, Boeing)

3:50 pm	A) Micro Satellite Deployment on Demand	Michael Hurley, NRL
4:10 pm	B) Reductions in Response Time for Non-Primary Payloads	Kevin Cope, Lockheed Martin Astronautics
4:30 pm	C) Overview of Responsive SOV Concepts and Technology Needs	Edwin F. Scholz, Lockheed Martin Astronautics
4:50 pm	D) "Launch-On-Demand:" A Revolutionary Paradigm for Space Utilization	Jeff Summers, MicroSat Systems, Inc.
5:10 pm	E) Survivability and Resource Management of Ground System Assets	Fred Wynkoop L-3 Communications Systems—West

5:30 pm – 7:00 pm SOCIAL

■ **WEDNESDAY, April 2, 2003**

7:00 am – 1:00 pm	REGISTRATION, CORAL FOYER	
7:00 am – 8:30 am	CONTINENTAL BREAKFAST AND NETWORKING SESSION	
8:30 am – 10:10 am	SPACE SYSTEMS-II (Chair—Terry Jagers, SMC/XR)	
8:30 am	A) Modular Micro-Satellite Bus	John Hodak, Starhunter Corporation
8:50 am	B) The Trailblazer Class of Low Cost Space Vehicle	Paul Blase, Transorbital, Inc.
9:10 am	C) Overcoming the Technology Barrier—Rapid Response and Low Cost	Jeff Janicik, Space Dev
9:30 am	D) University Collaborations: Jumpstarting Industry Responsiveness to Space	Dr. Ray M. Haynes, Northrop Grumman Space Technology
9:50 am	E) Affordable, Reponsive Space Asset delivery by Electro Dynamic Delivery Express (EDDE)	Joseph Carroll, Tether Applications, Inc.
10:10 am	BREAK	
10:40 am – 12:00 pm	BREAKING THE BARRIERS (Chair—Lawerence Cooper, Kepler Research)	
10:40 am	A) Accelerating the Development of Effective Space Propulsion Technologies Required for a Large-Scale, Permanent HumanPresence in Space	Christopher Boshuizen, University of Sydney
11:00 am	B) Lessons Learned From Past Reusable Launch System Designs	Greg Peralta, Lockheed Martin Technical Operations
11:20 am	C) Responsive Launch with the Scorpius Family of Low-Cost, Expendable Launch Vehicles	Dr. James R. Wertz, Microcosm, Inc.
11:40 am	D) NAI Study Outbrief	Babu Singaraju, AFRL
12:00 pm	LUNCH. Speaker: LTG. (RET) EUGENE L. T ATTINI—DEPUTY DIRECTOR, JET PROPULSION LABORATORY Plus Presentation of AIAA Space Systems Award	
1:30 pm – 3:10 pm	TECHNOLOGY FOR IMPROVED RESPONSIVENESS (Chair—Todd Mosher, USU)	
1:30 pm	A) Technology for Responsive Space Capability	Dr. Janet S. Fender, AFRL/VS
1:50 pm	B) Fast Responsive Experiment Flight Opportunities using SSPC	Gerald Murphy, Design-Net Engineering
2:10 pm	C) On-Demand Wavelength Tuning of Detector Responsivity for Multi-Mission Scenarios	Dr. Dave Cardimona, AFRL
2:30 pm	D) Pistonless Dual Chamber Rocket Fuel Pump	Steve Harrington, Flometrics
2:50 pm	E) A Low-Cost Flight Computer using GPS	Michael Castle, SiRF Technology, Inc.
3:10 pm	BREAK	
3:40 pm – 5:20 pm	BUSINESS ISSUES (Chair—Russ Joyner, Pratt-Whitney)	
3:40 pm	A) The Barriers and Lessons Learned	Carl Meade, Lockheed Martin
4:00 pm	B) Rapid Financing: The Ultimate Oxymoron	Mark R. Oderman, CSP Associates Inc.
4:20 pm	C) Decision Support Tools To Enable Affordability For Reponsive Space	Sam Boykin, Frontier Technology Inc
4:40 pm	D) Benefits of Commercial Spaceports	Maj. Gen. Jay T. Edwards (Ret., USAF), Oklahoma Space Industry Development Authority
5:00 pm	E)	Charlie Chafer, Celestis
5:20 pm	BREAK	
6:30 pm – 7:00 pm	SOCIAL	
7:00 pm – 9:00 pm	CONFERENCE BANQUET. Speaker: BG SIMON P. (PETE) WORDEN—DIRECTOR, OFFICE OF TRANSFORMATION, AF SPACE AND MISSILE COMMAND	

■ **THURSDAY, April 3, 2003**

7:00 am – 8:30 am	CONTINENTAL BREAKFAST AND NETWORKING SESSION	
8:30 am – 10:10 am	LAUNCH VEHICLES & OPERATIONS-I (Chair—Tony Williams, Booz Allen Hamilton)	
8:30 am	A) Responsive Space: Near-Term Options for the Military	Matt Bille, Booz Allen Hamilton
8:50 am	B) I-Cone for Rapid Response and Low Cost Access to Space	Peter Alea, Swales Aerospace
9:10 am	C) DNEPR LV Program Prospects and Capabilities	Vladimir A. Andreev, International Space Company Kosmotras
9:30 am	D) Improving Space-Asset Responsiveness using the SHERPA	Lt. Arnold Nowinski, AFRL/VS
9:50 am	E) Low Cost Responsive Space Launch Systems	Norman L. Bowers, Lockheed Martin Astronautics
10:10 am	BREAK	
10:40 am – 12:40 pm	LAUNCH VEHICLES & OPERATIONS-II (Chair—Larry Davidoff, Boeing)	
10:40 am	A) Air Force Space Operations Vehicle: Operability Driven	Keith McIver, The Boeing Company
11:00 am	B) Enabling Responsive Spacelift	Lt. Julia Rothman, Air Force Research Laboratory, Space Vehicles
11:20 am	C) Light Weight, Highly Maneuverable and Capable Systems	Stuart B. Wiens, Lockheed Martin Spacecraft Astronautics
11:40 am	D) Responsive Space and System Safety	Robert A. Dueease, The Boeing Company
12:00 pm	E) Demonstrating Low Cost Access to Space for Small Satellites	Lt. Richard Caldwell, Space and Missile Systems, Kirtland AFB
12:20 pm	F) The SCORPIUS® Expendable Launch Vehicle Family and Status of the SPRITE Small Launch Vehicle	Dr. Shyama Chakroborty, Microcosm, Inc.
12:40 pm	LUNCH. Speaker: DR. ANTONIO L. ELIAS—VP/GM ADVANCED PROGRAMS, ORBITAL SCIENCES CORP.	
2:20 pm – 3:30 pm	WRAP-UP PANEL WITH SUMMARIES BY SESSION CHAIRS	
2:20 pm	CD-ROM OF ALL PAPERS AVAILABLE TO PARTICIPANTS	
12:40 pm – 4:30 pm	EXHIBITS OPEN	
3:30 pm – 6:30 pm	TOWN MEETING REGISTRATION (Separate Registration Fee Required)	
4:30 pm – 6:30 pm	TOWN MEETING NETWORKING SESSION	
6:30 pm – 9:00 pm	NASA TOWN MEETING DINNER AND PANEL	

For More Information

Visit the Conference Website: www.ResponsiveSpace.com

E-mail us at: responsivespace@smad.com

General Information: Regina Jenkins, (310) 726-4100

Sponsorship & Exhibit Information: Dr. Robert Conger, (310) 726-4100

Registration Information: Terrie Kao, (310) 216-6772 or AIAA@meetingsRR.com

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**Come Join Us for a Great Meeting, a Good Time, and an
Excellent Chance for Discussion, Interaction, and Planning the
Future of Responsive Space.**

