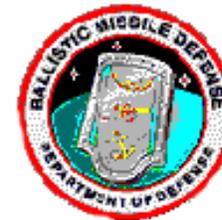




# Space Technology Alliance



. . . ensuring America's advantage



**Christine M. Anderson**  
**Director, Space Vehicles**  
**Air Force Research Laboratory**  
**Kirtland AFRL, New Mexico**  
**anderson@plk.af.mil**  
**EOE 1014 2312**

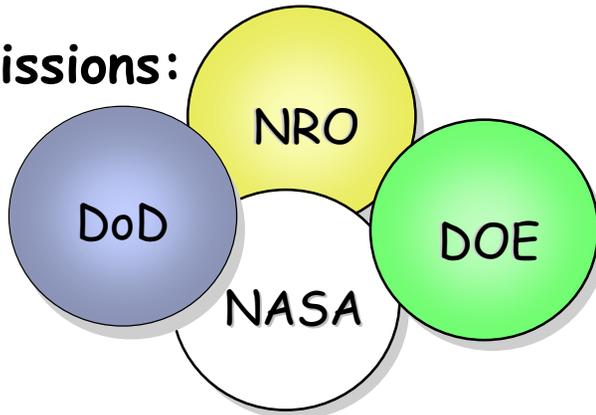
# Agenda

- Space Technology Alliance (STA):
  - **What is it?**
- STA Processes/Products
- Industry Involvement

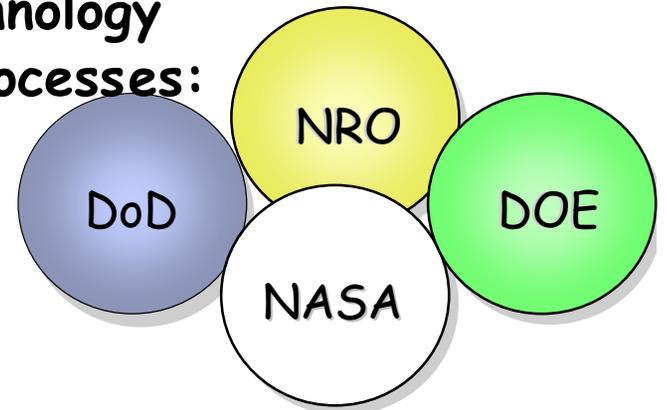


# Inter-Agency Coordination: The Environment

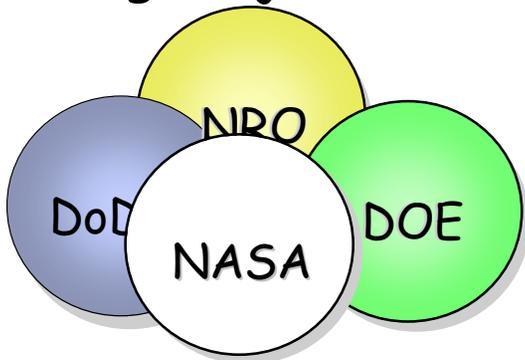
The Missions:



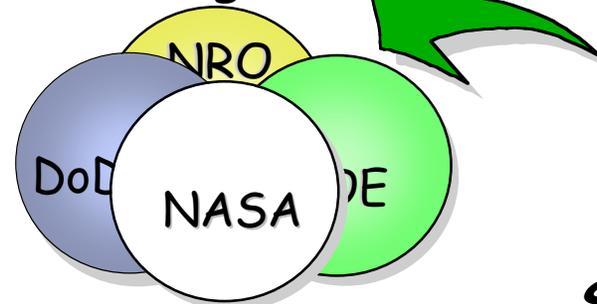
The Technology  
Planning Processes:



Planning Objectives:



Technologies:



*Capitalize  
on  
Similarities*

# Space Technology Alliance

## Space Technology Alliance (STA)

### Members

- Air Force
- Army
- Navy
- NASA
- NRO
- BMDO
- DARPA
- DOE

### Ex Officio

- DDR&E
- NSSA
- SAF/AQR
- AF/ST
- ASD(C3ISR&SS)

Inventory  
Coordinate  
Integrate

Coordinate the development of affordable, effective space technologies for the greatest return on investment of government funds

**New Partnerships**

Shared  
Database

Joint  
Roadmaps

Joint  
Programs

*Established 3 Oct 1997*

# STA Membership\*

Christine Anderson (AFRL) - *chair*

## Members

- Mr Bob Pattishall (NRO)
- Mr Sam Venneri (NASA)
- Dr Dwight Duston(BMDO)
- Mr Pete Wilhelm (NRL)
- Dr Dick Fisher (MDSTC)
- Dr Dave Whelan (DARPA)
- Mr. Bob Waldron (DOE)

## Ex Officio

- DDR&E
- NSSA
- SAF/AQR
- AF/ST
- ASD(C3ISR&SS)

\* Exploring ways to include industry and academia

# STA: What's Different?

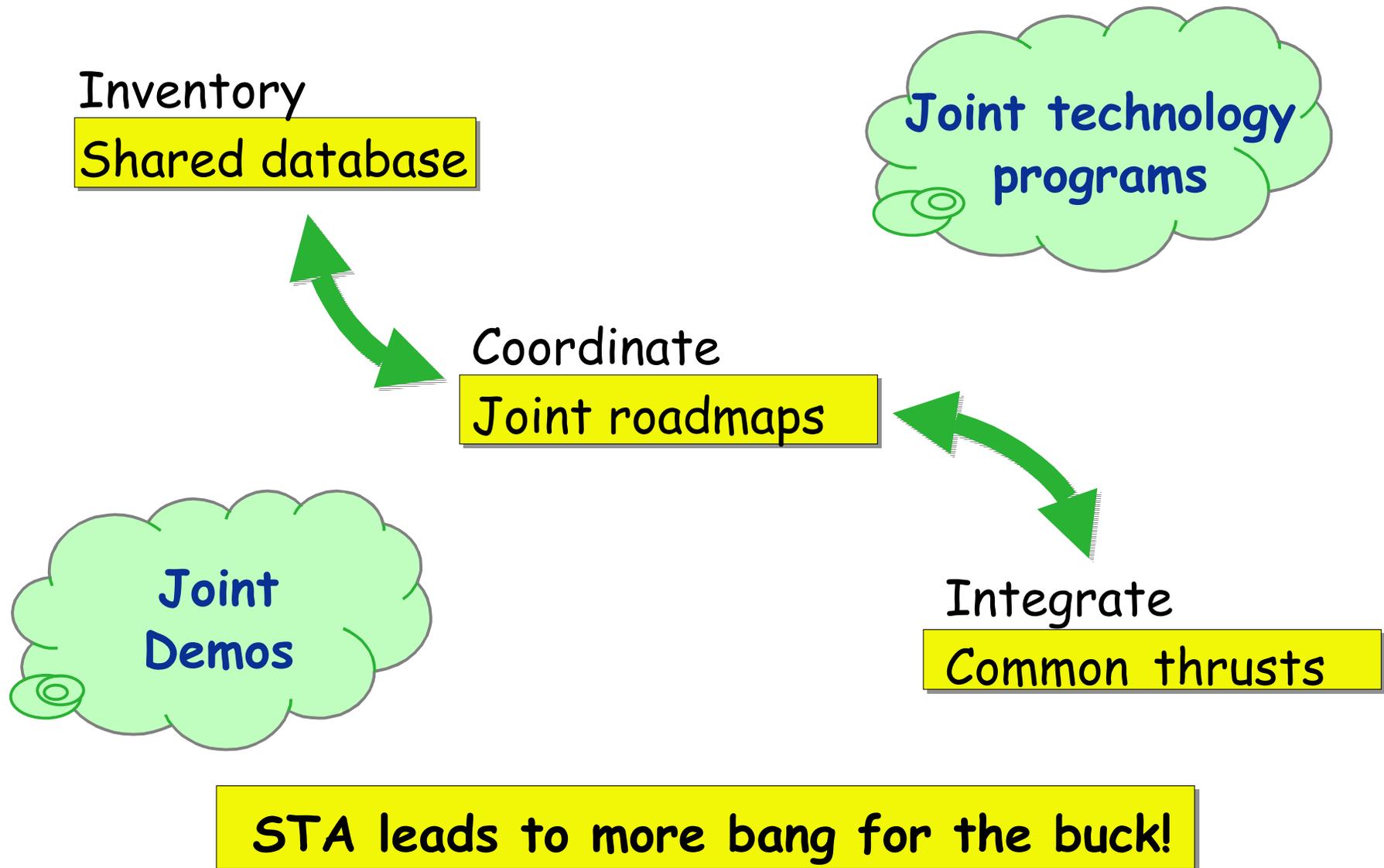
- STA is focused on Space Technology
  - AFSPC-NASA-NRO Partnership Council covers primarily operational issues, facilities issues, etc.
  - Aeronautics & Astronautics Coordination Board (NASA & DoD) covers aeronautics and space
- STA is broader than DoD Reliance
  - Includes NRO, NASA & DOE
  - Cross cuts DTAP panels to focus on space
- STA provides forum for space technology and advanced concepts collaboration/coordination  
Examples:
  - *Space Power*

# Agenda

- Space Technology Alliance (STA):
  - What is it?
- • *STA Processes/Products*
- Industry Involvement



# Space Technology Alliance: Process and Products



# Space Technology Alliance: Common Database

- Develop common "File Plan" & language
  - The "File Plan": Major technology groupings, e.g., structures, thermal management, power, sensors, etc
  - Common Language: e.g., "Space Processing"
    - NASA - manufacturing in the space environment
    - DoD - Computer processing of space generated data
  - Facilitate communication
  - Facilitate investment tracking
- Status: Space Technology Inventory created (in coordination)
  - Stored in NRO Database

# Space Technology Database\*

- Integrated Spacecraft Systems Technology
    - Systems Analysis & Design Methods
    - Advanced Concepts Definition
    - etc.
  - Autonomy
    - On-board Autonomy
    - Mission Operations
    - etc.
  - Space Vehicles Technology
    - Structures
    - Thermal Management
    - Power
    - etc.
  - Sensors
    - Focal Plane Arrays
    - Optics
    - etc.
  - Communications
    - RF
    - Laser
    - etc.
  - Space Environment
    - Solar
    - Deep Space (e.g., Cosmic Rays)
    - etc.
  - Information Systems Technology
    - Intelligent Systems & Networks
    - Human Computer Interfaces
    - etc.
  - Human Support
  - Launch and Transfer
    - Propulsion
    - Vehicles
  - Directed Energy
    - High Powered Lasers
    - High Powered Microwaves
- \* maintained by NRO

# Joint Roadmaps from a Strategic Perspective

Measurable milestones  
Agency contributions  
Technology deficiencies  
Collaborative opportunities



## *In Progress*

Space Power  
HSI  
Advanced Comm  
MicroSats

## *Other Candidates*

Optics  
Lidar

# STA Coordination Process

- **Phase 1 - Focus Area Selection**
  - STA member suggests area for "focus"
- **Phase 2 - Inter-Agency Government Coordination**
  - Lead is selected
  - Coordinated government roadmap developed
  - Revectoring Opportunities
- **Phase 3 - Government/Industry Coordination**
  - Government/Industry meeting to get industry feedback
- **Phase 4 - Collaboration**
  - Two or more STA members (and industry) agree to build a joint program to satisfy deficiencies

**Government/Industry Roadmaps Updated Annually**

# Space Power Coordination Process: Example

20 April	NASA/AFRL Space Power Program Overview to STA
20 April - 30 June	Discussions with Space Power Experts (power managers) across all Agencies
30 June	Interim presentation to STA
	
12 - 14 August	Space Power Workshop at KAFB
10 September	Interim Report to STA
17 November	Final report & brief STA
January	Space Power Meeting with Industry

# Space Power Workshop

12-14 August 1998

- 30+ attendees representing AFRL (KAFB, WPAFB), NASA (LeRC, JPL), NRO, DARPA, NRL, ONR, BMDO, DOE (SNL), DSWA
- **Sub-Group Meetings**
  - Photovoltaics
  - Energy Storage
  - Thermal-to-Electric
  - Power and Thermal Management

# Space Power Workshop Participates

12-14 August 1998

## AFRL

Ralph James  
Kitt Reinhark  
Dan Radzykewycz  
Chuck Donet  
Dean Marvin  
Mike Brasher  
Clay Mayberry  
Carole Hill  
Jerry Beam  
Mike Braydish  
Tom Lamp  
Dick Marsh  
Steve Vukson

## CIA

G. Methlie  
MDSTC  
Johnny Baldwin

## NRL

Chris Garner  
Bill Baker  
DOE (SNL)  
David Ingersoll

## DARPA

Bob Rosenfeld  
Steve Wax

## NRO

Ben Lamb  
Paul Malachesky  
Pat Rahilly  
Eric Vigilone

## BMDO

Doug Allen  
Jurgen Pullman  
John Stubstadt

## DSWA

R. Wiley

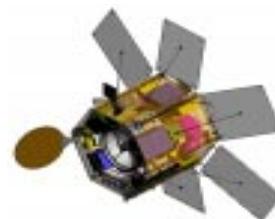
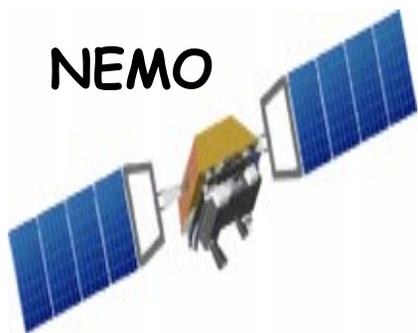
## NASA

Joe Sovie-Lead  
Perry Bankston  
Jim Dudenhoefer  
Dennis Flood  
Michelle Manzo  
Lee Mason  
Dave Christopher  
Jim Soeder  
Dick Shaltens  
Karl Baker  
ONR  
Charles Lloyd

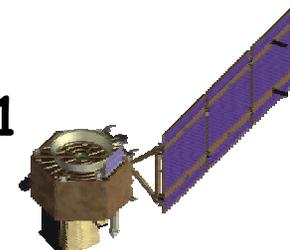
# HSI Working Group

## *Recent Accomplishments*

- **Established Three Subgroups**
  - Requirements & Phenomenology
  - Sensors & Integration
  - Exploitation & Data Fusion
- **Functional Breakdown (Taxonomy)**  
Developed at HSI Workshop
- **HSI Data Base Created**



EO-1



### Working Group Activity

- 11 Jun 98, Chantilly
- 25-27 Aug 98, JPL
- 29-30 Oct 98, Chantilly, VA



# Space Technology Alliance: Common Strategic Investment Areas

STA Members  
Individual  
Enterprises



DRAFT

Strategic Investment Areas:

Miniaturization

Intelligent Systems

Sensing

Self-Sustaining Human Support

Deep Space

Intelligent Synthesis Environment

Asset Protection

Force Projection

Spacecraft Systems Architectures

Space Mobility and Servicing

Advanced Communications

Advanced Power

Critical Industry Sectors:

Space Transportation

Communications

Commercial Remote Sensing

Material Processing in Space

# AIAA Space Technology Conference and Exposition



**“Partnering in the 21st Century”**

Albuquerque Convention Center  
Albuquerque, New Mexico  
September 28–30, 1999



**AIAA**  
*in cooperation with*  
**the Air Force Research Laboratory**  
*and*  
**the Space Technology Alliance**

- Strategic Planning and Policy
- Space Systems
- Space Mobility & Operations
- Miniaturization
- Advanced Communications
- Space Based Sensing





# Conference Approach

- **Conference Philosophy - “The Space Conference”**
  - Address programs in plenary and panel sessions
  - Six parallel tracks
  - Track dedicated to strategic planning and policy to attract senior management
  - Increase technical quality (peer review)
  - Oriented toward Space Technology Alliance emphasis areas
  - Technology as opposed to Science (avoid conflict w/Reno)
  - Recognized as the place to present the 'good stuff'
  - Leaders, users, architects, and program managers meet technologists
- **Key Milestones (Advertise early and often!)**
  - Conference advertisement flyer (10 June 98)
  - Call for papers submitted to AIAA (20 August 98)
  - Abstracts due (1 February 1999)
  - Author acceptance notification (12 April 99)
  - Aerospace America Preliminary Program (June 99)
  - Camera ready author manuscripts due (26 July 99)





# AIAA Space Technology Conference and Exposition

- **Strategic Planning & Policy**

*Col Larry James, USSPACECOM*

*Ms. Lori Garver, NASA*

*Mr. John Landin, ASD(C3ISR&SS)*

*Mr. Mike Griffin, OSC*

- Budgets/Policies/Treaties/  
Venture Capital/Licensing
- Major Program Status
  - Station, Shuttle, MILSATCOM
  - SBIRS, EELV/RLV, Commercial

- **Space Systems**

*Dr. Alok Das, AFRL*

*Dr. Dan Mulville, NASA +*

- Spacecraft & constellation trades
- Distributed satellite systems
- NASA Science Missions
- Standards for "plug & play"

- **Space Mobility & Operations**

*Mr. Rick Bachtel, NASA MSFC +*

*Mr. Mike Jacox, Texas A&M*

- RLV Technologies
- OTV Technologies

- **Miniaturization**

*Mr. Mike Sander, JPL +*

*Mr. John Comptois, AFRL*

- Micro/Nano Technology
- Mechanical, electrical, optical
- Low-power, high speed, radiation tolerant electronics

- **Space Based Sensing**

*Mr. Sean Roche, NRO +*

*Dr. Tony Ratkowski, AFRL*

- Advanced Sensor Programs
- Advanced detectors
- Integrated instruments
- Large, lightweight space optics
- Advanced EO & RF

- **Advanced Communications**

*Dr. Thomas Brackey, Hughes +*

- Commercial comms
- Total global & deep space coverage
- High frequency deep space comms
- LEO comms
- Future communications systems



# AIAA Space Technology Conference and Exposition Technical Excellence

- Technical Program Co-chair

Dr Dan Hastings

Chief Scientist, USAF

Dr Mike Borkey

Chief Scientist, TRW

- Refereed Extended Abstracts vs Papers
- NASA \$10,000 "Partnership" Paper Award



# AIAA Space Technology Conference and Expo Strawman Program

Six 'Tracks', Five Sessions per Track

	Tues 28 Sep	Wed 29 Sep	Thurs 30 Sep
Morning	<b>Government Plenary Panel</b> Moderator, Maj Gen Paul Honorary Co-chairs (invited) Gen Myers, Dan Goldin, Bill Richardson, Keith Hall, Lt Gen Lyles, Rear Admiral Gafney, Frank Fernandez	Honorary P. Aldridge  Parallel Technical Sessions	Dr. Dan Hastings  Parallel Technical Sessions
		Planning & Policy Space Systems Mobility Operations Minuteman Space Sensing Communications	Planning & Policy Space Systems Mobility Operations Minuteman Space Sensing Communications
Luncheon:	<b>Acting Secretary            Air Force Peters (Invited)</b>	<b>Industry Panel</b>	<b>TBD</b>
Afternoon	Users' Panel each track  Parallel Technical Sessions	Parallel Technical Sessions	Parallel Technical Sessions
	Planning & Policy Space Systems Mobility Operations Minuteman Space Sensing Communications	Planning & Policy Space Systems Mobility Operations Minuteman Space Sensing Communications	Planning & Policy Space Systems Mobility Operations Minuteman Space Sensing Communications

Reception



# What's Next?

- **Subcommittees Strengthened**
  - Power Advanced Comm
  - HSI (Instrumentation and Exploitation)
  - Communications
- **Advanced Concepts SubCommittee Formed**
  - NRO (Roche)
  - AF (Hastings)
  - NASA (Venneri)
  - DARPA (Whelan)
- **Yearly Report Planned**
- **Web Site Under Construction**

# Agenda

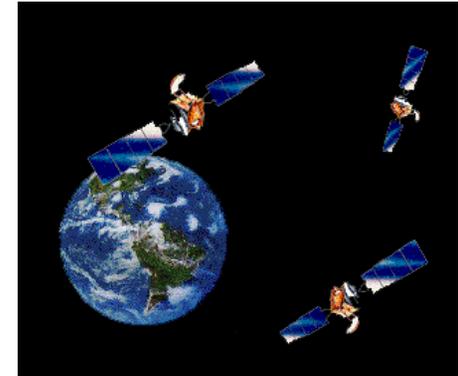
- Space Technology Alliance (STA):
  - What is it?
- STA Processes/Products
- **Industry Involvement**



# Why partner with industry?



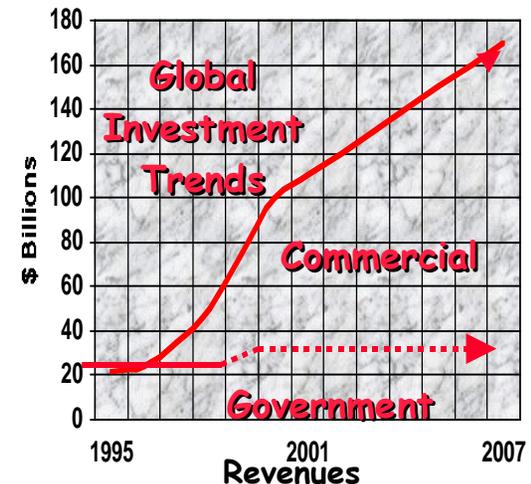
**\$.5 Trillion to be spent on space 1996-2000**  
... only about 30% government



**Over \$100 billion US dollars invested in space today**

**1500 - 1800 satellite to be launched next 10 years**  
only about 25% government

Over 500 active satellites  
(200+ US satellites)



**The Government does not drive the space market**

# STA - Industry Relationship

- **Aerospace Industries Association (AIA) has agreed to facilitate coordination**
- **The STA will issue a CBD (Commerce Business Daily) announcement for a technology workshop**
  - **Space Technology Workshop in 1999**
- **The AIA will review, integrate and present industry member responses to STA**
  - **Will serve to protect proprietary industry interests while providing the government with industry insight**
- **Other industry responses will be directly submitted to STA**

# AIA Members

**AAI Corp**  
**Aerojet, A Segment of**  
**GenCorp**  
**The Aerostructures Corp**  
**Alliant Techsystems Inc**  
**AlliedSignal Aerospace**  
**American Pacific Corp**  
**Argo-Tech Corp**  
**B.H. Aircraft Company, Inc**  
**Barnes Aerospace**  
**The Boeing Company**  
**CMS, Inc**  
**Coltec Industries Inc**  
**Cordant Technologies**  
**Digital Equipment Corp**  
**Dowty Aerospace**  
**Ducommun Incorporated**  
**DuPont Company**

**Dynamic Engineering Inc**  
**Esterline Technologies**  
**General Dynamics Corp**  
**General Electric Company**  
**The BFGoodrich Company**  
**Gulfstream Aerospace Corp**  
**Harris Corp**  
**HEICO Aerospace Corp**  
**Hexcel Corp**  
**Honeywell Inc**  
**Hughes Electronics Corp**  
**Interturbine Corp**  
**ITT Defense & Electronics Inc**  
**Kaman Aerospace Corp**  
**Kistler Aerospace Corp**  
**Litton Industries, Inc**  
**Lockheed Martin Corp**  
**Lucas Aerospace Inc**

**Marconi North America Inc**  
**MOOG Inc**  
**Northrop Grumman Corp**  
**Pacific Scientific Company**  
**Parker Hannifin Corp**  
**Raytheon Company**  
**Robinson Helicopter Company**  
**Rockwell Collins, Inc**  
**Rolls-Royce North America Inc**  
**Sundstrand Corp**  
**Teleflex Inc./TFX Sermatech**  
**Textron Inc**  
**Triumph Controls, Inc**  
**TRW Inc**  
**United Defense**  
**United Technologies Corp**  
**Veridian Corp**  
**Woodward Governor Corp**

# AIA Space Committee

- AIA rechartered and strengthened their Space Committee to be of greater service to government and industry
  - Established formal project to provide industry support to STA
- AIA will work with the STA to refine Space Committee to meet the needs of the STA
  - Develop industry working relationships with STA as working groups unveil

# Summary

- **Space Technology Alliance**
  - Off to a great start
  - Making the rules along the way
  - Motivated, grass roots initiative

Right Time, Right People . . .