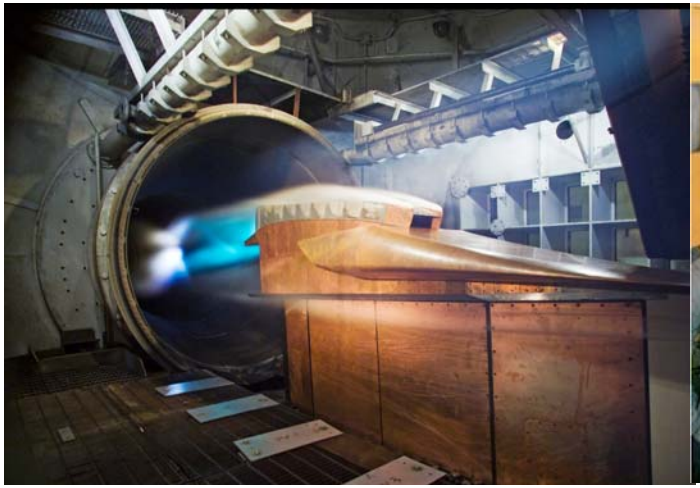
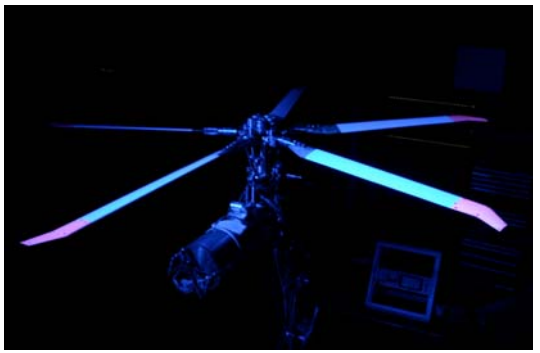




NASA's New Aeronautics Research Program

45th AIAA Aerospace Sciences Meeting & Exhibit

Dr. Lisa Porter
Associate Administrator for Aeronautics
11 January 2007

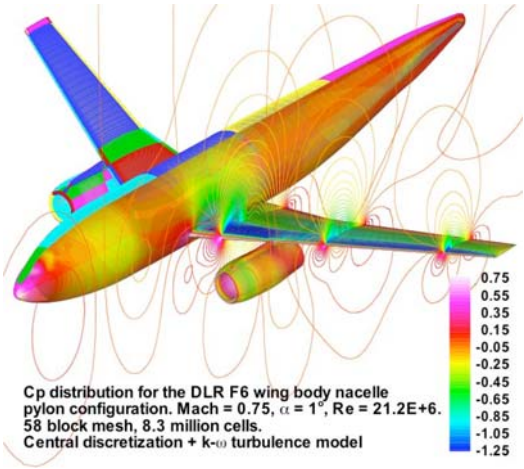
The Three Principles

- **We will dedicate ourselves to the mastery and intellectual stewardship of the core competencies of Aeronautics for the Nation in all flight regimes.**
- **We will focus our research in areas that are appropriate to NASA's unique capabilities.**
- **We will directly address the fundamental research needs of the Next Generation Air Transportation System (NGATS) in partnership with the member agencies of the Joint Planning and Development Office (JPDO).**

The New Aeronautics Programs

Fundamental Aeronautics Program

- Subsonics: Fixed Wing
- Subsonics: Rotary Wing
- Supersonics
- Hypersonics

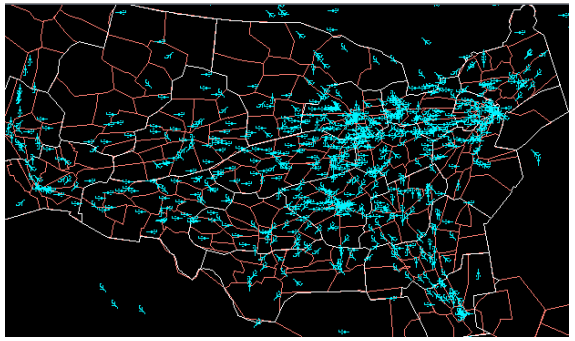


Aviation Safety Program

- Integrated Vehicle Health Management
- Integrated Resilient Aircraft Control
- Integrated Intelligent Flight Deck
- Aircraft Aging & Durability

Airspace Systems Program

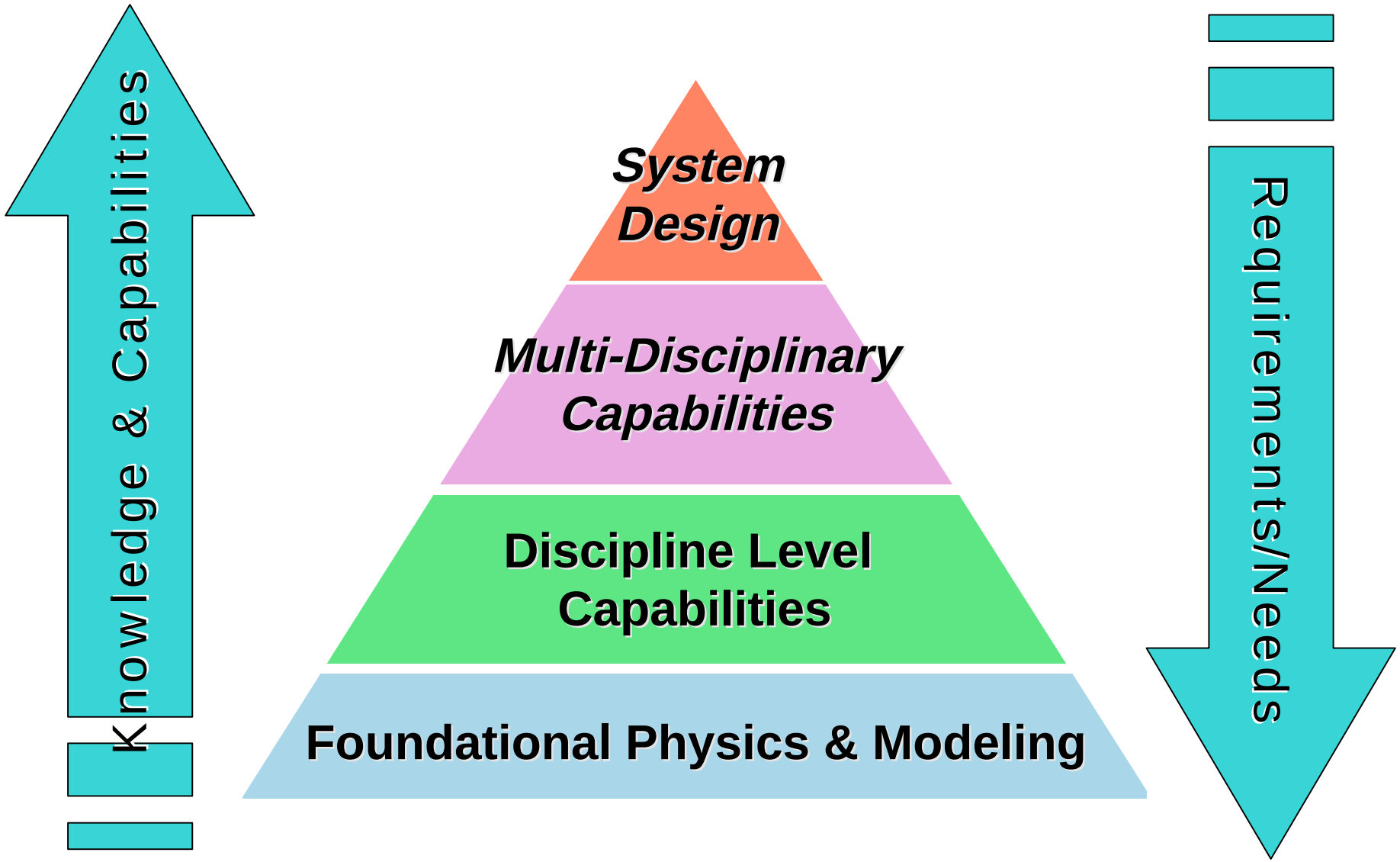
- NGATS Air Traffic Management: Airspace
- NGATS Air Traffic Management: Airportal



Aeronautics Test Program

- Ensure the strategic availability and accessibility of a critical suite of aeronautics test facilities that are deemed necessary to meet aeronautics, agency, and national needs.

Research Philosophy



Four-Step Process

- **Step 1: Oct 05 - Jan 06: Assess long-term research goals for each Project & develop preliminary roadmaps.**
  - Vet preliminary roadmaps with DOD, JPDO, and FAA.
  - Present roadmaps at AIAA conference in Jan 2006.
- **Step 2: Jan 06: RFI to solicit industry input regarding opportunities for cooperative partnerships in pre-competitive research.**
  - Over 230 responses from over 100 organizations.
- **Step 3: Feb - May 06: Project proposal development and review.**
  - NASA researchers at all 4 research centers developed proposals that incorporated input from RFI responses as well as from OGAs.
  - Proposals underwent rigorous review. Review panels included SMEs from the USAF, DARPA, USA, FAA, JPDO, and NOAA.
  - Technical content posted to NASA's aeronautics website.
- **Step 4: May - Dec 06: NRA to solicit proposals in foundational research areas.**
  - NRA released in May 2006. NRA competition was full and open.
  - More than 700 proposals were received in July 2006.
  - 135 proposals selected for negotiation for award.
    - 72 different organizations selected from 29 states plus D.C.
    - 51 different Universities, 15 different companies, 6 non-profit organizations.
  - Negotiations for awards: Oct - Jan. All anticipated to be awarded by end of January.

The Aeronautics Enterprise

"As the science and application of aeronautics progressed, an interdependence developed among the aircraft, the air transportation system, and the people who use these systems, resulting in a **multi-dimensional, highly integrated aeronautics enterprise**….Treating the entire system as a whole is complex but necessary, and requires close coordination among multiple government departments and agencies as well as industry, academia, and other non-Federal stakeholders to ensure that the needs of all enterprise users are addressed."

- National Aeronautics R&D Policy

AERONAUTICS RESEARCH MISSION DIRECTORATE

Associate Administrator: Dr. Lisa Porter
Deputy Associate Administrator: Dr. Jaiwon Shin

Airspace Systems Program

Director: Dr. Karlin Toner
Deputy: Dr. John Cavolowsky

Aviation Safety Program

Director: Herb Schlickenmaier
Deputy: John White

Fundamental Aeronautics Program

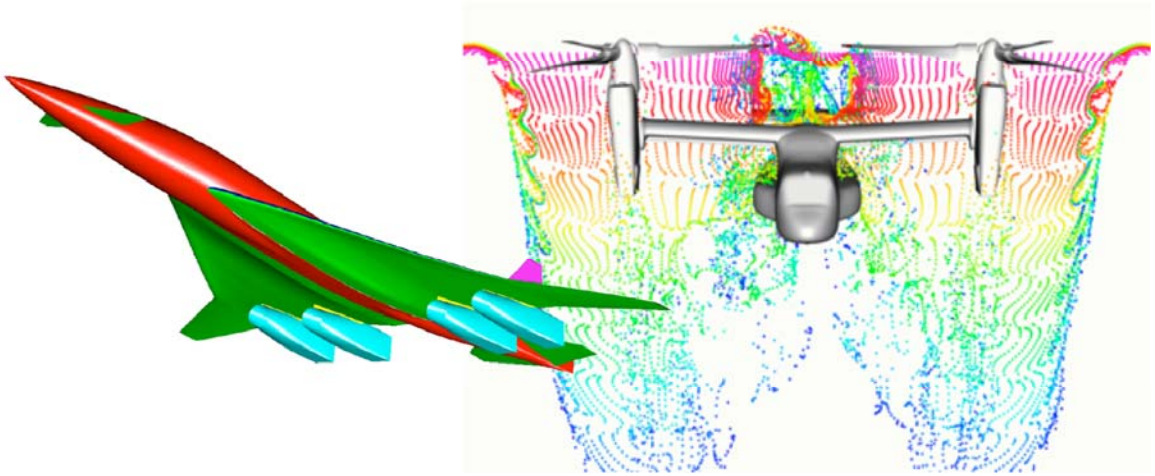
Director: Dr. Juan Alonso
Deputy: Vicki Crisp

Aeronautics Test Program

Director: Blair Gloss
Deputy: Tom Irvine

Fundamental Aeronautics Program ARMD

Dr. Juan Alonso
Program Director
(nasa-fa@nasa.gov)



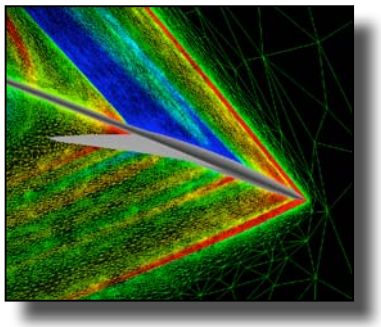
The New Fundamental Aeronautics Program

- Fundamental Aeronautics has transformed from a ***demonstration-based*** program to one focused on ***fundamental technology***
- Emphasis on ***core-capability*** in ***discipline and multidiscipline technology*** critical to sustaining the advancement of aeronautics
- Addressing main concerns of modern air transportation:
  - Public concerns over ***noise and emissions***
  - Increasing costs associated with ***high fuel consumption***
  - Lack of progress towards ***faster means of transportation***
- Aeronautics and space technology are closely related: ***Fundamental Aeronautics contributes to NASA's broader Vision for Space Exploration***
- Emphasis on advanced ***multidisciplinary analysis and design*** capability to
  - Guide our research and technology investments
  - Realize integrated technology advances in future aircraft and spacecraft

Fundamental Aeronautics Program: Mission Statements

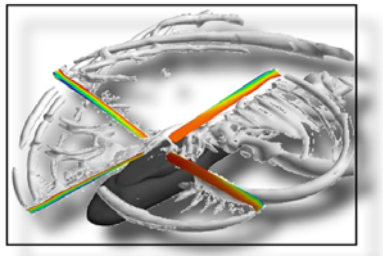
- ***Hypersonics***
  - Fundamental research in all disciplines to **enable very-high speed flight** (for launch vehicles) and **re-entry into planetary atmospheres**
  - High-temperature materials, advanced propulsion, aero thermodynamics, multi-disciplinary analysis and design, GNC, advanced experimental capabilities

- ***Supersonics***
  - **Eliminate environmental and performance barriers** that prevent **practical supersonic vehicles** (cruise efficiency, noise and emissions, vehicle integration and control)
  - Supersonic deceleration technology for **Entry, Descent, and Landing** into Mars



- ***Subsonic Fixed Wing***
  - Develop revolutionary technologies and aircraft concepts with highly **improved performance** while satisfying **strict noise and emission constraints**
  - Focus on **enabling technologies**: acoustics predictions, propulsion / combustion, system integration, high-lift concepts, lightweight and strong materials, GNC

- ***Subsonic Rotary Wing***
  - Improve **competitiveness of rotary wing vehicles** (vs fixed wing) while maintaining their unique benefits
  - Key **advances** in multiple areas through **innovation** in materials, aeromechanics, flow control, propulsion



Hypersonics Project

- Highly Reliable, Reusable Launch System (HRRLS)
  - Absolute speed record set by NASA's X-43 test vehicle: Mach 10 for <10 sec
  - Record for "sustained" hypersonic flight: SR-71 @ Mach 3 for ~2000 miles
  - HRRLS 1st stage for two-stage-to-orbit needs to reach Mach 10-12, and fly back to base
  - Significant challenges in aerothermodynamics, structures and materials, propulsion, GN&C and full vehicle system integration
- Heavy Mass Mars Entry Systems (HMMES)
  - Largest payload to land on Mars ~1 MT (Mars Science Laboratory ~775 kg)
  - Human missions to Mars will need to land 20 to 40 MT
  - Heating rate ~1000 W/cm^2 vs <100 W/cm^2 for MSL
  - Constraints for deceleration from hypersonic atmospheric entry speed and "safe" precision landing cannot be reasonably met with current technology (e.g. without prohibitively expensive propulsive deceleration)

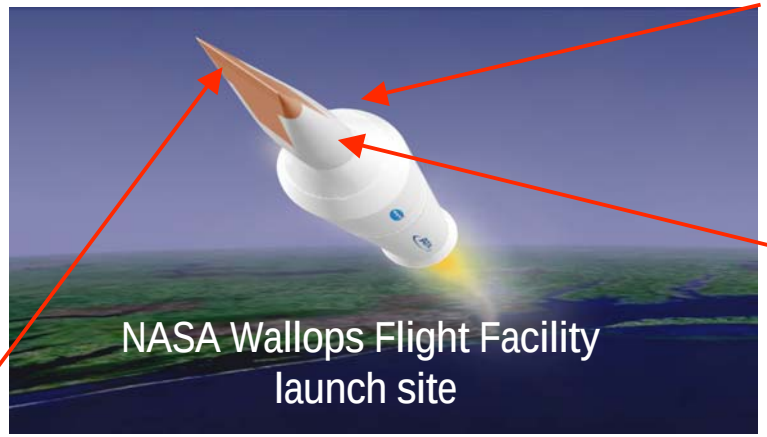
Hypersonic Boundary Layer Transition (HyBoLT) & Sub-Orbital Aerodynamics Re-Entry Experiments (SOAREX)

STS-114 gap-filler incident served as a potent reminder of the importance of pursuing mastery of the fundamentals of hypersonic flight.

Mission Objective: Obtain unique flight data for basic flow physics and Mars entry technology

Estimated launch date:
Late 2007

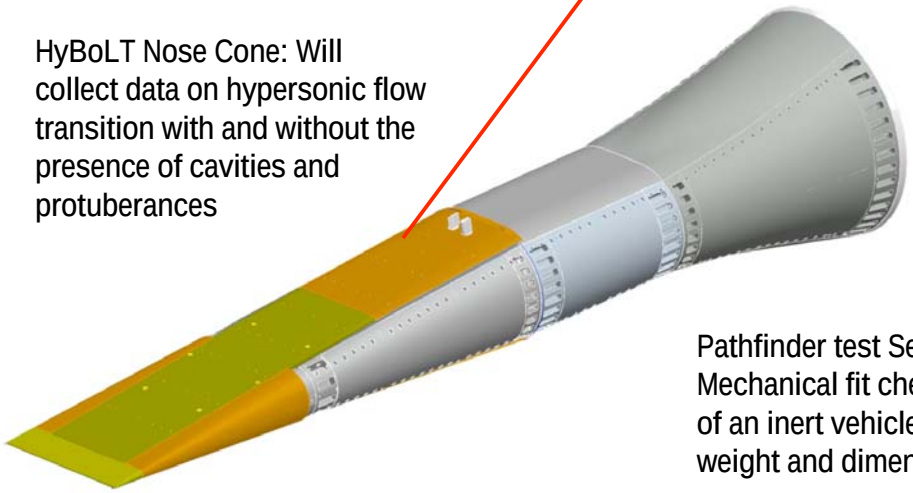
Cost-sharing partners:
NASA
ATK



ATK Launch Vehicle (ALV X-1)

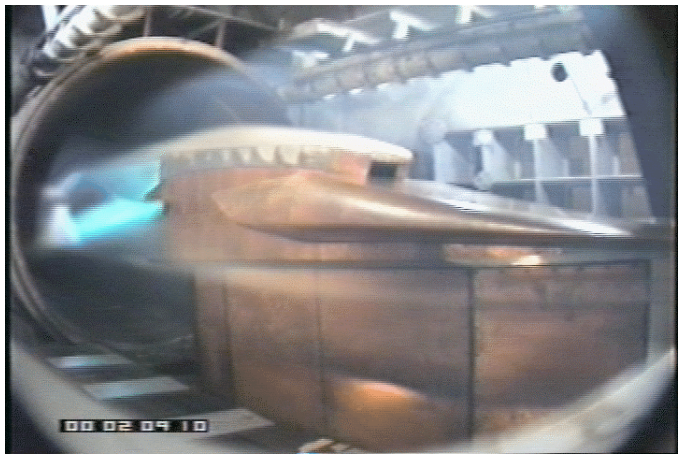
SOAREX will collect aerodynamic data on a re-entry shape during descent. Probe carried internally and ejected at 500 km altitude

HyBoLT Nose Cone: Will collect data on hypersonic flow transition with and without the presence of cavities and protuberances



Pathfinder test Sept 2006:
Mechanical fit check
of an inert vehicle with proper weight and dimensions

Hypersonics: X-51A Scramjet Engine Demonstrator



NASA Ground Demonstration Engine 2 Testing

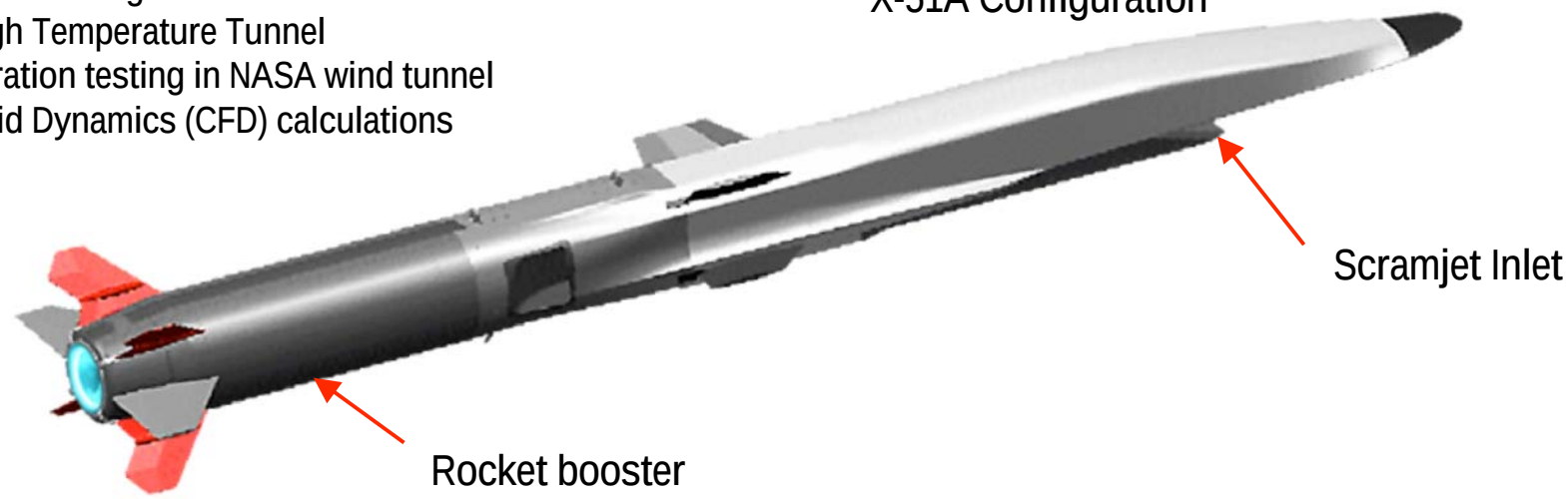
Program Overview

- **Joint AFRL/DARPA/NASA flight demo**
- **Hydrocarbon-fueled and cooled scramjet**
- **Scramjet flight from Mach 4.5 to 6.5**
- **5 minute-plus flight duration**
- **Four to eight flights (FY09 1st flight)**

NASA's Role:

- Full-scale propulsion testing in the NASA 8-Foot High Temperature Tunnel
- Sub-scale configuration testing in NASA wind tunnel
- Computational Fluid Dynamics (CFD) calculations

X-51A Configuration



Supersonics Project

Focus on two vehicle classes:

- **Supersonic Cruise Aircraft**
  - Eliminate the efficiency, environmental and performance barriers to practical supersonic cruise vehicles
- **High Mass Mars Lander**
  - Tools and technologies to address the critical supersonic deceleration phase of future Mars landing

Resolve the following technical challenges:

- **Efficiency Challenges**
  - Supersonic Cruise Efficiency and Light Weight and Durability at High Temperature
- **Environmental Challenges**
  - Airport Noise: Acceptable levels without weight or performance penalty
  - Sonic Boom: Propagation, prediction and design
  - High Altitude Emissions: Emissions impact must be minimized or eliminated
- **Entry Descent and Landing Challenges**
  - Supersonic Entry Deceleration: Develop tools and technologies to support the design and validation of exploration systems capable of landing payloads 100 times larger than current Mars missions
- **Multidisciplinary Design, Analysis and Optimization Challenges**
  - Understanding and exploiting the interactions of all these supersonic technology challenges is the key to the creation of practical designs

Partners include: DARPA, AFRL, JPDO, Gulfstream Aerospace, Lockheed-Martin

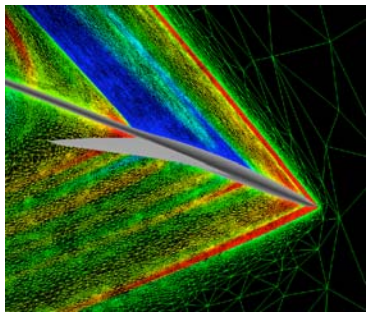
Supersonics: Cruise Efficiency

Problem Statement:

The design of efficient supersonic aircraft that also achieve low levels of sonic boom noise requires that the shape of the vehicle be carefully tailored.

Technical Approach:

- Development of new Computational Fluid Dynamics (CFD) tools
- Development of techniques for mounting wind tunnel models to enable accurate measurements of the flowfield on and around the aft portion of a supersonic aircraft.
- A modified F-15 aircraft will be used to collect in-flight measurements of the effects of the engine exhaust on the shock wave pattern in the near vicinity of the aircraft.



CFD calculation of an off body shock wave solution using an error adapted computational mesh.

Conventional wind tunnel mounting techniques distort the aft end of the model being tested.

NASA's F-15 Research Aircraft can be flown with varying nozzle positions to generate a variety of validation data

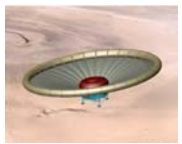
Supersonics : Entry, Descent and Landing

Problem Statement:

Supersonic parachute deceleration systems that have been used on recent Mars exploration missions are all based on the 30 year old Viking design. Although these systems have been successful, they are not capable of handling the larger masses required for future unmanned and manned missions to Mars. New concepts for supersonic reentry deceleration need to be explored. These concepts include inflatable aeroshells, inflatable decelerators, propulsive deceleration or improved parachutes.

Technical Approach:

- The Inflatable Reentry Vehicle Experiment (IRVE) will be conducted in F07. This flight experiment will demonstrate aeroshell inflation and survivability. It will also assess the thermal and aerodynamic performance of the inflatable aeroshell concept.
- Improved methods for using high-speed photography and other flow visualization techniques to collect high quality engineering data during inflation and parachute deployment testing will be explored in small scale tests.
- Prediction and validation of of the aerodynamic performance and stability of advanced decelerator concepts will be advanced through computational tool development and ground based experiments.
- For propulsive deceleration, computational and experimental studies will examine the interaction between the external and internal flow during the ignition of a rocket engine at supersonic speeds.

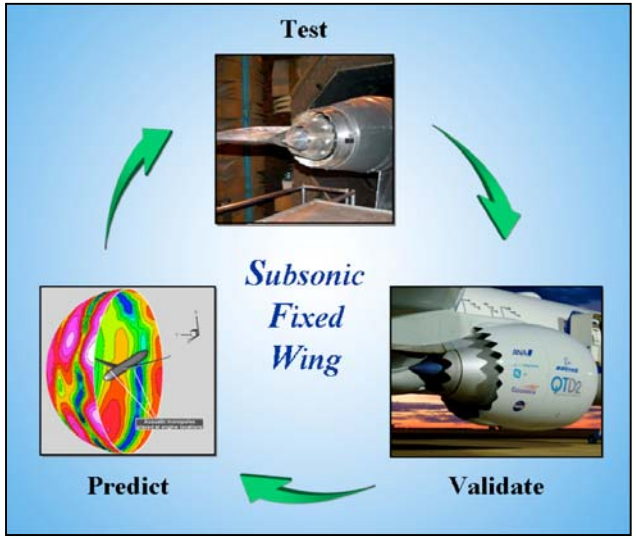


New Concepts for supersonic planetary deceleration are shown at left. New,validated analysis and deign tools are required for the development of these concepts

The IRVE flight test vehicle is shown at left during a ground deployment test

Subsonic Fixed Wing Project

- Air travel expected to increase 2-3 x by 2025
- Current air space reaching capacity, expansion limited by congestion, noise, emissions (JPDO alignment)
  - Most travelers (~85%) pass through 64 major hubs
  - Over 5000 underutilized airports
- Develop revolutionary new technologies including:
  - Lower emissions (e.g. 70-80% NOx reduction)
  - Confine landing/takeoff noise foot print to airport boundary
  - Increase efficiency (~15-25% less fuel consumption) by advanced lightweight materials, reduced drag
- Increased lift (double lift coefficient to ~6) to open many more airports, rapid climb-out/descent for reduced noise, smaller wing for lower drag
- Partners include: JPDO, Boeing, Northrop-Grumman, Lockheed-Martin, Pratt & Whitney, Air Force / AFRL, among others

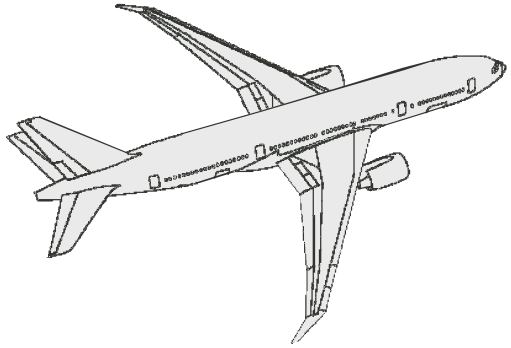


SFW: Noise, Emissions & Performance

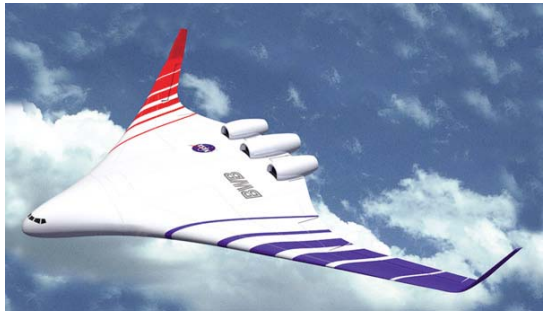
System Level Metrics

	"N+1" Generation Conventional	"N+2" Generation Hybrid Wing
Noise (cum below Stage 3)	**- 42 dB**	**- 52 dB**
Emissions (LTO NOx) (below CAEP/2)	**- 70%**	**- 80%**
Performance: Aircraft Fuel Burn (relative to 737/CFM56)	**- 15%**	**- 25%**

N+1 Conventional



N+2 Unconventional



Approach

- Reduced Uncertainty in Design and Analysis Tools and Processes.
- Major Changes in Engine Cycle/Airframe Configurations.
- Advanced Aerodynamic, Acoustic, Combustion, Aerothermodynamic, and Materials & Structures Based Concepts and Technologies.

Hybrid Wing/Body Research

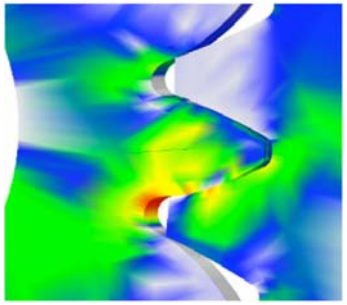
- **Goal**
  - Collaborate with airframe and engine manufacturers to focus on research opportunities associated with the development of highly integrated transport aircraft with substantial improvements in fuel burn, noise and emissions characteristics.
- **Approach**
  - Focus research efforts on Blended Wing Body and derivatives such as Cambridge/MIT Silent Aircraft Design.
  - Verify new technologies through scale model and full-scale component testing, leading to collaboration on full-scale ground and flight demonstrations.
  - Develop new performance prediction methods that can be validated using experimental data obtained during scale model and full scale testing.
- **Current Opportunities**
  - Boeing Phantom Works and AFRL
    - Develop ground to flight correlations of low speed stability and control data through flight test of the X-48B in early 2007.
    - Validation of CFD-based predictions of wind tunnel and flight data – 2007 and 2008.
    - Conduct high-speed test of the 2-percent model in AEDC 16T in 2008.
  - MIT, Cambridge, Boeing Phantom Works, and Engine Manufacturers
    - Develop research strategies to overcome barriers to realizing “silent” aircraft design attributes- FY2007.
    - Independently verify system attributes of Silent Aircraft design- FY2007.

Subsonic Rotary Wing Project

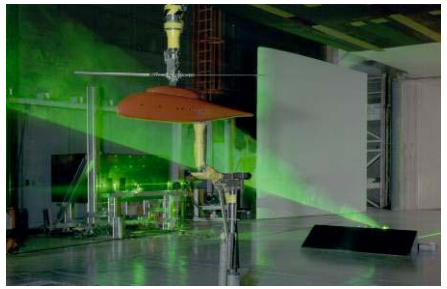
Strong partnership with the US Army

- Solving problems relevant to civil and military applications
- Researchers working side-by-side on fundamental, difficult problems
- Sharing and leveraging experimental and computational expertise

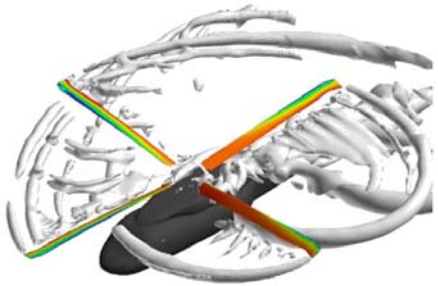
Other partners include: Bell Helicopter, Sikorsky, HeloWerks, AF, DARPA



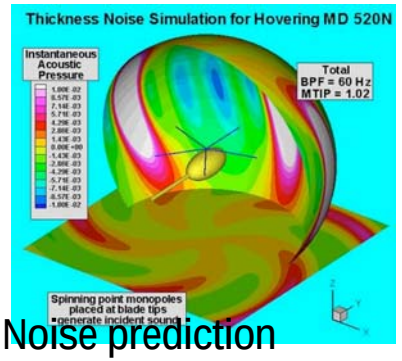
3-D Analysis of Spur / Helical Gears



14- by 22-Foot Subsonic Tunnel



First-Principles Modeling



Noise prediction

Research Areas:

Noise propagation and reduction	→	Community acceptance
Increase speed and range	→	Reduce airport congestion
Increase propulsion efficiency	→	Reduce emissions
Increase payload	→	Decrease cost, increase utility
Improve control systems	→	Safe operations for advanced concepts

SRW: Five Technical Integration Challenges

- Integrated Variable Speed Rotorcraft Concept (FY11) *Propulsion / Aeromechanics Integration:* Demonstrate variable-speed rotor concept that reduces rotor tip speed at high speed cruise operating conditions with a variable-speed transmission concept capable of 50% speed reduction from hover to cruise. Enables high-speed advanced rotorcraft concepts and noise reduction concepts.
- Super-Integrated Control Design (FY09) *Flight Controls/Noise/Propulsion/Aeromechanics Integration:* Develop a methodology and a design for an integrated, broadband rotorcraft control system incorporating flight control system, engine control, airframe/drive train/rotor load control, active rotor control of vibration and noise, vehicle heath management, and guidance for low noise operation.
- Advanced Structural and Propulsion Concepts for Interior Noise and Vibration Reduction (FY10) *Structures/Propulsion/Acoustics Integration:* Develop and demonstrate advanced structural concepts for interior noise and vibration reduction using optimized combinations of new material acoustic treatment, reductions in transmission gear vibration, and active noise cancellation.
- Interactional Acoustics Investigation (FY10) *Aeromechanics/Acoustics Integration:* Validate and assess capability to predict rotorcraft behavior, including performance, airloads, flow field, structural loads, and acoustics, by comparing predictions with validation data obtained in advanced wind tunnel experiments.
- Unified Experimental Techniques (FY10) *Integrated Experimental Systems:* Develop and integrate experimental techniques to enable efficient, multi-parameter, simultaneous measurements for characterizing rotorcraft behavior and providing validation data

Fundamental Aeronautics: NRA Status

Project	Number Selected for Negotiation for Award
Fixed Wing	27
Rotary Wing	12
Supersonics	23
Hypersonics	37
Total	99*

* All 99 Awards are expected to be completed by Jan 2007

Next solicitations will be available (estimated dates):

- Hypersonics: mid February
- Supersonics: mid January, a further solicitation available March
- Subsonic Fixed Wing: mid February
- Subsonic Rotary Wing: mid January

Next solicitation awards expected (estimated dates):

- Hypersonics: June/July 2007
- Supersonics: May/June 2007 & July/August 2007
- Subsonic Fixed Wing: June/July 2007
- Subsonic Rotary Wing: May/June 2007

Partnering/Interaction Opportunities

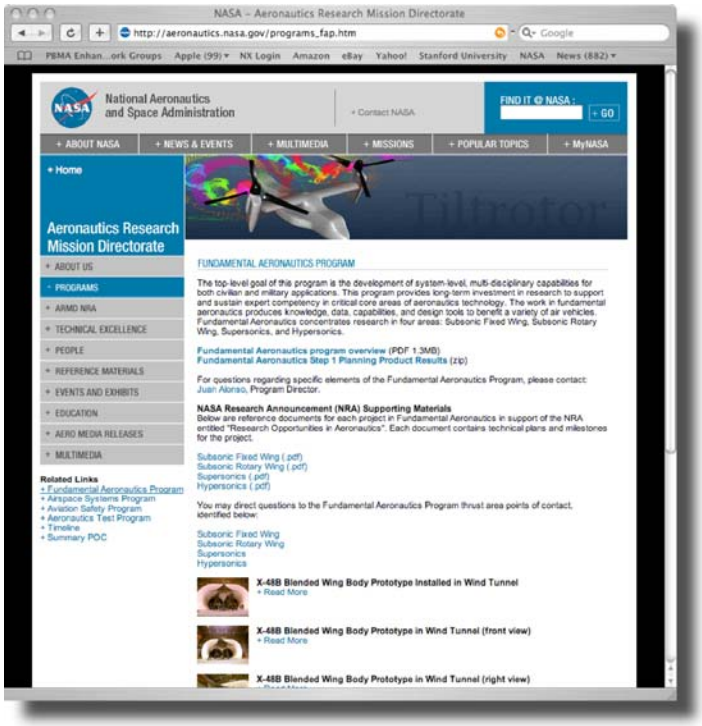
- NRA: universities, industry, research organizations
  - One or two solicitations / year / project (in steady-state)
  - Seeking close interaction with partners (knowledge transfer, visits)
  - NRA as a vehicle can take many forms
  - Filling voids in expertise at NASA and looking for new and innovative ideas

- Space Act Agreements with Industry
  - Actively seeking partnerships that make sense for NASA and industrial partners
  - Focus on pre-competitive research and consortia
  - Look for wide and open dissemination of data
  - Industry days and interaction with projects

For More Information…

http://aeronautics.nasa.gov/programs_fap.htm

nasa-fa@nasa.gov



Aviation Safety Program

Herb Schlickenmaier
Program Director
(NASA-AvSafe@nasa.gov)

Outline

- Objective and Research Thrusts
- Technical Accomplishments
- NASA Research Announcement Status
- Industry Coordination
- Technical Plans

Objective

Develop tools and methods for aircraft designers to incorporate revolutionary safety technologies and capabilities into their vehicles:

- Conduct long-term, cutting-edge research that will produce tools, methods, and technologies to improve the intrinsic safety attributes of current and future aircraft.
- Overcome safety technology barriers that would otherwise constrain full realization of the Next Generation Air Transportation System.

Research Thrusts

Integrated Vehicle Health Management

Integrated Intelligent Flight Deck

Aircraft Aging & Durability

Integrated Resilient Aircraft Control

Project Goals

Integrated Vehicle Health Management

Reduce system and component failures as causal and contributing factors in aircraft accidents and incidents.

Integrated Intelligent Flight Deck

Produce tools, methods, concepts, principles, guidelines, and technologies for revolutionary adaptive flight deck systems that improve safety.

Aircraft Aging and Durability

Detect, predict and mitigate or manage aging-related hazards for future aircraft.

Integrated Resilient Aircraft Control

Provide onboard control resilience to ensure flight safety during adverse flight conditions.

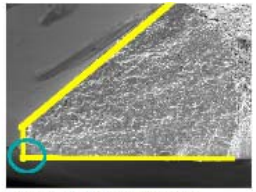
Technical Accomplishments

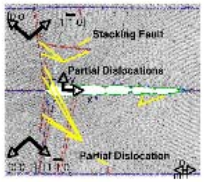
Improved Icing Research Tunnel to enable research on super-cooled liquid droplets.

Demonstrated new data mining tools to query information from a distributed archive of flight operational data.

Converted NASA S-3 Viking aircraft for icing flight research.

Completed the Airborne Subscale Transport Aircraft Research testbed to be used to flight test technologies that will require highly unusual attitude.





Conducted computer modeling of crack growth in aging aircraft to develop failure mitigation techniques and the design of more damage-tolerant materials.

NRA Status

- Round 1:
  - IIFD: 5 Selected and Awarded
  - IVHM: 8 Selected for Negotiation for Award
  - AAD: 7 Selected for Negotiation for Award
  - *All Round 1 awards anticipated by end of January*
- Round 2:
  - IIFD plans to release mid-January
  - IVHM and AAD plan to release early February
- IRAC will release later in 2007

Industry Coordination

Program works with **Commercial Aviation Safety Team** (CAST) and **International Helicopter Safety Team** (IHST) at systems design level for needs and requirements.

Projects work with **Industry Working Groups** at fundamental level for knowledge and capabilities:

Principles:

- Facilitate knowledge transfer between working group and the Aviation Safety Program.
- Ensure that fundamental knowledge and understanding underpins new technology development.

Working Groups:

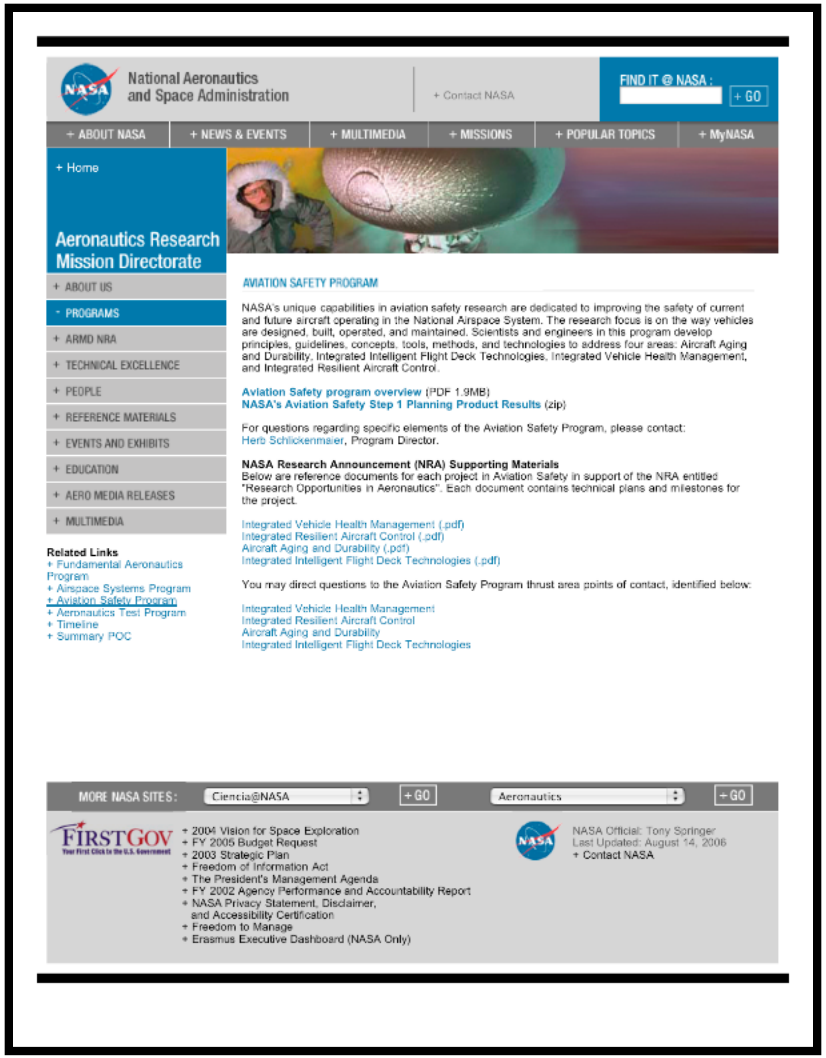
- Databases
- Modeling and Simulation
- Sensors
- Verification & Validation
- Algorithms and Signal Processing
- Vehicle State Awareness, Recovery & Control
- Flight Deck
- Aircraft Aging Challenges

Technical Plans

- Establish baseline for state-of-the-art aircraft safety concepts and flight deck information management systems. (’07)
- Complete feasibility study for assessment of active operator assistance in approach and landing task, including active attention management. (’08)
- Develop a framework that integrates Aircraft Aging and Durability technologies to detect, predict, and mitigate aging-durability related hazards and insert current state-of-the art methods in framework to establish a baseline. (’08)
- Develop and validate Integrated Vehicle Health Manage ment sensor fusion, fault detection, and isolation methods, using aircraft landing gear system as a testbed. (’08)

Find out more…

- Aviation Safety on the web…



http://www.aeronautics.nasa.gov/programs_avsp.htm

Airspace Systems Program

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Revolution in the Airspace System

- Next Generation Air Transportation System cannot be realized without integrated, revolutionary technologies contributed by all of NASA's Aeronautics Programs.
- Government and Industry must develop the Airspace System for 2025 and beyond by investing in long-term research now.
- The restructuring of NASA's Aeronautics Program addresses the long-term research needed to develop technologies for the future Airspace System.

Airspace Systems Program

NGATS ATM: Airspace	NGATS ATM: Airportal

Objective

Directly address the fundamental ATM research needs for the NGATS, in collaboration with the JPDO, by developing revolutionary concepts, capabilities, and technologies that will enable significant increases in the capacity, efficiency and flexibility of the NAS.

Key focus areas

NGATS ATM: Airspace

- Dynamic Airspace Configuration
- Traffic Flow Management
- Separation Assurance
- Super Density Operations
- Performance-Based Services
- Trajectory Prediction, Synthesis & Uncertainty

NGATS ATM: Airportal

- Safe & Efficient Surface Operations
- Coordinated Arrival/Departure Operations
- Airportal Transition and Integration Management

- Both projects will conduct system-level design and analysis.
- Substantial leveraging of research across the two projects will occur.
- Results of the two projects will be integrated to ensure gate-to-gate solutions that are aligned with NGATS needs.

NGATS ATM: Airspace

- ***Dynamic Airspace Configuration:*** Increase capacity through dynamic allocation of airspace structure and controller resources
- ***Traffic Flow Management:*** Effectively allocate demand through departure times, route modification, adaptive speed control, etc., in the presence of uncertainty
- Reduce capacity-limiting impact of human-controlled separation assurance
  - ***Automated Separation Assurance:*** (sequential processing of sequence and merging with separation) for transition and cruise airspace
  - ***Airspace Super Density Operations:*** (simultaneous sequencing, spacing, merging, and de-confliction) for terminal airspace
- ***Trajectory Prediction, Synthesis & Uncertainty:*** Accurate trajectory predictions that are interoperable with aircraft FMS trajectory generations using prediction uncertainty growth and propagation
- ***Performance-Based Services:*** Research that enables us to understand and quantify the performance-enhancing effects of emerging airborne technologies.

NGATS ATM: Airportal

- ***Safe & Efficient Surface Operations:*** develop trajectory-based automation technologies to optimize ground operations.
- ***Coordinated Arrivals/Departure Operations Management:*** maximize throughput by means of an optimal balancing of arrivals, departures and surface operations.
- ***Airportal Transition and Integration Management:*** investigate the dynamic response to airportal operational constraints including regional airport solutions, weather transition and change in traffic demand.

NGATS ATM: Foundational Research

Foundational Research Areas critical to advancements in both projects:

- Airspace complexity and equity metrics
- Optimization (organize, schedule and regulate) based on user needs and airspace constraints
- Separation assurance and collision avoidance compatibility
- Trajectory modeling
- Human model development and validation
- Optimization with multiple uncertain variables

NRA Awards

- Completed awards for 15 selected proposals totaling $5.7M
- Current NRA is open through late August
  - Evaluate the work underway via prior NRA awards to determine if they should be extended for a second year
- Airspace Project expects to have an additional series of subtopics released between January and August 2007 (approximately a 4-month process from release to proposal submission to evaluation, selection, and award)
  - Subtopic drafts are under development in areas of Dynamic Airspace Configuration and Performance Based Services
- Airportals Project has plans for initial NRA release in FY07
  - Work with the Airspace Project to develop a joint subtopic in metroplex operations for release in late January
  - Develop a series of NRA subtopics with phased release from February through August 2007
- Airspace Systems Program plans to award approximately $9.4M in FY07 through NRA competitions

Aeronautics Test Program (ATP)

Corporate Management of Aeronautical Facilities

Blair Gloss
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Outline

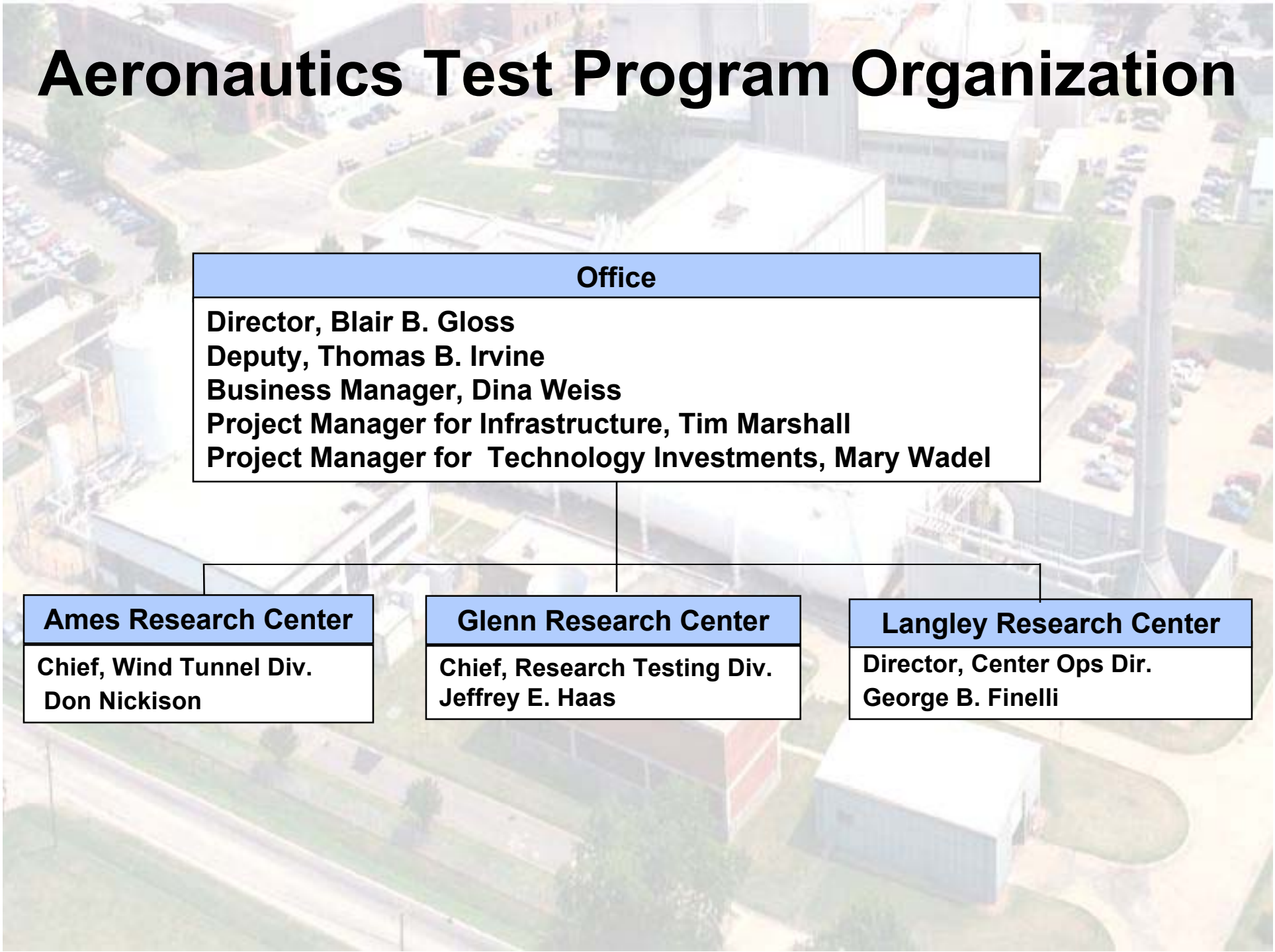
- Review ATP
- Accomplishments - FY'2006
- Plans
- Summary

Goals

Corporate Management of Aeronautical Facilities

- **Increase the probability of having the right facilities in place at the right time over the long-term**
- **Operate those facilities in the most effective and efficient manner possible**
- **Ensure intelligent investment in and divestment of NASA facilities**

Aeronautics Test Program Organization



Aeronautics Test Program
Primary Facilities

- Ames Unitary Wind Tunnel
- Glenn Icing Research Tunnel
- Glenn 9x15 Subsonic Tunnel
- Langley National Transonic Facility
- Langley Transonic Dynamics Tunnel
- Langley Hypersonic Complex
- Langley 8-Ft High Temperature Tunnel
- Langley 14x22 Subsonic Tunnel
- Langley 20-Ft Vertical Spin Tunnel
- Glenn Propulsion Systems Lab. 3 & 4
- Glenn 10x10 Supersonic Tunnel

FY 2006 Accomplishments

- ATP Office Staffed
- Investments
  - Maintained competitive user prices
  - Reduced backlog maintenance for ATP facilities
  - Investments made in test technologies
  - No NRA projects awarded - plan to release NRA in early spring of 2007
- Developing a new partnership with the DoD (Defense Test Resource Management Office)
  - The National Partnership for Aeronautical Testing (NPAT), DoD/NASA MOU, is nearly ready for signature

Plans and Activities For 2007

- Continue investing in ATP facilities to:
  - Insure stable and competitive user prices
  - Invest in critical maintenance issues
  - Develop test technology
  - Offer opportunities for graduate work in ATP facilities
- Complete the National Partnership for Aeronautical Testing (NPAT) and implement NPAT processes
  - Working to develop a communications process between DoD, NASA and Industry
  - Planning a facilities user meeting, co-sponsored by NASA and DoD
  - Explore reliance opportunities between NASA and DoD in the area of wind tunnel test facilities
- Develop long range investment strategy for facilities and test technology
- Develop a consolidated approach for strain gage balance skill retention
- Release a NRA for tasks that would include universities

Summary

- ATP was successfully implemented during 2006.
- ATP is working closely with DoD to develop a one government approach for wind tunnel facilities.

How to find out more

Information about NASA's Aeronautics Research:

www.aeronautics.nasa.gov

- Overview of each Program
- Detailed Project plans with Schedule and Milestones
- NASA Research Announcement (NRA) information