Agenda

• **Reshaping NASA’s Aeronautics Program**
  Lisa Porter, Associate Administrator, Aeronautics Research Mission Directorate

• **Fundamental Aeronautics Program Overview**
  Rich Wlezien, Director (Acting), Fundamental Aeronautics Program

• **Aviation Safety Program Overview**
  John White, Director (Acting), Aviation Safety Program

• **Airspace Systems Program Overview**
  John Cavolowsky, Deputy Program Manager for Technical Integration, Airspace Systems Program

• **Aeronautics Test Program Overview**
  Blair Gloss, Director, Aeronautics Test Program

• **Next Steps**
  Lisa Porter, Associate Administrator, Aeronautics Research Mission Directorate
Reshaping NASA’s Aeronautics Program

Dr. Lisa Porter
Associate Administrator for Aeronautics
January 12, 2006
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 R&D needs of the Next Generation Air Transportation System (NGATS) in partnership with the member agencies of the Joint Planning and Development Office (JPDO).
Big-Picture Implementation

• We will conduct long-term, focused, cutting-edge research.

• All research will be integrated.
  – No more “1000 flowers blooming”.
  – A holistic approach is needed to bring about system-level revolutionary capabilities.

• Long-term research can and should have milestones.
  – Enables continual assessment of research portfolio.
  – Enables short-term “products” while sticking to long-term revolutionary goals.

• No more “stove-piping”.
  – Research can and should be leveraged across Projects, Programs and Centers.
Re-shaping Aeronautics

OLD

Vehicle Systems
Aviation Safety and Security
Airspace Systems

NEW

Fundamental Aeronautics
Aviation Safety
Airspace Systems
Re-shaping Aeronautics

- **Fundamental Aeronautics Program (FAP)**
  - We will conduct long-term, cutting-edge research in the core competencies of aeronautics in all flight regimes, producing knowledge/data/capabilities/design tools that are applicable across a broad range of air vehicles.
  - Four thrust areas:
    - Hypersonics
    - Supersonics
    - Subsonics: fixed wing
    - Subsonics: rotary wing

- **Aviation Safety Program (AvSP)**
  - We will build upon our unique safety-related research capabilities to...
    - Improve the inherent safety attributes of new and legacy vehicles.
    - Overcome aircraft safety technological barriers that would otherwise constrain the full realization of the NGATS.

- **Airspace Systems Program (ASP)**
  - We will directly address the Air Traffic Management R&D needs of the NGATS as defined by the Joint Planning & Development Office (JPDO).

- **Aeronautics Test Program (ATP)**
  - We will protect and maintain our key research and test facilities.
Research Philosophy

- Foundational Physics & Modeling
- Discipline Level Capabilities
- Multi-Discipline Capabilities
- System Design

Technologies & Capabilities
Requirements/Needs
Impact on Partnerships

• NASA will take responsibility for the intellectual stewardship of the core competencies of Aeronautics for the Nation.
  - Ensures the availability of a world class resource (personnel, facilities, knowledge and expertise) ready to be drawn upon by our Government partners (e.g., DoD, FAA, JPDO) and by the private sector.

• University partnerships
  - We will integrate students and faculty as true partners in our research projects.
    ■ Enables replenishment of workforce at both NASA and in industry.
  - Full and open competition for funds.

• Industry partnerships
  - We will shift from near-term, evolutionary procurements to long-term, intellectual partnerships.
    ■ Ensures ability to provide long-term, stable investment in capabilities that will benefit all of industry.
## Approach

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<tr>
<th>Level 1</th>
<th>Conduct foundational research to further our fundamental understanding of the underlying principles.</th>
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<td>Level 2</td>
<td>Integrate methods and technologies to develop multi-disciplinary solutions.</td>
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**Use NASA Research Announcements (NRAs) to solicit proposals for foundational research in areas where NASA needs to enhance its core capabilities.**

**NASA development of discipline-related solutions.**

**Use Space Act Agreements to collaborate with industry; Establish partnerships with other Govt agencies (FAA, DOD, JPDO).**

**NASA development of multidisciplinary methods and technologies.**

**Leverage the foundational research to develop technologies and analytical tools focused on discipline-based solutions.**

**Develop system-level capabilities to enable our civilian and military partners to develop revolutionary systems to meet their needs.**

**Integrate methods and technologies to develop multi-disciplinary solutions.**

**Approach**

**Level 4**

Develop system-level capabilities to enable our civilian and military partners to develop revolutionary systems to meet their needs.

**Level 3**

Integrate methods and technologies to develop multi-disciplinary solutions.

**Level 2**

Leverage the foundational research to develop technologies and analytical tools focused on discipline-based solutions.

**Level 1**

Conduct foundational research to further our fundamental understanding of the underlying principles.
Four-Step Planning Process

Step 1: Assess the long-term research needs and goals in each Program and develop technical roadmaps to accomplish those goals.

Step 2: Solicit information on key areas of interest from the external community and determine opportunities for collaboration through an RFI.

Step 3: Define research proposals at the field centers.

Step 4: Issue NASA Research Announcements to solicit proposals for foundational research.
Step 1 Details

- Conducted a series of workshops for each project in each Program.
  - Drew upon NASA’s technical expertise.
  - Output: 10-year schedule/milestone roadmap for each project based upon the research pyramid philosophy.
    ■ Milestones at each of the 4 levels.
    ■ Milestones are linked together.
    ■ Milestones had to be technically credible and critical to long-term research goals.
    ■ Milestones were prioritized.
- Each Program then held a cross-cutting workshop to identify areas of overlap and collaboration as well as potential gaps across each project.
- Conducted an Inter-Program workshop to identify areas of overlap and collaboration across all programs.
  - Coordinate research activities to ensure optimal use of resources.
- Presented workshop results to Government partners, including DOD, FAA, and JPDO.
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