

NASA

Propulsion and Power Program

<http://www.grc.nasa.gov/WWW/AERO/base/psbase.htm>

Dr. Gary T. Seng, Manager

October 25, 2002



Glenn Research Center

Propulsion & Power Program



at Lewis Field



NASA's Vision

**To improve life here,
To extend life to there,
To find life beyond.**



The NASA Mission

*To understand and protect our home planet
To explore the Universe and search for life
To inspire the next generation of explorers*

... as only NASA can.



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University Research Engineering Technology Institute (URETI)

Mission

Achieve National aeronautics objectives through:

- Innovative approaches far beyond present scenarios
- Use of emerging and technologies (bio, nano, IT)
- A balance of multi-disciplinary, conventional approaches

Budget

- \$3.0M/yr for 5 years, with renewal provision for an additional 5 years
- Expected to be self-sufficient after 10 years

Seven Selected URETI's

1. **Aeropropulsion & Power – Georgia Inst. of Technology**
2. Third Generation Reusable Launch Vehicles (2 selected) - U of Maryland and U of Florida
3. Bio-Nano-Info Tech. Fusion – U of California
4. Bio-Nano Matls. & Structures for Aerospace Vehicles (2 selected) - Princeton U and Texas A&M
5. Nanoelectronics Computing & Electronics – Purdue Univ.

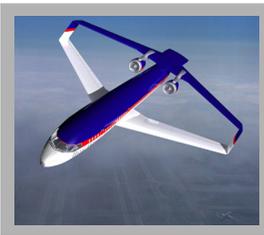


Glenn Research Center

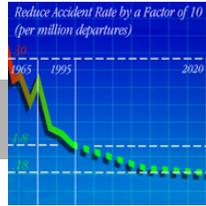
Propulsion & Power Program



at Lewis Field



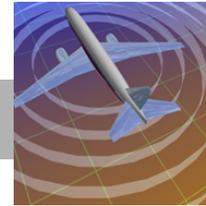
Revolutionize Aviation



Increase Safety



Reduce Emissions



Reduce Noise



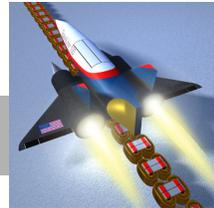
Increase Capacity



Increase Mobility



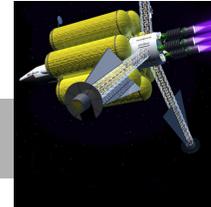
Advance Space Transportation



Mission Safety



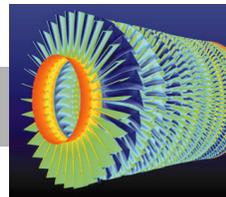
Mission Affordability



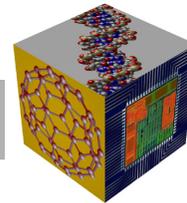
Mission Reach



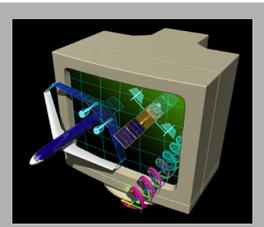
Pioneer Technology Innovation



Engineering Innovation



Technology Innovation



Commercialize Technology

Enterprise Goals & Objectives

NASA provides enabling technologies, expertise, state-of-the-art facilities, and technology solutions:

Economic Growth

- Productivity
- Global Competition
- Fullest Commercial Use

National Security

- Air Superiority
- Global Mobility

Quality of Life

- Freedom of Movement
- General Welfare



Toward A Bold New Era of Aviation: 2002 2005 2008 2009 2012 2018 2025

Technology advances have enabled today's world of aviation . . .

Aviation Progress Benefits Society



Glass Cockpit



KC-135/707, Jet Age



Wright Flyer



DC-3, Riveted Metal Structure,
Retractable Gear



Air Traffic Radar



777, Supercritical Wing,
Highly Reliable Engines



B-47, Swept Wing, Jet
Propulsion



Constellation, Pressurized Cabin, Limit on
Piston Propulsion

1900

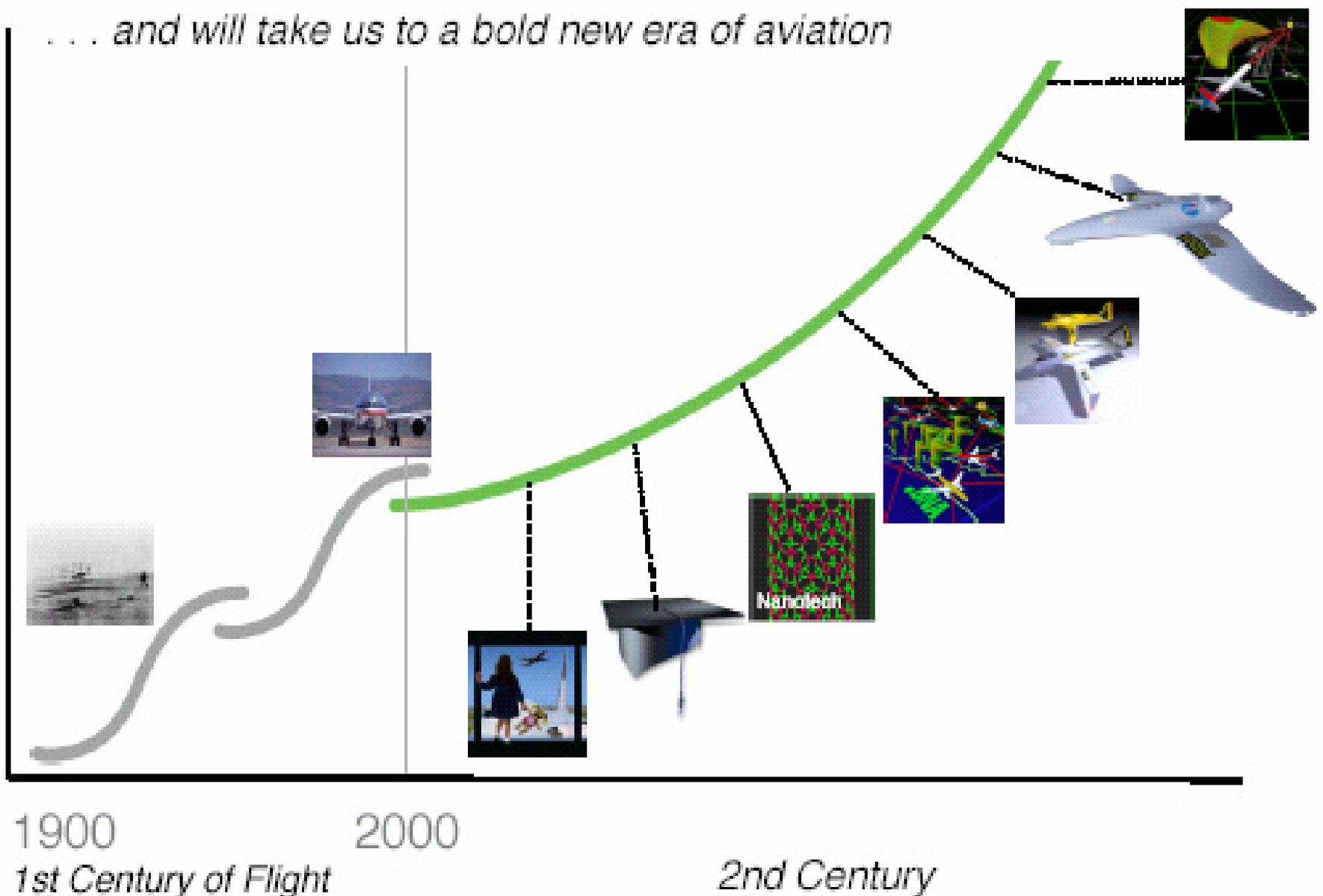
1950

2000

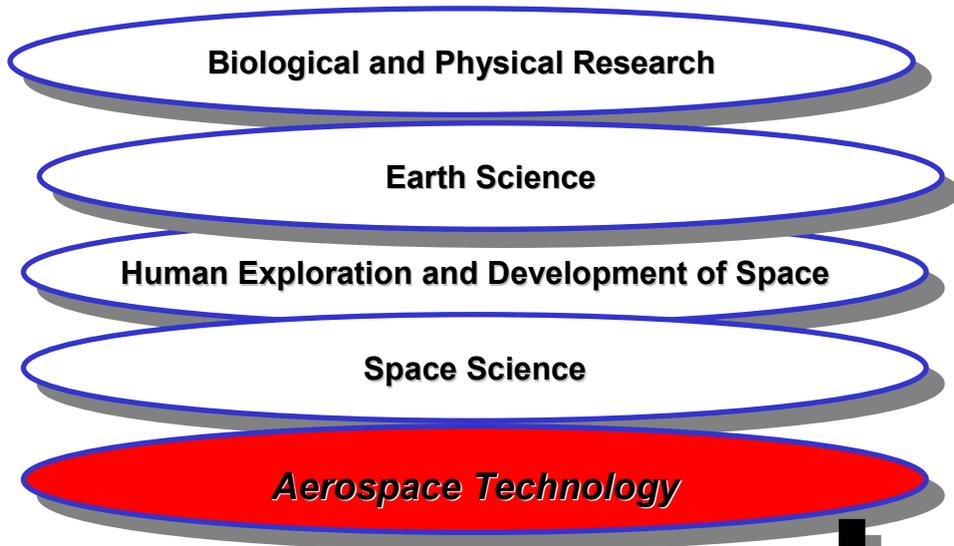
Toward A Bold New Era of Aviation: 2002 2005 2008 2009 2012 2018 2025

... and will take us to a bold new era of aviation

Aviation Progress Benefits Society

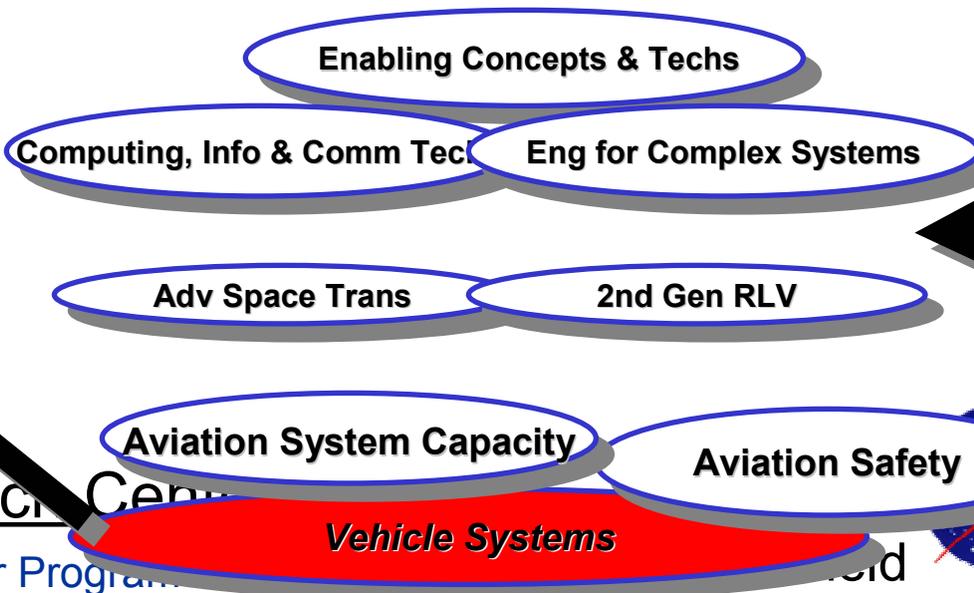
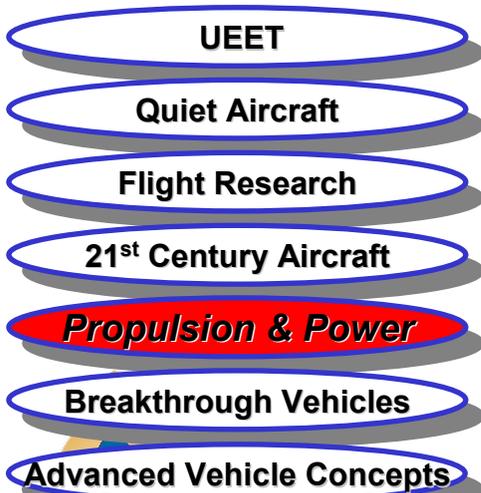


NASA Enterprises---From Strategic Plan to Programs



To understand and protect our home planet
 To explore the Universe and search for life
 To inspire the next generation of explorers
 ... as only NASA can

Aerospace Technology Enterprise Programs



National Goals

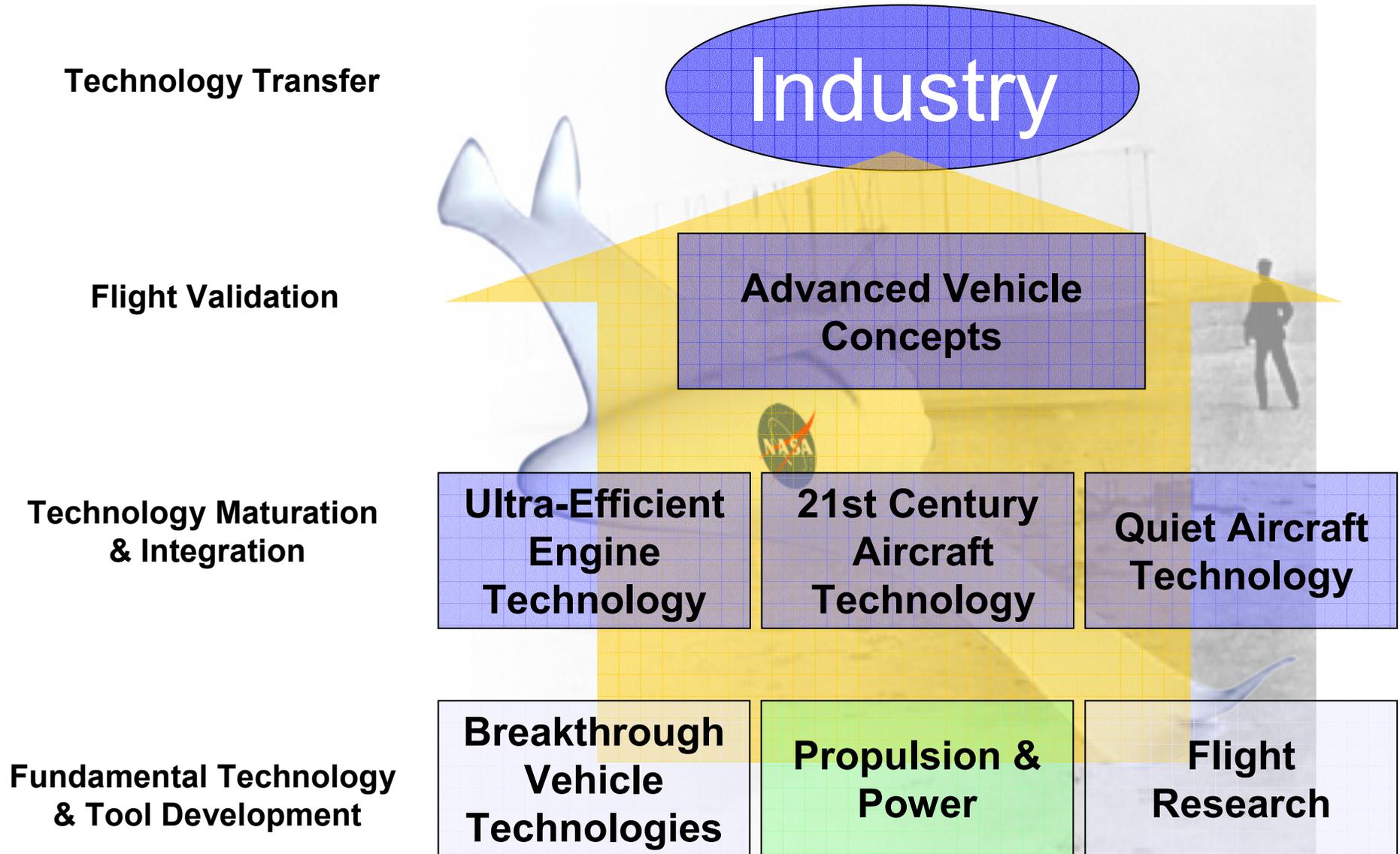
Goals & Objectives



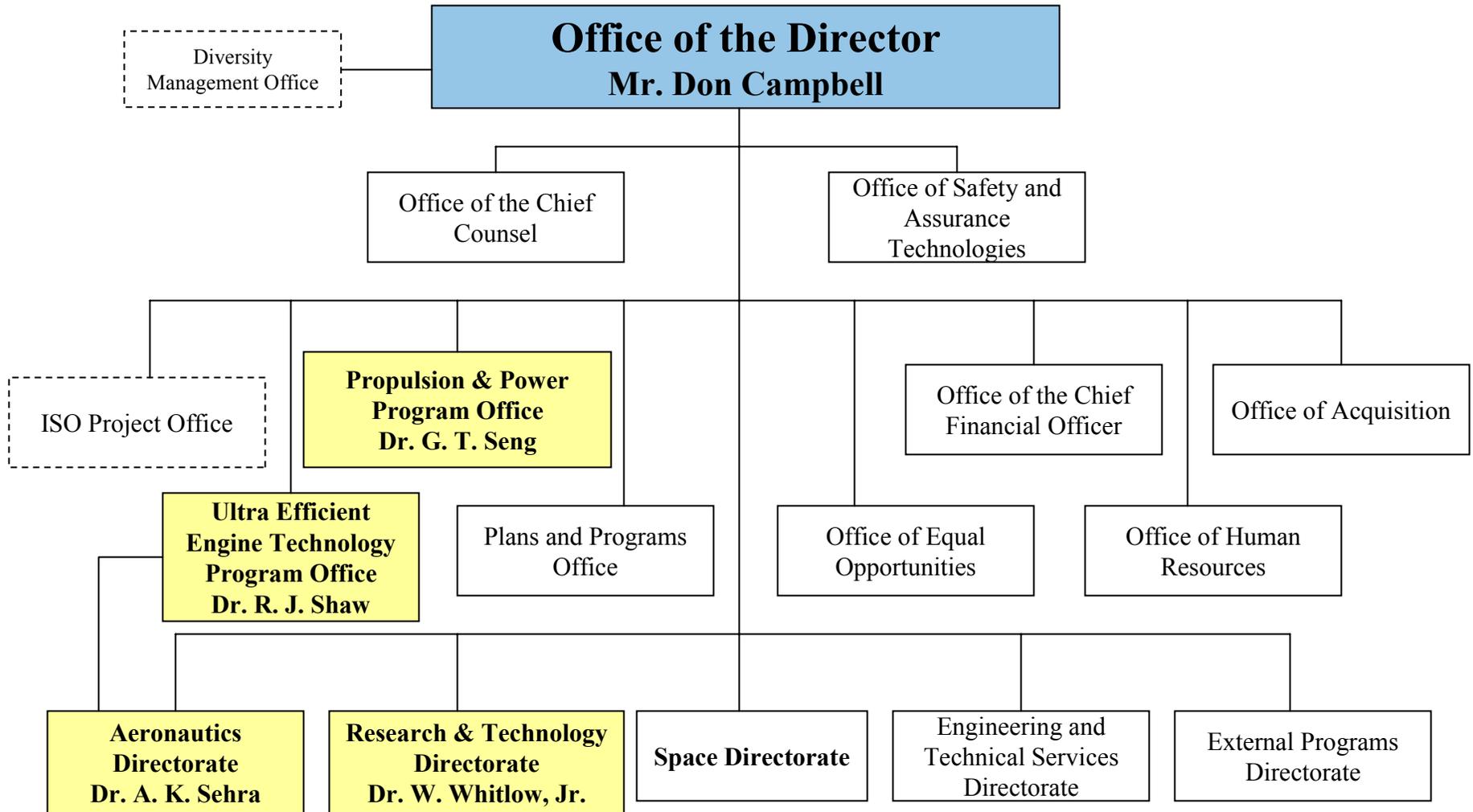
Stennis Research Center
 Propulsion & Power Program



Vehicle Systems

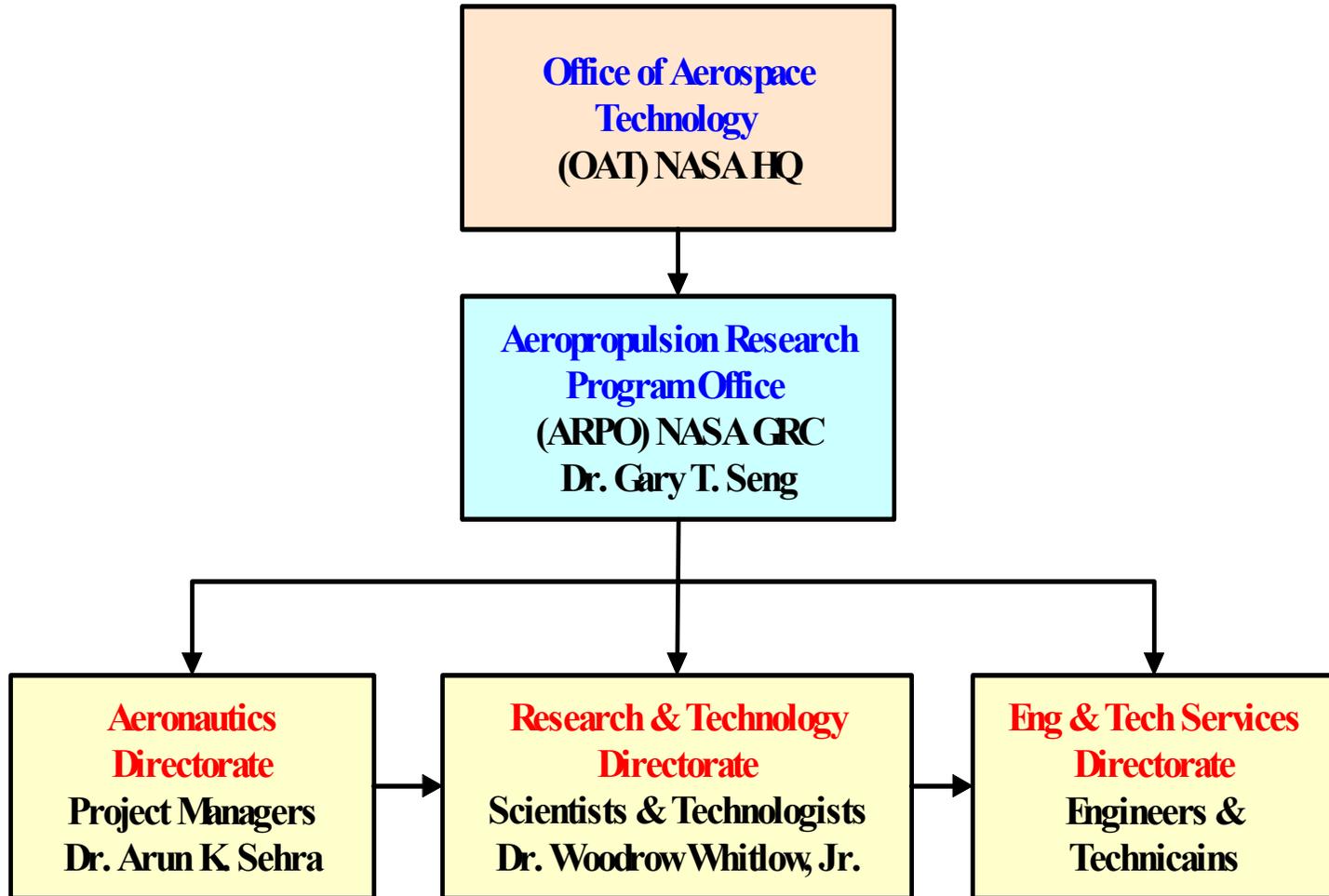


NASA Glenn Research Center



Program Flowdown to Matrix Organization

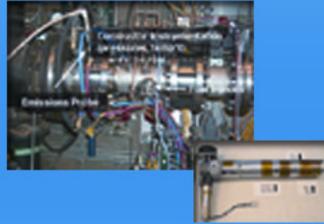
“How Work Gets Done”



PROPULSION & POWER PROGRAM - Investment Areas & Projects



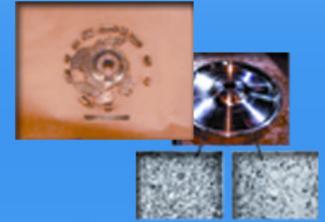
Turbine Engine Technologies



Smart Efficient Components

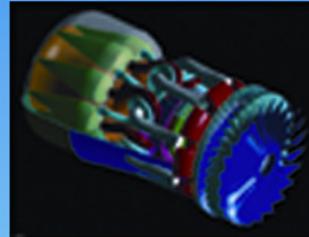


Oil-Free Turbine Engine Technology



UltraSafe Propulsion

New Propulsion Concepts



Pulse Detonation Engine Technology

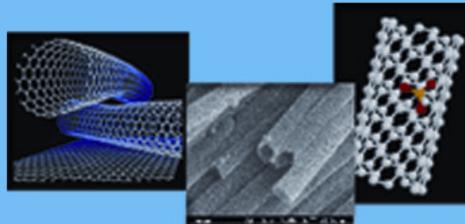


Revolutionary Aeropropulsion Concepts



ZERO CO2 Emission Technologies

Foundation Technologies



High Temperature Nanotechnology

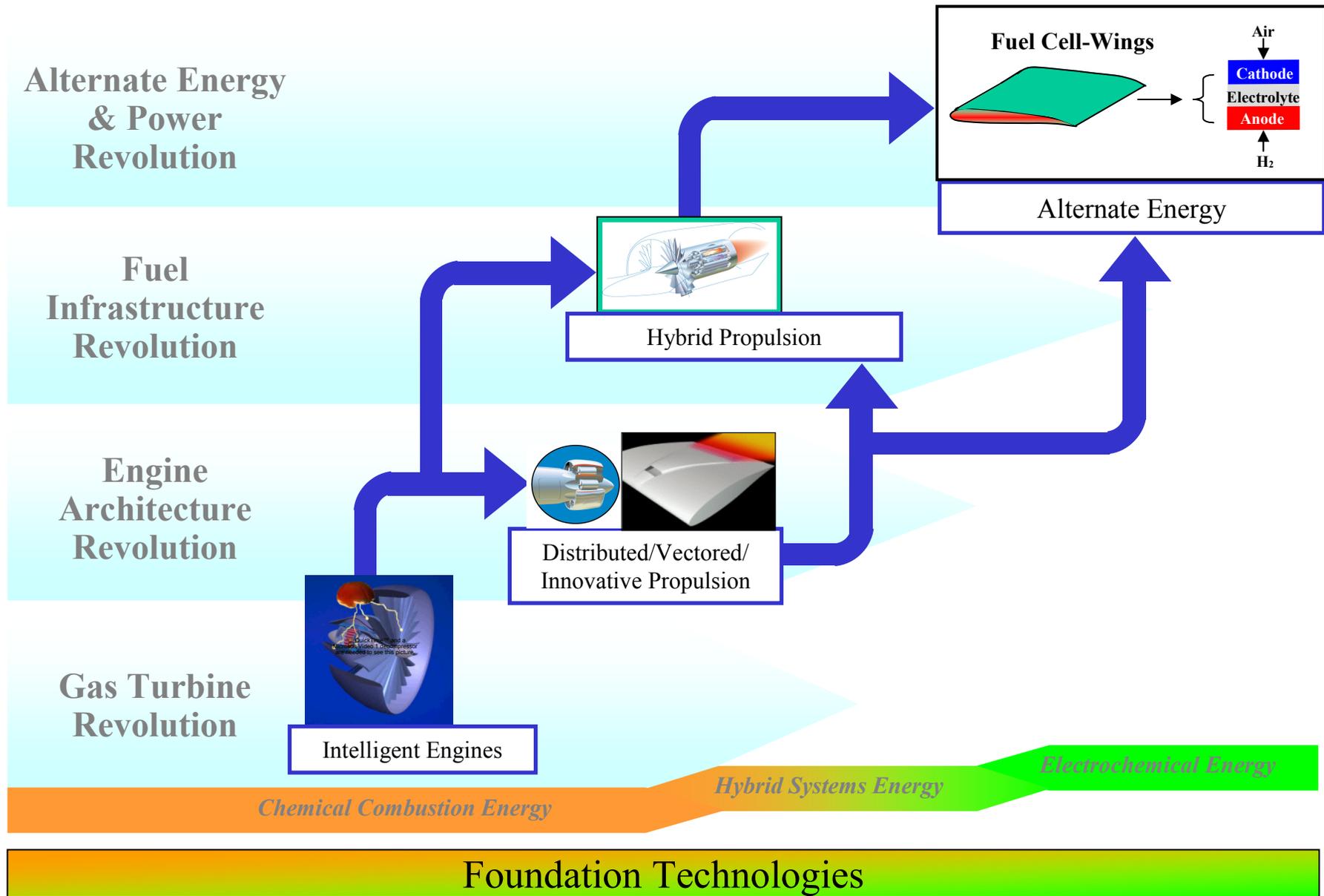


University Research, Engineering & Technology Institute (URETI)

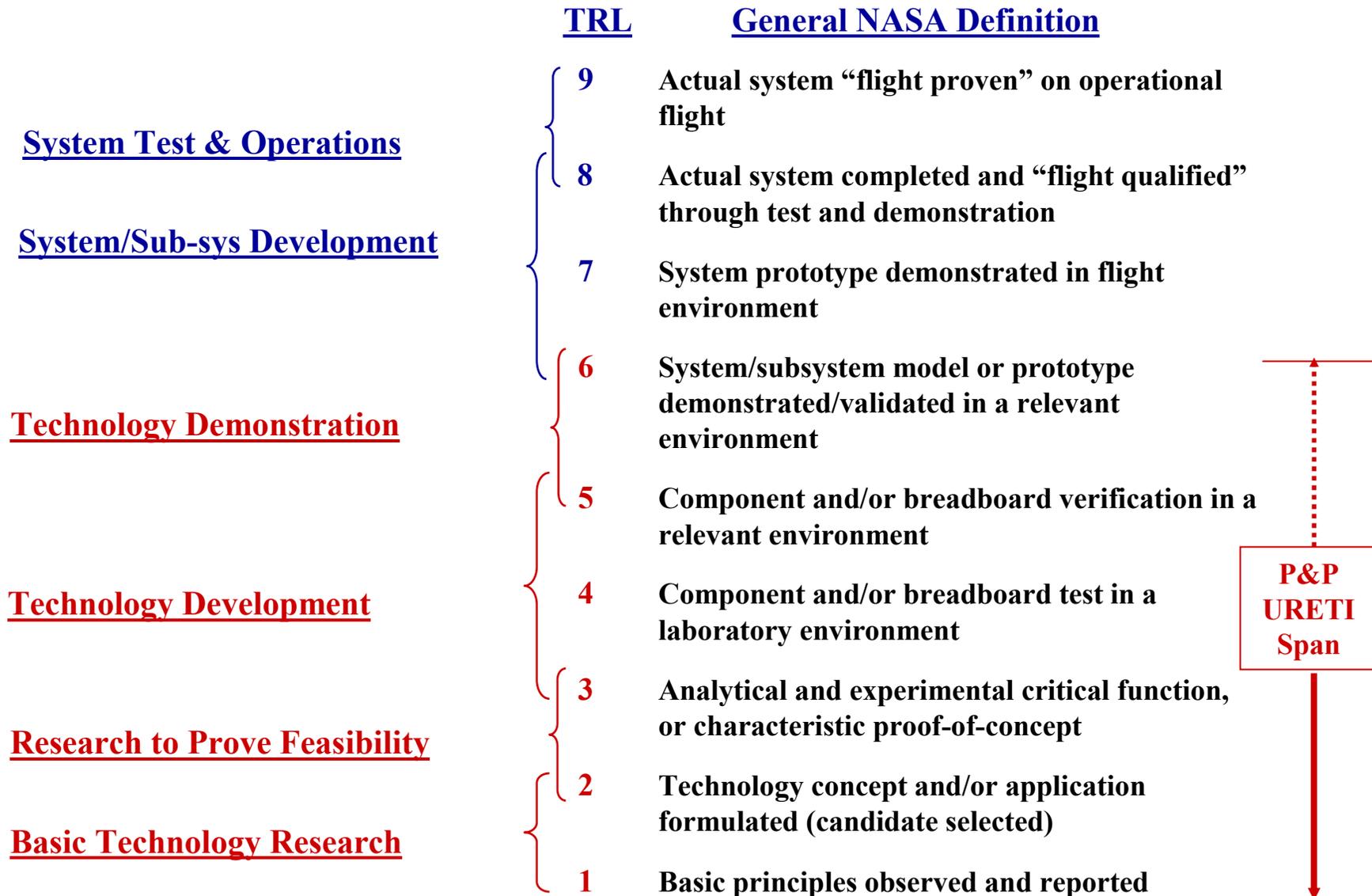


Higher Operating Temperature Propulsion Components

Aeropropulsion – NASA’s Future Directions



NASA's Technology Readiness Level (TRL) Span

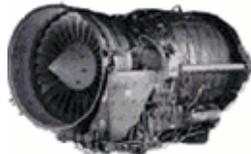


Ultra-Efficient Engine Technology and Propulsion and Power Programs - General Comparison

UEET

PROPULSION & POWER (P&P)

TRL's	Generally 3-6 (with cost share at 5 & 6)	Generally 1-3 (exceptions in both programs)
Focus	System level	Component or fundamental level
Where Performed	Primarily In-house plus contracts	Primarily in-house plus grants
Goals	Focused/specific (emissions)	Broader/more general (emissions, noise, power, new engine concepts...)
<p><u>Cooperation/collaboration:</u></p> <ul style="list-style-type: none"> -facilities investments for common needs -external collaboration activities (IHPTET, Govt. Alliance, etc.) -some coordinated funding in areas of mutual interest 		



Commitments from Our Partners and Industry Collaborators

VISION

The establishment of a world-class center for aeropropulsion and power that will develop revolutionary technologies and design methods, in a systems-oriented integration environment, and enable NASA and industry to close technology gaps that prevent deployment of high performance, intelligent, safe and environmentally compatible systems. Furthermore, the center's integrated, multidisciplinary education programs will prepare future graduates and NASA/industry engineers to develop the revolutionary engine systems that will be needed to ensure pre-eminence of the U.S. aerospace industry.

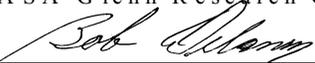
We strongly support the above vision and are committed to the success of a GT/O SU/FAMU/CWRU URETI for Aeropropulsion and Power Technology (UAPT) by serving as technical advisors and promoting technology transition from the center to government and industry.



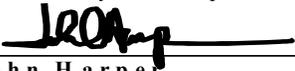
Michael Benzakein
General Manager, Adv. Engineering Programs Department
General Electric Aircraft Engines



Robert J. Shaw
Program Manager, UEET Program
NASA Glenn Research Center



Bob Delaney
Chief, Design Methods and Technology
Rolls-Royce Corporation



John Harper
Vice President, Corporate Technology Development
American Electric Power



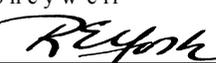
Leslie Southall
General Manager, Gas Turbine Engineering
Siemens Westinghouse Power Corporation



Edward Crow
Senior Vice President, Engineering
Pratt & Whitney



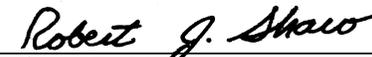
John Meier
Director, Advanced Technology Programs
Honeywell



Ron York
Chief Operating Officer
Allison Advanced Development Center



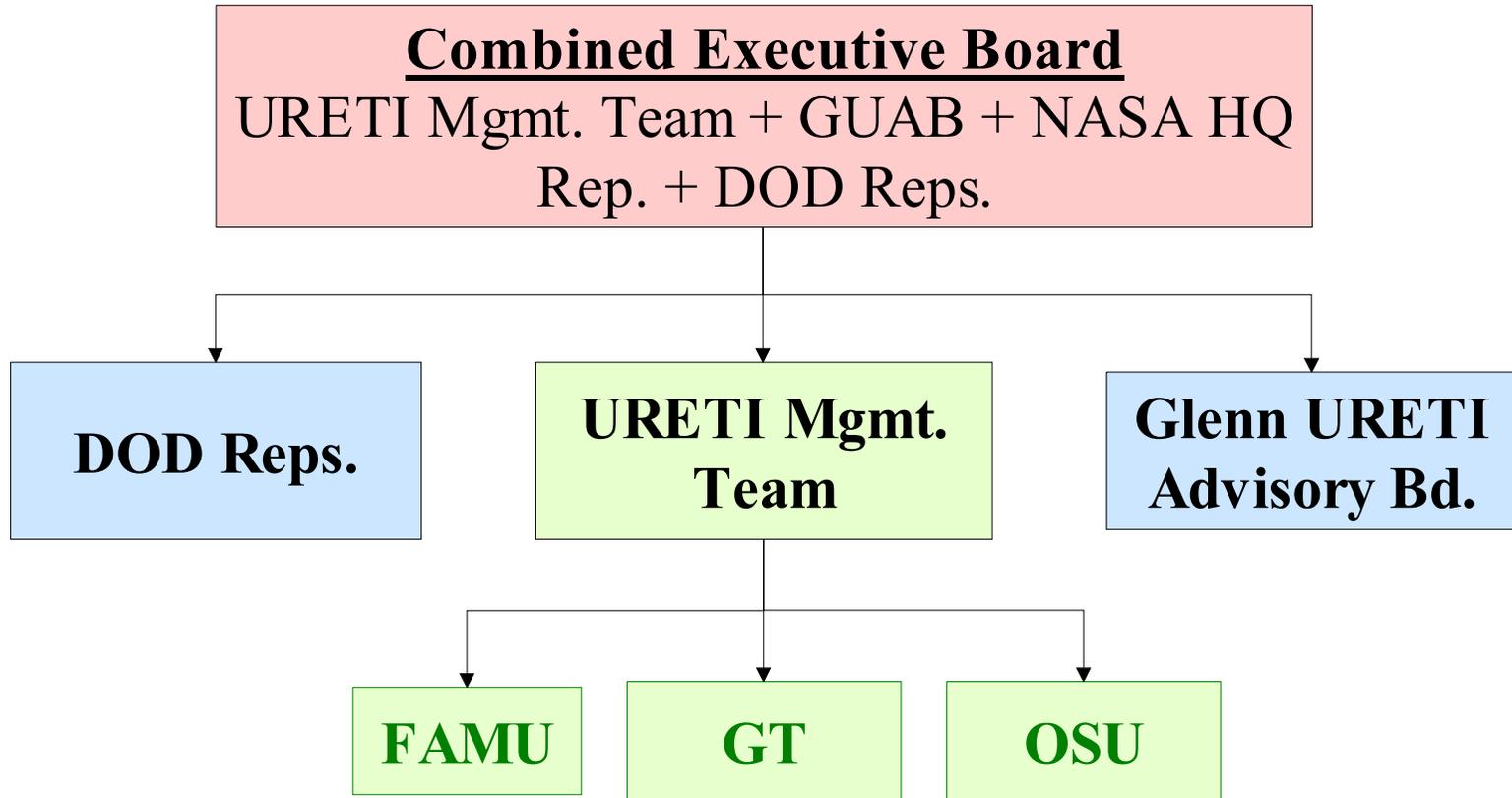
G. Scott Cruzen
Director, Advanced Technology
Williams International



Robert J. Shaw
Program Manager, TBCC Program
NASA Glenn Research Center



Aeropropulsion & Power URETI Team



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Propulsion & Power Program

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Who's Who

DOD Representative(s) For Aero Propulsion & Power URETI

- Dr. Walter Jones/AFOSR
- Dr. Alan Garscadden/AFRL
- Dr. Donald Paul/AFRL (Alternate)
- Dr. Kenneth E. Harwell/DDR&E

NASA Headquarters Representative

- Dr. Michael M. Reischman

NASA Glenn URETI Advisory Board (GUAB)

- Chair, APP Program Manager – Dr. Gary T. Seng
- UEET Program Manager – Dr. Robert J. Shaw
- Director, R&T Directorate – Dr. Woodrow Whitlow, Jr.
- Director, Aeronautics Directorate – Dr. Arun K. Sehra
- **Executive Secretary, Acting Project Mgr. – Kimlan T. Pham**

Propulsion & Power URETI Management Team

- Senior Research Officer – Dr. Jean Lou Chameau, GT's Provost
- Director – Dr. Ben T. Zinn
- Co-Director – Dr. Dimitri Mavris
- OSU Lead PI – Dr. James Williams
- FAMU Lead PI – Dr. Cesar Luongo



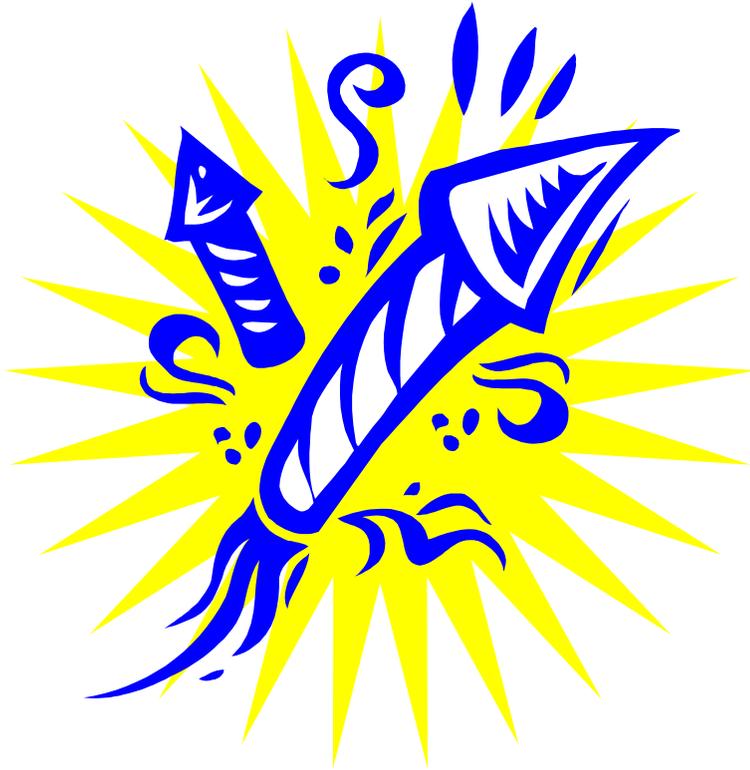
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CONGRATULATIONS!!



<http://www.grc.nasa.gov/WWW/AERO/base/URETI/>

“We are made to persist. That’s how we find out who we are.”

Tobias Wolff