

AEROPROPULSION & POWER
University Research Engineering Technology
Institute (URETI)



Kim Pham
Acting Project Manager
11/18/02

Our Journey Here...

- ✓ Cooperative Agreement Notice (CAN) Formulation – started Feb 2001
- ✓ **URETI CAN-01-OAT-01 – posted 6/13/01**
- ✓ Notice of Intention (NOI) due – 6/29/01
- ✓ **URETI Proposals due – 12/14/02**
- ✓ Proposals Evaluation – Feb-Mar 2002
- ✓ Selection Announcement – 6/12/02
- ✓ **Cooperative Agreement (NCC3-982) awarded – 8/19/02**
- ✓ NASA-DoD Inter-Agency Agreement signed – 8/22/02
- ✓ **Aeropropulsion & Power URETI Kick Off at GT – 10/25/02**
- **A&P URETI Technical Forum at GRC – 11/18/02**
- **A&P URETI Work Plan – Baseline 12/16/02**

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.**

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.



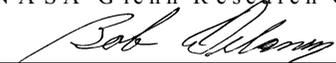
Michael Benzakein

*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*

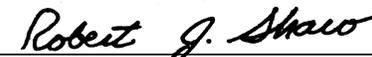


G. Scott Cruzen

*Director, Advanced Technology
Williams International*



Williams International

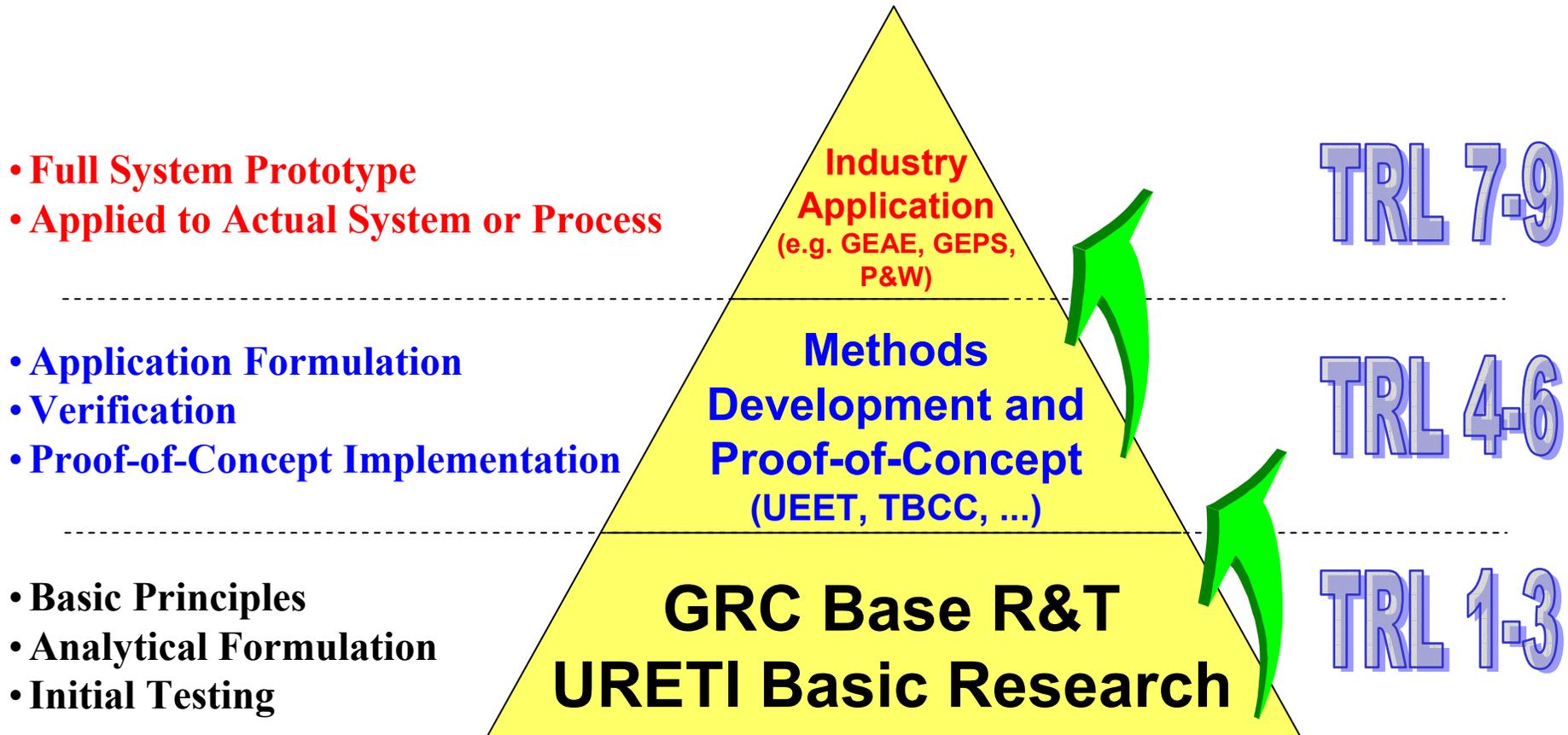


Robert J. Shaw

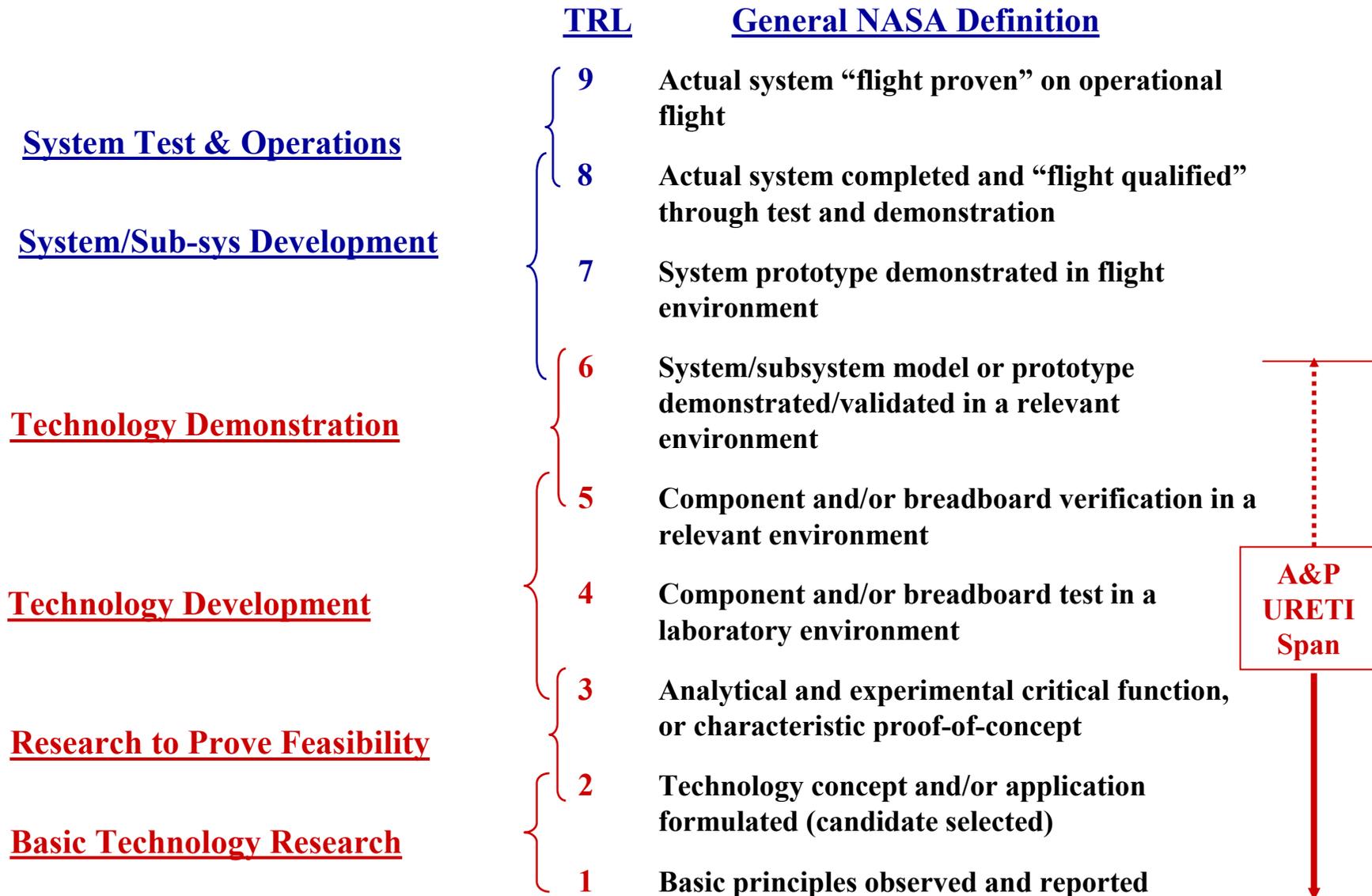
*Program Manager, TBCC Program
NASA Glenn Research Center*



Transition Pyramid for NASA/DoD UAPT Research



NASA's Technology Readiness Level (TRL) Span

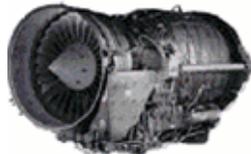


Ultra-Efficient Engine Technology and Propulsion and Power Programs - General Comparison

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 		



URETI Technical Areas & Responsible Universities

➤ **System Level Engineering (GTI)**

➤ **Enabling Technologies (OSU)**

➤ **Intelligent Engine Systems (GTI)**

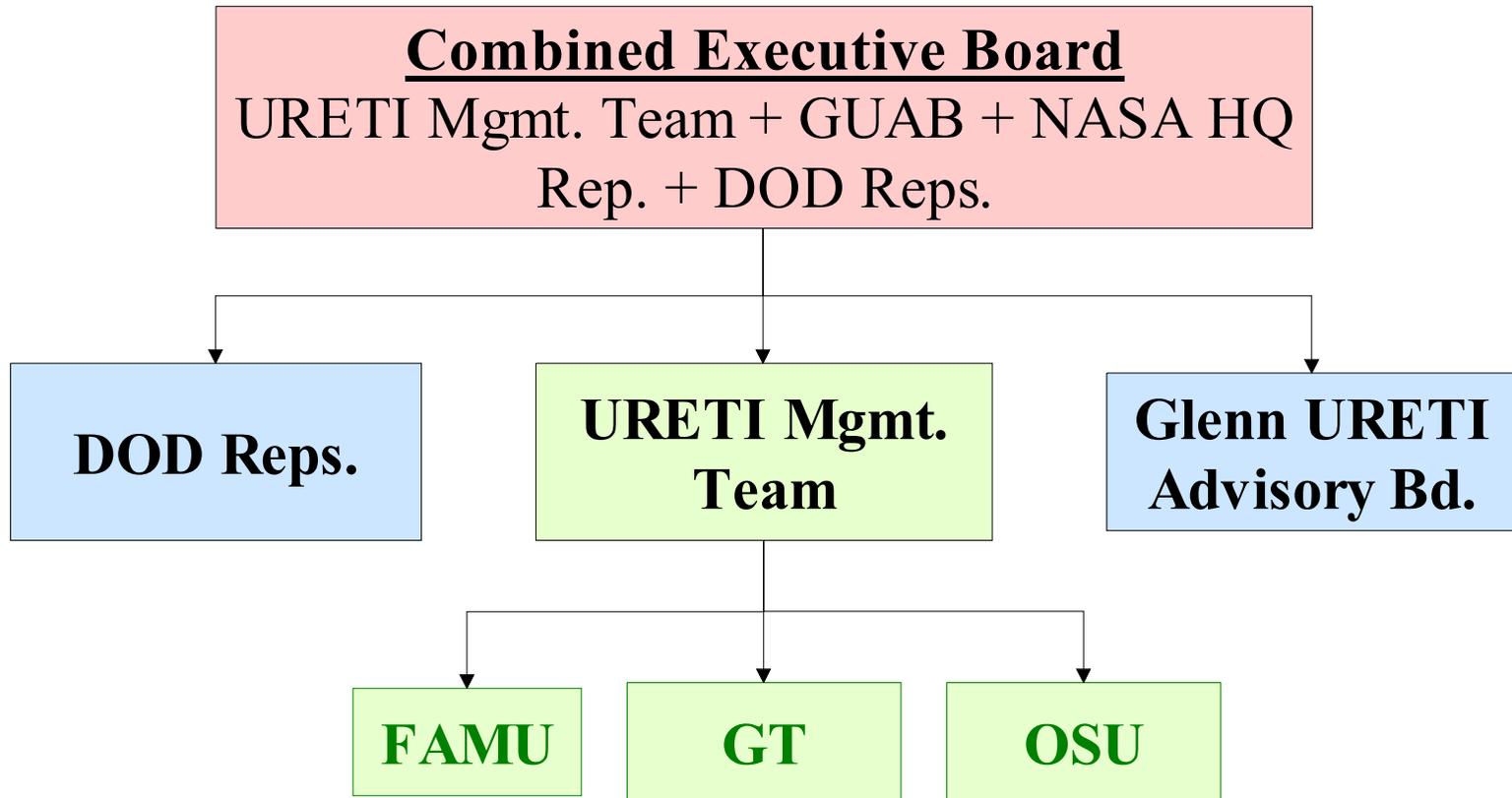
➤ **High Performance Components (GTI)**

➤ **Advanced Aeropower Technology (FAMU)**

➤ **Educational Program Plan (GTI)**

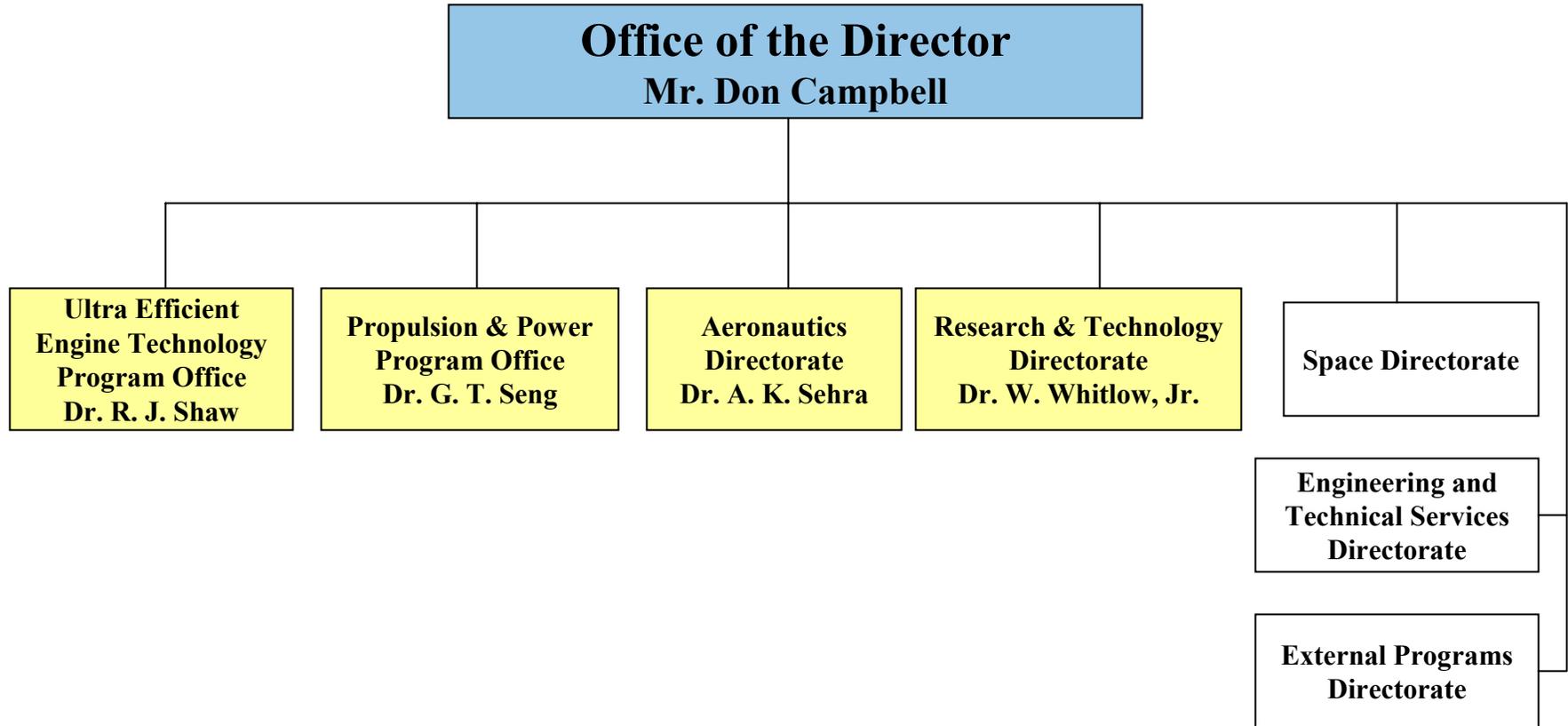
Budget: GTI - \$1.9M, OSU = \$0.8M, FAMU = \$0.3M

Aeropropulsion & Power URETI Team



NASA Glenn Research Center

Aeropropulsion & Power URETI Advisory Board



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

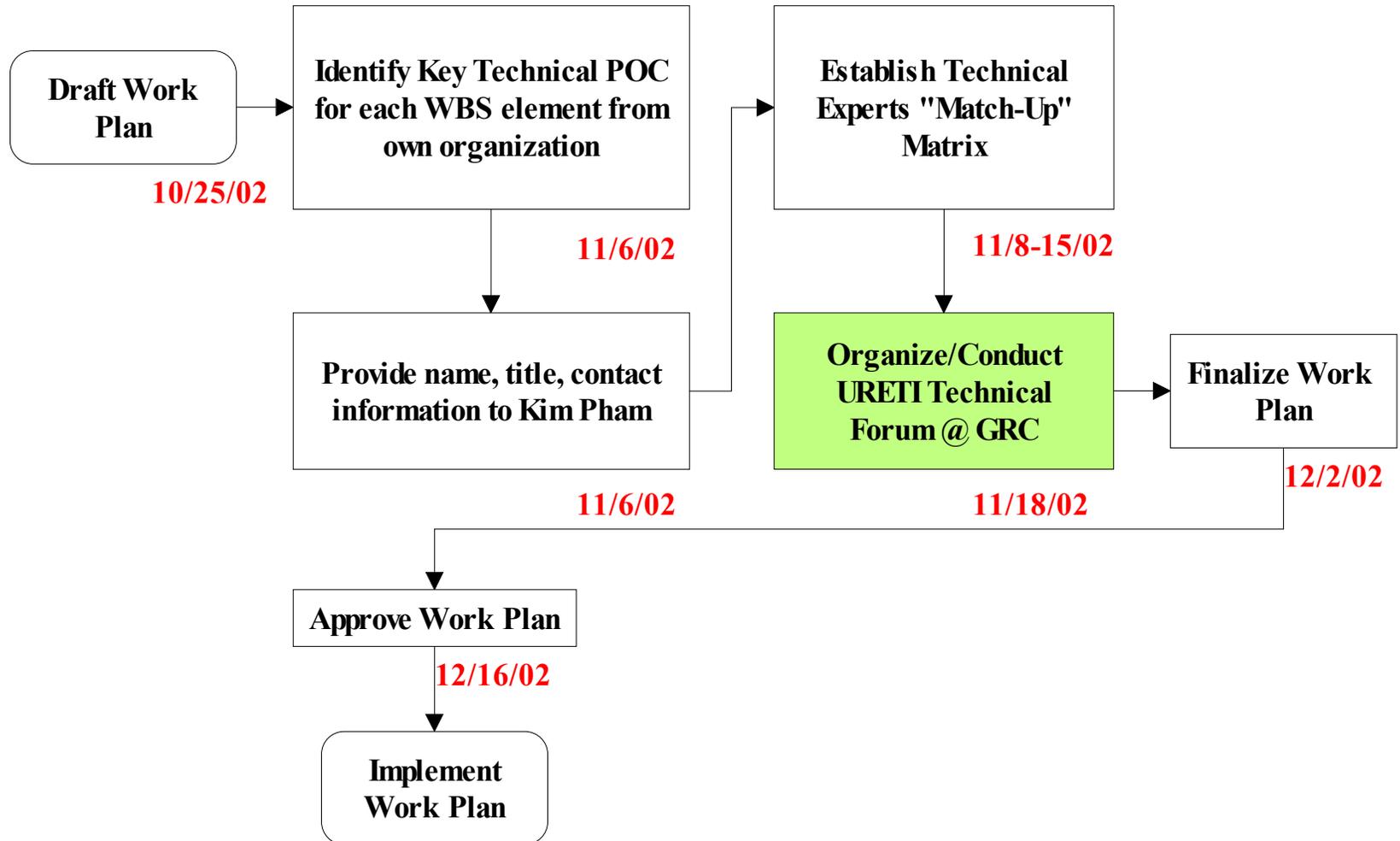
- Senior Research Officer – Dr. Jean Lou Chameau, GT's Provost
- Director – Dr. Ben T. Zinn
- Co-Director – Dr. Dimitri Mavris
- OSU Lead PI – Dr. James Williams
- FAMU Lead PI – Dr. Cesar Luongo

Aeropropulsion & Power URETI Team

Cobined Executive Board
NASA-DOD-GT/OSU/FAMU

Kim Pham

URETI Director/
Co-Director



**Aeropropulsion & Power
University Research Engineering Technology Institute**

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. industry.

- URETI Plans
- Team Directory
- Calendar - Events
- Presentations Reports
- News
- Education Programs
- Propulsion & Power

Advancing Science, Engineering, & Technology

High Performance Disk Alloys	Superconducting Electric Motors	LEADS: GIT, OSU, FAMU
Advanced High-Temp. Materials	High Work Turbine	
LENS Fab. Refract Composites	Integrated Power Management	Wireless MEMS Sensors
Co-Continuous Composites	Solid Oxide Fuel Cell	Nano Fuel Additives
Smart Compressor Materials	Distributed Exhaust Nozzles	Intelligent Compressor Controls
Emission Control	Active Noise Control	Interstage Turbine Combustion

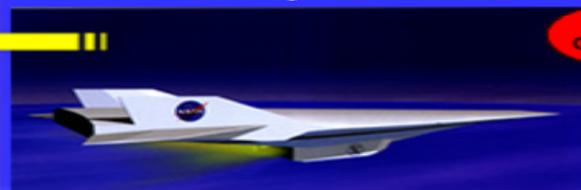
System Level Engineering, Analysis, & Technology Integration



Revolutionary and Innovative Aeropropulsion Concepts



NASA Aerospace Enterprise Goals & Objectives



**NASA Goals
Goal 1: Revolutionize Aviation**

- Reduce Accident Rate 10X
- Reduce Emissions 80%
- Reduce Noise 4X
- Triple System Capacity
- Decrease Door to Door Time 2/3

Goal 2: Advance Space Transp

- Mission Safety
- Mission Affordability
- Mission Reach

Goal 3: Pioneer Tech Innov.

- Engineering Innovation
- Technology Innovation

Goal 4: Commercialize Tech.