2nd NASA GRC Propulsion Control and Diagnostics Research Workshop
Dec. 8-10, 2009, Cleveland, OH

Dec. 8, 2009

7:00-8:00 **Continental Breakfast (LORAIN/MEDINA)**
7:30-8:00 **Registration**
8:00-8:30 **Welcome, Intros, Agenda and Logistics (LORAIN/MEDINA)**
8:30-9:00 **Overview of NASA Aeronautics PCD Research - Sanjay Garg (GRC)**
9:00-9:30 **Overview of AFRL PCD Research - Al Behabahani (AFRL)**

9:30-9:45 **Break**

9:45-12:00	**Session A (LORAIN/MEDINA)**	**Session B (ONTARIO/SUPERIOR)**
	IRAC/Enhanced Engine Control	**SUP/Combustion Instability Control**
	9:45 - Integrated Propulsion Control and Dynamics Overview - Ten-Huei Guo (GRC) **10:15** - Scenarios and Engine Response Requirements - Jonathan Litt (GRC) **10:35** - Risk Assessment Tool - Jonathan Litt (GRC) **10:55** - Fast Engine Response Approaches/Test Bed - Jonathan Litt (GRC) **11:15** - C-MAPSS40k Overview - Jonathan Litt (GRC), Jeff Csank (N&R Engineering), and Ryan May (ASRC)	**9:45** - Combustion Dynamics and Control Overview - John DeLaat (GRC) **10:00** - NASA's Combustion Test Capabilities - Clarence Chang (GRC) **10:15** - Dynamic Performance Characterization for Advanced Fuel Modulator Designs - Joseph Saus (GRC) **10:35** - Detection and Control of Instabilities and Blowoff for Low Emissions Combustors - Jerry Seitzman (GaTech) **11:00** - Adaptive Intelligent Combustion Control Based on Data-Driven Low-Order Models - Tongxun Yi (PSU) **11:30** - Independent Dynamic Actuation of Spray Parameters with the SARA Gen II Nozzle - Uri Vandsburger (VaTech)
12:00-1:00	**Lunch (ROCKFELLER)**	
1:00-2:30	**IRAC/Enhanced Engine Control (contd.)**	**HYP/Hypersonic Propulsion Control**
	1:00 - Fast-Response Engine Research - Bruce Wood (P&W) **1:45** - Engine Controls for Emergency Aircraft Operation - Walter Merrill (SMI Inc.)	**1:00** - Hypersonic Propulsion Control Task Overview - Tom Stueber (GRC) **1:10** - CCE-LIMX Inlet System ID Experiments - Tom Stueber (GRC) **1:30** - Aeroservoelastic Modeling for CCE-LIMX Inlet - D.K. Le (GRC) **1:45** - LAPIN in-the-loop implementation for control design and evaluation - Dan Vrnak (GRC) **2:00** - Inlet and engine simulation development - Tom Stueber (GRC)

2:30-2:45 **Break**

2:40-3:40 **One-on-One Meetings in Hypersonic Propulsion Control (LOBBY)**

2:45-5:30	**Session A (LORAIN/MEDINA)**	**Session B (ONTARIO/SUPERIOR)**
	IVHM/Gas Path Diagnostics	**SUP/Supersonic Propulsion Control**
	2:45 - Propulsion Gas Path Health Management Task Overview - Don Simon (GRC)	**2:45** - Supersonic Aero-Propulo-Servo-Elasticity Task Overview - George Kopasakis (GRC)
	3:05 - Systematic Sensor Selection for Turbofan Engine Diagnostics - Shane Sowers (QinetiQ)	**2:55** - Volume Dynamics Modeling of a Turbofan Engine & Propulsion GUI Library Development- Joe Connolly (GRC)
	3:30 - On-board Model-Based Aircraft Engine Performance Estimation - Don Simon (GRC)	**3:35** - Engine Component Characterization Based on Experimental Data and Modeling for Flow Distortion and Rotating Stall Studies - Rich Blech (N&R Engineering)
	4:00 - Development and Evaluation of On-board Model-Based Gas Path Diagnostic Methods - Jeff Armstrong (ASRC)	**3:50** - Stage by Stage Engine Component Modeling - George Kopasakis (GRC)
	4:30 - Data-driven Fault Detection & Symbolic System Identification in Aircraft Gas Turbine Engines - Asok Ray (PSU)	**4:00** - Engine Schedule Derivation - Compressor Bleed/Component Matching - Joseph Connolly (GRC)
	5:00 A Unified Nonlinear Adaptive Approach for Detection and Isolation of Engine Faults - Liang Tang (Impact Technologies)	**4:15** - Atmospheric Turbulence Modeling and Shock Position Control for a Supersonic Inlet - George Kopasakis (GRC)

5:30-7:00 **Reception - Cash Bar (ROCKFELLER)**

Dec. 9, 2009

7:00-8:00 **Continental Breakfast (LORAIN/MEDINA)**

8:00-10:00 **Industry perspective on PCD Research (LORAIN/MEDINA)**

8:00 - General Electric Aviation - Shreeder Adibhatla
8:30 - Pratt & Whitney - Bruce Wood
9:00 - Rolls Royce - Keith Calhoun
9:30 - Dewey Benson - Honeywell

10:00-10:15 **Break**

10:15-12:15	Session A (LORAIN/MEDINA)	Session B (ONTARIO/SUPERIOR)
	SFW/Distributed Engine Control	**Software Presentations and Demos**
	10:15 - Distributed Engine Control Task Overview and Implementation Roadmap - Dennis Culley (GRC) **10:45** - SiC High Temp Electronics: Concepts and Development Timeline - Mike Krasowski (GRC) and Glenn Beheim (GRC) **11:30** - Proposed 5 Yr Plan, System Benefits & Implementation Challenges - DECWG Industry members	**10:15 -** Commmercial Modular Aero-Propulsion System Simulation 40k - Jonathan Litt (GRC), Jeff Csank (N&R Engineering), and Ryan May (ASRC) **11:00** - Propulsion Diagnostic Method Evaluation Strategy (ProDiMES): A Public Approach for Benchmarking Gas Path Diagnostic Methods - Don Simon (GRC) **11:45** - Simulink Based test-bed for combustion instability modeling and control - John DeLaat (GRC)

12:15-1:30 **Lunch (ROCKFELLER)**

1:30-1:45 **Overview and Objectives of Break Out sessions (LORAIN/MEDINA)**
1:45-3:30 **Break Out Sessions**
Distribued Engine Control - Dennis Culley (LORAIN/MEDINA)
Engine Gas Path Diagnostics - Don Simon (ONTARIO/SUPERIOR)
Enhanced Engine Control - Jonathan Litt & Ten-Huei Guo (SALON A)
Combustion Instability Control - John DeLaat (SALON B)
Supersonic Propulsion Control - George Kopasakis (SALON C)

3:30-3:45 **Break** (Session Leads Prepare Reports)

3:45-5:00 **Session Report Outs and Discussions (LORAIN/MEDINA)**

Dec. 10, 2009

7:00-8:00 **Continental Breakfast (LORAIN/MEDINA)**
8:00-11:40 **One-on-One meetings with task leads**
(LORAIN/MEDINA) (See Separate Schedule)