

MEETING NO. 114

AGENDA

AEROSPACE CONTROL AND GUIDANCE SYSTEMS COMMITTEE

The Wyndham Cleveland at Playhouse Square
1260 Euclid Avenue
Cleveland, Ohio 44115
(216) 615-7500

14-17 October 2014

Tuesday
14-Oct-14
7:00pm

1.0 PLANNING ADVISORY BOARD MEETING

Location – Presidential Suite (Room 1410, 14th Floor)

Chairman	Lou Knotts
Vice-Chairman	Phil Hattis
Immediate Past Chairman	Dave Klyde
Treasurer	Stan Pszczolkowski
Secretary	Marge Draper-Donley

Board Members

Gary Balas	Steve Jacobson
Christine Belcastro	Gavin Jenney
Oliver Brieger	Brian Lee
Jan De Luca	Raman Mehra
Dave Doman	Piero Miotto
Shawn Donley	Dave Mitchell
Dale Enns	Dave Schmidt
Sanjay Garg	Mark Tischler
Irene Gregory	Marty Waszak
Klaus-Uwe Hahn	Kevin Wise
Ron Hess	

Wednesday
15-Oct-14
7:00am – 8:30am

2.0 REGISTRATION AND BREAKFAST

Location – Palace West Room

8:30am – 9:00am

3.0 GENERAL BUSINESS MEETING

Location – Palace West Room

Lou Knotts – Chairman

9:00am – 12:00pm

4.0 GENERAL COMMITTEE TECHNICAL SESSION

Christine Belcastro and Dale Enns Co-Chairs (Dave Klyde, acting)

4.1 Research Institutions, Industry, and University Summary Reports

4.1.1 Technical Committee Liaison

- 4.1.1.1 SAE S-7 HQ Technical Committee – Brian Lee
- 4.1.2 Universities
 - 4.1.2.1 Hamburg University of Technology – Frank Thieleke
 - 4.1.2.2 University of Washington – Anshu Narang-Siddarth
- 4.1.3 Research Institutions and Companies
 - 4.1.3.1 Systems Technology, Inc. – Dave Klyde
 - 4.1.3.2 Scientific Systems Company – Raman Mehra
 - 4.1.3.3 Hi-Tech Systems – Stan Pszczolkowski
 - 4.1.3.4 Calspan – Lou Knotts
 - 4.1.3.5 Aurora Flight Sciences – Jim Paduano

4.2 Government Agency Summary Reports

- 4.2.1 DLR – Klaus-Uwe Hahn
- 4.2.2 DoD
 - 4.2.2.1 AFRL – Dave Doman
- 4.2.3 NASA
 - 4.2.3.1 Aerospace Research Mission Directorate – Sanjay Garg
 - 4.2.3.2 John Glenn Research Center – Sanjay Garg
 - 4.2.3.3 Marshall Space Flight Center – Eric Gilligan
 - 4.2.3.4 Langley Research Center – Carey Buttrill

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|------------------|---|
| 12:00pm – 1:10pm | <p>LUNCHEON – Palace East Room (Meet in Subcommittees)
 Subcommittee chairs, members and attendees will meet for lunch and agenda planning for Meeting No. 115.</p> |
| 1:10pm – 1:50pm | <p>5.0 4th Annual Dave Ward Memorial Lecture
 “Propellant-less guidance and control of spacecraft using neural networks forecasting and drag”, by Dr, Riccardo Bevilacqua, University of Florida
 Location – Palace West Room</p> |
| 1:50pm – 3:10pm | <p>6.0 SUBCOMMITTEE E – FLIGHT, PROPULSION, AND AUTONOMOUS VEHICLE CONTROL SYSTEMS
 Sanjay Garg and Irene Gregory, Co-Chairs</p> <p>6.1 “Run Time Assurance Design Considerations for Advanced Aerospace Applications, John Schierman, Barron Associates</p> <p>6.2 “Autonomy Research for Civil Aviation – NRC Panel Report”, John-Paul Clarke, Georgia Tech (presented remotely)</p> |
| 3:10pm – 3:20pm | <p>BREAK</p> |
| 3:20pm – 4:00pm | <p>6.0 SUBCOMMITTEE E – FLIGHT, PROPULSION, AND AUTONOMOUS VEHICLE CONTROL SYSTEMS (cont)
 Sanjay Garg and Irene Gregory, Co-Chairs</p> <p>6.3 “A Critical Analysis of the X-15 3-65-96 Accident – Part I: Aircraft Systems and Flight Control, Jeb Orr, Charles Stark Draper Lab</p> |

4:00pm – 5:20pm **7.0 SUBCOMMITTEE A – AERONAUTIC AND SURFACE VEHICLES**
Steve Jacobson, Chair
Brian Lee and Dave Mitchell, Vice Chairs

7.1 “Optimal Control Allocation with Load Sensor Feedback for Active Load Suppression on an F/A-18”, by Chris Miller, NASA Armstrong Research Center (presented Thursday AM)

7.2 “Attitude Control and Estimation of High-Altitude Balloons”, by James Forbes, University of Michigan

5:30pm – 6:30pm **SOCIAL HOUR (hosted by Sanjay and Mala Garg)**
Location – Palace East Room

6:30pm – 9:00pm Rock and Roll Hall of Fame is open until 9 PM on Wednesdays
Group Discount tickets available 2 weeks in advance through ACGSC website
20 minute (1.1 mile) walk or cab ride

Thursday
16-Oct-14
6:30am – 7:30am **BREAKFAST**
Location – Palace West Room

7:30am – 8:10am **7.0 SUBCOMMITTEE A – AERONAUTIC AND SURFACE VEHICLES (cont)**
Steve Jacobson, Chair
Brian Lee and Dave Mitchell, Vice Chairs

7.3 “Legacy 500 Fly-By-Wire Development and Flight Test Results”, by Fabricio Caldeira, Embraer

8:10am – 9:30am **8.0 SUBCOMMITTEE B – MISSILES AND SPACE**
Piero Miotto, Chair
Kevin Wise, Vice Chair

8.1 “Tactical Aerial Logistics System (TALOS) for the ONR Autonomous Aerial Cargo / Utility System (AACUS)”, Dr James Paduano, Aurora Flight Sciences

8.2 “Results from Flight Testing the SLS Adaptive Augmenting Control on an F/A-18”, Eric Gilligan, Tannen VanZwieten, John Wall, and Jeb Orr, NASA

9:30am – 9:50am **BREAK**

9:50am – 10:30am **8.0 SUBCOMMITTEE B – MISSILES AND SPACE (cont)**
Piero Miotto, Chair
Kevin Wise, Vice Chair

8.3 “Retrospective Cost Adaptive Control for Non-minimum-Phase Systems with Application to Aircraft, Spacecraft, and Missiles”, by Dennis Bernstein, University of Michigan, Aerospace Engineering Department (presented Wednesday PM)

10:30am – 11:10am **9.0 SUBCOMMITTEE C- AVIONICS AND SYSTEM INTEGRATION**

Raman Mehra and Marty Waszak, Co-Chairs
Jan DeLuca, Vice Chair

9.1 “Unmanned Low-Cost Testing Aircraft for Innovative Teaching and Research”, Frank Thielecke, TUHH

11:20am – 12:30pm **LUNCHEON**

Location – Palace East Room
PAB will meet for lunch and agenda planning for Meeting No. 115.
Meeting attendees have open seating for lunch.

12:45pm – 1:45pm **BUS RIDE TO NASA GLENN RESEARCH CENTER (and Security Check-in)**

1:45pm –4:30pm **TOUR OF NASA GLENN COORDINATED BY SANGAY GARG**

Friday

17-Oct-14

7:00am – 8:00am

BREAKFAST

Location – Palace West Room

8:00am– 9:20am **9.0 SUBCOMMITTEE C – AVIONICS AND SYSTEM INTEGRATION (cont)**

Raman Mehra and Marty Waszak, Co-Chairs
Jan DeLuca, Vice Chair

9.2 “Needs Driven (Rationalistic) Autonomy – Concepts and NASA Applications”, Dr. K. Krishnakumar, NASA Ames Research Center

9.3 “Autonomous Control of UAS Ground Operations in the Terminal Area (ACUGOTA)”, Jerome Wei, Northrop Grumman Corporation

9:20am – 10:00am **10.0 SUBCOMMITTEE D – DYNAMICS, COMPUTATIONS, AND ANALYSIS**

Ron Hess and Dave Doman, Co-Chairs
Dave Schmidt, Vice Chair

10.1 “A Critical Analysis of the X-15 3-65-97 Accident – Part II: Human Factors, Immanuel Barshi, NASA Ames Research Center

10:00am – 10:20am **BREAK**

10:20am – 11:40am **10.0 SUBCOMMITTEE D – DYNAMICS, COMPUTATIONS, AND ANALYSIS
(cont)**

Ron Hess and Dave Doman, Co-Chairs

Dave Schmidt, Vice Chair

10.2 “Fractional Order Modeling of Atmospheric Turbulence – A More Accurate Modeling Methodology for Aero Vehicles,” George Kopasakis, NASA Glenn

10.3 “Rapid Mission Planning for Aircraft Thermal Management”,

Dave Doman, AFRL