

NASA/USRA CENTER FOR PROGRAM/PROJECT MANAGEMENT RESEARCH



*A Virtual Center for Research in Program/Project
Management for Aeronautics and Space*

Sponsored by
NASA/Academy of Program and Project Leadership

Operated by
The Universities Space Research Association

March 23, 2005





The Universities Space Research Association (USRA)

- ❑ **Nonprofit organization created in 1969 by the National Academy of Sciences at the request of NASA**
- ❑ **95 member colleges and universities**
- ❑ **Charter:**
 - *To be an entity through which universities and other research organizations cooperate with each other and with the government toward the development of knowledge associated with space science and technology, and*
 - *To acquire, plan, construct and operate laboratories and other facilities for research, development and education associated with space science and technology.*
- ❑ **Operation by the national research community**
 - **Council of Institutions**
 - **Board of Trustees**
 - **Science Councils**



USRA's Current Operations

- ❑ **Lunar and Planetary Institute (LPI)**
- ❑ **Research Institute for Advanced Computer Science (RIACS)**
- ❑ **Stratospheric Observatory For Infrared Astronomy (SOFIA)**
- ❑ **NASA Institute for Advanced Concepts (NIAC)**
- ❑ **National Center for Microgravity Research (NCMR)**
- ❑ **Division of Space Life Sciences (DSLIS)**
- ❑ **Cooperative Program in Space Sciences (CPSS)**
- ❑ **Other programs include: education, engineering, astronomy, earth science, microgravity materials science.**
- ❑ **Funding sources have included: NASA, NRL, USNO, NSF, AFOSR, AFRL, BMDO and private sector**
- ❑ **Total budget of roughly \$90 million per year**



About CPMR

- **Purpose:**
 - Engage universities in world-class research that addresses significant challenges in the discipline of Program/Project Management (P/PM) – with emphasis on NASA’s aeronautics and space program.

- **CPMR P/PM Objectives:**
 - Significantly advance the state of knowledge
 - Develop a cadre of professionals to conduct world-class research and serve as resource
 - Improve collaboration within Community
 - Facilitate hands-on developmental opportunities
 - Provide an atmosphere for open examination of innovative concepts
 - Promote the direct application of CPMR research to NASA challenges





CPMR: Plans and Operation

□ **First Year Implementation Goals:**

- ✓ **Establish and collocate CPMR program office at USRA HQ In Columbia, MD**
- ✓ **Search/Select Director**
- ✓ **Form CPMR Science & Engineering Council (CSEC)**
- ✓ **Hold Requirements Definition Workshop to establish research topics and priorities**
- ✓ **Disseminate Research Announcement to solicit proposals**
- ✓ **Competitively select and award grants to university researchers**
- ✓ **Establish CPMR Student Council**
- ✓ **Establish exchange program**

✓ = Completed action



Key Personnel

Director: Lewis Peach, Jr., USRA Chief Engineer

Associate Director: David Holdridge, CPSS Program Manager

Graduate Student Intern/CPMR Student Council: Tina Chindgren

CPMR Science and Engineering Council

Noel Hinnens (Univ. of Colorado) (Chairman)

John Cable (Univ. of Maryland)

Len Fisk (Univ. of Michigan)

John Kelly (NCA&T State Univ.)

Nancy Leveson (MIT)

Dava Newman (MIT)

John Niehoff (SAIC)

Heather Reed (Univ. of Colorado)

Joe Rothenberg (former AA, OSF)

Aaron Shenhar (Stevens Institute)

Alan Wells (Leicester Univ.)

Hussein Jirdeh, Executive Sec.



Requirements Definition Workshop

- **Key Presenters on P/PM Challenges**
 - Mike Hawes, Deputy Associate Administrator for Space Flight
 - Al Diaz, Center Director, Goddard Space Flight Center
 - Sherry Buschmann, Director, Integrated Project Management, NASA HQ
 - Dennis McCarthy, Swales Aerospace
 - Wally Fowler, Meek Centennial Professor In Engineering, University of Texas at Austin
 - John Douglass, President, Aerospace Industries Assn.

- **Conference Chair: Noel Hinnens (CU/LASP)**
- **Working Group Panel Sessions - Chairs:**
 - Best Practices and Lessons Learned—John Niehoff (SAIC Group)
 - Future Opportunities & Innovative Approaches—Aaron Shenhar (Stevens Inst. Of Tech.)
 - Decision Making Tools, Methods and Metrics—Mark George (Lockheed Martin, Inc.)
 - Cultural and Sociological Issues for Project Teams—Nancy Leveson (MIT)
 - Knowledge, Expertise, and Learning—Allan Wells (U. of Leicester)



Overall Summary of Research Announcement Responses

- ❑ **All 54 proposal leads were from US institutions**
- ❑ **Healthy mix of institutions**
 - Large, Small, State, Private, and some HBCU & OMI institutions
- ❑ **Multiple proposals from a few schools**
 - 6 from one, 5 from another, and at least two from three other universities
- ❑ **Most proposals conformed to specifications: only two rejected**
- ❑ **Broad representation in proposals**
 - Many government, university, and industry teaming arrangements
 - ~ 200 named investigators or members of oversight/advisory groups.
 - ~ 9 CO-Is from foreign institutions.
- ❑ **Many teams demonstrated solid connections to current personnel and projects at NASA.**
 - Important for application to real NASA P/PM concerns



CPMR Researchers & Phase I Research Projects 2004

Nancy Leveson/MIT

- Modeling: NASA's Safety Culture

Robin Dillon-Merrill/Georgetown University

- Prescriptive Approach to Preventing Future Mission Catastrophes

Isaac Maya/USC *

- Cultural Influence on Lessons Learned and Safety

Jeffrey Hoffman/MIT

- Innovative Management of Student-run Space Research Projects

Kevin Grant/UT, San Antonio *

- Student P/PM Curriculum Development/Challenger Centers

Karlene Roberts/U.C. Berkeley

- Risk and Safety/Security Assessment at NASA

Noel Hinnners/University of Colorado Boulder

- Lessons Learned Life Cycle Processes and Workforce Development

Tim Kotnour/University of Central Florida *

- Learning-Based Project Reviews

Thomas Lechler/Stevens Institute of Technology *

- NASA Strategic Multi-Project Resource Management "CC_Lite"

Aaron Shenhar/Stevens Institute of Technology

- Strategic Systems Approach to NASA's P/PM Project Types

* Presented at PMC '05 Conference



CPMR Student Council

“CPMR is critical to student development”

*Students attending RDW (12/03)

- **CPMR can:**
 - Provide a network and opportunity for interdisciplinary connections
 - Advocate for interdisciplinary work, i.e. university course flexibility, especially in engineering
 - Potentially guide students to internships or assistantships
 - Advocate for long-term, national space goals and projects

- **Recommend the establishment of a CPMR Student Council to:**
 - Liaison between students and CPMR
 - Provide feedback, offer ideas and unique perspective to CPMR





CPMR Service to Community

❑ Public Service

- NASA Program Management Challenge Conference (March '05)
- APPL Master's Forum #10 (February '05)
- Aviation Week Program Excellence Award (November '04)

❑ NASA Exploration Program

- Mars Human Precursor Mission Risk Workshop (August '04)
- Benchmarking Activity (November '04)
- CEV Mission Risk Advisory Group (November '04)
- NASA Safety Culture Assessment (January '05)

❑ NASA Office of Chief Engineer/NESC

- Return to Flight Inquiry Safety Culture Modeling (NESC)
- ITA Process Vulnerability & Risk Analysis (OCE)