The Meyer Institute at NPS

Dr. Paul Shebalin, Director
The Wayne E. Meyer Institute of Systems Engineering
Rear Admiral Wayne E. Meyer (1926 - 2009) is regarded as the "Father of AEGIS" for his 13 years of service as the AEGIS Weapon System Manager and later the founding project manager of the AEGIS Shipbuilding Project Office. He is the son of Mr. and Mrs. Eugene Meyer of Brunswick, Missouri, where he was born and raised. He retired from the U.S. Navy in 1985 as the Deputy Commander for Weapons and Combat Systems, Naval Sea Systems Command and Ordnance Officer of the Navy.

- www.answers.com
Meyer Institute within NPS

- One of four NPS Institutes
- Reports to Dean of Research
- Six assigned faculty and two admin staff
- Participating faculty from across campus
- Visiting faculty from academia and industry
- Director assignment is for 3 years
  - SE Faculty / MI Director (50/50)
  - Primary NPS-wide SE research POC
  - Facilitate interdisciplinary projects across NPS
  - Receives guidance/funds from external and internal stakeholders/sponsors
Mission

• The Meyer Institute provides NPS faculty and students with relevant, tailored, and unique research opportunities in systems engineering and designated warfare areas to support NPS graduate education that increases the combat effectiveness of U.S. and Allied armed forces and enhances the security of the United States.
Facilities and Material to Support SE Students and Interdisciplinary Projects
Meyer Institute Functions

- Establishes and conducts NPS-wide, interdisciplinary research programs for the Navy, DoD and other National Security customers.
- Fosters and encourages NPS faculty and students to apply their talents to answering the high-priority questions in defense systems science, technology, and engineering.
- Supports, facilitates and enables affiliated NPS faculty, visiting and adjunct faculty, and students to collaborate and conduct sponsored, interdisciplinary research and studies.
- Publicizes and shares the results of Meyer Institute-affiliated research.
- Provides a conduit to NPS faculty and students for defense contractor sponsored research.
- Supports the assigned Chair Professors – enables the Warfare Chairs and PEO-, Industry-, and other-sponsored Chair Professors to carry out their academic responsibilities.
<table>
<thead>
<tr>
<th>Speaker</th>
<th>Topic</th>
<th>Date</th>
<th>Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edmond Jonckheere</td>
<td>Traffic Pattern Analysis in Negatively Curved Networks</td>
<td>November 13, 2008</td>
<td></td>
</tr>
<tr>
<td>Barry Boehm</td>
<td>Integrating Systems and Software Engineering with the Incremental Commitment Model</td>
<td>November 20, 2008</td>
<td>Systems Engineering Department</td>
</tr>
<tr>
<td>Heinz Stoewer</td>
<td>Trends in Systems Engineering Education</td>
<td>February 5, 2009</td>
<td>Systems Engineering Department</td>
</tr>
<tr>
<td>Quyen Huynh</td>
<td>Computational Harmonic Analysis: Feature Extraction for Classification</td>
<td>March 5, 2009</td>
<td>Applied Math Department</td>
</tr>
<tr>
<td>Karl Astrom</td>
<td>Control—The Hidden Technology</td>
<td>March 30, 2009</td>
<td>Applied Math Department</td>
</tr>
<tr>
<td>Cihan H. Dagli</td>
<td>System of Systems Architecting: Can we design for desired systems behavior?</td>
<td>May 21, 2009</td>
<td>Systems Engineering Department</td>
</tr>
</tbody>
</table>
Associated Chair Professors

• Chair, Undersea Warfare
  – RADM (Ret.) Jerry Ellis, USN
  – Director, NPS USW Research Center

• Chair, Expeditionary and Mine Warfare
  – RDML (Ret.) Rick Williams, USN
  – Assistant Director, NPS USW Research Center

• Other Chair Professors
  – In progress, TBD
USW Research Center Functions

• Fostering education and research in Submarine Warfare, Anti-Submarine Warfare (ASW) and Mine Warfare (MIW)
  – Ongoing dialog with external sponsor for research topics and research proposals
  – NPS coordination of research and thesis topics with professors/advisors and students
  – Guidance and advice to the NPS USW Academic Committee on the content and management of the USW Curriculum
USW Education and Research

Fostering USW Research

Improving the USW Curriculum
Expeditionary and Mine Warfare
Capstone SEA Projects

2002
Expeditionary Warfare

The Expeditionary Warfare Integrated Project
Wayne Meyer Institute of Systems Engineering

2003
Expeditionary Warfare
Force Protection

Rapid Airborne Mine Clearance System

2004
Joint Expeditionary Logistics

Seahasing and Joint Expeditionary Logistics
ASNE Sea Basing Conference 2005

2007
Riverine Sustainment

2008
Maritime IEDs in Domestic Ports

Plus 10 years of METOC MIW Theses
SEA 14 BRIEFINGS (Dec 2008 – Jun 2009)

- NMAWC (RDML Girrier plus about 20 NMAWC staff from San Diego & Corpus Christi)
- PEO, LMW (Deputy plus 3 from program offices)
- NSWC Panama City (8)
- CNMOC
- NFESC
- EODTECHDIV
- DHS S&T
- DHS S&T Advisory Board (Copy of full report and presentation slides for use in their tasking)
- DHS PEO C-IED (pre brief only)
- HSI (attended 2 presentations)
- CNA
- NDIA USW Conference MIW Session (about 65 attendees)
- N85B / N8F (plus staff)
- USCG S&T
- ONR C4I
- QINETIQ (3 – at request of DHS S&T Director of Research)
- NDIA Industry Study – significant usage
Other Current Meyer Institute Research Projects

- **ASW Operational Scenario Simulation** (CAPT (Ret.) J. Kline, USN)
- **Network-Centric Enterprise Systems Engineering** (Dr. P. Shebalin, Dr. R. Goshorn)
- **Exterior Insulation Technology** (Dr. F. Marquis)

- **Condensed Matter Nuclear Science** (Dr. Melich, Dr. Johnson, Dr. Hagelstein)
- **Navy Ship Design** (Dr. F. Papoulas)
- **Carbon Nano Tubes and Heat Transfer** (Dr. Y. Kwon, Maj R. Pollack, USAF)
- **Electric Plant Modeling** (Dr. G. Oriti, Dr. A. Julian)
- **Open Source Tools for Modeling and Simulation** (Dr. D. Brutzman)

- Pits in **CR-39** from experiments at **SSC San Diego**. The pits have been interpreted as evidence of low-energy nuclear reactions. [Wikipedia]
Meyer Institute Sponsored Projects

**Education and Research**

- **FY06 Sponsored Projects**
  - CRITICAL EXPERIMENTS IN CONDENSED MATTER – DTRA
  - DEPLOYABLE JOINT COMMAND CONTROL – NSWC PANAMA CITY
  - DEVELOPMENT/VERIFICATION OF IMPACT – ONR
  - LITTORAL OCEANOGRAPHY FOR MINE WARFARE – NAVOCEANO
  - MS IN SYS ENGINEERING (SPACE SYSTEMS FOCUS) – NPS*
  - MSSE-MCTSSA-OTHERS – NPS*
  - NAVY SHIP DESIGN – NGSS
  - NPS CHAIR OF MINE WARFARE PROGRAM – PELOMW
  - NPS CHAIR OF UNDERSEA WARFARE PROGRAM – NUWC NPT
  - NPS USW CURRICULUM DEVELOPMENT – NAVSEA*
  - OCEANOGRAPHY FORCE/CAMPAIGN ANALYSIS ON USW – NAVOCEANO
  - RED TEAM SPT FORCE/MARITIME SECURITY OPS – OUSD
  - SAFETY & RISK-INFORMED DECISION-MAKING – NASA
  - SATELLITE ALTIMETRY DATA ANALYSIS – SPAWAR
  - SEM-PD21 – VARIOUS SPONSORS*
  - TECH SURPRISES IN NUCLEAR PHYSICS – OSD
  - UWMD - PROJECT NUMONKI II - 2005 – DARPA

*Education-related projects ($1.3M)

**FY07 Sponsored Projects**

- ATTRITION MODELS FOR UNMANNED SYSTEMS – NAVSEA
- CHINESE OCEANOGRAPHIC RESEARCH – ONR GLOBAL
- CRITICAL EXPERIMENTS IN CONDENSED MATTER NUCLEAR SCIENCE, PHASE I – DTRA
- DEPLOYABLE JOINT COMMAND CONTROL – NSWC PANAMA CITY
- IMPACT BURIAL PREDICTION – ONR
- NAVY SHIP DESIGN – NGSS
- NPS CHAIR OF MINE WARFARE PROGRAM – PELOMW
- NPS CHAIR OF UNDERSEA WARFARE PROGRAM – NUWC NPT
- NPS UNDERSEA WARFARE RESEARCH – OPNAV
- NAVY SHIP DESIGN – NORTHROP GRUMMAN

**FY08 Sponsored Projects**

- ATTRITION MODELS FOR UNMANNED SYSTEMS – NAVSEA
- CHINESE OCEANOGRAPHIC RESEARCH – ONR GLOBAL
- CRITICAL EXPERIMENTS IN CONDENSED MATTER NUCLEAR SCIENCE, PHASE II – DTRA
- IMPACT BURIAL PREDICTION – ONR
- NAVY SHIP DESIGN – NGSS
- NPS CHAIR OF MINE WARFARE PROGRAM – PELOMW
- NPS CHAIR OF UNDERSEA WARFARE PROGRAM – NUWC NPT
- NPS UNDERSEA WARFARE RESEARCH – OPNAV
- NET-CENTRIC ENTERPRISE SYSTEMS RESEARCH – PELOEIS
- PORT SECURITY/ MIED RESEARCH – OSD
- NAVAL SIMULATION SYSTEM – ASW – ONR
- NAVY SHIP DESIGN – NORTHROP GRUMMAN

**Primarily Research**

- **FY06 Sponsored Projects**
  - OCEANOGRAPHY FORCE/CAMPAIGN ANALYSIS ON USW – NAVOCEANO
  - RED TEAM SPT FORCE/MARITIME SECURITY – OUSD
  - SAFETY & RISK-INFORMED DECISION-MAKING – NASA
  - SATELLITE ALTIMETRY DATA ANALYSIS – SPAWAR

- **FY07 Sponsored Projects**
  - NAVY SHIP DESIGN – NGSS
  - NPS CHAIR OF MINE WARFARE PROGRAM – PELOMW
  - NPS CHAIR OF UNDERSEA WARFARE PROGRAM – NUWC NPT
  - NPS UNDERSEA WARFARE RESEARCH – OPNAV

- **FY08 Sponsored Projects**
  - RED TEAM SPT FORCE/MARITIME SECURITY – OUSD
  - TECH SURPRISE IN NUCLEAR PHYSICS – OSD

- **Education-related projects ($1.3M)**
Future Meyer Institute Research Areas

- Warfare Systems (Surface, C4ISR, …)
- Energy
- Follow-on SSBN/SSGN Launcher Technology
- Point Sur Ocean Acoustic Laboratory
- Collaborative Engagement Capability
- Enterprise Systems Engineering
- Systems Science
- Autonomous Agents and Multi-Agent Systems
- …
Contact Information

• Dr. Paul Shebalin
• Director, Wayne E. Meyer Institute of Systems Engineering
• Phone: 831-656-1047
• Email: pshebali@nps.edu