

Navy ManTech Program Electronics Manufacturing Center

NSRP All-Panel Meeting
March 29, 2023

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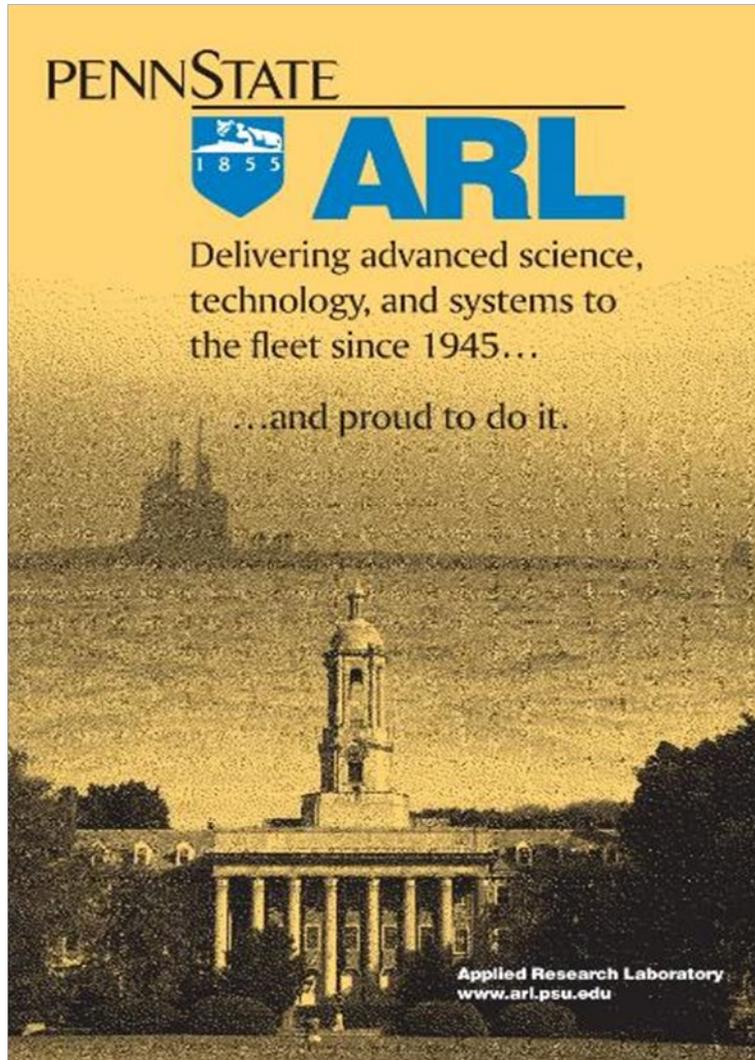


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PennState
Applied Research
Laboratory

Electronics
Manufacturing
Center



As a DoD designated University-Affiliated Research Center (UARC) Penn State ARL...

“...maintains a special long-term strategic relationship with DoD.”

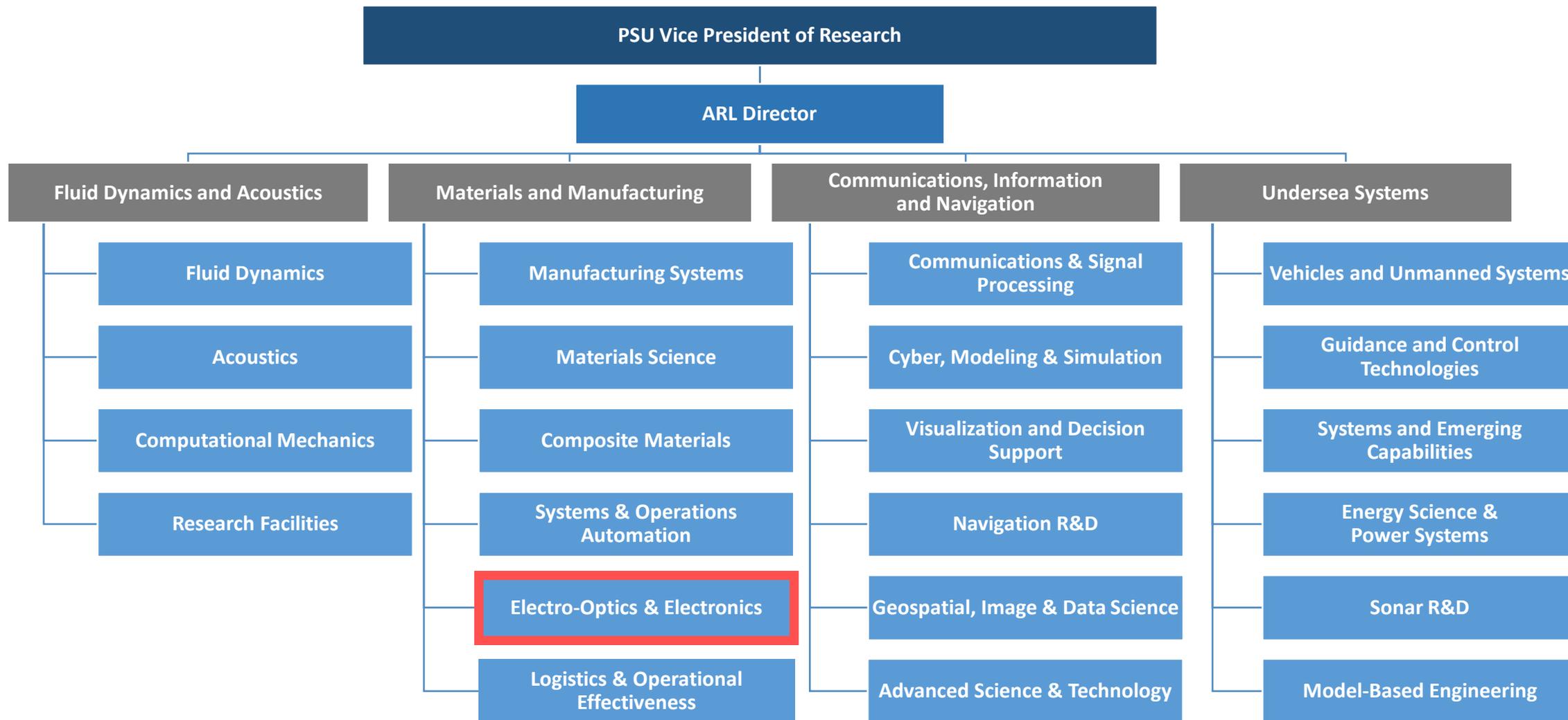
Characteristics of this relationship include:

- Responsive to evolving needs
- Comprehensive knowledge of needs and problems
- Access to information and proprietary data
- Corporate knowledge and technical memory
- Objectivity and independence from commercial interests
- Quick response capability
- Current operational experience
- Freedom from real and perceived conflicts of interest

UARC: 10 USC 2304 (c)(3)(b) “...to establish or maintain an essential engineering, research, or development capability to be provided by an educational or a federally funded research and development center and are designed UARC by the Director, Defense Research and Engineering (DDR&E).”



ARL Technical Offices and Divisions



EMC Introduction



The Electronics Manufacturing Center (EMC) goal is to reduce acquisition, operational, and life-cycle costs. The EMC, with the highest degree of vision, quality, integrity, and technical excellence, aims to maintain a strong scientific and engineering resource base that is responsive to manufacturing technology issues of national importance.

Established in 2021, EMC is the ONR ManTech Center of Excellence for electronics located within the Penn State Applied Research Laboratory in Freeport, Pennsylvania. EMC personnel and technical contributors are experienced in most facets of electronics manufacturing and include experts from the Applied Research Laboratory and Pennsylvania State University and collaborators in the electronics manufacturing industry. The EMC facility has multiple laboratories dedicated to technology research and development, offices and meeting rooms, and spaces for performing DoD classified work.

The core mission and function of the EMC is to identify, develop and facilitate the transition of electronics manufacturing technologies to reduce the cost and time to deploy electrical and electronic (digital and analog) systems as well as the supporting power storage and distribution infrastructure to naval ships, aircraft, submarines and unmanned systems.

EMC Scope



- Manufacturing technology
- Semiconductor devices
- Vacuum electronics
- Passive components
- Integrated circuit technologies
- MICs and MMICs
- Interconnections
- Compound semiconductors
- Wide bandgap semiconductors
- Manufacturing / assembly
- Nanoelectronics
- Power electronics
- Trusted electronics hardware
- Resilient electronics hardware
- Thermal management
- MEMS
- Packaging technology
- Non hermetic packaging
- Tamper proof / resistant
- Energy storage / distribution
- RF directed energy weapons
- Vetrionics manned / unmanned
- Precision timing and navigation
- Microwave electronics
- Emerging technologies
- Sustainment / Obsolescence
- COTS integration
- U.S. industrial base
- Supply chain integrity
- Counterfeit detection
- Detection embedded viruses
- Detection of cyber threats
- System Integration

Materials

Components

Devices
ICs

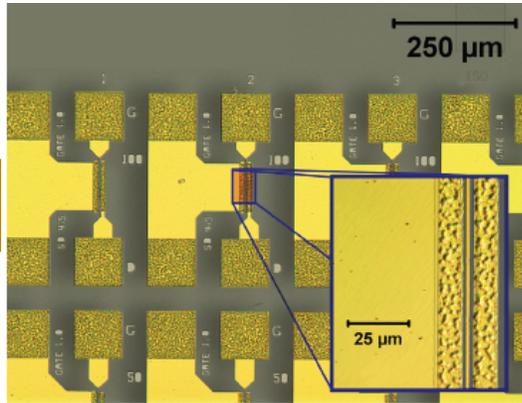
Integrated
Circuits

Interconnect

Embedded
Systems

Subsystems /
Systems

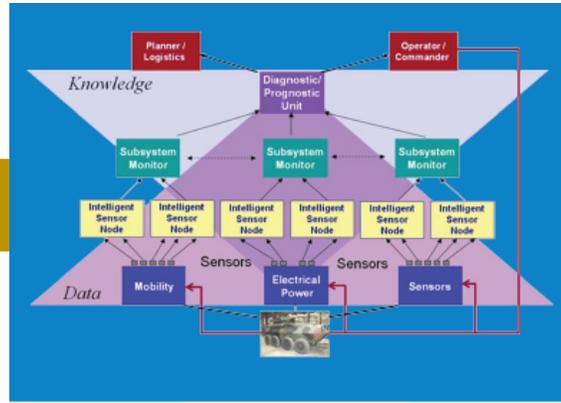
EMC Technology Approach



MANUFACTURING OF ELECTRONICS

- Materials
- Components
- Substrates
- Connections
- Devices
- Assembly
- Modules
- Subsystems

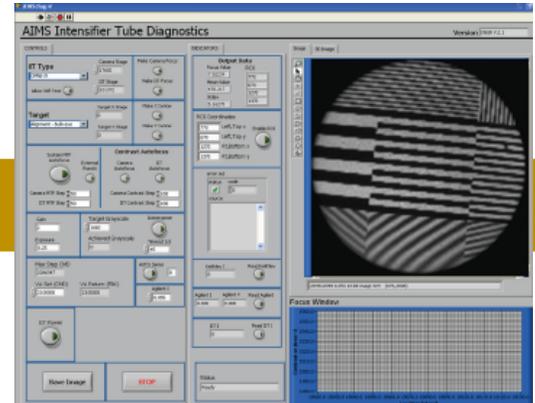
The Electronics Manufacturing Center (EMC) core function is identifying, developing, and facilitating the transition of electronics manufacturing technologies to reduce the cost and time to deploy electrical and electronic (digital and analog) systems as well as the supporting power storage and distribution infrastructure to Naval ships, aircraft, submarines, and unmanned systems.



MANUFACTURING FOR ELECTRONICS

- Industrial base assessment
- Sustainment
- Modeling and simulation
- Trade studies
- Supply chain
- Risk management
- Process capability
- Functional allocation

The EMC works with the Navy's acquisition community, naval shipyards, and the electronics manufacturing (EM) industrial base to identify manufacturing technology issues that negatively impact transition of EM products to the fleet, with respect to both cycle-time and cost.



MANUFACTURING USING ELECTRONICS

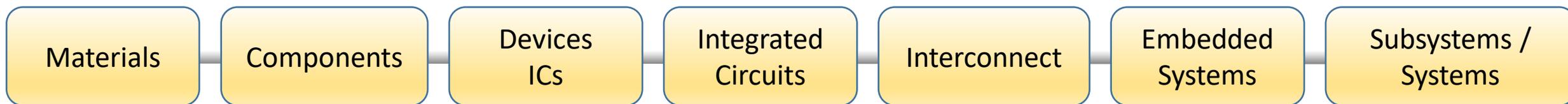
- Controls
- Communications
- Configuration
- Detection
- Verification
- Measurements
- Computing
- Automation

The EMC develops naval platform-related manufacturing technologies and transition the technology to the center specific industrial base. In addition to accomplishing the Centers core mission, the Center manages, operates, sustains, and enhances its ability to function as an ONR ManTech Center of Excellence.

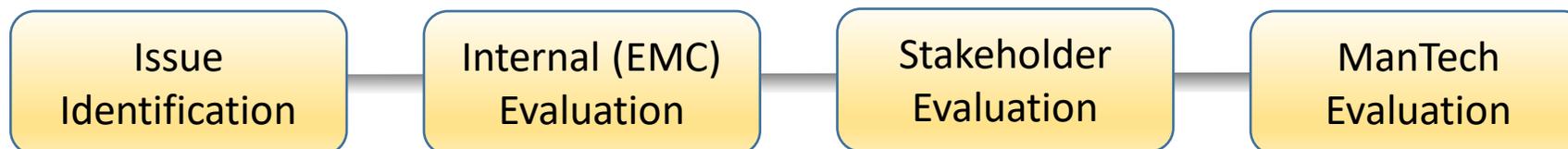


EMC Ecosystem

- Electronics ManTech topics **rarely** transition directly to the ManTech focus platforms.
- We must be careful to develop topics that follow DoD 4200.15, but optimize or maximize impact within the ManTech industrial base / ecosystem.



- We solicit opinions from Navy stakeholders with electronics competencies.
- We specifically identify experts with knowledge and authority for electronics.
- Opinions from these experts help us measure impact to the Navy ecosystem.





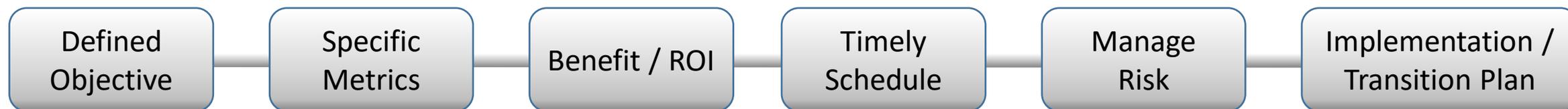
EMC Potential Project Concepts

YES!

- Well-defined Navy need
- Provide a cost benefit
- Complete in time to address the need
- Non-proprietary technology
- Can improve a known process or procedure
- Industry cannot develop on its own
- Applicable to multiple relevant programs

NO!

- Investment better funded by another means
- Routine application of existing technology
- Unique to a single weapon or platform
- Material development or product design
- Purchase capital equipment
- Certification or qualification testing
- Proprietary technology



PROJECT DECISIONS ARE BASED ON-

- Platform need
- Navy priority
- Benefit / ROI
- Technical / logistical risk
- Administrative approvals required
- Probability of implementation



EMC Key Staff and Contact Info

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Thank you!

-enjoy the 2023 NSRP
All-Panel Meeting!

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