DoD Microelectronics Commons

A National Network for Defense Microelectronics Innovation

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HTTPS://WWW.CTO.MIL @DODCTO @OUSDRE

If there is any inconsistency between the material presented here and the Request for Solutions (RFS), **the RFS shall take precedence**.

The Microelectronics Commons RFS will be posted on *www.sam.gov* and *https://nstxl.org/opportunity/microelectronics-me-commons/*

Lab-to-Fab Transition of Microelectronics Technologies

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Research Universities, **Start-ups** have facilities for Lab prototyping but face barriers to demonstrating manufacturability in a Fab.

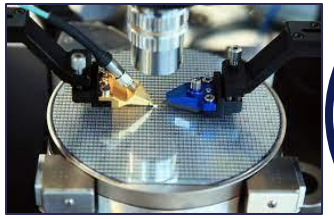
Core Facilities or Foundries/Fabs provide access to early stage Fab prototyping.

Microelectronics Commons aims to enable lab-to-fab prototyping– evolve microelectronics laboratory prototyping to foundry/fab prototyping – in domestic facilities.

The Microelectronics Commons: Innovation from Lab-to-Fab

Innovation Barriers

- Lack of access to existing fabs for lab-to-fab prototyping
- High capital costs for process and metrology tooling to support manufacturing of microelectronics technologies
- High Intellectual Property (IP) and Electronic Design Automation (EDA) design license costs
- Lack of domestic access to chip carriers, and packaging materials to support integration of electronics
- Lack of workforce talent and expertise to support technology transition



Partnerships

Technology Transition

Workforce Development

End State

- **Sustained partnerships** between emerging technology sources, manufacturing facilities, and interagency partners
- **Rapid transition** of early-stage microelectronics research to proven technology in domestic foundries
- Expand **domestic** microelectronics fabrication capability
- Enhance microelectronics **education** to bolster the microelectronics engineering workforce
- Develop a **pipeline of talent** to bolster local semiconductor economies and grow the domestic semiconductor workforce

Democratize access to capabilities needed for lab-to-fab prototyping

Microelectronics Commons Addresses the Valley of Death

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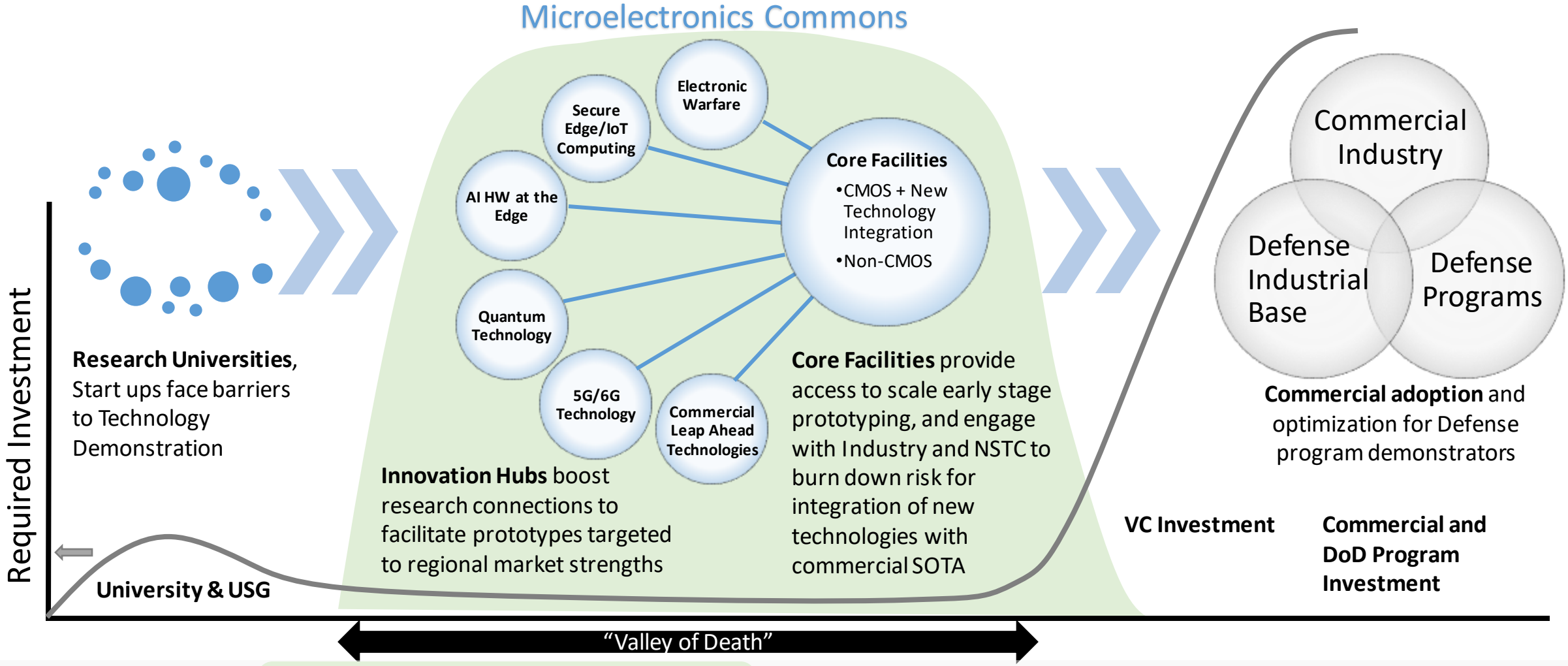


Progression from Concept to Product

S&T

- Electronic Warfare
- Secure Edge/IoT Computing
- AI HW at the Edge
- Quantum Technology
- 5G/6G Technology
- Commercial Leap Ahead Technologies

Tech Demos

- RAMP
- RAMP-C
- SHIP
- T&AM Prototypes

Application Platforms

- Aircraft
- Submarines
- Ships
- Space Systems
- Ground Systems
- Missile Defense
- C4ISR

Lab-to-fab prototyping bridges valley of death from laboratory research to foundry/fab prototyping

Hubs and Cores

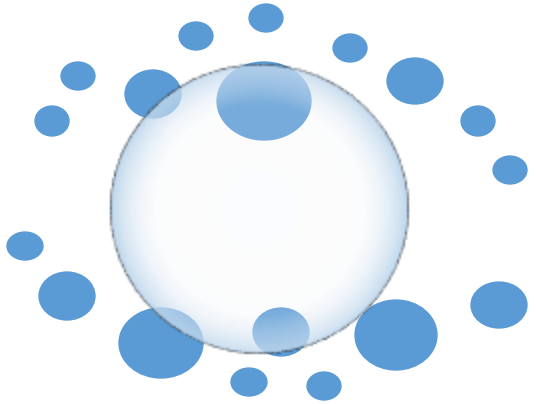
Hubs

A network of regional entities with lab prototyping capabilities and sources of microelectronics talent for onshore, lab-to-fab transition of semiconductor technologies while ensuring workforce training.

Hubs:

- Have the flexibility to bring in members from any region to be successful in their lab-to-fab efforts.
- Connect researchers and designers to prototyping capabilities targeted to strengths in the Hub's technical topic areas.
- Will be centers of expertise for one or more of the six critical technology areas.

Microelectronics Commons



Goal

To connect regional organizations through the Hub to accelerate lab-to-fab prototyping based on proximity and to strengthen local economies through a workforce that supports those regions.

Cores

Fabs/foundries that have scalable capacity beyond what the regional hubs can provide.

Cores serve to:

- Further complement and amplify the work of the regional hubs; for example, ≥200 mm wafer fab for Silicon CMOS-compatible technologies and ≥100 mm wafer fab for compound semiconductors.
- Engage with commercial fabs and align them better to commercial processes to facilitate transition to commercial and defense companies.
- Provide access to repeatable processes, back-end manufacturing/integration and full flow-fabrication.

Commons Will Support Infrastructure

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Human Infrastructure ....

Physical Infrastructure ....

Digital Infrastructure ...

Infrastructure is foundational to the success of the Microelectronics Commons

Role of Projects

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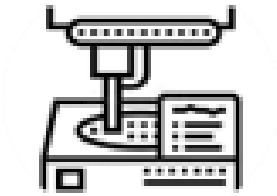
Support

Operational expenditures such as tooling maintenance and staff



Facilitate

Capacity increase of existing **infrastructure** through, for example, support for required staffing

Build

Additional infrastructure needed for successful prototyping as the Hubs mature

Develop

Talent and **technologies** in parallel

Challenge

Challenges incentivize the collaboration required for Cores to better align Hubs with commercial processes to **facilitate transition of technologies**.

This enables Hubs to better **support** the broader base of **researchers and designers**.

Projects enhance the value of infrastructure through staffing and utilization of lab and fab facilities

Hub Models

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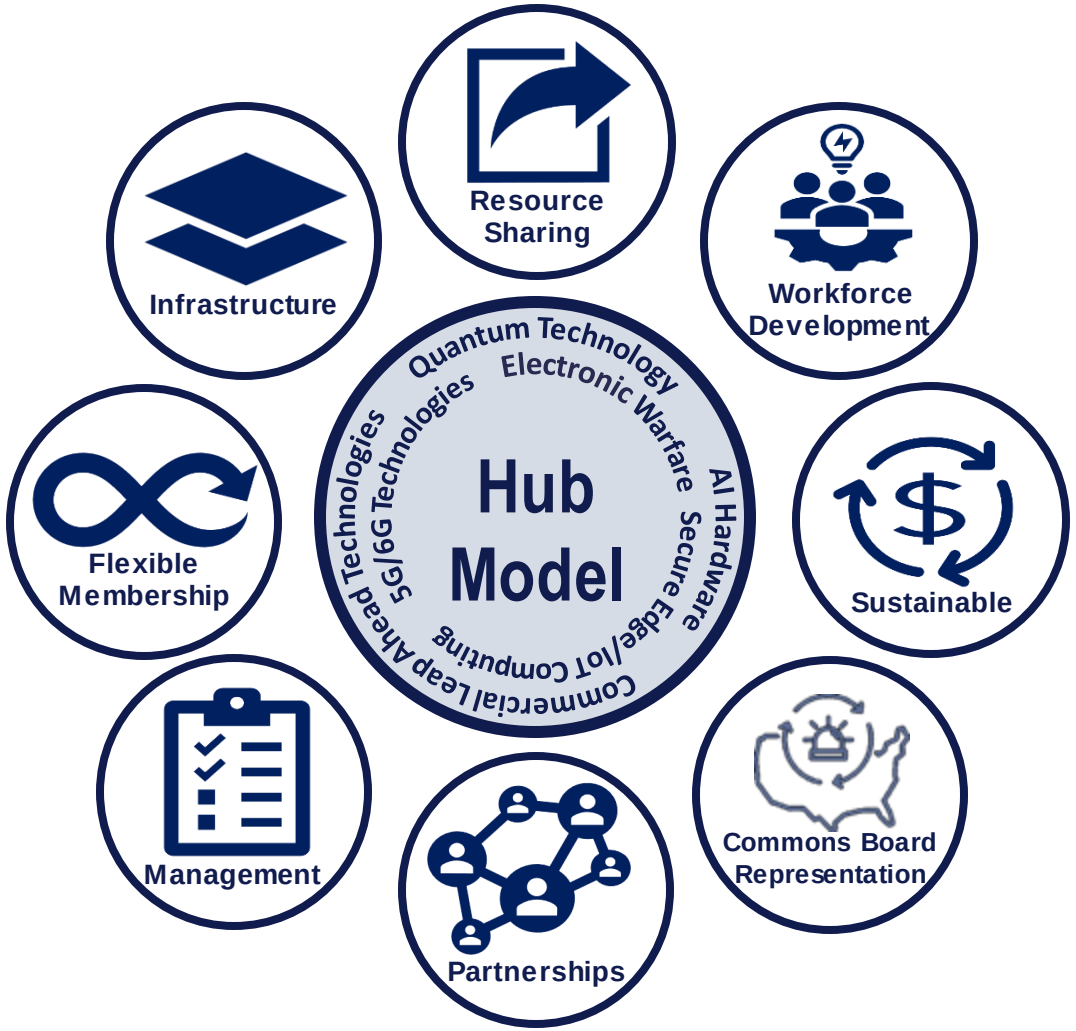

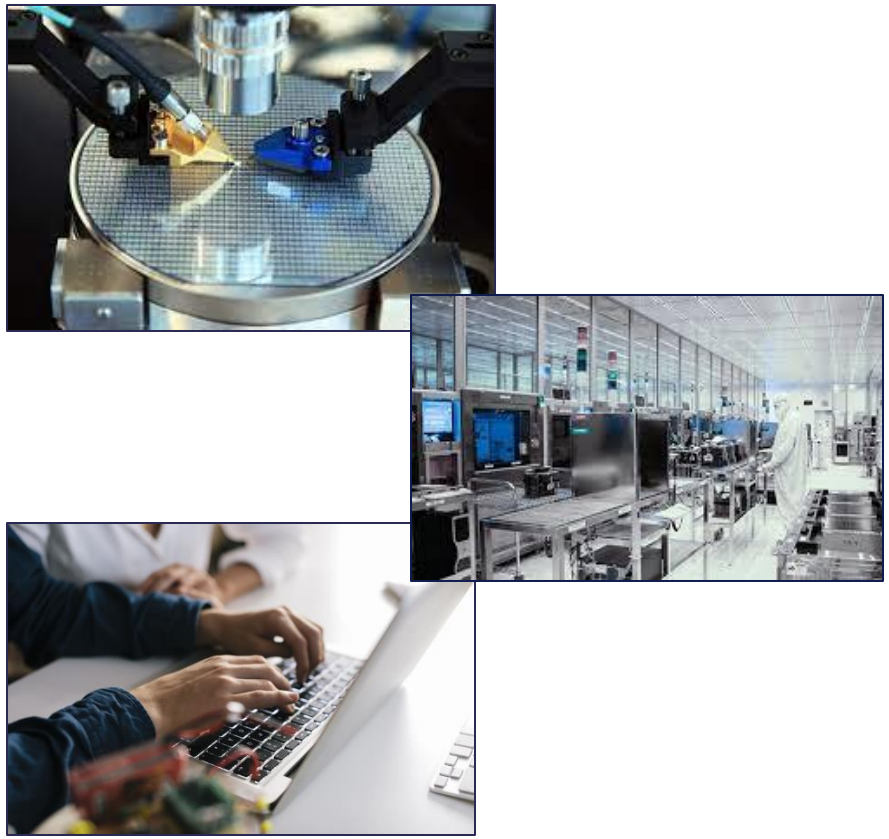

Core Facilities positioned to engage with industry and Government to provide production capacity and commercialization

Hubs have the flexibility to develop a model that ensures participation from all interested stakeholders and sustains the hub in the long term

How to Submit your Questions

The Naval Surface Warfare Center – Crane (NSWC Crane) Strategic & Spectrum Missions Advanced Resilient Trusted Systems (S²MARTS) Other Transaction Authority (OTA) will be the primary contract vehicle for the Microelectronics Commons

The Microelectronics Commons Consortium Manager, the National Security Technology Accelerator (NSTXL), will make program announcements (Events, Documentation changes, etc.) on the S²MARTS site and on www.sam.gov

Important Links

- Microelectronics – DoD Research & Engineering, OUSD(R&E) (cto.mil): *https://www.cto.mil/ct/microelectronics/*
- Microelectronics Commons NSTXL: *https://nstxl.org/opportunity/microelectronics-me-commons/*
  - To submit any questions, locate "Submit a Question" on that site, complete the fields, and click "Submit".