Vision and Strategy:
National Semiconductor Technology Center

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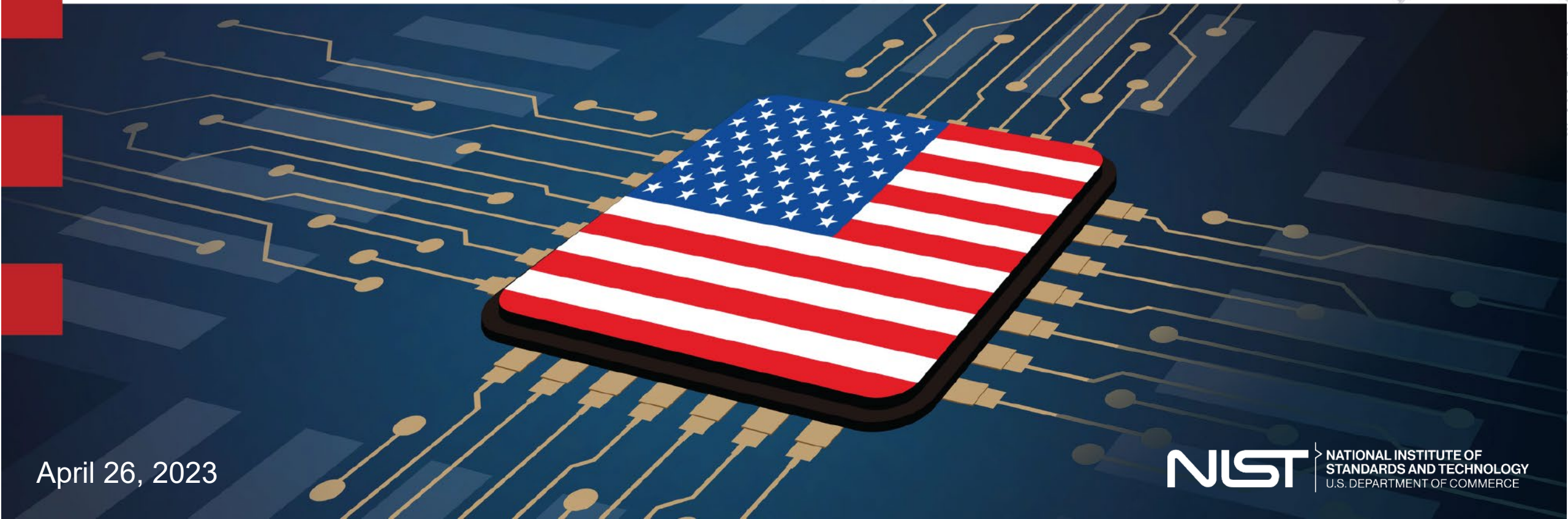


April 26, 2023

NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

CHIPS for America

$39 billion for manufacturing

Two component programs:

1. Attract large-scale investments in advanced technologies such as leading-edge logic and memory
2. Incentivize expansion of manufacturing capacity for mature and other types of semiconductors

$11 billion for R&D

Four integrated programs to:

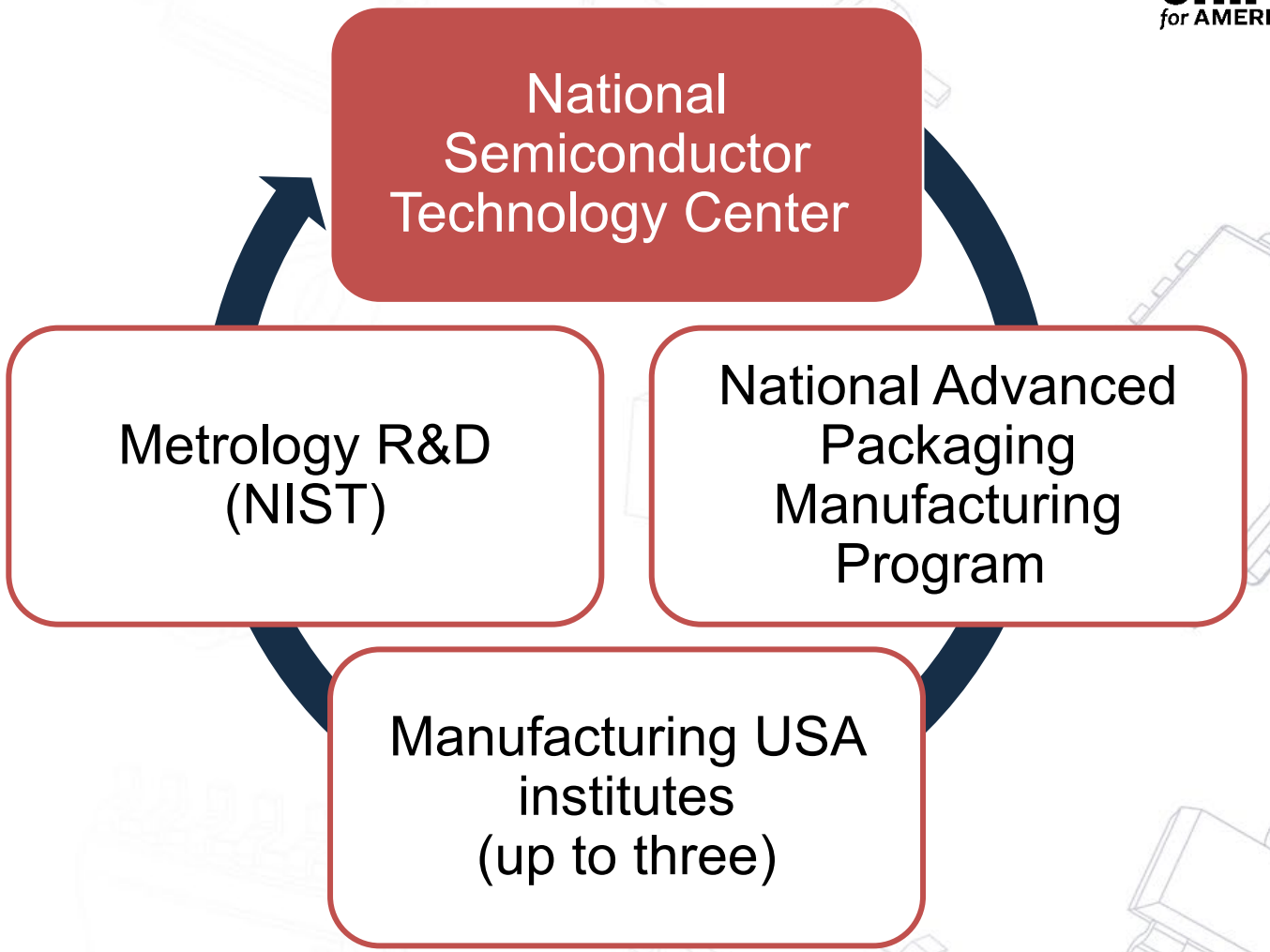
1. Conduct research and prototyping of advanced semiconductor technology
2. Strengthen semiconductor advanced test, assembly, and packaging
3. Enable advances in measurement science, standards, material characterization, instrumentation, testing, and manufacturing

Plus CHIPS initiatives from other agencies, including DOD, State, NSF, and Treasury

Workforce development

CHIPS for America R&D

- To strengthen and advance U.S. leadership in R&D
- An integrated ecosystem that drives innovation
- In partnership with industry, academia, government, and allies
- A strategic view of R&D infrastructure, participant value-proposition, and technology focus areas
- Informed by the Industrial Advisory Committee

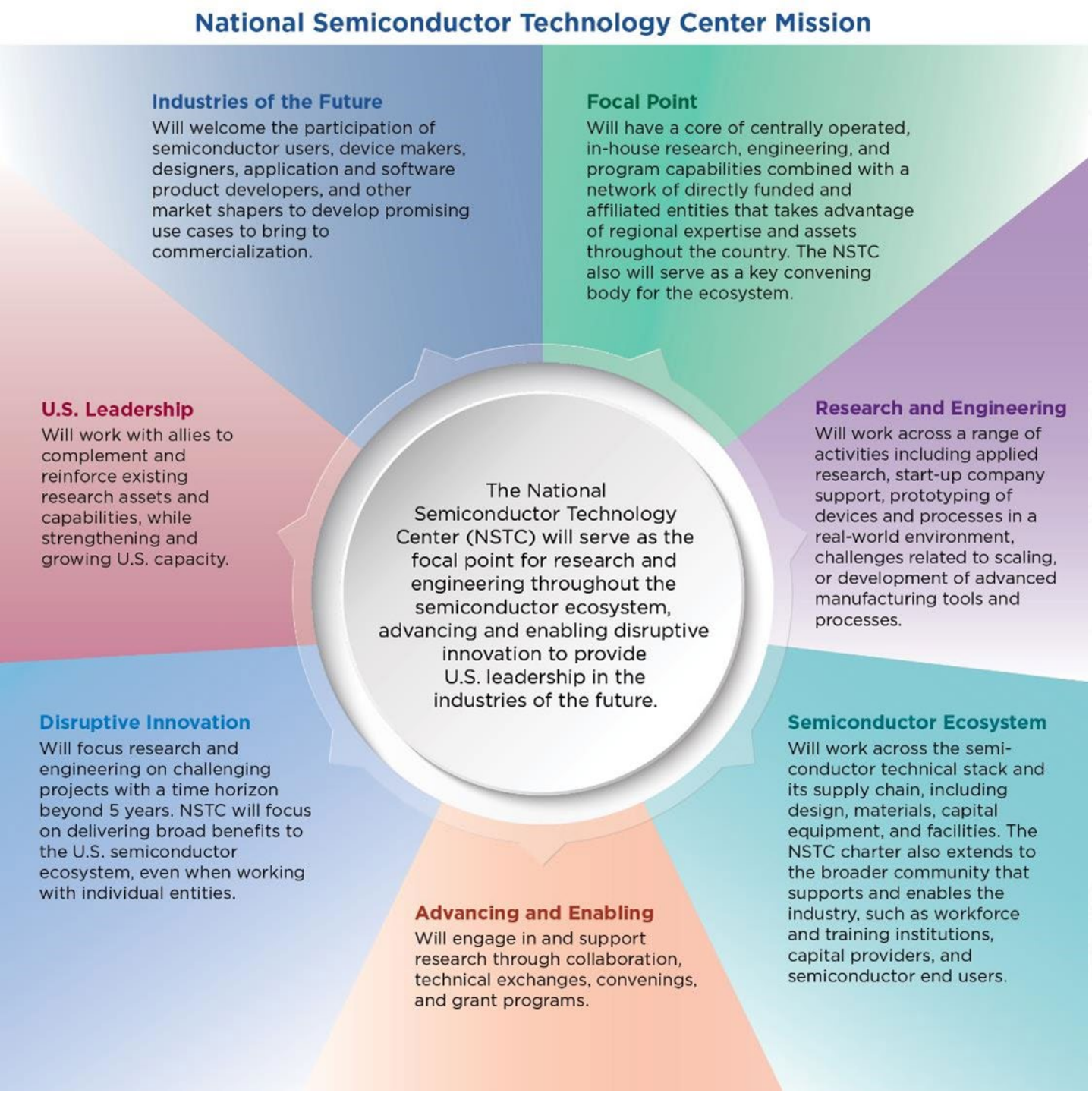


Challenges

1. Prototyping, testing, and scaling is too costly for most organizations to undertake
2. Researchers and developers do not have easy access to test facilities and equipment, or digital design tools and data set
3. Without these rich grounds for innovation and education, the U.S. lags in innovation

The U.S. needs a research and development ecosystem that is

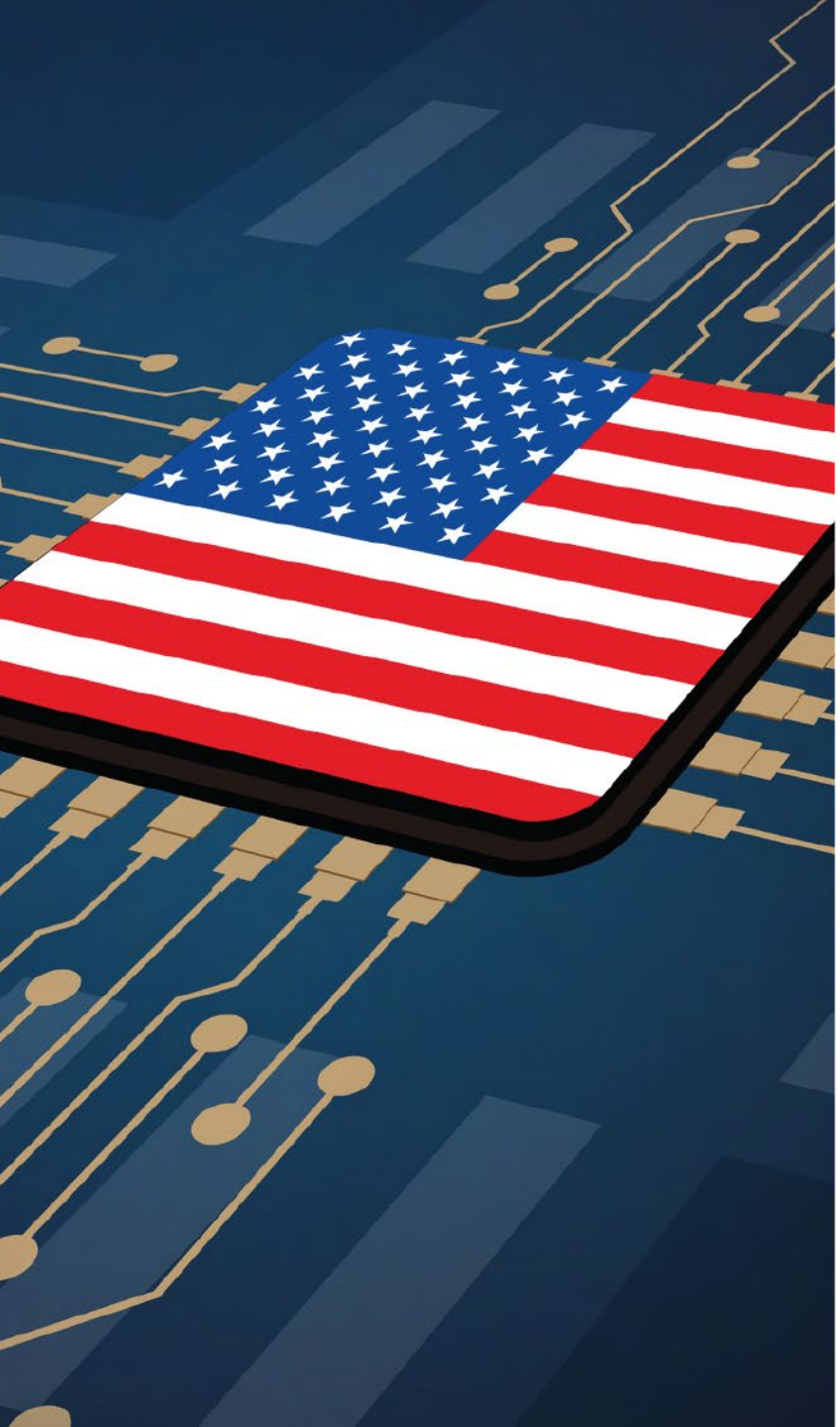
- robust
- holistic
- inclusive



CHIPS for AMERICA

The National Semiconductor Technology Center

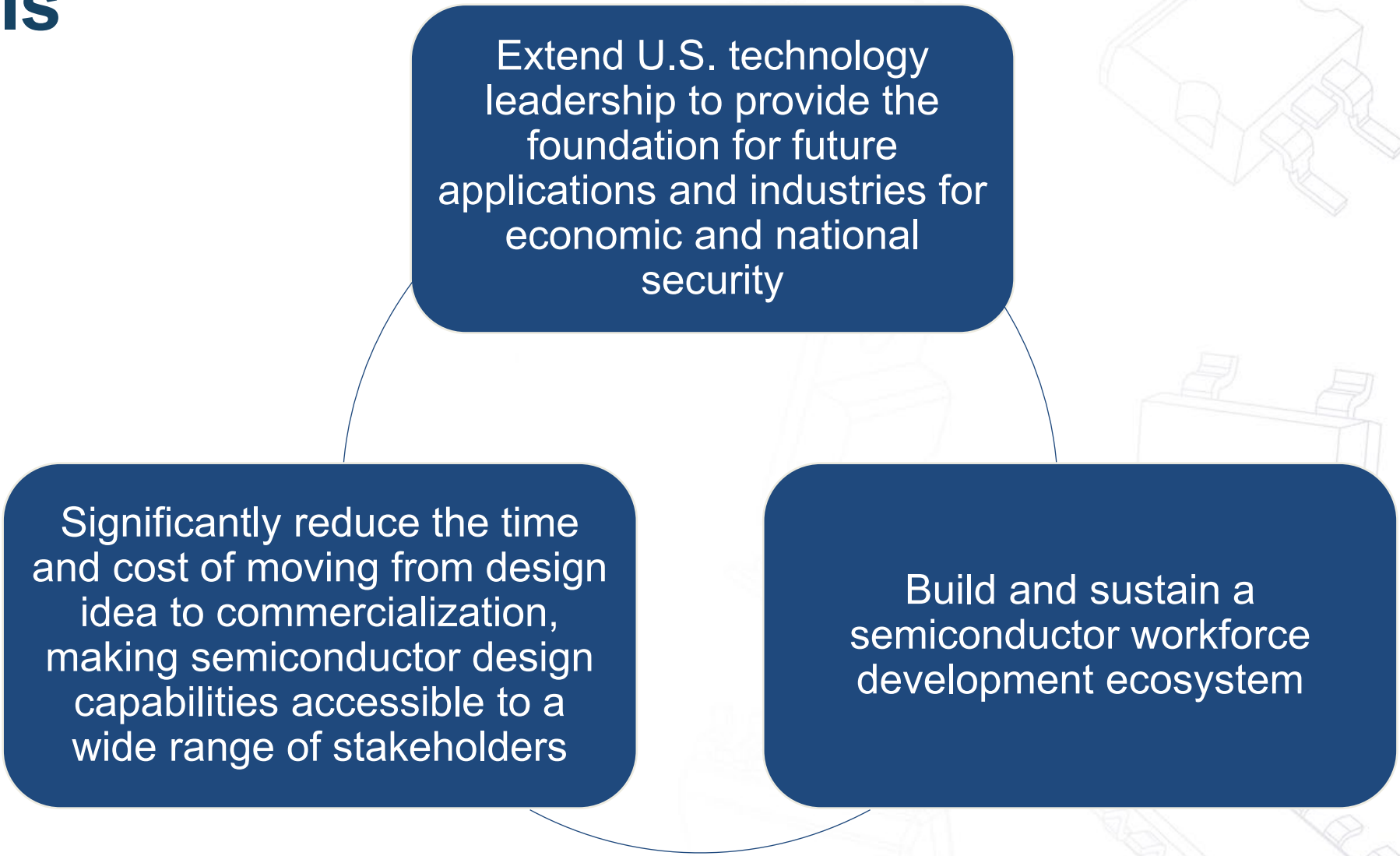
will serve as the focal point for research and engineering throughout the semiconductor ecosystem, advancing and enabling disruptive innovation to provide U.S. leadership in the industries of the future.



NSTC VISION

By the decade's end, the NSTC should be viewed throughout the world as an essential resource within the broad semiconductor ecosystem with a network of respected scientists and engineers, state-of-the-art facilities, effective programs, and demonstrated technical achievements.

Goals

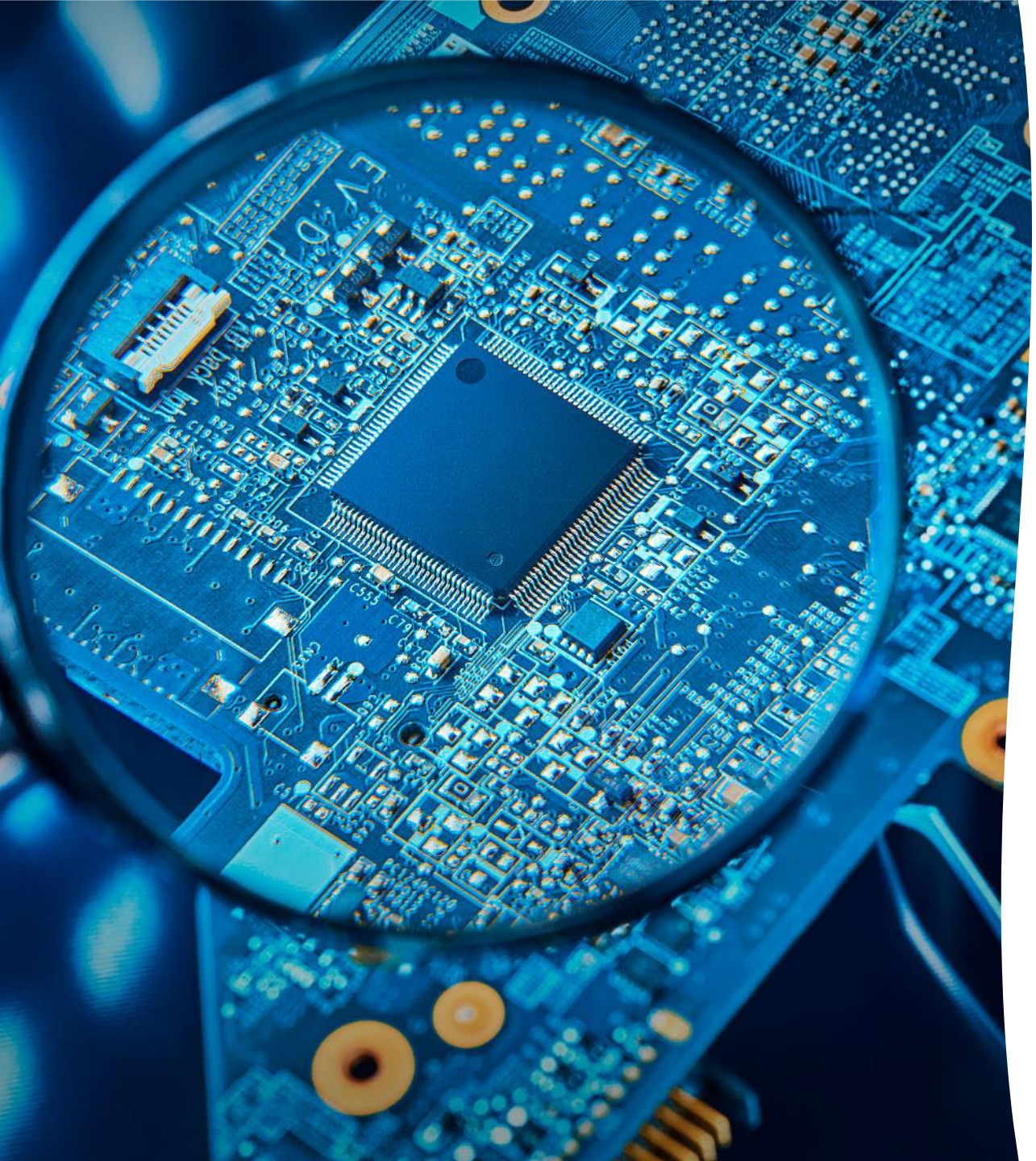

Extend U.S. technology leadership to provide the foundation for future applications and industries for economic and national security
Significantly reduce the time and cost of moving from design idea to commercialization, making semiconductor design capabilities accessible to a wide range of stakeholders
Build and sustain a semiconductor workforce development ecosystem

Programs

Technology leadership

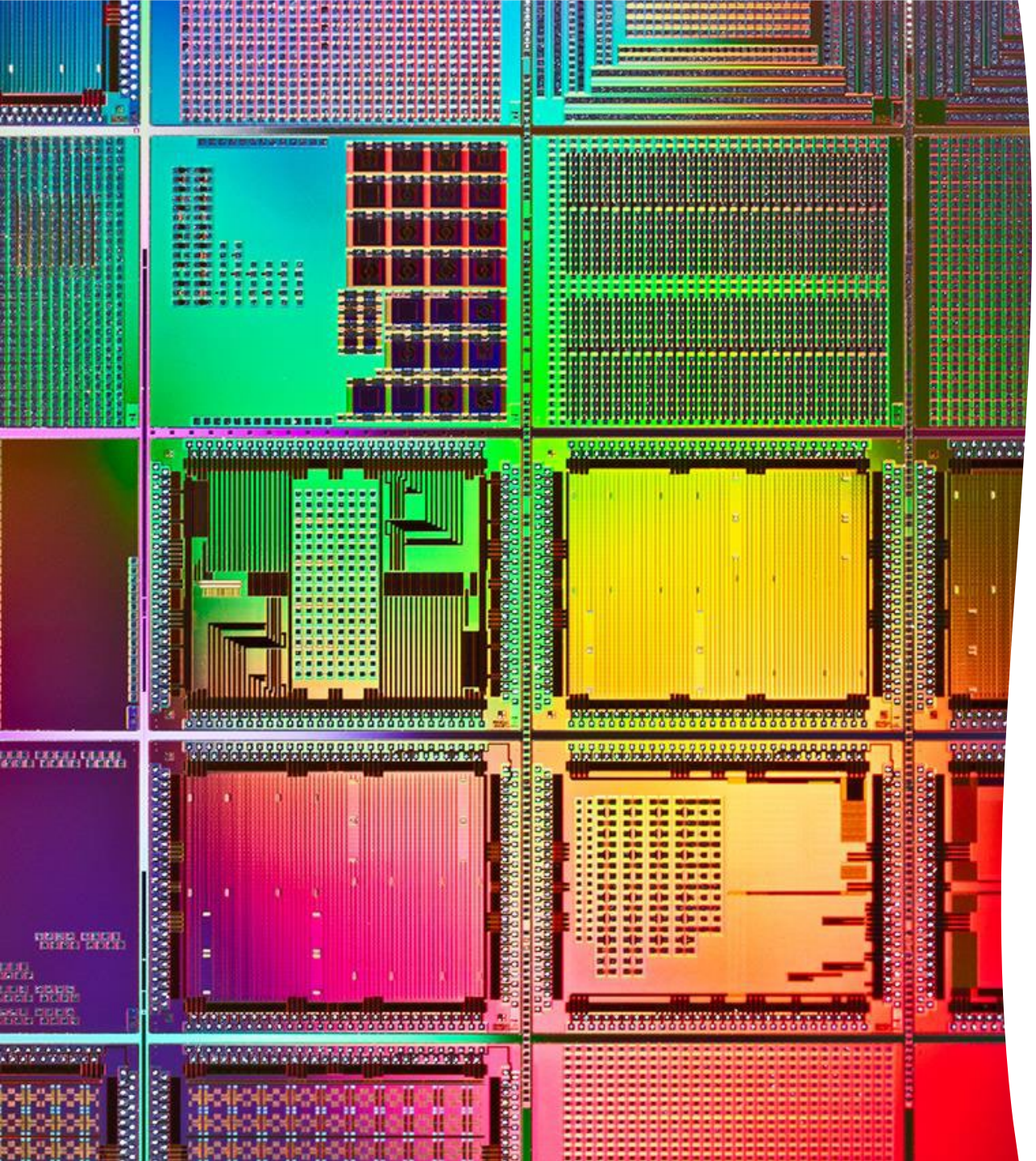
Community assets

Workforce



TECHNOLOGY LEADERSHIP

- In-house and funded research
- Grand challenges and road maps
- Standards and protocols
- Technical exchanges
- Security



COMMUNITY ASSETS

- Chiplets
- Design Enablement Gateway
- Data sets
- Patents
- Technical centers for prototyping, research, and experimentation

POTENTIAL AFFILIATED TECHNICAL CENTERS

CHIPS for AMERICA

- Design tools
- Power
- Process and production R&D
- RF, analog, and mixed signal
- Memory
- Microelectro-mechanical systems
- Mature node
- Bioelectronics
- Photonics
- Device security

Baseline CMOS and CMOS R&D

Advanced packaging

NSTC HQ core functions

WORKFORCE PROGRAMS

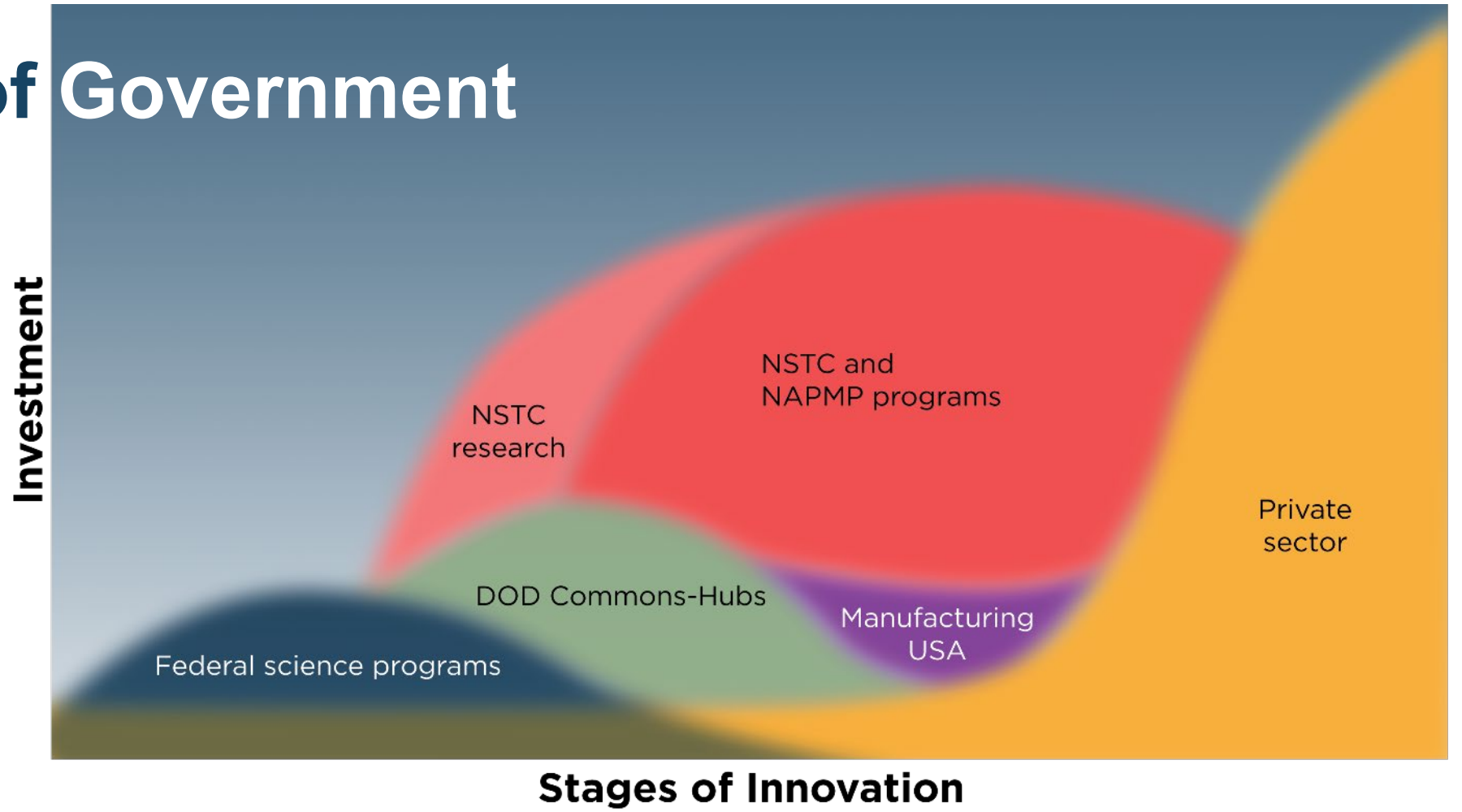
FOR SCIENTISTS, ENGINEERS, AND TECHNICIANS

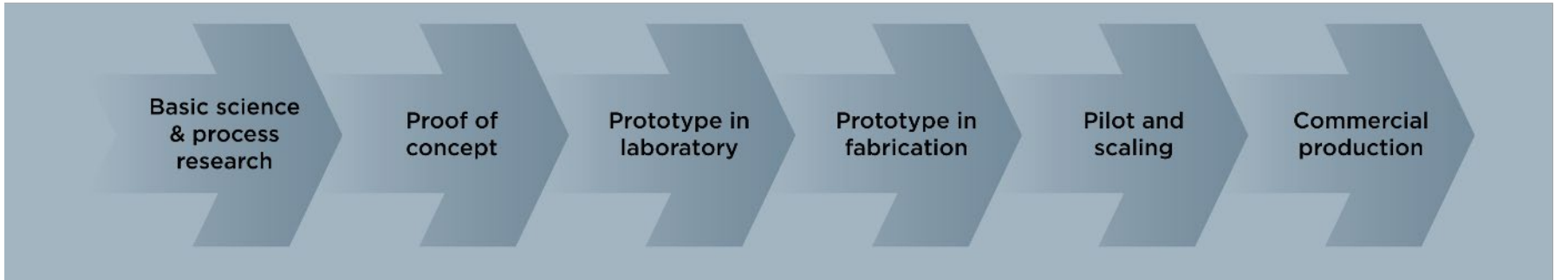
- Outreach to groups, including underrepresented communities
- Support scale-up of existing quality programs
- Develop novel approaches to training

Membership Examples

- Businesses of all sizes and at all stages
- Fabless companies
- Foundries
- Integrated device manufacturers
- Equipment vendors
- Materials suppliers
- Research institutions, including minority serving institutions
- Community colleges
- State and local governments
- National labs
- Labor unions
- Investors

Whole of Government





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Governance Recommendations

"Establish NSTC as an independent legal entity in public-private partnership by the end of 2023. The Secretary of Commerce should select a Board of Directors, and that Board should oversee both the NSTC and the NAPMP to ensure synergy and alignment in the investments. The Board members should include broad representation from government, industry, and academia."

PCAST Report on Revitalizing the U.S. Semiconductor Ecosystem

- "Structure the NSTC as a new and independent non-profit utilizing the Department's Other Transaction Authority"
- "Recruit a highly respected executive with deep technical expertise and senior level leadership experience in the semiconductor industry to serve as the CEO of NSTC"

DOC Industrial Advisory Committee PPP Working Group

Governance Overview

Goals:

- Agile, fast-moving, flexible
- Responsive, accountable
- Neutral, trusted, science-driven
- Expert, independent
- World-class leadership
- Visionary
- Dedicated to the public interest
- Long-lasting

Steps:

1. The Secretary of Commerce, in collaboration with the Secretary of Defense, will establish the NSTC through the creation of a public-private consortium as required by the CHIPS Act.
2. The Department anticipates the creation of a new, purpose-built, independent, nonprofit entity with the requisite neutrality, expertise, leadership, and capacity to serve as the operator of the NSTC.
3. The Department anticipates entering into an agreement with the NSTC operator that will include the processes for receiving government funds, program scope, and accountability.

Operating Structure

Member Advisors

General

Technical

Workforce

NSTC Consortium

NSTC Nonprofit Operator
Board of Trustees & CEO

Headquarters
Administration
Research
Workforce programs

Venture Fund
Member Services
USG Relations
Convenings

CHIPS R&D Office

Funding, oversight, support

Technical Centers

Examples: Prototyping facility, affiliated university lab, specialized equipment access, etc.

Affiliated facility

Affiliated facility

Affiliated facility

Advanced packaging facility (in coordination with NAPMP)

TODAY

April 26, 2023	A call for nominations for a short-term Selection Committee
	The committee, acting independently of the Department, will select the board of trustees that will form a non-profit
	The Department anticipates that the non-profit will serve as the operator for the NSTC

FEDERAL REGISTER
The Daily Journal of the United States Government

Notional timeline based on expectations at the time of the release of *A Vision and Strategy for the NSTC* on April 25, 2023.

R&D TIMELINE

April 2023	• A Vision and Strategy for the NSTC • FRN for Selection Committee
May 2023	• Manufacturing USA summary of RFI responses • NIST Metrology Program paper on focus areas and next steps
Summer 2023	• Creation of nonprofit entity that the Department anticipates will serve as the NSTC Operator • NAPMP strategy paper
Fall 2023	• Creation of NSTC Consortium • CHIPS Incentives Program funding announcement for construction of R&D facilities
End 2023	• NSTC membership details and first program offerings