# NIST Laboratory Strategic Priorities Update

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# Administration S&T Priorities

> How can the United States secure its position as the unrivaled world leader in critical and emerging technologies — such as **artificial intelligence**, **quantum information science**, and nuclear technology — maintaining our advantage over potential adversaries? We need to accelerate research and development, dismantle regulatory barriers, strengthen domestic supply chains and manufacturing, spur robust private sector investment, and advance American companies in global markets.


> In a moment of strategic significance, we must be more creative in our use of public research and development money, and shape a funding environment that makes clear what our national priorities are. Whether in **AI**, **quantum**, **biotech**, or **next-generation semiconductors**, in partnership with the private sector and academia, it is the duty of government to enable scientists to create new theories and empower engineers to put them into practice.

# Emerging Technology Strategic Priorities

1. **Accelerate Innovation in Critical and Emerging Technologies of the Future**
   Buildout and scale-up of the U.S. quantum industrial base, solidify American dominance in AI innovation, harness the power of biotechnology, and grow U.S. leadership in semiconductors.

2. **Bolster American Leadership in Standards**
   U.S. engagement and leadership in international standards for critical and emerging technologies (CETs) to promote U.S. trade, and standards policy coordination across the U.S. government.

3. **Accelerate the Commercial Adoption of U.S. Innovations**
   Adoption and commercialization of federally funded scientific discoveries and technology advancements in CETs at the pace of industry.

4. **Build 21st Century Research Infrastructure to Unleash CET Innovation**
   Construct world-class facility infrastructure and equip NIST with the required laboratory environments to drive innovation in Gaithersburg, MD, and Boulder, CO, campuses.

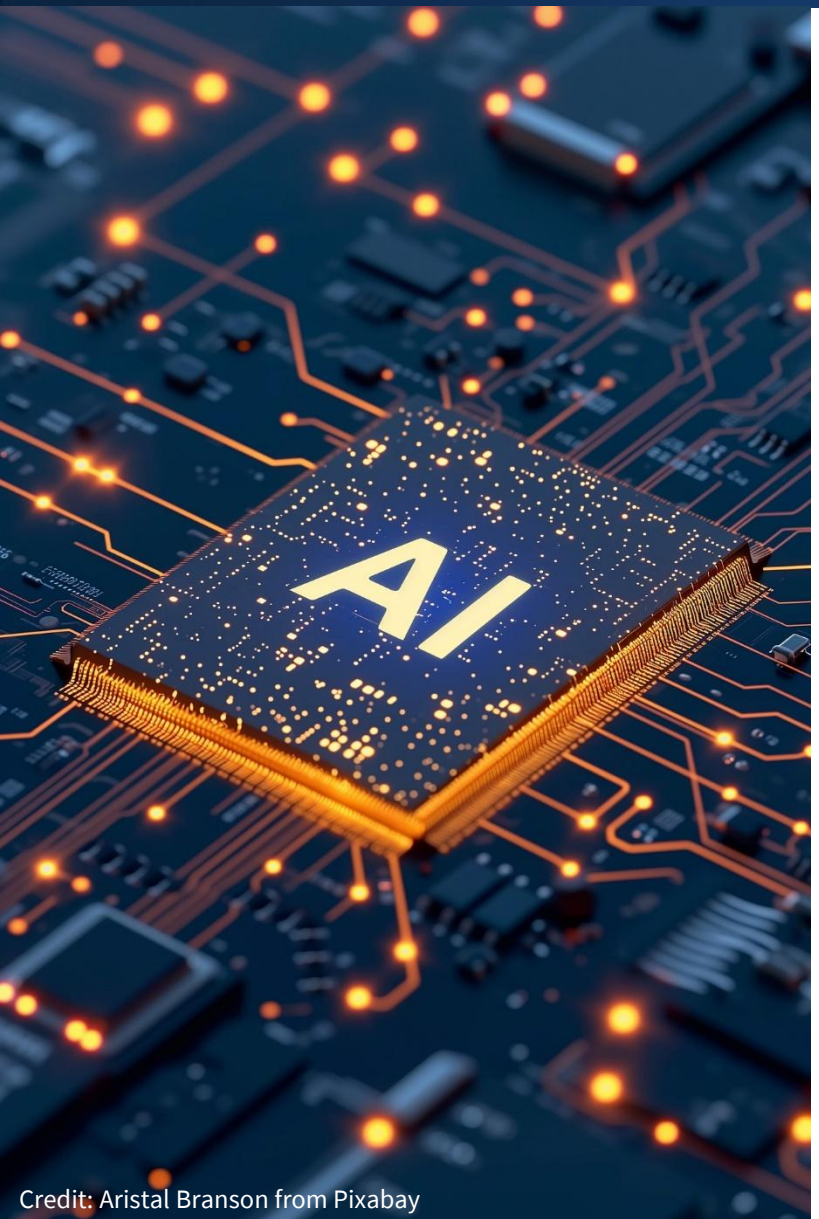
# Accelerate the Buildout and Scale-Up of the U.S. Quantum Industrial Base

NIST will advance U.S. quantum sector leadership and accelerate:

- Manufacturing of **new quantum sensors**.
- Manufacturing of **scalable, high-performance quantum components**.
- **Development of quantum networks**, including deployable atomic clocks.

Credit: NIST/CTL

# Solidify American Dominance in AI Innovation



Credit: Aristal Branson from Pixabay

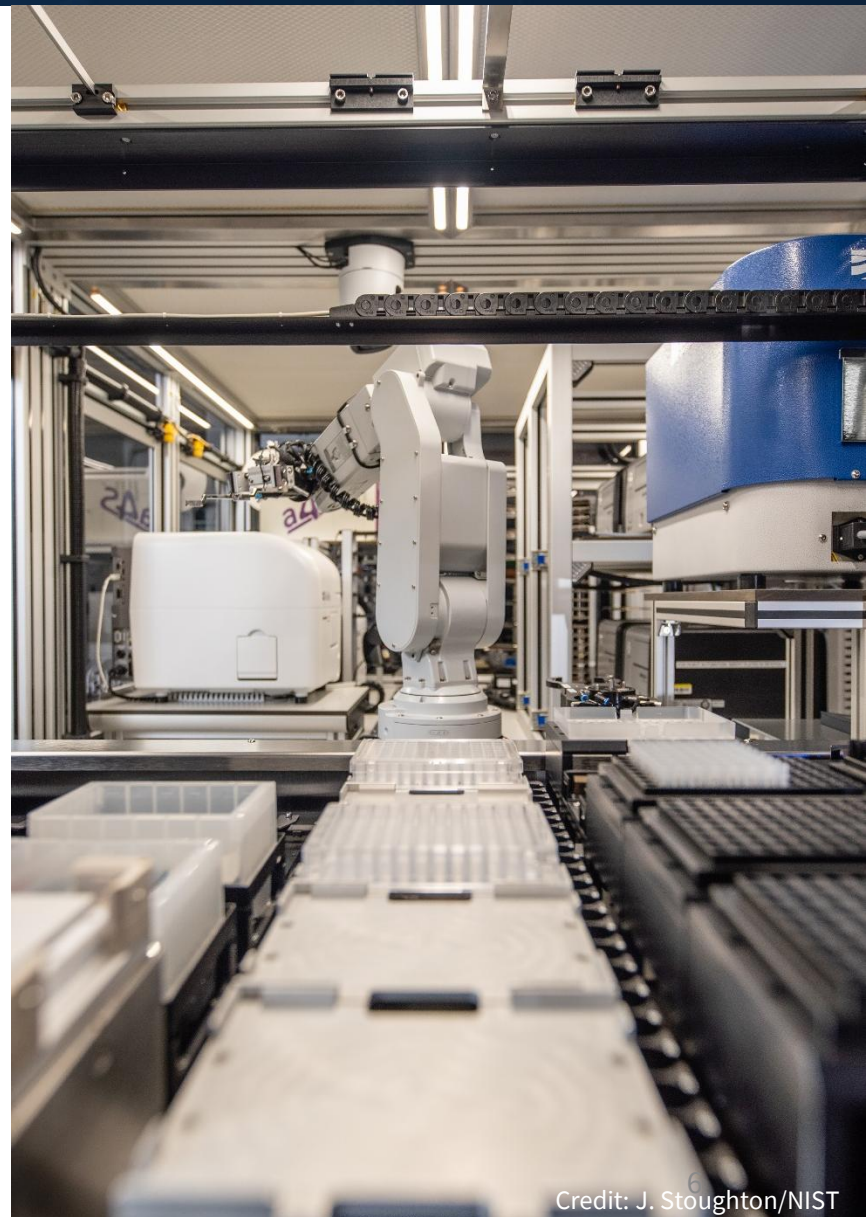
NIST will catalyze American AI innovation and accelerate:

- Development and adoption **of AI-driven** autonomous agents for increased **U.S. manufacturing productivity**.
- Development and adoption of **AI-based agents** to **protect and secure U.S. critical infrastructure** from cyberthreats.
- Adoption of American AI products by driving consistency in the **measurement of AI system performance, reliability, and security**.
- Abilities to rapidly **evaluate the capabilities of AI systems** to promote American AI innovation.

# Harness the Power of Biotechnology

NIST will unlock the potential of biotechnology and biomanufacturing to solve U.S. industry challenges and partner with U.S. industry to accelerate:

- **U.S.-based adoption** of emerging biotechnologies and development of biomanufactured products.
- Drug development and manufacturing of **new fit-for-purpose biological reference materials and reference data**.
- Development of **AI-enhanced biotechnology solutions**.



Credit: J. Stoughton/NIST

# NIST Emerging Technology Accelerators

*NIST Strategy for American Technology Leadership in the 21st Century*

Accelerator
Driving significant U.S. industrial impacts in 3-4 years

Hub

**NIST Research Laboratories**

**Portfolio-Based Focused Co-Development**

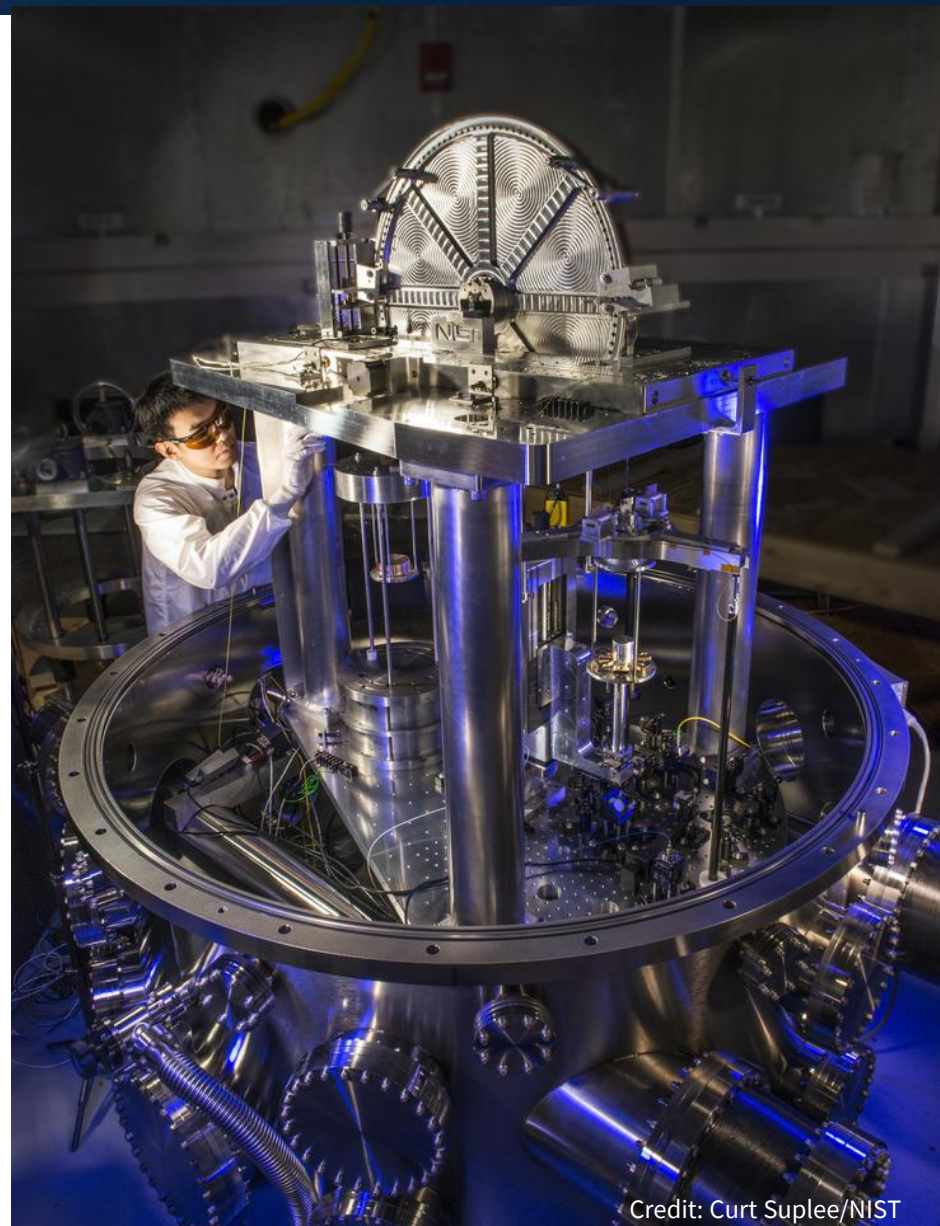
Spoke(s)

**Acceleration Center(s)**
Amplification of NIST research with essential private sector capabilities

**Disruptive/Transformative Technology Advancements (3X/5X/10X)**
adopted by industry

# Hub-and-Spoke Co-Development Model

- Implement adaptive and synergistic public-private partnerships using a **hub-and-spoke** model to accelerate transformative technology advances and industry adoption in strategic priority areas
- **“Hubs”**: Leverage **NIST’s core research and standards mission** capabilities
- **“Spokes”**: Leverage **essential industry capabilities** to co-develop, pilot, and implement transformative technology advances
- Demonstrate **near-term technology adoption impacts** (3X/5X/10X performance improvement)



Credit: Curt Suplee/NIST

# Portfolio-Based R&D Approach

- Accelerate technology advancement and adoption to tackle focused RDT&E grand challenges for the emerging technology
- Adopt a portfolio-based approach combining foundational and applied laboratory-based R&D to enable NIST to evolve with longer term changes to national priorities
- Catalyze private sector investments to scale the technology

# AI Accelerator Update

- Accelerate development and adoption of **AI-driven autonomous agents** for increased **U.S. Manufacturing Productivity**.
  - Advance AI-based “human-in-the-loop” robotics and autonomous systems.
  - Unleash innovation to adaptably produce cost-competitive, high-value, and customizable American products (e.g., high-mix, low-volume manufacturing).
- Accelerate development and adoption of **AI-based agents** to **Secure U.S. Critical Infrastructure from Cyberthreats**.
  - Advance AI-based agents for ultra-highspeed cyberthreat detection and remediation to protect and secure critical infrastructure grids (power, telecom, water, finance, health).

# Directors of the Acceleration Centers

Credit: NIST

**Andrew Wilson**
Director of the Quantum Technologies Accelerator

Credit: NIST

**Katerina Megas**
Director of the Artificial Intelligence Accelerator

Credit: NIST

**John Marino**
Director Designee of the Biotechnology Accelerator

# Thank you

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