NSF 2023 INDUSTRY CONVENING

Accelerating Research to Impact

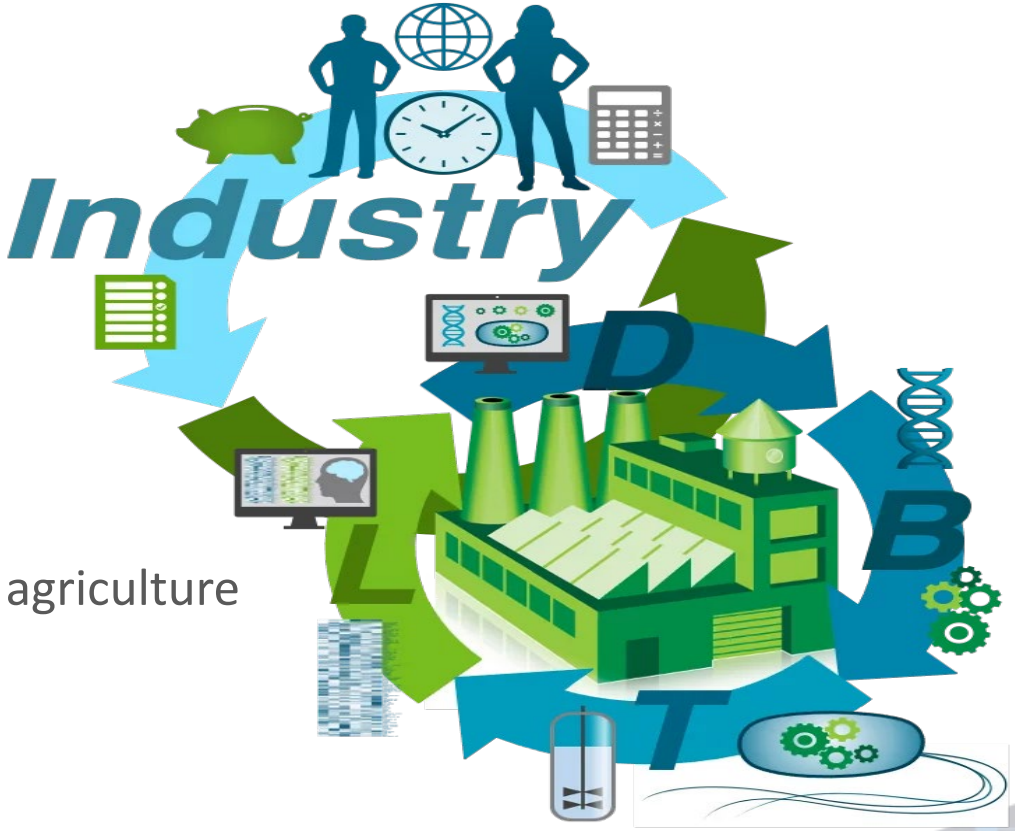
DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS (TIP)

OFFICE OF INTEGRATIVE ACTIVITIES (OIA)

OFFICE OF INTERNATIONAL SCIENCE & ENGINEERING (OISE)

Directorate for Biological Sciences (BIO)

BIO advances discovery and innovation across all scales of biological organization — from molecules to the global biosphere, from cells to organisms to communities, across time and space — that leads to societal impact.



Priorities:

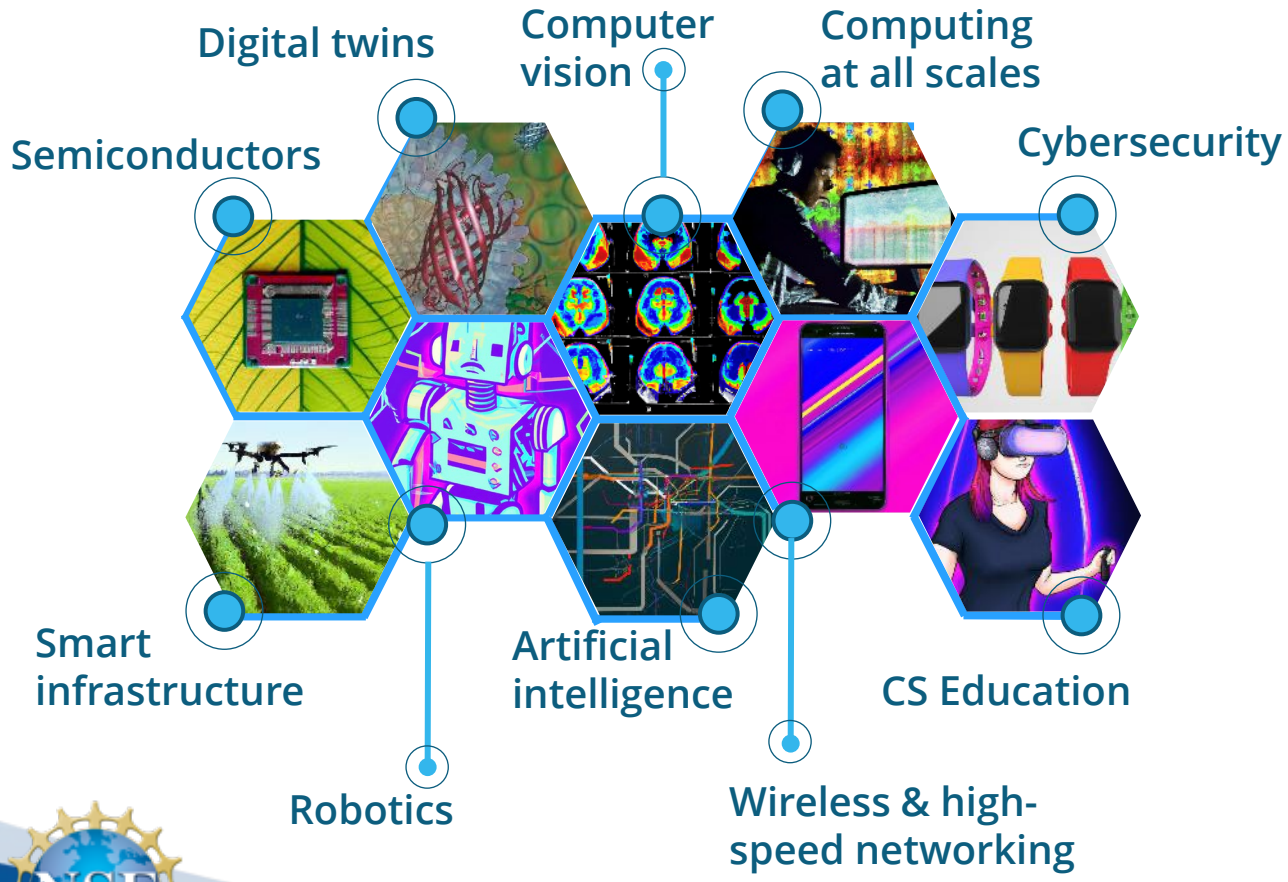
- Societal benefit:
  - Climate change
  - Sustainable food production
  - Pandemic prevention
  - Biotechnology and biomanufacturing
  - Conservation
  - Testbeds that enable innovation in health and agriculture
- Workforce development

Contact:

- *Brent Miller, bmiller@nsf.gov*

Computer & Information Science & Engineering

Mission: Advance & accelerate U.S. leadership in computing, communications, information science & engineering



images: DALLE 2 Open AI; Vincent Rotello, Department of Chemistry, University of Massachusetts-Amherst

CISE Partnership Priorities & Models

- Direct partnerships: co-investments and in-kind resources on a program level
  - *AI Institutes: Accenture, Amazon, Google, IBM, Intel*
  - *FUSE: Ericsson, IBM, Intel, Samsung*
- Catalyzed partnerships: co-investments and other relationships on awarded projects
  - *Frontera HPC: Dell, NVIDIA, Mellanox,…*
  - *PAWR: ~30 partners from wireless industry*

CISE Partnership POCs

- Margaret Martonosi, CISE Assistant Director mmartono@nsf.gov
- Joydip Kundu, CISE Deputy Assistant Director jkundu@nsf.gov
- Representatives: Bill Miller & Heather Masson-Forsythe

Directorate for STEM Education (EDU)

The Directorate for STEM Education works to develop a well-informed citizenry and a diverse and capable workforce of scientists, technicians, engineers, mathematicians and educators. EDU's programs support STEM education at all educational levels and in a variety of settings.

- **Current Partnership Highlights:**
  - *EDU is partnering with Intel to improve and make more equitable STEM education at two-year colleges and four-year universities, including minority-serving institutions, especially focused on semiconductor manufacturing education, research and design.*
  - *EDU is collaborating with Schmidt Futures to broaden access to data science education for grade 6-12 students and teachers in partnerships with academia, industry, and other community organizations. Education experiences strengthen data science curricula, classroom activities, and teacher professional development opportunities.*
- **Priorities for Partnering with Industry:**
  - *EDU funds cutting-edge research across all STEM disciplines, including investments in teaching and learning using emerging technologies (e.g., AI, robotics, immersive or augmenting technologies) as well as the education and training of technicians in high technology fields that drive our nation's economy (e.g., advanced manufacturing, micro- and nano-, security, geospatial, and autonomous technologies). EDU also invests in teacher education and education from pre-K12, through 2- and 4-year institutions of higher education, and graduate education. EDU is also one of the largest funders of afterschool and informal STEM education.*
- **Directorate Partnership POC:**
  - *Jolene Jesse, Acting Deputy Assistant Director, jjesse@nsf.gov*

Directorate for Engineering (ENG)

Investments in engineering research and education are critical building blocks for the nation's future prosperity. Engineering breakthroughs address national challenges, such as smart manufacturing, resilient infrastructure, and sustainable energy systems. Engineering also brings about new opportunities in areas ranging from advanced photonics to prosthetic devices.

Current (Direct) Partnership Highlights:

- *DuPont: Engineering Research to Advance Solutions for Environmental PFAS (ERASE-PFAS)*
- *Semiconductor Research Corporation (SRC): Research Experiences for Undergraduates (REU)*

DUPONT

Semiconductor Research Corporation

Priorities for Partnering with Industry

Clean Energy Technologies and Integrated Power Systems • Advanced Manufacturing (Including Biomanufacturing) • Circular Economies • Next-gen Microelectronics and Wireless Systems/Technologies • Climate Adaptation and Mitigation • Education and Workforce Training in a Changing Research and Technology Landscape

Directorate Partnership POC

Brandi Schottel
bschotte@nsf.gov

Directorate for Geosciences (GEO)

GEO: What It Does - What It Does for You!

Generates knowledge and technological innovations to understand the Earth, atmosphere, ocean, climate, space weather, and polar regions to build a resilient planet, economy, nation, and world.

GEO Industry Partnering Highlights

6 Industry-University Cooperative Research Centers (IUCRC) – 80 involved companies (large, medium, small)

Extreme weather and the electrical grid
Geohazard Mitigation
Mining/Critical Minerals
Sensor/Instrumentation Development
Wildfire
Marine Fisheries

Priorities for Partnering: A resilient planet = a resilient business

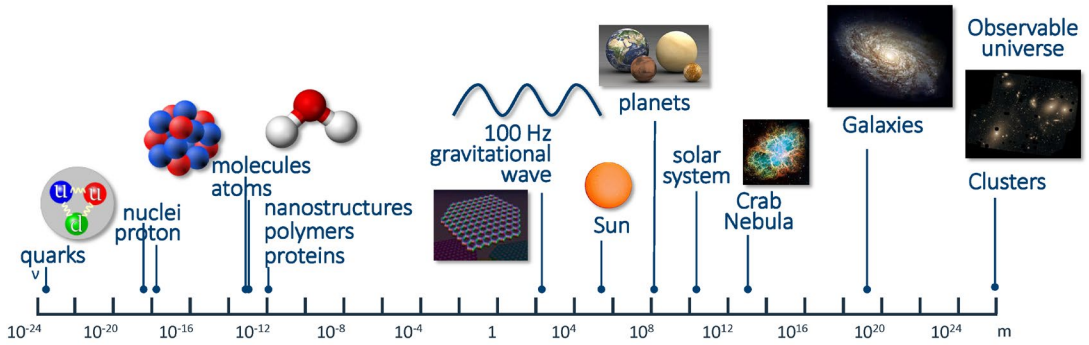
- Extreme weather forecasts to assess operation and supply chain risks and mitigation
- Solving the climate crisis: emission monitoring, reduction and CO2 sequestration
- Accelerated discovery of critical metals and new clean energy sources

GEO Points of Contact:

- Doug Kowalewski *(dkowalew@nsf.gov) 703-292-2181*
- Barbara Ransom *(bransom@nsf.gov) 703-292-7792*

Directorate of Mathematical and Physical Sciences (MPS)

- Directorate Statement:
  - *MPS advances the foundations of the physical and mathematical sciences, transforming our understanding of the world around us across many orders of magnitude in time, space, and complexity. To that end, we develop the technologies, instruments, tools, and techniques that allow us to explore the very small or very brief (elementary particles), the very large and very old (our universe), and the complex (biomaterials)*



- Current Partnership Highlights:
  - *Centers/Institutes: Our* Materials Research Science and Engineering Centers *(MRSEC) last year had nearly **125** individual industrial partners, generating ~ 60 awarded patents (at ~ **50%** success rate) with 30 patent licenses per year, and founded **198** companies since 1985 of which ~ **50%** are still active; our* Quantum Leap Challenge Institutes *(QLCI), although new, are on track to match that record with **70** industrial partners*
  - *Single Investigator efforts across MPS have developed **hundreds** of indirect industrial partnerships focusing on chemistry, clean energy, sustainability, semiconductors, and workforce development; many additional direct partnerships through GOALI.*

- Priorities for Partnering with Industry:
  - *Sustainable Chemistry; Biotechnology; AI-driven research/laboratories for materials design, development, characterization; Semiconductors; Digital Twins; Quantum Information Science*

- Directorate Partnership POC:
  - *Saul Gonzalez, Senior Science Advisor for Strategy and Engagement (sgonzale@nsf.gov)*

Social, Behavioral, and Economic Sciences (SBE)

- Directorate Statement:
  - *The "SBE" directorate supports basic research on people and society. The science we fund focuses on human behavior and social organizations and how social, economic, political, cultural, and environmental forces affect the lives of people from birth to old age and how people in turn shape those forces.*

- Current Partnership Highlights:
  - *With Social Science Research Council: Advancing knowledge about public health guidance*
  - *With William T. Grant Foundation: Increasing impact of research about youth*
  - *With America's Data Hub Consortium: Promoting the use of official statistics for evidence-based decision-making*

- Priorities for Partnering with Industry:
  - *Strengthening human resilience, security, and quality of life*
  - *Growing SBE science and research capacity at minority-serving institutions*
  - *Increasing use of science and engineering information, data, and statistics*
  - *… and many more!*

- Directorate Partnership POC:
  - *Dr. Andy DeSoto, SBE Senior Advisor for Partnerships and Innovation, kadesoto@nsf.gov*

Office of Integrative Activities (OIA)

- Directorate Statement:
  - *OIA focuses on expanding the impact of NSF by working across the agency unifying activities. OIA works to break down interdisciplinary boundaries in STEM to advance interdisciplinary research and innovation across the US, develop critical infrastructure for the nation's research enterprise, and develop a diverse and engaged next generation of scientists and engineers. (Eclectic Generalists)*
- Current Partnership Highlights:
  - *Driver of geographic diversity the Established Program to Stimulate Competitive Research*
  - *Research Infrastructure Improvement (RII) Track 4: Research Fellows NASA partnership brings students from underrepresented population to engage in research at NASA Centers.*
- Priorities for Partnering with Industry:
  - *Broadening Participation, Infrastructure and Capacity Building, Convergence Research*
  - *Brokering Partnerships*
- Directorate Partnership POC:
  - *Dina Stroud (dstroud@nsf.gov)*