LEWIS–BURKE ASSOCIATES LLC

Funding Opportunity: NSF Releases Solicitation for Science and Technology Centers (STC): Integrative Partnerships

Lewis-Burke Associates LLC – August 13, 2024

The National Science Foundation (NSF) has released the latest solicitation for the flagship Science and Technology Centers: Integrative Partnerships program. Science and Technology Centers (STCs) support innovative, complex research and education projects that require large-scale and long-term awards. As for recent solicitations, NSF defines STC as being focused on "creating new scientific paradigms, establishing entirely new scientific disciplines and developing transformative technologies which have the potential for broad scientific or societal impact." This STC competition is open to all areas of science and engineering supported by NSF and there are no priority research areas identified in the solicitation.

STCs should involve a range of partners including institutions of higher education, national laboratories, industry, international partners, and other public or private research entities. As for the previous STC competition, NSF is encouraging participation of groups traditionally underrepresented in STEM. According to the solicitation, "Centers may use either proven, or innovative mechanisms based on the relevant literature, to address issues such as recruitment, retention, success, and career progression of *all* individuals in the Center." NSF seeks to ensure a diverse portfolio of centers including "diversity among types of institutions leading centers and diversity amongst center directors." STCs are expected to foster excellence in education and enable integration with research to fully connect learning and inquiry. As well as research, education, and broadening participation, Centers are also required to carry out activities to advance knowledge transfer with other STCs and external stakeholders.

According to the solicitation, all STCs must include the following features:

- "Be focused on exceptionally innovative, complex research and education projects that require large-scale, long-term funding;
- Be based at an institution of higher education which assumes responsibility for oversight of sub-awards to all other partner institutions;
- Be directed by a faculty member with experience in leading research teams;
- Demonstrate institutional commitment to achieving strategic goals that are shared by the lead and other partnering institutions;
- Establish multi-institutional collaborations or linkages with other universities/colleges, national laboratories, research museums, private sector research laboratories, state and local government organizations, and international collaborations, as appropriate;
- Develop a management plan that integrates the research, education, broadening participation, and knowledge transfer activities across all partners and affiliates;
- Incorporate teams at all organizational levels of the Center that represent the full spectrum of diverse talent that society has to offer and include members of groups underrepresented in STEM;
- Provide research and education opportunities for U.S. graduate and undergraduate students, postdoctoral researchers and faculty that will result in outcomes consonant with the Center's goals;

- Facilitate knowledge transfer through significant intellectual exchange between the Center and various types of institutions and organizations (e.g., nonprofit organizations; national laboratories; industry; Federal, state, and local governments); and,
- Establish and convene at least annually an External Advisory Committee to provide guidance, advice, and oversight."

Preliminary proposals will be evaluated on the "vision and potential impact of the research proposed" rationale for STC-scale funding, the quality and ambition of the research plan, whether the partnerships and participants are appropriate, and if integration strategies for areas such as knowledge transfer, education, and broadening participation activities are included.

Lewis-Burke encourages teams to engage with relevant program officers at NSF to discuss research ideas. Note that the solicitation specifically states that STC proposals related to polar research should contact appropriate Office of Polar Programs (OPP) program officers during proposal development.

Total Funding, Award Size, and Budget Information: Pending funding availability, NSF intends to award a total of $30 million in fiscal year (FY) 2026 for up to five new STCs. STCs may propose a budget of up to $6 million per year for an initial five-year period, with the possibility of an additional five years of funding. Funding will be made through a cooperative agreement with NSF.

Eligibility: Preliminary and invited full proposals may be submitted by U.S. academic institutions with doctoral degree-granting research and education programs in any area of research supported by NSF. The PI is required to be full- time faculty and must "have an established record of leading research teams."

Institution and PI Limitations: An institution may submit up to three preliminary proposals as the lead institution, but NSF will not support more than one Center from any lead institution in this competition. There is no limit on the number of proposals in which an organization participates as a partner.

A PI or co-PI on one proposal in this competition may not be a participant in another STC proposal in the same competition. A PI or co-PI on a proposal that is declined at any stage may then participate in another STC proposal. The solicitation further states that past members of STCs may participate only if the themes "are substantially different from those they pursued with prior NSF Center support" and emphasizes that proposals to extend methods or intent of a previous STC will be rejected without review.

Partners: Lead institutions are expected to develop partnerships with other organizations, including other universities and colleges; national laboratories; research museums; private sector research laboratories; state and local government laboratories; and, when appropriate, international organizations. While not every partner must support all Center activities, all the expected features of the Center must be accomplished through the partners' activities. Related to broadening participation, "NSF encourages IHEs that enroll, educate, graduate, and employ individuals who are members of groups underrepresented and/or under-served in STEM education programs and careers to lead, partner, and contribute to NSF opportunities, including leading and designing STEM research and education proposals for funding."

Preliminary Proposals: Preliminary proposals are required and are **due November 20, 2024**. Detailed information on what should be included in the preliminary proposal is included in the solicitation.

Full Proposals and Competition Timeline: NSF will accept full proposals *by invitation only.* Those invited for full proposals will be informed in late February 2025**. Invited full proposals are due June 2, 2025.** Notification of site visits will occur in late September 2025, with site visits held from October to December 2025. Awards are anticipated to start on September 1, 2026.

Information on Previous STC solicitation: The previous STC solicitation was released in October 2021, and four awards totaling NSF investment of $120 million were announced in September 2023: Science and Technology Center for Quantitative Cell Biology (QCB); New Frontiers of Sound Science and Technology Center (NewFoS); Center for Complex Particle Systems (COMPASS); and Center for Braiding Indigenous Knowledges and Science (CBIKS). Additional information on current and graduated STCs is included in Appendix 1. The STC competition is very competitive, previous competitions have attracted around 250 preliminary proposals with 20-40 full proposals invited, around 10-15 sites visited, and three to six new centers funded.

Sources and Additional Information:

- The STC program page is available at https://new.nsf.gov/funding/opportunities/science-technology-centers-integrative.
- The complete STC solicitation is available at https://new.nsf.gov/funding/opportunities/science-technology-centers-integrative/nsf24-594/solicitation.
- Complete details of the STC program, including information on current and past awards, are available on the NSF website at https://new.nsf.gov/od/oia/ia/stc
- NSF announcement of 2023 awardees: https://new.nsf.gov/od/oia/ia/stc#news-14a.

Appendix 1: Active NSF Science and Technology Centers (STCs)

Information from https://new.nsf.gov/od/oia/ia/stc#active-centers-c98.

Center	Lead Institution	NSF Program Area	Partners	States Represented	Class	Area of Research
Science and Technology Center for Quantitative Cell Biology (QCB)	*University of Illinois at Urbana-Champaign*	Biological Infrastructure	Harvard Medical School; J. Craig Venter Institute	Three	2023	Whole Cell Biology
New Frontiers of Sound Science and Technology Center (NewFoS)	*University of Arizona*	Materials Research	California Institute of Technology; City University of New York; Georgia Institute of Technology; University of Alaska Fairbanks; UCLA; University of Colorado Boulder; Wayne State University; and Spelman College	Seven	2023	Topological acoustics
Center for Complex Particle Systems (COMPASS)	*University of Michigan - Ann Arbor*	Materials Research	University of Illinois Urbana-Champaign; Northeastern University; University of Southern California; Wayne State University; Chicago State University; North Carolina State University; and Formative Evaluation Research Associates	Five	2023	Additive manufacturing
Center for Braiding Indigenous Knowledges and Science (CBIKS)	*University of Massachusetts Amherst*	Behavioral and Cognitive Sciences	Northern Arizona University; University of Maine; University of California, Santa Cruz; University of Washington; Montana State University; Western Washington University; Huliauapa'a; Alaska Pacific University; New York University; College of Menominee	Ten+	2023	Environmental change/ Indigenous knowledge

			Nation; University of Michigan; Gedakina; and SUNY College of Environmental Science and Forestry. CBIKS also includes partnerships with 57 Indigenous communities.			
Center for Chemical Currencies of a Microbial Planet (C-CoMP)	*Woods Hole Oceanographic Institution*	Geosciences: Ocean Sciences	University of Virginia; Columbia University; University of Georgia; Marine Biological Laboratory; Bermuda Institute of Ocean Sciences; Stanford University; Boston College; Ohio State University; Massachusetts Institute of Technology; Boston University; University of Texas Rio Grande Valley; and University of Florida.	Eight	2021	Surface ocean carbon flux
Science and Technologies for Phosphorus Sustainability Center (STEPS)	*North Carolina State University*	Engineering: Civil, Mechanical, & Manufacturing Innovation	Arizona State University; University of Florida; RTI International; Appalachian State University; Marquette University; University of Illinois Urbana-Champaign; North Carolina A&T State University; and UNC Greensboro.	Five	2021	Phosphates
Center for Learning the Earth with Artificial Intelligence and Physics (LEAP)	*Columbia University*	Geosciences: Atmospheric and Geospace Sciences	New York University; University of California, Irvine; University of Minnesota; and Teachers College, Columbia University.	Three	2021	AI/Earth Systems
Center for OLDest Ice EXploration (COLDEX)	*Oregon State University*	Geosciences: Polar Programs	American Meteorological Society; Dartmouth College; University of California, Berkeley; University of	11	2021	Climate science

			California, Irvine; University of California, San Diego; the University of Kansas; the University of Maine; The University of Texas, the University of Washington; University of Minnesota Duluth; University of Minnesota Twin Cities; Princeton University; Amherst College; and Brown University.			
Center for Research On Programmable Plant Systems (CROPPS)	*Cornell University*	Biological Sciences: Biological Infrastructure	University of Illinois Urbana-Champaign; University of Arizona; and Boyce Thompson Institute.	Three	2021	Plant Systems
Center for Integration of Modern Optoelectronic Materials on Demand (IMOD)	*University of Washington*	Mathematical and Physical Sciences; Materials Research	University of Pennsylvania; Lehigh University; City University of New York; Columbia University; Georgia Institute of Technology; Northwestern University; University of Chicago; University of Colorado Boulder; University of Maryland, College Park; and University of Maryland, Baltimore County.	Seven	2021	Optoelectronics
Center for Bright Beams	*Cornell University*	Mathematical and Physical Sciences; Physics Research	University of Chicago; Chicago State University; the University of California, Los Angeles; the University of Florida; the University of Maryland; Brigham Young University; Morehouse College; Clark Atlanta University; the University of Toronto; the Fermi National Accelerator	Seven	2016	Accelerator Technologies

			Laboratory; the Lawrence Berkeley National Laboratory; and TRIUMF			
Center for Cellular Construction	*University of California-San Francisco*	Biological Sciences: Biological Infrastructure	*University of California, Berkeley; San Francisco State University; Stanford University; the IBM Almaden Research Center; and the Exploratorium*	One	2016	Cell biology
Science and Technology Center for Engineering Mechano-Biology	University of Pennsylvania	Engineering: Civil, Mechanical, & Manufacturing Innovation	Washington University in St. Louis; the University of Maryland; the New Jersey Institute of Technology; Bryn Mawr College; Alabama State University; and Boston University	Six	2016	Mechanobiology
Science and Technology Center on Real-Time Functional Imaging (STROBE)	*University of Colorado at Boulder*	Mathematical and Physical Sciences; Materials Research	*Fort Lewis College; Florida International University; the University of California, Berkeley; the University of California, Irvine and the University of California, Los Angeles.*	Three	2016	Imaging

Graduated NSF Science and Technology Centers (STCs)

Information from https://new.nsf.gov/od/oia/ia/stc#graduated-centers-530.

Center	Lead Institution	NSF Program Area	Partners	States Represented	Class	Area of Research
A Center for Brains, Minds, and Machines: the Science and Technology of Intelligence (CBMM)	Massachusetts Institute of Technology	Computer & Information Science & Engineering; Computing and Communications Foundation	*Allen Institute for Brain Science; Cornell University; Harvard University; Howard University; Hunter College; MIT; Rockefeller University; Stanford University; UCLA; Universidad Central del Caribe Puerto Rico; University of Puerto Rico - Rio Piedras; Wellesley College*	Four	2013	Information Science / Neuroscience
Center for Integrated Quantum Materials (CIQM)	*Harvard University*	Mathematical and Physical Sciences; Materials Research	*Massachusetts Institute of Technology; Museum of Science, Boston*	One	2013	Materials Science
Biology with X-Ray Free Electron Lasers (BioXFEL)	*University at Buffalo*	Biological Sciences: Biological Infrastructure	*Arizona State University; CFEL Science; Cornell University; The Hauptman-Woodward Institute; Lawrence Berkeley National Laboratory; Lawrence Livermore National Laboratory; Rice University; Stanford University; University of California – Davis; University of California - San Francisco; University of Wisconsin - Milwaukee*	Six	2013	Biology
Center for Dark Energy Biosphere	University of Southern California	Geosciences; Ocean Sciences	University of Alaska, Fairbanks; University of California, Santa	Four	2010	Environmental Science

Investigations (C-DEBI)			Cruz; University of Hawaii; University of Rhode Island			
Center for Energy Efficient Electronics Science (E3S)	University of California Berkeley	Engineering; Electrical, Communications, and Cyber Systems	Massachusetts Institute of Technology; Stanford University; The University of Texas at El Paso; Contra Costa College; Los Angeles Trade Technical College	Three	2010	Electrical Engineering
An NSF Center for the Study of Evolution in Action (BEACON)	Michigan State University	Biological Science; Biological Infrastructure	North Carolina A&T State University; University of Idaho; University of Texas at Austin; University of Washington	Five	2010	Ecology
Emergent Behaviors of Integrated Cellular Systems (EBICS)	Massachusetts Institute of Technology	Engineering; Chemical, Bioengineering, Environmental, and Transport Systems	Clark Atlanta University; Georgia Institute of Technology; Morehouse College; University of California, San Diego; University of Illinois at Urbana-Champaign; University of Michigan; University of Minnesota; University of Pennsylvania; Spelman College; Texas A&M	Eight	2010	Bioengineering
Center for Science of Information (CSoI)	Purdue University	Computer & Information Science & Engineering; Computing and Communications Foundation	Bryn Mawr College; Howard University; Massachusetts Institute of Technology; Princeton University; Stanford University; University of California, Berkeley; University of California, San Diego; University of Illinois at Urbana-Champaign	Seven	2010	Information Science
Center for Coastal Margin Observation and Prediction (CMOP)	Oregon Health and Science University	Geosciences; Ocean Sciences	Oregon State University; Saturday Academy; University of Maryland Center for Environmental Science; University of Utah; University of Washington; University of Wisconsin, Madison	Five	2006	Environmental Science

Center for Layered Polymeric Systems (CLiPS)	Case Western Reserve University	Mathematical and Physical Sciences; Materials Research	Cleveland Institute of Art; Cleveland Municipal School District Ohio Northern University; Fisk University; Naval Research Laboratory; Rochester Institute of Technology; Rose-Hulman Institute of Technology; State University of New York; University of Southern Mississippi; University of Texas at Austin	Seven	2006	Materials Science
Center for Microbial Oceanography: Research and Education (C-MORE)	University of Hawaii	Biological Sciences; Biological Infrastructure	Massachusetts Institute of Technology; Monterey Bay Aquarium Research Institute; Monterey Peninsula College; Oregon State University; University of California-Santa Cruz; Woods Hole Oceanographic Institution	Four	2006	Microbiology
ScCenter for Multi-Scale Modeling of Atmospheric Processes (CMMAP)	Colorado State University	Geosciences; Atmospheric and Geospace Sciences	Colorado College; Columbia University; Hampton University; Lawrence Livermore National Laboratory; National Center for Atmospheric Research; Pacific Northwest National Laboratories; The Catamount Institute; University of California, Los Angeles; University of California, San Diego; University of Colorado at Boulder; University of Maryland; University of Utah; University of Washington	Seven	2006	Environmental Science
Center for Remote Sensing	University of Kansas	Geosciences; Polar Programs	Elizabeth City State University; Ohio State University; NASA	Seven	2005	Environmental Science

of Ice Sheets (CReSIS)			Goddard Space Flight Center; NASA JPL; Pennsylvania State University; University of Maine			
Team for Research in Ubiquitous Secure Technology (TRUST)	University of California at Berkeley	Computer & Information Science & Engineering; Computing and Communication Foundations	Carnegie Mellon University; Cornell University; Mills College; San Jose State University; Smith College; Stanford University; University of California, Berkeley; Vanderbilt University	Five	2005	Cyber Security
Center for Advanced Materials for the Purification of Water with Systems (Waterscapes)	University of Illinois	Engineering; Chemical, Bioengineering, Environmental, and Transport Systems	Clark Atlanta University; Massachusetts Institute of Technology; National Risk Management Research Laboratory; Rose Hulman Institute; Rutgers University; Sandia National Laboratories; University of California at Berkeley; University of Notre Dame; Yale University	Eight	2002	Environmental Engineering
Center for Biophotonics Science and Technology (CBST)	University of California at Davis	Mathematical and Physical Sciences; Physics	Alabama A&M University; Fisk University; Lawrence Livermore National Laboratory; Mills College; Stanford University; University of California at Berkeley; University of California at San Francisco; University of Texas at San Antonio	Four	2002	Biophotonics
National Center for Earth-surface Dynamics (NCED)	University of Minnesota	Geosciences; Earth Sciences	Johns Hopkins University; Louisiana State University; Science Museum of Minnesota; Southern Illinois University Carbondale; St. Anthony Falls Laboratory; University of California at	Seven	2002	Environmental Science

			Berkeley; University of Colorado at Boulder; University of Illinois at Urbana-Champaign; University of Texas at Austin			
Center for Embedded Networked Sensing (CENS)	University of California at Los Angeles	Computer & Information Science & Engineering; Computing and Communication Foundation	California Institute of Technology; University of California, Merced; University of California, Riverside; University of Southern California	One	2002	Computer Science
Center for Integrated Space Weather Modeling (CISM)	Boston University	Geosciences; Atmospheric and Geospace Sciences	Alabama A&M University; Dartmouth College; Florida Institute of Technology, Melbourne; National Center for Atmospheric Research; Rice University; Science Applications International Corporation; Stanford University; University of California at Berkeley; University of Colorado at Boulder; University of Maryland	Nine	2002	Environmental Science
Center for Materials and Devices For Information Technology Research (CMDITR)	University of Washington	Mathematical and Physical Sciences; Materials Research	California Institute of Technology; Cornell University; Georgia Institute of Technology; New Mexico Highlands University; Norfolk State University; University of Arizona; University of Central Florida; University of Maryland, Baltimore County	Nine	2002	Materials Science