INTEGRATIVE ACTIVITIES (IA)

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(Dollars in Millions)					
	FY 2019	FY 2020	FY 2021	Change over FY 2019 Actual	
	Actual	(TBD)	Request	Amount	Percent
NSF Convergence Accelerator ¹	\$41.39	-	\$70.00	\$28.61	69.1%
EPSCoR ²	175.67	-	163.67	-12.00	-6.8%
CAREER	0.36	-	-	-0.36	-100.0%
Evaluation and Assessment Capability	3.00	-	3.00	-	-
Facility Operations Transition	-	-	10.00	10.00	N/A
Graduate Research Fellowship Program	142.29	-	137.64	-4.65	-3.3%
Growing Convergence Research	15.80	-	15.20	-0.60	-3.8%
HBCU Excellence in Research	15.20	-	9.50	-5.70	-37.5%
Major Research Instrumentation	75.11	-	61.70	-13.41	-17.9%
Mid-scale Research Infrastructure	60.04	-	32.67	-27.37	-45.6%
NSF 2026	6.01	-	-	-6.01	-100.0%
Planning and Policy Support ¹	3.73	-	2.00	-1.73	-46.4%
Research Experiences for Undergraduates	0.14	-	-	-0.14	-100.0%
Research Investment Communications	3.47	-	3.30	-0.17	-4.9%
STC Class of 2021	-	-	25.00	25.00	N/A
STC Admin	0.38	-	0.50	0.12	31.6%
Science & Technology Policy Institute	4.74	-	4.55	-0.19	-4.0%
Total	\$547.32	-	\$538.73	-\$8.59	-1.6%

¹ NSF Convergence Accelerator funding includes support for CA Planning and Development activities, which is part of NSF's total Planning and Policy Support (PPS) budget line within NSF's Organizational Excellence activities. Total IA funding for PPS in FY 2021 is \$4.0 million.

² No less than \$20.0 million in EPSCoR Co-funding will support Mid-scale RI Track 1 awards in EPSCoR jurisdictions.

The FY 2021 Budget Request for IA is \$538.73 million. This request highlights NSF's continuing emphasis on building capacity in research and research training across the United States.

About IA

The IA budget is managed by the Office of Integrative Activities (OIA), which is composed of four organizational units: NSF Convergence Accelerator (CA), Established Program to Stimulate Competitive Research (EPSCoR), Evaluation and Assessment Capability (EAC), and Integrative Activities.

IA investments catalyze transformational advances in science and technology by incubating new ideas and communities, supporting innovation in research and in NSF's own processes, and promoting the integration of research and education. They enhance the competitiveness of the Nation's research through activities that build capacity for science and engineering (S&E) and broaden participation in research and research training. They expand NSF's capability to gather and use evidence about the progress and impacts of its programs, and they nurture new cross-cutting programs, especially as S&E evolves toward more transdisciplinary, convergence-style research and education.

IA provides NSF stewardship support of two Big Ideas, Growing Convergence Research (GCR) and Midscale Research Infrastructure (Mid-scale RI), as well as the CA. Collectively, these activities expand NSF's capabilities to support innovative, transdisciplinary team science, advanced research infrastructure, and useinspired research.

IA provides funding for programs designed to enhance the capacity of jurisdictions, institutions, and individuals to conduct globally competitive research. IA's jurisdictional and institutional capacity-based programs include EPSCoR, NSF's Historically Black Colleges and Universities Excellence in Research (HBCU-EiR) program, and the Major Research Instrumentation (MRI) program. The Graduate Research Fellowship Program (GRFP) and the prestigious Alan T. Waterman honorary award are two programs that grow the capacity of the U.S. research enterprise by investing in and recognizing emerging talent. IA also supports a center-scale program, Science and Technology Centers: Integrative Partnerships (STC), that promotes discovery and innovation through collaborative research and knowledge transfer.

IA FY 2021 Activities

NSF Convergence Accelerator

• The CA enables NSF to move ideas from discovery into practice by identifying, nurturing, and funding use-inspired convergence research in areas aligned with Administration priorities. The CA will facilitate convergence activities in areas of national importance, especially by strengthening and expanding strategic, multi-sector partnerships and prioritizing the technologies that power Industries of the Future (IotF).

Established Program to Stimulate Competitive Research

- EPSCoR investments assist NSF in its statutory function "to strengthen research and education in the sciences and engineering, including independent research by individuals, throughout the United States, and to avoid undue concentration of such research and education."
- EPSCoR provides strategic programs and opportunities that stimulate sustainable improvements to EPSCoR jurisdictions' R&D capacity and capability. EPSCoR aims to stimulate research that enhances jurisdictional competitiveness in NSF disciplinary and multidisciplinary research programs, especially those that drive economic growth.

Evaluation and Assessment Capability

- EAC promotes and supports the rigorous generation and timely use of evidence across NSF. EAC invests in enhancing data access and quality, building methodological expertise, conducting research and evaluation studies, and developing analytic tools that make useful evidence available at key decision-making moments. These strategies help foster NSF's position as an innovator and leader in evaluating and assessing investments in S&E research, education, and infrastructure to support potentially transformative research ideas and build the S&E workforce.
- EAC collaborates with internal and external partners to conduct its work. Internally, EAC works with all NSF organizational units through a steering committee that provides advice and a working group that includes NSF staff engaged with EAC projects. Externally, EAC collaborates with partners in strategic initiatives; examples include (1) an ongoing collaboration with the National Institutes of Health on using machine learning to generate evidence, and (2) participation with OMB and an interagency council to develop guidance for program evaluation in fulfillment of the Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act) section 101(e).
- In FY 2021, EAC will continue to prioritize its response to OMB guidance on the implementation of the Evidence Act. This will include participation in meetings and councils (such as the Evaluation Officers Council) and preparation of deliverables specified in OMB's guidance, including NSF's evaluation policy, interim agency-wide learning agenda, and annual evaluation plan. Studies conducted to support this work include an agency-wide capacity assessment and several evaluations listed under "External Program Evaluations and Studies."

Facility Operation Transition

• Facility Operation Transition reflects NSF's strategic commitment to a smooth transition from MREFC to O&M funding of new major facilities, as well as achievement of a balanced portfolio between facilities and investigator research, both of which were emphasized in the NSB's Congressionally requested 2019 report entitled "Study of Operations and Maintenance Costs for NSF Facilities" (NSB-2018-17).¹ The Facility Operation Transition funding will be used to (1) partially support initial O&M of new facilities so that the full O&M costs can be gradually absorbed into the managing division or directorate, and (2) partially support divestment of lower-priority facilities, the full cost of which may significantly impact individual division or directorate funding.

Graduate Research Fellowship Program

• GRFP supports training tomorrow's leaders in the research community and contributes to building a diverse, highly skilled U.S. workforce. Funding for GRFP is split equally between IA and EHR. NSF's FY 2021 GRFP funding will support 1,600 new fellows. The program will continue to align awards with Administration priorities, including artificial intelligence, quantum information science, and other areas within the Administration's Industries of the Future initiative. Information on recent evaluations of GRFP may be found in the Graduate STEM Education narrative in the NSF-Wide Investments chapter.

Growing Convergence Research

• GCR, as an "enabling" Idea within NSF's Big Ideas, supports basic research that uses novel, transdisciplinary approaches to solve complex problems. The unifying characteristics of these undertakings are that: (1) they have the potential to make a significant impact, either on fundamental understanding in S&E or on the Nation's ability to meet pressing societal challenges, or both; and (2) they require the integration of knowledge, tools, and ways of thinking from multiple disciplines. GCR also aims to grow the next generation of convergence researchers. In FY 2021, GCR investments will support six to eight new exploratory research collaborations and the continuation of six to eight projects begun in FY 2019. For more information about GCR, see the narrative in the NSF-Wide Investments chapter.

Historically Black Colleges and Universities - Excellence in Research

• The HBCU-EiR program focuses on improving the research capacity and competitiveness of HBCUs by supporting new research opportunities at these institutions. IA will fund approximately 15 to 30 HBCU-EiR research grants managed by NSF's S&E directorates. A new solicitation will encourage new investigators and support projects with budgets similar to those typically supported by the research program(s) with which the proposals align. This may result in a change in the average award size relative to prior years.

Major Research Instrumentation

• MRI will continue to invest in shared-use S&E research instrumentation. Approximately 120 new awards will support instrument development and acquisition in all of NSF's S&E domains. MRI's investments also contribute to research-intensive learning environments that enhance the training of a diverse S&E workforce and facilitate partnerships between academia and the private sector.

Mid-scale Research Infrastructure

• The Mid-scale RI-1 activity funded through the IA budget within the R&RA account is one component of NSF's Mid-scale Research Infrastructure Big Idea. It aims to significantly advance the Nation's

¹ National Science Board, Study of Operations and Maintenance Costs for NSF Facilities (NSB-2018-17), May 2018, www.nsf.gov/pubs/2018/nsb201817/nsb201817.pdf.

capabilities for conducting potentially transformative research and maintaining U.S. leadership in global S&E. Mid-scale RI-1 investments support: (1) the implementation of research infrastructure projects between \$6.0 million and \$20.0 million; and (2) the design of future mid-scale or larger research infrastructure projects. In FY 2021, \$32.67 million will be available for investment in Mid-scale RI-1 projects in any jurisdiction. Additionally, the EPSCoR program will invest no less than \$20.0 million in Mid-scale RI-1 projects in EPSCoR jurisdictions. For more information about NSF's Mid-scale RI investments, see the NSF-Wide Investments chapter.

Planning and Policy Support (PPS)

PPS includes funding for Proposal Management Efficiencies, which comprises activities such as the NSF biennial survey and studies of NSF's merit review process. PPS supports annual agency awards (the Vannevar Bush Award, Public Service Award, Alan T. Waterman Award, and National Medal of Science) and summer science internship programs that target STEM students from underrepresented groups. PPS also provides funding to the National Academies of Science, Engineering, and Medicine (the National Academies) for the Committee on Science, Engineering, Medicine, and Public Policy (CoSEMPuP)² and the Government-University-Industry Research Roundtable (GUIRR),³ as well as studies, workshops, and letter reports spanning multiple research domains. PPS invests in catalytic activities - workshops, conferences, and long-term planning exercises, focused on emerging themes and agency innovations - as well as capacity-building activities for NSF's Big Ideas.

Research Investment Communications (RIC)

• RIC will continue its investment in a leading-edge communications effort that is essential for public awareness and support of S&E. RIC creates products and processes through traditional and social media platforms that make NSF's investments in STEM readily available and easily understandable to everyone. In FY 2021, RIC will continue to inform policy makers, the media, and the general public about the impact of NSF's investments on their daily lives and the Nation's future.

Science and Technology Centers: Integrative Partnerships Program

- The STC program supports innovative, potentially transformative, complex research and education projects that require large-scale, long-term awards. STCs engage the Nation's intellectual talent through partnerships across academia, industry, national laboratories, and government. These collaborations create synergies that enhance the training of the next generation of scientists, engineers, and educators. In FY 2021, five new STCs will begin as part of the STC Class of 2021 (\$25.0 million), which replaces the sunsetting Class of 2010 cohort.
- STC Administration (\$500,000) supports post-award management of STC awards, including site visits by review teams. Funding also supports the management of the STC Class of 2021 proposal competition that began in FY 2019 and concludes in FY 2021.

Science and Technology Policy Institutes (STPI)

• STPI is a Federally Funded Research and Development Center sponsored by NSF on behalf of the White House Office of Science and Technology Policy (OSTP). STPI provides analysis of significant domestic and international science and technology policies and developments for OSTP and other federal agencies.

² CoSEMPuP webpage (http://sites.nationalacademies.org/pga/cosepup/index.htm).

³ GUIRR webpage (http://sites.nationalacademies.org/pga/guirr/).

Program Monitoring and Evaluation

External Program Evaluations and Studies

Planned evaluations and studies (FY 2020 – 2021)

- In support of NSF's response to the Evidence Act, EAC will conduct the following NSF-wide assessments:
 - *Capacity Assessment.* EAC will support a capacity assessment as required in Title 1 of the Evidence Act; and
 - *Investment strategy analysis.* EAC will lead the first stage of a comprehensive study of NSF's portfolio of investments across directorates. This study will provide a foundation for the development of an agency-wide learning agenda.
- *"No deadlines" pilot* (NSF-wide). Four NSF directorates are experimenting with solicitations without proposal submission deadlines to increase efficiency in operations—namely, BIO, CISE, ENG and GEO. EAC will coordinate work across these directorates and divisions to study the overall impact of the change.
- *Research Experiences for Undergraduates (REU)* (NSF-wide). The REU data system will be tested at scale in FY 2020. Expected in 2021, results will inform the selection of a data collection approach to support program monitoring, evaluation, and research.
- Convergence Accelerator Evaluation (OIA). CA provides an innovative funding mechanism to accelerate public benefit arising from investments in basic research. EAC will work with CA to set requirements for an evaluation (contracted in FY 2020 or FY 2021) to inform program improvements.

Ongoing evaluations and studies (unless otherwise stated, results are expected in FY 2020)

- Intergovernmental Personnel Act (IPA) (NSF-wide). In FY 2017, NSF began piloting a requirement that all institutions provide a minimum of ten percent cost share for every IPA agreement. EAC is conducting a study of this pilot in collaboration with OIRM.
- *NSF INCLUDES* (NSF-wide). This study builds on the developmental evaluation completed in FY 2019 and addresses questions prioritized in the initiative's learning agenda. Results are anticipated in FY 2021 and will be used to inform strategy and disseminate best practices, both for NSF INCLUDES and as a pilot for NSF's learning agenda.
- Knowledge Management/Mobilization Architecture & Tool Development to Support the Use of Evidence-based Decision Making (OIA). This study seeks to strengthen EAC's knowledge management and mobilization efforts by (1) integrating existing NSF information management systems, and (2) developing and testing new technology-based communications solutions.
- *NSF Data Analytics and Evaluation Support Services* (OIA). This study pilots two approaches to using data analytics for ongoing learning. Pilot 1 builds an analytics workflow to support hypothesis testing or scenario planning for assessing NSF programs using quantitative, administrative data. Pilot 2 uses machine learning to replicate human coding of qualitative data.
- *EPSCoR* (OIA). The evaluation of EPSCoR's portfolio of investments seeks to (1) develop a cohesive academic research competitiveness evaluation framework, and (2) determine the availability and quality of data to document jurisdictional progress over time.
- Secure and Trustworthy Cyberspace (CISE). This evaluation examines the program's impact on the field of cyber-security and on the career trajectories of principal investigators. Results will inform revisions to program activities and investments in monitoring, evaluation, and learning.

Completed evaluations and studies (unless otherwise stated, completed in FY 2019)

• *NSF INCLUDES* (NSF-wide). This developmental evaluation provided real-time feedback to support continuous learning and improvement during this Big Idea's inaugural phase. Results helped refine the program's theory of change, create new funding mechanisms, clarify the solicitation, strengthen proposal review processes (reviewer training and review criteria), and pursue more streamlined

performance monitoring and outcome measurement.

- *NSF Innovation Corps Teams (I-Corps™)* (NSF-wide). This longitudinal evaluation focused on outcomes for participants and their academic institutions. I-Corps™ projects outperformed comparison projects on a range of commercialization outcomes. Program staff are considering recommendations for program improvements related to curriculum, communications, and data management.
- Broadening Participation (BP) in Research and Related Activities (OIA). This feasibility study showed that machine learning and text analytics can be used to identify underrepresented groups in STEM engaged in R&RA awards and suggests a viable approach for a future NSF-wide assessment of BP goals.
- *Centers for Chemical Innovation* (Chemistry). Study results are under review and are expected to (1) help strengthen program design and implementation, (2) identify program contributions, and (3) inform NSF about effective structures and operations for center-based research.

Science and Technology Policy Institute (STPI) Reports

- STPI is working on two reports for NSF that are anticipated to continue into FY 2021:
 - A conceptual framework for conducting themed evaluations; and
 - Administration and analysis of the U.S. Antarctic Program logistics support data collection instrument.

Workshops and Reports

- In FY 2020, several studies by the National Academies, co-funded with the National Institutes of Health and other agencies, continued:
 - The role of inducement prizes in spurring innovation. Three public meetings on the role of inducement prizes were held in the first half of 2019. Release of a final report is anticipated in 2020; and
 - The underrepresentation of women in science, engineering, and medicine. Several public meetings were held in 2019, including a symposium in March 2019 highlighting evidence-based interventions for addressing the underrepresentation of women. Release of a final report is anticipated by Spring 2020. In FY 2019, NSF provided additional funding to support an intensive, one-year outreach campaign to disseminate the key messages, best practices, and recommendations outlined in the final report.
- In 2019, the Committee on Equal Opportunity in Science and Engineering (CEOSE) transmitted to Congress its biennial report for 2017-2018, which emphasized investing in diverse community voices in research projects.⁴ The next biennial report is anticipated in 2021.

Committees of Visitors (COV)⁵

- In FY 2019, none of the IA programs held a COV.
- In FY 2020, a COV will review the EPSCoR program.
- In FY 2021, a COV will review the MRI program.

The Performance and Management chapter provides details regarding the periodic reviews of programs and portfolios of programs by external Committees of Visitors and directorate Advisory Committees. Please see this chapter for additional information.

⁴ Committee on Equal Opportunities in Science and Engineering, 2017-2018 Biennial Report to Congress: Investing in Diverse Community Voices. National Science Foundation, Alexandria VA, 2019,

www.nsf.gov/od/oia/activities/ceose/reports/CEOSE_ReportToCongress_RP_FVmp_508.pdf.

⁵ www.nsf.gov/od/oia/activities/cov/

ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

\$163,670,000 -\$12,000,000 / -6.8%

	EPSCoR Fundi	ng				
(Dollars in Millions)						
	FY 2019	FY 2020	FY 2021	Change over FY 2019 Actual		
	Actual	(TBD)	Request	Amount	Percent	
Total	\$175.67	-	\$163.67	-\$12.00	-6.8%	
Research Infrastructure Improvement	144.94	-	118.54	-26.40	-18.2%	
Co-Funding ¹	30.61	-	45.03	14.42	47.1%	
Outreach and Workshops	0.12	-	0.10	-0.02	-16.7%	

¹ No less than \$20.0 million in EPSCoR Co-funding will support Mid-scale RI Track 1 awards in EPSCoR

About EPSCoR

EPSCoR assists NSF in its statutory function "to strengthen research and education in science and engineering throughout the United States and to avoid undue concentration of such research and education." EPSCoR seeks to advance excellence in science and engineering research and education, enhancing the competitiveness of EPSCoR jurisdictions in the science and engineering domains supported by NSF.

In general, about 14 percent of the EPSCoR portfolio is available to support new research grants. The remaining 86 percent supports grants made in prior years.

EPSCoR uses three strategic investment tools: Research Infrastructure Improvement (RII) awards, Co-Funding, and Outreach/Workshops.

Research Infrastructure Improvement (RII)

• RII investments support development of physical, human, and cyber-based research infrastructure in EPSCoR jurisdictions, with an emphasis on collaborations among academic researchers, the private sector, and state and local governments, to effect sustainable improvements in research infrastructure. RII projects are designed to improve the research competitiveness of jurisdictions by strengthening their academic research infrastructure in areas of S&E supported by NSF that are critical to the jurisdiction's science and technology initiatives. RII projects increase the participation of underrepresented groups in STEM, enable broader regional and topical collaborations among jurisdictions. EPSCoR facilitates the engagement of its jurisdictions in S&E priority areas such as NSF's Big Ideas.

Co-Funding

• EPSCoR co-funding – with NSF directorates and offices – focuses on meritorious proposals from individual investigators, groups, and centers in EPSCoR jurisdictions that are submitted to the Foundation's research and education programs, including crosscutting initiatives. These proposals undergo merit review in the program to which they were submitted and are recommended for award, but cannot be funded without the combined, leveraged support of EPSCoR. In FY 2021, no less than \$20.0 million will be invested in Mid-scale RI-1 projects in EPSCoR jurisdictions. For more information about the Mid-scale Research Infrastructure Big Idea, see the narrative in the NSF-Wide Investments chapter.

Outreach and Workshops

• The Outreach component of EPSCoR solicits requests for workshops, conferences, and other community-based activities. These are designed to explore opportunities in emerging areas of S&E and to share best practices in strategic planning, diversity, communication, and other capacity-building areas of importance in EPSCoR jurisdictions. EPSCoR also supports outreach travel that enables NSF staff from all directorates and offices to directly engage and inform the EPSCoR research community about NSF opportunities, priorities, programs, and policies.

Strategic Partnership and Evaluation Activities

• In FY 2021, NSF EPSCoR will continue to implement a cohesive academic research competitiveness evaluation framework, which will be completed in May 2020. This framework will enable the study of the processes and outcomes that contribute to academic research competitiveness. EPSCoR will continue to identify and collect high-quality data from jurisdictions and will work with jurisdictions to use the framework to identify opportunities for increasing their competitiveness in NSF research programs and for other federal and private S&E funding. EPSCoR will also use the evidence gained from this framework to guide continuous improvement in its overall program.

People Involved in EPSCoR Activities

Number of People Involved in EPSCoR Activities				
	FY 2019			
	Actual	FY 2020	FY 2021	
	Estimate	(TBD)	Estimate	
Senior Researchers	384	-	360	
Other Professionals	72	-	70	
Postdoctoral Associates	39	-	40	
Graduate Students	385	-	360	
Undergraduate Students	397	-	370	
K-12 Teachers	2,607	-	2,400	
K-12 Students	42,132	-	39,200	
Total Number of People	46,016	-	42,800	

NSF CONVERGENCE ACCELERATOR (CA)

\$70,000,000 +\$28,610,000 / 69.1%

CA Funding						
(Dollars in Millions)						
	FY 2019	FY 2020	FY 2021	Change over FY 2019 Actual		
	Actual	(TBD)	Request	Amount	Percent	
Total	\$41.39	-	\$70.00	\$28.61	69.1%	
CA Research Tracks	41.39	-	68.00	26.61	64.3%	
CA Planning & Development (total)	-	-	2.00	2.00	N/A	

About CA

CA seeks to transform how NSF supports innovative science, reflecting its commitment to foundational research, while also encouraging rapid advances through partnerships between academic and non-academic stakeholders. CA makes timely investments that (1) initiate new capabilities to accelerate convergence research in areas of national importance, and (2) build capacity in multi-stakeholder convergence teams to address these critical challenges.

Convergence research is a means of solving complex research problems. The unifying characteristics of these problems are that: (1) they have the potential to make a significant impact, either on fundamental understanding in S&E or on the Nation's ability to meet pressing societal challenges, or both; and (2) they require the integration of knowledge, tools, and ways of thinking from multiple disciplines. Focusing on use-inspired, convergence research, with directed deliverables and using an approach that rewards innovation, risk-taking, and transition to use, CA has customized various models and techniques on acceleration and innovation activities that have proven successful in similar environments.

Convergence Accelerator Research

In FY 2021, CA will invest in HDR and FW-HTF related research tracks and new research tracks informed by community input through responses to a Request for Information and other external stakeholder input. The CA will support use-inspired research while encouraging rapid advances through partnerships that include, or will include, multiple stakeholders (e.g., industry, academic, not-for-profits, government entities).

CA research tracks comprise two phases of evolving technical topics within the CA.

- Phase 1: Each CA project begins with a nine-month planning effort, funded at up to \$1 million, for further development of the initial proposal, identifying new team members, participating in an innovation curriculum, and developing initial prototypes. The innovation curriculum consists of training in human-centered design, team science activities, inter-team communications, and presentation coaching, all of which are essential components of the operations of the Accelerator. The training will help the teams better prepare for success in the next phase of support, focused on building prototypes, developing experimental designs, and other deliverables, as appropriate. At the end of Phase 1, teams will participate in a pitch competition along with a proposal evaluation.
- Phase 2: Each Phase 1 team selected to proceed to Phase 2 will be provided additional support of up to \$5.0 million for 24 months. Teams are expected to provide specific research deliverables by the end of Phase 2.

In each of FY 2020 and FY 2021, an estimated 30 Phase 1 awards will be made in new CA tracks. Two or three new FY 2020 tracks will be selected in February 2020 based on the responses to the Request for

Information⁶ and community workshops. Two or three new FY 2021 CA research tracks will be selected no later than December 2020. The new FY 2021 tracks will be based on analysis of community-based inputs and assessment of the progress of the existing tracks and will take into account Administration R&D priorities such as IotF. In addition, an estimated 10 Phase 2 awards will be made in FY 2020 and 10 Phase 2 awards in FY 2021.

CA Planning and Development

Investments in CA Planning and Development will enable opportunities in emerging S&E areas best suited for CA consideration, through workshops, conferences, and other community-based activities. This component also supports the sharing of best practices in innovation, diversity, team building, and communication.

⁶ www.nsf.gov/pubs/2019/nsf19065/nsf19065.jsp?WT.mc_id=USNSF_179