“If ability, and not the circumstances of family fortune, determines who shall receive higher education in science, then we shall be assured of constantly improving quality at every level of scientific activity.”

—Vannevar Bush, 1945, National Science Foundation, Science, the Endless Frontier, A Report to the President.
RISING ABOVE THE GATHERING STORM

Energizing and Employing America for a Brighter Economic Future

NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF ENGINEERING, AND INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

RISING ABOVE THE GATHERING STORM, REVISITED
Rapidly Approaching Category 5

NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF ENGINEERING, AND INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES
REPORT TO THE PRESIDENT

ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Executive Office of the President
President’s Council of Advisors on Science and Technology

FEBRUARY 2012
Strategic Plan for 2014 - 2018

Investing in Science, Engineering, and Education for the Nation’s Future

National Science Foundation
The Committee on Equal Opportunities in Science and Engineering (CEOSE) is a congressionally mandated advisory committee to the National Science Foundation.
Title 42—THE PUBLIC HEALTH AND WELFARE

Chapter 16—NATIONAL SCIENCE FOUNDATION

Section 1885—Congressional statement of findings and declaration of policy respecting equal opportunities in science and engineering

Section 1885a—Women in science and engineering; support of activities by Foundation for promotion, etc

Section 1885b—Participation in science and engineering of minorities and persons with disabilities

Section 1885c—Committee on Equal Opportunities in Science and Engineering

Section 1885d—Biennial reports
Committee on Equal Opportunities in Science and Engineering

(a) Establishment; purposes
There is established within the Foundation a Committee on Equal Opportunities in Science and Engineering (hereinafter referred to as the “Committee”). The Committee shall provide advice to the Foundation concerning

(1) the implementation of the provisions of sections 1885 to 1885d of this title and

(2) other policies and activities of the Foundation to encourage full participation of women, minorities, and persons with disabilities in scientific, engineering, and professional fields
(b) Membership; Chairperson; term of members
Each member of the Committee shall be appointed by the Director. In addition, the Chairman of the National Science Board may designate a member of the Board as a member of the Committee. Members of the Committee shall be appointed to serve for a three-year term, and may be reappointed to serve one additional term of three years.
CEOSE Membership

Dr. Wendy Raymond, CEOSE Chair
Vice President for Academic Affairs and Dean of Faculty
Professor of Biology
Davidson College

Dr. Ira Harkavy, CEOSE Vice Chair
Associate Vice President and Founding Director
Barbara and Edward Netter Center for Community Partnerships
University of Pennsylvania

Dr. Mary Monroe Atwater
Professor
Mathematics and African American Studies
The University of Georgia

Dr. Karl S. Booksh
Professor
Department of Chemistry
University of Delaware

Dr. Nancy Cantor
Chancellor
Rutgers University - Newark

Mr. C. Michael Gooden
Chairman of the Board and CEO
Integrated Systems Analysts, Inc.

Dr. Charles Isbell
Professor and Associate Dean
Georgia Institute of Technology

Dr. Robert J. Jones
President
University at Albany

Dr. Alicia Knoedler
Associate Vice President for Research
Director, Center for Research Program Development & Enrichment
The University of Oklahoma

Dr. Daniela Marghitu
Faculty Coordinator and Director, Education and Assistive Technology Lab
Samuel Ginn College of Engineering
Auburn University

Dr. Louis A. Martin-Vega
Professor and Dean
College of Engineering
North Carolina State University

Dr. Robert Eugene Megginson
Arthur F. Thurman Professor
Department of Mathematics
University of Michigan

Dr. George Middendorf
Professor
Department of Biology
Howard University

Dr. Keivan Guadalupe Stassun
Professor
Department of Physics and Astronomy
Vanderbilt University

Dr. Lydia Villa-Komaroff
Board Member
Cytonome/ST, LLC, ATCC
Massachusetts Life Science Center

Dr. Joseph A. Whittaker
Dean and Professor
School of Computer, Mathematical & Natural Sciences
Morgan State University

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Office of the Director

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Senior Advisor and CEOSE Executive Secretary
Office of International and Integrative Activities (IIA)
Office of the Director
National Science Foundation
CEOSE Membership

- Meets three times a year, in person and/or virtually
- In 2015, CEOSE will meet in:
  - February (at NSF)
  - June (virtual)
  - October (at NSF)
(c) Responsibilities of Committee
The Committee shall be responsible for reviewing and evaluating all Foundation matters relating to opportunities for the participation in, and the advancement of, women, minorities, and persons with disabilities in education, training, and science and engineering research programs.
(d) Standing or ad hoc subcommittees
The Committee may organize such standing or ad hoc subcommittees as the Committee finds appropriate.

(e) Biennial report
Every two years, the Committee shall prepare and transmit to the Director a report on its activities during the previous two years and proposed activities for the next two years. The Director shall transmit to Congress the report, unaltered, together with such comments as the Director deems appropriate.

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2012 Report available at:
To retain the Nation’s tradition of STEM leadership and to help solve America's competitiveness dilemma, the country must increase its efforts toward successfully educating those groups within the Nation that are not being sufficiently tapped for the STEM workforce, particularly African Americans, American Indians, Hispanics, women, and persons with disabilities. Tapping this pool of talent is urgent to the well being of our country! This message has been stated multiple times before by CEOSE and others, and repeated, persuasively, in the recent report Expanding Underrepresented Minority Participation: America’s Science and Technology Talent at the Crossroads. The more time that passes without action, the more urgent the problem becomes.
Over the past half-century, the numbers of women, minorities, and persons with disabilities earning science and engineering degrees and the numbers entering science and engineering employment have increased. This is progress, but not sufficient progress to redress the historic patterns of underrepresentation for these groups.
Women have come closest to achieving parity, yet remain underrepresented in areas like engineering, physics, computer sciences as well as among the top academic ranks in all areas of science and engineering. African Americans, Hispanics, American Indians, and persons with disabilities remain woefully underrepresented in science and engineering. Only a small percentage of African Americans, Hispanics and American Indians complete college and earn bachelor’s degrees in any field, even fewer complete advanced degrees, and they remain severely underrepresented among science and engineering faculty. Students with disabilities have greater college attrition than students without disabilities; they remain a small share of the science and engineering workforce, and they have lower employment rates than those without disabilities.
“NSF should implement a bold new initiative, focused on broadening participation of underrepresented groups in STEM, similar in concept and scale to NSF’s centers, that emphasizes institutional transformation and system change; collects and makes accessible longitudinal data; defines clear benchmarks for success; supports the translation, replication and expansion of successful broadening participation efforts; and provides significant financial support to individuals who represent the very broadened participation that we seek.”
• Emphasizes institutional transformation and system change;
• Collects and makes accessible longitudinal data;
• Defines clear benchmarks for success;
• Supports the translation, replication and expansion of successful broadening participation efforts; and
• Provides significant financial support to individuals who represent the very broadened participation that we seek.
The “boldness” of this initiative rests in its focus on institutional transformation and systemic change in addition to basic research on broadening participation.

The “boldness” comes from making a long-term commitment to sufficient resources, to new resources, to alter the current trajectory in STEM employment.
In sum, the nature of the economy has changed and is changing, and so have the demographics of our nation. A democratic society in which large and rapidly growing population subgroups are unable to participate and contribute to scientific and technological advances faces a grave economic, intellectual and scientific disadvantage in an increasingly globalized competition for talent and innovation. Corrective and effective action must be taken now.
The NSF Broadening Participation Working Group examined CEOSE’s’s request and:

- developed an array of options to augment the Foundation’s on-going efforts in broadening participation in STEM
- issued “Pathways to Broadening Participation in Response to the CEOSE 2011-2012 Recommendation Summary” (NSF 15-037)
Guided by Vannevar Bush’s goal of a fully inclusive, fully diverse workforce, CEOSE plans to:

- Review the broadening participation efforts of NSF’s Centers portfolio as well as the broadening participation data and strategic plans of NSF directorates.

- Continue engagement with Federal Liaisons for leveraging opportunities to coordinate and be more systemic in addressing diversity and equity issues in STEM.
- Continue CEOSE’s emphasis on broadening participation accountability activities, including monitoring, assessment and evaluation.
- Explore and document the contributions of MSIs and programs in broadening participation to inform recommendations to NSF.
- Examine graduate admissions practices to inform recommendations for improved STEM graduate level workforce outcomes and for improved broadening participation of underrepresented groups in STEM graduate education and training.
CEOSE Future Activities

- Explore the significance of financial wherewithal and student debt as factors influencing persistence to the doctoral degree in STEM fields.
- Investigate the potential uses of data-intensive scientific approaches and methods for better informing the Committee and its recommendations to NSF on the condition of underrepresented groups and identifying barriers to and potential strategies to enhance their access, retention, completion and advancement, that is, pathways to meaningful careers and contributions to science and engineering.
CEOSE Future Activities

- Explore with NSF and others about hosting mini-symposia or other similar broad expert discussions focused on the condition in STEM of Hispanics and Hispanic serving Institutions, their institutional mechanisms, strategies, approaches and programs, as well as their significance and roles within U.S. higher education for broadening participation of Hispanics and other minority groups, in order to inform recommendations to NSF.

- Work with NSF to explore hosting mini-symposia or other similar broad expert discussions on the science of broadening participation.