



**POLICY AND
GLOBAL AFFAIRS**

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

OUR MISSION

Within the mission of the National Academies of Sciences, Engineering, and Medicine to help improve public policy, understanding, and education in matters of science, technology, and health, Policy and Global Affairs (PGA) focuses on national strategies and resources, global affairs, workforce, and the economy. The division is particularly charged to identify and build synergy among the disciplines and issue areas, and to promote interaction among science, engineering, medicine, and public policy. PGA includes a range of standing committees and boards concerned with the vitality of the research enterprise and the application of technology in the U.S. and abroad. In that connection, the units of the division focus on issues addressing the interaction of institutions central to science and technology policy, global organization, and bilateral collaboration with science and engineering bodies in other countries, the mission and organization of federal research activities, and the future sources of human and financial resources for research.

The division is organized into 15 units: four Boards, five standing committees, and six program units. Activities span a wide spectrum of cross-cutting topics and issues, including: aiding global security, building capacity abroad, making sound policy for science and technology, bolstering research and education, creating a sustainable environment, training for jobs of the future, strengthening American innovation, collaborating with foreign partners, and science and engineering meeting society's needs.



THE COMMITTEE

The Policy and Global Affairs Committee is entrusted with the oversight of the work of the division, with responsibility specifically for: (1) articulating intellectual and strategic goals for the division; (2) providing direction on emerging issues and new developments in science and technology policy; (3) performing strategic reviews of the underlying boards and standing committees on a regular basis; (4) reviewing board composition and approving new board member nominations; (5) strengthening connections between the Academies and the programs of the division; and (6) serving as a resource to the division staff by participating in division activities and the review process, identifying other potential participants, and interacting with relevant professional communities.

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The University of Texas

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Professor of Environmental Sciences
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John BRIGHT, Deputy Executive Director

Anna Hall, Director for Finance and Administration

Marilyn Baker, Director for Reports and
Communication

Wanda London, Executive Assistant

THE UNITS

BOARD ON HIGHER EDUCATION AND WORKFORCE (BHEW) monitors critical national issues in the education and training of, and labor market for, the nation's science and engineering workforce. It seeks to focus the expertise of scientists, engineers, educators, and economists on the formulation of national and institutional policies affecting our nation's human resources in science, mathematics, engineering, and technology.

Thomas Rudin, Director, 202-334-1596, trudin@nas.edu

BOARD ON INTERNATIONAL SCIENTIFIC ORGANIZATIONS (BISO) examines issues related to the conduct of science and evaluates opportunities for and barriers to international collaboration in scientific research. Its goals are to strengthen U.S. participation in international scientific, engineering, and medical organizations and to help build the capacity of these organizations.

Kathie Bailey, Director, 202-334-2807, kbailey@nas.edu

BOARD ON RESEARCH DATA AND INFORMATION (BRDI) is responsible for a program of studies and other activities related to the management, policy, and use of digital data and information for science and the broader society. The board maintains surveillance of the field and proposes new initiatives targeted at data challenges of national and international significance.

Ester Sztein, Interim Director, 202-334-3049, esztein@nas.edu

BOARD ON SCIENCE, TECHNOLOGY, AND ECONOMIC POLICY (STEP) examines issues related to: the composition of industrialized nations' investment portfolios and their bearing on productivity growth; the quality and quantity of U.S. investments in "intangible" capital—education, training, and research and development; the impact of new technologies on firm performance, job creation and destruction, and wage and skill levels; and increased international competition in technology and market development and its challenges for international trade and scientific and technical cooperation.

Gail Cohen, Director, 202-334-2253, gcohen@nas.edu

CHRISTINE MIRZAYAN SCIENCE AND TECHNOLOGY POLICY GRADUATE FELLOWSHIP PROGRAM, provides early career individuals with the opportunity to spend 12 weeks at the Academies in Washington, DC learning about science and technology policy and the role that scientists and engineers play in advising the nation.

Anne-Marie Mazza, Director, 202-334-1933, amazza@nas.edu

COMMITTEE ON HUMAN RIGHTS (CHR) addresses science-related human rights issues, particularly the unjust imprisonment of scientists, engineers, and health professionals anywhere in the world. Composed of NAS, NAE, and NAM members, CHR is actively supported by these three institutions who assist it by writing appeals for and letters of encouragement to imprisoned colleagues. CHR also serves as the secretariat for the International Human Rights Network of Academies and Scholarly Societies.

Rebecca Everly, Director, 202-334-3043, reverly@nas.edu

COMMITTEE ON INTERNATIONAL SECURITY AND ARMS CONTROL (CISAC) brings the scientific and technical resources of the National Academies to bear on critical problems of peace and security. CISAC conducts major policy studies, both in response to requests from the U.S. government and on the committee's own initiative. It also works with counterpart groups in Russia, China, and India to build common understandings of international security issues and to develop common solutions to arms control and security problems.

Micah Lowenthal, Director, 202-334-3074, mloventh@nas.edu

COMMITTEE ON WOMEN IN SCIENCE, ENGINEERING, AND MEDICINE (CWSEM) coordinates, monitors, and advocates action to increase the participation of women in science and engineering. The committee collects and disseminates information on the education and employment of women scientists and engineers and recommends ways to enhance women's advancement in the fields of science, engineering, and medicine.

Thomas Rudin, Acting Director, 202-334-1596, trudin@nas.edu



COMMITTEE ON SCIENCE, ENGINEERING, AND PUBLIC POLICY (COSEPUP) conducts studies on cross-cutting issues in science and technology policy and monitors key developments in U.S. science and technology policy. It is a joint unit of the National Academy of Sciences, National Academy of Engineering, and the National Academy of Medicine.
Kevin Finneran, Director, 202-334-1794, kfinneran@nas.edu

COMMITTEE ON SCIENCE, TECHNOLOGY, AND LAW (CSTL) brings together the science and engineering community and the legal community to explore pressing challenges, improve communication, and help resolve issues between the two communities.
Anne-Marie Mazza, Director, 202-334-1933, amazza@nas.edu

DEVELOPMENT, SECURITY AND COOPERATION (DSC) brings together expertise focusing on expanded and traditional areas of international development. This is done in part by maintaining programs of bilateral cooperation in science and technology and building new programs in areas where development and security issues intersect.
John Boright, Director, 202-334-3840, jboright@nas.edu

FELLOWSHIPS OFFICE (FO) administers predoctoral, dissertation, and postdoctoral fellowship programs in research-based fields of study. The office currently administers the following programs: Ford Foundation Diversity Fellowships for Achieving Excellence in College and University Teaching, the Resident Research Associateship Programs, the U.S. Department of State Jefferson Science Fellows Program, and the Optical Society Foundation Fellowships.
Ray Gamble, Director, 202-334-2787, rgamble@nas.edu

GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH ROUNDTABLE (GUIRR) provides a unique forum for dialogue among top government, university, and industry leaders of the national science and technology enterprise. Its purpose is to facilitate personal working relationships and the exchange of ideas on issues, problems, and promising opportunities facing those charged with developing and deploying science and technology resources.
Susan Sloan, Director, 202-334-1706, ssloan@nas.edu

OFFICE OF SPECIAL PROJECTS (OSP) through its convening activities, studies, exercises and other ad hoc projects, seeks to inform and assist policy and decision-making processes that build resilience at local, regional, or federal levels; develop tools for improved understanding of catastrophe-related risk; and promote better coordination and integration of resilience activities among key stakeholder groups.
Lauren Alexander Augustine, Director, 202-334-2243, lealexander@nas.edu

SCIENCE AND TECHNOLOGY FOR SUSTAINABILITY PROGRAM (STS) encourages the use of science and technology to achieve long-term sustainable development--increasing incomes, improving public health, and sustaining critical natural systems.
Jerry Miller, Director, 202-334-2613, jmiller@nas.edu

AIDING GLOBAL SECURITY THROUGH RESEARCH



Brazil-U.S. Workshop on Strengthening the Culture of Nuclear Safety and Security: Summary of a Workshop (CISAC, 2015)

On August 25-26, 2014, the Brazilian Instituto de Pesquisas Energéticas e Nucleares (IPEN) and the U.S. National Academy of Sciences convened the Brazil-U.S. Workshop on Strengthening the Culture of Nuclear Safety and Security. Held on the IPEN Campus in São Paulo, Brazil, the workshop examined how a culture of nuclear safety and security is built and maintained within the nuclear science, technology, and industrial sectors. Participants identified opportunities for cooperation to strengthen that culture and shared research, perspectives, and practices.

Potential Risks and Benefits of Gain-of-Function Research: Summary of a Workshop (CSTL, 2015)

In October 2014, The White House halted all federal funding for “gain-of-function” (GOF) studies, i.e., those studies that alter pathogens like MERS, SARS, or influenza to make them more transmissible or deadly but also help researchers develop animal models to combat the viruses. Researchers applied for an exemption to the moratorium for work “urgently necessary to protect the public health.” In December 2014, the Committee on Science, Technology, and Law and other NRC units convened a two-day workshop of government officials and researchers to discuss key considerations in the design of risk and benefit assessments of GOF research. The workshop discussions have fed into a broad risk-benefit analysis to help federal officials develop a new policy for GOF studies.



Ballistic Missile Defense in the Context of Strategic Stability (Ongoing Study/CISAC)

A U.S. committee, working jointly with a committee of the Russian Academy of Sciences, is conducting a technical examination of missile defense systems planned for deployment and the threats that they are intended to counter in the context of strategic stability. The committees are examining the technical implications of planned missile defense deployments for Russian and U.S. strategic deterrents, as well as the benefits and disadvantages of a range of options for cooperation on missile defense, including: (a) no cooperation between independent, unconnected, and uncoordinated missile defense systems following existing plans, (b) independent but joined systems, linked through, for example, a joint data and monitoring center and a joint planning center, and (c) a joint missile defense system, including mutually beneficial, jointly developed capabilities to counter missile threats.



BUILDING CAPACITY ABROAD



Arab-American Frontiers Program (Ongoing Program/DSC)

The third Arab-American Frontiers of Science, Engineering, and Medicine symposium was held December 2015 in Saudi Arabia, in partnership with the King Abdullah University of Science and Technology. The symposium gathered over 100 young scientists, engineers, and medical professionals to explore new research around the theme “Sensing Technologies, Networks and Applications.” Begun in 2011, the Arab-American Frontiers program brings together outstanding young scientists, engineers, and medical professionals from the U.S. and the 21 countries of the Arab League for symposia where participants share their research, explore advances in their fields, and identify potential areas for collaboration. The program also provides a small number of fellowships to teams of symposium participants for short-term exchanges to conduct joint research, as a way to promote long-term collaboration within and beyond the region.

U.S. - Egypt Science and Technology Joint Fund (Ongoing Program/DSC)

Funded by USAID and the Egyptian Ministry of Scientific Research, the U.S. - Egypt Science and Technology (S&T) Joint Fund was established to strengthen scientific and technological capabilities between the U.S. and Egypt. The program is designed to: (1) improve Egypt’s research environment; (2) increase the competitiveness of human resources; (3) fund science and technology programs; (4) support strategic innovation in research and development; and (5) build industry competitiveness. It provides support for short-term training visits of junior scientists to host country institutions and for 2-3 year collaborative research grants. Researchers from U.S. and Egyptian scientific institutes, universities, scientific societies, private sector companies, and governmental agencies are eligible to apply. In 2015, the fund accepted applications for basic or applied research with developmental impact in five priority areas: agriculture, health, energy, water, and information and communication technologies.



Engaging Belarus in Science, Engineering, and Health (Ongoing Program/DSC)

Part of the Former Soviet Union, Belarus has been governed for many decades as an appendage of Russia, with limited access by American and other western scientists and engineers and with research results published primarily in Russian-language journals. At the same time, Belarus has significant science, engineering, and medical capabilities that are important to the global community, including IT developments, laser technologies, remote sensing from a national satellite focused on environmental conditions of Eastern Europe, psychological aspects of dealing with the aftermath of disasters and particularly the Chernobyl accident, biodiversity losses and preservation measures, wildlife habitat management and protection, organ transplantation, agricultural research, and disease surveillance. This project is initiating science, engineering, and technology engagement with the Belarus Academy of Sciences, carrying out scientist-to-scientist and engineer-to-engineer exchanges and small seminars in selected areas of mutual interest in order to strengthen science and technology activities in Belarus and foster better communication among private citizens in the two countries.

MAKING SOUND POLICY FOR SCIENCE AND TECHNOLOGY



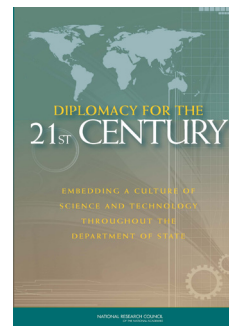
International Summit on Human Gene Editing: A Global Discussion. Meeting in Brief (CSTL, 2015)

New biochemical tools have made it possible to change the DNA sequences of living organisms with unprecedented ease and precision. These new tools have generated great excitement in the scientific and medical communities because of their potential to advance biological understanding, alter the genomes of microbes, plants, and animals, and treat human diseases. They also have raised profound questions about how people may choose to alter not only their own DNA but the genomes of future generations. To explore the many questions surrounding the use of gene editing tools in humans, the U.S. National Academy of Sciences, the U.S. National Academy of Medicine, the Royal Society, and

the Chinese Academy of Sciences hosted a three-day international summit on December 1-3, 2015. About 500 participants attended the summit from 20 nations, including the United States, China, the United Kingdom, India, Nigeria, Israel, South Africa, Sweden, Canada, Germany, Greece, Korea, Mexico, Netherlands, Japan, Chile, the West Indies, Australia, Italy, France, and Egypt. In addition, the Summit webcast was viewed by 3,067 people in 71 countries, with a combined viewing time for all viewers of over 235 days. More than 60 media outlets covered the event. At the end of the summit, the organizing committee issued a statement on human gene-editing research and its potential applications, and the presidents of the four hosting academies responded.

Diplomacy for the 21st Century: Embedding a Culture of Science and Technology Throughout the Department of State (DSC, 2015)

Many solutions to global problems can be found in science and technology (S&T), and this report recommends steps that the Department of State should embrace to take full advantage of leading U.S. capabilities in S&T to promote the interests of the U.S. and its allies in a rapidly changing world, where S&T drive economic development at home and abroad and help ensure international security. The report assesses the changing environment for conducting diplomacy in the years ahead and describes the role of S&T in the development and implementation of U.S. policies and programs. It proposes prompt steps the State Department should take to build capacities in basic sciences and engineering. As a direct outcome of the report, the State Department has asked the Academies to broker substantive discussions between nongovernment scientific experts selected by the Academies and government policy officials selected by the department, addressing foreign policy issues that have a significant S&T dimension.



Jefferson Science Fellowship Program (Ongoing, FO)

Twelve new Jefferson Science Fellows were selected in December 2015, bringing the total number to 127 since the program began in 2004. The program awards senior scientists and engineers one-year fellowships at the Department of State or the Agency for International Development, to bring their scientific expertise to bear on foreign policy decisions, and to help them better understand foreign policy issues. Jefferson Fellows remain available for additional assignments for five years, and many of the Fellows who have completed their tenure in Washington do continue to provide advice to the State Department and USAID.



BOLSTERING RESEARCH AND EDUCATION



Optimizing the Nation's Investment in Academic Research: A New Regulatory Framework for the 21st Century: Part 1 (CSTL, 2015)

Research universities are critical contributors to our national research enterprise; however, many are concerned that the unintended cumulative effect of federal regulations undercuts the productivity of the research enterprise and diminishes the return on the federal investment in research. This report recommends changes in federal research regulations that address the needs of Congress, federal agencies, and the broader public, while advancing to the greatest extent possible the missions of research universities. It proposes a new framework for research regulation, including the creation of a Research Policy Board to serve as a public-private forum for discussions of the regulation of federally-funded academic research. Part 2 of the report, to be released in summer 2016, will address some areas not covered in the first report, such as human subjects, select agents, and export controls. In the meantime, both the Senate and House are drafting legislation to address a number of the report's recommendations, and the Office

of Management and Budget, the Office of Information and Regulatory Affairs, and the Office of Science and Technology Policy are developing proposals for executive action to address items raised in the report.

Quality in the Undergraduate Experience: What is it? How Should it be measured? Who Decides? Meeting in Brief (BHEW, 2016)

Much of the focus on “quality” in undergraduate education in recent years has been on a combination of input factors and outcome measures: reputation, entrance examination scores and admissions selectivity, financial resources, graduation rates, graduates’ employment and earnings, and other attributes that can easily be measured but say little about student learning. On December 14-15, 2015, researchers and leaders from higher education, business, civic organizations and government convened in Washington, DC, to discuss quality in the undergraduate educational experience, including at community colleges, four-year colleges, and degree certification programs. The primary goal of the workshop was to begin to understand how to define and measure those factors that contribute to a quality educational experience that are difficult to quantify but that may represent the core elements of a successful undergraduate experience for most students. Workshop participants identified key questions and research topics that need further study on the definition, measurement and determination of a quality postsecondary education.

Board on Higher Education and Workforce
Policy and Global Affairs

MEETING IN BRIEF

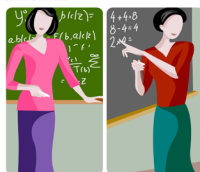
December 14-15, 2015



QUALITY IN THE UNDERGRADUATE EXPERIENCE
What is it? How Should it be measured? Who decides?

MATHEMATICS CURRICULUM,
TEACHER PROFESSIONALISM, AND
SUPPORTING POLICIES
in Korea and the United States

SUMMARY OF A WORKSHOP

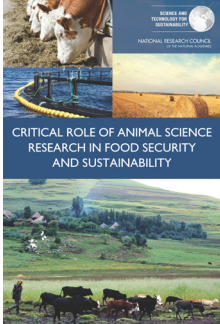


The National Academies of
SCIENCE, ENGINEERING, MEDICINE

Mathematics Curriculum, Teacher Professionalism, and Supporting Policies in Korea and the United States: Summary of a Workshop (BISO, 2015)

In July 2012, the United States National Commission on Mathematics Instruction and Seoul National University held a joint Korea-U.S. workshop on Mathematics Teaching and Curriculum. The workshop was organized to address questions and issues related to math teaching and curriculum that were generated by each country, including the following: What are the main concerns in the development of the curriculum? What issues have been discussed or debated among curriculum developers, teachers, teacher educators, and scholars regarding the curriculum? How have textbooks been developed for the curriculum? How are curricular tasks designed and what criteria are used? What is the role of learning trajectories in the development of curriculum? This report summarizes the presentations and discussions at the workshop.

CREATING A SUSTAINABLE WORLD IN THE U.S. AND ABROAD



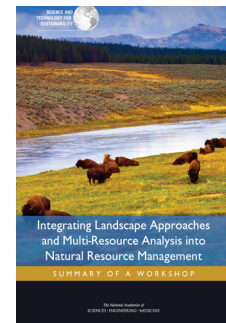
Critical Role of Animal Science Research in Food Security and Sustainability (STS, 2015)

This report assesses the global demand for products of animal origin in 2050 within the framework of ensuring global food security and evaluates how climate change and natural resource constraints may impact the ability to meet future global demand for animal products in sustainable production systems. It identifies factors that may impact the ability of the United States to meet demand for animal products, including the need for trained human capital, product safety and quality, and effective communication and adoption of new knowledge, information, and technologies. Finally, it identifies areas of research and development, technology, and resource needs for research in the field of animal agriculture, both nationally and internationally. The report has attracted broad national and international attention, with committee members taking the lead in presenting the report's findings and recommendations at major gatherings such as the Summit on Animal Nutrition Research Priorities for a Healthy Society in March 2015, and the General Meeting of the Animal Task Force, a European public-private platform representing key stakeholders from industry, farmers and research, in November 2015 in Brussels.

Integrating Landscape Approaches and Multi-Resource Analysis into Natural Resource Management: Summary of a Workshop (STS, 2016)

The responsible management of natural resources for present-day needs and future generations requires integrated approaches that are place-based, embrace systems thinking, and incorporate the social, economic, and environmental considerations of sustainability. Landscape-scale analysis takes this holistic view by focusing on the spatial scales most appropriate for the resource types and values being managed. At the request of USGS and NOAA, a workshop of key federal agency representatives, policymakers, and scientists was held in June 2015 to identify landscape approaches and multi-resource assessments that could assist federal decision making on the sustainable management of natural resources. Participants discussed:

- How can multiple resource assessments and ecosystem services be defined and integrated into a practical, overarching landscape-based framework to guide decision making?
- What key relationships among natural resources need to be incorporated into landscape analysis, and what social, economic, and environmental impacts are most relevant?
- What best practices can be implemented to ensure that these approaches will be beneficial to and utilized by key stakeholders, land managers, and ultimately, policy makers?



Measuring Progress Toward Sustainability: Meetings in Brief (STS, 2015, 2016)

Nearly 20 years ago, the NRC report *Our Common Journey: A Transition Toward Sustainability* challenged the field of sustainability science to focus on developing a strong scientific basis for indicators and metrics to assess the extent to which “progress is being made in navigating a transition toward sustainability.” The report noted that “there is no consensus on the appropriateness of the current sets of indicators or the scientific basis for choosing among them.” Today, despite the widespread proliferation of sustainability indicators and metrics, there remains no consensus on what indicators are most useful for decision making. The Roundtable on Science and Technology for Sustainability convened a meeting in June 2015 to identify indicators and metrics that have been found to be useful for promoting sustainability and to identify knowledge gaps in indicators that integrate across the ecological, social, and economic sciences related to climate change and infrastructure vulnerability. A second meeting in November 2015 focused on social and economic indicators and metrics for urban sustainability.” Two Meetings in Brief summarize the presentations and discussions at these meetings.



TRAINING FOR JOBS OF THE FUTURE

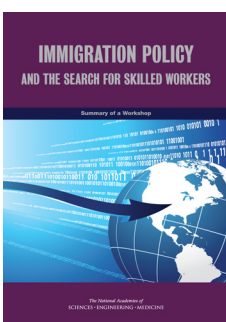
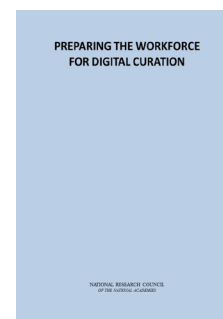


Promising Practices for Strengthening the Regional STEM Workforce Development Ecosystem (BHEW, 2016)

U.S. strength in science, technology, engineering, and mathematics (STEM) disciplines has formed the basis of innovations, technologies, and industries that have spurred the nation's economic growth throughout the last 150 years. Our understanding, however, of how universities receive, interpret, and respond to industry demands for STEM-trained workers is far from complete. This report examines the extent to which universities and employers in five metropolitan communities (Phoenix, Arizona; Cleveland, Ohio; Montgomery, Alabama; Los Angeles, California; and Fargo, North Dakota) collaborate successfully to align curricula, labs, and other undergraduate educational experiences with current and prospective regional STEM workforce needs. Based on examples from these five regions, the report identifies promising practices to create the kind of university-industry collaboration that promotes higher quality college and university course offerings, lab activities, applied learning experiences, work-based learning programs, and other activities that enable students to be successful in the STEM workforce.

Preparing the Workforce for Digital Curation (BRDI, 2015)

The massive increase in digital information in the last decade has created new requirements for institutional and technological structures and workforce skills. This study identifies the various practices and spectrum of skill sets that comprise digital curation, looking in particular at human versus automated tasks, and describes the education and training needed to meet the demands for access to and use of digital information, now and in the future. The report examines possible career paths and options for professionals working in digital curation activities and discusses the economic benefits and societal importance of digital curation for competitiveness, innovation, and scientific advancement. Finally, it considers the evolving roles and models of digital curation functions in research organizations, and their effects on employment opportunities and requirements.



Immigration Policy and the Search for Skilled Workers: Summary of a Workshop (STEP, 2015)

The market for high-skilled workers is becoming increasingly global, as are the markets for knowledge and ideas. While high-skilled immigrants in the United States represent a much smaller proportion of the workforce than they do in countries such as Australia, Canada, and the United Kingdom, these immigrants have an important role in spurring innovation and economic growth in all countries and filling shortages in the domestic labor supply. This report summarizes the proceedings of a fall 2014 workshop that focused on how immigration policy can be used to attract and retain foreign talent. Participants compared national policies to encourage migration and retention of skilled workers, attract qualified foreign students and retain them post-graduation, and add flexibility in countries with regional employment differences. They also discussed how immigration policies have changed over time in response to undesired labor market outcomes and whether there were sufficient data to measure those outcomes.

STRENGTHENING AMERICAN INNOVATION



SBIR at the National Science Foundation (STEP, 2016)

The Small Business Innovation Research (SBIR) program was established in 1982 to encourage small businesses to develop new processes and products and to provide quality research in support of the U.S. government’s many missions. Building on a 2004-2009 NRC assessment, Congress tasked the National Academies with undertaking a follow-up study of how the SBIR program could work better in addressing the congressional objectives for the program to stimulate technological innovation, use small businesses to meet federal research and development (R&D) needs, foster and encourage the participation of socially and economically disadvantaged small businesses, and increase the private sector commercialization of innovations derived from federal R&D. This is the third in a series of reports on the SBIR program at the five agencies responsible for 96 percent of the program’s operations: DoD, NIH, NSF, NASA, and DoE.

SBIR/STTR at the National Institutes of Health (STEP, 2015)

Similar in purpose to the assessment of the SBIR program at NSF, this report examines the SBIR program at NIH and makes recommendations for its improvement. It also examines the companion Small Business Technology Transfer (STTR) Program at NIH. The two remaining reports in the series, on the programs at NASA and DoE, will be published in summer 2016.



STTR: An Assessment of the Small Business Technology Transfer Program (STEP, 2016)

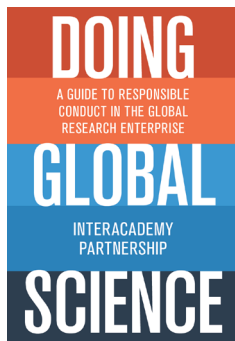
The Small Business Technology Transfer (STTR) and the Small Business Innovation Research (SBIR) program form one of the largest examples of U.S. public-private partnerships. In the SBIR Reauthorization Act of 2000, Congress tasked the National Research Council with undertaking a comprehensive study of how the SBIR program has stimulated technological innovation and used small businesses to meet federal research and development needs and with recommending further improvements to the program. When reauthorizing the SBIR and STTR programs in 2011, Congress expanded the study mandate to include a review of the STTR program, which directs agencies to fund awards to small businesses that partner with research universities to develop new processes and products. Building on the methodology and outcomes from the previous reviews of SBIR, this report assesses the STTR program at DoD, NIH, NSF, NASA, and DoE.

The Disruption Myth and Gaps in the Innovation Ecosystem: Meeting in Brief (GUIRR, 2016)

The term “disruption” is used broadly to characterize the pattern of technological innovation that unsettles industries and displaces earlier technologies to create new markets and value networks. The Government-University-Industry Research Roundtable held a meeting on October 20-21, 2015 that explored what drives disruptive innovation and disruptive innovators today, how patterns of disruption and business dynamism are changing in a modern world, and how disruption can inform national science and technology policy in the present and future. In addition to this brief summary of the meeting, a 3-minute video in the “Science Unscrambled” series shows Richard Foster, the keynote speaker, explaining “Disruptive Innovation” (<https://www.youtube.com/watch?v=iTMTqxdg1Nk>).



COLLABORATING WITH FOREIGN PARTNERS TO MEET GLOBAL CHALLENGES



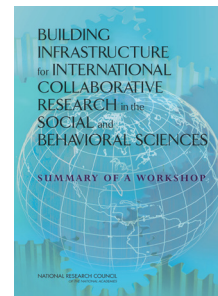
Doing Global Science: A Guide to Responsible Conduct in the Global Research Enterprise (IAP/DSC, 2016)

This report of the InterAcademy Council and IAP—The Global Network of Science Academies identifies responsible research practices that scientists around the world should embrace, as well as practices that should be avoided. “Scientific research is being transformed by globalization, interdisciplinary research projects, team science, and information technologies,” said Indira Nath, co-chair of the authoring committee. “This new guide emphasizes the importance of having internationally harmonized standards in a rapidly changing research environment.” A follow-up to the 2012 IAC/IAP report “Responsible Conduct in the Global Research Enterprise: A Policy Report,” this volume is a practical guide to research conduct. It offers guidance on responsible conduct at different phases of the research process, from planning to reporting results. Chapters explore how to prevent misuse of science and technology, ways to align incentives with responsible science, and the benefits and challenges of international collaborations. Throughout, the

guide includes discussion scenarios -- hypothetical situations that raise difficult and complex questions that can be used as springboards for conversations in classrooms and other venues.

Building Infrastructure for International Collaborative Research in the Social and Behavioral Sciences: Summary of a Workshop (BISO, 2015)

This volume summarizes the content of a 2013 workshop convened to identify ways to reduce impediments and increase access to cross-national research collaborations among a broad range of American scholars in the behavioral and social sciences (and education), especially early career scholars. Over the course of two and a half days, individuals from universities, federal agencies, professional organizations, and others with interests in international collaboration in the behavioral and social sciences and education, made presentations and participated in discussions. They came from diverse fields, including cognitive psychology, developmental psychology, comparative education, educational anthropology, sociology, organizational psychology, the health sciences, international development studies, higher education administration, and international exchange.



Future Earth Program (Ongoing Program/BISO, STS)

Future Earth is a 10-year international program on earth system research for global sustainability. Growing out of programs originally affiliated with the International Council for Science (ICSU), the program is now part of an alliance of 8 major international organizations. Future Earth is designed to be a research platform providing the knowledge and support to accelerate our transformations to a sustainable world. Bringing together and in partnership with existing programs on global environmental change, Future Earth coordinates new, interdisciplinary approaches to research on three themes: Dynamic Planet, Global Sustainable Development and Transformations towards Sustainability.

It also aims to be a platform for international engagement to ensure that knowledge is generated in partnership with society and users of science. It is open to scientists of all disciplines, natural and social, as well as engineering, the humanities and law. A number of Academies boards and roundtables have expressed interest in Future Earth. BISO is currently coordinating the internal conversations.

SCIENCE AND ENGINEERING MEETING SOCIETY'S NEEDS

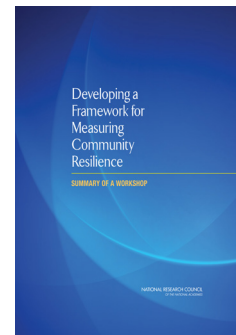


Committee on Human Rights

The Committee on Human Rights (CHR) and the International Human Rights Network of Academies and Scholarly Societies work tirelessly to assist scientists, engineers, and health professionals who are unjustly detained or imprisoned for exercising their basic human rights. In a case in fall 2015, 4 scientific colleagues in Ethiopia were acquitted of terrorism charges after one and a half years in detention and 39 trial hearings. They had been arrested for their membership in Zone 9, a group of young professionals who blog about the importance of the rule of law, document human rights violations, and raise the profile of Ethiopia's political prisoners. During the initial weeks of their detention, the group alleged that they were held incommunicado under deplorable conditions of confinement and were ill-treated. Their release followed intense international pressure – supported by appeals from the CHR to Ethiopian officials -- for the constitutionally guaranteed right to freedom of expression to be upheld in Ethiopia.

Developing a Framework for Measuring Community Resilience: Summary of a Workshop (OSP, 2015)

The 2012 NRC report Disaster Resilience: A National Imperative highlighted the challenges of increasing national resilience in the United States, concluding that “without numerical means of assessing resilience, it would be impossible to identify the priority needs for improvement, to monitor changes, to show that resilience had improved, or to compare the benefits of increasing resilience with the associated costs.” The report recommended that government entities at federal, state, and local levels and professional organizations partner to help develop a framework for communities to adapt to their circumstances and begin to track their progress toward increasing resilience. In response, the Resilient America Roundtable convened a workshop in September 2014 in Washington, D.C. to begin to help communities develop a framework of measures and indicators that could support their efforts to increase their resilience. The framework will be further developed through feedback and testing in pilot and other partner communities working with the Resilient America Roundtable.



Unmanned Aircraft Systems: Use & Regulation. Meeting in Brief (GUIRR, 2015)

The use and regulation of civil unmanned aircraft systems (UAS), commonly known as “drones,” has become a compelling topic of national conversation, fueled by a growing number of unauthorized landings and interference with commercial aircraft. This document contributes to that conversation with an 8-page summary of the June 2015 meeting of the Government-University-Industry Research Roundtable (GUIRR). Meeting participants explored the potential applications for recent technological advances in UAS, the existing and evolving regulations to promote safety without inhibiting innovation or economic advancement, and the privacy and security concerns that are unique to UAS.





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