National Science Board

Written Statement
of
Dr. Steven Beering
Chairman, National Science Board
Before the
House of Representatives
Committee on Appropriations
Subcommittee on Commerce, Justice, and Science
February 28, 2007

Chairman Mollohan, Ranking Member Frelinghuysen, and Members of the Subcommittee, I appreciate the opportunity to testify before you. I am Steven Beering, President Emeritus of Purdue University, West Lafayette, Indiana and Chairman of the National Science Board. This is my first time testifying before you as Chairman of the National Science Board, a position to which I was elected in May 2006. I am honored to represent the National Science Board before you today.

Since the Board last testified before this Subcommittee, there have been many changes--both in Congress and on the Board. Nine of our 24 Board Members rotated off the Board in 2006 and nine new Board Members have been appointed by the President and confirmed by the Senate. Board members are selected so as to broadly represent the leadership of U.S. science and engineering research and education.

In addition to my being elected as the new Board Chairman, the Board also elected a new Vice-Chairman, Dr. Kathryn Sullivan, Director, Batelle Center for Mathematics and Science Education Policy, John Glenn School of Public Affairs, Ohio State University, Columbus. I have appointed Dr. Kenneth Ford, Director and Chief Executive Officer, Institute for Human and Machine Cognition, Florida, to lead our Committee on Programs and Plans; Dr. Dan Arvizu, Director and Chief Executive of the National Renewable Energy Laboratory (NREL), Colorado, as Chairman of our Committee on Audit and Oversight; Dr. Ray Bowen, President Emeritus of Texas A&M University to lead our Committee on Strategy and Budget; and Dr. Elizabeth Hoffman, Executive Vice President and Provost Iowa State University, Ames, as Chairman for the Committee on Education and Human Resources.

Congress established the National Science Board in 1950 and gave it dual responsibilities:

- Oversee the activities of, and establish the policies for, the National Science Foundation (the Foundation, NSF); and
- Serve as an independent advisory body to the President and the Congress on national policy issues related to science and engineering (S&E) research and education.

On behalf of the entire Board and the widespread and diverse research and education communities that we all serve, I thank the Members of this Subcommittee for your long-term commitment to a broad portfolio of investments in science, technology, engineering, and

mathematics (STEM) research and education. While it is critical that our Nation significantly increase our support for this portfolio, it is also important that these investments be diverse and balanced. The Board greatly appreciates Congressional long-term support of the Board, the Foundation, and their programs and activities. Your continuing bipartisan commitment to excellence in U.S. science and engineering research and education has ensured that the U.S. remains a world leader in the global innovation and discovery enterprise. As you all are well aware, continued investment is required for the U.S. to maintain a global leadership position in science and technology. We feel that NSF must continue its essential role at the core of this investment.

In this regard, I would like to provide some general comments pertaining to the NSF FY 2008 budget request, then update you on National Science Board activities over the last year and some of our priorities for the coming year.

FY 2008 NSF BUDGET REQUEST

In August 2006, the National Science Board reviewed and approved an NSF FY 2008 budget request that was submitted to the Office of Management and Budget (OMB) by the NSF Director, Arden Bement, in September 2006. The Board generally supports the President's budget request before you today, which reflects a commitment to the objectives of the American Competitiveness Initiative (ACI). We are greatly encouraged by the overall level of increase in the total NSF FY 2008 budget request. We are also cognizant of the current Federal fiscal constraints that our Nation faces and that there are many worthy competing interests for limited resources. This budget request affirms the importance of innovation to the future prosperity of our Nation and quality of life of our people, dependent on wise investment in science and engineering research and education.

In September 2006, the National Science Board approved a new Strategic Plan for the National Science Foundation for FY 2006-2011, *Investing In America's Future* (NSF 06-48) https://www.nsf.gov/pubs/2006/nsf0648/NSF-06-48.pdf, articulating strategic outcome goals of discovery, learning, research infrastructure, and stewardship, and investment priorities in order to accomplish these goals. These reflect the National Science Board's *2020 Vision for* NSF (NSB-5-142) https://www.nsf.gov/nsb/documents/2007/02_28_testimony.pdf, published in December 2005, establishing specific broad priorities for the National Science Foundation to:

- Drive the cutting edge of fundamental and transformative research;
- Tap the talents of all our citizens, particularly those belonging to groups that are underrepresented in the science and research enterprise, and continue to attract foreign students and scientists to the U.S.;
- Develop and test new approaches to teaching science to elementary and secondary school students and catalyze partnerships among schools, museums, aquariums, and universities to put these techniques into effective practice;

- Provide the bright minds in our research institutions with the tools and instruments needed to probe the frontiers of knowledge and develop ideas that can transform our understanding of the world; and

- Maintain the financial and talent resources to be an effective agent for excellence in the critical national enterprises of learning, discovery, and innovation.

The President's FY 2008 NSF budget request is a significant step towards achieving the Board's 2020 Vision for NSF. The Board fully supports the FY 2008 NSF budget focus on the long term investment priorities that address current national challenges as well as strengthening the core portfolio's of NSF's research investment. We recognize that a budget request of $6.43 billion, representing a 7.5 percent increase over the recent Congressional FY 2007 budget appropriation for NSF, is a significant investment in NSF programs in a time of National fiscal austerity.

Nevertheless, it is incumbent on the Board, in our role as an independent advisory body to both the President and Congress, to note that this still represents a significant gap between the existing congressionally authorized FY 2007 NSF budget of approximately $10 billion that was included as part of the NSF Act of 2002, which sought to double the NSF budget in 5 years. The American Competitiveness Initiative again calls for a doubling of the NSF budget over a 10-year period. The Board welcomed the 2002 congressional authorization to double NSF's budget, the President's new call for a doubling of NSF's budget and all past efforts to double NSF's budget. However, we would respectfully suggest that the time to implement these admirable authorizations and initiatives has never been more urgent than now.

It is also important to note that the recent Congressional FY 2007 budget appropriation for NSF is different from the President's FY 2007 request, and this has potential impacts on the FY 2008 budget request for NSF. One such area is the NSF Major Research Equipment and Facilities Construction (MREFC) account. The Board intends to discuss this particular issue in depth during our March 2007 meeting.

The Board has been especially concerned with a major area of NSF responsibility—education in science, technology, engineering and mathematics. Education is a core mission of NSF, which not only includes research, but also shares in the responsibility for promoting quality math and science education as intertwining objectives at all levels of education across the United States. NSF's highly competitive peer-review process is second to none for openly and objectively identifying, reviewing, selecting, funding and providing stewardship for the very best STEM proposals and programs in research and education. Nearly a quarter century ago, the National Science Board's Commission on Pre-college Education in Mathematics, Science and Technology assessed the state of U.S. pre-college education in the subject fields and found it wanting (https://www.nsf.gov/nsb/publications/1995/nsb0095.pdf) In the intervening years, our Nation has failed to raise the achievement of U.S. students commensurate with the goal articulated by that Commission — that U.S. pre-college achievement should be "best in the world by 1995" — and many other countries have surpassed us. Not only are they not first, but by the time they reach their senior year, even the most advanced U.S. students perform at or near the bottom on

international assessments. There is now an even more pressing need to build a new foundation for U.S. STEM education.

In 1983 the U.S. Department of Education's National Commission on Excellence in Education published the report, *A Nation At Risk* http://www.ed.gov/pubs/NatAtRisk/risk.html. This document stated: "By the year 2000, U.S. students will be the first in the world in mathematics and science achievement," expressing alarm on the "rising tide of mediocrity [in education] that threatens our very future as a Nation and a people." Despite these two reports – *A Nation At Risk* sounding the alarm and the Board's Commission report recommending solutions – and many others since then, we continue to slip further behind.

Even while U.S. student relative performance in mathematics and science is declining on international assessments, changing workforce requirements mean that new workers will need ever more sophisticated skills in STEM disciplines. This emerging workforce, consisting of degreed and highly skilled technical workers, will need to begin developing their mathematical and science skills early in their educational career. In addition, the rapid advances in technology in all fields mean that even those students who do not pursue professional occupations in technological fields will also require solid foundations in science and math in order to be productive and capable members of our Nation's society. The Board established a second Commission on STEM education—the Commission on 21st Century Education in Science, Technology, Engineering and Mathematics in March 2006, comprising a wide range of eminent experts representing the broad scope of interests in U.S. STEM education http://www.nsf.gov/nsb/edu_com/. We look forward to receiving their draft report for discussion at the March 2007 National Science Board meeting and to their suggestions on the appropriate NSF role in STEM education reform at all levels.

Over the past year, the Board has been undertaking, through its Committee on Education and Human Resources, an examination of the NSF/EHR Directorate's programs with respect to evaluation procedures and results. We have submitted an initial report on our review to Congress at the request of Congressman Rush Holt, and we will be continuing to apprise you about that review as we take into account the recommendations of the Board's STEM Education Commission, the report of the Academic Competitiveness Council, and the plans for the EHR Directorate under its new leadership.

The NSF Mathematics and Science Partnerships (MSPs) funded through the NSF Education and Human Resources budget, are important tools for addressing a critical - but currently very weak - link between pre-college and higher education. The NSF MSP Program provides for the collaboration between pre-college and college to promote excellence in teaching and learning, therefore facilitating the transitions for students from kindergarten through the baccalaureate in STEM disciplines. The added benefit for our Nation is those students who do not choose STEM careers become the informed scientifically literate voting citizens we need for the 21st Century. Recent assessment data on MSP projects indicate this program has been effective in increasing student performance at all levels assessed—elementary, middle and high school (http://www.nsf.gov/news). Therefore, we are pleased that this budget will permit funding of new starts in the NSF/MSP program. We urge that, given the importance of NSF programs and the low success rate of applicants to the program, at about 20 percent over the last two years (See

Report to the NSB on the *National Science Foundation's Merit Review Process Fiscal Year 2005* [NSB-06-21] (https://www.nsf.gov/nsb/documents/2006/0306/merit_review.pdf) that should additional funds become available they would be well spent in support of EHR programs that have been shown to be effective through rigorous merit review and assessment.

The NSF physical sciences are well deserving of significant budget increases, but so are the other facets of NSF's diverse portfolio. Another example of areas of NSF's portfolio that would warrant attention should the Congress find additional funds beyond the President's request, are the Biological Sciences (BIO) Directorate. While the overall funding increase for NSF is 7.5 percent, the BIO Directorate increase is only 4.1 percent over the FY 2007 appropriation. The emergence of biology at the forefront of scientific advances began with the discovery of the structure of DNA by Watson and Crick in 1953 and has accelerated ever since. Among the many landmark discoveries was the validation of the universal genetic code in the late 1960's. The work on determining the genetic code was performed in England using a bacterial virus, a "bacteriophage". These and many other biology-focused discoveries have been recognized by numerous Nobel prizes. One major factor that may have inadvertently contributed to a perceived lack of need to significantly increase the NSF Biology budget may have been the dramatic and worthy budget increases over the last decade for the National Institutes of Health (NIH). However, NIH and NSF have different missions and foci in regards to supporting basic research in biological sciences. Yet funding of biology has decreased as a proportion of the NSF budget over the last decade.

Notwithstanding the Board's concern regarding NSF's MREFC, EHR and BIO budgets, I would emphasize that the Board supports the integrated portfolio of investments in S&E research and education represented in the President's FY 2008 budget proposal for NSF. It thoughtfully blends support for the core disciplines with encouragement for interdisciplinary initiatives, brings together people from diverse and complementary backgrounds, provides infrastructure for research and STEM education, and strengthens the NSF's management of the enterprise.

OVERVIEW OF NSB ACTIVITIES DURING THE LAST YEAR

NSF Oversight and Policy Direction

During the last year, the Board accomplished a great deal in terms of its mission to provide oversight and policy directions to the Foundation, including: reviewed and endorsed the OIG Semi-annual Reports to Congress and approved NSF management responses; approved the NSF FY 2008 Budget Submission for transmittal to OMB; approved the Foundation's annual Merit Review Report; and provided review and decisions on major awards or proposal funding requests, including awards totaling $616 million. These awards will support advanced research, science education, and public understanding of critical issues facing our Nation. The Board also approved a new strategic plan for NSF *Investing in America's Future: Strategic Plan FY 2006-2011* (NSF-06-48), based on the *National Science Board 2020 Vision for the National Science Foundation* (NSB-05-142) report to Congress. In addition, the Board accepted the Foundation's *2007 Facility Plan* (NSF-07-22) and the Plan was released in conjunction with the President's budget in February 2007. The Facility Plan was mandated by a joint management report of the

Foundation and the Board, *Setting Priorities for Large Research Projects Supported by the National Science Foundation* (NSB-05-77) https://www.nsf.gov/pubs/2005/nsb0577/index.jsp.

The Board has just released our draft report, *Enhancing Support of Transformative Research at the National Science Foundation* (http://www.nsf.gov/nsb/documents/2007/tr_draft.pdf) for public comment and review. In this report the Board recommends that NSF develop a distinct, Foundation-wide Transformative Research Initiative distinguishable by its potential impact on prevailing paradigms and by the potential to create new fields of science, to develop new technologies, and to open new frontiers. Foundation management will report back to the Board at its August 2007 meeting on its preliminary plan for a simple and transparent process for instituting the Transformative Research Initiative that encourages maximum participation by the community.

In a constrained budget environment, achieving the reasonable balance of award size, and duration, and proposal success rate at the Foundation is an important concern of the Board. We have held several discussions with Foundation management about this issue and are anticipating a comprehensive report later this year that will inform us in establishing appropriate policy guidelines.

A very high priority for the Board has been our continuing work with the NSF Management and the Office of Inspector General to resolve the correction of the existing reportable conditions that have been longstanding in NSF annual audits. We have reviewed the draft Corrective Action Plan for Reportable Conditions in the FY2006 Financial Statement Audit and are confident that we can quickly and effectively resolve outstanding issues. We will be hearing from NSF management at the March Board meeting on the status of their efforts to resolve the reportable conditions, as well as efforts to enhance NSF's business model practices and develop a strategic personnel workforce plan for the 21st. Century.

Advice to the President and Congress

The Board, in our broader role as an independent advisory body to the President and the Congress on national policy issues related to science and engineering (S&E) research and education, has undertaken a wide range of activities this year.

- The Board completed a series of public hearings, in response to a Congressional request that the Board consider reconstituting its 1982 Commission on Pre-college Education in Science, Mathematics, Engineering and Technology, and in March 2006 approved the establishment of the new Commission on 21st Century Education in STEM, due to present its draft report to the Board in March 2007;

- The Board published and disseminated an important report, *HURRICANE WARNING: The Critical Need for a National Hurricane Research Initiative* (NSB-06-115). The

report presents an agenda for action that will provide urgently needed hurricane science and engineering research and education that engages relevant agencies across the Federal government; involves industry, academia, and other levels of government; establishes highly focused priorities; strengthens disciplinary research; creates multidisciplinary frameworks; and stimulates the efficient transfer of research outcomes to operational practice.

- The Board responded to a request from Senator John McCain to examine existing policies of Federal science agencies concerning the suppression and distortion of research findings and the impact these actions could have on quality and credibility of future Government-sponsored scientific research results. Our central recommendation was that an overarching set of principles for the communication of scientific information by government scientists, policy makers, and managers should be developed and issued by the Administration to serve as the umbrella under which each agency would develop its specific policies and procedures.

- The Board responded to a request from Congressman Rush Holt for a summary of its review of the evaluations and impacts of the programs of the National Science Foundation's Education and Human Resources Directorate's programs in January 2007. We will be providing a more thorough report later in 2007.

- Exercising the Board's obligation to inform and advise on critical issues, the Board sent a letter to congressional leadership on February 13, 2007, expressing its full endorsement and appreciation for the FY 2007 Congressional Joint Budget Resolution funding level increase of the FY 2006 level for the NSF Research and Related Activities account, and encouraging congressional approval of a similar budget increase for the NSF Education and Human Resources account.

- The Board published and disseminated its statutory biennial report, *Science and Engineering Indicators 2006* (NSB-06-01) http://www.nsf.gov/statistics/seind06 and also prepared and disseminated a Board policy statement Companion Piece to Indicators 2006, *America's Pressing Challenge—Building a Stronger Foundation* (NSB-06-02) http://www.nsf.gov/statistics/seind06, February 2006;

- Board Members provided comments to Congressman Bart Gordon on his bill, "10,000 Teachers, 10 Million Minds Science and Math Scholarship Act" in February 2006.

Further, the Board provided testimony to congressional hearings in 2006, and responded to other specific questions and inquiries from Members of Congress and their staff.

Improved Outreach and Communication by the Board

The Board continues to increase and improve our direct outreach and communication with Congress, other Federal agencies, various interest groups and the external science and engineering research and education community.

For example, the Board sponsored:

- Five public meetings of the Commission on 21st Century Education in Science, Mathematics and Technology (See Commission Webpage at http://www.nsf.gov/nsb/)

- A second and third precommission hearing in January and March 2006 in Boulder, Colorado and Los Angeles, California, respectively, seeking input from a cross section of stakeholders in U.S. STEM education on the value of establishing a new STEM Commission to address this topic for the Board a second time (See: http://www.acpt.nsf.gov/nsb/edu_com/hearings.htm)

- A third public workshop on Transformative Research (May 16, 2006 http://nsf.gov/nsb/committees/tskfrcetrans_cmt.htm);
- A second public workshop on engineering education reform, including leading deans of engineering, *Moving Forward to Improve Engineering Education* *http://nsf.gov/nsb/eng_edu/start.htm*, at the Georgia Institute of Technology in November 2006;
- A public "rollout" event for the Hurricane Science and Engineering report, *Hurricane Warning: The Critical Need for a National Hurricane Research Agenda* http://www.nsf.gov/nsb/, in the U.S. Capitol Building in September 2006, with the participation by Senators Mel Martinez and Bill Nelson of Florida, and Senator David Vitter of Louisiana.
- Two public presentations on Capitol Hill on *Science and Engineering Indicators 2006* (NSB 06-02) and its Companion Piece, *America's Pressing Challenge – Building a Stronger Foundation* (NSB 06-02), February 23, 2006 to the media and general public and April 6, 2006 to the House R&D and STEM Caucuses;
- A presentation to Colorado State legislators at the invitation of the American Electronics Association on both *Science and Engineering Indicators 2006* and the recently completed hearings to consider establishing a new National Science Board Commission on STEM Education for the 21st Century, March 23, 2006;
- Two presentations to the National Science Teachers Association (NSTA) in April in Anaheim, California, on *Science and Engineering Indicators 2006* and its Companion Piece, *America's Pressing Challenge -- Building a Stronger Foundation* (NSB 06-02); and
- National Science Board informational booths at both the American Association for the Advancement of Science (AAAS) meeting in February in St. Louis, Missouri, the

National Science Teachers Association (NSTA) meeting in Anaheim, California in April, and Sigma Xi, the Research Society meeting in Detroit, Michigan in November.

In an effort to facilitate more openness of Board meetings in accord with the Sunshine Act, we expanded our practices for:

- providing public notice of all our meetings in the *Federal Register* and on the NSB Web site;
- treating teleconferences of the Board, Board Committees, subcommittees and task forces as 'meetings,' subject to the requirements of the Government in the Sunshine Act;
- providing much more information to the public in a more timely manner regarding meeting discussions and decisions; and
- expanding efforts to encourage public comment during the development of Board publications.

FY 2008 NSB BUDGET

The Board's FY 2008 Budget Request seeks resources to carry out its statutory authority and to strengthen the Board's oversight responsibilities for the Foundation. Enhanced Board responsibilities established in the NSF Authorization Act of 2002 and directed by Congressional Report language include the continued expanding role in prioritizing and approving MREFC projects; new requirements for meetings open to the public; and responsibilities for reporting on the Foundation's budgetary and programmatic expansion, with specific focus on the projected impact on the science and technology workforce, research infrastructure, size and duration of grants, and underrepresented populations and regions.

Effective communications and interactions with our constituencies contribute to the Board's work of identifying priority science and technology issues, and developing policy advice and recommendations to the President and Congress. To this end, the Board will continue to increase communication and outreach with the university, industry and the broader science and engineering research and education community, Congress, federal science and technology agencies, and the public. The Board's activities will aim to support U.S. global leadership in discovery and innovation based on a continually expanding and evolving science and technology enterprise in this country, and will ensure a principal role for NSF programs in providing a critical foundation for science and engineering research and education.

The Board has much to do over the next year. Perhaps one of the most important actions is to oversee the implementation of the new NSF Strategic Plan, which addresses the broad priorities established in the Board's 2020 Vision for the Foundation. We will be looking to provide policy direction to the Foundation with respect to recommendations of the newly released Hurricane Research and Transformative Research reports. Both involve broad, multidisciplinary questions on the broad frontiers of science and engineering and across the portfolios of NSF's science, engineering and education directorates.

Our Task Force on International Science Partnerships will complete its international meetings in 2007, and we expect to be providing specific guidance to NSF and broader advice on the role of the federal government in supporting international S&E partnerships. Our *ad hoc* Task Group on Engineering Education is poised to present us with recommendations that will impact university engineering programs and the future engineering workforce, reflecting the input from two important workshops, incorporating the ideas of engineers, faculty, administrators, and employers in developing guidance for engineering education for the 21st Century that reflects the increasing diversity of the U.S. workforce and growing challenges for engineering from globalization of both science and technology and the engineering workforce. We will be continuing our review of program evaluations and impact in the NSF Education and Human Resources Directorate.

Over the next year, the Board expects to complete our development of a national action plan for 21st Century Education in Science, Mathematics and Technology by making a formal report to the Congress. While many of these recommendations will be at a national system level, a number will focus specifically on the role NSF can and should play in supporting the development of an adequate and diverse science and engineering workforce. The Board will also continue to review and approve NSF's actions for creating major NSF programs and funding, and expects new efforts to be implemented regarding enhancement of NSF support for potentially transformative research as a result of new Board guidance.

Several endeavors that the Board expects to formally complete by the end of FY 2007 will require significant follow-up outreach efforts by the Board in FY 2008 to ensure the desired impacts are realized. For example, lessons learned by the Board's experience with its 1982 STEM Education Commission report and the 2001 report on the role of the federal government in supporting international science, have provided clear and strong lessons on the importance of the Board undertaking significant follow-up efforts to ensure action based on our reports. While the Board's Commission on 21st Century Education in Science, Mathematics and Technology will complete its work later this year, it is clear that much follow-up outreach by the Board will be required throughout FY 2008 to ensure the work of the commission has the highest possible impact. Likewise, the Board's Task Force on International S&E partnerships will complete its work at the end of FY 2007, but will require significant follow-up by the Board in FY 2008.

The Board will be producing a new summary volume to our biennial *S&E Indicator*s report in FY 2008 that will require significant new effort on the part of the Board. In addition, the Board will continue to review and approve NSF's actions for creating major new programs and funding large projects in FY 2008, as well as dealing with evolving NSF policy issues. Experience has demonstrated that the Board will receive a number of requests from Congress asking that the Board examine and report quickly on a wide range of national policy topics related to S&E research and education. The Board welcomes such Congressional and Administration requests, and will itself continue to identify high priority topics focused specifically on NSF, or more broadly on national S&E policy issues that it feels it should examine in FY 2008.

Essential to the conduct of Board business is a small and independent core of full-time senior policy, clerical, and operations staff. In addition to the Board Office's essential and independent

core resources and capabilities, temporary contractual advisory and assistance services continue to be critical to support production of Board reports and supplement the Board Office staff's general research and administration services to the Board. These external services provide the Board and its Office with the flexibility to respond independently, accurately, and quickly to requests from Congress and the President, and to address issues raised by the Board itself.

By statute the Board is authorized five professional positions and other clerical staff as necessary. The full impact of increasing the number of professional positions to the statutory level will occur in FY 2008 with increased attention to addressing new skill requirements. However, the results of a strategic restructuring of the Board Office management and operations over the last three years has led to more efficient use of appropriated resources while retaining the ability to support an active Board agenda.

CLOSING REMARKS

This is a challenging time for Federal S&E research and education budgets and the organizations and individuals that rely on Federal support. For over 50 years the Federal government has sustained a continual, visionary investment in the U.S. research and education enterprise in the expectation that such investment would benefit all Americans. That Federal effort has expanded the horizon of scientific discovery and engineering achievements far and wide, leading to the realization of enormous benefits to the Nation's prosperity and security.

We know what works – we have a very long history of success to draw on. In 1946, legislators contemplating the creation of a national science foundation were disturbed by the relative weakness of America in basic scientific discoveries. This weakness was evidenced by several factors, including the scarcity of U.S. researchers awarded Nobel Prizes in chemistry, physics, and medicine and a serious deficit of trained American scientists. By the 1960s, evidence of the success of the Foundation they established was abundant: U.S. researchers were regularly honored for their accomplishments in the sciences by many authorities, including the Nobel Foundation, and the American education enterprise that trained scientists and engineers became the envy of the world.

We know the expanding frontiers of knowledge offer enormous opportunities for research and innovation. We also know that the education of all our citizens in the fundamentals of math, science and engineering must continue to be enhanced if the U.S. is to remain eminent in critical S&T disciplines. As other nations ramp up their investment in the infrastructure for S&E research and innovation, we cannot be complacent. The Federal investment in the Nation's S&T is a necessity for the Nation's future prosperity and security. The U.S. must sustain its advantages through continued wise, adequate Federal support for our S&E enterprise.

In recognition of fiscal realities, the National Science Board pledges that we will guide NSF by setting priorities and working closely with the NSF Director in making difficult programmatic budget decisions that will obtain the best return on the taxpayers' investment. However, even in a time of budget constraints, we cannot ignore the Nation's growing dependence on innovation

for economic prosperity and the ever-improving quality of life Americans have come to expect. The Board recognizes that competing priorities may impose fiscal constraints that limit the Foundation's, and so the Nation's, aspirations. In weighing these competing priorities, we ask you to keep in mind that in our changing global environment, investments in our national science and technology capabilities—talent, knowledge, and physical infrastructure—are not luxuries but essential to our Nation's long-term prosperity and security. We ask you to consider in your deliberations that the challenges we defer today will be faced by our children, and the opportunities we forego today will be charged to their future. The Board therefore urges that the Congress take the long view in its annual budget deliberations for funding U.S. science and engineering through the National Science Foundation.

Dr. Steven C. Beering

Chairman, National Science Board
Medicine and Higher Education
B.S., University of Pittsburgh, 1954
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Steven C. Beering received B.S. and M.D. degrees and an honorary Doctor of Science degree from the University of Pittsburgh. Before becoming President of Purdue in 1983, he served for a decade as Dean of Medicine and Director of the Indiana University Medical Center. He holds appointments as professor of medicine at Indiana University and professor of pharmacology at Purdue University. He retired from the Purdue presidency in 2000.

He served on active duty with the USAF Medical Corps from May 1957 to June 1969, achieving the rank of lieutenant colonel.

Beering has held numerous national offices, including the chairmanship of the Association of American Medical Colleges and the Association of American Universities. He is a former regent of the National Library of Medicine.

He is also a Fellow of the American College of Physicians and the Royal Society of Medicine, a member of Phi Beta Kappa, the Institute of Medicine of the National Academy of Sciences, and the Indiana Academy.

He serves on a number of national and corporate boards, including NiSource Inc., Central Indiana Corporate Partnership, Inc., Community Foundation of Northern Indiana, CID Corporation, and Marquis Who's Who. He is a Trustee of the University of Pittsburgh, and the Universities Research Association, and is Director Emeritus of the Purdue Research Foundation.

Beering was appointed to the National Science Board in 2002, reappointed in 2004, and elected Chairman in 2006.

August 2006