

The President of the United States
The White House
Washington, DC 20500

Dear Mr. President:

Your Committee of Advisors on Science and Technology (PCAST) strongly endorses the establishment of a National Nanotechnology Initiative (NNI), beginning in Fiscal Year 2001, as proposed by the National Science and Technology Council (NSTC). Our endorsement is based on a technical and budgetary review of a comprehensive report prepared by the NSTC Committee on Technology's Interagency Working Group on Nanoscience, Engineering and Technology (IWGN).

We believe that the Administration should make the NNI a top priority. America's continued economic leadership and national security in the 21st century will require a significant, sustained increase in nanotechnology R&D over the next 10 to 20 years. We strongly endorse the robust funding and the research strategy that has been proposed by the NSTC's IWGN.

Nanotechnology is the science and engineering of assembling materials and components atom by atom, or molecule by molecule, and integrating them into useful devices. It uses new discoveries, new eyes (high resolution microscopes) and hands (laser tweezers) to work, at the scale of a nanometer (one billionth of a meter – ten thousand times smaller than the diameter of a human hair). Nanotechnology thrives from modern advances in chemistry, physics, biology, engineering, and materials research. We believe that nanotechnology will have a profound impact on our economy and society in the early 21st century, perhaps comparable to that of information technology or of cellular, genetic, and molecular biology. Nanotechnology also promotes the convergence of biological, chemical, materials and physical sciences and engineering disciplines.

Nanotechnology is the first economically important revolution in science and technology (S&T) since World War II that the United States has not entered with a commanding lead. Federal and industrial support of R&D in the United States for this field already is significant, but Europe and Japan are each making greater investments than the United States is, generally in carefully focused programs. Now is the time to act.

In our view, the Federal government, together with academia and industry, plays a vital role in advancing nanotechnology. This role will require a new, bold national initiative coordinating focused R&D in the decade ahead. Today nanoscale S&T is roughly where the fundamental R&D on which transistors are based was in the late 1940s or early 1950s. Most of the work currently required is still fundamental, with a much longer time horizon than what most industries can support. The NNI is balanced well across fundamental research, grand challenges, centers and networks of excellence, research infrastructure, and education and training.

We believe that the science, technology, applications, products, and programs catalyzed by the NNI will inspire a new generation of young Americans with exciting new opportunities and draw them to careers in S&T. Potentially the NNI will help provide for a better world through advances in environmental technologies, lowering of energy consumption, and advances in medical diagnostics and therapeutics.

The NNI is an excellent multi-agency framework to ensure U.S. leadership in this emerging field that will be essential for economic and national security leadership in the first half of the next century. We recommend that progress toward NNI goals be monitored annually by an appropriate external body of experts, such as the National Research Council.

A brief summary of our review of the IWGN report, National Nanotechnology Initiative – Leading to the Next Industrial Revolution, is enclosed. We hope that our recommendations will be helpful as you consider your priorities for Federal investments. We look forward to discussing this review with you, with members of your Administration, and with members of Congress.