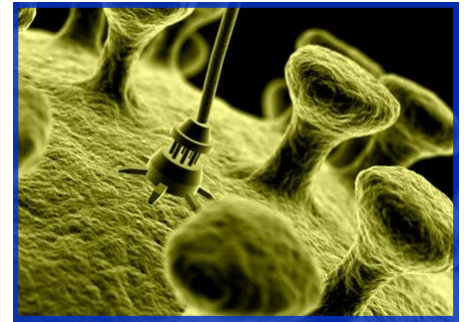
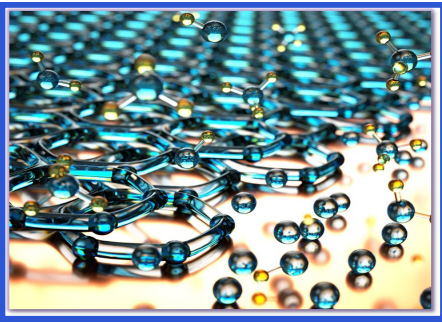




Manufacturing Our Future



U.S. manufacturing has been declining as a share of our nation's gross domestic product for many decades. Our nation has lost almost 30 percent of manufacturing jobs during the last decade. Concurrently, emerging economies have vastly increased manufacturing capacity. In-depth knowledge of manufacturing processes has boosted innovation in these nations. Hence, the nation should launch a "leap-ahead" advanced manufacturing initiative to boost the development of potentially transformative products and emerging technologies.



NSF's **Cyber-Enabled Materials, Manufacturing, and Smart Systems** portfolio will spur U.S. marketplace innovation, yielding high-technology jobs and industrial growth, while accelerating convergence of frontier research in materials, cyber-enabled systems, and manufacturing science. The **Designing Materials to Revolutionize and Engineer Our Future** program will accelerate materials discovery and development, allowing deployment of advanced systems twice as fast as today, and at a fraction of the cost. **Cyber Physical Systems** research will transform static manufacturing systems to "smart" systems that deeply integrate computation, communication, and control with physical processes.

NSF will continue to lead the multi-agency **National Robotics Initiative** to accelerate the development and use of robots that work cooperatively with, or alongside, people in manufacturing environments. The use of cooperative robots will optimize workforce productivity gains and long-term economic growth, increasing efficiency, performance, and safety.

The agency's nanomanufacturing component of the **National Nanotechnology Initiative** will support efforts across NSF aimed at enabling reliable, cost-effective, and scaled-up manufacturing of nanoscale materials, structures, devices, and systems.

Educational programs are also critical to the future of U.S. manufacturing, enabling advances in undergraduate and community college curricula in manufacturing technology and engineering. **Industry/University Cooperative Research Centers** and **Engineering Research Centers** facilitate student training via research immersion and technical advances readily adopted by industry. The **Advanced Technological Education** program focuses on education for high-technology fields, with an emphasis on two-year colleges to produce well-qualified technicians for existing and emerging high-technology fields.