



TASK FORCE ON THE FUTURE OF AMERICAN INNOVATION

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Department of Defense Basic Research

Strengthening National and Economic Security Through Innovation

For over 50 years, America's unique ability to improve the nation's defense through innovation has spurred new technologies that have contributed to our nation's national security and our economy. Innovations as a result of DOD basic research (budget category 6.1) include radar, lasers, fiber optics in communications and medicine, satellite and global positioning system (GPS) navigation, precision guidance technologies, advanced composite materials, and the Internet. Consequently, America's men and women in uniform are the best-equipped and most effective in the world. Moreover, our nation's economy is enhanced by new technologies that spawn new civilian products and industries.

- **DOD 6.1 Basic Research Undergirds Military Strength and Troop Safety**

- As DOD has faced increasingly complex military challenges, it has relied on science and technology as a force multiplier. "Smart" or precision-guided bombs, stealth technology, and composite materials that help shield U.S. forces from enemy fire are just two examples. Such revolutionary technologies are built on the foundation of discovery and knowledge created by DOD basic research.

- **DOD 6.1 Basic Research Bolsters Scientific and Engineering Fields Vital to National Security**

- DOD accounts for over one-third of all federal funding for engineering research.
- DOD provides 70 percent of *all* federal funding for research in mechanical engineering, 60 percent for electrical engineering, 42 percent for materials engineering, 29 percent for computer sciences, and 28 percent for ocean sciences.
- Over 300 universities and colleges conduct DOD-funded research and development.
- DOD accounts for about 10 percent of all federal support (and 27 percent of non-NIH support) for basic research at academic institutions.

- **DOD 6.1 Basic Research Helps to Train the Next Generation Scientists & Engineers**

- Over 50 percent of DOD 6.1 basic research grants are awarded to scientists and engineers at universities and colleges. These grants support not only the research conducted by leading scientists and engineers but also the graduate students who work in their laboratories.
- DOD annually supports approximately 8,000 graduate students in fields important to national defense needs.
- DOD 6.1 basic research also provides direct support to students through undergraduate scholarships and graduate fellowships, including the National Defense Science and Engineering Graduate (NDSEG) Fellowship Program and the National Defense Education Program. These programs help to educate, train, recruit, and retain U.S. citizens in disciplines that are critical to national security. DOD has awarded approximately 2,200 NDSEG Fellowships since 1989.
- Undergraduate and graduate students supported by DOD receive hands-on training in the physical sciences and critical defense fields like computer science and aerospace and electrical engineering. These students will be the next generation of highly-qualified scientists and engineers.

- **The American Competitiveness Initiative Should Incorporate DOD 6.1 Basic Research in FY08**

- In the early 1980s, 6.1 basic research accounted for nearly 20 percent of total DOD Science & Technology (6.1, 6.2, and 6.3) funding. Today it accounts for less than 12 percent.
- DOD plays a critical role in the support of basic physical sciences and engineering research.
- The President's FY08 budget should outline a clear path to increase DOD 6.1 basic research funding. This would help to rectify DOD's recent shift from support of fundamental, long-term basic research toward more short-term objectives of technology development and deployment.