

## C. Small Business Innovation Research (SBIR)



The purpose of DoD's SBIR program is to harness the innovative talents of our nation's small technology companies for U.S. military and economic strength. DoD's SBIR program funds early-stage R&D projects at small technology companies -- projects which serve a DoD need and have the potential for commercialization in private sector and/or military markets. The program, funded at approximately \$50 million in FY 2000, is part of a larger (\$1.2 billion) federal SBIR program administered by ten federal agencies.

As part of its SBIR program, the DoD issues an SBIR solicitation twice a year, describing its R&D needs and inviting R&D proposals from small companies -- firms organized for profit with 500 or fewer employees, including all affiliated firms. Companies apply first for a six-month phase I award of \$60,000 to \$100,000 to test the scientific, technical, and commercial merit and feasibility of a particular concept. If phase I proves successful, the company may be invited to apply for a two-year phase II award of \$500,000 to \$750,000 to further develop the concept, usually to the prototype stage. Proposals are judged competitively on the basis of scientific, technical, and commercial merit. Following completion of phase II, small companies are expected to obtain funding from the private sector and/or non-SBIR government sources (in "phase III") to develop the concept into a product for sale in private sector and/or military markets.

The Deputy Under Secretary of Defense (Science & Technology) SBIR Program is sponsoring two new technology area initiatives this year, Cognitive Readiness Technology and Smart Sensor Web Technology. We are also co-sponsoring a third technology area, biomedical technology topics, with Defense Health Affairs.

All three Services and the Special Operations Command are participating in the Office of the Secretary of Defense (OSD) program this year. The Service laboratories act as our OSD Agent in the management and execution of the contracts with small businesses. The Army, Navy, and Air Force laboratories, often referred to as a DoD Component acting on behalf of the OSD, invite small business firms to submit proposals under this SBIR program.

Objectives of the DoD SBIR Program include stimulating technological innovation, strengthening the role of small business in meeting DoD research and development needs, fostering and encouraging participation by minority and disadvantaged persons in technological innovation, and increasing the commercial application of DoD-supported research and development results. The DoD Program strives to encourage technology transfer with a focus on advanced development projects with a high probability of commercialization success, both in the government and private sector.

Cognitive Readiness is ensuring that the warfighter is mentally prepared for accomplishing the mission and is performing at their optimal performance level. Cognitive readiness focuses on optimizing and enhancing the human dimension of U.S. forces. Extended further, the effectiveness of all DoD personnel can be maximized by improvements in cognitive readiness.

Optimization and enhancement of human performance is challenged by many different factors, such as general health issues, mental and physical stress, cultural and societal influences, environmental stressors, adequate education and training. Currently, there are two "core" Department of Defense program areas organized to address Cognitive Readiness issues, the Biomedical and Human Systems programs with subcomponents dealing in health, psychology, sociology, personnel and training, and human factors engineering issues. Of these issues, we have chosen to focus first, and in general, on technologies necessary for the education and training missions of the Department. Specifically, we are examining a focused investment in S&T projects to support the Department's Advanced Distributed Learning strategic plan.

While the emerging technology area of advance distributed learning (ADL) is generically addressed in the core human systems S&T program, the emergence of new information technologies present the opportunity to make significant improvements in training and education effectiveness through ADL technologies. In addition, providing ADL technologies to the DoD enterprise of education and training offers a key opportunity to reduce costs in these domains. The Cognitive Readiness Topics and the Service Laboratory Executive Agents, who will manage the projects, are:

- OSD00-CR01 Automated Dialogue Modeling Using Natural Language Understanding in ADL, by the Naval Air Warfare Center Training Systems Division (NAWCTSD)
- OSD00-CR02 Training Users' Cognitive Readiness for Combat Command Using an Intelligent Tutor to Model Expert Mentor Interactions by the US Army Research Institute (ARI) for the Behavioral and Social Sciences
- OSD00-CR03 A Personal Health and Fitness Assistant by the US Army Medical Research Acquisition Activity (MRMC)
- OSD00-CR04 Digital Resource for Instructional Design in CBT Authoring Environments by the Office of Naval Research (ONR)
- OSD00-CR05 Dismounted C4ISR Data Presentation and Dissemination by the Army Research Laboratory (ARL)
- OSD00-CR06 Enhancing Situation Awareness in Military Operations by the Army Research Institute (ARI), Ft. Benning
- OSD00-CR07 Personal Education and Training Assistant for Distance Learning (PETA) by the Naval Air Warfare Center Training Systems Division (NAWCTSD)
- OSD00-CR08 Common Operating Picture for Stability and Support Operations by the Army Research Laboratory (ARL), Ft. Huachuca

- OSD00-CR09 Cognitive Learning Strategies for Medical Skills Training and Sustainment via Distance Learning Means by the Special Operations Command (USSOCOM)
- OSD00-CR10 Computerized Cognitive Assessment Battery by the Office of Naval Research (ONR)

Smart Sensor Web (SSW) is a recent focus inspired by extraordinary technological advances in sensors and microelectronics and by the emergence of the Internet as a real-time communication tool. The near future will see a proliferation of sensors and associated processors available for battlefield use. Commercial and military space technology and systems will provide major leaps in coverage, timeliness, and resolution. Many efforts in these areas are ongoing in the Services and Agencies, and together could provide a tremendous new warfighting capability. The overall vision for SSW is an intelligent, secure, web-centric distribution and fusion of sensor information that provides greatly enhanced situational awareness, on demand, to Warfighters at lower echelons.

The Smart Sensor Web Topics and Service Laboratory Executive Agents to manage the SBIR topics in this technology area are:

- OSD00-SSW01 Sensor Data Collection Management Over a Web by Air Force Wright Lab, Rome, NY (AFRL)
- OSD00-SSW02 Agent-based Visualization by Air Force Wright Lab, Rome NY (AFRL)
- OSD00-SSW03 Semantic/Context Based Data Collection, Management and Visualization by Air Force Wright Lab, Rome, NY (AFRL)
- OSD00-SSW04 Target Tracking with a Distributed Sensor System by Office of Naval Research (ONR)
- OSD00-SSW05 Wireless Surveillance Scalable Sensor Netting by Office of Naval Research (ONR)
- OSD-SSW06 Low Cost implementation of High Density Wireless Networks by Naval Surface Warfare Center, Philadelphia Division (NSWC)
- OSD-SSW07 Wireless Networks for Disaster Control and Bandwidth Augmentation by the Naval Surface Warfare Center, Philadelphia Division (NSWC)
- OSD-SSW08 Hardware Compression of Video Data by the US Army Night Vision Laboratory (NVEDS)
- OSD-SSW09 WeatherWeb Sub-Web Meteorological Sensor Array by the Army Research Laboratory (ARL)
- OSD00-SSW10 Unmanned Aerial Vehicle Meteorological Sensing Package by the Naval Research Laboratory (NRL)

The Jointly Sponsored Deputy Under Secretary of Defense (S&T) and Defense Health Program Office have established this focus area to explore biomedical technology research issues. The biomedical technology area is focused to yield essential technology in support of the DoD mission to provide health support and

services to U.S. Armed Forces. Most national and international medical S&T investment is focused on public health problems of the general population. Military medical S&T is concerned with developing technologies in order to preserve combatants' health and optimal mission capabilities despite extraordinary battle and non-battle threats to their well being. Preservation of individual health and well being sustains warfighting capabilities. The Biomedical Reliance Panel is included within the overarching structure of the Armed Services Biomedical Research Evaluation and Management (ASBREM) Committee, which provides joint coordination and cooperation to ensure synergy across all biomedical programs.

The Biomedical Topics and Service Laboratory Executive Agents to manage the SBIR topics in this technology area are:

- OSD00-HP01 Three-Dimensional Model of Thermoregulation by the Naval Health Research Center (NHRC) Detachment at Brooks Air Force Base, TX
- OSD00-HP02 Enhancing Malaria Vaccine Development by the Naval Medical Research Center (NMRI)
- OSD00-HP03 Functional Genomic Analysis of the Malaria Parasite by the Naval Medical Research Center (NMRI)
- OSD00-HP04 Systems For Improved Red Blood Cell Storage by the Army Medical Research Acquisition Activity (MRMC)
- OSD00-HP05 Blast Mitigation Jacket for Training by the Army Medical Research Acquisition Activity (MRMC)
- OSD00-HP06 Analysis and Interpretation of Real-Time Multi-Parameter Biological Data by the Army Medical Research Acquisition Activity (MRMC)