

NATIONAL ACADEMY OF ENGINEERING AND
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

**Workshop on Science, Technology, Engineering and Mathematics (STEM)
Workforce Needs for the
U.S. Department of Defense and the U.S. Defense Industrial Base**

1-2 August 2011

The Waterview Conference Center
24th Floor, University North Room
1919 North Lynn Street | Arlington, VA 22209

Agenda

Day One (1 August)

Continental Breakfast will be available in the meeting rooms starting at 7:00 AM

8:00 AM – 8:10 AM	Opening Remarks
	<ul style="list-style-type: none">• Terry Jagers, <i>National Research Council</i>• Norm Augustine, <i>committee co-chair</i>
8:10 AM – 8:30 AM	Welcome and Introduction
	<ul style="list-style-type: none">• Charles M. Vest; <i>President, NAE</i>
8:30 AM – 8:40 AM	Purpose and Plan
	<ul style="list-style-type: none">• C. Dan Mote, Norm Augustine, <i>committee co-chairs</i>
8:40 AM – 9:00 AM	STEM Workforce Development for the Department of Defense
	<ul style="list-style-type: none">• The Honorable Zachary J. Lemnios; <i>Assistant Secretary of Defense (Research & Engineering)</i>

I: Emerging science and technology in next 15 years

9:00 AM – 10:00 AM	Introductory talks
	<ul style="list-style-type: none">• Donald Burke; <i>Dean, Graduate School of Public Health, University of Pittsburgh</i>• Anthony Tether; <i>President, The Sequoia Group and Distinguished Fellow, Council on Competitiveness</i>
10:00 AM – 10:30 AM	Break
10:30 AM – 12:00 PM	Panel Discussion (moderator: Fran Ligler, U.S. Naval Research Laboratory)
	<ul style="list-style-type: none">• Thomas Russell, Director, Air Force Office of Scientific Research• Lyle Schwartz, ASM Materials Educational Foundation

- **John Sommerer**, Space Department Head, Johns Hopkins University Applied Physics Laboratory
- **Leonard Buckley**, Director, Science and Technology Division, Institute for Defense Analyses

12:00 PM – 1:00 PM *Lunch*

II: Estimating STEM workforce needs under future scenarios

- 1:00 PM – 1:30 PM Introductory talk
- **Rolf Lehming**; *Director, S&E Indicators, National Center for Science and Engineering Statistics, National Science Foundation*

1:30 PM – 3:00 PM Panel Discussion (moderator: Anita Jones, University of Virginia)

- **Leif Peterson**, managing partner, Advanced HR Concepts & Solutions
- **Dixie Sommers**, Assistant Commissioner of Labor Statistics, U.S. Department of Labor
- **John Fischer**, Director, Laboratories Office, ASD(R&E)
- **Edward Swallow**, Vice President, Business Development, Northrop Grumman Corporation; Chairman, STEM Workforce Division, National Defense Industrial Association

3:00 PM – 3:30 PM *Break*

III: Limitations to meeting workforce needs of DoD and the industrial base

- 3:30 PM – 4:00 PM Introductory talk
- **Harold Salzman**; *Professor of Public Policy, Rutgers University*
- 4:00 PM – 5:30 PM Panel Discussion (moderator: Sharon Levin, University of Missouri St. Louis)
- **Burt Barnow**, Amsterdam Professor of Public Service and Economics; Trachtenberg School of Public Policy and Public Administration; The George Washington University
 - **Dixie Sommers**, Assistant Commissioner of Labor Statistics, U.S. Department of Labor
 - **Mike Finn**, economist, Oak Ridge Institute for Science Education
 - **Rick Stephens**, Senior Vice President, Human Resources and Administration, The Boeing Company
- 5:30 PM Adjourn

Day Two (2 August)

Continental Breakfast will be available in the meeting rooms starting at 7:00 AM

8:00 AM – 8:30 AM	Orientation for day two
<i>IV: Institutional capacity in education and the DoD investments needed to ensure a sufficient workforce</i>	
8:30 AM – 9:00 AM	Introductory talk
	<ul style="list-style-type: none">• Carl Wieman; <i>Associate Director for Science, Office of Science and Technology Policy</i>
9:00 AM – 10:30 AM	Panel Discussion (moderator: Dan Oliver, Naval Postgraduate School)
	<ul style="list-style-type: none">• Katrina McFarland, President, Defense Acquisition University• Wes Harris, Charles Stark Draper Professor of Aeronautics and Astronautics; Associate Provost; Massachusetts Institute of Technology• Paul Gaffney, President, Monmouth University• S. James Gates, Jr., John S. Toll Professor of Physics & Director of Center for String and Particle Theory; University of Maryland, College Park
10:30 AM – 11:00 AM	<i>Break</i>
<i>V: Ensuring an adequate workforce capability in an uncertain future</i>	
11:00 AM – 12:00 PM	Introductory talk
	<ul style="list-style-type: none">• Ruth David; <i>President, ANSER</i>
12:00 PM – 1:15 PM	<i>Lunch</i>
1:15 PM – 2:45 PM	Panel Discussion (moderator: Bob Hermann, NAE)
	<ul style="list-style-type: none">• David Chu; President, Institute for Defense Analyses• Jennifer Byrne; Vice President, Corporate Engineering & Technology, Lockheed Martin• Vallen Emery; Outreach Program Manager, U.S. Army Research Laboratory
2:45 PM – 4:00 PM	Wrap-up presentations

Workshop Charge

1. Identify emerging science and technology that could significantly impact the STEM workforce needs of the DOD and its defense contractors over the next 15 years.
2. Estimate the STEM workforce needs by number and field of the DoD and its defense contractors under each of the following three budget scenarios:
 - a. The current 5-year defense budget¹ continues under identical basic assumptions.
 - b. An abrupt change in security threats calls for an abrupt 35 percent² DoD budget increase over that in 2.a above.
 - c. A peace dividend calls for reallocating 25 percent³ of the DoD budget in 2.a to other national needs.
3. Assess the limitations in meeting the above workforce needs and the forces shaping those limitations.
4. Estimate the fraction of the above workforce needs that will not be met by the civilian educational enterprise without supplemental DoD intervention. Where and how should DoD invest to achieve its workforce need?
5. Given the unpredictability of: scientific and technological change; levels and trajectory of DoD budgets; advancements and emerging threats; and the historical inadequacy of past projections of future workforce needs--How can the DoD ensure an adequate workforce capability for itself and its defense contractors in the future?

¹ The outlays for FY 2010 were \$667 billion for "DoD-Military" (Function 051). The estimates for the out-years were as follows (in billions): FY'11: \$740; FY '12: \$707; FY '13: \$648; FY'14: \$637; FY'15: \$644; and FY'16: \$651. (SOURCE: President's Budget FY 2012)

² Roughly the percent increase, in real terms, in DoD spending from FY 2001 to 2005 following 9/11; compare also the 25 percent increase from FY 82 to FY 89.

³ Roughly the percent decrease, in real terms, in DoD spending from FY 1990 to 2000 following end of the Cold War