



SPIE

MATH & SCIENCE EDUCATION

SPIE - The International Society for Optics and Photonics; recognizes that strong math and science programs at all levels of education, from K-12 to higher education, are vital to our nation’s long-term prosperity, global competitiveness and homeland security. SPIE Supports President Obama’s policy effort to increase funding for math and science education through a variety of government agency and private sector initiatives. These include increasing the number of Americans with advanced degrees in science, mathematics, and engineering by making those degrees more affordable, and initiatives that are planned to boost one-time spending for laboratory and scientific equipment for the nation’s secondary schools.

- The U.S. Department of Labor predicts that jobs requiring science, engineering, and technical training will increase 24% between 2004 and 2014.
- In 1970, the United States produced more than half of the world's science and engineering doctorates; by 2010, our share is projected to fall to 15%.
- U.S. students rank below the Organization for Economic Cooperation and Development (OECD) average in Programme for International Student Assessments (PISA) for math and science.

SPIE urges Congress to support:

- 1) \$450 million in funding for the FY2010 **Math and Science Partnership** program at the **Department of Education**.
- 2) A \$140.5 million increase for the **National Science Foundation’s Education and Human Resources Directorate** as planned under the *America COMPETES Act of 2007*
- 3) An increase of 8% to approximately \$5 million for the **DOE Office of Science**.

The Administration and Congress need to work together to create and enhance existing science, technology, engineering, and math (STEM) education programs that can best meet the challenge of educating and training our nation’s students. Reports such as the National Academies of Science’s *Rising Above the Gathering Storm* (http://books.nap.edu/execsumm_pdf/11463.pdf) indicate that our nation’s future competitiveness in the global marketplace is directly tied to the ability of our schools to prepare children for the technological economy of the 21st century.

2006 PISA Science Ranking

Finland
Hong Kong-China
Canada
Chinese Taipei
Estonia
Japan
New Zealand
Australia
Netherlands
Liechtenstein
Korea
Slovenia
Germany
United Kingdom
Czech Republic
Switzerland
Macao-China
Austria
Belgium
Ireland
Hungary
Sweden
Poland
Denmark
France
Croatia
Iceland
Latvia
☆ United States
Slovak Republic
Spain
Lithuania
Norway
Luxembourg
Russian Federation
Italy
Portugal
Greece
Israel
Chile
Serbia
Bulgaria
Uruguay
Turkey
Jordan
Thailand
Romania
Montenegro
Mexico
Indonesia
Argentina
Brazil
Colombia
Tunisia
Azerbaijan
Qatar
Kyrgyzstan

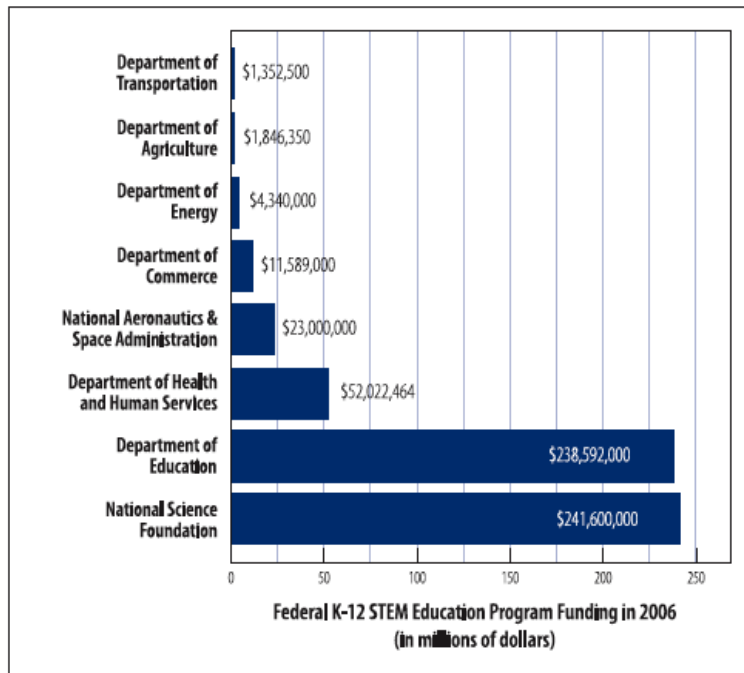
Statistically significantly above the OECD average
Not statistically significantly different from the OECD average
Statistically significantly below the OECD average

SPIE also supports recommendations from the National Science Board's October 2007 *National Action Plan for Addressing the Critical Needs of the Science, Technology, Engineering, and Mathematics Education System* found at http://www.nsf.gov/nsb/documents/2007/stem_action.pdf.

This report commends higher priority and closer coordination for STEM Education policy development at the federal level. STEM Education policy is fragmented and involves many overlapping and duplicative programs; SPIE recommends better coordination at all levels of involvement.

KEY STEM ED AGENCY SUPPORT

The overall federal funding effort can be seen in the following chart, which depicts total 2006 federal agency spending on STEM Education programs across key agencies.



Department of Education (DoEd): To remain competitive in the global economy, every high school graduate needs strong analytical skills in mathematics and science. SPIE supports the Administration's FY 2010 Budget Request for \$450 million in funding for the FY2010 Math and Science Partnership program at the Department of Education.

National Science Foundation (NSF): SPIE supports the Administration's FY 2010 Budget Request for the National Science Foundation (NSF) of \$ 7 billion. This will help strengthen the preparation of American students for the science and engineering workforce, with a focus on broadening participation in those fields. The

Budget Request ensures that NSF's Robert Noyce Match & Science Partnerships program will continue. SPIE recommends full funding for the Robert Noyce Teacher Scholarship program — an increase of \$140.5 million for FY 2010 — which has already been authorized under the *America COMPETES Act of 2007*.

Department of Energy (DoE): DOE's Office of Science conducts a number of STEM Education programs through its Office of Workforce Development for Teachers and Scientists. SPIE recommends an increase of 8% for this function to an estimated \$5 million dollars for FY 2010.

SPIE is the largest international not-for-profit society in optics, photonics and imaging. Together with our 17,000 individual members and 450 corporate members, the Society seeks to build a better world with light through scientific education and innovation. www.spie.org.