

Testimony of Anthony F. (Bud) Rock
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Before the
House Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies
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Seeking Support for the Following Programs in FY 2012:
National Science Foundation – Education & Human Resources/Informal Science Education
National Oceanic and Atmospheric Administration – Education
National Aeronautics and Space Administration – Education

Introduction

Chairman Wolf, Ranking Member Fattah, and Members of the Subcommittee – thank you for the opportunity to testify before you today. My name is Bud Rock, and I serve as the Chief Executive Officer of the Association of Science-Technology Centers (ASTC). My testimony today will advocate for science, technology, engineering, and mathematics (STEM) education by focusing on the FY 2012 budgets for the Informal Science Education (ISE) program at the National Science Foundation (NSF), which would receive \$68.14 million under the Administration’s request, and education programs at the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA), which would receive \$20.84 million and \$138.4 million, respectively, under the request.

About ASTC and Science Centers

ASTC is a nonprofit organization of science centers and museums dedicated to providing quality educational experiences to students and their families as well as furthering public engagement with science among increasingly diverse audiences. Now, more than ever before, we must spark the interests of our young people in all that science has to offer. This is exactly why community-based science centers throughout the country are providing unique educational programs that excite, energize, and enrich our understanding of science and its many applications – frequently with support from NSF, NOAA, and NASA, among other federal agencies.

Science centers are unique places where visitors can discover, explore, and test ideas and, most importantly, learn how science impacts their quality of life. Their offerings are varied, and include interactive exhibits, hands-on science experiences for children, professional development opportunities for teachers, and educational programs for adults.

ASTC has 566 members, including 437 operating or developing science centers and museums in 42 countries. Collectively, these institutions garner 82 million visits annually worldwide. **Here in the United States, your constituents pass through science center doors nearly 60 million times to participate in intriguing educational science activities and explorations of scientific phenomena.** The most recent *Science and Engineering Indicators* (2010) supports this data, finding that 59% of Americans visited a science center, museum, or similar institution in the past year.

Science centers come in all shapes and sizes, from large institutions in metropolitan areas – like

the Franklin Institute in Philadelphia, the Center of Science and Industry (COSI) in Columbus, and the California Science Center in Los Angeles – to smaller centers in less populated areas – like the Shenandoah Valley Discovery Museum in Winchester, Virginia, the Mary G. Harden Center for Cultural Arts in Gadsden, Alabama, and the University of Kansas Natural History Museum in Lawrence, Kansas. ASTC member institutions range in size from 3,000 square feet of exhibit space to one that has more than 200 times that – nearly 650,000 square feet. ASTC works with science centers and museums – small, large, and everywhere in-between – to educate and inform visitors on critical societal issues, locally and globally, where understanding of and engagement with science are essential. As liaisons between the science community and the public, science centers are ideally positioned to heighten awareness of critical issues including energy, the environment, infectious diseases, and space; increase understanding of important new technologies; and promote meaningful informed debate between citizens, scientists, policymakers, and the local community.

Science Centers as an Integral Part of the Nation’s Educational Infrastructure

Science centers are physical places where science and citizens can meet. Many have scientists on staff, and some feature research facilities on-site. Through exhibits and programming – such as lectures and science cafés – science centers help bring current research findings to the public while encouraging discussion and debate of current science issues. More and more, science centers are also getting members of the public involved in research projects themselves.

Our centers reach a wide audience, a significant portion of which are school groups. **Here in the United States, 90% of our members offer school field trips, and we estimate that nearly 11 million children attend science centers and museums as part of those groups each year.** Field trips, however, are just the beginning of what science centers and museums contribute to the educational experience of students and teachers alike. In the United States:

- 90% offer classes and demonstrations
- 89% offer school outreach programs
- 82% offer workshops or institutes for teachers
- 75% offer curriculum materials
- 71% offer programs for home-schoolers
- 41% offer programs that target senior citizens, and
- 40% offer youth employment programs.

Furthermore, more than half offer afterschool programs – especially noteworthy given that more than 15 million school-age children – including more than 1 million in grades K-5 – are on their own after school. Research shows that kids who participate in such programs improved significantly in three major areas: feelings and attitudes, indicators of behavioral adjustment, and school performance. This translates, of course, to self-confidence and self-esteem, positive social behaviors, and accomplishment in school settings.

Serving All Youth - The ASTC Youth Inspired Challenge

In an effort to further expand these already strong educational programs – and to assist the

nation's youth in becoming the innovative and creative thinkers needed for the 21st century workforce – ASTC launched a major new initiative, the *Youth Inspired Challenge*, in September. The *Challenge* – extended to more than 300 science centers in all 50 states – sets a three-year goal to engage thousands of youth, ages 10-19, in 2 million hours of science enrichment. Building on the valuable science education and youth employment programs ASTC members already offer, the goals of the *Youth Inspired Challenge* include: (1) increasing the STEM literacy of America's students; (2) expanding opportunities for STEM engagement of underrepresented groups, including minorities and women; and (3) moving America's students from the middle to the front of the pack in STEM achievement over the next decade. As part of the *Challenge*, ASTC and its member institutions will also collect, catalog, and share best practices for improving STEM literacy for all youth, and will measure and report success based on participation and reach of programs in specific audiences. That process has already begun. **I am pleased to report that nearly 100 science centers in 31 states – including Alabama, California, Kansas, New York, Ohio, Pennsylvania, Texas, Virginia, and Texas – have formally accepted our *Challenge* to date.** I look forward to keeping the Subcommittee abreast of our numbers – and even more importantly, our impact – as this initiative matures.

The Importance of Federal Support for STEM Education

For fiscal year 2010, Congress – led by this Subcommittee – appropriated about \$1.4 billion for STEM education through the National Science Foundation, the National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration. **In fact, this Subcommittee is singularly responsible for nearly 40% of all the federal support for STEM education.**

As you know, there is a strong consensus that improving science, technology, engineering, and mathematics education is critical to the nation's economic strength and global competitiveness in the 21st century. Reports like the National Academies' *Rising Above the Gathering Storm* (2005) and the recent offering from the President's Council of Advisors on Science and Technology (PCAST), entitled *Prepare and Inspire*, have emphasized the need to attract and educate the next generation of American scientists and innovators, and have recommended that we increase our talent pool by vastly improving K-12 science and mathematics education. Clearly, in order to improve STEM education, we must draw on a full range of learning opportunities and experiences, including those in non-school settings.

In its report entitled *Learning Science in Informal Environments: People Places, and Pursuits*, the National Research Council (NRC) of the National Academies, *Pursuits*, said "beyond the schoolhouse door, opportunities for science learning abound..." The NRC found, among other things, that there is ample evidence to suggest that science learning takes place throughout the life span and across venues in non-school settings. Furthermore, the report highlighted the role of afterschool STEM education in promoting diversity and broadening participation, finding that non-school environments can have a significant impact on STEM learning outcomes in historically underrepresented groups, and that these environments may be uniquely positioned to make STEM education accessible to all.

Given the important role science centers and museums play in the education of both students and

teachers, ASTC strongly supports the STEM education activities of NSF, NOAA, and NASA.

National Science Foundation

Located within NSF's Directorate for Education and Human Resources (EHR) and the Division of Research on Learning in Formal and Informal Settings (DRL), the Informal Science Education (ISE) program supports innovation in anywhere, anytime, lifelong learning, through investments in research, development, infrastructure, and capacity-building for STEM learning outside formal school settings. The ISE program invests in projects that advance knowledge through research and evaluation about STEM learning in informal environments; design, implement, and study models, resources, and programs for STEM learning in informal environments; and/or build the STEM and education expertise of informal science education's broad community of professionals, volunteers, parents and caregivers, and all those with potential to facilitate the learning of others.

For years, ISE funding has supported museum-community partnerships like the *Community Ambassadors in Science Exploration* (CASE) project, conducted by the Philadelphia/Camden Informal Science Education Collaborative (PISEC), which includes the Franklin Institute, the Philadelphia Zoo, the Academy of Natural Sciences, and the New Jersey State Aquarium. CASE offers a new model for encouraging the appreciation and understanding of science among underserved families through a corps of teen and adult peer presenters; a curriculum of hands-on learning experiences for families of diverse ages and backgrounds; a regional network of museum-community collaboration; integration of community and museum resources through joint programming; and a longitudinal research study of program impacts. CASE will serve over 20,000 people over three years with peer-presented family learning opportunities and museum experiences. In addition, CASE will train a total of 108 science ambassadors who will offer science workshops at community-based organizations in the languages spoken by their constituencies. Through CASE, the ambassadors will gain training and experience in informal science education that can open the door to possible future career opportunities in community and museum settings.

The FY 2012 budget request for NSF's Informal Science Education program is \$68.14 million. Support for ISE has hovered between \$62.5 million and \$66 million since FY 2004.

National Oceanic and Atmospheric Administration

Since 2005, NOAA's Office of Education has promoted the improvement of public environmental literacy through competitive grants like the Environmental Literacy Grants for Informal/Nonformal Science Education program. The program has consistently demonstrated alignment with NOAA's mission goals and its Education Strategic Plan, and awards require a robust project evaluation plan; promote best practices; emphasize partnerships with NOAA offices and programs; and promote ocean and/or climate literacy. The agency strives to fund projects that complement rather than duplicate grant programs and other educational efforts offered by other NOAA offices and other Federal agencies. To date, 75 competitive awards have been made, supporting a wide range of projects including teacher training, experiential learning for youth and families, and the development of media products and public opinion research.

Just last year, NOAA provided funding to help the Science Museum of Virginia – along with a unique team of federal, state, and private institutions – create the Earth System Display Center based on the popular *Science on a Sphere* (SOS) platform. The Center’s goal is to capture visitor attention, spur interest in climate change literacy, and demonstrate how the local impacts of energy consumption, stormwater management, agriculture practices, and climate change can have an aggregate effect globally. SOS will serve as an iconic centerpiece in the museum's overall interpretive program and a catalyst for meaningful visitor-docent interaction and community learning.

The FY 2012 budget request for Competitive Educational Grants and Programs at NOAA is \$20.84 million.

National Aeronautics and Space Administration

NASA’s Informal Education Program provides support to individual learning and informal education communities by facilitating access to NASA staff, research, technology, information, and/or facilities. It also provides professional development opportunities for science educators and works to facilitate collaborative partnerships within the educational community, both inside and outside the agency. The Informal Education Program goals are to: (1) increase interest in and understanding of STEM disciplines by inspiring and engaging individuals of all ages; (2) establish linkages between out of school settings and formal education; and (3) stimulate parents and others to support children’s STEM learning endeavors by becoming informed proponents for high-quality, universally available STEM education.

Science centers have received funding through the NASA’s Competitive Program for Science Museums and Planetariums, which supports NASA-themed STEM education, including exhibits, on topics like space exploration and science, aeronautics, earth science, and microgravity. To date, 32 projects have been funded, including a 2010 award to the Boonshoft Museum of Discovery in Dayton, Ohio to develop and install a new Exoplanets Exploration exhibition and circulate a traveling version that will cross the country. The exhibition will be integrated into all aspects of STEM and space-related programming at the museum and will address relevant Ohio Academic Content Standards for Earth and Space Science, based on National Science Education Standards. Support materials will be available for educators, parents, and caregivers for use in classrooms, in the home, and in other learning venues.

The FY 2012 budget request for NASA includes \$138.4 million for Education Programs, \$41.7 million less than the FY 2010 enacted level.

Conclusion

ASTC urges the Subcommittee to continue to recognize the importance of the STEM education offerings science centers and museums provide for students and teachers – and the federal support provided by NSF, NOAA, and NASA for the same purpose. To that end, ASTC encourages the Subcommittee to see these programs as integral to meeting the STEM education needs of our students and teachers by providing them with the resources they need to carry out this important service to the country. Thank you once again for the opportunity to present these views. I would be happy to respond to any questions or provide additional information as needed by the Subcommittee.