

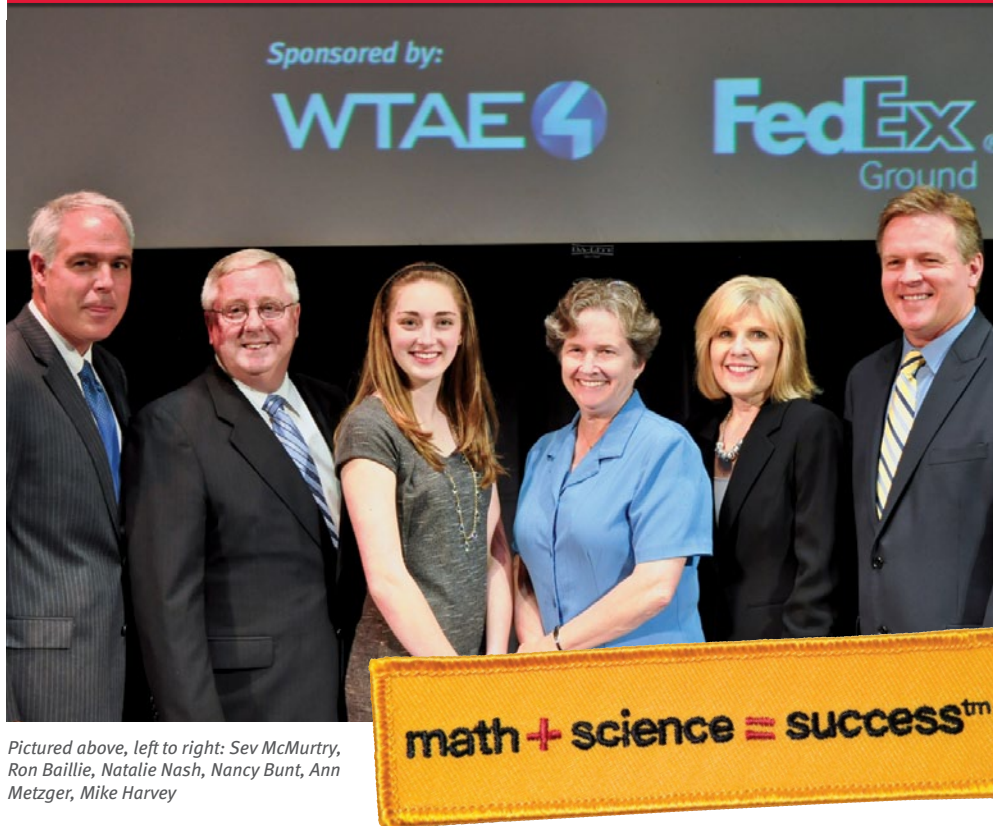
# science IMPACT

SUMMER 2012: VOL. 1, NO. 2



**CARNEGIE  
SCIENCE  
CENTER**

One of the four Carnegie Museums of Pittsburgh



*Pictured above, left to right: Sev McMurtry, Ron Baillie, Natalie Nash, Nancy Bunt, Ann Metzger, Mike Harvey*

beyond Algebra II doubles a student's chances of earning a bachelor's degree.

Over the next decade, one million additional STEM graduates will be needed to fill economic demands. In western Pennsylvania alone, industries will require more than 150,000 new STEM employees.

"It's very important for parents to know about the rich career opportunities their children will have if they have a solid foundation in math and science," said **Ann Metzger**, Henry Buhl, Jr., co-director of the Science Center.

"The Math + Science + Success campaign aligns very well with the goals of our Chevron Center for STEM Education and Career Development," Metzger said. "A key goal of the Chevron STEM Center is to foster a committed community, which we are trying to nurture through this public awareness effort."

*(Story continues on page 3)*

## **SPREAD THE WORD: MATH + SCIENCE = SUCCESS**

The economic demands of the 21st century challenge the American workforce to develop strong skills in science, technology, engineering, and math (STEM).

Math and science are the pillars of a firm STEM foundation. Math is the gatekeeper for science because students cannot learn higher level science without understanding mathematics.

To help ensure our region's economic prosperity, the Science Center is partnering with the **Math & Science Collaborative** and **WTAE 4** to launch a community awareness campaign called **Math + Science = Success**.

Sponsored by **FedEx Ground**, the campaign aims to encourage students to enroll in higher level math and

science courses. "There is no math gene" and "All kids can, and need to, learn math and science" are among the messages the campaign delivers to parents and children. Math + Science = Success provides online resources at **mathsciencesuccess.org** for parents, caregivers, teachers, and kids to help keep interest in science and math percolating.

Right now, the fastest-growing and highest-paying jobs require solid math and science skills. Completing advanced math in high school is proven to influence college graduation rates and taking math

### **STEM Stats**

- The fastest-growing economic clusters need a STEM workforce:
  - Biotechnology (Biomedicine)
  - Information Technology
  - Environmental Technology
  - Advanced Manufacturing
- By 2013, national jobs in science and engineering are expected to increase by 2.2 million and a trained labor force is in short supply.
- Nearly 2,000 positions remain unfilled because candidates lack required STEM skills.
- Completing advanced math in high school influences college graduation rates more than any other factor—including family background.
- Taking math beyond Algebra II doubles the chance of earning a bachelor's degree.

# directors' note



**W**e use the word “inspire” a lot at Carnegie Science Center. You’ll find it in our mission statement, and you’ll often hear us talk about inspiring young people to explore careers in science, technology, engineering, and math (STEM). But inspiration is not a one-way street. We ourselves have been inspired this spring by the extraordinary kids (and teachers and parents) we’ve met at the 2012 Pittsburgh Regional Science and Engineering Fair, an event we have sponsored since 1939.

More than 1,100 kids from our region in grades 6-12 entered projects in this year’s fair—the highest science fair participation here in 30 years. By the time they arrive at the fair with their projects in tow, these young people have spent countless hours over the course of many months getting ready for the fair. They’ve chosen their topic of study and have followed the scientific method by developing a hypothesis, testing it, and coming to a conclusion. Then they design a display board and defend their project to expert judges on the day of the fair.

Talk about inspiring! These kids demonstrate confidence and maturity and intelligence that belies their age. It’s truly an honor for us to witness it all and to know that the Science Center played a role in their future success.

But this was an extra-special year—because Pittsburgh also was host this year to the Intel International Science and Engineering Fair, where more than 1,500

students from 68 countries came together at the David L. Lawrence Convention Center in mid-May to compete for prizes and scholarships.

We’re proud that Carnegie Science Center played a large role in bringing this competition to Pittsburgh—and were thrilled to host the participants for a social evening at the Science Center during the week of the fair. Kids from all nations—despite the international strife—laughing and talking and sharing their hopes and dreams in our science center. Watching some of the world’s best and brightest young people united in their dreams to create a better world through scientific discovery and application was...well... *inspiring*.

We were reminded once again how privileged we are to lead this wonderful organization.

Ron Baillie and Ann Metzger  
Henry Buhl, Jr., Co-Directors



One of the four Carnegie Museums of Pittsburgh

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[CarnegieScienceCenter.org](http://CarnegieScienceCenter.org)

Carnegie Science Center delights, educates and inspires through interactive experiences in science and technology. By making science both relevant and fun, the Science Center’s goal is to increase science literacy in the region and motivate young people to seek careers in STEM (science, technology, engineering and math).

The Science Center also serves as a town square for community dialogue on science and its social implications and seeks to showcase regional science and technology advances.

One of the four Carnegie Museums of Pittsburgh, the Science Center is Pittsburgh’s premier science exploration destination, reaching more than 700,000 people annually through its hands-on exhibits, camps, classes and off-site education programs.

Ron Baillie and Ann Metzger  
Henry Buhl, Jr., Co-Directors

*Science Impact* is available online at  
[CarnegieScienceCenter.org/Publications](http://CarnegieScienceCenter.org/Publications).

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Sev McMurtry of FedEx Ground is interviewed by WTAE 4 at a news conference for the campaign launch.

## Spread the Word: Math + Science = Success

(...continued from page 1)

### THE MESSAGE

Since its inception in 1994, the Math & Science Collaborative has worked to strengthen the teaching and learning of math and science by applying research and collaboration from kindergarten through college.

“All students must learn math and science for their future and our country’s future,” said **Nancy Bunt, EdD**, program director of the Math & Science Collaborative, headquartered at the **Allegheny Intermediate Unit**. “For too long, we’ve acted like only a select few are capable of attaining those skills and knowledge. Now we know, in fact, there is no math gene.”

Math + Science = Success represents both research and collaboration.

The campaign was originally designed as part of a National Science Foundation grant to Georgia Math Science Partnership, where research found that strong messages on TV really do change public perceptions.

Given their long-time partnership, the Math & Science Collaborative approached Carnegie Science Center, whose own strategic planning had identified the same need, about bringing the campaign to western Pennsylvania.

“The Science Center went on to recruit WTAE 4, which offers a team with extensive knowledge and experience in launching effective public awareness campaigns,” said Ron Baillie, co-director

of the Science Center.

Collaboration among partners from the three organizations worked on securing corporate sponsorship with **FedEx Ground** for a campaign that would be extensive enough to impact the region. Pittsburgh-based FedEx Ground, which has made a multi-year commitment to serve as an equal partner in the program.

“As a leading employer of STEM professionals in our hometown of Pittsburgh, FedEx Ground is proud to serve as a presenting sponsor of the campaign,” said **Sev McMurtry**, FedEx Ground’s senior vice president, Operations Planning and Engineering.

“This program and its aim to increase young people’s interest in math- and science-related subjects and careers is a natural fit with our company. We’re excited to be launching this program in 2012 and look forward to tremendous success in the years to come.”

### THE IMPACT

Measures of long-term campaign success will be determined by examining the increase in the number of students enrolling in

higher level math and science courses at area schools.

The Science Center’s general visitor and teacher surveys, in addition to WTAE 4’s overall market research, will help gauge general awareness of the campaign’s message and FedEx’s role in bringing these issues to the public forefront.

As a parent of two teenaged sons, **Michael J. Hayes**, president and general manager of WTAE 4, is a true believer in the overall effectiveness of the Math + Science = Success campaign.

“It’s important for everyone to understand that kids are very impressionable,” Hayes said.

“They’re listening to the messages you’re sending. So if we can reach out to parents and show them the statistics, we can get them on board and ultimately

“All kids can learn math & science... There is no math gene.”

make a difference in our children’s lives. The whole world revolves around problem solving. You need to know math and science to succeed.”

WTAE 4’s scientist, Weather Watch 4 chief meteorologist **Mike Harvey**, will play a role in the campaign.

“What excites me about the Math + Science = Success campaign is the power of its message,” said Bunt. “Learning math and science is like putting on the jeans we wear. Some may have to tug harder than others, but everyone can get them on.” ■

### Kids need a solid foundation in math and science for their everyday lives, regardless of career:

- Balancing checkbooks
- Becoming an educated consumer
- Managing credit and debt
- Safeguarding the environment

# Family Science Nights



Wendy Brenneman, early childhood coordinator, teaches five-year-old Collin McKenna and his father, Randy, about the Pro-Bot car at the “Robot Roundup” activity station.

## Robots Explored Inside & Out

Micaiah Wheeler pressed his forehead against the plastic tank to examine the living Madagascar hissing cockroaches crawling inside.

“This is so cool,” said four-year-old Wheeler, who scooped up the magnifying glass at the “Robots and Roaches” activity station to get a better look. The “hex-bug,” an insect-like robot armed with antennas, snagged his attention next.

In May, Wheeler joined more than 160 students and their families at Spring Garden Early Childhood Center for one of the Science Center’s robot-themed Family Science Nights, which feature science experiences and hands-on activities.

“I think it’s exciting because he’s getting what he needs,” said Micaiah’s mother Regina Wheeler, who watched her son use a robot arm to pick up colored pom poms from a container and drop them into color-coded graduated cylinders.

The Science Center’s early learning activities are funded in part by a grant from **PNC’s Grow Up Great with Science** program, which brings Science Center staff with interactive programs to 133 Head Start classrooms in Pittsburgh Public Schools and Westmoreland County.

“We show teachers how to incorporate hands-on scientific learning into their lessons,” said **Wendy Brenneman**, Carnegie Science Center’s early childhood coordinator. “We also provide classroom kits for teachers as a companion piece to our programs. So when we leave, teachers can continue educating students in a way that gets them excited about science.”

Family Science Nights—funded by **Spark**, a program of the **Sprout Fund**—are scheduled to engage parents and other family members in scientific fun with Head Start students.

This year, the Science Center introduced the concept of robotics and programming to Head Start classrooms through the Spark-funded “Hello Robo!” Family Science Night participants had a chance to explore these unique robotic activities.

“The three main principles I tried to demonstrate with ‘Hello Robo!’ are that robots are machines that help humans, all robots have jobs, and humans must tell robots what to do,” said Brenneman. “By breaking the subject of robotics into easily understood concepts like these, we create a fun, accessible experience for early childhood students and their families.”

The “Reach like a Robot” station proved to be popular among the pint-sized students who buzzed around the gymnasium to experience all eight hands-on activity stations. Dasia White, 5, and her three-year-old sister Amil used tweezers to “rescue” robot parts from a tray of slime, and sort them into compartments labeled nuts, bolt, springs, and gears.

Five-year-old Elizabeth Lapp explored “Robot Reactions,” which featured a “My Keepon” robot that has been programmed by humans to respond to touch and sound. It has touch sensors in many parts of its body, and a microphone in its nose to sense sound.

Her mother, Angel Lapp, watched close by: “What kinds of things do you like to build?” she asked.

“Everything that’s a part,” Elizabeth said matter-of-factly.

“What’s Inside?” invited students to open disassembled electronic devices. Students who explored this station referred to a labeled circuit board to discover what’s inside the devices. Other stations included “Gears Make Robots Go,” “Say it in Binary Code!,” and “Robot Roundup,” which introduced students to two types of robots with sensors: the Pro-Bot car and light-sensing robots.

“Science is everywhere,” said Angel Lapp, on the importance of science education in schools. “It’s in everything you do, see, feel, and touch.” ■



Micaiah Wheeler tests out a robot arm at the “Reach like a Robot” activity station. This station illustrates that all robots perform jobs, which often involve sorting products by shape and color.

# BOARD SPOTLIGHT



## Steve Massaro

Vice Chair, Carnegie Science Center Board

When the Massaro family drives through the Fort Pitt Tunnels, **Steve Massaro** waits for his four-year-old son to point out his favorite building in the North Shore skyline: Carnegie Science Center.

Massaro and his family are frequent visitors to the Science Center. His son, Joseph, loves to play with the plastic balls at the water fountain and watch Hoops, the basketball-shooting robot.

Massaro, vice president of business development at Massaro Corporation, joined the Science Center board in 2009 and became vice chair in 2011. He says he has a deep appreciation for the Science Center's ability to get kids excited about science, technology, engineering, and math.

"It's important that we continue to encourage our kids to stick with math and science even when it gets tough," he said. "It will be worth it in the long run."

# GRANTS & AWARDS

Grants from **Joan and Bob Peirce, The Grable Foundation, Allegheny Technologies, Rob Thompson, and PPG Industries Foundation** is helping to make the new SpacePlace astronomy gallery a reality in November 2012. Joan Peirce and Rob Thompson both serve on the Carnegie Science Center Board. The Science Center raised \$1.4 million for SpacePlace and associated upgrades to the Buhl Digital Planetarium including carpeting, seating, and dome refurbishment. SpacePlace will be located in the Science Center Atrium and will fill the space vertically with full-body Zero-G experiences, full-scale International Space Station module mock-ups, and interactive exhibits relating to the basic sciences and technological advances in space exploration.

**Dollar Bank** is the presenting sponsor of *GITAR: The Instrument That Rocked The World*, a new interactive exhibit about the science of sound, running June 16 – Sept. 30. Created by The National Guitar Museum, this traveling exhibit features historic guitars, giant touchscreens, audio, performance videos, and the world's largest playable guitar, as certified by *Guinness World Records*. In total, the Science Center acquired more than \$100,000 in funding for *GITAR*. Sponsors include **Trib Total Media, Sonic, PA Leadership Charter School, Bottom Dollar, Hard Rock Café, Associates in Ophthalmology, Sewickley BMW, and 529 College**

## Savings Plans.

Carnegie Science Center received a \$50,000 planning grant from the **Heinz Endowments** to explore the development and implementation of the Carnegie Science Center STEM Education Endorsement, and to pilot a unique teacher professional development model that involves teachers and students in a STEM based summer workshop experience.

The Science Center's STEM Endorsement would "certify" a school or district as having pursued STEM education in a structured, comprehensive manner. Components would include curriculum, career development, parent involvement, and teacher professional development. The endorsement would serve as a national model to define STEM Education in a consistent way while providing, and modeling, effective instructional strategies including inquiry-based, hands-on, project-based learning, real-world applications of technology, and team-based instruction and learning.

To achieve these goals, the Science Center plans to work with partners including the **Math & Science Collaborative; ASSET; University of Pittsburgh, School of Education, Department of Instruction and Learning; California University of Pennsylvania;** and a range of industry partners.

## Science Center Staff Speak at National Conference

Three Carnegie Science Center education staff gave presentations at the **National Science Teachers Association (NSTA)** conference, held in Indianapolis from March 28 through April 1.

NSTA conferences are considered the premier event for science educators to take advantage of professional development and networking opportunities. The strong Science Center presence helped advance Carnegie Science Center's national profile as a leader in STEM education.

**Linda Ortenzo**, director of STEM programs, spotlighted the Science Center's Chevron Center for STEM Education

and Career Development in her presentation about "STEM Education: Partnerships, Collaboration, and Programming."

**Marilyn Fitzsimmons**, education coordinator for the Science Center's outreach program Science on the Road, presented a workshop titled, "Taking Care of Our Environment for Future Generations."

**Robert Marshall**, educator at Carnegie Science Center and STEM Education Specialist for **Fisher Science Education** led several workshops, including "What's New in Astronomy News?"

# PARTNER SPOTLIGHT



Snee-Reinhardt  
Charitable Foundation



**Christina Treadwell**  
Foundation Manager

*“The Snee-Reinhardt Charitable Foundation believes that life is like an oak tree—strong and beautiful—and should be given every chance to grow. As a family foundation in Pittsburgh, our philanthropic traditions are well rooted in our continued support of organizations that foster transformative programs, which best serve the local community as a whole in the areas of arts and culture, education, environmental, health and medical, human services, and religion.”*

## **Why did the Snee-Reinhardt Charitable Foundation choose to partner with the Science Center?**

“Carnegie Science Center provides a wide variety of activities, programs, and opportunities to children and adults alike. The benefits of learning are priceless to those who walk through the Science Center’s doors. There are so many programs and interactive exhibits that tease your senses and boggle your brain. Carnegie Science Center combines learning with fun. It’s a family venue and a place for friends to bond. It’s an educational encounter that cannot accurately be put into words because it is something that must be experienced. It’s the enriching of lives, the growing of knowledge, the fostering of curiosity and the transformation of ideas into possibilities that make the partnership between the Carnegie Science Center and the Snee-Reinhardt Charitable Foundation achievable.”

## **What is the history of the foundation’s work with the Science Center?**

“In honor of our founder, Katherine Snee, the Board of Directors installed a bronze compass set in stone at the Science Center’s main entrance when it opened in 1991. This compass, a demonstration of the earth’s magnetic field, was appealing to our board as well as Mrs. Snee since her husband Bill’s lifelong work was in geology. To commemorate the 20th anniversary of the Snee-Reinhardt Charitable Foundation in 2007, the Board of Directors refurbished the faded bronze compass, updated and added planting areas and seating, and further enhanced the beautification and preservation of the Science Center’s entrance. Two years later, the Snee-Reinhardt Charitable Foundation funded exterior improvements to establish a more visually dynamic entry corridor and enhance the impact of the Science Center’s presence in the North Shore skyline.”

## **What are the most recent improvements made possible by the foundation?**

“Each restoration project has enhanced the overall educational anticipation of what Carnegie Science Center offers once inside. Most recently, the enlightening experience of the Science Center extended outdoors with interactive and educational elements, including Discovery Park outside of Highmark Sportsworks® and the Brain Maze. At night, Carnegie Science Center is alive with color. The letters spelling the Science Center’s name on the Rangos Omnimax Theater change color, and colorful messages are projected above the entrance, beckoning everyone to come be a part of the magic of science.” ■

## microbits

### **STEM Programs and Science Sleepovers create buzz**

The spring 2012 edition of *The Pittsburgh Regional Compact Quarterly* featured **Linda Ortenzo**, director of STEM programs at the Science Center, in its “60-Second Insight” section. In the article, she highlights the Chevron Center for STEM Education and Career Development and the programs that engage, educate, and inspire girls to pursue careers in STEM.

In Slippery Rock University’s alumni magazine, *The Rock*, Science Sleepovers were touted as an experience to “boost learning”—not only among students, but future educators. As part of their schooling, SRU education majors served as sleepover volunteers and led scientific activities with children (ages 6-12). Science Sleepovers provided an opportunity for education majors to sharpen their class planning and organizational skills.

### **Carnegie Mellon University Graduate volunteers at PRSEF for eighth year**

**Evan Danahar** started off as a set-up assistant, greeting and directing students at Carnegie Science Center’s Pittsburgh Regional Science and Engineering Fair. A year later, he served as an inspector, marking off a checklist of science fair “dos” and “don’ts.” Now a seasoned volunteer, Danahar is a jack-of-all-trades.

“I help with whatever needs to get done,” said Danahar, 25, who earned a computer science degree from Carnegie Mellon University, prior to completing grad school at Cornell University. He currently works as a software engineer at Ooyala in San Francisco.

“Volunteering at PRSEF is so different from what I normally do—getting computers to do what they’re supposed to,” he said. “It feels really good to help out.”

## Carnegie Science Center serves the underserved

At the Science Center, ACCESS cards, Tickets for Kids® Charities (TFK), and free admission days make it possible for visitors from all walks of life to experience scientific fun.

Visitors can receive general admission for up to four people for \$2 each when they present their Pennsylvania ACCESS EBT Card, issued by the state for access to cash, food stamps, and/or Medicaid benefits. More than 31,000 people—about 8 percent of Science Center visitors— took advantage of the discount last year.

The Science Center also assists about 5,000 visitors through a partnership with TFK, which focuses on enriching the lives of low-income and at-risk children and their families by providing access to high-quality extra-curricular events, activities, and venues.

Several free days throughout the year offer visitors an opportunity to explore the Science Center at little or no cost.

**Duquesne Light** sponsors a Conservation Day on Martin Luther King Day, offering free admission, free parking, and a free Omnimax movie. Nearly, 5,000 people attended in 2012.

On a more whimsical note, each year the Science Center invites the public to save a snowball during the winter and bring it in on the first day of summer. Those who do can name their price for admission. Last year, about 300 visitors participated.

Each fall, the general public can take advantage of free admission to the Science Center, as part of the Allegheny Regional Asset District's RADical Days. More than 3,300 people visited on RAD Day in 2011.



*Mike Hennessey, program development coordinator at Carnegie Science Center, engages visitors at the Intel International Science and Engineering Fair held in Pittsburgh this past May.*

## Young Scientists Unite at Pittsburgh Science Fairs

Every year, thousands of students from the western Pennsylvania region spend months preparing their experiments for Carnegie Science Center's Pittsburgh Regional Science & Engineering Fair (PRSEF). This year, 1,500 students from around the world converged on Pittsburgh for the Intel International Science and Engineering Fair (ISEF) and, along with their teachers and families, they celebrated at the Science Center the night after they presented their projects to the judges.

Intel ISEF, which is affiliated with the Society for Science & the Public, is the world's largest pre-college science competition with awards totaling \$3 million. The Science Center was instrumental in the selection of Pittsburgh from an international pool of eligible sites to serve as a host city for Intel ISEF in 2012, 2015, and 2018.

"Pittsburgh was chosen as a host site for ISEF based on the longstanding success of our Pittsburgh Regional Science & Engineering Fair and the strong commitment of our community to educating the next generation of STEM professionals," said **Ann Metzger**, Henry Buhl, Jr., co-director of the Science Center. "We worked with numerous partners,



including the University of Pittsburgh, Carnegie Mellon University, and Visit Pittsburgh, to bring ISEF here."

"Our science fair is one of the nation's oldest and largest – it's been a Pittsburgh tradition since 1940," said **Ron Baillie**, co-director of the Science Center. "As part of the Science Center's Chevron Center for STEM Education and Career Development,

*(Story continues on back cover)*



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The western Pennsylvania region needs  
**more than 150,000 new employees**  
with STEM training in the next 5-10 years.

## Young Scientists Unite at Pittsburgh Science Fairs



*(...continued from page 7)*

PRSEF is among our many STEM initiatives to help ensure that the next generation workforce has a strong background in science, technology, engineering, and math.”

This year, more than 1,100 students competed in PRSEF for awards totaling \$1 million in cash and scholarships. Seven students advanced to the Intel ISEF competition. Among them is **Natalie Nash**, 17, of Vincentian Academy in McCandless. She created a navigation device for the visually impaired, which won an Intel ISEF Grand Award: 3rd place, \$1,000 cash prize, in computer science. She also won three special awards, including a full fellowship to the Fondazione Bruno Kessler’s “WebValley” summer school in Italy.

**Chareeni Kurukulasuriya**, a student at Pittsburgh Allderdice High School, earned an Intel ISEF Grand Award: 3rd place, \$1,000 cash prize, in cellular biology.

Several Science Center staff members served on the ISEF Local Arrangements Committee. **Charles K. Vukotich**, senior project manager at the University of Pittsburgh’s Center for Public Health Practice, a member of the the Science Center Board, and a longstanding PRSEF volunteer, also was active on the committee and played a major role in recruiting judges for ISEF. Officials noted that Pittsburgh recruited an unprecedented number of judges. **■**