



Carnegie Science Center Co-Directors Ann Metzger (far left) and Ron Baillie (far right) flank ASTC CEO Bud Rock (second from left) and Allegheny County Executive Rich Fitzgerald

## Science Center Shares Best Practice With International Organization

How can science centers and museums across the country become STEM education conveners? Science center CEOs and senior staff from as far away as Arizona explored this topic at Carnegie Science Center during a one-day workshop, presented by the Association of Science-Technology Centers (ASTC) in November.

ASTC—an international organization of more than 600 science centers and museums—recognized Carnegie Science Center’s Chevron Center for STEM Education and Career Development with the “Leading Edge Business Practice” award at its 2012 annual conference in Columbus.

ASTC Chief Executive Officer Bud Rock asked Science Center Co-Directors Ann Metzger and Ron Baillie to host a work-

shop to help other science centers and museums implement a model similar to the Chevron STEM Center at their organizations.

### THE CARNEGIE MODEL

Dubbed the ‘Carnegie model’ by ASTC, the Chevron STEM Center provides a focused forum for collaboration among key STEM education stakeholders.

“This workshop is an opportunity to gain first-hand knowledge about Carnegie Science Center’s Chevron Center for STEM Education and Career Development, which was developed to be a leader in creating and delivering high quality and effective STEM education programs,” said Rock.

Pillars of the Science Center’s vision—collaboration, great teaching,

inspired learners, and a committed community—were highlighted during the workshop led by Co-Directors Ann Metzger and Ron Baillie, Director of STEM Programs Linda Ortenzo, and Senior Scientist John Radzilowicz.

Their presentations explained the conceptualization and collaborative process that led the Science Center to develop a STEM education center.

“As a ‘community connector,’ the Chevron STEM Center brings together a coalition of corporations, K-12 formal education, higher education, and foundations with a common goal to address challenges in STEM education and workforce development in the western Pennsylvania region,” said Metzger.

Launched in November 2011, the Chevron STEM Center encompasses the Science Center’s existing informal science education programs for students and has embarked on a remarkable array of new initiatives, including partnerships with area school districts to develop and strengthen STEM curricula, a database of regional STEM programs, and the “Math + Science = Success” public awareness campaign aimed at students, teachers, parents, and caregivers.

“Our Chevron STEM Center has positioned us as a regional leader in STEM education, elevated our community profile, and raised significant funds to support our mission,” said Metzger.

Workshop participants were encouraged to become STEM education conveners in their communities. They heard from representatives from the Chevron STEM Center’s founding partners—California University of Pennsylvania, Duquesne Light, Eaton Corporation, Kennametal, LANXESS Corporation, NOVA Chemicals, and PPG Industries Foundation—to hear why they chose to support the Chevron STEM center with significant funding.

The speakers—**Bruce Niemeyer**,

*(Story continues on page 3)*

# directors' note



**E**ver have one of those days that just seems so... right? A day you'd like to bottle up and keep in storage to be brought back out on those days that don't go so well?

We had one of those great days last November when we hosted science center colleagues from across the country who came to Pittsburgh to hear about how we conceived and launched our Chevron Center for STEM Education and Career Development. (See story, page 1.) It was an invigorating—if exhausting—day during which we shared our initial insights that led to the formation of our STEM Center. We told our colleagues that we had noticed that there was a wealth of STEM-related programs in western Pennsylvania offered by many different types of organizations — but we also noticed that they were not coordinated to work together synergistically.

We realized that Carnegie Science Center could be a “connector” and a “neutral convener” of these disparate programs so as to focus efforts for the greatest impact. Because we have our own array of STEM-related informal science education (ISE) programs and student competitions, we have partnered for many years with regional corporations concerned about the next-generation workforce. We also partner regularly with those in K-12 STEM education — but realized that these two groups, industry and education, rarely communicate with each other. In addition, those in higher education sometimes had ties to regional corporations through their science departments or to formal

education through their teacher training programs — but, again, these partnerships tend to be random without a holistic view of regional needs for education and workforce development.

As a respected community asset, we knew we could bridge many of these gaps and develop a structure within which all of the concerned STEM stakeholders—including pre-K-12 school districts, colleges and universities, technical schools, business and industry, and informal science education providers, among others—could work together. It's a simple idea—but one that requires community collaboration and great diligence to implement.

We've been gratified by the support we've received for our concept — not only from Chevron and our other founding partners—but also from ASSET, the Math & Science Collaborative, the Allegheny Conference, a number of area school districts, universities, and the foundation community. We're on to something big—something that can help grow the next-generation workforce in the sciences. We're at the beginning of an exciting journey—together as a community we can make real changes.

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



One of the four Carnegie Museums of Pittsburgh

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412.237.3400

[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.

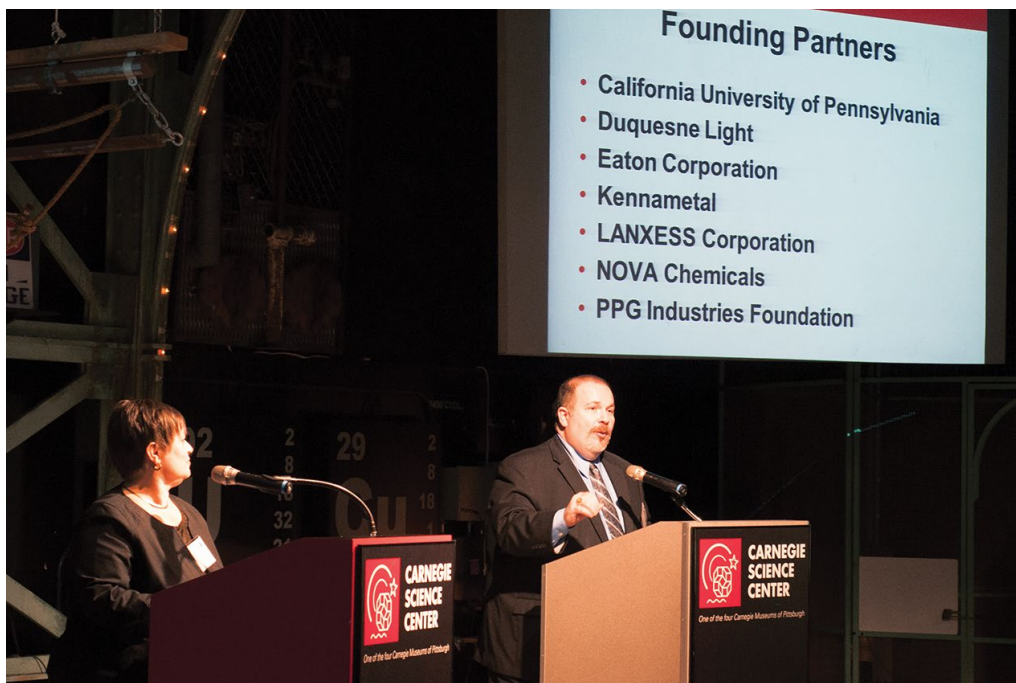
One of the four Carnegie Museums of Pittsburgh, the Science Center is Pittsburgh's premier science exploration destination, reaching more than 700,000 people annually through its hands-on exhibits, camps, classes and off-site education programs.

**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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STEM Programs Director Linda Ortenzo and Senior Scientist John Radzilowicz address workshop participants.

## Best Practice With International Organization

(...continued from page 1)

vice president, Appalachian/Michigan Strategic Business Unit, Chevron; **Chuck Kahle**, chief technology officer and vice president of Research and Development, PPG Industries, Inc.; **Judith Hallinen**, assistant vice provost for Educational Outreach, Carnegie Mellon University; **Audrey Russo**, president and CEO, Pittsburgh Technology Council; and **Winifred V. Torbert**, program director, K-12 Initiatives and Community Social Responsibility, UPMC Center for Inclusion—also discussed ways to approach businesses for STEM-related partnerships.

### ROADS TO STEM SUCCESS

The Roy L. Shafer Leading Edge Awards are presented annually to ASTC members and/or their employees in recognition of extraordinary accomplishments that not only enhance the performance of their own institutions, but also significantly advance the mission of science-technology centers and museums.

The 2012 honor is the second Leading Edge Award that Carnegie Science Center has won in the past four years; the Science Center's BrainCake website for girls won the 2009 award as the "Leading Edge Visitor Experience."

"It is a great honor to be recognized for our achievements by our international peers," Baillie said.

"Much of the energy and excitement of our Chevron STEM Center comes from

our highly engaged STEM Advisory Board, comprising leaders from the education, business, technology, and philanthropy sectors." (Visit [CarnegieScienceCenter.org/stemcenter/](http://CarnegieScienceCenter.org/stemcenter/) for a list of advisory board members).

According to the U.S. Bureau of Labor Statistics, eight of the 10 fastest-growing occupations nationally are related to science, math, or technology. The U.S. Department of Commerce estimates that STEM occupations are projected to grow by 17 percent from 2008 to 2018, compared to 9.8 percent growth for non-STEM occupations.

Statewide, more than 200,000 new STEM-educated employees are needed in the next 10-15 years.

Allegheny County Executive **Rich Fitzgerald**, who earned a bachelor's degree in mechanical engineering from Carnegie Mellon University, is a strong supporter of STEM education.

The father of eight children, Fitzgerald has a daughter who is currently pursuing a degree in engineering—a field that allows recent college graduates to potentially earn up to \$90,000 annually.

"Advances in technology in the region date back to the Industrial Revolution," said Fitzgerald. "STEM reflects the heart of what we do here in Pittsburgh." ■

## microbits

### National Chemistry Week

More than 1,700 local students in grades K-12 explored everyday uses for chemistry, potential careers in the field, and dozens of hands-on exhibits and demonstrations presented by local companies during ChemFest in October.

Themed "Nanoscience: The Smallest Big Idea in Science," ChemFest offered a chance for participants to experiment with bouncing bubbles and magic sand; create Alka-Seltzer® Rockets; discover how to make soap or lip gloss; and investigate the science behind disappearing ink.

Representatives from the **Bayer Corporation**, **PPG Industries, Inc.**, **Thermo Fisher Scientific**, **Carnegie Mellon University**, **Bidwell Training Center**, and **University of Pittsburgh** were among the presenters.

Additionally, 160 high school students also participated in a fast-paced introduction to chemistry careers at the new Career Café. They interacted with industry professionals, enjoyed café-style beverages, and watched live science demos.

### Staff Member Recognized For Nonprofit Work

**Nina Barbuto**, program manager of the Science Center's Girls, Math & Science Partnership, has been named by *Pittsburgh Magazine* as one of its "40 Under 40" honorees for her work at Carnegie Science Center and Assemble, a nonprofit organization founded by Barbuto, dedicated to fostering learning and creativity. Assemble connects technologists, artists, and innovators with curious adults and kids of all ages through interactive gallery shows, community talkbacks, learning parties, and workshops focused on teaching STEAM principles (science, technology, engineering, art, and math).



Astronaut Mike Fincke with the Peirce family inside one of the International Space Station modules at SpacePlace. Bob and Joan Peirce provided major support for SpacePlace.

# Journey into SpacePlace

## New exhibit offers lesson in space travel for visitors

Life as an astronaut is no longer left to the imagination for Carnegie Science Center visitors.

Launched in November, the new SpacePlace exhibit features a two-story, walk-in replica of the International Space Station (ISS), a 1/3 scale model of the Hubble Space Telescope, and a “weightless” experience.

“Everything you see looks like you’re on the space station,” said **Dennis Bateman**, director of Exhibit Experience at the Science Center. “You can climb into an astronaut’s bunk, try your hand at a space experiment, or control the camera on a robot arm. There’s even a space toilet you can sit on!”

SpacePlace, which explores themes in physical science, technology, astronomy, engineering, and environmental science, instantly allows visitors to visualize their own role in space or other scientific endeavors.

“Carnegie Science Center had its roots in the Buhl Planetarium and Institute of Popular Science, and SpacePlace is an exciting culmination of that legacy,” said **Ron Baillie**, co-director of the Science Center.

Visitors can see and feel the difficulties

of working and conducting experiments in space through hands-on interactives. A microgravity glove box in the ISS allows them to interact with floating objects, powered by a small Bernoulli blower.

They can learn the effects that gravity and friction place on the environment by lying on a rolling low-friction platform at the Micro-G Simulator. There, visitors complete a series of simple tasks similar to those used in astronaut training, such as opening and closing valves, inspecting equipment, and simply traveling from points A to B.

Rockets take flight daily in the Science Center’s Atrium, which showcases the Hubble Space Telescope model suspended high into the air. Visitors can design a rocket and launch it four stories in the air, or drop payload parachutes safely to the ground.

Nearby, a touchscreen interactive allows visitors to select career interests – from art to astronomy – and see the variety of career opportunities available in the space industry other than being an astronaut.

Artifacts that made the trip beyond Earth’s atmosphere are on display on a Living and Working Space Wall. Mission patches, toiletries, and a flight suit are among those donated by Pittsburgh native and NASA astronaut **Mike Fincke**. The ‘Ask the

Astronaut’ interactive allows visitors to choose questions and get answers from Fincke.

Visitors can learn what life is like without gravity or experience this first hand at the Zero-G Climbers.

“You’re strapped into a harness that compensates for your weight, removing leverage and gravity from your actions,” said Bateman. “Most people find that it’s more difficult than it looks to do even the simple tasks the astronauts do every day.”

Fincke, who speaks warmly of his childhood visits to Buhl Planetarium, credits the inspiration he found there with his determination to become an astronaut. He has logged more time in space than any American in history, including more than a year on the International Space Station.

Bateman had a chance to discover what a real astronaut thought of the Science Center replica when Fincke toured the exhibit for the opening of SpacePlace.

“He said stepping into our ISS made him feel like he was ‘home.’ It felt very gratifying to know that we just about nailed it,” Bateman said. ■



# BOARD SPOTLIGHT



## Bonnie VanKirk

Carnegie Science Center Board

Bonnie VanKirk has always considered Carnegie Science Center to be one of the premier attractions in western Pennsylvania and an asset to the region.

“The Science Center is always a buzz of activity,” said the Pittsburgh native. “It is a place where children can run around and be noisy, and still learn something. And everyone—staff and visitors alike—always has a smile on their face.”

When approached to join the board three years ago, VanKirk was eager to be a part of an organization that offers a “total sensory experience” for kids and adults.

Her favorite exhibits, the Miniature Railroad & Village® and roboworld™, continue to amaze her every time she visits the Science Center.

“The Miniature Railroad has been a Pittsburgh attraction for over 50 years, and is constantly evolving,” she said. “Roboworld™ is a modern interactive exhibit that has wide appeal. One may be old, and the other is new, but both are huge draws for the Science Center.”

VanKirk has a background in the publishing business, working for Time Warner Inc. as a regional advertising manager for the magazine division. Upon retiring, she became an active community volunteer serving on various boards and committees in the region.

“I’m always fascinated by the transformation that has taken place in Pittsburgh,” she said. “The culture, sports, medical facilities, schools, parks, and rivers make it such a great place to live.”

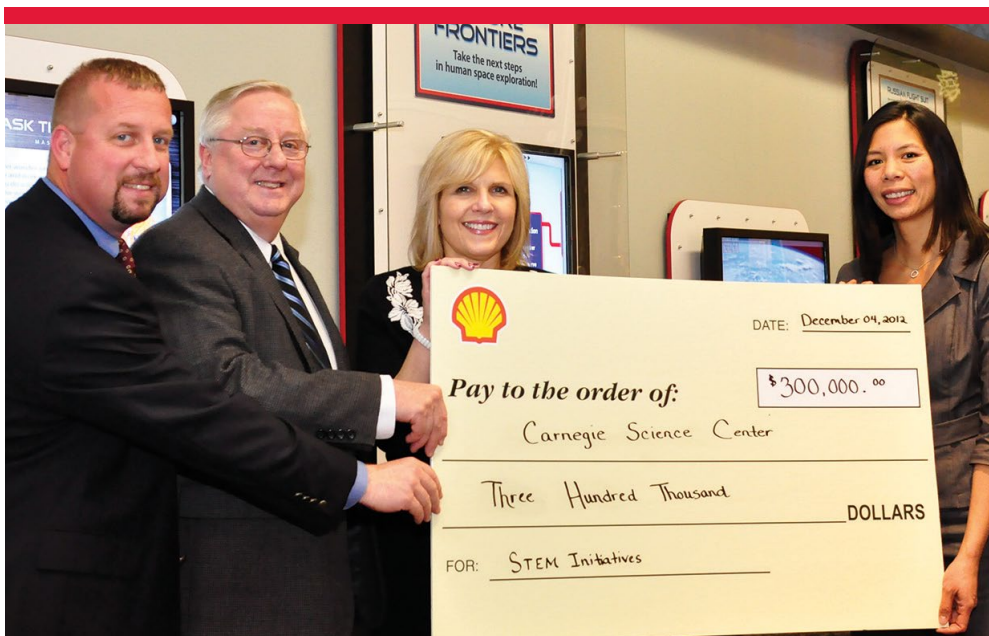
# GRANTS & AWARDS

■ Carnegie Science Center has received a \$50,000 grant from **Verizon** for its Mobile Digital Learning Project. This project will give Carnegie Science Center the ability to convert any gallery, exhibit, or classroom into a mobile learning laboratory.

The Mobile Digital Learning Project will allow additional technology camps and classes to be offered to students of all economic backgrounds through scholarships that are made available to underserved students who qualify for reduced or free lunch. More than 35 students are able to attend week-long summer camps through these scholarships. Carnegie Science Center has partnered with Pittsburgh Public Schools, The Hill House Association, and The Homeless Children’s Education Fund on promoting these scholarship opportunities.

Additionally, the project will allow Science Center staff to reach thousands of students and teachers who will use the digital technology on field trips. More than 1,200 students (ages 6-18) are expected to be directly impacted by this project over a three-year period, with at least 20% of all participants coming from underserved communities.

■ The Claude W. Benedum Foundation and the Alcoa Foundation provided a total of \$50,000 toward Carnegie Science Center’s initiative to build an online directory of STEM programs available regionally for those in grades K-12. Currently under development, this searchable directory will be useful to students, parents, teachers, and others seeking to access the broad array of STEM resources available in the western Pennsylvania region.



Board member Sylvie Tran, far right, presents check to Director of Development Ron Gruca (left) and Co-Directors Ron Baillie and Ann Metzger

## Major Shell Grant to Support STEM Initiatives

Carnegie Science Center received a \$300,000 grant from **Shell Oil Company** to help fund various initiatives that fall under the auspices of the Chevron Center for STEM Education and Career Development. Programs supported through this grant include a database of regional STEM programs, a new Teacher Excellence Academy, SciTech Days, the Pittsburgh Regional Science & Engineering Fair, and the Science Center’s digital learning initiatives.

# PARTNER SPOTLIGHT



## ThermoFisher SCIENTIFIC

### Spencer Todd

Vice President Business Development & Strategy,  
Customer Channels Group, Thermo Fisher Scientific

#### What is Thermo Fisher's mission?

Thermo Fisher Scientific (NYSE: TMO) is the world leader in serving science. The company enables its customers to make the world healthier, cleaner and safer by providing analytical instruments, equipment, reagents and consumables, software and services for research, analysis, discovery and diagnostics.

Thermo Fisher Scientific has more than 39,000 employees and serves more than 350,000 customers in pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, schools, research institutions and government agencies, as well as environmental, industrial quality and process control settings.

The company delivers the industry's broadest selection of analytical instruments, equipment, consumables, and laboratory supplies. Its growing portfolio of products includes innovative technologies for mass spectrometry, elemental analysis, molecular spectroscopy, sample preparation, informatics, fine and

high-purity chemistry production, cell culture, RNA interference analysis and immunodiagnostic testing, as well as air and water quality monitoring and process control.

#### On the importance of Thermo Fisher's partnership with the Science Center:

As the world leader in serving science, we are pleased to partner with Carnegie Science Center. The Science Center's expertise in delivering high quality, and meaningful informal STEM education programming and experiences to the students in our region directly aligns with our Foundation's mission to inspire young people to pursue careers in science.

#### In what ways has Thermo Fisher supported the Science Center?

Over the years, we have supported many of Carnegie Science Center's programs. Most recently, Thermo Fisher employees have been involved in the SciTech Festival, National Chemistry

Week events, Carnegie Science Awards, and Science on the Road educational outreach programming.

ThermoFisher has also partnered with Carnegie Science Center to send Robert Marshall across the country offering STEM Professional Development Workshops. In these workshops, Marshall demonstrates how Fisher products can be used to enhance classroom education. (See "Staff Member Chosen for NASA Research Program" below.)

Through sponsorships and volunteer opportunities with organizations like Carnegie Science Center, Thermo Fisher Scientific's more than 1,500 Pittsburgh-based employees have the opportunity to take an active role in giving back to the Greater Pittsburgh region. □

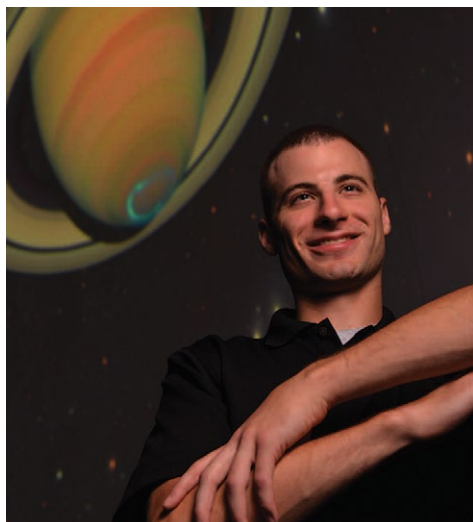


Photo: Jim Judkis

## Staff Member Chosen for NASA Research Program

Robert Marshall, program development coordinator for the Buhl Planetarium, was one of 19 educators nationwide – chosen from a pool of more than 100 applicants – selected to participate in the NASA Infrared Processing and Analysis Center Teacher Archive Research Program (NITARP). NITARP gets educators involved in authentic astronomical research. The educators incorporate the experience into their teaching and share their experience with other teachers.

Marshall was selected to participate in part because of the Science Center's partnership with Fisher Science Education, which allows the Science Center to bring STEM education training to teachers across the country. Last year, Marshall presented teacher workshops at SUNY Stony Brook University; Franklin Schools in Westfield, NJ; Clay County Schools in Jacksonville, FL; and Bedford Area Schools at St. Francis University.



## microbits

### SciTech Days

Nearly 3,100 students—a near record number—attended Carnegie Science Center’s SciTech Days in November. SciTech Days, held each March and November, are a key component of the Science Center’s annual STEM offerings.

The four-day program featured the latest technological research and hands-on exhibits from organizations, including **PPG Industries, Inc., Allegheny General Hospital/Allegheny-Singer Research Institute, the University of Pittsburgh, Carnegie Mellon University, and Duquesne University.**

SciTech Days is made possible by the generous support of more than 100 foundations, corporations, and professional organizations throughout the region, including **Chevron, FedEx Ground, California University of Pennsylvania, and United States Steel Corporation.**

### CanTEEN Library Interactive

CanTEEN Career Exploration is an innovative resource to inspire girls to envision themselves in STEM careers through gaming and online activities. The CanTEEN Library Interactive is a multiple choice trivia game that contains 11 categories, including *Human Body, Modern Technology, Spending, and What Matters?* Through support from the Motorola Foundation, Carnegie Science Center is working with The American Library Association’s division—American Association of School Librarians Network. The CanTEEN Trivia Wheel Library Interactive will be distributed to more than 2,500 middle schools with a focus in Pennsylvania, West Virginia, Ohio, and Illinois in early 2013. An additional 500 copies will be distributed on a first-come, first-served basis to partners in-and-out of classrooms locally and nationally. The interactive game, while designed with girls in mind, is also suitable for middle school boys.



Adults explore four floors of exhibits, experience hands-on science demonstrations, and enjoy live music, drinks, and snacks during 21+ Night.

## Adults Revel in Science at 21+ Night

Carnegie Science Center is a mecca for children, and its new 21+ Nights are demonstrating that it’s also a mecca for the child that lives within each adult.

Nearly 900 adults attended “21+: The Art and Science of Glass” in November, presented in collaboration with the Pittsburgh Glass Center. Besides enjoying themselves in exhibits throughout the building, they attended demonstrations about the science of melting glass and other materials at temperatures over 2,000 degrees, as well as how glass gets its color. Almost 200 guests participated in an optional workshop to make their own colorful fused-glass tile to take home.

“you never stop learning”

Aligned with the Science Center’s mission to advance science literacy in people of all ages, 21+ Nights are planned monthly for 2013, giving adults frequent opportunities to rekindle their scientific curiosity without feeling embarrassed about acting like a kid in front of kids. “21+ Nights give adults the opportunity to remember what it is like to have that ‘wow’ moment when you discover something new and realize that you never stop learning,” notes **Jessica Lausch**, the Science Center’s director of Visitor Experience.



21+ Night participants play in Exploration Station, Jr. at the Acme Ball Factory.





## CARNEGIE SCIENCE CENTER

One of the four Carnegie Museums of Pittsburgh

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*The Seneca Valley Intermediate High School team placed first at the Chain Reaction Contraption Contest. Picture above Tanner Quiggle, Andrew Lingenfelter, Emerson Maloney, and Cole Davis.*

## Chain Reaction Contraption Sparks Creativity

Teams from 35 high schools put their engineering skills and creativity to the test during the Science Center's Chain Reaction Contraption Contest in December.

Seneca Valley Intermediate High School took top honors, Hempfield Area High School came in second, and Greater Latrobe Senior High School claimed third place.

The Chain Reaction Contraption Contest challenged students to create a complex machine to complete an everyday task in 20 steps or more. This year's task was "fill a container and close

it." Contraptions were judged on functionality, complexity, and creativity in achieving the task.

Chain Reaction Contraption is a celebration of National Engineers Week. The contest is sponsored by **Westinghouse Electric Company LLC** and presented in cooperation with Carnegie Science Center and the **Engineers' Society of Western Pennsylvania.** ■