

## Workshops, demonstrations and activities for children:

**Educational Programs during Cèilidh Weekend:** Cèilidh is Carnegie Mellon's homecoming and family weekend, held each fall. Professor Catalina Achim presented activities from the DNA Zone program, which is designed to provide curriculum and supplies to local educators, for students in grade 3-5. Students from the Women@SCS organization presented a workshop for middle school children who were attending the Cèilidh event on campus.



**Product Testing:** Working with kits provided by KnowAtom, the Gelfand Center held a "product testing" workshop for children in grades 1-8. The students built Rubber Band Cars, Electric Cars or Hovercrafts and we shared feedback with KnowAtom. As an added experience for the children, the CMU Racing Team presented a session for the families to discuss building a real electric car. They showed photographs and videos and also brought parts from their vehicle for the children to hold. More than 300 families signed up but we were only able to accommodate 70 children.



**Girl Scout Mall Show:** The Gelfand Center and graduate student members of the Future Leaders of Science group from the Mellon College of Science traveled to Washington, PA to present hand-on activities and science demonstrations to 400+ Girl Scouts and their families on a Saturday in March.



**\*\* Spring Carnival:** Gelfand Outreach is coordinating an educational outreach event for families who attend Spring Carnival on Saturday, April 18. Free two-hour workshops will be held: *BugBots* for grades 1-2; *Building Up!* for grades 3-5, *Science Explorations* for grades 6-8 and Spanish Carnival for Grades 1-5.

**Gelfand Outreach School Year Workshops:** On April 25 the Gelfand Center will conduct a series of rigorous and fun educational workshops for students in grades K-8. The programs are being conducted by Carnegie Mellon faculty and staff. Workshops to be offered: *Science of Everyday Things* for K-2 presented by Professor Kris Dahl, Biomedical Engineering; *Building Up!* For Grades 3-5 presented by Samantha Carter, Architecture; *It's a Material World* for grades 5-7, presented by Neetha Khan, Materials Science; *Additive Manufacturing*, presented by Professor Jack Beuth, Mechanical Engineering; and *Extreme Weather Trends, Climate Science and Public Opinion* for Grades 7-9 presented by Kelly Klima, Engineering and Public Policy; and *Puzzles, Games and Problem Solving* for grades 7-9, presented by Professor Raja Sooriamurthi, Information Systems.

**SciTech Academy in-class mentors:** Two Carnegie Mellon Gelfand tutors are assisting teachers at the SciTech Academy, a school of the Pittsburgh Public Schools. The students assist students and also present information about studying science or engineering to the high school students at the school.

**\*\* Gelfand Outreach July Workshops:** registration is ongoing for one- and two-week programs for students, to be held on Carnegie Mellon's campus. The schedule includes the following topics: *Anatomy and Robotics* for grades 5-7 (2 separate sessions); *Green Engineering* for grades 5-8; *Beginning Alice Programming* for grades 3-4; *Science & Engineering Summer Sampler* for grades 3-5; *Science of Everyday Stuff* for Grades K-2, and *Robotics Programming and Design* for grades 6-8.

**SciTech Festival, at the Carnegie Science Center:** The Gelfand Center provided sponsorship support for this event, which provides two demonstration tables during the fall and spring SciTech Festival program. Local middle and high school students attend, with the Carnegie Science Center providing funding to offset the cost of transportation and registration for schools with high percentages of students who receive free or reduced cost lunch. CMU groups who presented information at the Gelfand demonstration space include Dr. Carmel Majidi's soft robotics lab [Mechanical Engineering], the CMU Racing Team, Future Leaders of Science, the Sciences Teaching Club, and Pi Tau Sigma mechanical engineering honorary society. More than 5,000 local children attended SciTech during this school year. In addition to working with school groups, demonstrations were presented to family groups who were at the Science Center for a visit.



**\*\* Pittsburgh Regional Science and Engineering Fair Sponsored Awards:** As part of the sponsorship of the SciTech Festival the Leonard Gelfand Center provides three special awards at the Pittsburgh fair which is affiliated with the International Science and Engineering Fair. Undergraduate students from the Society of Women Engineers selected two of the winning projects and the third was selected by Carnegie Mellon faculty. One of the winning entries is a team project that converts written words to pictures to help people with aphasia to understand the text, among other applications. This team will represent Pittsburgh at the international event.

**Chinese Culture and STEM:** This two part program for middle school children was conducted on consecutive Saturdays to provide an understanding of how STEM practices are intertwined in the culture of China.

**SPARK Saturdays!** This workshop series held in the fall of 2014 and again in the spring of 2015. Each program consists of four Saturday workshops that focus on a different theme: Mechanical Logic, Programming, Smart Light and Radio Building. Twenty-five high school students participate in each session of SPARK!

**\*\* Family STEM Night at McKnight Elementary School:** The Gelfand Center and volunteers from the Sciences Teaching Club will present hands-on activities and demonstrations during this evening celebration of STEM. The school is expecting more than 500 people to attend.

**\*\* Snap Circuits for Middle School Students:** The Electrical and Computer Engineering Outreach Group, which has designed and has presented four SPARK Saturday series is conducting a Snap Circuits lab experience to introduce middle school students to Electrical and Computer Engineering.

**\*\* Intel ISEF Sponsored Award:** The Gelfand Center sponsored award will be selected by faculty in the Mechanical Engineering Department of the Carnegie Institute of Technology. This award will be presented on-stage to three student winners during the event on Thursday, May 14.

**\*\* Intel ISEF Expo:** The Gelfand Center will have a demonstration table at the Expo which will be held during the International Science and Engineering Fair. During the first two days the audience will be the 1,700 finalists who travel to Pittsburgh from 84 countries. On the Education Outreach Day, May 14, more than 4,000 local school children are expected to attend. The Expo booth was provided to the Gelfand Center by the Society for Science and the Public at no cost, in recognition of Judy Hallinen's work as chair of the ISEF Pittsburgh Local Arrangements Committee.

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**\*\* Broadcom MASTERS (Math, Applied Science, Technology and Engineering Rising Stars):** Middle school science fair winners from Australia, Brazil, Canada, South Africa, Singapore, Chinese Taipei, China, Czech Republic, United Kingdom, Israel, Japan, South Korea, Mexico, India, Ireland, USA who will be in Pittsburgh as observers at the Intel ISEF for high school students will spend at day at Carnegie Mellon. They'll complete a radio building program with faculty and students from Electrical and Computer Engineering, tour a Mechanical Engineering lab and will have lunch with university students from their home country.

### Workshops, demonstrations and activities for educators:

**What is Research? Summer Session:** Supported by a grant from the Siemens Foundation, this three-day workshop has been held annually since 2010. The event is to help educators understand the importance of ensuring that all students have an opportunity to engage in creative thinking, problem solving and original research. Faculty and students from a variety of STEM disciplines share information about their research and about their career path, with a focus on the ways in which teachers helped them to achieve their goals. Resources and information about local science competitions are share with the educators. Funding for this program is provided by the Siemens Foundation.



**Engineering Web Site Focus Group:** The Carnegie Institute of Technology is designing a new web site to assist educators as they work to learn about the role of engineers and the ways in which content that they teach is used in engineering design and projects. To ensure that this resource meets the expectations of K-12 teachers a focus group session was held. The teachers learned about programs and resources that are already available and then were asked about the way that they would like to see the information presented.

**\*\* What is Research? Cameras, Optics and Signal Processing – Oh my!** will be presented to educators on Saturday, May 2. The goal is for middle and high school teachers to learn about the research conducted in the lab of Dr. Aswin Sankaranarayanan, professor of Electrical and Computer Engineering. Following the educational program the teachers will help to design an educational outreach strategy that is aligned with school curriculum and academic standards.

**\*\* What is Research? Computational Design of Mechanical Characters** will be presented by Dr. Stelian Coros, professor in the Robotics Institute in June. The session will feature information from the presenter's work with graphics, controls and 3D printing here at Carnegie Mellon and from his work at Disney Research in Zurich.

## Mark Gelfand Award for Educational Outreach

This year's winner of the award is Carol Frieze from the School of Computer Science. Carol has worked at CMU for 15 years. She teaches a course, 15-296: Images of Computing, described as a "research and action based course" that explores computing from a cultural perspective, and coordinates Women@SCS and SCS4All which is "a student-run initiative that works to develop a program of social and professional activities, and leadership opportunities to broaden interest and participation in computing by underrepresented groups including women, minorities, students and K-12 teachers, and others who may feel isolated or left out." Carol coordinates TechNights which are held each spring and fall to introduce middle school girls to computer science. Approximately 40 local students participate in these free workshops that are presented by CMU students. Among the other initiatives that Carol started and supports is the Roadshows activity that provides free in-school presentations to help middle school students develop an accurate understanding of careers in computer science and robotics. Hundreds of local children benefit from Carol's work each year.

## Child Protection

**Clearance Request processing** Throughout the fall semester the Gelfand Center continued to provide logistical support to ensure that faculty, staff and students who work with children have appropriate and current clearances. A new Pennsylvania law requires all university employees who work with minors to be cleared before the end of 2015 so the Human Resources department has assumed responsibility for processing requests for employees. The Gelfand Center continues to process forms for students who volunteer to share expertise and time with children through student organizations or service learning focused courses. As of April 7, 2015 the Gelfand Center has cleared 450 new volunteers who are making a difference in the lives of children. While personnel from the LGC are instrumental in providing this service, the cost of the clearances is provided by the office of the provost.

## **Mini-grants to support educational outreach initiatives; 2014-2015 year:**

### **Public Communication for Researchers**

Three graduate students at Carnegie Mellon created this organization to help their peers because, "It is not enough for researchers to do good work without explaining why it matters." The Gelfand Center provided funding for transportation to an event where five CMU students shared their experiences as science or engineering researchers. The podcasts are available through the Story Collider Project.

### **Girls of Steel High School Robotics Team**

To support the travel of 30 local high school students as they attend and compete in the FIRST Robotics Championship in St. Louis. The team won the Chairman's Award at the FIRST Buckeye Regional in Cleveland in March. This is the fifth consecutive year that this all-female FIRST team will compete in the national championship.

### **Future Leaders of Science**

This organization was formed and is coordinated by graduate students in the Mellon College of Science. They travel to local schools and organizations to conduct hands-on science activities for children. Highlights of the current academic year include participating in the South Fayette STEM Night for Families, Chemistry Carnival and a Girl Scout Mall Show. Several students delayed their spring break plans to present the activities to the Girl Scouts. More than 500 local children participated in these activities.

### **Technology Consulting in the Global Community**

Fund are provided to assist with the transportation costs of students who travel in the summer to spend 10 weeks supporting the technology infrastructure and/or the technology education programs in high-need countries. The Palau Ministry of Education has requested support to make online resources more readily available to students. Being an island, connectivity to remote resources is slow and costly, and they would like to cache them. The work will impact the entire school system.

### **PROGRESS Negotiation Strategy Programs for Girls**

PROGRESS, in the Heinz College, created tools for girls 8-13 to teach them negotiation basics. A mini-grant supported the signature program 'Speak Up!' in DC and Pittsburgh. It will engage approximately 150 girls and 50 adults. The events are on April 11 (Boys and Girls Clubs in DC) and May 2 (Public School Students in Pittsburgh). This negotiation workshop is a one-day community event, but PROGRESS (as a program at the Heinz College) engages the community on a weekly basis with its school partnerships (Clairton Middle/High School, Gwen's Girls, Pittsburgh Classical Academy, Urban League Charter School) and nonprofit connections. Our effort stems beyond the one-day community wide event which is lasting, enduring, and impactful. Our program educates the community about the importance of teaching girls to negotiate, to build foundational negotiation skills in girls, and to help connect them to more information, training, and support as they develop their negotiation skills.

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## Transportation Services

The Gelfand Center buses have, once again, been a key factor in the ability of Carnegie Mellon student organizations to provide support to youth. Groups that have used the buses this year include:

**Colfax School Tutors:** The Gelfand Center hires and trains university undergraduates who support the after school tutoring activities at Colfax, with the goal of narrowing the achievement gap between the affluent children from Squirrel Hill and the population from the East Hills of Pittsburgh.

**FORGE:** travel to local communities to work with refugee populations. While the work is focused on the children in the refugee families, support is also provided to the adults who are learning how the school system in the US works.

**Higher Achievement:** Carnegie Mellon students support the mathematics and science mentoring for children in the Homewood area of Pittsburgh through this program that, “gives youth from at-risk communities their best opportunity to succeed in middle school — and in life.” The goal is to ensure that the middle school students persist in school, as they are living in a community where more than 50% of the students drop out before high school.

**Project Sunshine:** University students provide educational programs for children in the Children’s Institute, which serves children who have special health care needs.

**Strong Women, Strong Girls:** “The mission of Strong Women, Strong Girls is to support positive mentoring relationships between college women and pre-adolescent girls in underserved local communities to help raise ambition and combat the dangers of low self-esteem.” Programs are conducted in the Pittsburgh Public Schools.

**Moneythink:** This student organization provides weekly session on personal finance for urban youth. This group is part of a national network of university students who are dedicated to helping at-risk students learn about saving and managing money. The CMU chapter was recognized as outstanding for their work during the 2013-14 year, because of their impact on students in school and also on youth in homeless shelters or group living situations.

**Society of Women Engineers:** Student members of SWE provide service to the Global Links, an organization that provides medical relief to resource-poor communities.

**Tutoring for Community Outreach:** The buses are used to transport students in this university course for their initial visit to local schools where they will provide in-class tutoring services to assist local teachers.