

# Annual Report **2014**



Connections



Communication



Collaboration

**Fiscal Year 2014**  
**(July 1, 2013 – June 30, 2014)**



*Northwest Ohio Center for  
Excellence in STEM Education*

**[www.nwocenter.org](http://www.nwocenter.org)**

# FY 2014 NWO Staff

<b>W. Robert Midden</b>	Director
<b>Emilio Duran</b>	Faculty Associate Director
<b>Jodi Haney</b>	Faculty Associate Director
<b>Jessica Belcher</b>	Assistant Director of Finance and Operations
<b>Susan Stearns</b>	Assistant Director of Programming and Development
<b>Lisa Addis</b>	Graphic Designer/Marketing Director
<b>Jacob Burgoon</b>	Project Evaluator
<b>Joetta S. Kynard</b>	Office Manager/BOSEF & GRAMS Project Coordinator
<b>Jenna Pollock</b>	STEM in the Park Coordinator/Project pi r <sup>2</sup> Program Manager
<b>Judith Steiner</b>	iEvolve with STEM Project Manager

## NWO Mission

The Center's mission is to advance science, technology, engineering, and mathematics (STEM) education for people of all ages.

## NWO Vision

The Northwest Ohio Center for Excellence in STEM Education aims to advance science, technology, engineering, and mathematics (STEM) education for people of all ages. Our purpose is to work with community partners to (a) generate new knowledge about the science of teaching and learning, (b) apply this knowledge by developing the expertise of K-12 educators and higher education faculty, (c) increase public support for, and understanding of, the STEM subject areas, and (d) stimulate the interest of young people, especially those in underrepresented groups, in these rewarding fields of study and career opportunities.

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## NWO Goals and Corresponding Activities



**Goal 1: Develop the expertise of pre-service and in-service teachers in STEM and STEM education disciplines.**

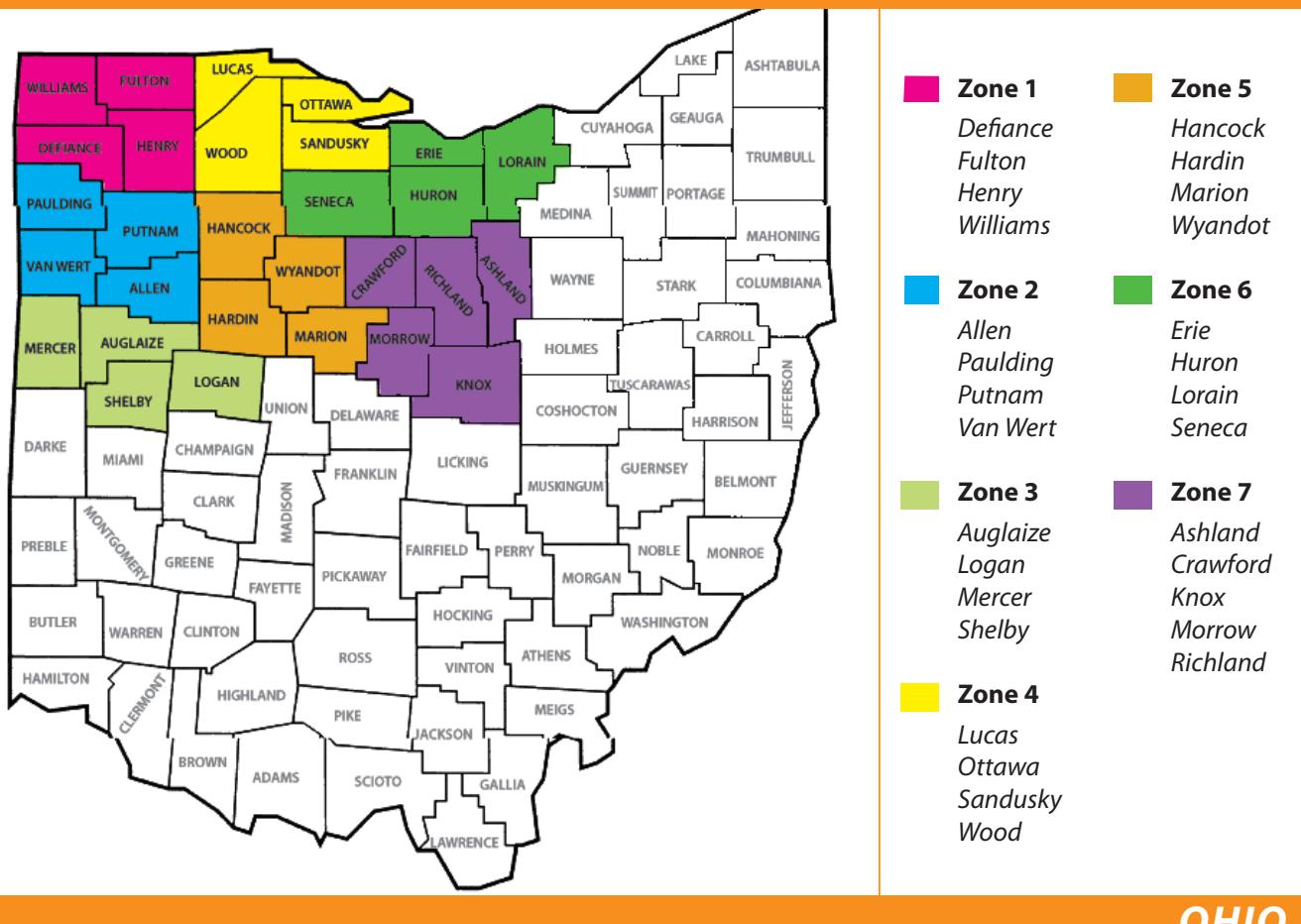
**Goal 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.**

**Goal 3: Conduct and communicate collaborative research in STEM and STEM education disciplines.**

**Goal 4: Develop and sustain a regional collaborative alliance including university, school, informal education, and business partners through a shared vision and collaborative spirit for tackling current STEM education issues.**

**Goal 5: Support higher education faculty and future faculty in pursuit of the best practices in STEM and STEM education disciplines to enhance undergraduate and graduate education.**

## 29 Counties Served by NWO



# FY 2014 NWO Advisory Board

<b>John Agostinelli</b>	Cardinal Stritch Catholic High School
<b>Eric Baumgartner</b>	Ohio Northern University
<b>Lynette Baxley</b>	Sandusky City Schools
<b>Anne Bullerjahn</b>	Owens Community College
<b>Mary Caprella</b>	BP Refinery, LLC
<b>Dave Enzerra</b>	Lubrizol
<b>Julie Garke</b>	St. Henry Local Schools
<b>Anjali Gray</b>	Lourdes University
<b>Jim Gunner</b>	Perkins Local Schools
<b>Sonny Hamizadeh</b>	SSOE
<b>Stephanie Johnson</b>	Ohio STEM Learning Network
<b>Andy Jorgensen</b>	The University of Toledo
<b>Mitchell Magdich</b>	Toledo Zoo
<b>Sloan Mann</b>	Imagination Station
<b>Bob Mendenhall</b>	Toledo Public Schools
<b>Dusty Miller</b>	WGTE
<b>Rod Moorman</b>	Mercer-Auglaize Business Education Alliance
<b>Jan Osborn</b>	Putnam County ESC
<b>Jed Osborn</b>	Ball Corporation
<b>Jamie Pafford</b>	Imagination Station
<b>Kevin Parkins</b>	Cardinal Stritch Catholic High School and St. Kateri Catholic Academy
<b>Julie Payeff</b>	Andersons
<b>Gwynne Rife</b>	The University of Findlay
<b>Eric Rosenbeck</b>	St. Henry Local Schools
<b>Eugene Sanders</b>	Sandusky City Schools
<b>Eric Schild</b>	Cardinal Stritch Catholic High School
<b>Michelle Shafer</b>	Maumee City Schools
<b>Joel Steinmetz</b>	Lima Senior High School
<b>Tom Stuckey</b>	Northwest State Community College
<b>Sybil Truster</b>	Shelby County ESC

# **Educator Professional Development and Outreach**



## **Community Resources Workshop (CRW)**

### **Brief Description**

This weeklong K-12 teacher professional development workshop began in 1998 through a partnership with The Toledo Museum of Art, The Blade, WGTE Public Media, The University of Toledo, and Bowling Green State University. The 40-hour Monday-Friday summer workshop, currently sponsored in part by NWO, features visits to area organizations that focus on inquiry-based, hands-on learning in both formal and informal settings. Teachers may earn 2 graduate credits from Lourdes University and enjoy meeting education specialists from exciting places such as The Toledo Zoo, Toledo Area Metroparks, Challenger Learning Center, and Toledo Lucas County Library on whom they can call for lesson plans, activities, hands-on resources, and school programming. **Meets NWO Goals: 1 & 4**

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### **FY 2014 Activity Information**

In 2014, 24 teachers took part in the Community Resources Workshop (CRW) with activities delivered by Lourdes University, Toledo Area Metroparks, The Toledo Blade, The Mudhens, Challenger Learning Center of Lake Erie West, Imagination Station, Toledo – Lucas County Public Library, Toledo Zoo, WGTE Public Media, and several guest speakers. Highlights included a visit to the Toledo Zoo, and a walking tour of downtown Toledo including the Valentine Theater and The Blade. The 2014 Community Resources Evaluation Report offers a more thorough account of the implementation and impact of the workshop, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix A for advertisement materials.

## **“NWO STEM Connection” E-Newsletters**

### **Brief Description**

The NWO e-newsletter is focused on bringing attention to new opportunities, programs and events happening in K-16 STEM education. Monthly e-newsletters feature stories about area K-12 schools with a focus on STEM learning. Each edition also includes feature stories from community partner organizations detailing how business and non-profit organizations are working with K-12 schools to enhance STEM teaching and learning. Additionally, a hands-on, inquiry based STEM activity is also included for teachers to use in K-12 classrooms. The e-newsletter also features a list of upcoming teacher professional development and student opportunities as well as STEM resource announcements. It is distributed electronically to 8,000+ contacts within the NWO database who are involved with regional school districts, higher education institutions, non-profit agencies, and STEM-orient corporations as well as select individuals from across the State. See Appendix G for an example of an e-newsletter for FY 14. **Meets NWO Goals: 1, 2, & 4**

## **NWO STEM Education Inquiry Series**

### **Brief Description**

Sustained professional development is offered by NWO throughout the academic year through the NWO Inquiry Series. The Inquiry Series is a series of STEM professional development workshops that continues to be highly popular with educators in the region. It also functions as a monthly platform for affiliated NWO grant projects and regional educators to come together for project-specific professional development. The Inquiry Series is open to in-service and pre-service teachers, higher education faculty, and business/community partners in the region. Participants can opt to attend only one event or all the Inquiry Series events. **Meets NWO Goal: 1**

### **FY 2014 Activity Information**

The 2013-14 NWO STEM Education Inquiry Series was held at WGTE Public Media in Toledo, OH. A \$20/session fee was charged for all attendees (undergraduates were charged \$10). The theme for the year was “Going Digital: The STEM Effect” and featured 3-hour long inquiry based presentations from some of the leading names in STEM technology education research and professional development. On the next page is a list of the STEM opportunities offered during the series and the overall attendance data. These events were funded in part by PNC Bank and The Andersons. See Appendix H for advertisement materials.

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Date	Session Title	Presenter(s)	Total Attendance
Oct. 8, 2013	The Benefits of Mobile Technologies for K-12: Transformative and Inevitable! Enabling New Pedagogical Practices and Dramatic Increases in Student Performance.	Elliot Soloway and Cathleen Norris	70
Dec.10, 2013	Using Flipped Technologies to Increase Student Performance in a Traditional Classroom	David Harms	59
Jan. 14, 2014	Connect, Communicate, and Collaborate with Web 2.0	Betsy Hood	22
Feb. 11, 2014	Embrace the Chaos! Using Digital Resources to Empower Learning	Savilla Banister	33
March 4, 2014	Using Creativity Tools for Active & Engaged STEM Learning	Carrie Rathsack	41

Participant Group	Total Attendance for 2013-14 (Unique Visitors)	Total Attendance for 2013-14
College/University Faculty or Staff	3	7
Informal Educator	4	4
Other	1	2
PreK-12 Administrator (or Retired Administrator)	1	2
PreK-12 Teacher (or Retired Teacher)	106	208
Undergraduate Student	2	2
<b>TOTAL</b>	<b>118</b>	<b>225</b>

## NWO STEM Resource Center Website

### ***Brief Description***

The STEM Resource Center website was created as part of a STEM Consortium grant received by NWO in January 2011 from the Ohio STEM Committee, the Ohio Board of Regents, and the Ohio Department of Education, in collaboration with the Ohio STEM Learning Network. The website is designed to be the premier website to visit when searching for STEM teaching resources in northwest Ohio. It is designed to assist preK-12 educators in locating and using STEM resources in the area. Many of the resources are available elsewhere on the internet, but this website is designed as a comprehensive resource where visitor may narrow searches utilizing many filters, including geographical area, grade level(s), subject area(s), types of resources, and others. The STEM Resource Center may be viewed at <http://nwostemresources.org>. **Meets NWO Goal: 4**

## NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching (NWO Symposium)

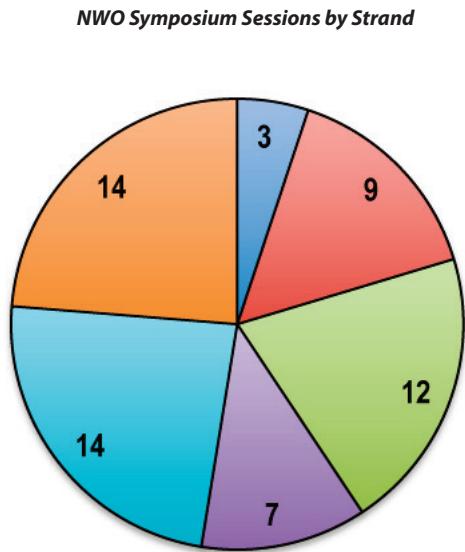
### Brief Description

Over the past several years, the NWO Symposium has brought together hundreds of participants to exchange effective strategies for teaching STEM. This popular event has provided the Center with huge visibility in the community, attracting educators to our long-term professional development opportunities and giving all participants resources and ideas they can use immediately in their classroom or setting.

### Meets NWO Goals: 1 & 5

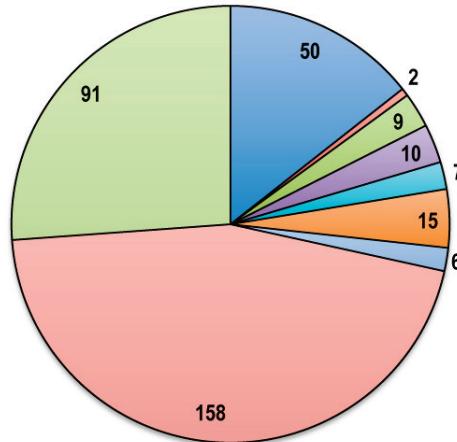
### FY 2014 Activity Information

The 2013 NWO Symposium was held on the BGSU campus on Saturday, November 2. The Symposium began with a keynote address by educational researcher, author, and speaker, Alfie Kohn, and continued with five one-hour blocks of content sessions, with an average of 13 sessions being offered during each block. A registration fee was charged for all attendees (\$35 for educators and \$20 for undergraduate students). Presenters remained free, but for-profit vendors were charged \$100. Session strands continued to help attendees determine what sessions were ideal for their personal professional development. Below is a breakdown of the sessions offered by strand (59 total) and the overall attendance (348). The evaluation report can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix I for examples of the Symposium advertising.



- Inquiry in the College Classroom: Enhancing the Undergraduate Experience
- Integrating Technology in the Classroom
- Putting Creativity to Work: Teaching STEM With Innovation
- STEM in the Community: Thinking Outside the Classroom
- Teaching and Learning in MATHEMATICS
- Teaching and Learning in SCIENCE

### NWO Symposium Attendance by Participant Group



- College/University Faculty or Staff
- For-Profit Education Organization Staff
- Graduate Student
- Informal Educator
- NWO Staff
- Other
- PreK-12 Administrator (or Retired Administrator)
- PreK-12 Teacher (or Retired Teacher)
- Undergraduate Student

# *Faculty Professional Development and Collaborative Education Research*



## COSMOS Research Learning Community

### **Brief Description**

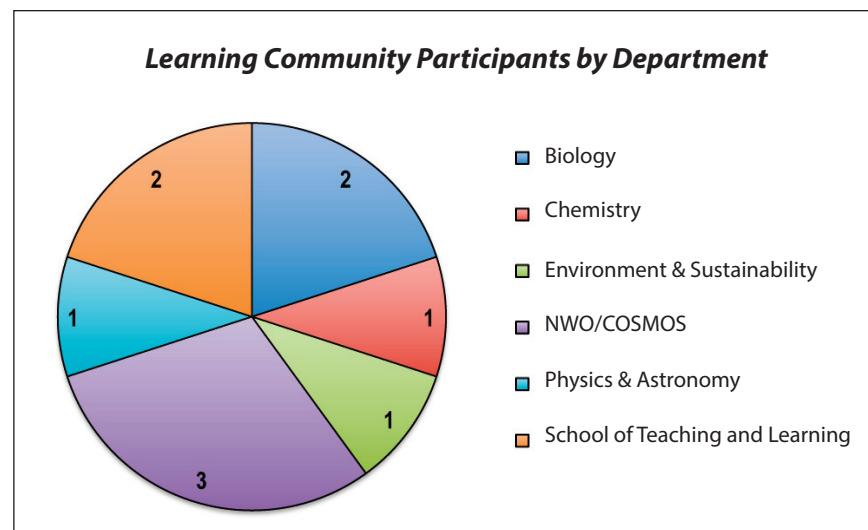
Faculty, graduate students, and others with a common interest in STEM teaching and learning come together throughout the academic year to collaboratively examine and design high tech and highly engaging environments to enhance student attitudes, motivation, engagement, and ultimately success. The learning community supports the overriding goal of enhancing STEM education for people of all ages. **Meets NWO Goals: 3 & 5**

### **FY 2014 Activity Information**

The 2013 – 14 faculty and staff learning community “HiTech by Design” was led by Dr. Jodi Haney (School of Teaching & Learning and Department of Environment & Sustainability). The learning community was a continuation of the 2012 – 13 community and continued to focus on (a) education applications (apps), (b) productivity tools, (c) educational games, (d) social media tools, and (e) HI-TECH devices. The ideas and materials explored during the 2013 – 14 learning community were presented at the 2014 Learning Community Fair. See Appendix F for a copy of the poster presented at the 2014 Learning Community Fair.

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Participation in the COSMOS Research Learning Community shows a diverse group of faculty and staff participants from 6 university departments and 2 corresponding colleges (Arts & Sciences and Education). The community consisted of 10 regular attendees and met bi-weekly throughout the academic year.



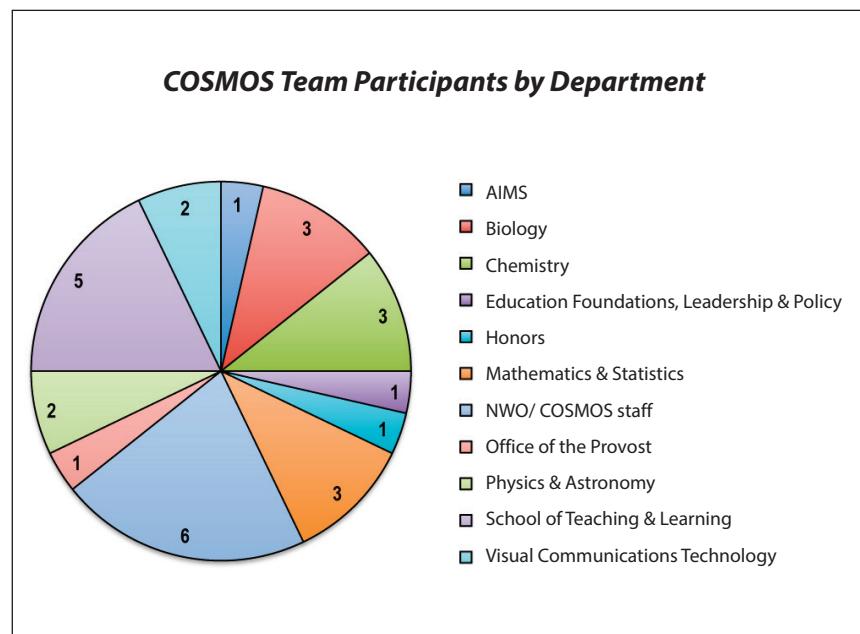
## COSMOS Team and Research Dissemination

### **Brief Description**

The Center Of Excellence in Science and Mathematics Education: Opportunities for Success (COSMOS), the BGSU branch of NWO, hosts the COSMOS Team meeting for BGSU faculty and administrators to work with NWO staff to communicate, collaborate, and champion STEM initiatives at BGSU and throughout the northwest Ohio region. This enthusiastic and supportive group has been meeting as a formal group for over 10 years and is committed to advancing STEM education for people of all ages. **Meets NWO Goal: 3**

### **FY 2014 Activity Information**

Participation in the COSMOS Team demonstrates a diverse group of faculty participants from 11 university departments and 4 corresponding colleges (Arts and Sciences, Education, Technology and Honors College). Representatives from 2 unique areas included the School of Education Foundations, Leadership and Policy and the Office of the Provost. A representative from the AIMS (Academic Investment in Mathematics and Science) program also offered a perspective on the undergraduate experience at BGSU for minority students and women in STEM fields. The team consisted of 28 total attendees and met 8 times over the course of 2013 – 14 academic year. See Appendix B for examples of faculty recognition throughout the year.

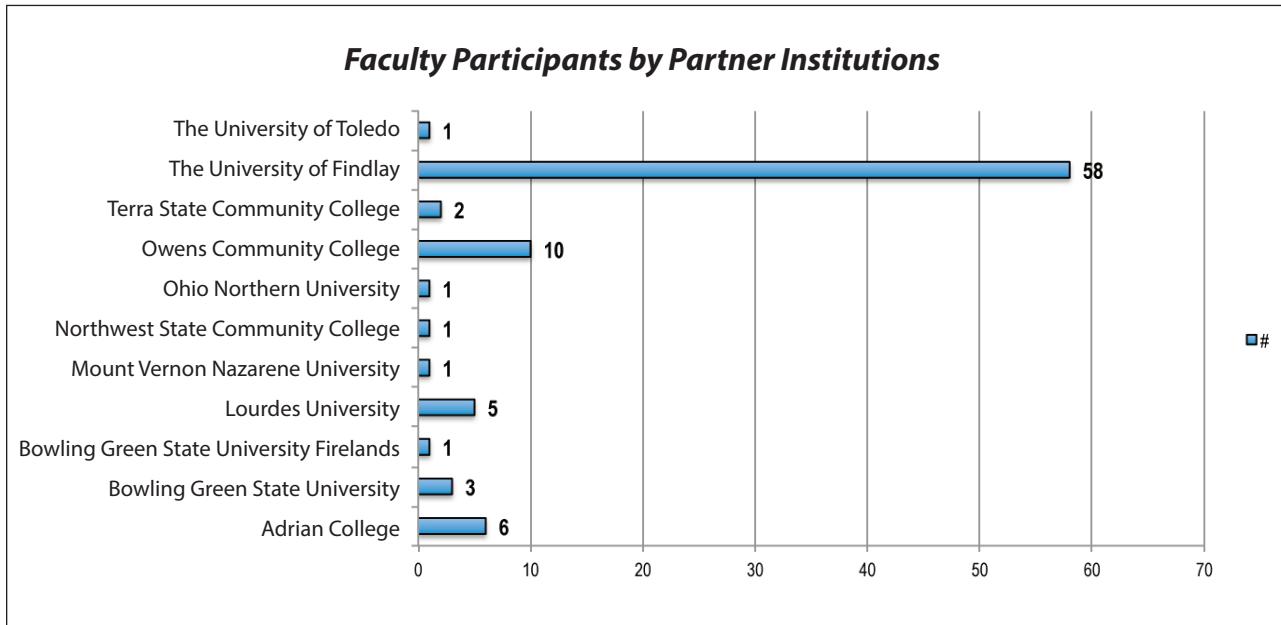


## NWO Faculty Participants

### Brief Description

NWO has partners in colleges and universities all over northwest Ohio and southeast Michigan. These faculty assist NWO in many ways, including participating in and/or presenting at the following NWO events: (a) NWO STEM Education Inquiry Series, (b) NWO Symposium, (c) STEM in the Park, (d) OJSHS, (e) NWO Advisory Board, (f) COSMOS STEM Education Learning Community, (g) COSMOS Team, (h) iEvolve with STEM Facilitation Team, and (i) iEvolve with STEM Leadership Team. **Meets NWO Goals: 3 & 5**

### FY 2014 Activity Information



## Grant Projects



### Common Core for Achievement & Middle Grades Mathematical Proficiency (C<sup>2</sup>AM<sup>2</sup>P Middle Grades): \$265,569 for 7/1/2014 - 8/15/2015

#### **Brief Description**

C<sup>2</sup>AM<sup>2</sup>P Middle Grades is a Math Science Partnership project funded by the Ohio Department of Education. C<sup>2</sup>AM<sup>2</sup>P will serve 30 grades 6-8 mathematics teachers from Bellefontaine, Fairlawn, Findlay, Hardin-Houston, Jackson Center and Lima Schools. This grant is a partnership between these K-12 school districts and Bowling Green State University's Colleges of Education and Human Development and Arts and Sciences as well as the Northwest Ohio Center for Excellence. Teachers will become familiar with the content and practices embedded in the new mathematics standards and develop instructional strategies that promote problem solving through rich tasks, technology, and research-based practices such as teaching through problem solving. The project will run from August 2014 through August 2016. **Meets NWO Goals: 1, 3, 4, & 5**

#### **NWO Role in C<sup>2</sup>AM<sup>2</sup>P Middle Grades**

- Financial management of the grant budget
- Evaluation services
- Grant project management assistance

## **Common Core for Mathematical Proficiency in Elementary Schools ((CO)<sup>2</sup>MP Elementary): \$248,010 for 7/1/2014 - 8/15/2015**

### ***Brief Description***

(CO)<sup>2</sup>MP Elementary is a Math Science Partnership project funded by the Ohio Department of Education. (CO)<sup>2</sup>MP Elementary is a collaboration between Sandusky City Schools, Sandusky Central Catholic, and Bowling Green State University's Colleges' of Education & Human Development and Arts & Sciences as well as the Northwest Ohio Center for Excellence. This project differs from C<sup>2</sup>AM<sup>2</sup>P in that it addresses different grades levels and schools in a different location in our region. Through this partnership 30 K-5 teachers from 2 schools in the Sandusky area (Sandusky Central Catholic & Sandusky City Schools) will take part in professional development focused on the greatest areas of their students' mathematical content and mathematical proficiency needs. The project will run from August 2014 through August 2016. **Meets NWO Goals: 1, 3, 4, & 5**

### ***NWO Role in (CO)<sup>2</sup>MP Elementary***

- Financial management of the grant budget
- Evaluation services
- Grant project management assistance

## **Common Core for Reasoning and Sensemaking – Elementary ((CO)<sup>2</sup>RES): \$168,456 for 1/20/2014 - 5/31/2015**

### ***Brief Description***

(CO)<sup>2</sup>RES Elementary is a one-year Improving Teacher Quality grant from the Ohio Board of Regents. (CO)<sup>2</sup>RES Elementary focuses on preparing K-5 in-service teachers for the new Common Core State Standards for Mathematics (CCSSM). This preparation includes over 100 hours of professional development and work for three connected graduate courses. Through the program teachers learn about best practices in teaching mathematics including ways to promote the 8 Standards for Mathematical Practice expected by the CCSSM. Teachers also explore and practice (CO)<sup>2</sup>RES Elementary techniques with their own students, and share their findings with others at state level conferences. **Meets NWO Goals: 1, 2, 3, 4, & 5**

### ***NWO Role in (CO)<sup>2</sup>RES Elementary***

- Financial management of the grant budget
- Evaluation services
- Grant project management assistance

## **Common Core for Reasoning and Sensemaking – Secondary ((CO)<sup>2</sup>RES): \$168,202 for 1/20/2014 - 5/31/2015**

### ***Brief Description***

(CO)<sup>2</sup>RES Secondary is a one-year Improving Teacher Quality grant from the Ohio Board of Regents. (CO)<sup>2</sup>RES Secondary focuses on preparing grades 5-10 in-service teachers for the new Common Core State Standards for Mathematics (CCSSM). This preparation includes over 100 hours of professional development and work for three connected graduate courses. Through the program teachers learn about best practices in teaching mathematics including ways to promote the eight Standards for Mathematical Practice described by the CCSSM. Teachers are expected to implement ideas from the coursework into daily instructional practice with their own students. Finally, (CO)<sup>2</sup>RES Secondary teachers and instructors share their lessons and experiences with pre-service and in-service teachers, administrators, and support personnel at state-level conferences such as the NWO Symposium on STEM Teaching and Ohio Council of Teachers of Mathematics annual meeting. **Meets NWO Goals: 1, 2, 3, 4, & 5**

### ***NWO Role in (CO)<sup>2</sup>RES Secondary***

- Financial management of the grant budget
- Evaluation services
- Grant project management assistance

## **Inquiry and Engagement to Invigorate and Optimize Learning for Everyone (iEvolve) with STEM: \$7,277,347 for 1/1/2013 - 12/31/2017 (\$1,538,352 for year 2: 1/1/2014 - 12/31/2014)**

### ***Brief Description***

The iEvolve with STEM project is funded by the National Science Foundation: Math and Science Partnership Program. This project is designed to transform teaching and learning in grades 3-8 of two moderate size school districts by fully integrating the practice of science research throughout the curriculum, with the goal of substantially improving student achievement of Ohio science standards. The project also aims to improve undergraduate science instruction by increasing science and mathematics research faculty engagement with K-12 education. Based on past experience in prior NSF-funded work, this will increase awareness and appreciation of best practices in teaching among higher education faculty and will foster a greater commitment to improving the STEM pipeline as well as the effectiveness of undergraduate learning.

Based on nearly a decade of highly successful collaboration in STEM education research and reform and the experience gained from more than \$12 million of externally funded STEM initiatives, the key innovations in this project are: 1) students mastering rigorous state and national science standards by practicing science in national citizen-science research projects led by professional scientists fully integrated into classroom learning; 2) participation of teachers and administrators for an extended 3-year period in a rigorous program of professional development as members of Professional Learning Communities; 3) teachers and students learning to lead through dissemination of their findings to their peers, to their communities, and to their profession; 4) implementation of best practices for differentiating instruction to maximize learning for all students.

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The primary research questions focus on some of the most salient issues that STEM educators currently face: how student engagement and motivation relate to achievement of rigorous learning outcomes. We will examine how participation in citizen-science research affects these variables across the grades 3-8 range. NWO is working with nationally renowned Horizon Research, Inc., for evaluation of project outcomes.

Two cohorts of 50 teachers (100 teachers total) will evolve through an intense 3-year professional development program involving more than 400 hours in direct contact, additional project activities, and research with their students, collaborating with more than 20 professional scientists in 5 different disciplines to accomplish sustained, transformational change in 3-8 science instruction. The instructional innovations practiced by iEvolve teachers are expected to improve learning for more than 6,000 students in grades 3-8 during the 5 years of this project, and through the sustained transformation of these districts, tens of thousands of additional students will be affected. This impact is expected to increase as the influence of iEvolve teachers and students is spread throughout the region through their dissemination of their achievements.

This project is implementing strategies that have been previously found effective for increasing the engagement and success of all students, especially in high-needs schools like those involved in this project. A central theme of iEvolve will be differentiating instruction within all contexts so that every student participates, every student learns, and every student succeeds, as each one becomes a practicing scientist-learner. iEvolve teachers will use action research with the support of Professional Learning Communities to promote continuous improvement of their teaching. They will also learn how to disseminate their action research findings and their students' findings in their science research projects to their peers, their local communities, and their professions. Through this dissemination they will influence the region, shifting the culture towards a greater level of engagement and interest in science discovery and innovation in education. Improving the quality and effectiveness of science education for all students will benefit our society due to higher economic productivity and better participation of citizens in democratic decision-making involving complex STEM issues. The project is led by NWO at BGSU with Dr. W. Robert Midden acting as the Principal Investigator. Project partners include Bowling Green State University, Erie Soil and Water Conservation District, Lourdes University, Toledo Area Metroparks, NWO, The Ohio State University: Stone Lab, Perkins Local Schools, Sandusky City Schools, The University of Toledo, and the Toledo Zoo. **Meets NWO Goals: 1, 2, 3, 4, & 5**

#### **FY 2014 Activity Information**

The first cohort of teachers began implementation of their new science curriculum, adopting Full Option Science System (FOSS) kits to implement hands-on inquiry as the primary instructional method. Each grade level worked with one kit each in the Earth, Life and Physical science content areas, which lay the groundwork for adding Citizen Science Research projects for the following year. The curriculum design team, comprised of representative teachers from each of the third, fourth and fifth grades from both districts, helped to map out the curriculum to align with state standards and create cross-disciplinary connections that would eventually relate to topics presented in the Citizen Science Research projects. Teachers worked in cross-district grade level professional learning teams to examine best practices in science instruction and to support each other in their FOSS kit implementation. Throughout the year teachers participated in monthly professional development meetings.

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Also during this year, the Citizen Science Research projects were created and adapted to their respected grade levels. Pollinator gardens were installed at 6 school sites for third graders, with 2 of these gardens doubling as rain gardens for fourth graders to investigate. One pollinator garden doubled as a community garden, also for fourth grade. The Toledo Zoo and The Erie Soil and Water Conservation District headed up these projects and the garden installations. FrogWatch USA also targeted fourth graders, led by Dr. Eileen Underwood of BGSU's Herpetology Lab. Fifth grade projects were spearheaded by Dr. Chris Winslow of OSU's Stone Lab and Dr. Matt Partin of BGSU's Marine Lab, so that students can monitor water quality and aquatic life in the Sandusky Bay and local streams.

The second summer institute for teachers began in June of 2014, with 4 days of professional development and focused on training teachers in data collection for their respective Citizen Science Research projects, as well as local and global impacts projects can have. The final 2 days of the summer institute was planned for August, with implementation of Citizen Science Research projects with students scheduled to begin in the fall of 2014. The evaluation report can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix D for examples of the recognition received for iEvolve throughout the year.

## iTraining: \$16,100 for 7/1/2013 - 5/31/2014

### **Brief Description**

NWO, in conjunction with Putnam County Schools, implemented iTraining, a series of iPad professional development training sessions for teachers in the school districts of Putnam County, Ohio, during the academic year of 2013-14. This program was funded by the Martha Holden Jennings Foundation and NWO.

### **Meets NWO Goals: 1 & 4**

### **FY 2014 Activity Information**

A three-session track geared toward elementary school teachers took place in the fall of 2013. A three-session track geared toward high school teachers took place in the winter of 2014. The monthly sessions were designed to focus on these two groups within separate tracks. This project provided a total of 65 teachers with nine hours of thorough professional development designed to train the teachers in effective and engaging technology integration. Topics included:

- Using mobile apps for professional collaboration;
- Managing a digital classroom;
- Implementation of mobile apps.

The components of these trainings included practical applications of effective digital classroom management, building and advancing teachers' level of knowledge on how to effectively engage their students with appropriate technology in the digital classroom. Monthly session surveys and a pre and post survey were conducted to assess program success, and teacher reflections provided data on student engagement. The evaluation report can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix E for examples of the advertising for this program and the recognition received.

## **Project pi r<sup>2</sup> THREE (Partners in Inquiry Resources and Research THREE): \$94,743 for 1/20/2013 - 5/31/2014**

### **Brief Description**

Project pi r<sup>2</sup> united the resources of NWO and BGSU in conjunction with principal partner Toledo Public Schools, a high-need local educational agency, and additional partners Challenger Center of Lake Erie West, Educational Service Center of Lake Erie West, Imagination Station, Ohio Energy Project, Toledo Botanical Garden, and Wood and Lucas County Soil and Water Conservation Districts. This project boasts a proven model of sustained professional development in inquiry science education implemented through an intense summer workshop and monthly academic collaboration.

The Principal Investigator on the project is Dr. Emilio Duran of Bowling Green State University's School of Teaching and Learning. The program's overall goals are to (a) improve teachers' content knowledge in science; (b) increase teachers' use of reform-based teaching strategies in science; and (c) improve student achievement in science. **Meets NWO Goal: 1**

### **FY 2014 Activity Information**

Project pi r<sup>2</sup> THREE was an Ohio Board of Regents: Improving Teacher Quality funded grant spanning across FY 2013 and FY 2014. The project provided 30 grades 2 – 5 teachers with 105 hours of thorough and sustained professional development and reached over 1,200 students in high needs schools with state-of-the-art inquiry science education. The teachers who participated in the project represent nineteen different schools from northwest Ohio, seventeen of which are public. Teachers started with the project in July 2013 by attending an eight-day summer institute. This professional development opportunity provided exciting opportunities for teachers to participate in hands-on content sessions relevant to the revised science standards at each grade level. Experienced science educators (all lead classroom teachers in their districts) along with scientists delivered high quality investigative sessions in a 5E lesson format along with assistance of community resource partners. Teachers came away with ready-to-go units to implement in their classrooms and have the opportunity to invite the community resource partners into their classrooms to collaborate in extending science concepts with their students.

The summer institute also offered general sessions facilitated by education experts where teachers learned about broader educational topics such as assessment, the new learning standards, the 5E learning cycle, differentiated instruction, and how to create a classroom wiki.

The teachers involved in the project have developed a Project pi r<sup>2</sup> wiki page where every teacher has contributed lesson plans, videos, photos, web resources, and other information relevant to each grade level's learning standards. The teachers continually post their own information and explore others' posted information for the purposes of increasing the effectiveness of their science teaching.

*Continued on page 18*

Teachers continued with the project through the 2013-2014 school year by participating in the highly popular STEM in the Park and NWO Symposium events. Participants also engaged in monthly cohort meetings in conjunction with the NWO Inquiry Series which was facilitated in a 'lesson study' format as teachers reflect and report on the 5E investigative units in which they were integrating in their classrooms.

The final phase of professional development focused on teacher reflective practices. This phase also included teachers hosting a 'Science Expo' in their school where students worked collaboratively to highlight the design process of an investigation completed in the classroom. The evaluation report can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports).

## **Village of Ottawa: Collaborative Research: Regional Water Treatment & Manure Treatment Feasibility Study: \$197,332 for 1/1/2013 - 12/31/2013**

### ***Brief Description***

The Manure Treatment Feasibility Study and The Regional Water and Sanitary Sewer Feasibility Study are grant projects funded by the Local Governmental Innovation Fund and are undertaken in partnership with the Village of Ottawa and Putnam County Educational Service Center. The projects aim to (1) address the possibility of integrating sustainable manure management practices and long-term regional development while assessing the environmental and economic context of the area of interest, (2) estimate the feasibility of applying an integrated regional water and sewer system approach as a response to growing environmental concerns and regional development, (3) expand the educational potential by including the participation of high school students in the public school districts of Putnam County in the research, development and economic analysis aspects of the studies and (4) increase teachers' and students' interest in real science research that could have an important impact on the development of their local communities. **Meets NWO Goals: 2, 3 & 4**

### ***NWO Role in the Village of Ottawa Projects***

- Financial management of the grant budget
- Grant project management assistance

## *School and Community Activities and Outreach*



### Falcon BEST Robotics

#### **Brief Description**

The Falcon BEST Hub at Bowling Green State University is a proud participant in BEST (Boosting Engineering, Science and Technology) Inc. - a national organization that inspires middle and high school students to consider careers in science, technology, engineering, and mathematics (STEM) through participation in a sports-like, science- and engineering-based robotics competition.

However, BEST is more than just a robotics competition; it offers several opportunities for many students to be involved in different parts of the competition. The competition consists of an engineering notebook, robotics competition, spirit competition, marketing presentation, and display presentation with awards given for each of these aspects of the event. All of these pieces are combined to get the score for the overall "BEST" award. Because awards are given for these other aspects of the competition, students with a diverse array of skills are rewarded for their participation and thus a broader array of students benefit than from some other types of robotics competitions. Students who participate in BEST: (1) understand the practical use of math concepts and applied physics, (2) solve real-world science and engineering problems, (3) gain training that is transferable to

*Continued on page 20*

all academic disciplines and career pursuits, (4) increase their interest in science, technology, engineering, and mathematics (STEM), (5) learn what engineers “do”, and (6) experience “design-to-market” product development.

The Falcon BEST Hub is a partnership between BGSU’s College of Technology, Architecture and Applied Engineering and the Northwest Ohio Center for Excellence. The Hub was created in 2013 and the first completion was held that fall. The top teams from the Falcon BEST Hub join teams from several other states at the Northern Plains Regional Competition each year. This is the highest level of advancement for BEST as they do not have a national competition. Each year a new Hub around the nation designs the competition for that year and each new year brings a completely new robotics task for the participating students. **Meets NWO Goals: 2 & 4**

#### **FY 2014 Activity Information**

The first Falcon BEST Robotics Competition was held in the fall of 2013 and started with 16 teams. The six-week competition called “Gatekeeper” started on September 14 with the Kick-Off for teams. At this event they received their robotics materials and got their first look at the robotics game. Teams had the next four weeks to work on their robot and other aspects of the BEST competition before participating in Practice Day on October 12. Practice Day allowed the teams to test out their robots on the game field and learn what others were doing and share ideas. The Falcon BEST Game Day took place in Anderson Arena on October 26. Some teams were not able to complete their robot before Game Day and as a result only 14 teams competed on Game Day. The first place “BEST Award” earned by to the team from Vanguard Technology Center. The first place “Robotics Game Award” was won by the Millstream Career Center at Findlay City Schools. The top teams performed well at the Northern Plains Regional BEST in Fargo, ND December 5th – 7th. A full list of winners and more information about Falcon BEST and BEST robotics is available at: <http://www.bgsu.edu/technology-architecture-and-applied-engineering/falcon-best-robotics-competition/events/2013-events.html>. See Appendix C for an example of recruitment materials.

## **Math Camp**

### **Brief Description**

Math Camp is an energetic and active day of teamwork, problem solving, and development of skills for K-12 students. Students engage in fun filled experiences about mathematics, the connections between mathematics and the real world, and mathematicians, all in a camp atmosphere where there is song, dance, and silliness. Each math camp is designed by the preservice teachers of the Bowling Green Council of Teachers of Mathematics (BGCTM) at BGSU with oversight from BGSU’s mathematics education faculty. The camps are aligned with the Common Core and New Ohio Learning Standards for Mathematics. The BGCTM preservice teachers work with each school’s liaison to identify specific areas of mathematical need for the students in order to design a worthwhile and focused camp experience. Camps are conducted for one grade level at a time to ensure that the mathematics tasks are targeted to the specific needs of the students attending the camp.

Research has shown that students who attend BGCTM Math Camp’s demonstrate statistically significant improvement in their mathematical self-efficacy, are more comfortable with mathematics, and become more flexible in their problem solving strategies. Math Camp was started at BGSU in 2014 and the first training camp

*Continued on page 21*

for mathematics preservice teachers will take place in Fall 2014. Math Camps for K-12 schools in the area will follow in Spring 2015 and beyond. **Meets NWO Goals: 1, 2, 3, 4 & 5**

#### **NWO Role in Math Camp**

- Financial management of the camp funds
- Assistance purchasing materials for camps
- Advertising assistance

### **Ohio Junior Science and Humanities Symposium (Ohio JSHS)**

#### **Brief Description**

OJSHS brings the best and brightest students from Ohio middle and high schools together for a competition to highlight and judge the quality of their research projects in the sciences and humanities. This event is an excellent opportunity for the recruitment of the next generation of scientists, mathematicians, engineers, and teachers. OJSHS is co-sponsored by NWO and a grant from the Academy of Applied Science. Paper and poster presentations by these students demonstrate a level of achievement that would rival some of the very best junior and senior undergraduate students with some even approaching what is expected of beginning graduate students. Past Ohio winners have gone on to win the top award at the National competition, demonstrating the extraordinary talent and achievement of these students. **Meets NWO Goal: 2**

#### **FY 2013 Activity Information**

Bowling Green State University hosted the 3-day event for the sixth year in a row from March 19 – 21, 2014. This year marked the 51st Anniversary of the OJSHS program. Dr. Jodi Haney, a Bowling Green State University faculty member with a joint appointment in the College of Education and Human Development and the College of Arts and Sciences gave the keynote address. There were 24 paper presentations and over 71 poster presentations. Bluyé DeMessie from William Mason High School was the 1st place winner for paper presentations with his project titled “Developing a Sustainable Water Filtration System for Use in Low Income Countries”. Bluyé, was the top award winner for the second year

in a row. He along with 3 other OJSHS winners traveled to the National JSHS in Washington D.C. in April 2014. At the national competition Bluyé won 3rd place in the Environmental Science division. A complete program and other information about the 2014 OJSHS can be found at [www.ojshs.org](http://www.ojshs.org). Above is a breakdown of attendance data for the 2014 Symposium. The 2014 OJSHS Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix J for examples of the Ohio JSHS recruitment materials.

<b>Participant Group</b>	<b>Total Attendance for 2013</b>
High School and Middle School Students	101
K-12 Educators	13
Higher Education Faculty (Poster & Paper Judges)	32
Staff and Volunteers	13
Parents and Guests	36
<b>TOTAL</b>	<b>195</b>

## STEM in the Park™

### Brief Description

STEM in the Park is a free NWO event for all northwest Ohio families and the entire community to stimulate public interest and encourage learning in science, technology, engineering, and mathematics (STEM). Held on the campus of Bowling Green State University, the event features three and a half hours of engaging hands-on STEM activities from over 50 area businesses, schools, and organizations along with take-home STEM activity cards for parents and children to continue STEM exploration at home. By increasing awareness in STEM facilities, programs and activities in the area, STEM in the Park is an opportunity for businesses, universities, K-12 schools, and non-profit organizations to showcase innovation, educational opportunities, careers, and to promote positive attitudes toward STEM teaching and learning. **Meets NWO Goal: 2**

### FY 2014 Activity Information

The September 7, 2013 event provided over 80 activity station providers. Providers included many NWO community and business partners and university departments. Free lunch for all participants was provided by Tony Packos. Presenting sponsors for the event were BGSU, BP, Lubrizol, and Verizon, with additional support from the BGSU Foundation, Cooper Tires, Carolina Biological Supply Company, NWO, PNC Bank, Spectra, Tony Packo's, and Wal-Mart. The event was held at the Perry Field House for the third consecutive year. The attendance was the largest to date, with a total of 3,287 attendees/exhibitors/staff/volunteers. The event attracted families from at least 88 different cities and towns in Ohio and Michigan. A complete list of exhibitors as well as pictures of the event are available at [www.STEMinthePark.org](http://www.STEMinthePark.org). The evaluation report can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports). See Appendix K for examples of the advertising used for this event.

### STEM in the Park Attendance from 2010 to 2013

STEM in the Park Participants	2010	2011	2012	2013
Adults	620	617	991	1,255
Total Children	785	759	1,279	1,626
<b>Total Attendees</b>	<b>1,405</b>	<b>1,376</b>	<b>2,270</b>	<b>2,881</b>
Volunteers/Staff	32	65	69	68
Exhibitors	177	270	342	338
<b>Total Staff and Exhibitors</b>	<b>209</b>	<b>335</b>	<b>411</b>	<b>406</b>
<b>Total Attendance</b>	<b>1,614</b>	<b>1,711</b>	<b>2,681</b>	<b>3,287</b>

## Women in STEM

### ***Brief Description***

Women in STEM is an outreach and engagement program that exposes sixth through eighth grade girls from the region to STEM education and professions. The program goal is two-fold as it (1) aims to connect high impact and fun-filled STEM-based activities to the real world while (2) inspiring students to pursue higher education and careers in STEM fields.

The annual Women in STEM program is held on BGSU's main campus to give students the experience of the college setting. Scores of dedicated BGSU students and staff members volunteer to escort students around campus and share their collegiate experiences. The schedule of events begins with a welcome and interactive keynote address followed by over 40 hands-on breakout sessions provided by dynamic and devoted STEM professional role models. Additional information can be found on the NWO website at <http://cosmos.bgsu.edu/womeninSTEM/index.htm>. **Meets NWO Goal: 2**

## You Be the Chemist Challenge

### ***Brief Description***

The You Be the Chemist (YBTC) Challenge is a fun and innovative academic competition that engages 5th – 8th grade students in learning about important chemistry concepts, discoveries, and chemical safety. Challenge competitions are exciting events that take place across the country, encouraging the collaboration of community organizations, schools and the chemical industry, as together they educate students about the benefits and value of the study of chemistry. Ohio schools take part in local challenges within their school districts, and winners attend a state competition held in northwest Ohio to qualify for the YBTC National Challenge. **Meets NWO Goal: 2**

### ***FY 2014 Activity Information***

Thirty-three 5th – 8th grade students from schools all over the northwest Ohio region competed in the You Be the Chemist Challenge held at Imagination Station in Toledo on April 19, 2014. Competitors answered questions on topics concerning important chemistry concepts, processes, and historical discoveries over eight rounds of elimination. The Chemical Educational Foundation, Imagination Station, NWO, The University of Toledo's American Chemical Society and Toledo Public Schools sponsored the 2014 Ohio Challenge. Robert Mendenhall, Director of Science at Toledo Public Schools, chaired the event. See Appendix L for an example of the YBTC recruitment materials.

### ***NWO Role in YBTC in FY 2014***

- Funding for student awards and certificates of participation
- Advertisement/recruitment via Constant Contact to 8,000+ regional K –16 contacts
- Announcement in NWO e-newsletter

## **Student Scholarship Programs and Grants**



### **Academic Investment in Mathematics and Science (AIMS)**

#### **Brief Description**

The Purpose of the Academic Investment in Math and Science (AIMS) Program is to increase the number of women and students of color who graduate from BGSU with majors in Science, Technology, Engineering & Mathematics (STEM), and who proceed to get terminal degrees in their fields then ultimately perform cutting-edge research and/or teaching.

All AIMS Scholars have a unique array of resources to help them strengthen their academic skills and to increase their likelihood for academic success in college, by developing professional leadership skills required for advancement in mathematics and the sciences. The AIMS Program requires study leading to a bachelor's degree in STEM related fields or teacher education with majors in these areas. The AIMS program has two scholarship packages with distinct requirements. The AIMS Standard scholarship is traditionally awarded to women and students of color with STEM majors. The AIMS BOSEF scholarship targets Ohio residents majoring in the following programs: chemistry, physics, biology, geology, environmental science, applied mathematics, engineering technology and those students with career goals related to renewable and sustainable energy. More information about AIMS can be found at [www.bgsu.edu/aims.html](http://www.bgsu.edu/aims.html). **Meets NWO Goals: 1, 2, &3**

## **Building Ohio's Sustainable Energy Future (BOSEF)**

### ***Brief Description***

BOSEF is a scholarship project funded by the Choose Ohio First program of the state of Ohio. BOSEF increases the recruitment, training, and graduation of STEM students to supply the growing job markets in renewable energy and sustainable environment technologies. Northwest Ohio has a growing reputation for research, development, and manufacturing in the high technology, renewable energy fields of photovoltaics (PV) and wind. In addition, northwest Ohio has major research and development strengths in environmental analysis and remediation technologies. The University of Toledo (UT), Bowling Green State University (BGSU), and the community colleges of Owens, Terra, and Northwest State work together to leverage the enormous public interest and burgeoning job markets in these fields to recruit, educate, and retain the best and brightest of Ohio's students to support these rapidly developing high tech professions. Student success is enhanced through a cooperative summer bridge program focused on mathematics, undergraduate research experiences for all, and integration with the Wright Center for PV Innovation and Commercialization, the Lake Erie Research Center, Center of Photochemical Sciences, and the Environmental Remediation and Restoration Experimental Park. It prepares students for scientific and technical careers by providing internships with business, industry, agencies, and non-profits in renewable energy and environmental sustainability fields. Although the primary program focus is on the undergraduate STEM pipeline, it also includes masters and PhD students. The participating institutions have a comprehensive and vertically integrated approach to STEM education that maximizes student success and provides skilled professionals in these crucial STEM areas.

### **Meets NWO Goals: 2 & 3**

### **NWO Role in BOSEF in FY 2014**

- Oversight and management of the grant project including financial management of the grant budget
- Direct recruitment of students through AIMS and the chemistry and physics departments at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Career development
- Student advising
- Academic mentoring and support

## **Granting Access to Mathematics and Science (GRAMS)**

### ***Brief Description***

GRAMS (Granting Access to Mathematics & Science) is a scholarship up to \$10,000 per student each year for up to four years program supported by two 5-year grants totaling \$1,200,000 from the National Science Foundation. In this project, Bowling Green State University collaborates with two regional community colleges, Owens and Terra, to increase the number of highly qualified and capable students who are able to complete degrees in STEM majors by providing approximately 20-30 need-based scholarships up to \$10,000 per student each year for up to four years and a proven support program to foster student success. Student persistence and success was

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fostered with two major projects: (a) our NSF-funded STEP grant project Science, Engineering, and Technology Gateway Ohio (SETGO) which ended in 2013 and (b) the BGSU Academic Investment in Mathematics and Science (AIMS). These programs include a 4-week summer bridge for entering students, to prepare them for the rigors of college science and math courses; a tiered system of mentoring by peers and faculty; learning communities with monthly events that draw students and faculty together by merging academics and social networking; and summer research opportunities. These strategies have been proven in BGSU's AIMS program to increase student persistence and success, particularly of under-represented minority students majoring in science and math disciplines and are based on research that has identified the factors that most account for student attrition from these disciplines. **Meets NWO Goals: 2 & 3**

#### **NWO Role in GRAMS in FY 2014**

- Oversight and management of the grant project including financial management of the grant budget
- Direct recruitment of students through AIMS and the chemistry and physics departments at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Career development
- Student advising
- Academic mentoring and support

## **Science and Math Education in ACTION (ACTION)**

#### **Brief Description**

BGSU, received \$3,000,000 in funding from the Ohio Board of Regents through the Choose Ohio First program to recruit and train undergraduates to become Ohio mathematics and science teachers. ACTION focuses on the use of innovative strategies for preparing highly effective science and mathematics teachers for grades 5-12. Students involved in the project participate in: (a) a 4-week summer bridge program preceding the first regular semester of college; (b) a collaborative science or mathematics research team that addresses a real community problem or concern; (c) a co-op or internship work experience in a regional science or mathematics related business or industry in their second year; (d) early teaching experiences in a regional school; and (e) the creation of a capstone project that involves applying research techniques to determining the best teaching practices that advance the students' learning. **Meets NWO Goal: 1, 2, & 3**

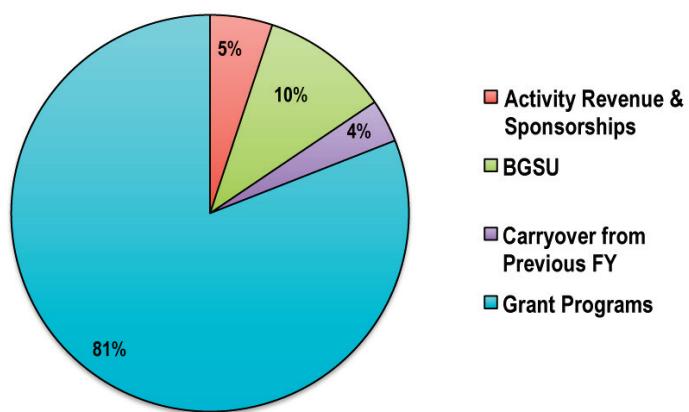
#### **NWO Role in ACTION in FY 2014**

- Assistance with the undergraduate research component of the project
- Assistance and advice for project activities and logistics

## FY 2014 NWO Budget



FY 2014 Income Sources



**TOTAL INCOME FOR FY 2014**

**\$2,378,912.45**

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The table below shows funding sources that supported FY 2014 NWO Activities.

BGSU FUNDS		
Agency: Program	Description	Award Amount
Bowling Green State University Fiscal Support for NWO/COSMOS	<ul style="list-style-type: none"> <li>• Director</li> <li>• Secretary</li> <li>• Fringes</li> <li>• Assistant Directors</li> <li>• Faculty Associates</li> <li>• Operating Budget</li> </ul>	\$245,503.01
BGSU Cost Share	BOSEF: Building Ohio's Sustainable Energy Future - BGSU portion (Year 5 of 5)	\$35,429.35
	<ul style="list-style-type: none"> <li>• Support Staff Salaries</li> <li>• Fringes</li> <li>• Faculty Salaries</li> <li>• Supplies</li> </ul>	
	History Lab	\$1,754.00
	• Student Scholarships	
Carryover	COSMOS Carryover from FY 2005 – 2013 Funds	\$84,984.00

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The table below shows funding sources that supported FY 2014 NWO Activities.

ACTIVITY REVENUE AND SPONSORSHIPS		
Agency: Program	Description	Award Amount
Community Resources Workshop	Revenue from Registrations	\$3,932.50
Misc. Income	Payment for Services Provided • Poster Printing                    • Graphic Design • Evaluation                         • Registration	\$8,950.68
2013 – 14 NWO Inquiry Series Education Inquiry Series	Revenue from Registrations	\$2,895.00
2013 – 14 NWO Inquiry Series Education Inquiry Series	PNC Bank	\$18,500.00
2013 – 14 NWO Inquiry Series Education Inquiry Series	The Andersons	\$5,000.00
2014 NWO Symposium	Revenue from Registrations	\$10,823.30
2014 NWO Symposium	BP-Husky, LLC	\$10,000.00
2014 NWO Symposium	The Andersons Foundation	\$5,000.00
OJSHS	BGSU Department Sponsorships	\$1,250.00
	Perstorp Polyols	\$1,000.00
	Revenue from Registrations	\$3,085.00
2013 STEM in the Park Sponsors	BGSU Department Sponsorships	\$10,500.00
	BGSU Foundation	\$3,000.00
	BP-Husky, LLC	\$10,000.00
	Cooper Tires	\$250.00
	Lubrizol	\$10,000.00
	PNC Bank	\$4,080.00
	Spectra	\$3,000.00
	Verizon	\$10,000.00
	Wal-Mart	\$2,000.00

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<b>GRANT PROGRAMS</b>		
<b>*Funding amount listed is for the grant award period which could be longer or shorter than the NWO fiscal year.</b>		
<b>Agency: Program</b>	<b>Description</b>	<b>Award Amount</b>
Academy of Applied Science	Ohio Junior Science & Humanities Symposium	\$20,000.00
Martha Holden Jennings Foundation	iTraining	\$16,100.00
National Science Foundation: S – STEM	GRAMS: Granting Access to Mathematics and Science (Year 4 of 5) & GRAMS II: Granting Access to Mathematics and Science II (Year 4 of 5)	\$392,997.00
National Science Foundation: Math Science Partnership Program	iEvolve: Inquiry and Engagement to Invigorate and Optimize Learning for Everyone (Year 2 of 5)	\$1,538,352.00
Ohio Board of Regents: ITQ Program	Common Core for Reasoning and Sensemaking – Elementary ((CO) <sup>2</sup> RES) (Year 2)	\$164,415.00
	Common Core for Reasoning and Sensemaking – Secondary ((CO) <sup>2</sup> RES) (Year 2)	\$163,270.00
	Common Core for Reasoning and Sensemaking – Elementary ((CO) <sup>2</sup> RES) (Year 3)	\$168,456.00
	Common Core for Reasoning and Sensemaking – Secondary ((CO) <sup>2</sup> RES) (Year 3)	\$168,202.00
	Partners in Inquiry Resources & Research (Project pi r <sup>2</sup> THREE)	\$94,743.00
	Science Teaching Advancement through Modeling Physical Science (STAMPS III) (BGSU Subaward for Evaluation Services)	\$7,096.05
Ohio Board of Regents: Choose Ohio First Program	BOSEF: Building Ohio's Sustainable Energy Future (Year 5 of 5)	\$243,241.75
Ohio Development Services Agency	Manure Treatment Feasibility Study (Subaward from the Village of Ottawa)	\$98,666.00
	Collaborative Research: Constructive Chemistry (Subaward from the Village of Ottawa)	\$98,666.00
OSLN/Battelle Foundation	OSLN/Battelle Hub Grant	\$25,000.00

# Appendices



- A. Community Resources Workshop Recruitment Email
- B. Faculty and Student Recognition
- C. FalconBest Recruitment Email
- D. iEvolve with STEM Recognition
- E. iTraining Advertising and Recognition
- F. Learning Community Poster
- G. NWO STEM E-Newsletters
- H. NWO STEM Education Inquiry Series Advertising
- I. NWO Symposium Advertising
- J. OJSHS Recruitment Email
- K. STEM in the Park Advertising
- L. You Be The Chemist Challenge Recruitment Email

# Appendix A: Community Resources Workshop Recruitment Email



**Community Resources Workshop**  
Awareness Professional Development  
Informal and Formal education institutions learn as active participants  
In the classroom week-long

## 2014 Community Resources Workshop for Educators

### June 16 - 20, 2014

#### REGISTRATION NOW OPEN!

Spend a Week of Your Summer Vacation on a Fun-Filled Field Trip for Educators While You Earn College Credit or 40 Contact Hours!

Registration Fee: \$150

Registration Fee Includes:

- Light breakfast daily, lunch provided Monday, Wednesday, Thursday, Friday and dinner also provided on Wednesday
- CEUs/Contact Hours for the entire week
- Teaching resources and hands-on materials

Join us for an exciting week packed with activities addressing the new common core standards, literacy standards, college to career standards, and 21st Century skills.

You'll visit some of northwest Ohio's best educational resources as well as informal and formal education institutions as well as learn about hidden gems to energize classroom instruction!

Here's what some participants had to say about last year's workshop:

"This workshop is excellent. I've lived in Toledo for 27 years and I am amazed how much I did not know was there!"

"It was well organized and everything was explained thoroughly. A lot of the information can be adapted to the classroom."

"Hands-on experience provided useful information to pass on..."

"I was very impressed with the amount of materials that were presented during these week long workshops."

This opportunity is open to all educators, including administrators, homeschooling educators, and pre-service teachers. This workshop is recommended for preK-8 educators but is open to all grade levels.

**Online Registration:** <https://docs.google.com/spreadsheet/viewform?formkey=dDRJWXQ3SUJd0s4dHNV2JRbWdoOHc6MQ#gid=0>

**Payment Information:** After completing the online registration form you can access the [online credit card payment system](#). You can either pay online through this system or mail a check (payable to BGSU) or purchase order to:

NWO-Community Resources Workshop  
c/o COSMOS/NWO  
241 Math Science Bldg.  
Bowling Green State University  
Bowling Green, OH 43403

**PLEASE NOTE: TITLE I PART A FUNDS OR TITLE III FUNDS CAN BE USED TOWARD THIS WORKSHOP**

For more information and to register visit:  
<http://www.nwocenter.org/CRW/CRWhome.htm>

**Special on graduate credit!**

In addition, Lourdes University is offering 2 or 3 graduate credit hours for the one-week course at a special discounted rate of just \$200 per credit hour. That means you can receive two graduate credits for only \$400! Contact Carolyn Jaksetic for information at: [cjaksetic@lourdes.edu](mailto:cjaksetic@lourdes.edu)

\*The graduate credit fee is in addition to the \$150 registration fee, and can be easily arranged through Carolyn Jaksetic at Lourdes University.

#### 2014 Community Resource Partners



# Appendix B: Faculty and Student Recognition

**BGSU. NEWS**

ATHLETICS ALUMNI RESEARCH STUDENT LIFE LIBRARIES MYBGSU EMAIL SEARCH

## TORELLI PROMOTES CONTRIBUTIONS OF CRYSTALLOGRAPHY

Home / News / 2014 / March / Torelli promotes contributions of crystallography

The crystal has been a source of fascination for thousands of years, even before Johannes Kepler observed the symmetrical shape of snow crystals in 1611. From gemstones to many forms of metals and even chocolate, innumerable substances in the world around us are crystalline in nature.

So important is the potential involved in understanding crystals and their roles in the structure of materials, biological molecules and chemical compounds that the United Nations has declared 2014 the "International Year of Crystallography." BGSU chemistry faculty member Dr. Andrew Torelli, a specialist in crystallography, was invited to participate in the opening ceremony for the celebratory year, held in late January at the United Nations Educational, Scientific and Cultural Organization (UNESCO) headquarters, in Paris.

The goal of the year is to bring new awareness of crystallography, a field that has grown from physics and chemistry to be "at the forefront of many scientific endeavors," Torelli explained, "and is even involved in important goals of advancement, awareness and peace."

Crystallography has contributed to multiple Nobel Prize-winning discoveries and applications of wide-ranging benefit to humanity. From early studies demonstrating that matter comprises specific arrangements of atoms, to medicine, mining, testing construction materials and even analysis of substances on Mars, crystallography plays important roles in our everyday lives that are easily overlooked, Torelli said.

At the two-day event, Torelli joined several hundred guests including distinguished speakers, U.N. officials, a small American Crystallographic Association (ACA) delegation and many other international scientists, members of the press and students of all ages. He found himself in the company of prominent scientists from around the world, including a Nobel laureate and heads of numerous international scientific organizations. U.N. Secretary General Ban Ki-Moon and UNESCO Director-General Irina Bokova were among those addressing the assembly.

Torelli was also nominated by the ACA International Year of Crystallography Task Force to serve on an eight-member discussion panel of next-generation crystallographers, and was the only American among the international group.

The young crystallographers identified key issues to communicate to policy makers and global leaders on the importance of providing resources and advanced crystallography training not only in developed nations but in emerging nations as well – which is also an overall goal of the year.

As a member of a Young Scientist group within the ACA, Torelli has co-chaired several sessions at the association's national conferences. Being able to work on an international scale, he said, promotes even greater connections among scientists and opportunities for up-and-coming researchers.

Torelli said, "One of the most moving and impressive parts of the event was seeing scientists of all ages coming together for dialogue and cooperation."

Attendees learned about the Open Labs initiative, a partnership to bring X-ray instruments and training to Africa, Latin America and Asia. "I was also moved by the description of the SESAME [Synchrotron Light for Experimental Science and Applications in the Middle East] project, which is nearly operational after decades of planning and partnerships between scientists from countries that could hardly be imagined working together. . . . proof of the power of science to transcend political and social boundaries," Torelli said.

Interestingly, the ranks of crystallography have always included a significant number of women responsible for **major scientific achievements**, including research related to identifying the structures of important molecules such as vitamin B12, penicillin and DNA, Torelli noted. That continues to be true today. In 2009, for example, Ada Yonath shared the Nobel Prize in Chemistry for her work solving the structure of the ribosome, an essential molecular machine that translates our genes into proteins.

Crystallography is the study of the structure of molecules. "Everything around us has a function that's tied to the way it's built," Torelli explained, "and the same is true of molecules. The composition of a substance alone is not the whole story. A simple example, he said, is graphite and diamond – they share exactly the same chemical composition, carbon, but the atoms are arranged and bonded differently in each substance, and that makes all the difference."

As the influential architect Louis Sullivan famously said, "... form ever follows function;" and thus, Torelli said, by understanding the spatial arrangement and relationship of atoms in a molecule – "how they're built" – we can better understand what they do. This also benefits efforts to control processes, for example in the case of medicine, or to design new materials with desirable properties.

Over the past 100 years, crystallography-related Nobel prizes have been awarded in medicine, physics, chemistry and physiology. Building upon early diffraction experiments that looked at how various crystals bend light in characteristic ways, Max von Laue was awarded the prize 100 years ago for his discovery of the diffraction of X-rays by crystals.

X-ray crystallography enabled scientists to measure the planes of the atoms in their crystalline arrangement and predict accurately their repeating array. Understanding the internal structure of crystals at the atomic level has allowed researchers to do such things as develop better drug treatments.

For example, "proteins in our bodies respond to small molecules like morphine and adrenaline," Torelli said, so being able to design drugs in accordance with their intended targets is most effective.

Although over the past 100 years crystallography has become widely used, it requires a variety of skills and is not at all a routine procedure, Torelli said. It is "so essential" for both basic and applied science that UNESCO deems it a "very critical science," he explained. With today's financial challenges and competing demands on resources, a focus of the International Year of Crystallography is to remind society of the value of science and crystallography to humanity, not just in short-term solutions but in the long-term benefits of research, Torelli said.

Torelli wrote in his report to the ACA, "I left the event with a renewed sense of excitement to be included in a defining science that will have an important role to play in many great achievements of the future."

## Appendix B: Faculty and Student Recognition cont.

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BOWLING GREEN STATE UNIVERSITY



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#### Students grasp concepts with online 'Constructive Chemistry'

By Bonnie Blankinship

Two containers are displayed side by side on a computer screen, each filled with equal numbers of purple disks representing molecules. The ones in the left container are actively bouncing around, while those on the right remain still.

Dr. Neocles Leontis, a professor of chemistry at Bowling Green State University, attempts to cause the disks on the right to behave like their neighbors by making adjustments such as raising the temperature and decreasing the attraction between the molecules.

Though it looks like a video game, the "Constructive Chemistry" exercise is designed to help students discover basic laws of molecular dynamics for themselves by "playing" with the available variables and seeing the motions of molecules in real time.

Leontis and his BGSU chemistry faculty team members hope the curriculum they are developing around Constructive Chemistry will transform undergraduate chemistry education and dramatically improve both student learning and science teacher preparation. The curriculum will eventually be available free online to educators and students worldwide.

"Research shows that most people will make wrong predictions about how molecules behave based on what they know about large objects like balls and marbles," Leontis said. "But molecules are nano-sized objects, and physical laws work differently on the nano-scale. Constructive Chemistry gives people a tool to learn about the nano-world by testing their ideas and constructing knowledge for themselves. By allowing students to create meaningful scientific models on their own, they can unlearn their incorrect preconceptions and learn how nature really works on the nano-scale."

"Using software that allows you to interact with and modify molecular simulations, you can easily test ideas about what governs the behavior of a particular system or property. Sometimes there are surprises," said Dr. Andrew Torelli, chemistry. "This is especially powerful when students investigate well-known chemical principles and can discover for themselves which parameters have the greatest impact."

"Students at a higher level can even design their own simulations," Torelli added. "We start with simple challenges where students create simulations to demonstrate a certain principle. In doing so, they learn which components and parameters must be adjusted to achieve the desired behavior of their system."

A major advantage of the approach is that working out challenges on a computer is a natural for today's students. "They live in that world," Leontis observed.

Funded by the National Science Foundation (NSF), Leontis, Torelli, and BGSU chemistry faculty Drs. Peter Blass and David Erickson are collaborating with Senior Scientist and Molecular Workbench developer Charles Xie of the **Concord Consortium**, a nonprofit educational research and development organization dedicated to improving education in science, math and engineering through technology. Also part of the partnership is Dakota County Technical College in Minnesota.

Together they are developing curriculum modules for the **Molecular Workbench**, free online software for anyone to use. With NSF support, the team is making it easier for students to construct their own scientifically accurate simulations to master some of fundamental concepts of chemistry, instead of merely relying on "canned" simulations prepared by experts. They've begun with the topics that present the greatest conceptual difficulties in general chemistry, physical chemistry and biochemistry.

"Only by first understanding the fundamental ideas of how atoms and molecules behave can students make sense of more complex ideas in chemistry," Erickson said.

"It's surprising to find that even master's level students often lack a deep understanding of some of the fundamental principles of chemistry," he noted. "They can repeat the rules but their conceptual understanding is shallow. We're hoping that this will give them much deeper knowledge. Looking at charts and graphs is one thing, but seeing the principles in motion allows students to visualize what's happening at the molecular level."

"We're really integrating research into teaching," Leontis said. "We're taking a 'scaffolded' approach to designing the simulations so they're appropriate for each stage of learning. There are activities with basic elements for beginners and then they become more complex. They're designed to be engaging and give the freedom to experiment, but not be overwhelming."

To further strengthen learning, the Molecular Workbench program keeps track of the participant's actions and creates a mathematical model students can analyze.

With the help of Dakota County Technical College and the Northwest Ohio Center for Excellence in STEM Education (**NWO**), located at BGSU, the team is also assessing their curriculum to be sure it is usable and easily teachable to faculty.

An important audience will be science education majors, who will be faced with teaching new standards and assessments, the team said.

"We think this will strengthen teachers' content knowledge and increase their confidence," Erickson said.

"This will also give teachers a free, online tool they can use with high school and even junior high school students," concluded Leontis.

(Posted December 2, 2013)

## Appendix B: Faculty and Student Recognition cont.

 campusupdate@bgsu.edu  
Wed 11/6/2013 8:00 AM

BOWLING GREEN STATE UNIVERSITY



**New Prototype Learning Spaces Open House**  
**2nd Floor, Olscamp Hall| Friday, Nov. 15 | 3-5 pm**

Check out the redesigned second floor of Olscamp Hall, which includes:

- Prototype Active Learning Classrooms
- Study and Meeting Spaces
- Tech Bar

Faculty currently using these classrooms will hold hands-on demonstrations of various teaching methods and technology uses.

**BGSU.**

### Distinguished Faculty Lecture Series

## Roots to STEM:

Seeking footholds for effective teaching and learning



### JODI HANEY

Professor, Department of the Environment and Sustainability,  
College of Arts and Sciences,  
School of Teaching and Learning, College of Education and Human Development

Just what will it take to truly advance Science, Technology, Engineering, and Mathematics (STEM) education? How might we motivate our students to care about STEM let alone persevere in STEM fields? How do we convince educators that a radical change in pedagogy is both necessary and worthy? Will administrators provide and sustain the support structures required? Jodi Haney discusses these issues and shares related implications gleaned from her sponsored research projects and teaching experiences within both K-12 and higher education systems. Working at the nexus between the Colleges of Arts and Sciences and Education and Human Development, Haney offers a unique and integrated perspective on the educational change process and delivers potential footholds for progress in STEM education.



**November 19, 2013**  
**4:00 - 5:00 p.m.**  
**206 Bowen-Thompson**  
**Student Union Theater**

Admission is free and open to the public.  
A reception will follow the lecture.

**BGSU** COLLEGE OF ARTS & Sciences

BOWLING GREEN STATE UNIVERSITY

## Appendix B: Faculty and Student Recognition cont.

**BG SU**

LIQUID MANURE TO SOLID GOLD

Bob Midden, students work to make environmental concern a profitable option

**ZOOM news**  
BOWLING GREEN STATE UNIVERSITY

BG SU IN THE NEWS

New Greek Housing - Sentinel-Tribune  
Midden research on turning manure into energy - WTVG  
BGSU breaks ground on new flight center - WTVG

Manure Research

**BG SU** NEWS

LIQUID MANURE TO SOLID GOLD

Home / News / 2014 / April / Liquid manure to solid gold

Bob Midden, students work to make environmental concern a profitable option

**LIQUID MANURE TO SOLID GOLD**

Robert Midden, chemistry, analyzes water samples with [center] Jennifer Marshall, a freshman environmental science major, and Rebecca Shiroka, a sophomore AYA chemistry and physics major, using an instrument called the discrete chemical analyzer, which determines the levels of phosphate, nitrate and ammonia in water samples.

**By Jen Sobolewski**

Large-scale dairy farms have been a divisive issue in Ohio since they started popping up in rural areas across the state. One of the main concerns is the large amount of diluted manure these farms produce. But what if the nutrients that make manure so good for the soil could be removed from this liquid and sold as a low-cost, high-yield fertilizer? It's a question that Dr. Bob Midden, chemistry, and six of his undergraduate students are trying to answer.

The village of Ottawa in Putnam County approached Midden in December 2012 to see if he'd be interested in working with them in the development of this process. Putnam County is home to a number of these large-scale farms.

"Crop fertilizer is one of the most expensive parts of growing crops, so that represents value, but because of the high water content it is expensive to transport that material very far relative to its value," Midden explained. "If you apply more nutrients to the land than can be absorbed by the crops, when it rains or snows and ice melts, it can be washed into the waterways."

If most of the water is eliminated from the dilute manure produced by large-scale farms, Midden says what is left is material that is much lighter and cheaper to move. His team has developed a process that binds the nutrients in the manure together so it can be filtered out as a solid.

The science behind it is relatively simple. First, lime is added to the liquid manure, which raises the pH level and kills off the microorganisms. Next, a polymer is added, which grabs the "fertilizer" in the manure – phosphate, nitrate and nitrite – essentially pulling all the solids out of the water. Then the solids are filtered out. If the treatment process works as well as Midden hopes, the water can simply be released with no harm to the environment.

He said that occasionally they will have to add ferric chloride or alum to the liquid to enhance the process, but that they are working to eliminate that step. "We want to find a polymer and conditions that will achieve the results we want without alum or ferric chloride. They require additional equipment and storage, which increases the cost, and ferric chloride is a somewhat caustic material that's a little hazardous to handle."

Midden's team then takes plastic tubes filled with soil, mixes the solid material in the top and simulates rain. After a certain number of simulations they test the soil to see how far the nutrients traveled. They look at how rapidly the nutrients are released and how much they move through the soil. "Ideally you want to see the nutrients eventually released at a slow rate closer to the rate that the crops will absorb."

While their preliminary results are promising, Midden said they've only done testing and development in the lab. He is preparing for pilot tests at the Ohio State Agriculture Research Station in southern Wood County. Additional tests will involve growing crops and a full-sized field test to see which polymers work the best in matching the absorption in crops, and trapping the maximum amount of nutrients from the manure and then releasing the maximum amount in the soil.

*"I never expected to be involved with research my freshman year...It's cool to be in a lab, talk about this with my family and do hands-on things."*

The project has received considerable interest from various state agencies and organizations as well as some state legislators. Midden is hoping that interest will translate into grant money to fund the next step in the research. That includes getting manure samples from multiple dairy farms for testing.

*"We need to make sure the process works consistently and reliably across all different conditions and materials even processed in different conditions. Once we have a viable process we can start to process manure at the Ottawa wastewater treatment plant."*

In a stroke of luck, Ottawa has one wastewater treatment unit sitting idle and is willing to let Midden and his team use it to process manure on a commercial scale when they are ready.

"One aspect of our work is aimed at minimizing the cost of this treatment process. If we can keep the cost low, this method of dealing with the manure could be economically competitive with other methods of simply applying it or transporting it elsewhere," said Midden. "In fact, one hope is that we could produce material so valuable it could be sold and generate more income than the process even costs. So it could be a profitable way to deal with this and thereby provide a strong financial incentive to use this alternative method that would greatly reduce the environmental impact. So that's what we're striving for."

Midden also has a strong educational component to this project. He currently has six undergraduate students working in the lab; the majority of them are first-year students. "I think the best way to learn science is to get involved in something like this, and what better time to do that than in your first year," he said.

During one of their progress meetings they discussed getting a new runoff sample during the first major thaw and troubles they were having in the lab with getting the material to filter properly. Midden offered his suggestions and also challenged the students to help them solve their problems.

*"I never expected to be involved with research my freshman year," said Kimberly Lentz, who is from Mentor and majoring in adolescent to young adult math education. "It's cool to be in a lab, talk about this with my family and do hands-on things."*

*"I never thought I'd be working with manure," exclaimed Sarah Jindra, a junior from Brunswick majoring in chemistry.*

Devoney Miller, a first-year student from Westerville majoring in middle childhood education, was surprised when she first encountered a large-scale dairy farm. "It was interesting to see how they feed the manure down these tubes and across the street, through the water. I was really amazed by the big production in putting the manure on the ground."

# Appendix C: FalconBEST Recruitment Email

**FALCON  
BEST ROBOTICS**

## ROBOTICS COMPETITION

See robots in action - behind the scenes!  
Volunteer to be a part of this exciting competition!

16 high/middle schools  
16 amazing robots!

We need 100 [volunteers](#) - and we need you!

Check out this video!  
<http://bit.ly/FalconBESTVideo>



**Saturday, October 26, 2013**

Anderson Arena @ BGSU

*Parade of robots starts at 8:00 am \* Awards at 3:30 pm*

[Click here to learn more!](#)

**Want a preview?**  
Watch the teams practice with their robots!

October 12th  
Woodland Mall  
10:00 am - 3:00 pm

**Sherri Orwick Ogden**  
FalconBEST Event Coordinator  
[FalconBEST@bgsu.edu](mailto:FalconBEST@bgsu.edu)

**BGSU** THE COLLEGE OF TECHNOLOGY, ARCHITECTURE AND APPLIED ENGINEERING BOWLING GREEN STATE UNIVERSITY

**NWO** Northwest Ohio Center for Excellence in STEM Education

# Appendix D: iEvolve with STEM Recognition

**Bowling Green Register** SANDUSKY NORWALK SPORTS ENTERTAINMENT HEALTH COUPONS  
NEWS EPAPER OBITUARIES PHOTOS BLOGS TVLISTINGS REAL ESTATE

SCHOOLS

**Citizen scientists**

STEM program in full force at area schools.

ALISSA WIDMAN PERKINS TWP NOV 22, 2013



Alley Porter rolled up her sleeves and delved into a container of cold water. The fourth-grader pulled out a wriggling crayfish, one of the newest members of her Meadowlawn Intermediate School class, and introduced it to a nearby classroom visitor. "We've been studying their habitat," Porter said. "We even got to see some baby crayfish in a magnifying glass. They're really tiny." She then returned the crustacean to its home and adjusted her sturdy plastic safety goggles. One of the area's largest educational grants ensures Porter and her classmates don't just look the part.

Third- to sixth-grade students at Perkins and Sandusky schools are now full-fledged "citizen scientists," thanks to the National Science Foundation's revamped, hands-on curriculum. The new program, iEvolve with STEM, is in full force this year.

The acronym stands for "Science, Technology, Engineering and Math," which are fields educators nationwide are encouraging students to pursue post-graduation.

The program's twofold goal: show students how science can be fun and provide real-world context for education. A \$7.28 million grant awarded to Bowling Green State University's main campus from the National Science Foundation will fund iEvolve with STEM for the next five years. It was one of only six such awards distributed in the United States this past year, and it is equally distributed between Perkins and Sandusky schools.

The funds pay for supplies and a slew of training for local teachers. Schools nationwide will likely emulate the model in years to come.

"When my students open up their lab materials, it's like Christmas, because they're that excited," Meadowlawn teacher Erich Fahr said. "Many of these experiments are something they're going to remember for the rest of their lives."

The plan is to expand iEvolve with STEM to sixth, seventh and eighth grade in the 2015-16 school year, said Bob Midden, a BGSU main campus chemistry professor.

Midden is the director of the Northwest Ohio Center for Excellence in STEM Education and is spearheading the university's role in the project.

Classroom instruction is significantly supported by FOSS kits, which are shipped periodically to provide classes with materials for experiments, such as the crayfish students raised in Fahr's class. The acronym stands for "full option science system."



The scope of the project doesn't stop in the classroom.

Two national projects students will participate in are Monarch Watch and FrogWatch USA, which aim to track dwindling species in the United States. They'll also partner with Bowling Green State University, The Ohio State University, professional scientists and local organizations for other educational endeavors.

"It's no longer simulated or pretend; this is real science research they're collecting," Midden said. "By 2015, the plan is to have students tell others about what they've done by publishing their results."

Students in younger grades, meanwhile, will build a solid foundation for revamped science education moving forward.

Shamarion Clinton, a third-grader at Venice Heights Elementary School, said engaging classes this year have helped him learn the difference between a solid, liquid and gas.

"A liquid has no definite shape and a flat surface, a gas has no definite shape or surface, and a solid has a definite shape," Clinton recited this past week.

Classmate Jocelyn Beier, meanwhile, said her favorite part of the lesson was going outside to measure circumferences of equipment on the school playground.

No matter the activity, the overall goal remains constant, Venice Heights teacher LouAnn Cebull said. "At this grade level, we're teaching them about the basics of the scientific method," Cebull said. "It encourages critical thinking and discussion to really get them thinking like a scientist."

# Appendix E: iTraining Advertising and Recognition

Attention Elementary Teachers!



## iTraining



### Professional Development opportunity:

Through a grant provided by the Martha Holden Jennings Foundation and the Northwest Ohio Center for Excellence in STEM Education, Beth H. Putnam County Curriculum Coordinators, will be conducting iPad trainings at the Putnam County ESC. These trainings are designed to train you in effective and engaging technology integration for your digital classroom. Topics will include:

- using mobile apps for professional collaboration;
- managing a digital classroom;
- implementation of mobile apps.

**Thursdays – September 19, October 17, & November 21  
4-7 pm at the Putnam County ESC**

\*Must attend all three sessions

Snacks and beverages will be provided. **REGISTER NOW**, space is limited to 35 participants. Please bring your own tablet/iPad. A limited number of iPads will be available for use.

Please register at [www.nwocenter.org/iTraining](http://www.nwocenter.org/iTraining)

Attention High School Teachers!



## iTraining



### Professional Development opportunity:

Through a grant provided by the Martha Holden Jennings Foundation and facilitated by the Northwest Ohio Center for Excellence in STEM Education, Gary Herman, Putnam County Curriculum Coordinator, will be conducting iPad trainings at the Putnam County ESC. These trainings are designed to train you in effective and engaging technology integration for your digital classroom. Topics will include:

- using mobile apps for professional collaboration;
- managing a digital classroom;
- implementation of mobile apps.

**Thursdays – January 16, February 20, & March 27  
4-7 pm at the Putnam County ESC**

\*Must attend all three sessions \*\*Please note this class is **NOT** for beginners

Snacks and beverages will be provided. **REGISTER NOW**, space is limited to 35 participants. Please bring your own tablet/iPad. A limited number of iPads will be available for use.

Please register at [www.nwocenter.org/iTraining](http://www.nwocenter.org/iTraining)



**iTraining**



*Northwest Ohio Center for Excellence in STEM Education*

## Appendix E: iTraining Advertising and Recognition cont.

Putnam County Sentinel

## EDUCATION

Wednesday, October 30, 2013

B5

# Grant provides I-Pad training for teachers

By Nancy Kline

Staff Writer

[nkline@putnamsentinel.com](mailto:nkline@putnamsentinel.com)

OTTAWA — Several Putnam County elementary teachers were busy last Thursday afternoon learning how to use mobile apps and I-Pads in the classroom. The training was made possible through a grant from The Martha Holden Jennings Foundation. The grant will also provide I-Training for high school teachers.

Beth Hench, Putnam County Educational Service Center Curriculum Coordinator, is doing the classroom instruction for the teachers. The classes are limited to 30 teachers.

The three-session track geared toward elementary teachers is taking place now. The three-session, geared toward high school teachers will take place in the spring of 2014. This project provides each set of 30 teachers with nine hours of thorough professional development designed to train teachers in effective and engaging technology integration.

This includes using mobile apps for professional collaboration, managing a digital classroom and implantation of mobile apps.

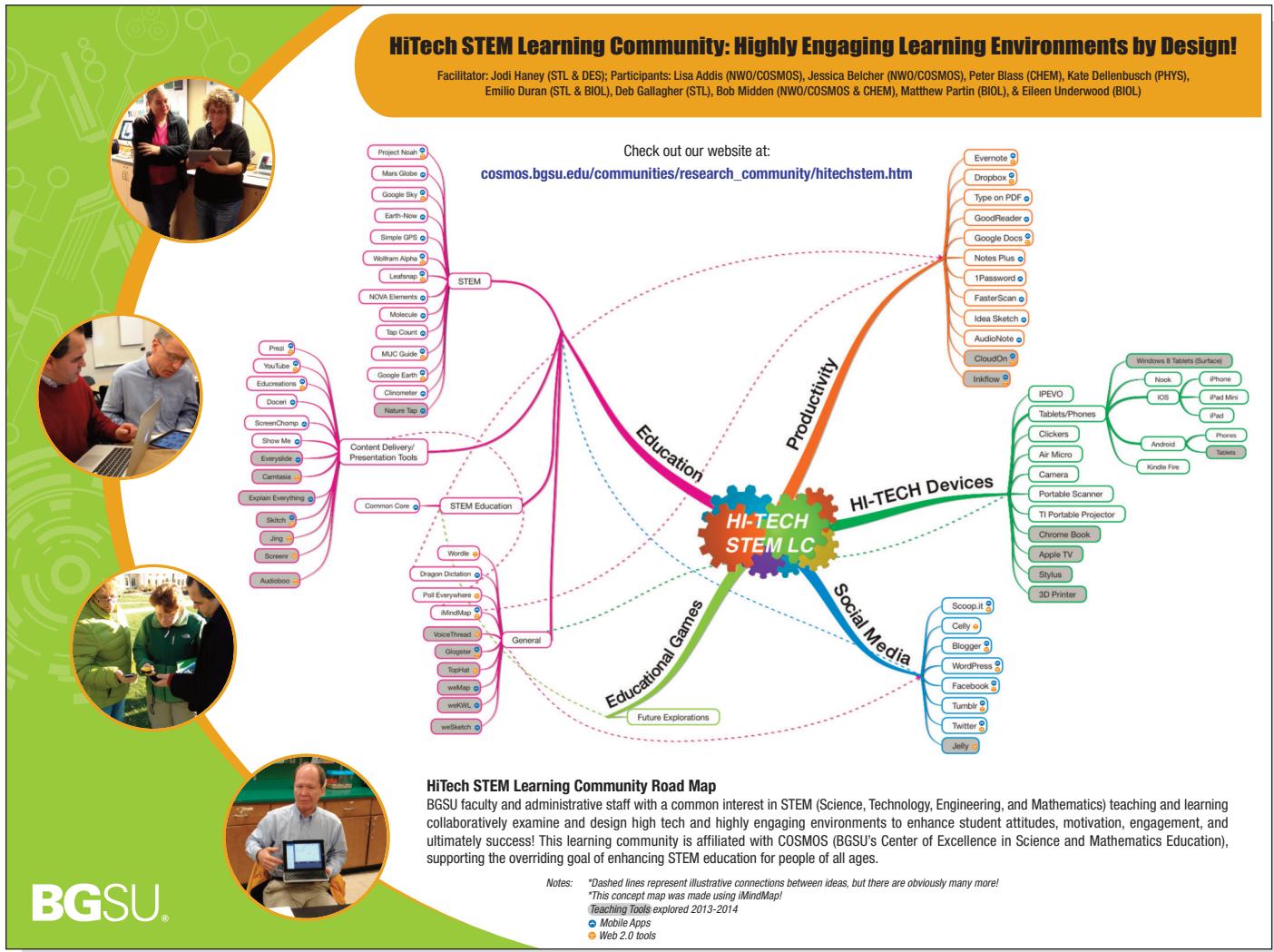
The grant application for Putnam County was written by Susan Stearns, assistant director of the NW Ohio Hub. Putnam County was awarded \$16,000 for the training.

The Northwest Ohio hub with the Ohio STEM Learning Network serves a 29-county region and contains a regional STEM training center.



**Beth Hench, Putnam County ESC curriculum coordinator (standing right), is serving as the instructor for the I-Training for Putnam County elementary teachers. The grant for the training was written by Susan Stearns (left), assistant director with the NW Ohio STEM Learning Network. (Putnam Sentinel/Nancy Kline)**

# Appendix F: Learning Community Poster



# *Appendix G: NWO STEM E-Newsletters*

**NWO Inquiry Series**

NWO is very pleased to announce the theme and key topics for its 2013-14 Inquire Series. The theme of this year's five-part series is: *Going Digital: the STEM Effect* and will focus on incorporating digital tools and technology into the pre-K-16 STEM classroom. Sessions may include:

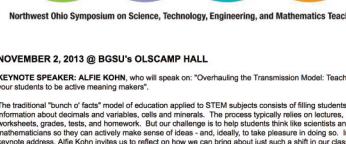
- Print Outcomes
- Collaboration and Communication Tools
- Creative Tools
- Digital Inquiry

The Series will once again be held at WGSTEPSB in Toledo and headlining the first program will be Elliot Soloway from the University of Michigan and Cathleen Norris from the University of North Texas, two internationally known and sought-after speakers in the field of integrating technology into the digital classroom.

Registration information will be announced soon on our website at: <http://cosmos.bgsu.edu/inquirieseries>

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**SAVE THE DATE - NWO Symposium on STEM Teaching**



Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

**NOVEMBER 2, 2013 @ BGSU's OLSCAMP HALL**

**KEYNOTE SPEAKER: ALFIE KOHN**, who will speak on: "Overhauling the Transmission Model: Teaching your students to be active meaning makers".

The traditional "batch of facts" model of education applied to STEM subjects consists of filling students with information about decimals and variables, cells and minerals. The process typically relies on lectures, worksheets, grades, tests, and homework. But our challenge is to help students think like scientists – problem solvers, inventors, engineers, mathematicians. Alfie Kohn will show how we can do this. In his keynote address, Alfie Kohn invites us to reflect on how we can bring about just such a shift in our classrooms.

**Presenter and Vendor Registration** is OPEN! Space is still available and you can submit your proposal by visiting: <http://cosmos.bgsu.edu/nwoSymposiumPresenterInfo.htm>

**Attendee Registration** is OPEN! Visit <http://cosmos.bgsu.edu/nwoSymposiumAttendeeInfo.htm> for more information and registration details.

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**Toledo Botanical Garden**



Teachers – plan your field trip now!

"Growing Science" is a two-year program for grades 1 - 6 and includes indoor activities and experiments, as well as outdoor explorations.

More information on this and other programs: [www.tolobotgarden.org](http://www.tolobotgarden.org)

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**Lexus and Scholastic Launch Seventh Annual Environmental Contest for Middle and High School Students**

A program of automaker Lexus and children's publishing company Scholastic, the Lexus Eco Challenge is an environmental program designed to engage middle and high school students in the United States to learn about the environment and take action to improve it. This fall, the program will award a total of \$100,000 in grants to schools whose environmental projects are open to students in grades 6-12. Middle and high school teams of five to ten students and a teacher-advisor are invited to participate in one or both of the two initial challenges, each addressing different environmental elements: land/water and atmosphere.

Visit: <http://lexus.scholastic.com>

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**Falcon BEST Robotics Competition is coming to BGSU!**



Bowing Green State University has very recently established the Falcon BEST Robotics Hub, the first and only BEST Robotics hub in the state of Ohio. As a partner with BEST Robotics Inc., BGSU will sponsor the first robotics competition this fall to area schools in the region.

This unique and exciting competition teaches students how to think through a problem, analyze and solve it, while building many skills along the way, which include:

- leadership development
- presentational skills
- technical skills
- organizational skills
- problem solving abilities
- other areas of personal and career development

The sports-like competition is comprised of developing a marketing presentation, creating an engineering notebook, crafting a robot, and a split-building component.

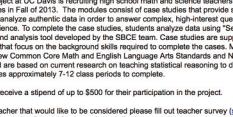
A series of events will kick off on September 14th, at Perry Field House; Mall Day (practice day) on October 12th and Game Day on October 26th.

The Falcon BEST Hub is a team of volunteers in many areas to help run this worthwhile event: judges, referees, crowd control, spectators, greeters, and mentors.

Please contact:

Shawn Owick Ogden, Event Coordinator: [sawick@bgsu.edu](mailto:sawick@bgsu.edu)  
For more information: <http://www.bgsu.edu/colleges/technology>

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**Recruiting Teachers for High School Science and Biostatistics Modules - Stipends Available**

The SBCE project at UC Davis is recruiting high school math and science teachers to teach Biostatistics and cancer modules in Fall of 2013. The modules consist of case studies that provide students with the opportunity to analyze authentic data in order to answer complex, high-interest questions relating to cancer, health, and science. To complete the case studies, students analyze data using "Sellt", a free data visualization software developed by the project. Each module consists of a series of lessons and student presentation that focuses on the background skills required to complete the cases. Modules and case studies address the new Common Core Math and English Language Arts Standards and Next Generation Science Standards. Each module is designed to be self-contained, requiring minimal teacher preparation. Each module requires approximately 7-12 class periods to complete.

Teachers will receive a stipend of up to \$500 for their participation in the project.

If you are a teacher that would like to be considered please fill out teacher survey ([sbcecsr.org/teacher-festival](http://sbcecsr.org/teacher-festival)) on our website. Stipend funds are limited. Preference will be given to early applicants.

For more information, check the website at [SBCESEPA.org](http://SBCESEPA.org) or contact [SBCE@stemed.ucdavis.edu](mailto:SBCE@stemed.ucdavis.edu).

**Imagination Station Opportunities**

**Little Scientists Workshops**  
A series of programs that encourage families with young children, ages 3 - 5, to investigate the world around them. These programs are a great way for families to spend time creating and exploring together.

Chosen from Thursday (beginning September 26th) to Saturday (beginning October 26th) evenings from 6:00 pm to 7:00 pm or 7:00 pm to 8:00 pm. This series will run on nine different days. Reservations are required, and rates for individual workshops and a group rate for the entire series are available.

Visit <http://www.imaginationstationtoledo.org> or call 419.244.2674 ext. 250 for pricing, workshop dates and to register.

**Science & Space**  
October 26 - 31  
Explore the month-long science of Halloween with this hair-raising, bone-chilling, spine-tingling event.

**National Chemistry Week**  
November 5 - 9  
Experience demonstrations you can't replicate in the classroom as staff get kids excited about this year's national theme: Energy!

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**Akron Hub - Two Upcoming Programs:**

**1. Professional Learning Communities for Curriculum, Assessment and Instruction for 21st Century Learners**  
Professional One STEM Learning Network (OSLN)-Akron Hub, this blended learning course is designed to provide participants with an opportunity to develop an understanding of Professional Learning Communities (PLCs) as a foundation for curriculum, assessment and instruction for the 21st century learner.

This blended learning course includes two face-to-face meetings and 5-6 weeks of an online learning experience. The introductory session provides learners a chance to meet the other members of the PLC and become involved in the online course. The follow-up meeting provides an opportunity to create SMART goals for personal learning.

Introductory Meeting: **Sep. 11, 2013 6:30 p.m. to 7:30 p.m.**  
Room 12, OTL Staff Development Center, 65 Steiner Ave Akron, 44301

Follow-up Meeting: **Nov. 20, 2013**  
6:30 p.m. to 7:30 p.m.

National Inventors Hall of Fame® School Center for STEM Learning, 199 S. Broadway, Akron Ohio 44308

**Deadline to register:** August 30, 2013  
Register online: [http://tinyurl.com/OSLN\\_AkronHubPd](http://tinyurl.com/OSLN_AkronHubPd)  
\$450 per educator, including all books and fees. 3 graduate credit hours at \$150 per credit or a certificate for 3.0 continuing education units are available upon workshop completion.

**2. Snapshots of STEM Fall 2013 Program**  
This hands-on learning experience is designed to provide participants with a real-world experience inside a fully functional and operational STEM school, the National Inventors Hall of Fame® School Center for STEM Learning.

During the program experience, a STEM learning environment is modeled using observation, reflection and discussion to support participant understanding of the meaning of STEM.

199 S. Broadway Akron, Ohio 44308  
Deadline to register: September 1, 2013 and 2013  
8:30 am - 3:30 pm

**Deadline to register:** September 6, 2013  
[http://tinyurl.com/OSLN\\_AkronHubPd](http://tinyurl.com/OSLN_AkronHubPd).

\$25 per participant, per day including all materials and lunch (discounts can be provided for groups of five or more)  
2 graduate credit hours at \$150 per credit or a certificate for 2.4 continuing education units are available upon workshop completion

For more information about either of these workshops, contact:  
Alison White, Director  
OSLN-Akron Hub  
[awhite@akron.k12.oh.us](mailto:awhite@akron.k12.oh.us)

[\[back to top\]](#)

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**NWO Hands-On STEM Activity**

**Pinterest** (<http://pinterest.com/lagayekmnm/stem-for-kids/>) is a pinboard-style photo-sharing website that allows users to create and manage theme-based image collections such as events, interests, and hobbies.

**Electricity and Magnetism**

*This month's Hands On Activity is from Pinterest.  
"Electricity and Magnetism" by MCREL.*

**Purpose:** As a result of this activity, students will be able to understand that electricity and magnetism are related forces.

Download a pdf of the complete hands-on activity by [clicking here!](#)

[\[back to top\]](#)

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**Share Your Story!**  
Thank you for your support of NWO, our programs, our activities, and our partners. Please send us updates, press releases, and news of STEM happenings at your school, district, or organization. Please consider to share your story with us. We are always looking for great STEM education stories to feature in upcoming newsletters.

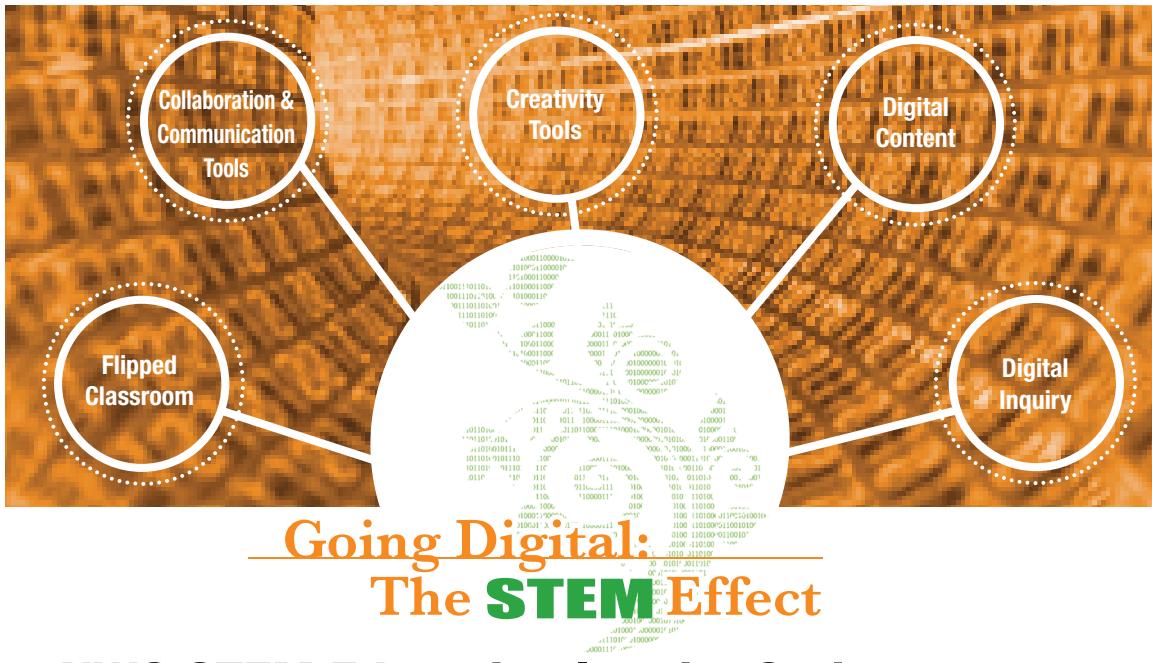
**Join NWO on Facebook**  
**Follow NWO on Twitter**

**Find Even More Ohio STEM Education Resources**  
Visit our STEM clearinghouse, [ohioscienceresources.org](http://ohioscienceresources.org), for more STEM activities, programs, and information.

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**Print and eNewsletters from the past!**  
Looking for past articles from our print and eNewsletters?  
[Click here](#) view and download from our Print Newsletter archives.  
[Click here](#) view and download from our eNewsletter archives.

# Appendix H: NWO STEM Education Inquiry Series Advertising



## NWO STEM Education Inquiry Series 2013-14

*STEM Professional Development for preK – 12 Teachers & Administrators*

**Each event runs from 5:00 PM – 8:00 PM at WGTE Public Media (1270 S. Detroit Ave., Toledo, OH)**

**Registration Fee: \$20/night (\$10/night for undergraduate students) (includes dinner)**

**Contact Hour Certificates available for ALL events. Bring your own internet capable device.**

**October 8, 2013 – Elliot Soloway & Cathleen Norris** (Registration Open: Aug. 12 – Oct. 4)

*The Benefits of Mobile Technologies for K-12: Transformative and Inevitable! Enabling New Pedagogical Practices and Dramatic Increases in Student Performance.*

**December 10, 2013 – David Harms** (Registration Open: Oct. 9 – Dec. 6)

*Using Flipped Technologies to Increase Student Performance in a Traditional Classroom*

**January 14, 2014 – Betsy Hood** (Registration Open: Dec. 11 – Jan. 10)

*Connect, Communicate, and Collaborate with Web 2.0*

**February 11, 2014 – Savilla Banister** (Registration Open: Jan. 15 – Feb. 7)

*Embrace the Chaos! Using Digital Resources to Empower Learning*

**March 4, 2014 – Carrie Rathskack** (Registration Open: Feb. 12 – Feb. 28)

*Using Creativity Tools for Active & Engaged STEM Learning*

**Session descriptions, directions, & registration available at: [www.nwocenter.org/inquiryseries](http://www.nwocenter.org/inquiryseries)**

Sponsored in part by:



## Appendix H: NWO STEM Education Inquiry Series Advertising cont.

### Recruitment Email Sample



**Going Digital:  
The STEM Effect**

**NWO STEM Education  
Inquiry Series 2013 - 14**

**STEM Professional Development for preK - 12  
Teachers & Administrators**

**5:00 PM - 8:00 PM  
at WGTE Public Media  
(1270 S. Detroit Ave., Toledo, OH)**

**Registration Fee: \$20 (\$10 for undergraduate students)  
(includes dinner)**

**Contact Hour Certificates available.  
Bring your own internet capable device.**

*Registration is FREE for preK-2 Educators (sponsored by PNC Bank)*

**October 8, 2013 - Elliot Soloway & Cathleen Norris**  
*(Registration Open: Aug. 12 - Oct. 4)*

**The Benefits of Mobile Technologies  
for K-12: Transformative and Inevitable!  
Enabling New Pedagogical Practices and  
Dramatic Increases in Student Performance**

We stand by our 2010 prediction: by 2015, each and every student in America's K-12 classrooms will be using his or her own mobile computing device 24/7 for curricular purposes. For good reasons! Those miraculously-thin and light, aluminum-encased slabs of glass afford significant benefits for teaching and learning. For example, Internet-connected, mobile devices enable learners to directly and immediately access information, events, organizations, places, individuals, data, tools, etc., etc. Such unprecedented access enables learners to take control of their own learning - thereby enabling all teachers, not just artisan teachers, to enact a learn-by-doing, inquiry-directed pedagogy in their classrooms. Flipping the classroom is only the beginning; mobile technologies extend the classroom to enable all-the-time, everywhere learning, which, in turn, supports the linking of the abstract ideas explored inside the classroom to the concrete, real world of people, places, and things outside the classroom. The benefits of mobile devices can - and will - enable the next wave of educational practices and unleash dramatic increases in student performance. And, most importantly make no mistake: THIS CHANGE IS INEVITABLE.

In our workshop, attendees will use the collabriified apps; a limited number of IOS and Android tablets will be available for use during the workshop. However, we encourage you to BYOD - Bring your own Device!

[Click here to register online!](#)

For more info, visit us at: [www.nwocenter.org/inquiryseries](http://www.nwocenter.org/inquiryseries)



Sponsored in part by:



# Appendix I: NWO Symposium Advertising

**2013  
NWO Symposium**

Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

November 2, 2013  
8:30 am - 4:00 pm

Olscamp Hall @  
Bowling Green  
State University

**Keynote  
Speaker**  
Alfie Kohn

Registration Fee Includes:

- 7 hours of high quality professional development
- Keynote address by Alfie Kohn
- Conference bag
- Light breakfast & full lunch

**Featuring a keynote presentation by Alfie Kohn.** Kohn has been described by *Time* magazine as “perhaps the country’s most outspoken critic of education’s fixation on grades [and] test scores.” His criticisms of competition and rewards have helped to shape the thinking of educators – as well as parents and managers – across the country and abroad. He has appeared on numerous TV and radio programs, including the “Today” show and two appearances on “Oprah.” He lectures widely at universities and to school faculties, parent groups, and corporations, as well as speaking at staff development seminars and keynoting national education conferences.

**Registration Fee:**

\$35 (deadline Oct. 25); \$45 onsite

Undergraduate Students: \$15 (deadline Oct. 25); \$25 onsite

Special Rate for BGSU Students: \$10 online registration;  
BGSU Faculty: \$20 online registration

*Multiple Participant Discount (\$30/person) for 5 or more participants from the same school*

**Contact Hour Certificate Available**

**For more information or to register visit: <http://nwocenter.org/nwoSymposium>**

**4 x 6 Postcard**

Sponsored in part by BGSU's College of Education and Human Development and the Center of Excellence for 21st Century Educator Preparation

with support from:

The Andersons bp Husky PNC BANK

## Appendix I: NWO Symposium Advertising cont.

### Recruitment Email - Attendee



**2013  
NWO Symposium**

**2013 NWO Annual Symposium on Science,  
Technology, Engineering, and Mathematics  
Teaching**

**November 2, 2013 8:30 am - 4:00 pm**

**Olscamp Hall @  
Bowling Green State University**

**Registration Fee:**

- \$35 (deadline Oct. 25); \$45 onsite
- Undergraduate Students: \$15 (deadline Oct. 25); \$25 onsite
- Special Rate for BGSU Students: \$10 online registration;  
BGSU Faculty: \$20 online registration
- *Multiple Participant Discount (\$30/person) for 5 or more  
participants from the same school*

**Registration Fee Includes:**

- 7 hours of high quality professional development
- Keynote address by Alfie Kohn
- Conference bag
- Light breakfast and full lunch

**Contact Hour Certificate Available**

**Featuring a keynote presentation by Alfie Kohn.**

Kohn has been described by Time magazine as "perhaps the country's most outspoken critic of education's fixation on grades [and] test scores." His criticisms of competition and rewards have helped to shape the thinking of educators - as well as parents and managers - across the country and abroad. He has appeared on numerous TV and radio programs, including the "Today" show and two appearances on "Oprah." He lectures widely at universities and to school faculties, parent groups, and corporations, as well as speaking at staff development seminars and keynoting national education conferences.



**For more information or to register visit:  
<http://nwocenter.org/nwoSymposium>**



Sponsored in part by BGSU's College of Education and Human Development and the Center of Excellence for 21st Century Educator Preparation.

With support from:

The AMERICAN  Husky 

# Appendix I: NWO Symposium Advertising cont.

## Recruitment Email - Presenter

**Deadline: August 31, 2013**



Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

### The Northwest Ohio Center for Excellence in STEM Education

brings you the 2013 NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching

Saturday, November 2, 2013  
8:30 AM - 4:00 PM  
Olscamp Hall, Bowling Green State University  
Bowling Green, OH 43403

Presenters can attend the ENTIRE Symposium (including the keynote) for FREE!

#### Presentation Proposal Information

Thank you for your interest in presenting at the 2013 NWO Symposium on Saturday, November 2nd at Bowling Green State University. To submit a presentation proposal, please click the link below and complete the online form. **Please review the Symposium Strands listed below; you will need to choose one of these strands for your presentation.**

[Click Here To Apply by August 31](#)

All presentation proposals must be submitted by AUGUST 31st at 5:00PM. Beginning September 1, NWO staff will review the proposals and notify prospective presenters if their proposal has been accepted. Accepted presenters will be not be charged a registration fee.

For more information visit the Symposium website at [nwocenter.org](http://nwocenter.org).

Questions? Contact [nwo@bgsu.edu](mailto:nwo@bgsu.edu).

#### 2013 NWO Symposium Strands

##### Special Strands for the 2013 Symposium

1. Inquiry in the College Classroom: Enhancing the Undergraduate Experience

Inquiry-based teaching practices and active learning strategies are often difficult to implement in the high-enrollment courses that tend to make up much of the early undergraduate experience. These difficulties, however, are not insurmountable. **Sessions in this strand will demonstrate how inquiry-based practices and active learning strategies can effectively be implemented in undergraduate STEM courses, especially those that are high-enrollment.**

2. Citizen Science: Thinking Outside the Classroom

Making STEM concepts relevant for students serves an essential instrumental purpose in improving motivation and STEM learning. Conducting research around important community STEM issues, such as water quality and animal conservation, engages students in real STEM problems, and allows them to experience STEM in a whole new way. **Sessions in this strand will demonstrate what citizen science is, and how it can be integrated into the classroom.**

3. What Works in STEM: Applying Research in the Classroom

There is often a wide gulf between STEM educational research and classroom practice. One major problem is the recommendations of STEM educational researchers are often difficult to apply in real classroom settings. While educators like Robert Marzano have attempted to bridge this gap between theory and practice, there is much more to be done to make research relevant to STEM classrooms. **Sessions in this strand will explore some prominent research in STEM education, and demonstrate how it can be applied in the classroom.**

4. Putting Creativity to Work: Teaching STEM With Innovation

Creativity and innovation might aptly be described as the drivers of educational growth and success. New and innovative approaches to STEM teaching and learning result in deeper and more meaningful STEM learning for students. **Sessions in this strand will explore some innovative ways to teach STEM.**

##### General Strands for the 2013 Symposium

5. Integrating Technology in the Classroom

**Sessions in this strand will focus on how to use technology in STEM teaching focusing more on the technology being used than a specific content area.**

6. Teaching and Learning in SCIENCE

This is the general SCIENCE strand. **Sessions in this strand will focus on deepening science content and/or exploring interesting and effective ways to teach science.**

7. Teaching and Learning in MATHEMATICS

This is the general MATHEMATICS strand. **Sessions in this strand will focus on deepening mathematics content and/or exploring interesting and effective ways to teach mathematics.**

8. Teaching and Learning in ENGINEERING

This is the general ENGINEERING strand. **Sessions in this strand will focus on deepening engineering content and/or exploring interesting and effective ways to teach engineering.**

This event is supported by BP/Husky and BGSU's College of Education and Human Development and the Center of Excellence for 21st Century Educator Preparation.

## Recruitment Email - Vendor

**Deadline: August 31, 2013**



Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

### The Northwest Ohio Center for Excellence in STEM Education

brings you the 2013 NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching

We are seeking vendors for the upcoming 2013 event

Saturday, November 2, 2013  
8:30 AM - 4:00 PM  
(Vendor Area Open All Day)  
Olscamp Hall, Bowling Green State University  
Bowling Green, OH 43403

#### Vendor Registration and Fee Information

Please follow the link below to apply as a vendor for this outstanding educational opportunity expected to draw over 350 preK-16 educators!

[Click Here to Register by August 31](#)

After your registration has been submitted, you will receive a confirmation e-mail for your records. Closer to the event date, you will receive an email with further information regarding the symposium.

If you are also interested in presenting, please [click here](#) to submit a presentation proposal by August 31.

For more information, please contact [nwo@bgsu.edu](mailto:nwo@bgsu.edu).

##### Registration Fee:

- For-Profit Businesses: \$100
- Non-Profit Organizations: \$25 (501C3 may be requested as proof of non-profit status)

##### Registration Fee Includes:

- ONE eight foot table
- Meal Tickets for up to 3 people (additional tickets can be purchased on site for \$10 each)
- Limited Access to Electricity
- Wireless Internet Access

##### Additional Items:

- Additional Meal Ticket: \$10 (paid on-site at the event)
- Additional Table: \$10 (pre-paid as part of registration payment)

##### Payment Information:

- Option 1: [Credit Card Payment](#) (Link also available on the vendor registration webpage)
- Option 2: Mail check or money order payable to BGSU to address below:

NWO Symposium  
241 Math Science Bldg.  
Bowling Green State University  
Bowling Green, OH 43403

This event is supported by funds from BP/Husky and BGSU's College of Education and Human Development and the Center of Excellence for 21st Century Educator Preparation.

## Appendix I: NWO Symposium Advertising cont.

### NWO Symposium Advertising

The screenshot shows the BGSU website homepage. At the top, there's a navigation bar with links for MyBGSU, email, directory, and search. Below the navigation is a banner with the text "ROBOTS IN ACTION" and a subtext "» Competition drives home STEM lessons". The main content area has three columns: "QUICK LINKS", "UNIVERSITY NEWS", and "TOOLS". The "UNIVERSITY NEWS" column features a story about Renowned author Alfie Kohn speaking at BGSU. The "MEDIA SPOTLIGHT" section includes a link to "Russell Mills on Leading Edge with Jerry Anderson". The right side of the page has a "CALENDAR OF EVENTS" section with an event for "IM Sign Ups Going on Now" on November 2, 8:30 AM, and a "MAKE A GIFT NOW" button.

This screenshot shows the same BGSU website layout as the first one, but with a different banner at the top. The banner features a group of people and the text "ONE FOR THE BOOKS: LACROSSE ALUMNI RAISE \$150,000 FOR ATHLETIC ARCHIVES". The rest of the page structure is identical to the first screenshot, including the "QUICK LINKS", "UNIVERSITY NEWS", "TOOLS", "MEDIA SPOTLIGHT", "CALENDAR OF EVENTS", and "MAKE A GIFT NOW" sections.

# Appendix I: NWO Symposium Advertising cont.

## NWO Symposium Advertising

The screenshot shows a news article from the BGSU website. The header includes links for My BGSU, email, directory, and search, along with ACADEMICS, ADMISSIONS, THE ARTS, ATHLETICS, LIBRARIES, and A-Z LINKS. The main content is titled "Educational reformer Alfie Kohn to keynote BGSU conference". It discusses Kohn's role as a reform advocate and his upcoming keynote address. The article includes social media sharing icons and a timestamp "(Posted October 03, 2013)".

The screenshot shows a news article from Toledo.com. The header features a weather forecast (45° F, slight chance of showers) and links for Arts, Events, Things to Do, Articles, Kids, Movies, Music, Directory, Dining, Nightlife, Shopping, and more. The Toledo.com logo is prominently displayed. The main content is identical to the BGSU article, including the same details about Kohn's keynote and registration information. It also includes social media sharing options and a date/time stamp (Date: 11/02/2013, Time: 8:30 am - 4:00 pm).

# Appendix J: Ohio JSHS Advertising



**March 19-21  
2 0 1 4**

## The 51<sup>st</sup> Annual Ohio Junior Science & Humanities Symposium hosted by Bowling Green State University

### ***Call for High School Research Papers and Posters***

Sponsored by the Northwest Ohio Center for Excellence in STEM Education (NWO) and The School of Teaching and Learning at Bowling Green State University.

In cooperation with The Academy of Applied Science and with the support of the Departments of the Army, Navy, and Air Force.

#### **Important Deadline ~ February 21, 2014**

- Online registration is required for all participants including Paper Presenters, Poster Presenters, Teachers, Student Delegates.
- Registration fee: \$25 per student
- **Poster Presenters** must submit an **Abstract** during the registration process.
- **Paper Presenters** must submit an **Abstract** and a copy of the **Research Paper** during the registration process.



The National Association of Secondary School Principals has placed this program on the NASSP National Advisory List of Student Contests and Activities for 2013-2014

Visit our web site for more information

**[www.ojshs.org](http://www.ojshs.org)**

**8.5 x 11 Flyer**

## Appendix J: Ohio JSHS Advertising cont.

### Recruitment Email Sample

The 51st Annual Ohio Junior Science & Humanities Symposium  
hosted by Bowling Green State University

**Call for High School Research Papers and Posters**

**Call for High School Research Papers and Posters**

Sponsored by the Northwest Ohio Center for Excellence in STEM Education (NWO) and The School of Teaching and Learning at Bowling Green State University.

In cooperation with The Academy of Applied Science and with the support of the Departments of the Army, Navy, and Air Force.

**Important Deadline ~ February 21, 2014**

- Online registration is required for all participants including Paper Presenters, Poster Presenters, Teachers, Student Delegates.
- Registration fee: \$25 per student
- Poster Presenters must submit an Abstract during the registration process.
- Paper Presenters must submit an Abstract and a copy of the Research Paper during the registration process.

NASPS APPROVED FOR LISTING 2013-2014 STUDENT CONTESTS & ACTIVITIES

NWO Northwest Ohio Center for Excellence in STEM Education

BGSU

The National Association of Secondary School Principals has placed this program on the NASP National Advisory List of Student Contests and Activities for 2013-2014

**Registration Dates: November 18 - February 21, 2014**  
**Register Online at: [www.ojshs.org](http://www.ojshs.org)**

## Appendix J: Ohio JSHS Advertising cont.

### Ohio JSHS Advertising

**BGSU NEWS**

ATHLETICS ALUMNI RESEARCH STUDENT LIFE LIBRARIES MYBGSU EMAIL SEARCH

## STUDENTS TO PRESENT WORK AT OHIO JUNIOR SCIENCE AND HUMANITIES SYMPOSIUM

Home / News / 2014 / March / Students to present work at Ohio Junior Science and Humanities Symposium

[Tweet 0](#) [Like](#) [Share](#)

BOWLING GREEN, O.—Ohio's top high school science students and selected eighth-grade students will present the results of their original research during the 51st annual Ohio Junior Science and Humanities Symposium (Ohio JSHS) at Bowling Green State University March 19-21. The event is patterned after research sessions at professional meetings where both paper and poster sessions take place. In addition to the student presenters, area high school students and teachers will attend the sessions to network and learn about cutting-edge research.

More than 100 high school students from throughout the state will present their research on topics from all areas of science. The eight paper sessions will take place on Thursday and Friday in 101B Olscamp Hall. Poster judging will take place on Thursday. The public may view the posters from 4-5 p.m. Thursday, and from 8:45 a.m. until 12:15 p.m. Friday in 101A and 101B Olscamp.

At stake is more than \$18,000 in scholarship money and cash awards for the winners of the Ohio JSHS. The top three paper presenters all receive scholarships, and the top five paper presenters receive an all-expense-paid trip to the National JSHS to take place in Washington, D.C., April 23-27. The top two presenters at the National JSHS will have the opportunity to compete for one of six \$12,000 scholarships and a trip to the International Fortnight in London.

Faculty members from BGSU, Lourdes University and the University of Toledo will serve as judges for the competition along with representatives from the U.S. Department of Agriculture Forest Service. Undergraduate students will serve as paper session presiders, with high school teachers serving as moderators.

Sponsorship awards come from the Academy of Applied Science, BGSU's Northwest Ohio Center of Excellence in STEM Education (NWO), COSMOS, College of Arts and Sciences, Department of Biological Sciences, Department of Physics and Astronomy, Department of Chemistry, College of Education and Human Development, School of Teaching and Learning, and the U.S. Army, Navy and Air Force.

BGSU's Pershing Rifles Color Guard will initiate the program at 8:30 a.m. on Thursday.

NWO director Dr. Robert Midden; Lt. Col. Douglas Mohler, U.S. Army and BGSU professor of military science; and Bly Tipping, Ohio JSHS assistant coordinator and science teacher at Sylvania Southview High School, will give the welcome address.

On Thursday evening, keynote speaker Dr. Jodi Haney will discuss "Roots to STEM."

Haney is a professor in the School of Teaching and Learning with a joint appointment in the Department of Environmental Sustainability.

Visit <http://www.ojshs.org> for information on the program.

For additional information on the free public event, contact Midden at [midden@bgsu.edu](mailto:midden@bgsu.edu) or 419-372-0563; Dr. Emilio Duran, School of Teaching and Learning, at [eduran@bgsu.edu](mailto:eduran@bgsu.edu) or 419-372-1262; or Jessica Belcher, OJSHS coordinator and NWO assistant director, at [jbelche@bgsu.edu](mailto:jbelche@bgsu.edu) or 419-372-5571.

Thursday, February 13, 2014

# ZOOM news

BOWLING GREEN STATE UNIVERSITY

BG24 News hits stride | BGSU to host young scientists

### Calling young scientists



Promising young scientists will converge on campus March 19-21 for the 51st annual Ohio Junior Science and Humanities Symposium, an opportunity for high school students to present their research, learn more about the scientific process and meet other young scientists and faculty.

A student at last year's symposium shares her research with a faculty member.

Participants also may win significant scholarships and the opportunity to travel to the national conference later this year.

The deadline to submit high school research papers and posters is Feb. 21. Register online at [www.ojshs.org](http://www.ojshs.org).

The symposium is hosted by the Northwest Ohio Center for Excellence in STEM Education (NWO) and the School of Teaching and Learning at BGSU, in cooperation with the Academy of Applied Science and with the support of the departments of the Army, Air Force and Navy.

For more information, contact Dr. Emilio Duran at [eduran@bgsu.edu](mailto:eduran@bgsu.edu)

# Appendix K: STEM in the Park Advertising

**Free Family Event**

**STEM in the PARK™** Science, Technology, Engineering, and Mathematics

**SAVE TIME... Pre-register online!**  
at [www.nwocenter.org/STEMinPark](http://www.nwocenter.org/STEMinPark)  
and be entered into a drawing to win  
a \$25 gift card to Amazon!

**Saturday, Sept. 7, 2013**  
**10 am – 2 pm at BGSU**  
**Perry Field House**

**FREE Lunch catered by Tony Packo's 11:30 am - 1:30 pm**

**What do you get when you cross a giant bubble, a snake, and an electric vehicle? You get... STEM in the Park**

**STEM in the Park** will feature interactive displays and activities created by community partners, local businesses, and area universities to engage children of all ages in science, technology, engineering, and mathematics (STEM).

Join us for a family day of **hands-on fun** at Bowling Green State University featuring everything from sea creatures to pop rockets, take-home STEM activities, and a free lunch. You won't want to miss it!

**While at STEM in the Park 2013 enjoy activities and information provided by:**

Academic Investment in Math and Science (AIMS) Imagination Station SECO/INSTA  
ACTION Program – BGSU Lourdes University Seven Eagles Historical Education Center  
Adelante Maumee Valley Historical Society-Wolcott Spectra Group Limited, Inc  
Bowling Green State University House Museum Complex St. Kateri Catholic Academy  
Bowling Green Early Childhood Learning Center Montessori School The Laptop Company  
Bowling Green Fire Division Montessori School of Bowling Green The University of Findlay-Biology Department  
Built Challenger Learning Center of Lake Erie West NWOET at BGSU Toledo Botanical Garden  
Curriculum Resource Center, BGSU Library PNC Bank - Sponsoring Pre K-2 activities Toledo Zoo  
E.S. Wagner Company PVS Nolvwood Chemicals, Inc Usborne Books & More  
Educating by SDG Creations, Ltd Rainbow Co-Op Preschool Wood County Historical Center  
ERG Environmental Services Sauder Village Wood County Hospital  
Wood County Soil & Water Conservation District

*For a complete list of activity providers and sponsors please visit: [www.nwocenter.org/STEMinPark](http://www.nwocenter.org/STEMinPark)*

presented by **BGSU**, **bp**, **Lubrizol**, **Verizon**, with support from **COOPERTIRES**, **McKee**, **NWO**, **Spectra**, **PNCBANK**, **WAL-MART**

Visit the website for more info at [www.nwocenter.org/STEMinPark](http://www.nwocenter.org/STEMinPark)

**8.5 x 11 Flyer**  
**11 x 17 Poster**

**Free Family Event**

**STEM in the PARK™** Science, Technology, Engineering, and Mathematics

**SAVE TIME... Pre-register online!**

**Saturday, Sept. 7, 2013**  
**10 am – 2 pm at BGSU**  
**Perry Field House**

**FREE Lunch catered by Tony Packo's 11:30 am - 1:30 pm**

**Visit the website for more info at [www.nwocenter.org/STEMinPark](http://www.nwocenter.org/STEMinPark)**

## Appendix K: STEM in the Park Advertising cont.

### Recruitment Email



We are excited to invite you to participate with NWO/COSMOS at our fourth annual **STEM in the Park event!** This event will be Saturday, September 7, 2013 from 10AM-2PM on the campus of Bowling Green State University. Last year's event drew close to 2,700 people! This is almost 1,000 more than the previous year! This family day of exciting hands-on STEM activities is growing thanks to your participation!



**Exhibitor provides:**

- Hands-on activity plus materials for attendees to complete the activity
- The text for a **STEM in the Park Take-Home Activity** (see example, if desired)
- Take Home brochures and marketing material featuring your company, department, college or campus organization (if desired)

**Registration:**  
[\*\*Please click here to complete registration form\*\*](#)

**Questions?** Contact Jenna Pollock at NWO/COSMOS ([jpolloc@bgsu.edu](mailto:jpolloc@bgsu.edu)) or Dr. Emilio Duran ([eduran@bgsu.edu](mailto:eduran@bgsu.edu)), School of Teaching and Learning.

**Information regarding the previous years' STEM in the Park events can be found at [nwocenter.org/STEMinPark](http://nwocenter.org/STEMinPark)**



NWO/COSMOS  
241 Math Science, BGSU  
Bowling Green OH 43403  
419-372-2718  
[nwo@bgsu.edu](mailto:nwo@bgsu.edu)

If this email was forwarded to you and you would like to be placed on our contact list for updates about this particular event, please email Jenna Pollock at [jpolloc@bgsu.edu](mailto:jpolloc@bgsu.edu). We will see that you receive future communications regarding STEM in the Park 2013.



# **Appendix L: You Be The Chemist Challenge Recruitment Email**



**Teachers: Announcing an exciting learning opportunity for students grade 5-8 called "You Be the Chemist!"**

"You be the Chemist" is a **FUN & INNOVATIVE** academic competition engaging students in learning about important chemistry concepts, discoveries, and chemical safety.

**CHALLENGE COMPETITIONS** take place across the country and encourage collaboration among community organizations, schools, and the chemical industry.

The **TOP STUDENT** in the State Challenge **QUALIFIES** for an all expenses paid trip to the National Competition in Philadelphia, PA in June!

Participating is easy - please email **Bob Mendenhall** (Toledo Public Schools) at [rmendenh@tps.org](mailto:rmendenh@tps.org) or call (419) 671-8320 more information. In the email include the following information: **(RETURN BY DECEMBER 3, 2013)**

Teacher Name:

Principal Name:

School Address (include County):

Number of Students Participating:

Please visit <http://www.chemed.org/ybtc/> for more information.

This event is supported by

