

tools for the classroom. This is a wonderful opportunity for teachers and administrators to recharge, network, and continue learning about the Common Core curriculum, the Standards for Mathematical Practice, technology, and assessment. Visit the NCCTM web site at ncctm.org to register for the Conference and see a preliminary program.

2013 Fall Leadership Seminar

The 2013 Fall Leadership Seminar will be held at the Koury Convention Center on Wednesday, October 30 (the day before the State Mathematics Conference). The theme is "Common Core: The Journey Continues." The keynote speakers will be Dr. Linda Gojak and Dr. Diane Schaefer. Dr. Gojak is the current President of the National Council of Teachers of Mathematics, an author, and the Director of the Center for Mathematics and Science Education, Teaching and Technology at John Carroll University. Her presentation at the Leadership Seminar will be titled "Leading for Change in the Common Core Era." Dr. Schaefer was a Mathematics

Specialist and Director of the Office of Instruction for 18 years at the Rhode Island Department of Education and is currently a consultant for the U. S. portion of the Mathematics Assessment Project (MAP) from the Shell Centre (London, UK). Her presentation at the Leadership Seminar will be titled "Broadening our Understanding of Formative Assessment." The North Carolina Department of Public Instruction will do an information session with updates and time for questions. The Leadership Seminar is another great opportunity for teacher leaders and administrators to recharge, network, and continue learning about the Common Core curriculum, the Standards for Mathematical Practice, and assessment. Visit the NCCTM web site at ncctm.org to register for the Leadership Seminar.

Visit us online at: www.msec.appstate.edu

DATES TO REMEMBER

Science Seminars 2013: Sept. 19, 26; Oct. 3, 10, 24; Nov 21; and 2014: April 10

October 30, 2013: NCCTM Leadership Seminar, Greensboro, NC

October 31 - November 1, 2013: NCCTM State Mathematics Conference, Greensboro, NC

November 7-9, 2013: NSTA Area Conference, Charlotte, NC

January 31, 2014: Deadline for SVSM Applications

March 22, 2014: NCCTM Western Region Math Fair, ASU

March 28 - April 13, 2014: North Carolina Science Festival

April 1, 2014: Math Contest, ASU

April 3-6, 2014: NSTA National Conference on Science Education, Boston, MA

April 9-12, 2014: NCTM Annual Meeting, New Orleans, LA

May 2, 2014: NCCTM State Math Fair, Durham, NC

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MSEC Staff: Phillip Johnson, Director; Betty Long, Assistant Director; Lori Tyler, Summer Ventures in Science and Mathematics Director; Vickey Isaacs, Administrative Assistant

NOTES FROM THE DIRECTOR

Science seminars, Science Festival activities, Family Math and Family Science Nights, science programs for visiting school groups, and a well-stocked math and science resource room are among the offerings of the Math and Science Education Center. In addition to our work with pre-service and in-service teachers, we strive to have programs for the entire community; the science seminars and Science Festival activities are examples of activities that everyone can benefit from and enjoy.

I am sad to report that the MSEC's long-time Administrative Assistant Judy Bumgarner, who retired about ten years ago, died from cancer on August 31, 2013. Judy was a tireless worker who contributed greatly to the work of the Math and Science Education Center; she made my and former director Steve Dyche's jobs easier. We will miss our friend and colleague.

My thanks for contributions to the newsletter by Betty Long, Debbie Crocker, Lori Tyler, Tracie Salinas, Mike Bossé, Rahman Tashakkori, and Vickey Isaacs

Phil Johnson

Mathematics and Science Education Center

APPALACHIAN STATE UNIVERSITY

MSEC Newsletter

Fall 2013



Teachers conducting the Monte Carlo simulation with lintels

NSF-Sponsored Research Experience For Teachers

The Department of Computer Science at Appalachian State University has received funding from the National Science Foundation (NSF) to establish a three-year Research Experience for Teachers (RET) site in Data Analysis & Mining, Visualization, and Image Processing; Dr. Rahman Tashakkori wrote the successful grant proposal for the program. The objective is to provide an opportunity for twelve in-service high school teachers and community college faculty to work with faculty mentors and their graduate and undergraduate assistants to conduct research in these fields. During this six-week summer program, participants gain skills that they can utilize to assist their students to solve interdisciplinary problems. In addition, participants design learning modules to teach STEM concepts in their courses. The program supports active involvement of K-12 STEM teachers and community college faculty in computer science research in order to bring knowledge of computer science and technological innovation into their classrooms. The goal is to help build long-term collaborative partnerships between K-12 STEM teachers, community college faculty, and the NSF university research community.

The first RET program in summer 2013 was a great success and resulted in six excellent research projects and more than 30 course modules that are available for adoption at www.cs.appstate.edu/ret. These modules are created so that teachers can use them to teach a concept in their classrooms. The program provides \$6,000 stipends, free housing and meals during summer, and other supports during the academic year. There is also a one-day paid workshop on Saturday, November 16 in which participants will be introduced to the program. We encourage interested parties to refer to the web page of the program for details. License renewal credits are certified by the Math and Science Education Center.

MATH CONTEST

The Department of Mathematical Sciences at ASU will host one of the North Carolina Council of Teachers of Mathematics Math Contests again this spring for Algebra I/Common Core Math

2013-2014 Science Seminars

The last two seminar series had themes that have not nearly been exhausted, so we have chosen a theme for this year that encompasses the subjects of those two series. We will be investigating *Incremental Changes and Paradigm Shifts in Scientific Knowledge that Improve Our Understanding of the Natural World*. The seminars are open to everyone, are free, and offer license renewal credits (0.2 per seminar) to teachers. All seminars will be in room 124A in the new Reich College of Education Building from 6:00-8:00pm with refreshments at 6:00. The spring seminar is part of the North Carolina Science Festival that will take place during March 28 - April 13, 2014. The schedule for the 2013-2014 series is:

September 19, 2013: Tonya Coffey (Physics and Astronomy), "Higgs, Quarks, and Gluons, Oh My!"

September 26, 2013: Rene Salinas (Mathematical Sciences), "Managing Feral Hogs in Great Smoky Mountains National Park: What Can Models Tell Us?"

October 3, 2013: Andy Heckert (Geology), "Hot-blooded Dinosaurs?"

October 10, 2013: Dan Caton (Physics and Astronomy), "Deep Impact: Our Growing Awareness of Danger from Space"

October 24, 2013: Carla Ramsdell (Physics and Astronomy), "Know Watts Cooking: the Physics of Energy-efficient Cooking"

November 21, 2013: Howie Neufeld (Biology), "What Is Life and How Did it Arise from non-Life?"

April 10, 2014: Jeff Goodman (Curriculum and Instruction), "Technology and Understanding: How New Tools Shape Scientific Thinking"

I and Comprehensive divisions. The contest is scheduled for Tuesday, April 1, 2014. Registration information will be mailed to area schools as well as emailed to sponsors who have brought teams in the past. Please consider bringing a group of students to participate! If you would like further information about ASU's contest, please check the Math Contest website <http://www.mathsci.appstate.edu/news-events/math-contest> or contact Lori Tyler at tylerle@appstate.edu. The NC State High School Mathematics Contest page is <http://math.ncssm.edu/smc/state.htm>

SUMMER SCIENCE WORKSHOPS

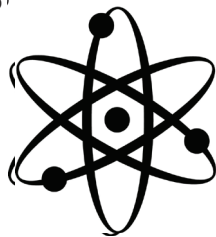
In addition to partnering with several other programs to offer professional development in math and science, the Mathematics and Science Education Center was the sole sponsor of three science workshops during summer 2013. All workshops were week-long events, Monday through Friday. Experienced elementary school teachers Judy Sink and Lou Moore led a five-day K-5 workshop that followed up on their successful workshop from last summer with "Unraveling the New Science Essential Standards, Round 2." Laura Mallard and Crystal Wilson of the Department of Geology led a week-long Earth Science Workshop for middle and high school teachers entitled "Earth-Shaking Science." The third workshop was held at the new Patterson Science Center in Lenoir, and was led by the Director of the Center, Amy Bradley. Amy's workshop, "Bridging the Gap: What Do Biotechnology and Agriculture Have in Common," was for middle school teachers. We are pleased to have a partnership with the Patterson Science Center similar to what we have had with the Catawba Science Center in Hickory for many years. We welcome suggestions from school systems as to what professional development opportunities would be helpful for your teachers.



NORTH CAROLINA SCIENCE FESTIVAL

The fourth annual North Carolina Science

Festival will be held March 28-April 13, 2014. Science Expo Day on the ASU campus will be held on April 9 during this year's Festival. Science Expo Day with its large number of awesome science and math activities gets more popular each year and draws large crowds of excited participants. You are encouraged to get requests in early to attend Science Expo Day as accommodating the many requests to attend is difficult. More information will be in the spring newsletter and on our website. You may also get information by visiting www.ncsciencefestival.org. Dr. Tonya Coffey of the Physics and Astronomy Department with able assistance from Ms. Tracey Tardiff will again coordinate campus events for the North Carolina Science Festival.



PROGRAMS FOR K-12 STUDENTS

The MSEC is always pleased to arrange math or science programs for visiting students. Especially popular with visiting school groups have been science presentations by Jeff Goodman and Leslie Bradbury. Most of these programs take place during the academic year, but programs for summer visitors are also possible.

Family Math Nights and Family Science Nights in elementary and middle schools involve students and their parents exploring

together interesting facets of mathematics and science. Bill and Birgitta McGalliard conduct the Family Math Nights; Judy Sink and Lou Moore conduct the Family Science Nights. Also popular are presentations for grades 3-9 classes on rocks, minerals, North Carolina geology, the Blackbeard shipwreck, geo-archaeology project or other geology topics by geologist Jack Callahan. The MSEC is pleased to offer these programs at no cost to the schools. Contact Ms. Vickey Isaacs at isaacsve@appstate.edu for further information on these or other programs.

The Mathematics and Science Education Center jointly sponsored with the Department of Mathematical Sciences the **sixteenth annual Math Camp** for rising sixth through twelfth graders in summer of 2013. For the third summer, there was also an ASU Math Camp at Discovery Place in Charlotte in addition to the on-campus Math Camp. We are pleased to be a joint sponsor of this program that continues to draw large numbers of students year after year.

SUMMER VENTURES IN SCIENCE AND MATHEMATICS

Summer Ventures had a great summer this year with 88 students attending from 66 high schools in 34 counties from across North Carolina. All instructors commented on the intelligence of students and this is represented by the fact that ASU SVSM students had an average of 3.7 unweighted GPA and a 4.5 weighted GPA with 41 students having a 4.0 average. We offered eleven research and demonstration courses taught by ASU Faculty and area high school teachers as well as an exciting residence life program! Applications will be available online at www.summerventures.org in early October with a January 31, 2014 deadline. Please contact Lori Tyler (tylerle@appstate.edu) if you would like to schedule a recruitment visit to your school.



Math Fairs

The North Carolina Council of Teachers of Mathematics (NCCTM) sponsors three regional math fairs. Winners from the three regional fairs are invited to participate in the State Math Fair. The 2014 Western Region Math Fair will be held on Saturday, March 22 at Plemmons Student Union on the campus of Appalachian State University in Boone, and the NCCTM State Math Fair will be on Friday, May 2, 2014 at the North Carolina School of Science and Mathematics in Durham. The winners of the 2013 State Math Fair may be found at ncctm.org/math_fair.cfm.

Start working with your students on their projects for the Western Region Math Fair. For more information on the math fairs, go to the NCCTM web site, ncctm.org, and click on Math Fairs on the left of the screen. New information on this year's fairs and registration forms are posted.

APPALACHIAN MATHEMATICS PARTNERSHIP

Now in its third year, the Appalachian Mathematics Partnership (AMP) brings together teachers and administrators from more than a dozen districts and private schools to collaborate with university faculty in professional development in Common Core mathematics. Through AMP, teachers engage their own mathematical practices as they experience and examine rich mathematical content. Through their experiences, teachers gain insight into how to support their students' mathematical practices and to deliver mathematics content using student-centered and inquiry-oriented methods.

The project has cultivated a growing partnership among counties and districts, resulting in a number of additional scholarship and outreach opportunities. For example,

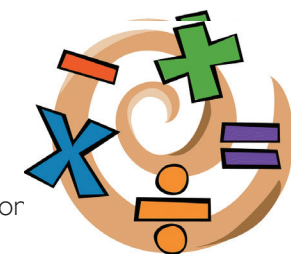
- Three teams of AMP teachers will be presenting at the North Carolina Council of Teachers of Mathematics state conference in October of 2013.
- The modeling working group has successfully received additional funding from a North Carolina Ready for Success grant to support the developing of vertical alignment materials for mathematical modeling content.
- The project staff will present a poster on the work of the AMP project at the U.S. Department of Education MSP Conference in September 2013.

The AMP project is funded by a Mathematics Science Partnership grant. Dr. Tracie McLemore Salinas of the ASU Department of Mathematical Sciences is the project director. She is joined in grant leadership and management by Drs. Kathleen Lynch-Davis and Lisa Poling of the Department of Curriculum and Instruction and Drs. Debbie Crocker, Katie Mawhinney, and Todd Abel of the Department of Mathematical Sciences. The Math and Science Education Center and the ASU Public School Partnership are also partners in the project. Additional information about the project can be found at <http://amp.mathsci.appstate.edu>.

2013 State Math Conference

The State Mathematics Conference will be held on October 31-November 1, 2013 at the Koury Convention Center in Greensboro. Drs. Kathleen Lynch-Davis and Chrystal Dean are the Conference Co-chairs; Sheila Brookshire and Kelly DeLong are the Program Co-chairs; and Karen McPherson is the Program Booklet Editing Chair. There are several new features this year at the math conference. There will be no workshop tickets, but the workshops will have a limit of 40 seats. A conference app will be piloted. Look for information in the program booklet and at the conference about the app. The Product Showcase presentations will be offered again at the back of the Exhibit Hall. The theme for the conference is "Common Core: The Journey Continues." There are over 300 sessions and workshops on a wide variety of topics for teachers and other school personnel at all levels. The keynote

speakers are Doug Clements, Linda Gojak, Teruni Lamberg, Stuart Murphy, and Diane Schaefer. The featured speakers are Jere Confrey and David Burleson. The conference consists of many informative sessions on how to continue implementation of the Common Core State Standards for Mathematics. The sessions include content in the Common Core Standards, ideas for incorporating the Standards for Mathematical Practice into classrooms, information on incorporating technology in the classroom, and assessment



MATHEMATICS EDUCATION LEADERSHIP TRAINING (MELT) PROGRAM

Under the guidance of its new Director, Michael Bossé, the summer 2013 MELT Program experienced one of its most successful years. The six courses that were offered all emphasized the Common Core State Standards for Mathematics (CCSSM). In the first week of Summer Institutes, MELT offered Course 1 of the CCSSM. In the second week, MELT offered Algebra and Functions in the CCSSM and Course 2 of the CCSSM. The third week covered Course 3 of the CCSSM and Mathematical Modeling with Data and Statistics. The last week concluded with Building Mathematical Thinkers through Assessment and Inquiry. Careful consideration was given to just what courses would best meet the needs of teachers as the state implements the CCSSM.

The MELT program aims to build on the success that it experienced under Dr. Debbie Crocker, Interim Director in 2011-2012, and Dr. Bossé in 2012-2013. In addition to the MELT Summer Institutes, this fall MELT is resurrecting the fall and spring workshops to provide graduate coursework for students. Additionally, MELT is currently redesigning and updating a wiki space for MELT participant resources and developing a MELT Facebook page to encourage mathematics education leadership. Thus, MELT is evolving in a number of dimensions to better meet the needs of K-12 teachers in the local and extended region.

MELT is now looking at participant evaluations, communicating with K-12 and university faculty, planning for this year's meeting of its Board of Advisors, and communicating with school administrators in order to complete plans for next year's offerings.

MELT wishes to capitalize on, and build upon, a number of successes: two years of increase in participation in Summer Institutes, the continued support and collaboration with the Mathematics and Science Education Center, this fall's student participation in workshops, and the increase in enthusiasm among faculty and participants. The Mathematics and Science Education Center looks forward to continuing its long collaboration with and support of MELT to help make the program the best that it can be.