

DATES TO REMEMBER

Science Seminars 2014: Sept. 18, 25; Oct. 2, 9, 23; Nov. 13; and **2015:** Apr. 16, 23

October 29, 2014: NCCTM Leadership Seminar, Greensboro, NC

October 30-31, 2014: NCCTM State Mathematics Conference, Greensboro, NC

November 6-7, 2014: NCSTA Annual Professional Development Institute, Winston Salem, NC

December 16, 2014: Region 7 Science Fair, ASU

January 31, 2015: Deadline for SVSM Applications

March 12-15, 2015: NSTA National Conference on Science Education, Chicago, IL

March 21, 2015: NCCTM Western Region Math Fair, ASU

March 31, 2015: NCCTM Math Contest, ASU

April 10-26, 2015: North Carolina Science Festival

April 15-18, 2015: NCTM Annual Meeting & Exposition, Boston, MA

April 22, 2015: ASU STEM Expo

May 8, 2015: NCCTM State Math Fair, Durham, NC



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, Leslie Bradbury and Rachel Wilson. We welcome the increasing number of requests for math presentations and have several math educators who give interesting, informative and entertaining presentations. 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 for many years have conducted the Family Science Nights, but are no longer able to do this; we are trying to identify other science educators who can take on this program. 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. Vicky Isaacs at isaacsve@appstate.edu for further information on these or other programs.



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NOTES FROM THE DIRECTOR

My thanks to everyone who contributed to and helped proofread the newsletter. If you have ideas for articles in math and science education that should be considered for inclusion in future newsletters, please let me know.

The MSEC is always pleased to arrange math and science presentations for visiting school groups and also to visit schools with family math and science nights or other programs in math or science during the day (see the section of the newsletter on Programs for K-12 Students). Bill and Bergitta McGalliard continue to present family math nights and Jack Callahan does a variety of programs in geology. Judy Sink and Lou Moore for many years have done family science nights, but are not able to do these any more. I greatly appreciate the work that Judy and Lou have done in bringing fascinating science programs to the schools; I will attempt to find others to carry on the work that they have done so well for so long.

Phil Johnson

Mathematics and Science Education Center

APPALACHIAN STATE UNIVERSITY

MSEC Newsletter

Fall 2014

Mathematics Education Leadership Training (MELT) Program

Under the guidance of its new Director, Michael Bossé, the 2014 MELT Program offered twelve Summer Institute courses that emphasized the Common Core State Standards for Mathematics (CCSSM). These included: Math Ed Technology, Probability & Statistics, Algebra in the Common Core, Math 1, 2, and 3 of the CCSSM, K-5 Algebra, Grades 6-8 Algebra, K-5 Geometry, 6-8 Geometry, Common Core Math 1-3 Geometry, and Building Mathematical Thinkers through Assessment and Inquiry. This was the greatest number of Summer Institutes offered through MELT. The MELT Program continues to give significant consideration to the political and educational movements within the state in order to best meet the needs of teachers in the state.

In addition to the MELT Summer Institutes, MELT has successfully held fall and spring workshops to provide graduate coursework for students. MELT has also redesigned a wiki space for MELT participant resources and 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 and the number of Summer Institutes offered, the continued support and collaboration with the Mathematics and Science Education Center, 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.

2014-2015 Science Seminars

The important subject of sustainability will be addressed in this year's Science and Sustainability Thursday night science seminars. The seminars are open to everyone, are free, and offer license renewal credits (0.2 per seminar) to teachers. The fall seminars will be in room 124B in the new Reich College of Education Building from 6:00-8:00 p.m. with refreshments at 6:00. Parking on campus is free after 5:00 p.m. with the most convenient parking for the seminars being in the Library Parking Deck near the College of Education Building. The spring seminars are part of the North Carolina Science Festival that will take place during April 10-26, 2015. The spring seminars will be in the same building in room 124C and will also be on the same time schedule, 6:00-8:00 p.m. The schedule for the 2014-2015 series is:

September 18, 2014: Carla Ramsdell (Physics and Astronomy), "Know Watts Cooking – the Physics of Energy-efficient Cooking"

September 25, 2014: Tonya Coffey (Physics and Astronomy), "The Nuts and Bolts of Nuclear Power"

October 2, 2014: Gary Walker (Biology), "Sustainable Approaches to Rock Climbing Indicated by Ecological Investigations of Cliff Systems in the Southern Appalachians"

October 9, 2014: Laura England (Sustainable Development), "In Hot Water: Challenges for Sustaining the Health and Natural Services of Watershed Systems"

October 23, 2014: Dan Caton (Physics and Astronomy), "Sustaining the Night Sky: a Primer on Light Pollution"

November 13, 2014: Sammie Sigmann (Chemistry), "The Environmental Revolution of the 1970s"

April 16, 2015: Brett Taubman (Chemistry), "Fermentation, the Original Sustainable Practice"

April 23, 2015: Rachel Wilson (Curriculum and Instruction), "The Sustainable Student: Educating for Empowerment and the Environment"



KEEP UP WITH MSEC ACTIVITIES

Print copies of the newsletter are distributed to math and science and some other departments on campus and are available at the MSEC for visitors and participants in center programs. You can always read both current and earlier newsletters at www.msec.appstate.edu. If you are a K-12 teacher, we invite you to add your name to one or more of our elementary, middle or high school list serves by sending your e-mail address and which list serve(s) you wish to join to Mrs. Vickey Isaacs at isaacsve@appstate.edu. Once you are on a listserv, please remember to let us know of any address changes. In addition to information in the newsletter and information sent to listserv members, the MSEC website always has the most up-to-date information on center activities.

NORTH CAROLINA SCIENCE FESTIVAL



The fifth annual North Carolina Science Festival will be held April 10-26, 2015. 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. Science Expo Day on the ASU campus will be held on Wednesday, April 22 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 Tracey Tardiff (tardiffa@appstate.edu) to attend Science Expo Day since space is limited. More information will be in the spring newsletter and on our website in the early spring. You may also get information by visiting www.ncsciencefestival.org.

NORTHWEST REGIONAL SCIENCE FAIR

The Reich College of Education is again hosting the Region 7 Science Fair. The Fair will be on Tuesday, December 16, 2014 in the new College of Education Building at ASU. The counties in Region 7 are Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davie, Iredell, Surry, Watauga, Wilkes, and Yadkin. The registration fee is \$10.00 per entry. Mr. Coleman Bailey, colemanbailey@averyschools.net, is chairing the 2014-2015 Northwest Regional Science Fair. Online registration will be available sometime after mid-October at <http://ncsefreg7.sfiab.com>. Refer also to the MSEC website, www.msec.appstate.edu, for updated information concerning the Fair.

NCCTM MATH CONTEST

The Department of Mathematical Sciences at ASU in cooperation with the Math and Science Education Center will again host a North Carolina Council of Teachers of Mathematics Math Contest this spring for Level I and Comprehensive divisions. The contest is scheduled for Tuesday, March 31, 2015. Registration deadline will be March 17, 2015. 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.

RESEARCH EXPERIENCE FOR TEACHERS

The Department of Computer Science at Appalachian State University received funding from the National Science Foundation (NSF) in 2012 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 twelve in-service math/science high school teachers and community college faculty the opportunity 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 goal of our program is for teachers to bring knowledge of computer science and its applications to their classroom and expose their students to computer science. The program supports the 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 two RET programs, in summers 2013 & 2014, were great successes and resulted in twelve excellent research projects and more than sixty course modules that are available for adoption at www.cs.appstate.edu/ret. These modules are created such that teachers can use them to teach a concept in their classrooms. The program provides \$6,000 stipends, free housing & meals during summer, and other supports during the academic year. There is also a one-day paid workshop on Saturday November 15 where participants will be introduced to the program. We encourage interested parties to refer to the web page of the program for details.

SUMMER VENTURES IN SCIENCE AND MATHEMATICS

Summer Ventures celebrated its 30th summer this year with 56 students attending from 43 high schools in 27 counties from across North Carolina. Students had an average of 3.98 unweighted GPA and a 4.58 weighted GPA with 27 students having a 4.0 average. We offered ten 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, 2015 deadline. Please contact Lori Tyler (tylerle@appstate.edu) if you would like to schedule a recruitment visit to your school.

Chilean Mathematics Modeler Visits AppState

Roberto Araya, faculty member at the University of Chile, visited mathematics faculty and teachers in June. Araya met with mathematics faculty to discuss K-12 mathematical modeling and then met with teachers in the Appalachian Mathematics Partnership project to discuss modeling in the elementary and middle grades. Teachers were impressed with the level of engagement and enthusiasm shown by elementary students participating in modeling competitions and picked up some ideas for using modeling in their own classrooms.

Math Modeling Project Creates Modeling Framework

Faculty in the Department of Mathematical Sciences received a mini-grant from NC Ready for Success to investigate mathematical modeling across educational sectors earlier this year. Using the Common Core as a start, faculty and K-12 teachers explored the modeling process, expanding the Common Core diagram of modeling into a useful framework. A professional development day allowed for dialogue across grade levels, revealing the challenges of teaching mathematical modeling. The framework the group created guides teachers through the process of modeling, clarifying the important features of each phase: Formulate, Compute, Interpret, & Validate. More information is available at: <http://amp.mathsci.appstate.edu/node/49>.

NCCTM NEWS



2014 FALL LEADERSHIP SEMINAR

The 2014 Fall Leadership Seminar will be held at the Koury Convention Center on Wednesday, October 29 (the day before the State Mathematics Conference). The theme is "Teaching and Learning for All Students." The keynote speakers will be Dr. Juli K. Dixon and her daughter, Alex Dixon, and Dr. Thomasenia Lott Adams. Dr. Dixon is a professor of Mathematics Education at the University of Central Florida. She has taught at

the elementary, middle, secondary, and post-secondary levels. Dr. Dixon's professional interests relate to developing and deepening teachers' mathematics content knowledge for teaching and communicating and justifying mathematical ideas. Her presentation at the Leadership Seminar will be titled "'Key Words Help,' 'Inquiry Won't Work,' and Other Myths: A Case Study Approach to Best Practices." Dr. Adams is a professor of Mathematics Education at the University of Florida, Gainesville. Her current research interests include the intersection of multiculturalism and the teaching and learning of mathematics and teachers' mathematics content knowledge. Her presentation at the Leadership Seminar will be titled "Building Students' Capacity to Learn." The Leadership Seminar is a great opportunity for teacher leaders and administrators to recharge, network, and continue learning about curriculum, pedagogy, and assessment. Visit the NCCTM web site at ncctm.org to register for the Leadership Seminar.

2014 STATE MATH CONFERENCE

The State Mathematics Conference will be held on October 30-31, 2014 at the Koury Convention Center in Greensboro. Tracey Howell, Tony Thompson, and Ryan Dougherty are the Conference Co-chairs; Lisa Carnell and Amy Travis are the Program Co-chairs; and Karen McPherson is the Program Booklet Editing Chair.

Two new features from last year will be continued this year: There will be no workshop tickets, but the workshops will have a limit of 40 seats. The conference app, Grupio, will be used. Look for information in the program booklet and at the conference about Grupio. The theme for the conference is "Big Ideas for Teaching and Learning Mathematics." 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 Dr. Juli K. Dixon, Dr. Thomasenia Lott Adams, Wade Ellis, Cindy Neuschwander, and David Schwartz. The featured speakers are Dr. Lee Stiff and Jane Kang. The conference consists of many informative sessions on mathematics content, pedagogy, technology, and assessment. This is a wonderful opportunity for teachers and administrators to recharge, network, and continue learning. Visit the NCCTM web site at ncctm.org to register for the Conference. A preliminary program is posted on the web site.

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 2015 Western Region Math Fair will be held on Saturday, March 21 at Plemmons Student Union on the campus of Appalachian State University in Boone, and the NCCTM State Math Fair will be on Friday, May 8, 2015 at the North Carolina School of Science and Mathematics in Durham. The winners of the 2014 State Math Fair may be found at ncctm.org/math_fair.cfm and pictures of the Western Region Math Fair as well as the State Math Fair are posted at mathsci.appstate.edu/events/math-fair. Start working with your students on their projects for the upcoming 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 or contact Dr. Betty B. Long (longbb@appstate.edu). Information on the 2015 fairs and registration forms are posted on the NCCTM website.