

2017 DATES TO REMEMBER

March 4: NCCTM Western Region Mathematics Conference, Owen High School, Black Mountain, NC
March 8: Regional NCCTM Math Contest, Appalachian
March 24: Student Academy of Science, NCSSM, Durham, NC
March 24: NCCTM Spring Leadership Seminar, Greensboro, NC
March 24-25: North Carolina Science and Engineering Fair, Meredith College, Raleigh, NC
March 25: NCCTM Western Region Math Fair, Appalachian
March 30-April 2: NSTA National Conference on Science Education, Los Angeles, CA
April 5-8: NCTM Annual Meeting & Exposition, San Antonio, TX
April 7: STEAM Expo Day, Appalachian
April 7-23: North Carolina Science Festival
April 8: Sumo Bot Competition, Appalachian
April 13: Science Seminar, Appalachian
April 26: STEM West Meeting, Hickory, NC
April 27: NCCTM State Comprehensive Math Contest Finals, NCSSM, Durham, NC

April 28: NCCTM State Math Fair, NCSSM, Durham, NC
April 29: NCCLA Meeting, Raleigh, NC
May 4: NCCTM State Level 1, 2, and 3 Math Contest Regional Finals • Western Region - UNC-Asheville • Central Region - UNC-Greensboro • Eastern Region - Fayetteville State
June 26-30: MELT Week 1
July 1-29: Summer Ventures in Science and Mathematics, Appalachian
July 10-14: MELT Week 2
July 17-21: MELT Week 3
October 18: NCCLA Fall Meeting, Greensboro, NC
October 19-20: NCSTA Professional Development Institute, Greensboro, NC
October 24-25: Sixth Annual Bridging the Gap Conference, Raleigh, NC
November 1: NCCTM Fall Leadership Seminar, Greensboro, NC
November 2-3: NCCTM State Mathematics Conference, Greensboro, NC



PROGRAMS FOR K-12 STUDENTS

The MSEC is always pleased to arrange math or science programs for students visiting campus or to present programs in the schools. For many years, we have been sponsoring Family Math Nights and Family Science Nights in elementary and middle schools. These programs involve students and their parents together exploring interesting facets of mathematics and science. The MSEC is pleased to offer these programs at no cost to the schools. Contact Ms. Leah McManus at mcmanusld@appstate.edu for further information on these or other programs.



Visit us online at

www.msec.appstate.edu

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MSEC Staff:

Phillip Johnson, Director; Betty Long, Assistant Director; Lori Tyler, Summer Ventures in Science and Mathematics Director; Leah McManus, Administrative Assistant

NOTES FROM THE DIRECTOR

We invite you to visit the Math and Science Center Resource Room (Suite 121) and investigate the materials that can be helpful in adding more hands-on activities to your math and science teaching. Most materials are available for checkout for a two-week period, and some may be checked out for longer terms. Madagascar Hissing Cockroaches are available to add to your classroom permanently, or on loan if you do not want to keep them.

The Center is offering a large number of math and science activities on campus this spring and summer. We also have math and science workshops in the schools as well as numerous programs for students both on campus and in the schools. This summer the MELT program is offering twelve institutes spread over three weeks in June and July. The NCDPI Science Summer Institutes will be announced later; we are hopeful that we will again host one of these statewide institutes. We anticipate again hosting the "Inspiring Innovation in Student Research" workshop sponsored by the North Carolina Science and Engineering Fair, Biogen Foundation, and Appalachian State University, probably during July. If your school or LEA would like a workshop in a particular area of science or math, let us know and we will attempt to meet your needs. Check our website for updates on MSEC activities.

My thanks to the contributors to the spring 2017 newsletter: Betty Long, Lori Tyler, Leah McManus, Mike Bossé, Eric Marland, Andy Heckert, Coleman Bailey, Sue Purser, Tracey Tradiff, and Tracie Salinas.

Phil Johnson

Math & Science Education Center

APPALACHIAN STATE UNIVERSITY

MSEC Newsletter

Spring 2017

MATHEMATICS EDUCATION LEADERSHIP TRAINING (MELT) SUMMER INSTITUTE

Through the Mathematics Education Leadership Training Program (MELT), twelve weeklong professional development institutes for K-12 mathematics teachers will be offered on the Appalachian State University campus this summer. The weeks of the institutes are June 26-30, July 10-14, and July 17-21, 2017. The institutes are offered in cooperation with Appalachian State University's Department of Mathematical Sciences and the Mathematics and Science Education Center. All of the institutes are focused on the North Carolina State Standards for Mathematics. The fee for each institute is \$300, with group discounts available. Discounts have been arranged at area hotels for lodging. Additionally, participants will earn either 3 CEUs or 2 graduate credits for each Summer Institute. (If an institute is taken for graduate credit, the usual graduate fees will also apply.) The twelve institutes are:

Week 1: June 26-June 30, 2017

- Math 3 (3rd High School Math)
- Integrating Technology into Mathematics (Grades 6-12)
- Numbers, Operations, & Meaning (Grades K-5)
- Numbers, Operations, & Meaning (Grades 6-8)

Week 2: July 10-14, 2017

- STEM & Leadership (Grades 6-12)
- Math 2 (2nd High School Math)
- Literacy in Mathematics (Grades K-8)
- Algebraic Thinking, Algebra, & Functions (Grades K-5)
- Algebraic Thinking, Algebra & Functions (Grades 6-8)

Week 3: July 17-21, 2017

- Math 1 (1st High School Math)
- Math 4 (4th High School Math)
- Formative Assessment & Learning (Grades 6-12)
- Fractions, Ratios, Proportions & Geometry (Grades K-5)
- Fractions, Ratios, Proportions & Geometry (Grades 6-8)

Registration for all institutes is now open. For a registration form and descriptions of the institutes, visit the MELT website, <http://melt.appstate.edu>, and select the link for Summer Institutes. If you have questions about 2017 MELT institutes, please contact Dr. Mike Bossé, Director of MELT, at 828-262-2862 or bossemj@appstate.edu.

SPRING SCIENCE SEMINAR

The final seminar of the 2016-2017 series is part of this year's North Carolina Science Festival. All seminars are open to everyone, are free, and offer license renewal credits (0.2 per seminar) to teachers. The seminars are held in room 124C in the Reich College of Education Building from 6:30-8:00 p.m. with refreshments at 6:00. The remaining seminar in this year's series:

April 13, 2017: Andy Heckert (Geology), "Dinosaurs and STEM: Using 'Terrible Lizards' to Teach Paleontology, Geology, Biology and More"

This year's theme, "Increasing Scientific Literacy," has been a popular one with seminars averaging 34 participants in the fall. The seminars have explored numerous themes over the years. We are considering themes for next year; if you have ideas of themes that you would like to see explored, please share them with me at johnsnpe@appstate.edu. Once they are finalized, next season's seminars will be announced on our website and will start in September 2017.

KEEP UP WITH MSEC ACTIVITIES



We are pleased with the continuing popularity of our math and science programs for schools. This year has seen an increase in requests for math and science programs both on and off campus, and we have been able to accommodate most of them. Family Math Night with Dr. and Mrs. Bill McGalliard remains one of our most popular programs in the schools. The McGalliards visit area elementary and middle schools and involve families working together on activities that emphasize problem solving, logical thinking, numbers and operations, geometry, and spatial thinking and patterns. Participants enjoy the math puzzles and games and go away with a renewed interest and excitement about mathematics. Other programs that we can schedule for your campus include a variety of topics in Geology for Grades 3-9 and Family Science Night for elementary and middle schools. Unfortunately, we are not able to offer as many family science nights as we have in the past due to lack of personnel, but we are working to get more science educators involved in the program. If you are interested in exploring programs in areas of math or science not mentioned here, let us know, and we will explore putting together a program to meet your needs. You may keep up with math and science activities taking place at Appalachian on our website, www.msec.appstate.edu, and at <http://stem.appstate.edu>. Print copies of the newsletter are widely distributed, and the newsletter is also available on the MSEC website. If you are a K-12 teacher, we encourage you to add your name to our Google Group (formerly listserv) by notifying Leah McManus at mcmanusld@appstate.edu. Once you are in the Group, please remember to let us know of any address changes.



AIDS FOR HANDS-ON TEACHING

The MSEC has a number of items that can aid hands-on teaching in math and science. Items available for two-week checkout include math manipulatives, science kits and models, and print materials. There are

also a number of science kits that are available for a more extended check-out period; ask Leah about these when you visit the Math/Science Center. Madagascar Hissing Cockroaches are also available for classrooms. You are invited to come in for a visit and see what we have that could be of use to you in incorporating more hands-on activities in your math and science teaching.

NORTH CAROLINA SCIENCE FESTIVAL,



April 7-23, 2017

A one-day Appalachian STEAM (Science, Technology, Engineering, Arts and Mathematics) Expo will be held on campus

on Friday, April 7 as part of the seventh annual North Carolina Science Festival. The Expo event will be in the Holmes Convocation Center from 9:00 a.m. - 2:00 p.m. with other stand-alone events in Plemmons Student Union and other places on campus. The STEAM Expo is on a weekday so that schools can come to campus for a field trip and have their students experience some awesome science and math activities. Approximately 2000 students annually participate in Appalachian's Expo activities. This year's MSEC Expo booth will have a number of displays along with science activities led by Judy Sink and Lou Moore, science educators who for many years have done the popular Center-sponsored Family Science Nights. For more information about STEAM Expo and other activities taking place at Appalachian State University during the festival, visit <http://ncsciencefestival.appstate.edu>. To book your class or homeschool group for the Expo, contact Tracey Tardiff (tardiff@appstate.edu).

SUMMER VENTURES IN SCIENCE AND MATHEMATICS

Summer Ventures in Science and Mathematics 2017 applications were due January 15, 2017 for the programs to be held



at Appalachian State University, East Carolina University, and The University of North Carolina at Charlotte. The program is down to only three campuses this summer and we continue to have many eligible students apply. The program is free and high school students apply during their sophomore or junior years. Summer Ventures is coordinated through the North Carolina School of Science and Mathematics, and students study and conduct research for four weeks on a university campus. Lori Tyler, Appalachian Director, is available for school visits to share recruitment/program information. Please contact Lori (tylerle@appstate.edu) or visit <http://www.ncssm.edu/summerventures>.

NCSSM WORKING WITH EDUCATORS & SCHOOLS



NCSSM

Do you know that there are many resources available to teachers provided by the North Carolina School of Science and Mathematics (NCSSM)? NCSSM hosts many professional development initiatives including a blog, "Learning Innovations," where educators can share teaching ideas, lesson plans, and materials. Teachers can

bring students to conferences and events on the NCSSM campus throughout the year. In addition to students applying to either the NCSSM residential or online programs, they can also participate in K-9 STEM enrichments as well as Interactive Video Conferencing courses, which are tuition-free, and offer opportunities for students to take advanced coursework that may not be available at their local

school. The 2017-2018 course catalog is now available. For further information, explore <https://www.ncssm.edu/for-educators> and <https://www.ncssm.edu/ivc-courses>.

NCSSM also offers several summer camps and online courses for students, including Summer Accelerator and Step Up to STEM, and coordinates Summer Ventures in Science & Mathematics.

ACADEMIC SUMMER CAMPS AT APPALACHIAN STATE UNIVERSITY

Many academic camps for students are offered at Appalachian each summer. Be sure to check out the Office of Conferences and Camp Services at <http://conferences-camps.appstate.edu/youth-camps>. The Future Doctors and Scientists Camp is being supported by the MSEC, and we encourage all students in grades 9-12 who are interested in health science and/or research professions to apply. Dates for 2017 are July 5-28 and will include four days of intensive clinical instruction using a program called The Apprentice Doctor, and the remainder of the program will involve research in a biomedical science laboratory. Other academic camps for students include two sessions of Anatomy & Physiology, Forensic Anthropology, and Forensic Science. Multiple sessions of the Future Engineers Camp will be held at the NC Center for Engineering Technologies in Hickory. Please share these summer academic opportunities with students.



SUMO BOTS RETURN TO THE NORTH



CAROLINA SCIENCE FESTIVAL

Saturday, April 8 will see more SumoBots. After breaking all expectations last year with over 100 teams registering, Appalachian State will again host the event. Although divisions will depend on registration numbers, expect several youth categories and at least one category for adults. We encourage parent-child teams, school teams, and collegiate participation. This is a spectator-friendly event, so join with your own entry or come by and watch! If you want ideas on how

to get started, contact the Math and Science Education Center, which has a limited number of robots available for check out in the MSEC Resource Room. For more information see <http://www.appstate.edu/marlandes/robots/sumosumo.html>

GEOLOGY AND ART DEPARTMENTS CREATE NEW EXHIBIT

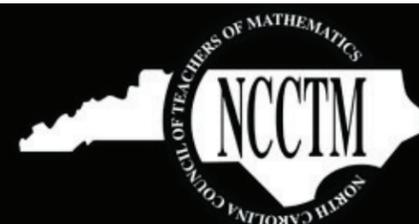
Teachers and students who visit the Appalachian Geology Museum and Fred Webb, Jr. Outdoor Geology Laboratory will soon have a surprise – a life-size model of *Gorgetosuchus pekinensis*, an extinct fossil reptile that lived alongside early dinosaurs 230 million years ago. Geology Professor Andy Heckert led a research team that discovered armor plates of the reptile, and a conversation with exhibit designers and the Appalachian Art Department resulted in the idea for a life-size model of the animal. Art students used a variety of digital technologies to create models for reference and will ultimately create the model that is used for bronze casting. Pending funding, the bronze reptile will find a home in the Outdoor Geology Laboratory in a special exhibit made up of appropriate looking plants and rocks from six states that tell the geologic history of the Appalachians. The idea for the bronze reptile was the brainchild of Geology Lecturer Lauren Waterworth, who is seeking funding for the project. Visitors to campus can contact the McKinney Geology Teaching Museum (Dr. Andy Heckert, heckertab@appstate.edu or 828-262-7609) for more information or to plan a visit once the exhibit is installed.



NORTHWEST REGIONAL SCIENCE FAIR

The Mathematics and Science Education Center (MSEC) hosted the Region 7 Science and Engineering Fair in the Reich College of Education Building on December 13, 2016. With 317 projects and more than 500 participants from 72 different schools, the Region 7 Fair will most likely again be the largest regional fair in the state (ours is the first regional Fair). The counties comprising Region 7 are Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davie, Iredell, Surry, Watauga, Wilkes, and Yadkin. There was a Region 7 record high of 48 projects entered at the high school level. Thirty seven of the projects (8 elementary, 14 middle school and 15 high school) merited advancement to the State Science and Engineering Fair to be held at Meredith College in Raleigh on March 24-25, 2017. There were 94 projects presented from 16 schools in 9 counties in the afternoon North Carolina Student Academy of Science (Grades 6-12) research paper competition; forty-five of these will advance to the state level of competition at the North Carolina School of Science and Mathematics in Durham on March 24, 2017. Under the able direction of

Avery County High School science teacher Coleman Bailey and his retired colleague Sue Purser; a large number of school personnel worked to assure the success of the fair. Judges consisted of teachers, upper-level university science students, professors, and scientists and engineers from industry. Between sessions, science education instructor Jeff Goodman entertained students, parents and others with an awe-inspiring science show. Appreciation is expressed to the large number of volunteers who helped make this year's event a resounding success. Congratulations to the participants who will advance to the state level of competition and commendations to all who prepared such good projects for the regional competition. The list of North Carolina Fair winners chosen from the ten regional science and engineering fair winners will be posted at <http://www.ncsciencefair.org>



NCCTM News



NCCTM MATH CONTEST

The Department of Mathematical Sciences and the MSEC will host a regional NCCTM Math Contest at Appalachian State University for Level I and Comprehensive on Wednesday, March 8, 2017. Registration and information is on the Math Contest website: <http://mathsci.appstate.edu/news-events/math-contest>. Registration cost is \$10 per student and includes a T-shirt. Teachers can participate in a professional development session led by a Mathematical Sciences faculty member and earn 0.2 license renewal credit through the MSEC. Deadline to register is February 17, 2017. Contact Lori Tyler (tylerle@appstate.edu) or John Sevier (sevierjn@appstate.edu) with any questions.

The ASU Math Contest has been held since 1979. Check out an article recently published by Jeff Cloninger that highlights the Math Contest: Appalachian to host qualifying event for NCCTM State Mathematics Contest at <http://www.news.appstate.edu/2017/02/01/mathematics-contest/>

NCCTM Spring Leadership Seminar

The NCCTM Spring Leadership Seminar will be held on March 24 at the Greensboro-High Point Marriott Airport Hotel. The theme of the seminar is "What's Your Message?" The speakers will be Gary Martin, individuals from the North Carolina Collaborative for Mathematics Learning and the mathematics consultants from the North Carolina Department of Public Instruction. Dr. Martin is currently the Emily R. and Gerald S. Leischuck Endowed Professor in the Department of Curriculum and Teaching at Auburn University and is the co-director of the Mathematics Teacher Education Partnership. Martin has served on numerous national initiatives and has an extensive record of publications and presentations, but he most values his work with teachers of mathematics. The focus of this leadership seminar will be on providing leaders in mathematics education with ways of communicating more effectively the intent and practices of mathematics education in North Carolina to teachers, administrators, parents, elected officials, business leaders, stakeholders, concerned citizens, etc. The seminar will address the need to have strong messages of success to share with key stakeholders in a proactive manner. The registration fee for the seminar is \$65 for NCCTM members, and you can register at ncctm.org.

NCCTM Western Region Math Fair

The NCCTM Western Region Math Fair will be held on Saturday, March 25, 2017, in the Plemmons Student Union at Appalachian State University for students in Grades K-12. The math fair is coordinated by Sumer Inman at North Buncombe High School and Stefanie Buckner in Buncombe County Schools. Fifty ASU pre-service teachers and other volunteers will assist them. We encourage K-12 teachers to enter students in the math fair. It is a wonderful experience that enables students to work on a math project as well as gain experience communicating mathematics. The students who place First, Second, Third, or receive Honorable Mention will be invited to participate in the NCCTM State Math Fair to be held on Friday, April 28, 2017, at the North Carolina School of Science and Mathematics in Durham. Visit <http://tinyurl.com/ncctmwestmath> for more information on the Western Region Math Fair and to fill out the online registration form located on the Participant or Parent/Teacher page. The registration fee is \$10 per student, and payment must be postmarked by March 3, 2017.

2017 NCCTM Fall Leadership Seminar and Annual State Mathematics Conference

The Fall Leadership Seminar will be on November 1 at the Koury Convention Center in Greensboro. The State Mathematics Conference will be held on November 2-3 at the Koury Convention Center in Greensboro. The theme for the conference is "Developing a Positive Mathematical Identity," and the keynote speakers will be Jennifer Bay Williams, Peg Smith, Jennifer Wilson, and others. Go to ncctm.org for more details as they become available.