AUBURN UNIVERSITY
COLLEGE OF SCIENCES AND MATHEMATICS

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Engaging More Community Connections

Volume 9: Issue 3

COSAM Outreach Newsletter Summer Round-Up 2017

Inside

Current Events & Programs:

Eclipse Across America @ Auburn University

Monday, August 21, 2017
10am – 3pm

Join us at Auburn University for a safe, fun, and informative way to view the upcoming eclipse! Auburn University's 2017 Eclipse Across America event will promote eclipse safety and build community through the sciences and arts. Approved safety glasses will be distributed while supplies last. There will be materials on hand to make pinhole cameras, as well as group viewing stations. Participants can also make art in response to the eclipse, including shadow drawings that observe the sun's path, and sundials for recording the timing of the eclipse. The event is open to students, faculty, and the community.

For more information including a schedule of the eclipse day and viewing locations, please visit http://aub.ie/eclipse . You can also visit the facebook event at https://www.facebook.com/events/257545464764387/.

Student Programs

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COSAM Outreach has been busy this summer getting students engaged in science! Here's a quick round-up of our student programs:

Science Matters

Science Matters is a summer enrichment program for elementary students in rising grades 1-8 offering youngsters a supercharged science experience. The program allows participants to explore the world of science through real experiments, technology and art projects, and hands-on, make-n-take activities. This summer we hosted a total of 174 young scientists over 5 weeks and 17 courses! For more info, visit us online at http://auburn.edu/cosam/sciencematters .

Outreach Calendar

August

- 21 Eclipse Across America
- 29 August Science Café

September

- 14 War Eagle BEST Kickoff
- 22 Destination STEM
- 28 September Science Pub

Summer Science Institute (SSI)

SSI is a summer program for outstanding rising 11th and 12th graders who are interested in science and mathematics. Students engage in real-world applications of science, perform experiments using cutting edge research equipment, and partner with COSAM researchers to gain lab skills not taught in high school. This summer we hosted 18 brilliant students over a week-long session! For more info, visit us online at http://auburn.edu/cosam/ssi .

Drone Camp

Designed by the Southeastern Center of Robotics Education (SCORE), Drone Camp is a week-long camp for rising 6th-9th grade students interested in learning about the world of quadcopters, drones, and UAVs. Participants learned about the basics of flight, the anatomy of a drone, different uses of drones in research and industry, as well as how to program and pilot their drone to fly through an obstacle course designed by the participants. This summer we piloted 13 new drone aviators through the course at Auburn University and 14 more in Birmingham in partnership with the Southern Museum of Flight! For more information, visit http://scoreau.org .

Summer SCORE Camp

At the Summer SCORE Camp, students learned about the basics of robotics, the anatomy of a robot, and the different uses of robots in research and industry. They participated in make-and-take robotics activities, and learned how to program and drive their robots in a variety of challenges. This summer, the Southeastern Center of Robotics Education (SCORE) at AU trained 51 students (grades 3-6) in this fun camp! For more information, visit http://scoreau.org .

Chaotic Robotics:

Working in teams, students engaged in real-world design scenarios that culminated in a friendly competition on the last day of camp. Students were introduced to the engineering design process and gained hands-on experience programming and building robots using VEX robotics kits. This summer, the Southeastern Center of Robotics Education (SCORE) at AU trained 26 robotics designers (grades 6-9) in this fun camp! For more information, visit http://scoreau.org .

The AU Science Café & Pub

Join us **each month** for a night of science, good drinks, tasty sweets, and great conversations! At the AU Science Café & Pub, you'll have the opportunity to sit down and talk about new and exciting science and technology with scientists in our region, all the while relaxing in a great local food and drink venue. The event typically alternates between a "pub" version at Red Clay Brewery and a "café" version at Mama Mocha's Coffee Emporium.

The event is **FREE**, open to the public, and is **family-friendly** whether hosted at Mama Mocha's or Red Clay Brewery. **No science background is required**, and no question is too silly to ask! For more info, including parking directions and the event schedule, visit us online at http://auburn.edu/cosam/sciencecafe or contact Josh King at josh.king@auburn.edu.

Next Science Café/Pub Dates:

August 29th – "Is Orange Really the New Black?" by Dr. Kelli Thompson @ Mama Mocha's
September 28th –Dr. Matthew Grilliot @ Red Clay Brewery (in partnership with Montgomery's "Professors in Pubs")

Teacher Programs

Our summer also had plenty of opportunities to equip teachers with further skills in the classroom! Here's a quick snapshot of the 107 contact days of impact we've had:

AP Summer Institute

The AP® Summer Institute Workshop is designed to aid the professional development of teachers, counselors, and administrators who are involved with Advanced Placement (AP®) courses. For more info, visit the AP Summer Institute online at http://auburn.edu/apsi.

- *Teachers Trained:* 111
- *Contact Days:* 12
- *Courses:* AP Computer Science, Biology, Chemistry, US Government

FLIP

The FLIP (Flipped Learning and Instruction in Physics) project supports teachers in developing the necessary skills, knowledge and beliefs to effectively implement research based inquiry instruction using flipped/inverted approaches in high school physics courses. For more info, contact Mary Lou Ewald at ewaldml@auburn.edu .

- *Teachers Trained:* 8
- *Contact Days:* 1
- *Courses:* 1 day training workshop as part of a 2-year professional development program

Project Lead The Way (PLTW)

Each summer, Auburn University offers Core Training for Engineering, Biomedical Science, and Gateway programs to train participants to become Project Lead The Way certified teachers. For more info, visit us online at http://auburn.edu/pltw .

- *Teachers Trained:* 120
- *Contact Days:* 60
- *Courses:* 8 courses with topics such as "Principles of Engineering," "Human Body Systems," and more.
- Supplemental training courses were also offered training 21 teachers on "Design and Modeling" and VEX Robotics

Pave The Way

The 2017 Pave The Way workshop offered ongoing support of teacher growth in Science, Technology, Engineering, and Mathematics content and pedagogy at the 3rd, 4th, and 5th grade levels by applying research-based practices and emphasizing project-based learning. For more info, contact Kristen Bond at Kristen.bond@auburn.edu.

- *Teachers Trained:* 7
- *Contact Days:* 2
- *Courses:* Various STEM project-based learning techniques utilizing the Dash & Dot robotics system.

Science in Motion

The goals of Science in Motion are to provide high-tech laboratory experiences for high school students and effective professional development for teachers, each summer offering teacher workshops on the implementation of laboratory technology and procedures. For more info, visit us online http://cws.auburn.edu/asim.

- *Teachers Trained:* 51
- *Contact Days:* 24
- *Courses:* Physics, Biology, Physical Science, and Chemistry laboratory activities and technology

STEM-IQ

The objective of STEM-IQ is to advance teachers' motivation and ability to lead science fair projects. It also tests the hypothesis that improving science fair participation will enhance teachers' ability to lead scientific inquiry and enhance the quality and diversity of the STEM pipeline in Alabama. For more info, visit us online at http://auburn.edu/cosam/stemiq.

- *Teachers Trained:* 26
- *Contact Days:* 7
- *Courses:* A 2-day training focused on running a science fair, and a 5-day training on overviewing science fair and inquiry/project-based learning

BEST Robotics Training

The Southeastern Center of Robotics Education (SCORE) at AU provided training at Shelton State Community College for teachers and students interested in participating in the BEST robotics program. For more info on SCORE, visit http://scoreau.org. For more information on BEST, visit http://bestinc.org.

- *Trained: Mix of 24 students and teachers*
- *Contact Days: 1*
- *Courses:* A workshop on the basics of involvement in the BEST Robotics program

Activity of the Issue

Predict the Corona (2017 Eclipse)

If you're hunting for activities to do with your young students or classroom related to the eclipse, NASA has collected a number of them here:

- Activities: https://eclipse2017.nasa.gov/activities
- Activity Guide: https://eclipse2017.nasa.gov/sites/default/files/NASA_Eclipse_Activity_Guide.pdf
- Educational Resources: https://eclipse2017.nasa.gov/education

Selected here is one on predicting the shape of the eclipse corona, found here: https://eclipse2017.nasa.gov/predict-corona-art-project

Materials:

- Dark (blue or black) cardstock paper (construction paper doesn't work well)
- White chalk
- Pencil, scissors, and tape
- Circle templates (cups, cut circles, etc.)

What to do:

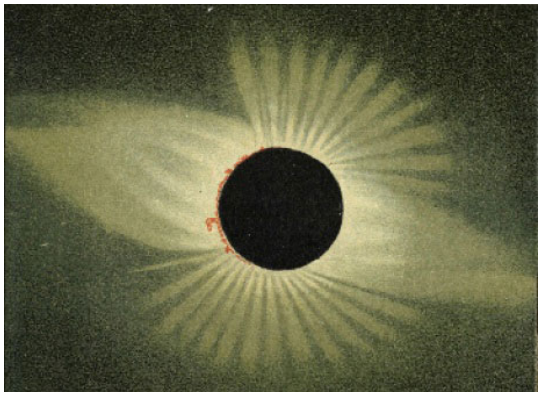
1. Describe the **corona** of the sun and its general appearance to your students. Have students predict in their mind what it will look like during the 2017 eclipse. The next steps here have them draw that prediction:

2. Using your circle template, draw a thick circle using chalk. Go 2 or 3 times around the template to make it thick (it doesn't need to be neat).

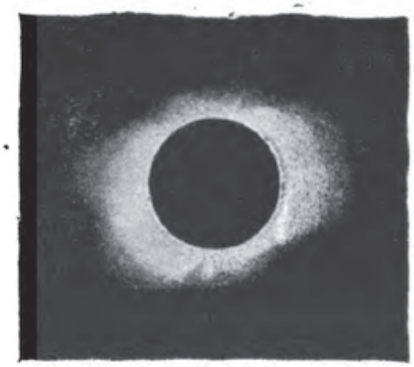
3. Still holding the circle template in place over the center of the circle, smudge the chalk outline outwards away from the circle to "draw" your prediction of the corona.

4. When you're done smudging, remove the circle template and add words, pictures, or fun designs.

5. Go see the 2017 Eclipse using proper safety equipment! Compare your drawing to what you see. Safety info here: https://www.nasa.gov/content/eye-safety-during-a-total-solar-eclipse



May, 1878 corona



22 December 1889 (Perry)
(*From photographs*)

Questions to Consider

1. Does the visible shape of the sun's corona change?

Yes! Two examples from previous eclipses are shown above. Notice how one is a smooth gradient while the other forms noticeable rays.

2. Why would the corona shape change?

The corona is the aura of plasma that surrounds the sun. The sun itself is a very active body, with the plasma on its surface churning and moving along with the changing forces at the sun's surface.

2. Are there any patterns to the shape change?

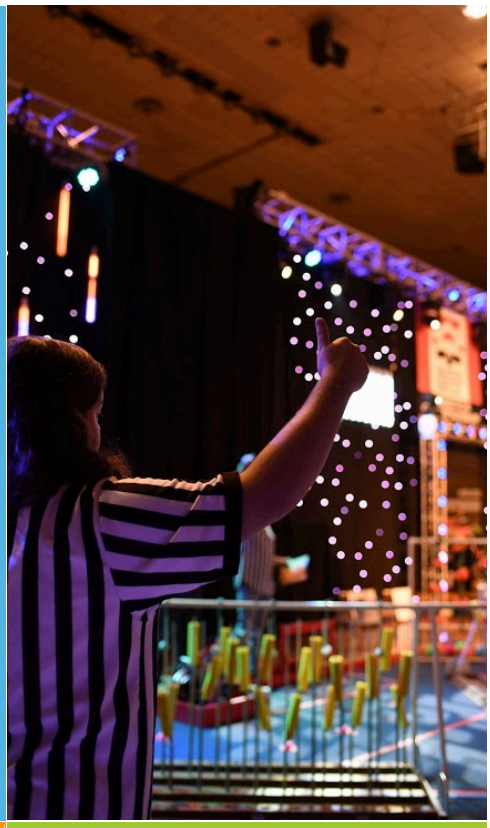
Interestingly, the corona does seem to change along with the sunspot cycle. See this NASA page for some graphs of this cycle: https://go.nasa.gov/2rNv8cX. Would knowing this have changed your original prediction?

BEST is coming!

War Eagle BEST is the local BEST Robotics hub for schools located in East Alabama and West Georgia. The program is co-hosted by the College of Sciences and Mathematics and the Samuel Ginn College of Engineering at Auburn University. Each fall ~25 local schools design, build, and program a robot from a kit of raw materials through implementation of the Engineering Design Process. The six-week-long program culminates in a one-day, sports-like competition.

Kickoff for War Eagle BEST occurs September 14th. Teams should be getting ready for an awesome robotics challenge this Fall!

For further information, visit http://wareaglebest.org or contact Kristen Bond at Kristen.Bond@auburn.edu .



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131 Sciences Center Classrooms Bldg.
315 Roosevelt Concourse
Auburn University, AL 36849

auburn.edu/cosam/outreach
facebook.com/cosamoutreach
twitter.com/cosamoutreach
instagram.com/cosamoutreach

Phone: 334-844-5745
Fax: 334-844-5740

For more information about any of our programs visit:

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