

VAST's Vision:

Excellence in Science Education
Through Innovation

ISSN 1945-7405

VAST.Org

Check the web for news, conference updates, registration, and forms.

The Science Educator

Winter 2019

A Publication of VAST, The Virginia Association of Science Teachers

Vol. 67, No.3

One of Our Own: First Lady of Virginia Pamela Northam



Mrs. Northam clapping for a quiz winner.





Mrs. Northam taking notes.

Mrs. Northam addressing the audience.

On the closing day of the 2018 Annual Virginia Association of Science Teacher (VAST) Professional Development Institute (PDI), Pamela Northam, First Lady of Virginia was escorted into the hotel by her staff. 2018 VAST President Jackie McDonnough greeted her and accompanied her to the general session room filled with VAST members eagerly awaiting to hear her speak.

As a former biology teacher and now an advocate in Virginia for early education and the environment, attendance at VAST was a natural for Mrs. Northam. It was clear once she started to speak to the capacity crowd she knew her audience. She spoke to the VAST membership regarding what was most important to them—their students' success. Interspersed within her talk were quizzes for the audience. She would call out for a volunteer to identify who said a particular quote regarding education, such as "Who said, 'Education is the most powerful weapon which you can use to change the world (Nelson Mandela)'?" As members of the audience recognized the

quotes, the first one to raise their hand and provide the correct answer received a "You're correct" followed by an invitation from Mrs. Northam to come to the stage and receive a bag of goodies. The audience was delighted and they also were spellbound as she spoke to those issues closest to her heart:

- Promoting Innovation and Diversity in STEM Education
- Elevating Environmental Education
- Preparing Virginia Children for success from Cradle to Career

Mrs. Northam remained to hear the general session speaker Dr. Okhee Lee from New York University and she took notes on the speaker's presentation.

To learn more about the initiatives of Mrs. Northam in STEM education in Virginia, please visit https://www.firstla-dy.virginia.gov. Be sure to view the pictures of her staff.

From the Executive Director



Happy New Years!

It's the beginning of the New Year and one takes a step back to reflect and uses that to move forward into the new year. Honestly, I try this idea every year and it fails. I say... heh, I'm going to exercise. I either quit within the week or keep telling myself I'll start fresh again on Sunday. So this year...well I am going to be realistic.

I'm going to commit to me for my sanity in the classroom. If I can get that straight then all other things like exercise, time for myself and peace of mind should fall in place. Right?

To do this, I need your help! I need you to help me make VAST the best it can be. What do you need? What do you want? Ask and let's see if we can make it happen. We are all on the same team so let's pull together and all prosper in the new year.

Susan Booth, EDS EXECUTIVE DIRECTOR



In December and January the National Science Teachers Association will be holding elections for its Board of Directors and Council. If you are an NSTA member, watch for your ballot by email. Visit NSTA's Website to find out more about the nominees. Search your email for: "Vote Now in NSTA's Election!" for your ballot.

Menu

Click on the article name to go directly. Click "Menu" to return to this page.

- 1. Front Page, First Lady of Virginia, Mrs. Northum
- 2. Executive Director's Message; Menu
- 3. President's Page
- 4. PDI Sponsors
- 5. Preservice Teachers Enjoy Pizza & Freebies at PDI
- 6. PDI Photos
- 7. 2018 Presidential Awards for Excellence
- 8. VAST RISE Awards 2018; RISE Awards & Mini-grants
- 9. Virginia OBTA Winner, Apply to OBTA 2019
- 10. Kip Community partners; Sterling Awardees
- 12. VDEQ Landfill Model
- 13. Virginia Start-up: PurSolution

- 14. Project Plant It
- 15. JVSE (Journal) Update
- 16. VAST Website; Students Apply Biology Olympiad
- 17. CLUSTER Telescopes for Educators
- 18. Virginia Lottery Winners
- 19. Engaging Secondary Students in STEM Research
- 20. VJAS Needs Your STEM Expertise
- 21. January Evening Eclipse & Morning Conjunctions
- 22-23. PDI in Pictures
- 25. VAST Corporate Benefactors and Members
- 26. VAST Leadership, Social media, & VAST Mission

P 2. Men

From the desk of the VAST President



Tom Fitzpatrick VAST President 2019



We can look back on a great year in 2018 for the Virginia Association of Science Teachers! We are 1870 members strong. Our 2018 PDI theme **Diversify and Strengthen Science for All** brought together over 700 members for many insightful and transformational breakout sessions and keynote speeches. We went back to our classrooms refreshed and invigorated for the next steps.

Please start making plans now to attend the VAST 2019 Professional Development Institute in Roanoke, VA on November 14, 15, and 16, 2019. Our theme, **STEM Starts with Science**, really encompasses the idea that Technology, Engineering, and Mathematics have their roots in science. Isaac Newton's work in science over 200 years ago established the principles that allowed engineers to create rockets to reach the moon and Mars. All of the parts of STEM work hand in hand to be successful. Mathematics is required to calculate speed or acceleration. The invention of technology like the microscope allowed biologists to develop the cell theory. Our scientific understanding of germ theory allowed scientists and other medical professionals to understand and fight diseases. This fall at the PDI we will delve into how all parts of STEM support each other and what our role as teachers is in preparing our students for careers in fields only dreamed of.

Please visit the VAST website and log into the members section. There you will find the fall 2018 edition of the *Journal of Virginia Science Education* as well as past editions, available only to members. You will also find our newsletter, *The Science Educator* and our members forum.

Please plan on making 2019 a year in which you actively take part in VAST and in Science education in the Commonwealth. I look forward to working with you. Please feel free to email me at president@vast.org to share your thoughts.

Tom Fitzpatrick

VAST President, 2019

P 3. Menu

PDI Sponsors: Support Science Education



The 2018 VAST PDI is brought to you by the hard work of many people and the generous contributions of individuals and organizations. Our sponsors contribute to the success of VAST by their presence, financial support, and resources.

The VAST Board of Directors would like to recognize the organizations listed below for their generous donations and contributions.

































Don Cottingham Retired VAST President



Thank You!



Please take a few moments to offer a special "Thank You!" to the representatives of each of these organizations! Additionally, please extend a special thanks to the people who make up the VAST Board of Directors. This group of individuals makes VAST a reality and gives many hours to develop and makes the VAST PDI happen each year.

P 4.

Preservice Teachers Enjoy Pizza and Freebies, Learn About All VAST Has to Offer!



Preservice teachers enjoy pizza and an ice breaker.

On Friday November 16, at the 2018 VAST PDI in Williamsburg, approximately 50 preservice teachers from K-12 teacher preparation programs all over Virginia gathered for socializing, networking, and to enjoy a pizza lunch.

Among the colleges and universities represented by students were JMU, VCU, UVa, Longwood, and William and Mary. The preservice teachers heard from VAST preservice teacher representative Alex Shafer (JMU, '19) and VAST Universities and Colleges board member Jennifer Maeng



VAST Board members Alex Schafer (left) and Jennifer Maeng (right) thank the Explore Learning representative for their sponsorship of the preservice session.

(UVa) describe what to expect at VAST, sessions not to be missed, how to navigate the exhibit hall, and how VAST supports preservice and beginning teachers. In addition, Myra Thayer (VDOE) and Lisa Lawrence (VIMS) spoke with attendees about the supports preservice teachers have from these state organizations.

The session was sponsored by ExploreLearning TM, which donated two 1-year subscriptions to EL Gizmos and Flinn Scientific, which donated two \$25 gift certificates as door prizes.



Preservice teachers from programs all over VA attended the preservice teacher session at the 2018 VAST PDI!

P 5. Menu



2018 Presidential Awards for Excellence in Mathematics and Science Teaching: Elementary Science State Finalists

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) Program was established in 1983 by The White House and is sponsored by the National Science Foundation (NSF). The program identifies outstanding mathematics and science teachers, kindergarten through 12th grade, in each state and the four U.S. jurisdictions. These teachers serve as models for their colleagues and will be leaders in the improvement of science and mathematics education. The competition alternates each year between teachers of grades K-6 and teachers of grades 7-12.

On June 25, 2018, the 2016 Science PAEMST finalist for Virginia, was announced.

Congratulations to the 2016 Virginia State Winner for Science: Ms. Julia Young Deep Creek Elementary School, Chesapeake, Virginia

The spring of 2018 the Virginia PAEMST finalists were announced. One of the finalists will be chosen to be named as the winner. Each state's Presidential Awardee will receive a \$10,000 award from the National Science Foundation. Each PAEMST Awardee will also be invited to attend, along with a guest, recognition events in Washington, D.C. during a week long recognition. These events will include an award ceremony, a Presidential Citation, meetings with leaders in government and education, sessions to share ideas and teaching experiences, and receptions and banquets to honor recipients. Ms. Young was not at the November PDI.

Congratulations to the 2018 Virginia State <u>Finalists</u> for Science, who were presented plaques at the November PDI.

Ms. Rebecca Schnekser, Cape Henry Collegiate, Virginia Beach Ms. LoriAnn Pawlik, Penn Elementary School, Woodbridge



Congratulations also to the 2017 Virginia State <u>Finalist</u>, Ms. Tara Brunyansky, James River High School, Midlothian, She was also presented a plaque by Anne Peterson at the November PDI.

For more information about the PAEMST program or to nominate a teacher, please visit www.paemst.org or contact Anne Petersen (anne.petersen@doe.virginia.gov).

P 7. Menu

VAST RISE Awards 2018: Presented by Sandy Pace

Congratulations to our Outstanding Educators

Outstanding Elementary Teacher: Steve Martin, Leesburg Elementary, **Loudoun County Public Schools**

Outstanding Middle School Teacher: Katherine Ewalt, Colonial Heights M.S., **Colonial Heights Public Schools**

Outstanding Environmental Science Teacher: Darlene Mojado-Ligan, Greensville Co. H.S. **Greensville County Public Schools**

Outstanding Chemistry Teacher: Loubna Elhelu, **Palm Tree Private School**

Outstanding At- Risk K-12 Teacher: (no photo) Kristin Andersen, **Loudoun County Detention Center**

Outstanding Informal Science Educator: Rachel Clark. Virginia Aquarium and Marine Science Center



Steve Martin



Darlene Mojado-Ligan



Katherine Ewalt



Loubna Elhelu



Rachel Clark

VAST Awards and Mini-grants Applications for 2019

At our recent PDI, I was honored to present the VAST Rise awards to six of our members. Prior to the PDI, three other members were awarded mini-grants for their ongoing or start-up programs. The Award committee members are excited to work with your submissions.

As 2019 begins, start now to think about a colleague to nominate for an award or to apply for a min-grant for your program.

Do not wait until the late summer deadline when all of us are away from our schools. I know that someone that works with you is deserving of recognition. I also know that your teaching program could use some seed money to start a project or funding to refine what you have in place.



Sandy Pace at the Podium at the PDI

Go to VAST.org to locate the necessary forms and guidelines to submit a nomination or mini-grant proposal.

Sandy Pace
Awards chairman

P 8.

2018 VIRGINIA OUTSTANDING BIOLOGY TEACHER AWARD

The National Association of Biology Teachers (NABT)

named Kettle Run High School teacher Linda Correll the 2018 recipient of the Outstanding Biology Teacher Award (OBTA) for Virginia. The NABT recognizes an outstanding biology educator for grades 7-12 from each of the 50 states based on their teaching ability, experience, cooperativeness in the school and community, and student-teacher relationships.

Linda Carrell teaches biology at Kettle Run High School in Fauquier County. She was recognized by NABT in November with the other OBTA state winners in San Diego, California. At the VAST PDI Linda received a plaque presented by Kathy Frame, NABT's Outstanding Biology Teacher Award Director for Virginia. Annually the winner is determined by a committee from the fields of academia, industry, nonprofits, and VOBTA Awardees is identified to review and make recommendations based on the candidates' applications and classroom videos.



OBTA Winner and Kathy Frameat the VAST PDI

2019 VIRGINIA OUTSTANDING BIOLOGY TEACHER AWARD

NOMINATION INFORMATION

Since 1961, the National Association of Biology Teachers each year attempts to identify an Outstanding Biology Teacher in all 50 states, Puerto Rico, Washington D.C. and overseas territories. The program continues strong, sponsored by Carolina Biological and Ken-A-Vision. Award winners receive certificates as well as public recognition and professional gratification, in addition to several gift certificates and a year's membership in NABT. Each year NABT also honors recipients at a special luncheon held in conjunction with NABT 's National Convention. This is an excellent way to reward outstanding biology teachers for their valuable contributions to the profession and to their students.

WHO IS ELIGIBLE?

All biology teachers in grades 7-12 in public or private schools, who teach primarily life sciences. Membership in NABT is not required. Candidates may be nominated again in subsequent years.

WHO CAN MAKE NOMINATIONS?

Colleagues, administrators, students, the teacher/candidates themselves or anyone competent to judge the candidate's teaching effectiveness.

WHAT ARE THE CRITERIA?

Teaching ability and experience, cooperativeness in the school and the community, inventiveness, initiative and inherent strengths.

Candidates will complete a record form summarizing their professional experience, academic background and educational philosophy. Two recommendations from colleagues closely familiar with each candidate's teaching effectiveness are required.

WHAT IS THE PROCESS?

Candidates will complete a record form summarizing their professional experience, academic background and educational philosophy. Two recommendations from colleagues closely familiar with each candidate's teaching effectiveness are required.

HOW DO I PARTICIPATE?

Send nominations to the Virginia OBTA Director: Kathy Frame Email: chuckframe@aol.com

APPLICATION DEADLINE

May 1, 2019

P 9. Menu



VAST Community Partner Award

Kip Bisignano has worked for School Specialty and Delta for more than a decade. During that time he has been a friend and partner of VAST and science teachers throughout the Commonwealth. Kip has led workshops and inservice opportunities as well as supported the VAST PDI by funding bags, name tags or in many other ways. He has been a presenter at the PreCons for several years.

Recently, Kip has been transferred to California. We are going to miss him but are proud of him as he takes on this new challenge. VAST is thankful for all that Kip has done in Virginia and are sad to lose him as a partner.

We were very honored to present Kip with the VAST Community Partnership Award 2018, in recognition of his continued support of VAST, science educators, and science students. Thank you, Kip and we wish you the best in the future.



Jackie McDonnough, 2018 President, and Kip Bisignano

Donna Sterling Award for Exemplary Science Teaching



Rebecca Schnekser, Dr. Juanita Jo Matkins who presented the awards, and Ellen Peterson.

2017 Sterling Award: Rebecca Schnekser

The 2017 recipient of the Donna Sterling Exemplary Science teaching award, Ms. Rebecca Schnekser, used the award money for professional development. She traveled to the Amazon to study general characteristics of the tropical rainforest, and assisted André Ruzo.

2018 Sterling Award: Ellen Peterson

Ms. Ellen Peterson, a 7th grade science teacher at Smithfield Middle School in Smithfield, Virginia, has been awarded the 2018 Donna R. Sterling Exemplary Science Teaching Award.

Ms. Peterson plans to use the award money (\$5000) to attend workshops on 3-D printing and to purchase a 3-D printer for use in her classroom so that her own students can design and actually print out their ideas for organism adaptations. Additional technologies Ms. Peterson plans on learning about and using include 360 degree cameras, virtual reality devices, and drones. After training on these technologies, this Sterling awardee plans on providing workshops to her colleagues at Smithfield Middle School so that the entire student body can benefit from her award.

P 10. Menu

Reading · Science · Authentic Literature
National Geographic Nonfiction · Digital · Print

Experience the power.







Panorama

Reading Through the Lens of Science



- Interactive texts
- Stunning videos
- Customized lessons
- Reading standards
- Science standards

NGL.Cengage.com/Virginia

NATIONAL GEOGRAPHIC LEARNING



NGL.Cengage.com/Panorama 888-915-3276

"National Geographic", "National Geographic Society" and the "Yellow Border Design" are registered trademarks of the National Geographic Society "Marcas Registradas.

P 11.

Menu

DEQ Landfill Model At Virginia Association of Science Teachers PDI

Katy T. Dacey Virginia Solid Waste Inspector

When **Katy T. Dacey** first worked as a Department of Environmental Quality (DEQ) Solid Waste Compliance Inspector, she loved to volunteer at the State Fair for the DEQ. After several years of volunteering at the Fair, Katy noticed that there were always displays for the Air and Water programs, but never anything that was educational or interactive for the Waste Program or specifically about landfills.

Katy brought an idea for a landfill model to the DEQ outreach program and found that a landfill model was not something the Department wanted to have a professional create. She decided to create one herself and began to envision what she wanted to do.

Katy thought about all the details she had observed while conducting landfill inspections. She consulted the Virginia Solid Waste Management Regulations (VSWMR); and conferred with Solid Waste Permit writers.

Her next step was to collected materials for the model. She used a Styrofoam cooler from the DEQ outreach storage as the base and shape of landfill. Tire materials came from the DEQ tire guy to be used as the drainage layer. Other materials were collected at home and were recycled such as mini trash bags cut from plastic bags. At Lowe's she found wood, hinges, tubes, and paint. From the Dollar Store Katy purchased pens, and glow sticks. Craft stores provided green turf, glue, and cardboard. Throughout the process she consulted Solid Waste Permit writers.

After four months working at least one afternoon a week, the landfill model was completed. The name "Eagle Top Sanitary Landfill" was chosen for the facility because Katy said "if you ever want to see a bald eagle, just go to the top of an sanitary landfill and you will see several along with buzzards, vultures and seagulls!"

The model landfill was used for three years in a row at the State Fair by DEQ. Katy enjoyed making the model and is pleased that it is still in use today. After several years



Katy T. Dacey and Her Land Fill Model

working on another program within the Department, she recently returned to the Solid Waste Inspector position and she loves being back out in the field. In the future she plans to add a Material Recovery Facility to the Landfill Model.

Nancy Drumheller wrote to Katy Dacey:

"We took the DEQ landfill model you created to the recent Virginia Association of Science Teacher Professional Development Institute (Nov. 15-17) as part of the "Night with Exhibitors" event. I must say that the landfill model was very popular with many science teachers across the state. Lots of cell phone pictures. Several teachers asked me for directions on how it was built to scale. Of course, we gave you and other DEQ staff all the credit.

We had over 150 teachers stop by our table and make a pledge to reduce, reuse, recycle.
As always, we love sharing the landfill model. It creates great conversation."

Nancy Drumheller Public Affairs Manager, (CVWMA) Central Virginia Waste Management Authority

P 12. Menu

Virginia-Grown Startup Takes a New Approach to the Traditional Laboratory Kit

by Nora J. Foegeding, PhD Student at Vanderbilt University



The Self-Assembly Module aligns with learning standards and makes cross-disciplinary connections.

Science educators are hungry for new teaching materials. Tasked with delivering government-mandated learning standards in a manner that students find relevant and engaging, STEM teachers constantly strive to connect fundamental concepts with real-world applications. There are a range of challenging STEM topics to teach, but new laboratory kits which engage the modern classroom are scarce. PurSolutions, a small business based out of Charlottesville, VA, is filling the gap.

The company has modified a research-grade experiment, historically used for cancer drug discovery, to be class-room-ready. At the center of the experiment is tubulin, a cytoskeletal protein that self-assembles into remarkable filaments, termed microtubules, within cells. During mitosis, the self-assembly of tubulin into microtubules is required to capture and separate sister chromatids into two new daughter cells. Once this occurs, microtubules disassemble back into tubulin monomers. Self-assembly is a fascinating phenomenon by which nature can "build itself", meaning that individual subunits can find one another inside a cell and self-organize based solely on their local interactions with one another. The "Self-Assembly Module"



PurSolutions, LLC is founded by Virginia natives Emma and Beattie Sturgill, and Prashant Singh of Nashville, TN.



The Self-Assembly Module by PurSolutions uses hands-on experimentation to teach relevant skills and applications.

by PurSolutions, containing hands-on experiments, 3D models, and computer simulations, is an engaging way to teach students about molecular bonds, thermal motion, protein-protein interactions, and more.

The Self-Assembly Module not only conveys fundamental learning standards, but it also permits students to see how core science concepts have cross-disciplinary applications. The topic of self-assembly, while rooted in biology, is being applied across diverse fields; engineers are making self-assembling nanodevices and MIT's International Design Center houses a Self-Assembly Lab. As the focal point of the educational module, self-assembly helps students grasp how molecular interactions are dynamic and how they can be harnessed to solve real-world problems.

One of PurSolution's cofounders, Dr. Emma Sturgill, grew up in southwest Virginia and she credits her high school science classes and teachers with giving her a glimpse of the microscopic world and the opportunities a career in science could offer. She graduated with a BS in biology from Emory and Henry College in 2009 and completed a PhD in cell biology from Vanderbilt University in 2014 before co-founding PurSolutions. "The STEM landscape is rapidly evolving...we are making new materials that keep pace with current STEM initiatives to help foster enthusiasm and prepare students for STEM careers," says Sturgill.

PurSolutions was founded in 2015 by siblings Beattie and Emma Sturgill, and Prashant Singh and is funded by a Small Business Innovation Research (SBIR) grant from the National Science Foundation (NSF). To learn more about the Self-Assembly Module and how to bring it to your classroom, please visit https://www.PureSoluble.com/Self-Assembly.

P 13. Menu

Science Springs to Life with Project Plant It!

By Suyapa Marquez, Senior Community Affairs Representative





Deer Park Elementary School in Newport News

Parkside Elementary in Fredericksburg

Project Plant It!, Dominion Energy's springtime tree-planting program, is back in 2019 with innovative strategies to teach students about the important role of trees in the ecosystem. Many VAST members visited the program's exhibit at the annual conference in the fall and signed up to get free redbud tree seedlings for Arbor Day celebrations. Teachers can register for tree seedlings while supplies last at projectplantit.com.

For the 2018-2019 academic year, the program includes two fun features to engage teachers, parents and youth in learning about the science of trees and the many benefits that trees provide to the environment:

- A newly-refreshed website, projectplantit.com, highlights the educator resources and lesson plans that can be downloaded at no charge. News about the program is readily accessible on every type of device, so check it out.
- Three new educational games showcasing cool tree trivia are now on the website for grade levels K-4, 5-8, and 9-12. These games are perfect for rainy day fun when kids can't play outside. Play one, two or all three there's a lot to learn about trees.

The website also includes a number of instructional tools, including an Educator's Guide with 12 lesson plans that support third-grade learning standards for math, science, language arts and social studies. All of the lesson plans can be adapted easily for all ages and grade levels of students.

"Project Plant It! promotes environmental sustainability, especially when the redbud seedlings are planted in areas to prevent soil erosion," said VAST member Rebecca Musso, a science teacher at T. Benton Gayle Middle School in Stafford County, Va. "A pond on our school grounds is located downhill from our sports fields, so our students planted several redbud seedlings at the base of the hill to reduce pollutants entering the pond. Thanks to **Dominion Energy and Project Plant It!**, we're helping to restore the natural habitat of the pond and we're looking forward to doing another project like this in 2019."

Fast Facts about **Project Plant It!**:

- **Project Plant It** was established by **Dominion Energy** in 2007 to educate children, plant trees and improve the environment.
- The tree seedlings are grown and shipped to participants in April by the **Arbor Day Foundation**, a longtime partner with **Dominion Energy**.
- From 2007-2019, more than 560,000 tree seedlings will have been distributed to children in states where **Dominion Energy** operates.
- According to the **Virginia Department of Forestry**, this equates to about 1,400 aces of new forest if all of the seedlings are planted and grow to maturity.

For more information about **Project Plant It!**, visit projectplantit.com.

P 14. Menu

JVSE Update



The Virginia Journal of Science Education (JVSE) is the flagship journal for VAST and gives member teachers and

researchers a place to publish their instructional materials and research related to K-16 science education. **JVSE** publishes articles that offer solutions to current challenges in science education, describe innovative classroom activities that foster student learning, and disseminate original research related to science education. The most recent issue of **JVSE** can be found in the members only section of the VAST website here.

With the start of 2019 we are excited to announce our new journal editors: Drs. Amanda Gonczi and Jennifer Maeng. Both received their Ph.D. in science education from the University of Virginia and have a long history of presenting at VAST, supporting science teachers across Virginia, and reviewing for and publishing in science education journals.

They are excited to move **JVSE** forward by bringing forth several changes including:

- 1. A revised double-blind peer review process. Authors will now submit a blinded manuscript (with no author names or affiliations).
- 2. An article review rubric that can be accessed on VAST's website.
- 3. Increased participation through greater recruitment of teachers, researchers and administrators across Virginia to submit and peer review articles.
- 4. A theme for each of the bi-annual issues.



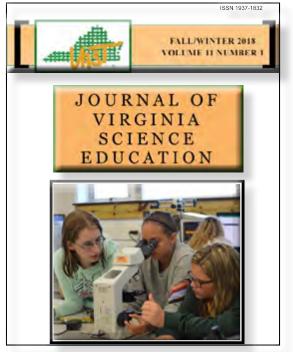
We encourage all VAST members to consider submitting a manuscript for an upcoming issue of VJSE. You may not know that this is a great way to earn points toward teacher licensure renewal in Virginia. (See the VDOE licensure manual p. 9 for more information). The themes for 2019 are:

- Summer Issue: *Making Science Accessible to All Students* (submissions due February 1st), published July 1, 2019 Manuscripts that put forth for this theme may address issues of differentiated instruction, inclusive science teaching, etc.
- Winter Issue: Computer Simulation Use for STEM Education. (submissions due April 1st), published December
 1, 2019. Manuscripts that address this theme may focus on only one or a combination of STEM (science,
 technology, engineering, or mathematics) disciplines.

While we encourage alignment to the above themes, manuscripts that are not related to these themes will also be considered for an issue if submitted by the deadline.

Please visit the publication website page for publication and review guidelines starting January 1st and email your manuscripts to <u>journal@vast.org</u>.

Dr. Amanda Gonczi and Dr. Jennifer Maeng
VAST Journal Editors



P 15. Menu

VAST Website

The **VAST Website** is your connection to all things VAST: news and updates, awards, grants, regional contacts, professional development opportunities, and more! The site is where to find the latest on the VAST PDI, including registration, keynote presentations, and hotel accommodations. Members may log in to visit the *Member's Portal* to connect vast colleagues by email.

Link to VAST members in *LinkedIn*. Visit the *Forum* to discuss science educational issues or post a lesson or lab activity.

To get to the **Portal** and the **Members only** section sign in

and click on the "additional menu" icon (\equiv) At the end of the menu bar on the home page.

While you are logged in, check the data in your account. Please update your data especially if there are any changes in your home address or email address.

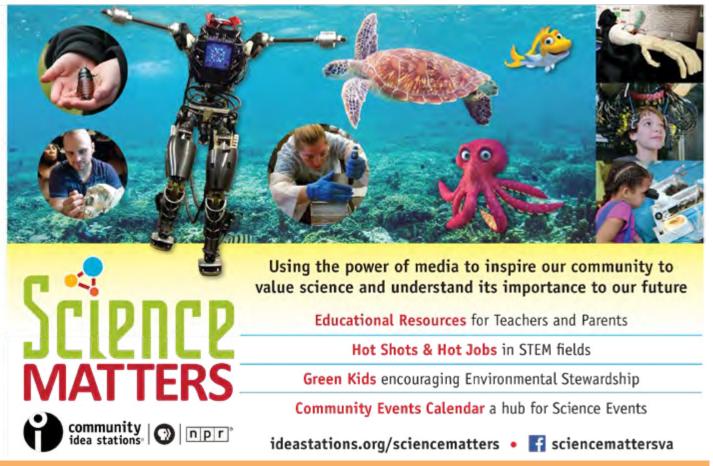
Submissions opinions, offers of assistance, and inquiries may be sent to Denny Casey webmaster@vast.org

Dr. Denny Casey
Webmaster

Biology Olympiad Registration

There is still time to register for the USA Biology Olympiad (USABO). As the premiere biology competition for high school students in the United States, the USA Biology Olympiad (USABO) enriches the life science education of nearly 10,000 talented students annually. It provides the motivation, curricular resources, and skills training to take them beyond their classroom experience to the level of international competitiveness. After two rounds of challenging exams, twenty Finalists are

invited to a residential training program where they learn advanced biological concepts and exacting lab skills at the USABO National Finals. Ultimately, four students earn the right as Team USA to represent the USA at the International Biology Olympiad (IBO), a worldwide competition involving student teams from over seventy countries. Please go to https://www.usabo-trc.org. For questions, please email Kathy Frame at kframe@cee.org.



P 16. Menu

Borrow a Telescope from the University of Virginia Astronomy Department What is CLUSTER?

Chandra: Loaning UVA'S Telescopes to Educators

The University of Virginia's Department of Astronomy is loaning telescopes to educators in Virginia and providing training on how to use them. Teachers can borrow a kit containing one Meade 8-inch Schmidt-Cassegrain telescope, a tripod, and several eyepieces suitable for viewing a variety of celestial objects. Kits are loaned for a semester and can be used to host an evening star party at their school, to conduct experiments with their students, and to enjoy other projects in conjunction with the Space Science portion of the SOLs. Thanks to funding from the Friends of McCormick Observatory, the telescopes are now equipped with safe solar filters to allow daytime viewing of the Sun. Teachers DO NOT need to have experience using a telescope. There is a six-hour orientation and training session at the McCormick Observatory on the grounds of the University for first-time participants. Prior participants are not required to re-take the training. The cost of the program is \$50 for the semester. The next session will be held on Saturday, February

2, 2019 from 3:00 pm to 9:00 pm. For more information, please contact Steve Layman at slayman2528@comcast.net.

CLUSTER is managed by Steve Layman, a long-time member and past president of the Charlottes-

ville Astronomical Society. From 2010-2013, support for this education and outreach program was provided by the National Aeronautics and Space Administration through Chandra award GO0-11097X to Dr. Craig Sarazin of the University of Virginia, issued by the Chandra X-Ray Observatory, which is operated by the Smithsonian Astrophysical Observatory for and on behalf of NASA under contract NAS8-03060.

Current funding is provided by the Friends of the McCormick Observatory. For information on supporting their education and outreach programs, please visit their webpage.



SAVE THE DATE! 7.11.2019 in Northern Virginia
From STEAM 6.0 to Retooled as TEAMS 2.0: Integrated &
Inclusive Instruction Begins & Ends with SCIENCE!

Region IV has presented previous professional development conferences offering presentations to support instruction that integrates STEM, the arts, and medical science. Discounts for school teams and VAST

members are offered for educators grades PK-12 in all subject areas. Please mark your new year's calendar for Thursday, July 11th and look for more information this spring!

Virginia Tech

College of Natural Resources and Environment

Preparing students through career-oriented programs

- Meteorology
- Packaging systems
- Sustainable biomaterials
- Environmental informatics
- Water

- Fish and wildlife
- Forestry
- Geospatial technologies
- Environmental education
- Geography

- International development
- Conservation and recreation
- Environmental management

Want to learn more? Visit us at

cnre.vt.edu

Advancing the Science of Sustainability





Virginia Lottery Winners

VAST was excited to announce the winners of the third year of the Virginia Lottery's sponsorship, that provided two registrations for the Friday and Saturday VAST PDI. Two teachers received lunch on each day, plus a seat at the Awards Dinner on Friday night. Dylan Boeckman from JMU who teaches 9-12th graders chemistry and Paul Hanna of Covington High School.

Thank you Virginia Lottery!



Register to Receive Information!

Engaging Secondary Students in Authentic STEM Research – Year 2 Old Dominion University, Norfolk, VA

May 22-23, 2019

- Twenty teachers who do not currently participate in VJAS - will be supported to attend the Virginia Junior Academy of Science (VJAS) and Virginia Academy of Science (VAS). Registration and meals will be provided on May 22-23, 2019. Participants will receive certificate renewal credits.
- Priority will be given to teams of teachers and an instructional leader from Superintendent's Region 2 (Tidewater), Region 3 (Northern Neck), and Region 8 (Southside). These regions are targeted because of proximity to ODU and the need to increase VJAS participation, especially of under-represented populations. Teachers from other regions will be served on a space-available basis and when VJAS-VAS is in their area.
 - May 22, 2019: Orientation breakfast;
 Observation of VJAS student presentations (over 600); Lunch with judges; College/Career Fair and laboratory tours; Group dinner and discussion;
 VJAS General Session & George W. Jeffers
 Memorial Lecture (Time: 7:45 am 8:30 pm)
 - May 23, 2019: VJAS Awards Ceremony (part); VAS Education Section – concurrent presentations; Presentations by VJAS first place

- winners; VAS Poster Session & President-Provost Reception; Closing events (Time: 8 am 2:30 pm)
- o **Hotels.** Because of the early starts and long day, especially May 22, commuting will be difficult. VJAS-VAS is seeking funding to defray hotel costs; however, school divisions may need to pay. Information will be provided in final registration materials. Previously, participants took advantage of the hotel to dialogue and develop implementation plans.
- VJAS-VAS are planning programs, and seeking funds, to support teachers who are working with student research, e.g. mentoring by VAS members, use of large-scale databases, and involvement with collaborative citizen- science programs.
- Share this information with your division's decision makers. Targeted divisions will receive final registration information by February 15, 2019. Participants will be accepted by April 1, 2019. To receive registration information, send the information below to Dr. Julia H. Cothron, VJAS Board Member at cothron9293@ gmail.com.

Yes, I would like to receive registration information for Engaging Students in Authentic STEM Research, Year 2

Name	
School	
School Division	
Subject/Grade Taught	
E-Mail (print clearly)	
Is there a division rep. That should be contacted? If so, provide name and e-mail	

Sponsored by Virginia Junior Academy of Science, Virginia Academy of Science, Virginia Mathematics & Science Coalition, and Institute for Teaching Technology and Innovative Practices (ITTIP) at Longwood University.

P 19. Menu



VJAS Needs Your STEM Expertise: Volunteer Now!

Dr. Julia H. Cothron, VJAS Representative to VAST Board

Annually, the Virginia Junior Academy of Science (VJAS) gives approximately 750 students, grades 7-12, an opportunity to present original research they have conducted. This volunteer-driven event needs STEM professionals to evaluate student research papers, judge categories, and review first place papers to determine special awards. You may volunteer to work with middle or high school papers in your area of expertise.

Middle School: Animal & Human Sciences, Chemical Sciences, Ecology & Earth Sciences, Engineering & Technology, Human Behavior, Mathematics: Patterns & Relationships, Physical Science & Astronomy, Plant Sciences & Microbiology High School: Botany, Chemistry, Engineering, Environmental & Earth Science, Mathematics: Theoretical & Modeling, Medicine & Health, Microbiology & Cell Biology, Physics & Astronomy, Psychology, Statistical Analysis & Inferences, Zoology.

Below is a synopsis of volunteer needs. Check your calendar and see if you can provide your expertise.

Evaluating Student Research Papers (March). Each reader receives twenty papers to review and score using the 2019 Reader's Evaluation Form which provides characteristics of an outstanding paper in five areas, e.g. abstract, introduction, methods/materials, results, discussion/conclusion, and general assessment of paper. Readers are asked to provide constructive comments because score sheets are returned to students. The scores are used to determine if a paper is accepted for presentation. Readers have at least three weeks to score papers, with papers distributed to readers in early March. The Reader's Evaluation Form is available at

Judging Student Presentations (May). On May 22, 2019 selected students will make presentations from 9 am through 4:30 pm at Old Dominion University. A head judge and judges are needed for each of the middle and high school categories. Each judge uses the 2019 Judge's Evaluation Form to score the student paper (same criteria as reader), symposium presentation, and quality of research. Characteristics of outstanding presentations and research are detailed on the form. Judges receive the selected papers about three weeks prior to the event. Readers are asked to carefully score papers because papers are returned to students. Succinct constructive comments



are helpful. Judges arrive at 7:15 am for breakfast, an opportunity to meet fellow judges, and last-minute information. Judges receive lunch. If your schedule allows please consider being a reader and a judge. That way, you will be familiar with most of the student research papers, which streamlines scoring.

Special Judges (May 22). From 4 pm to approximately 9:30 pm, judges are needed to review first place papers and determine a variety of special awards. Judges are needed with expertise in biology, environmental and earth sciences, mathematics, engineering and technology, physics, and chemistry. Individuals with expertise in more than one area are very helpful. Judges may elect to work with middle or high school papers. Prior experience working with student research at the secondary or undergraduate level is very helpful. In making decisions, special judges consider validity, creativity, thoroughness, and overall impression as related to accepted disciplinary practices. Judges receive a complimentary dinner and specific information in advance. Because of late schedule, judges may need to stay overnight if they are not from the area.

Help make the 2019 VJAS Symposium a memorable experience for students. Go to the VJAS Website (www. vjas.org) to register as a reader, judge, or special judge. The same site is used to register both. On the same page you will see a link to the 2018-19 VJAS Handbook and Forms. If you are interested in reader and judges forms, go to Appendix C. Your help is providing information to other interested parties will be appreciated.

To Receive Top Choice, Register by March 15, 2019
VJAS Reader, Judge, or Special Judge
www.vjas.org

P 20. Menu

January's Evening Eclipse and Morning Conjunctions

By David Prosper

Have you ever wondered how eclipses occur? You can model the Earth-Moon system using just a couple of small balls and a measuring stick to find out! The "yardstick eclipse" model shown here is set up to demonstrate a lunar eclipse. The "Earth" ball (front, right) casts its shadow on the smaller "Moon" ball (rear, left). You can also simulate a solar eclipse just by flipping this model around. You can even use the Sun as your light source! Find more details on this simple eclipse model at bit.ly/yardstickeclipse

Observers in the Americas are treated to an evening total lunar eclipse this month. Early risers can spot some striking morning conjunctions between Venus, Jupiter, and the Moon late in January.

A total lunar eclipse will occur on January 20th and be visible from start to finish for observers located in North and South America. This eclipse might be a treat for folks with early bedtimes; western observers can even watch the whole event before midnight. Lunar eclipses takes several hours to complete and are at their most impressive during total eclipse, or totality, when the Moon is completely enveloped by the umbra, the darkest part of Earth's shadow. During totality the color of the Moon can change to a bright orange or red thanks to the sunlight bending through the Earth's atmosphere - the same reason we see pink sunsets. The eclipse begins at 10:34 pm Eastern Standard Time, with totality beginning at 11:41 pm. The total eclipse lasts for slightly over an hour, ending at 12:43 am. The eclipse finishes when the Moon fully emerges from Earth's shadow by 1:51 am. Convert these times to your own time zone to plan your own eclipse watching; for example, observers under Pacific Standard Time will see the eclipse start at 7:34 pm and end by 10:51 pm.

Resources:



Lunar eclipses offer observers a unique opportunity to judge how much the Moon's glare can interfere with stargazing. On eclipse night the Moon will be in Cancer, a constellation made up of dim stars. How many stars you can see near the full Moon before or after the eclipse? How many stars can you see during the



total eclipse? The difference may surprise you. During these observations, you may spot a fuzzy cloud of stars relatively close to the Moon; this is known as the "Beehive Cluster," M44, or Praesepe. It's an open cluster of stars thought to be about 600 million year old and a little under 600 light years distant. Praesepe looks fantastic through binoculars.

Mars is visible in the evening and sets before midnight. It is still bright but has faded considerably since its closest approach to Earth last summer. Watch the red planet travel through the constellation Pisces throughout January.

Venus makes notable early morning appearances beside both Jupiter and the Moon later this month; make sure to get up about an hour before sunrise for the best views of these events. First, Venus and Jupiter approach each other during the third full week of January. Watch their conjunction on the 22nd, when the planets appear to pass just under 2 ½ degrees of each other. The next week, observe Venus in a close conjunction with a crescent Moon the morning of the 31st. For many observers their closest pass - just over half a degree apart, or less than a thumb's width held at arm's length - will occur after sunrise. Since Venus and the Moon are so bright you may still be able to spot them, even after sunrise. Have you ever seen Venus in the daytime?

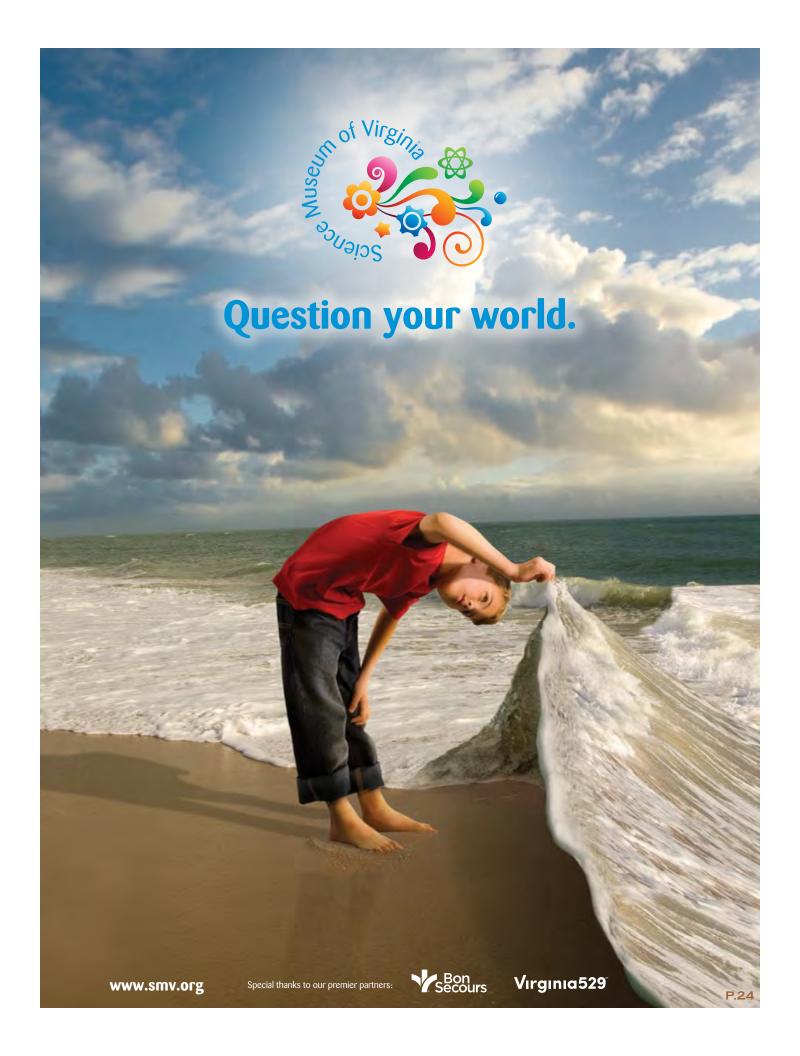
If you have missed **Saturn** this winter, watch for the ringed planet's return by the end of the month, when it rises right before sunrise in Sagittarius. See if you can spot it after observing Venus' conjunctions!

You can catch up on all of NASA's current and future missions at nasa.gov

P 21. Menu









"Working Together to Promote Quality Science Education"

Many thanks for the support of science education by our Corporate Benefactors and Corporate Members.

VAST Benefactors



Associated Microscope

P.O. Box 1076 Elon, NC 27244

www.associatedmicroscope.com

Regent University School of Education

1000 Regent University Drive Virginia Beach, VA 23464 www.regent.edu







Frey Sciencetific/ CPO Science

P.O. Box 3000 Nashua, NH 03061 www.cposcience.com www.freyscientific.com

Science Museum of Virginia

2500 West Broad Street Richmond, VA 23220 www.smv.org





Delta Education 80 Northwest Boulevard

Nashua, NH 03063 www.delta-education.com

Science Matters Community Idea Stations 23 Sesame Street

Richmond, Virginia 23235 www.ideastations.org/sciencematters www.facebook.com/sciencemattersva



National Geographic

20 Channel Center Street Boston, MA 02210





Cengage Learning

10650 Toebben Drive Independence, KY 41051 ngl.cengage.com

Vernier Software & Technology

13979 SW Millikan Way Beaverton, OR 97005 www.vernier.com



VAST Corporate Members

Astrocamp

8144 Mt. Laurel Rd., Clover, VA 24534 astrocampsummerva.org

Flinn Scientific Inc.

P.O. Box 219 Batavia, IL 60510 www.flinnsci.com

Fisher Science Education Part of Thermo Fisher Scientific 1523 W Philadelphia St. Fl 2 York, PA 17404 www.fisheredu.com

Five Ponds Press

477 South Rosemary Ave, Suite 202 West Palm Beach, FL 33401 www.fivepondpress.com

Jefferson Lab

628 Hofstadter Road, Suite 6 Newport News, VA 23606 www.jlab.org

Lab-Aids, Inc.

17 Colt Court Ronkonkoma, NY 11779 lab-aids.com PASCO Scientific 10101 Foothills Blvd. Roseville, CA 95747 www.pasco.com

Virginia Space Grant Consortium 600 Butler Farm Rd. S-200

Hampton,VA, 23666 www.vsgc.odu.edu



P 25. Menu

2019 VAST Leadership

President Thomas F. Fitzpatrick 540-268-1109 President@vast.org

Secretary Robin Curtis 757-903-4586 secretary@vast.org Past President Dr. Jackie McDonnough (804) 321-9310

pastpresident@vast.org

Treasurer Matt Scott (703) 577-6482 treasurer@vast.org President Elect Michael Pratte (540) 842-4188 presidentelect@vast.org

Editor *Science Educator*Jean Foss
434-973-3709
newsletter@vast.org

Vice President Nicholaus Swan (757) 591-4900 vice.president@vast.org

Executive Director Susan Booth 757-897-3104 executive.director@vast.org

Board Information

Is Your Address Changing?

Be sure to let VAST know your new contact information. Neither the post office or the Internet will forward our newsletters. Please e-mail Barbara Adcock, Membership chair: membership@vast.org

VAST Regional Directors:

Regional Director Coordinator - Eric Pyle - pyleej@jmu.edu

Director, Region 1, Carolyn Elliott region1@vast.org Director, Region 2,

Becky Schnekser

Rebeccaschnekser@capehenry.org

Camilla Walck

Camilla.Walck@VBSchools.com

Director, Region 3,

Dr. Dianne Clowes

dclowes@spotsylvania.k12.va.us

Director, Region 4,

Susan Bardenhagen region4@vast.org

Director, Region 5, Tammy Stone

tstone@rockingham.k12.va.us

Director, Region 6, Jill Collins,

Jill.collins@pcs.k12.va.us

Dr. Patricia Gaudreau
pgaudreau@mcps.org

Director, Region 7, Donna Rowlett region7@vast.org

<u>Director, Region 8,</u> Katherine Bowen

bowen.katherine@nottowayschools.org

Ben Campbell

campbellbk@longwood.edu



Join the VAST community on line. "LIKE" the Virginia Association of Science Teachers so that the latest science educational news will appear on your page.



<u>Follow VAST by joining Twitter.</u> Follow all the 2018 PDI tweets at #2018vastpdi.



Network with VAST members, colleagues and friends through LinkedIn

Please consult the website for up to date information, VAST forms for awards and mini-grants, advertising and current PDI information: vast.org or https://vast.wildapricot.org



Mission: The Virginia Association of Science Teachers (VAST) is a community of Science educators whose mission is to:

- inspire students,
- provide professional learning opportunities,
- build partnerships,
- advocate for excellence at the school, local, state and national level.

Please send articles, letters to the <u>editor</u>, or labs by the submission deadline, <u>MARCH 1, 2019</u>, for inclusion in the next digital PDI VAST Newsletter.

The Virginia Association of Science Teachers (VAST) is incorporated in Virginia as a charitable, scientific, and educational organization. VAST is an IRS 501 (c) 3 qualified organization, and is registered with the Virginia Department of Consumer Affairs.

P 26. Menu