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# The Science Educator

Winter 2015

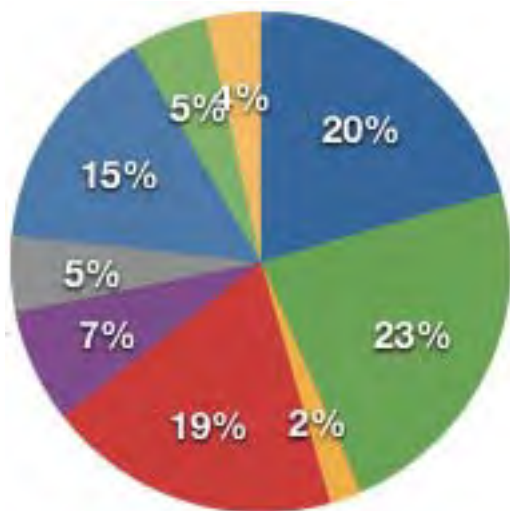
A publication of VAST, The Virginia Association of Science Teachers Vol. 63, No.3

## 900+ Attend the VAST PDI



Presidential Awardees for Excellence in Math and Science (PAEMST), VAST Awardees including a Lifetime Achievement and NABT Virginia Awardee at the November 2014 VAST PDI.

Attendance at VAST 2014 PDI by Region



Region III Co-directors Sherrie Roland and Leslie Lausten with keynote speaker Carol Tomlinson.

The General Session Speakers were a definite draw. Dr. Carol Tomlinson inspired us all with her workshop and her General Session presentation Differentiation and Mindset. She provided the key principles of differentiation and connected them to brain research.

- Region 1
- Region 2
- Region 3
- Region 4
- Region 5
- Region 6
- Region 7
- Region 8
- Not provided



## Walking across the hallway....

It always strikes me how we as educators talk about sharing.

We typically spend our day with students and our interactions with adults are greetings in the office or hallway or maybe the bathroom.

So.... the idea of more meetings has led to a collaboration efforts designed to facilitate creation of the best lessons for all students instead of just sharing materials.

We need to take this one step further...we need to leave the school and go to professional developments that can help us gain a better understanding of each child. To do this we have to see how we can connect concepts instead of teaching one more topic in isolation.

I encourage you to share your work as a presenter or to come as a team to the VAST PDI. Your school and many other classrooms will be enriched and you will grow as a professional.

We hope that your principal will join you at the PDI15. This year the precon are designed to insure that inquiry is alive and well and addressed from the beginning through to the assessments of your lessons.

*Susan Booth, EdS*

### Save the Date!

## Announcing the 2015 VAST PDI!

**When:** Thursday November 19 to Saturday November 21, 2015

**Where:** Westfields Marriott Washington Dulles,  
14750 Conference Center Drive, Chantilly, Virginia

MAKE SURE YOU SHARE THIS NEWSLETTER WITH YOUR PRINCIPAL BECAUSE OUR PRECON AND FUTURE SPEAKERS WILL HAVE ADDED VALUE FOR THEM....

Invited Speakers include Dr. Frederic Bertley, Principal Kafele, National Geographic Speaker and Dave Burgess to name a few....

**Make your tax-deductible gift today. Make a real difference by supporting Virginia Science Educators!**

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# The Virginia Association of Science Teachers

*Dr. Jenny Sue Flannagan, VAST President*



## From the President-

Happy New Year! I cannot believe it is already January and a brand new year is upon us! It seems like only yesterday we were at the annual PDI at the Hotel Roanoke learning how to inspire students to love science!

As I look to our new year, I am excited with what VAST is going to do. We are already in the process of planning some new events to provide science teachers with great ideas and support. I hope you will be able to join us at these events. Be on the lookout for them coming up later this spring!\

The theme for this year is all about Making a Difference. At the PDI, I shared one of my favorite stories from the book Chicken Soup for the Soul. In the story, a man is walking down the beach that is littered with thousands of starfish. The starfish have washed ashore from a recent storm. Off in the distance he see a man walking along, picking up and throwing the starfish back into the sea. As he nears the man, he says to him “don’t you know you can’t possibly make a difference? There are thousands of these things on the shore.” The other man simply reached down and picked up another starfish and threw it back into the sea upon which he said, “made a difference to that one!”

Each and every day you go into your classroom and you touch the lives of your students. You make a difference with the words you use, the activities you design, and the support you show your students. This year, VAST wants to hear your stories. In February, you will get an email from VAST with directions on how to tell us about someone who is making a difference in science education. Each quarter, VAST will select our Making a Difference awardees who will be showcased on our website. Be on the lookout for this information!

--Dr. Jenny Sue Flannagan

## *Difference Makers on Your VAST Board*



**Jean Foss** - Do you know Jean Foss? Well you should! She is the editor and creator of the VAST Newsletter. She also was instrumental in designing our conference program this year. From the creation of the strand icons to designing the layout, Jean did an outstanding job! For 23 years, Jean has been creating and sharing the news about science education. This is why she is a VAST Difference Maker!



**Jimmy Johnson** - Keeping track of the money is something Jimmy knows very well! As your VAST Treasurer, he has been instrumental in keeping up with membership dues and invoicing for the annual PDI. Jimmy always has a smile on his face and treats each member with grace and kindness. Jimmy, a former VAST president, makes a difference in the way he serves and supports each and every board member.

## Message from the 2015 President-Elect

Kathy Frame - VAST President- Elect

I thank you for the opportunity to serve as president-elect of the Virginia Association of Science Teachers (VAST) this year and as your president in 2016. I invite you to be an active member in VAST by attending our Board Meetings that are held quarterly each year. You will find the dates listed on the VAST web site ([www.vast.org](http://www.vast.org)). This summer, I will have the responsibility of setting the theme and strands for VAST 2016 to be held in Williamsburg, VA. I invite your ideas for this conference theme and strands for consideration of incorporation into the 2016 program. There are many ways that you can participate in VAST on the state, regional, and local level. I especially would like to draw your attention to your regions. Please visit your Regional Director. You can find your Regional Director on the VAST site as well. Bookmark the VAST site and make it your go-to-site for information on the 2015 PDI, but also current issues of interest in science education, grant and award opportunities, and many other opportunities for you to grow as a professional.

One would best describe my experience in education as eclectic. I have over 15 years experience in the classroom teaching elementary, middle school, high school, and adult learning and two years of teaching in a museum setting. On the national level, I have served as Education Director for the National Association of Biology Teachers (NABT) and as Vice President of Education for the Biotechnology Institute. I presently direct the USA Biology Olympiad sponsored by the Center for Excellence in Education and Purdue University.

This year, I will be responsible for working with our president Jenny Sue Flannigan on the 2015 VAST Conference to be held in Dulles, Virginia from November 19 to 21, 2015. Jenny Sue has set the theme Designing Inquiring Minds, and with the Professional Development Institute (PDI) Committee which I co-chair with John Kowalski will assist her in planning all the necessary details. The call for proposals was opened in December 20 and registration will open in early 2015. Keep checking the VAST website to see the latest updates.

Some exciting events are coming. Look for the call for the VAST K-12 Artwork Competition for the conference theme Designing Inquiring Minds. Invited



Calling my mom from Sungate at Machu Picchu

speakers include Dr. Frederic M. N. Bertley from the Franklin Institute and David Burgess who will do his nationally speak to his nationally known Teach Like a PIRATE, a super high-energy, entertaining presentation with a heavy emphasis on increasing student engagement and using creative, innovative strategies. More speakers to come! We are also in the process of setting up field trips and are in the negotiation stages of doing one at Howard Hughes Medical Institute's world-class research facility Janelia Farms where Eric Betzig 2014 Nobel Laureate works on microscopy. This is only the beginning. So get out your calendar and block off November 19 to 21 for the best VAST PDI ever!

### *Ask me about the:*



Blue-footed Boobie (*Sula nebouxi*)



## VAST Board Reports:

### Colleges and Universities

Suzanne M. Donnelly, Ph. D.  
Assistant Professor of Science Education  
Department of Chemistry & Physics  
Longwood University - donnellysm@longwood.edu

The VAST Colleges and Universities Committee will be working to organize a professional development opportunity for pre-service science teachers during the summer. Planning is in the early stages, but the focus of the event will be to inspire future teachers to teach their students science using innovative and engaging pedagogy to ignite their passion for science.

### Physics

Jeff Steele, VIP President

AP Physics 1 teachers! Need some ideas for teaching rotational motion? Plan on attending the Rotational Motion Workshop at St. Catherine's school in Richmond on Saturday, January 24 sponsored by the Virginia Instructors of Physics! Spots are limited and filling up fast. Please register at <http://tinyurl.com/neycm60> or contact Jeff Steele at [jeffsteele1@gmail.com](mailto:jeffsteele1@gmail.com) for further information.

### VRUEC

Stephanie DeNicola, VRUEC Representative on the VAST Board [stephanied@culpeperswcd.org](mailto:stephanied@culpeperswcd.org)

VRUEC is in Year 2 of a 3-year NOAA grant to provide quality professional development to teams of interdisciplinary teachers. The goal is to give them the tools and connections to provide Meaningful Watershed Educational Experiences in an interdisciplinary manner. Called Mountains to the Bay Watershed Academy, the teachers travel through the watershed over 4 weekends. Upon completion of a team MWEE unit, the teams receive a \$500 classroom grant. If teachers participate in all 4 weekends they can receive up to 80 PD points. Here are the details on the individual academies:

- a. Rappahannock/York Watershed: 31 teachers participating.
- b. Potomac Watershed: 18 teachers.
- c. James Watershed: 10 teachers.

Sign up for Year 3 will begin in May 2015. For details contact Stephanie DeNicola at: [stephanied@culpeperswcd.org](mailto:stephanied@culpeperswcd.org). These opportunities are provided at no cost to participants. All food, lodging and curriculum are provided through the grant.

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College of Natural Resources and Environment

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## VAST Regions



### REGION II

Elizabeth River Project (ERP) educators and guest presenters teach environmental literacy, stewardship and outdoor activities through placed-based explorations at the ERP's new 40-acre Paradise Creek Nature Park and award winning Learning Barge, America's Greenest Vessel. Teachers participate in hands-on activities that can be replicated at school and other natural settings and receive tons of resources. Experience how to utilize a natural environment as a classroom and engage students in investigative activities that result in a new generation of stewards. Certificate of attendance is provided for recertification points.

For additional information, contact Adrienne Sawyer [adriennesawyer@gmail.com](mailto:adriennesawyer@gmail.com)

Adrienne Saawyer - Region II Director

### REGION III



## Building Tomorrow's Thinkers

Region Three Mini Conference

Featuring Kip Bisignano as the Key Note speaker

March 7, 2015

University of Mary Washington

Registration open to all on the VAST website

8:30 am – 2:00 pm

K-8 teachers

Cost \$25

Sherrie Roland and Leslie Lausten  
Region III Directors

### REGION IV

As an Educator Associate with the American Institute of Aeronautics and Astronautics, I help coordinate the eight judging teams of judges for metro DC's regional Science/STEM Fairs and review abstracts and titles of the projects with aerospace themes. Check out the website <http://www.aiaa.org/> to secure a complimentary educator associate membership for yourself. The opportunities and support for K-12 STEM education are wonderful.

Susan Bardenhagen - Region III Director

“Inspiring a **LOVE** of Science with **S.T.E.A\*.M.**”

February 14, Valentine's Day; 8:30 am – 2:00 pm

\* Art

Region IV Mini-Conference, a follow-up to the region's 2014 “Teaching Science with a T.E.A.M. Approach”

**Keynote: “Thinking Like Artists and Designers”** - Margaret Hancock is owner of Margaret Hancock Studio and former curator and director of public programs at the Virginia Center for Architecture. She holds a BA in art history from Duke University and a MEd from The University of Virginia. She is an adjunct educator with the Virginia Museum of Fine Arts.

Presentations on crosscutting instruction with Science, Technology, Engineering, the Arts, and Mathematics as an introduction or next step; working lunch with vertical alignment planning from other teams/educators; discount for current VAST members; teams from schools or districts encouraged.

**Location:** Metz Junior HS, 9950 Wellington Road, Manassas, VA 20110; Manassas City Schools

Contact: Regional Director- Susan Bardenhagen [region4@vast.org](mailto:region4@vast.org)

**Registration form download:** <http://www.vast.org/2015STEAMRegion4ConferenceRegistrationForm.pdf>

# 2015 The Virginia Association of Science Teachers VAST PDI Art Contest: Calling all Pre-K to 12 Grade Students!



All public and private school children and youth organizations are invited to showcase their artistic talent to increase the public understanding of the VAST PDI theme: “Designing Inquiring Minds”. The top 12 selected artworks will be included in the VAST PDI Program and/or throughout the Conference, displayed at the VAST Booth, and be recognized by the VAST president at the November PDI in Chantilly, Virginia. All submissions must be postmarked by **Thursday, April 30, 2015**.

For more information on judging criteria, poster specifications, and submission criteria, Visit <http://www.vast.org>

## VAST Needs Your Expertise: Call for Volunteers



The VAST PDI Committee needs your help in preparing for the 2015 PDI in Chantilly, VA. Sign up online by visiting the VAST website (<http://www.vast.org>) to volunteer. We can provide you with ways you can help, so that you can answer the questions of HOW can you help?

# USA BIOlympiad 2015



## USA Biology Olympiad (USABO) Registration Opens

You and your students are invited to participate in the 2015 USA Biology Olympiad (USABO). Registration is open now for teachers and students! To register, please visit the USABO website <https://www.usabo-trc.org/>. Be sure to check out the Biology Story of the day and to friend the USABO on Facebook. Students should check the Student Corner for study resources and how to form a USABO Club. Registration closes January 16, 2015. The final four students on Team USA will compete at the International Biology Olympiad in Arhaus, Denmark, July 12 to 19 (<http://ibo2015.org/>). Contact Kathy Frame, USABO Director, at [kframe@cee.org](mailto:kframe@cee.org) if you have any questions. We look forward to your students participating!



Visit us on Facebook

Kathy Frame - VAST Biology Chair

## VJAS Update



### The Virginia Junior Academy of Science Scholarships

The Virginia Junior Academy of Science encourages your participation. Please look (<http://www.vjas.org>) at the opportunities that are available to your students. We would like to hi-light the Virginia Environmental Endowment SPECIAL SCHOLARSHIPS. These scholarships are determined by special panels of judges at the VJAS Research Symposium.

#### THE FRANCES AND SYDNEY LEWIS ENVIRONMENTAL SCIENCE SCHOLARSHIP

Description: This \$14,000 four-year college scholarship may be awarded to the student whose project presented at the VJAS Research Symposium evidences the most significant contribution in the field of Environmental Science. The purpose of the award is to stimulate interest in environmental sciences and to enable promising young students to pursue undergraduate studies in a related field. The Virginia Environmental Endowment (VEE) and the VJAS offer this scholarship in tribute to the outstanding and generous services of VEE Directors Emeriti, Frances A. Lewis and Sydney Lewis.

#### THE HENRY W. MACKENZIE, JR. ENVIRONMENTAL SCHOLARSHIP

Description: This \$5,000 four-year college scholarship may be awarded to the student whose project presented at the Research Symposium evidences the most significant contribution in the field of Environmental Science dealing with the James River Basin and Chesapeake Bay. The purpose of the award is to stimulate interest in environmental sciences and to enable promising young students to pursue undergraduate studies in a related field. Virginia Environmental Endowment (VEE) and the VJAS offer this scholarship in tribute to the outstanding and generous services of Judge Henry W. MacKenzie, Jr. one of the founding directors of VEE who has a great interest in the James River and the Chesapeake Bay.

We are off on to a New Year and we hope that you are ready to help prepare students with their VJAS research projects. As you know it is very important that you join as a member so that you do not miss anything. The deadline is quickly approaching and it makes it flow smoother in the office if you do it early instead of waiting until you mail the papers for review. Also, when writing the paper please make sure you follow the format and label the headings consistently, as well as providing the necessary safety certifications. The following are a reminder of dates to come:

Deadline for affiliation with VJAS: School & Individual Memberships and Membership Fees **January 15**.

Each student is expected to pay a **\$15 Student Entry Fee** and that each school will collect the Student Entry fees and submit a single check to VJAS to cover those fees along with the papers.

Each Head Sponsor is reminded to complete the School Entry Form according to the instructions provided in the Handbook and Appendix.

Please also include a printed copy with the papers and email an electronic version to the VAS/VJAS office.

Deadline for submitting papers and Student Entry Fees: last Wednesday in February (i.e., **February 25**)

Susan Booth, EdS





### VAST Awards

**Outstanding Elementary Teacher**

***Mindy Gumpert***

**Outstanding Middle School Teacher**

***Luzdary Chamorro***

**Outstanding Environmental Teacher**

***Greg Corder***

**Outstanding Physics Teacher**

***Rachel White***

**Outstanding University Science Educator**

***David Slykhuis*, James Madison University**

**Outstanding Community Partnership**

***Lisa Surlis-Law*, Jefferson Lab**

**Outstanding Leadership in**

**Science Education**

***Dr. Linda Wallinger***

Dr. Linda M. Wallinger has worked at the Virginia Department of Education since 1998. Currently she is assistant superintendent for instruction, working with the offices of elementary, middle, and high school instruction; career and technical education; federal programs; and adult education and literacy. She also has served as director of the office of program administration and accountability, director of the office of high school instruction, and associate director of both teacher quality enhancement and foreign languages as well as English as a second language. Prior to her service at the Department of Education, she was a middle school administrator in Hanover County and a French teacher in Botetourt and Henrico Counties.

### Presidential Awards for Excellence in Mathematics and Science Teaching: Virginia Finalists

***Barbara –Ann Adcock***

Pocahontas Elementary, Powhatan County  
Public Schools

***Susan Eckenrode***

John Wayland Elementary,  
Rockingham County Public Schools

***Ryan McKinney***

The Langley School in McLean

### National Association of Biology Teachers: Virginia Awardee

***Richard Strauss***

**Science Education Lifetime**

**Achievement Award**

***Dr. Patricia Wright***

State Superintendent Patricia I. Wright retired as Virginia's top public school administrator in May 2014. Wright was appointed state superintendent by Governor Tim Kaine in 2008, and was re-appointed by Governor Bob McDonnell in 2010. She also served as acting superintendent of public instruction under Governor Mark Warner in 2005 and early 2006. During her tenure, Wright oversaw a major revision of the commonwealth's Standards of Learning (SOL) to emphasize college and career readiness, the introduction of more challenging and innovative SOL tests in all subjects, and the expanded use of technology in instruction and assessment.

# VAST Recognizes the 2014 RISE Award Recipients

Tim Couillard - VAST Chair Awards and Grants

timothy\_couillard@ccpsnet.net

On November 21, 2014, VAST recognized its 2014 recipients of the **VAST Recognition In Science Education (RISE) Awards**. Awardees were nominated by members of their community and selected by the VAST Awards and Grants Committee. Please join us in congratulating each of this year's recipients for representing the best in science education in the Commonwealth of Virginia.

The window for **2015 RISE Award** nominations will open on February 1. The nomination deadline is August 19. For more information, please visit [www.vast.org](http://www.vast.org).

Below we've included excerpts from the awardees' nominations.

## **Community Education Partnership Award**

### **Lisa Surles-Law**

"For the past twenty years, Lisa Surles Law has been a force for excellence in K-12 science education. In her position as Science Education Administrator for Jefferson Lab she is a most valuable resource to science teachers. She has brought enthusiasm and knowledge to many Virginia teacher in-service events over the past years. She helps provide on-site and outreach programs, including Physics Fest, for the students of local science teachers and has been a major facilitator of the regional Science Bowl competitions. Lisa's organizational skills and creativity are superb. She employs these skills in the very successful and long standing programs: Research Experience for Undergraduates (REU), Science Undergraduate Lab Internship (SULI), and Becoming Enthusiastic About Math and Science (BEAMS). The undergraduate opportunities incorporate collaboration with facility scientists and independent research with the goal of encouraging students to pursue physics. The BEAMS program challenges sixth and eighth grade students in hands-on and Inquiry lessons with the goal of creating scientifically literate citizens and increased enthusiasm for math and science. BEAMS targets "students at risk" and seeks to encourage under-represented minorities and females in the fields of science.

## **Outstanding Elementary Education Award**

### **Mindy Gumpert**

Mindy Gumpert is a special education teacher in Chesapeake, Virginia. She works in a co-teaching inclusive classroom. She has the desire to be the best teacher she can be for her students. As a teacher always involved in reflective practice, she noticed and boldly pronounced her weaknesses in teaching science. Since then, she has soaked

up everything science often asking for recommend readings from her courses or any of my interesting findings in the world of STEM education.

## **Outstanding Environmental Education Award**

### **Greg Corder**

Dr. Greg Corder presently serves as the lead teacher and coordinator for his middle school's award winning STEM Explorations Academy. Last year, he was tasked with integrating engineering design with middle school life science. Dr. Corder developed a rigorous and meaningful design-based curriculum centered around environmental science. One of the main project this year engaged students in the design and creation of a school garden that models a sustainable ecosystem. Specifically, the garden applies the principles of permaculture. At the beginning of the year, students designed, built, and tested composting systems to provide healthy soil to the garden. Students learned more on a field trip to a local community garden that uses permaculture principles. Dr. Corder was able to recruit volunteers from the local community farm to help with our project. Students worked together to plan the location and layout of the garden. To fund this project, he obtained thousands of dollars from multiple grants to purchase tools, seeds, plants, trees, and other supplies. Certainly, the garden has been a success and students are eager to apply their knowledge and experience in their own neighborhoods. In addition, parents and families will help maintain the garden during the summer. Next year, Dr. Corder is already planning a design project that will involve a food hedge, or fedge, for a local park's bike trail system that connect to our school.

Beyond the school ecogarden, Dr. Corder established other meaningful experiences that related to environmental science. For instance, students learned about the importance of bats and concerns about white nose syndrome. Then, they designed and built bat houses that will be placed in our city parks and community garden. Students inoculated logs with mushrooms and researched bioremediation techniques to use mushrooms to clean polluted streams. Students used GIS tools to learn about invasive species in Virginia and across the nation. At the end of our genetics unit, students researched the arguments surrounding GMOs and debated the issues. His students identify environmental issues and create video ad campaigns to raise awareness and solutions, and post those videos on a STEM YouTube channel. Most important, his students develop a deeper understanding of their role in and impact upon the environment.

# Donna Sterling Exemplary Science Teaching Award

## 2015 Elementary (K-6) and 2016 Secondary



VAST President Shirley Sypolt, Dana Sterling, Donna Sterling's daughter and Dr. Juanita Jo Matkins at the VAST PDI 2014.



Dr. Donna R. Sterling Teaching

***Dana Sterling, daughter of Donna Sterling, attended the VAST PDI in Roanoke and presented the first “Donna Sterling Exemplary Science Teaching Award” check to VAST for the administration of the Award. The first elementary winner will receive this prize in November 2015.***

Donna Sterling was a visionary science educator with a passion for working with science teachers and developing habits of inquiry-based teaching. Most recently, her leadership in the Virginia Initiative for Science Teaching and Achievement (VISTA) focused on elementary and secondary teacher professional development. This award recognizes that exemplary teachers engage in continuous improvement, and is designed to support a professional development plan for the improvement of science teaching. In 2015, the award will be given to an exemplary elementary teacher. The award will alternate between elementary and secondary in future years.

The awardee will receive a total of \$4000. In addition, travel costs will be reimbursed to attend the 2015 VAST PDI to receive the award and to the 2016 VAST PDI to present a session on the professional development experience and outcomes. The awardee will receive \$3000 at the VAST PDI in 2015. The remainder will be awarded after the awardee presents at the next VAST PDI and also submits an article to either the newsletter *The Science Educator* or the *Journal of Virginia Science Education*.

**Deadline for applications: July 15, 2015**

### **To apply:**

(1) In no more than two pages, single-spaced, describe an inquiry-based science unit that the applicant taught. Give evidence that the unit was effective. Evidence documents

such as student work can be submitted separately, and will not count toward the two-page limit.

In no more than two pages, single-spaced, describe the plan for professional development, using the funds received through the Sterling award. These plans may include summer courses, study abroad opportunities, instructional materials development under the guidance of experts on-site, etc. Submit the professional development description with anticipated outcomes, including plans for a presentation at the 2016 VAST PDI. Tell how this award will help the awardee become a better teacher of science.

(2) Submit three letters of recommendation based on direct observations of teaching. One letter must be from the science supervisor or someone serving in that capacity, a second letter must be from the principal, assistant principal, or instructional leader, and a third letter must be from a fellow teacher or a parent. Letters should address the following: Why is this teacher a good candidate for this award? What qualities do they exhibit as teachers that make the recommender think they will use the funds from the award to improve their practice as teachers of science?

All materials must be submitted by 5 pm on July 15, 2015.

Submit applications and letters of recommendation to Dr. Juanita Jo Matkins, [jjmatk@wm.edu](mailto:jjmatk@wm.edu)



## Westfield Marriott

**2015 Annual PDI**  
**November 19-21, 2015**  
**Westfield Marriott**  
14750 Conference Center Drive  
Chantilly, VA 20151

**We Need You!**  
**Submit Your**  
**Proposal to Present Today!**  
Submit a session proposal for  
the 2015 VAST PDI!

### Designing Inquiring Minds

“The hallmark of critical thinking is an inquiring mind. Good thinkers are good questioners. What they see, read, hear, or engage with results in questions.”

The 2015 VAST professional development institute (PDI) will give teachers more ways to encouraging the growth of an inquiry mindset in our students.

### Theme: Designing Inquiring Minds

#### Strands:

**Assessment For and Of Learning in Science**  
**Beyond Just Books**  
**Literacy and Science**  
**Instructional Strategies for Science**

#### Make Your Reservations Today

Online: Book your group rate:

VAST Professional Development Institute 2015

Phone: 1-800-228-9290

Check the VAST website for hotel  
reservation information

<http://www.vast.org/annual-pdi.html>

VAST session presentation proposals for the 2015 VAST Science Education Professional Development Institute to be held at the Westfields Marriott Washington Dulles, Chantilly in November may be submitted into the interactive form on the VAST website. Click here: <https://docs.google.com/forms/d/1b2VYIWeA7JX0iyrmx7IM2rwHILmi65cCDFOc5cuxIEU/viewform> or go to the PDI 2015 page and click on “Submit a proposal to submit”. <http://www.vast.org/annual-pdi.html>

Proposals must be submitted by **MAY 1, 2015**. Late proposals will be considered on a space-available basis. Presenters will be notified by **AUGUST 1, 2015**. All presenters are required to register and pay all fees for the PDI by **SEPTEMBER 5, 2015**. A special discounted rate is provided for up to four presenters per session. Presenters who do not register by **SEPTEMBER 5** will be dropped from the program.

**Note:** Commercial presenters must be registered as exhibitors and pay the \$150.00 session fee in addition to the standard exhibit fee.

**QUESTIONS?** Contact John Kowalski at [jkowalski@rvgs.k12.va.us](mailto:jkowalski@rvgs.k12.va.us).

#### Exhibitors!

Meet your customers at VAST  
Teachers, Administrators, Pre-K to grade 16  
Go to the VAST website for information!  
<http://www.vast.org/exhibitorInfo.html>

## Contrasting Worlds

One day the fields will be forever green  
The earth black, sweet and wet.  
Our children will grow tall upon that earth  
And our children's children...

And they will be free like mountain trees  
And birds.

Each morning they will wake happy to be alive  
And know the earth was claimed again for them.

One day...

Today we plough dry fields  
Though every furrow is soaked in blood.

–*Song of Hope*  
By Daisy Zamora

How often are we conscious of the contrast between the world of social, political and economic events and the other world where various major religions celebrate the shining of light into the solstice-induced darkness of early winter. Such contrasts compel us to scrutinize the very nature of reality. Whether in our schools' daily "pledge" or in our own religious promptings, we so often find our words speaking the ritual as our anxious minds rehearse daily agendas or events: The crowds busy buying before Christmas, rejecting and exchanging after the holiday; cars furiously passing others half a block away from those already stopped at a red light, jamming brakes in a sudden stop as though surprised everyone is not traveling at their pace [anecdotal evidence suggests a marked increase in frequency of brake repairs and replacement in the past ten years or so]; the pleasant though helpless smile of the man who opens a space to let a car through, immediately followed by a fellow in a Chevy Force flipping the bird as he jams between two other cars, narrowly missing each by inches; we murder black males and children and think assassinating policemen provides a solution to racial tensions; we comfortably insulate ourselves in homes and vehicles forgetting the shivering and homeless persons outside us; we gift others from compulsion rather than from the heart as obligation trumps need; we endure seeming endless political posturing while the genuine needs of citizens go unmet. Art Alexakis in his pop song, *Santa Monica*, puts it this way: "We can live beside the ocean/ Leave the fire behind/ Swim out past the breakers/ Watch the world die/ Yeah watch the world die."

\*\*\*\*\*

"How does one become a butterfly?"  
Pooh asked pensively.  
"You must want to fly so much that  
you are willing to give up being a  
caterpillar," Piglet replied.  
"You mean to die?" asked Pooh.  
"Yes and no," he answered. "What  
looks like you will die, but what's  
really you will live on."

– A.A. Milne

Ten years ago when one of the world's greatest tsunamis struck from Indonesia to India, there was contrast of another sort as people across the globe overcame many divisions of geography and nationality to provide physical, economic, and spiritual aid to nations who had lost hundreds of thousands of lives.

And yet another tragedy had befallen two months prior to that as Irish-British-born Margaret Hassan, a 30-year resident of Baghdad, Iraq, was kidnapped and brutally murdered. I have two riveting photographs of her: one a genuinely smiling face in her work with CARE International, the other, from Al-Jazeera, genuinely anguished and pleading for the release of Iraqi prisoners in exchange for her life. One would hardly believe both pictures were of the same woman. She was executed the next day.

Margaret Hassan was a symbol for international humanitarian aid at its best and her devotion to the Iraqi people was shown in her marriage and in her commitment to the people of that war-ravaged country. British Foreign Secretary, Jack Straw, had commented, "To kidnap and kill anyone is inexcusable, but it is repugnant to commit such a crime against a woman who has spent most of her life working for the good of the people of Iraq." An American Friends Service Committee representative pointed out that "the blurring of distinctions between political action and true humanitarian work in Iraq has led to one of the greatest tragedies of all: the crippling – if not the complete demise – of the international aid community there." Following withdrawal of the AFSC from Iraq came the departure of CARE and Doctors Without Borders and others.

\*\*\*\*\*



Listen to the words of the internationally-acclaimed artist, Makoto Fujimura, which he spoke at the commencement of Messiah College in Pennsylvania in 2013, recounting a story told him by a musician friend in Japan<sup>1</sup>:

“A girl in northern Iraq ran toward a bunker with her father. A Japanese photographer was capturing this unfolding drama on the front lines of the war, and he followed the girl with his camera until she was safely behind the bunker. But as he put his camera down, he noticed a look of horror on her face.

“She realized that as she was running away from the bullets, she had stepped on a flower. Before anyone could say or do anything to stop her, she let go of her father’s hand, and she ran back to the flower, knelt down, and she tried in vain, to restore the flower by holding it up in her little hands.

“As she tried to resurrect beauty, a cruel stray bullet pierced her body. She fell crumpling on top of the flower.

“In Iraq, a flower is a rare, esteemed emanation, a gift to cherish. This girl valued a flower so much so that she risked her life, and lost her life, for a single flower. In a desert culture, a flower represents life itself. In a war-stricken land, a flower may even be a cruel reminder of beauty in the midst of human brokenness – an ephemeral vision that is ever-Present, being trampled by us as we try desperately to save our lives.

“In his novel, *The Idiot*, the 19th Century Russian writer Dostoevsky wrote a line that people have been puzzling over ever since: ‘Beauty will save the world.’ ...In that enigmatic statement, we must understand that beauty is also sacrifice. Every beauty is sacrifice. The sun is dying. Cherry blossoms fall...

“This girl, by turning back toward the path of danger, rather than running into safety, graduated. She graduated from the horror-stricken world full of bullet holes. She graduated toward beauty and sacrifice.

“Now, you might say that what she did was foolish – that her sacrifice was unnecessary. But you cannot say that what she did was not genuine. It is my humble opinion that authenticity counts more than pragmatic performance and survival. Authentic self runs toward beauty. By losing ourselves, we can finally find ourselves. I contend that this girl was not foolish. No. She recognized in the world something to cherish, something worth risking her life for.

“Her small act – which would have disappeared from the world unnoticed, had it not been for a witness of a Japanese photographer – is an antidote to those who desire to pave the path to expand the Ground Zeros of the world – to those who see violence as the only means to an end.

“Her life represents a refusal to live without beauty. So she graduated *toward* beauty. And she left the world of violence, the world of discord behind her.”

\*\*\*\*\*

How do you measure the immeasurable? How do you see the invisible amid all the clumsy clutter of ourselves separating us? When “every furrow is soaked in blood” how can we ensure that “our children will grow tall upon that earth, and our children’s children?” [Daisy Zamora is a Nicaraguan poet, past member of the FSLN, struggling against the Samosa regime in the 1970’s, later Vice

Minister of Culture in the new Sandinista government.] Beauty does seem so elusive, unless we photograph it in our hearts and help our young people to see and encourage it amid all the somber contrasts and tragedies which surround us. One hundred years ago this spring the battle-scarred surgeon-poet, Major John McCrae, had written: “In Flanders fields the poppies blow... Take up our quarrel with the foe: / To you from failing hands we throw / The torch; be yours to hold it high...” And Brahms set Friedrich Schiller’s poem to music in his *Nänie*: “Auch das Schöne muß sterben... Even the beautiful must perish... the most perfect passes away. / but a lament on the lips of loved ones is glorious...”

As Makoto Fujimura has observed, the struggle is really one between superficiality, imposing one’s will, and authenticity and risk. The Iraqi girl’s small act of care and sacrifice finds echoes in the small triumphs each of us can make in our own world and lives. A.A. Milne’s wisdom reminds us that what is authentic lives on beyond what looks like death. In my own circle of friends, two very different ladies who made a difference in my life passed away on the very same June day this past year, both having lived beyond the century mark. But in numerous ways they live on in the lives of family, students, and friends.

A half-century after the historic Civil Rights Act, as journalist Cynthia Tucker noted, a first-generation Ghanaian-American was accepted at *all* of the Ivy League colleges largely, she conjectures, because his parents focused on the opportunities he had before him rather than any “racism prompted by the color of his skin.” In this sense the search for beauty and authenticity succeeded in spite of the atmosphere of hatred or prejudice which Kwasi Enin may have encountered.

On a summer’s day along the highway near New London, New Hampshire, a man in shorts and T-shirt had pulled over his car and was in the process of picking up roadside trash and depositing it in a plastic shopping bag. No one would notice, no one had paid him; whatever the motive, one might say he was responding to his own sense of beauty and care.

We are jarred so often by the contrast between conflicting worlds, and yet we have complete control over the world view which we embrace with our lives. Margaret Hassan, a small Iraqi child, and those sometimes baffling people we meet in shops or automobiles have their own unique message. How we respond tells us and others how we measure the immeasurable, in spite of all that clumsy clutter which separates us.

As Lane Weller has written in *The Breathable Air*:

“A man might search his life away for something meaningful – success perhaps. But joy is in doing the thing that’s needed at the moment, and doing it well and without fear and with something like love.”

- 
1. Fujimura, Makoto. 2013. Messiah College Commencement Address. [www.makotofujimura.com](http://www.makotofujimura.com). Used with kind permission.

*George*

A VAST Life Member, George Dewey is a former VAST President and former NSTA District VIII Director. He teaches physics in Fairfax County, NBCT since 1999. He can be reached at: [george.dewey@fcps.edu](mailto:george.dewey@fcps.edu).

**Save the Date!**

## **Announcing the 2015 VAST PDI!**

**When:** Thursday November 19 to Saturday November 21, 2015

**Where:** Westfields Marriott Washington Dulles,  
14750 Conference Center Drive, Chantilly, Virginia

MAKE SURE YOU SHARE THIS NEWSLETTER WITH YOUR **PRINCIPAL** BECAUSE OUR PRECON AND FUTURE SPEAKERS WILL HAVE ADDED VALUE FOR THEM....

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VIP VP

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“V-I-P” stands for the Virginia Instructors of Physics -and physical science. Since 1988, VIP has been a less than non-profit organization sponsored by the University of Virginia’s physics department and the Virginia Association of Science Teachers. It is an organization for all levels of physics and physical science education in the state of Virginia. Its purpose is to end the isolation felt by so many high school physics and physical science teachers. (As many physics teachers are the only ones in their county.) This is done through the University of Virginia’s sponsorship of an annual meeting, an e-mail listserv, a printed newsletter that comes once a year and support for the VAST through the sessions we present. Membership is free to all educators teaching in the state of Virginia.

We sponsor several sessions each November at the Virginia Association of Science Teachers Professional Development Institute. We maintain a website dedicating to physics tips, tricks, tools, activities, and help. VIP runs an e-mail list serve and sends out a print newsletter each spring. In

April or May we meet at the University of Virginia’s physics department where we elect officers and run hands on sessions in the afternoon.

### Educators can join VIP for free.

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Images credit: NGC 3393 in the optical (L) by M. Malkan (UCLA), HST, NASA (L); NGC 3393 in the X-ray and optical (R), composite by NASA / CXC / SAO / G. Fabbiano et al. (X-ray) and NASA/STScI (optical).

## Minor Mergers Have Massive Consequences for Black Holes

By Dr. Ethan Siegel

When you think of our sun, the nearest star to our world, you think of an isolated entity, with more than four light years separating it from its next nearest neighbor. But it wasn't always so: billions of years ago, when our sun was first created, it very likely formed in concert with thousands of other stars, when a giant molecular cloud containing perhaps a million times the mass of our solar system collapsed. While the vast majority of stars that the universe forms—some ninety-five percent—are the mass of our sun or smaller, a rare but significant fraction are ultra-massive, containing tens or even hundreds of times the mass our star contains. When these stars run out of fuel in their cores, they explode in a fantastic Type II supernova, where the star's core collapses. In the most massive cases, this forms a black hole.

Over time, many generations of stars—and hence, many black holes—form, with the majority eventually migrating towards the centers of their host galaxies and merging together. Our own galaxy, the Milky Way, houses a supermassive black hole that weighs in at about four million solar masses, while our big sister, Andromeda, has one nearly twenty times as massive. But even relatively isolated galaxies didn't simply form from the monolithic collapse of an isolated clump of matter, but by hierarchical mergers of smaller galaxies over tremendous timescales. If galaxies with large amounts of stars all have black holes at their centers, then we should be able to see some fraction

of Milky Way-sized galaxies with not just one, but multiple supermassive black holes at their center!

It was only in the early 2000s that NASA's Chandra X-ray Observatory was able to find the first binary supermassive black hole in a galaxy, and that was in an ultra-luminous galaxy with a double core. Many other examples were discovered since, but for a decade they were all in ultra-massive, active galaxies. That all changed in 2011, with the discovery of two active, massive black holes at the center of the regular spiral galaxy NGC 3393, a galaxy that must have undergone only minor mergers no less than a billion years ago, where the black hole pair is separated by only 490 light years! It's only in the cores of active, X-ray emitting galaxies that we can detect binary black holes like this. Examples like NGC 3393 and IC 4970 are not only confirming our picture of galaxy growth and formation, but are teaching us that supermassive relics from ancient, minor mergers might persist as standalone entities for longer than we ever thought!

-----

Check out some cool images and artist reconstructions of black holes from Chandra:

<http://chandra.harvard.edu/photo/category/blackholes.html>

Kids can learn all about Black Holes from this cool animation at NASA's Space Place:

<http://spaceplace.nasa.gov/black-holes>.



**Question your world.**



[www.smv.org](http://www.smv.org)

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# VAST PDI NOVEMBER 2014, Roanoke, VA



Region III co-directors, Sherrie Roland and Leslie Lausten, take a selfie before their session on *"Integrating Science and Literacy"*



VAST President, 2014, Shirley Sypolt, passes the gavel to Dr. Jenny Sue Flannagan who is the new VAST President for 2015.



A plaque is awarded to VAST President, 2014, Shirley Sypolt, in gratitude for her service.



The newly elected VAST Officers were introduced at the PDI. President Elect (2015) who will become President in 2016 - Kathy Frame; Secretary - Robin Curtis; Region 2 Director Adrienne Sawyer; Director Region 4 - Susan Bardenhagen; Director Region 6 - Tom Fitzpatrick, Director Region 8 Pam Aerni

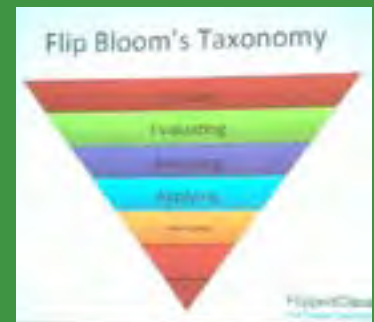
# VAST PDI NOVEMBER 2014 General Session Speakers



Carol Tomlinson spoke on *Differentiation and Mindset*. She described the different outcomes achieved when teachers and parents had Growth mindsets rather than a Fixed mindsets.



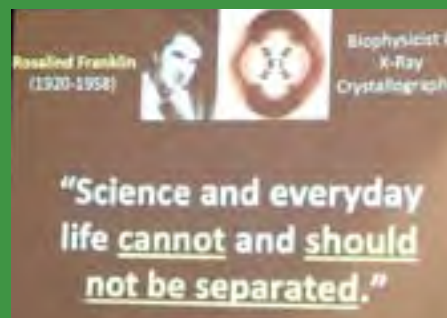
Jonathan Bergman urged teachers to “Flip “ their classrooms . The result was to give individual students more teacher guidance when they needed it rather than using class time for activities students could do independently.



Andres, How long was that snake?



Andres Ruzo inspired educators to inspire their students every day.



Andres, included these words on a slide by Rosalind Franklin whose photos inspired Watson and Crick .

# VAST PDI 2014 Award Ceremony



**VAST Awardees and the NABT Virginia Outstanding Biology Teacher Award**  
 Elementary : Mindy Gumpert — Middle School : Luzdary Chamorro — Environmental : Greg Corder  
 Physics : Rachel White — University Science Educator: David Slykhuis, JMU  
 Community Partnership - Lisa Surles-Law, Jefferson Lab — NABT Virginia: Richard Strauss



Tim Couillard & Dr Wright

**Science Education  
 Lifetime  
 Achievement Award  
 Dr. Patricia Wright**

**Outstanding Leadership  
 in  
 Science Education  
 Dr. Linda Wallinger**



Tim Couillard & Dr Wallinger

**PAEMST Awards**

**Presidential Awards  
 for Excellence in  
 Mathematics and Science  
 Teaching:  
 Virginia Finalists**



**Ryan McKinney**

**Barbara –Ann Adcock**

**Susan Eckenrode**

See pages  
 9-10 for more  
 on Awards

Table of Contents

# VAST PDI \* NOVEMBER 2014

More than 900 teachers, 130 sessions, 50 exhibits, music and a science auction, door prizes, VAST annual meeting and five general sessions with five nationally famous speakers! Thank you all you wonderful partners in Science Education who help sponsor our event.



Delta-FOSS exhibit saw many teachers and administrators.



NASA Exhibit provided many materials to bring to students.



Ron Shaneyfelt provided music & entertainment during the Friday auction.



Conference participants waiting for a session on "Integrating Science and Literacy in the Elementary Grades".



Frey representatives assist a teacher at their exhibit.



The Virginia Space Grant Consortium sponsored Dr. Tomlinson. Chris Carter gave the introduction.



The Science Museum of Virginia exhibit provided information to help teachers plan museum field trips.



# “Working Together to Promote Quality Science Education”

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

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Region 2 has a new Facebook page. Please visit and join our community at:

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Please consult the website for up to date information, VAST forms for awards and mini-grants, advertising and current PDI information. [www.vast.org](http://www.vast.org)



### VAST is a comprehensive educational organization dedicated to the nurturing and advancement of superior science education.

A. The objective of VAST shall be to advance the study of science, to promote excellence in the teaching of science, and to provide an opportunity for communication among science educators in the Commonwealth of Virginia.

B. Mission Statement: On October 19, 1991 the Advisory Board (henceforth the Board of Directors) developed the following statement:

"The Virginia Association of Science Teachers is a comprehensive educational organization dedicated to the nurturing and advancement of superior science education. VAST provides leadership by:

1. promoting the study of science at all grade levels;
2. supporting conditions which ensure an optimal environment for the teaching of science;
3. advocating high quality science instruction for all students at all levels; and
4. providing an avenue for communication among the members of the science teaching community."

This Mission Statement was reaffirmed on July 29, 2000 and March 8, 2014.

**Please update any changes in your P.O. or e-mail addresses by sending in a new membership form as an update. P.O. will not forward the newsletter.**

**Please send articles, letters to the editor, or labs by the submission deadline, March 1, 2015, for inclusion in the next digital VAST Newsletter.**

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