# Virginia Scientists

Volume XXVI, Issue 2 Fall 2020

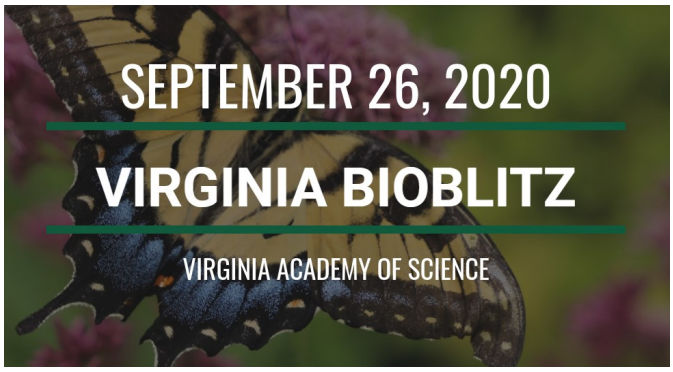
***"Virginia Scientists"*** is the official newsletter of the Virginia Academy of Science (VAS). This publication offers information for VAS members such as upcoming events, past events, scholarships/ awards information, accomplishments of VAS members and other timely information.

**Editors:**
Sujan Henkanaththegedara
Deborah Neely-Fisher

**Inside this issue:**



## Join Virginia BioBlitz 2020 on September 26




The Virginia Academy of Science (VAS) is organizing a Statewide BioBlitz, Virginia BioBlitz 2020, to promote exploration, discovery, citizen science, and conservation. Come join us to survey the biodiversity in every part of the Commonwealth. This is a VIRTUAL EVENT facilitated through iNaturalist, so, you can join from home or anywhere else in Virginia! This event is open to anyone willing to spend some time outdoors, explore biodiversity and learn more about species living around you.

We welcome toddlers, K-12 students and teachers, scouts, college students, wildlife professionals, scientists, naturalists… anyone! All it requires is registration at our website, download iNaturalist App into your smart phone, join the Virginia Bioblitz iNaturalist project and reporting species around you! *…cont'd. P.2*

## President's Message

I am honored to serve as the President of the Virginia Academy of Science for 2020-21 and am humbled to be serving during what is one of the most tumultuous years in the history of our Academy. The COVID-19 pandemic forced us to cancel our traditional annual meeting in 2020, has moved our Fall Undergraduate Research meeting to a virtual platform, and has forced us to reconsider everything that we do both personally and professionally in the name of the public safety and health of the Commonwealth. While we do not as of yet know when this threat to the public health will subside, we can take comfort in the fact that our Academy can play a part in helping the people of Virginia to be educated on their health and safety while developing critical roles in scientific education and outreach that will long outlast this pandemic.

As the Academy rapidly approaches its Centennial year in 2023, it is critical that we step back and not only celebrate our history of service to the scientific enterprise of Virginia but also to assess our current position amongst the many state and national scientific organizations serving Virginia's scientists and to chart a course forward that allows this Academy to continue to play a vibrant role in the Commonwealth. While the research enterprise will always occupy a central role in the operations of the Academy, it is clear that several national-level professional societies have largely subsumed the role that we have played for several decades as a primary platform for this research. This presents an exciting but uncertain opportunity for us as an Academy: what roles can and should we fill to remain a vibrant and relevant force for the scientific life of the Commonwealth?

It is here where the perils of COVID-19 unite with the shifting face of our Academy's purpose. As an Academy, we must do all we can to support the continuation of science education and advocacy for the citizens of the Commonwealth in these trying times. I am pleased to report that we are taking strong action in response to this challenge. The Academy is sponsoring a statewide campaign called Virginia Bioblitz to engage the students and citizens of the *…cont'd. P.7*

**Michael J. Wolyniak**
**President, VAS**

## VAS 2021 Annual Meeting

As with everything in the current times, there is uncertainty regarding our plans for the 2021 Virginia Academy of Science Annual Meeting. James Madison University in Harrisonburg, who were slated to host us and the Virginia Junior Academy of Science in 2020 prior to the COVID-19 pandemic, have graciously offered to defer their invitation to us to 2021, and we sincerely hope we will meet in person in Harrisonburg this coming May. If the pandemic's biological or economic effects force us to once again cancel the meeting, we will press forward with a virtual gathering. Stay tuned as we work out our plans in response to the continuing public health crisis, and rest assured that we will gather as an Academy in one form or another in 2021.

The 2020 Fall Undergraduate Research meeting has been scheduled for November 7, 2020 at Hampden-Sydney College. The organizers are already planning for a variety of formats for this meeting depending on the state of the COVID-19 pandemic in the fall. Regardless, the meeting stands to once again provide the Commonwealth's undergraduates with an outstanding way to gain professional presentation experience, learn more about prospective STEM careers, and gain financial support for their research efforts.

Submitted by **Michael J. Wolyniak**

President, Virginia Academy of Science
Associate Professor of Biology, Hampden-Sydney College

## 2020 Fall Virtual Undergraduate Research Meeting hosted by Hampden-Sydney College

Due to COVID-19, this year's annual Fall Undergraduate Research Meeting is being held virtually for the first time. It will be hosted by Hampden-Sydney College on November 7, 2020. Begun in 2001, the meeting is designed as a way for undergraduate scientists from across the Commonwealth to prepare research posters and compete for $500 grants in support of their ongoing research. Winners of these grants will present their final projects in May at the Virginia Academy of Science Annual Meeting to be held in 2021 at James Madison University.

Thanks to the generosity of the Academy, at least 5 grants are expected to be awarded at the Meeting this year. Other highlights include a keynote presentation from Dr. Sujan Henkanaththegedara of Longwood University on his research in conservation biology, and a career panel featuring scientists in academic, government, and industrial positions.

Submitted by **Amorette Barber**

President-Elect and The Program Chair for the 2020 Fall Undergraduate Research Meeting,
Virginia Academy of Science
Associate Professor of Biology, Longwood University

## Virginia BioBlitz 2020 *Contd. from P 1*

**When:** Saturday, September 26
**What:** Virtual Kickoff event at 9:00am (check website for Zoom link)
**Where:** Anywhere in Virginia
**Why:** Use iNaturalist to find as many species as you can for at least 30 min.

You can find more information and register at Virginia BioBlitz website at **https://sites.google.com/view/virginiabioblitz/**.

Please spread the word to your family, friends, students and neighbors. We are counting on you to find and record every species in our beautiful state. If you have any questions, please contact us at vabioblitz@gmail.com.

Submitted by **Sujan Henkanaththegedara**

Treasurer, VAS, and Program Chair for Virginia BioBlitz, Associate Professor of Biology, Longwood University

# Virginia Scientist in the Spotlight

**"Virginia Scientist in the Spot-light" series introduces scientists in Virginia covering various scientific disciplines. Our guest scientist for this issue is:**

## Gary D. Isaacs

**Affiliation:** Professor of Biology, Department of Biology & Chemistry, Liberty University, Lynchburg, VA

**Education:** I was a pre-Med major at Liberty University from '95-'99. It was during this time that I fell in love with the State of Virginia. Growing up in the state of Delaware, I was not familiar with the amazing views of rocky, river paths or sunsets behind mountains. I became awe-struck by the beautiful skyline of mountains, especially in the fall time. After leaving VA with my B.S. degree I taught high school biology and chemistry for 3 years. It was during this time that I realized my love for teaching science and how fun the 'pursuit of knowledge' could actually be.

I spent the next six and a half years in upstate NY where I earned my Ph.D. in Biochemistry, Molecular & Cellular Biology (2002-2008). My research focused on the mechanisms by which estrogens activated the transcription of genes in breast cancer. As my time at Cornell University was drawing to an end, I knew I wanted to continue my research pursuits as an extension of my goal to be a science teacher. I joined the faculty at Liberty University as the genetics professor in January 2009 where I am currently working. Although I am no longer pursuing additional science degrees I will always be a student of science!

**Your teaching/classes?**
I teach a variety of courses at LU with undergraduate genetics (BIOL301) being my main course. I also teach a graduate course (BIOM503) that focuses on epigenetic mechanisms in humans as part of the MS/Ph.D. program. I mentor 2-3 undergraduate research students each year as part of a Directed Research course (BIOL495) where we focus on my current research interests as a team. This is a very rewarding course as many of my students stay with me for 2 years as they work on their research project. Over the past few years I have had the opportunity to take on my first Ph.D. student serving as her project leader and research mentor (BIOM889/890). Looking over all these courses, I get to use research as a teaching tool to educate both large groups of students and a small research team.

**Your research? Past and current projects?**
Overall, my research interests deal with the epigenetic modifications that are associated with human disease states. Specifically, I focus on DNA methylation and the role that plays in regulating gene expression in the brain. As for my past research projects with students, several have resulted in publication so I will just mention those projects briefly.

The first project focused on identifying the DNA methylation patterns associated with neuronal cells in the presence of amyloid beta (the insoluble plaques in the brain of Alzheimer Disease (AD) patients). Using a microarray-based protocol, we compared methylation sites of these neurons with and without the AD-associated peptide. Interestingly, we found the methylation pattern of these AD-like cells resembled the methylation pattern of undifferentiated neurons which suggest an epigenetically similar pattern between AD and cancer (1).

Our second project stemmed from the need to identify cytosine methylation levels in various tissue samples. A review of the literature demonstrated a method to separate cytosine and methylated cytosine using an HPLC-based procedure but a technique for separating these molecules from other modified forms found in vivo (like hydroxymethylated cytosine) was not described. Using purified standards for various cytosine

derivatives, we demonstrated an HPLC-based approach that could resolve the 5 main cytosine forms that constituted the methylation pathway. Our findings also suggested that previous calculations of cytosine methylation ratios might be biased to inappropriately favor the unmodified form (2).

We just finished our third project which examined the effects of folic acid on cognition and gene expression in the brain. Briefly, we compared the behavior of mice on a folate-free or control diet and determined that mice without nutritional folate have significant cognitive impairment relative to their control counterparts. These differences were noted both at 4mo and 18mo. We examined the gene expression profiles in the hippocampus of these mice and determined the folate regulated genes associated with cognitive decline. This study also identified two transcription factor binding sites that were associated with the altered genes suggesting a folate dependent mechanism for controlling gene expression of these genes (3).

1. Taher N, McKenzie C, Garrett R, Baker M, Fox N, Isaacs GD. Amyloid-beta alters the DNA methylation status of cell-fate genes in an Alzheimer's disease model. J Alzheimers Dis. 2014;38(4):831-44.

2. Roberts CE, Raner GM, Isaacs GD. High Performance Liquid Chromatography Separation of Epigenetic Cytosine Variants. Methods Protoc. 2018;1(2).

3. Abigail Lawton , Caroline R. Morgan, Caleb R. Schreiner, Chris G. Schreiner, Jacqueline Baumann, Britton Upchurch, Feifan Xu, Michael S. Price and Gary D. Isaacs. Folate-dependent cognitive impairment associated with specific gene networks in the adult mouse hippocampus.
Front. Nutr. - Neuroenergetics, Nutrition and Brain Health; currently under review

*...Contd. P7*

***"Be open to serendipity! Many of what I believe to be the coolest times in science trace back to an experiment NOT working out the way we thought it would."***

***-Gary D. Isaacs***

## Science Education Committee
## Classroom Mentoring Initiative Update

The Academy's Science Education Committee launched a new mentoring initiative in the 2019-20 academic year with the intention of getting Academy members more involved in the science education activities of the Commonwealth's middle school and high school classrooms. Academy members serve as mentors for long-term research projects designed in conjunction with middle and high school classroom instructors who wish to develop more sophisticated scientific challenges for their students. The products of these projects may be entered into the Virginia Junior Academy of Science's annual competition as well as partially fulfill the requirements for the Virginia Department of Education's new Seal for Excellence in Science and the Environment program available to students starting in the high school graduating class of 2022.

In its pilot year, the program placed six Academy members with middle and high school classes. These collaborations were showing strong signs of developing strong new partnerships between the students in these classes, their instructors, and Academy members when the COVID-19 pandemic disrupted plans across the board. For 2020-21, the Academy is using the pandemic as inspiration to expand this initiative. With the Junior Academy of Science in need of support for continuing scientific research in the Commonwealth's classrooms in a time when many are online for the foreseeable future, the Science Education Committee is working closely with the Junior Academy to promote virtual long-term mentorships that can promote research initiatives that can be done effectively on a remote basis. So far, the Committee has created 13 partnerships, and requests for mentors and to become a mentor continue to roll in. The Academy is excited to be sponsoring this education-focused initiative and to be promoting new varieties of research projects to be featured at the Junior Academy's May 2021 meeting.

Submitted by **Michael J. Wolyniak**

President, Virginia Academy of Science
Associate Professor of Biology, Hampden-Sydney College

## Progress Report on the History of the Science Museum of Virginia Project

Ms. Kasey Sease completed and submitted her manuscript on the history of the Science Museum of Virginia, titled "More Than a Building on Broad Street: A History of the Science Museum of Virginia, 1910-2017". The project was completed within budget. The manuscript was reviewed by persons familiar with various aspects of the history of the Science Museum of Virginia and found to be accurate and well-written. The manuscript was then converted into an online HTML document and a pdf version, which are available for use at https://vacadsci.org/publications/smv-history-table-of-contents/ on the VAS site. While the project is currently on hold in terms of further expenditures due to budget constraints, Dr. Walter Witschey has generously volunteered to work at no cost to VAS to integrate images that he and Ms. Sease have located into an illustrated version of the SMV History edited into a book format pdf.

Reported by **Art Conway** and **Conley K. McMullen**, co-chairs of the committee

## Joint efforts from the Science Advocacy Committee and the Junior Academy Promote Vaccination Literacy for Middle School Students


The Academy and Junior Academy are working together with Dr. Edward Lewin, a Research Professor at the Georgetown University School of Medicine, to implement a research study that seeks to examine the efficacy of using YouTube instructional videos as a means to promote literacy on the importance of vaccination to middle school students. With vaccination rates alarmingly decreasing across the country among several segments of the population, Dr. Lewin and his colleagues believes that these videos (available at https://www.youtube.com/channel/UCk1afYat8W-WVoosNEc2IfQ) provide a unique opportunity for discussion about vaccination in both a family and classroom setting. Dr. Lewin is using a series of short quizzes with students who have and have not seen the videos to see if they are having a positive effect on vaccine literacy. According to Dr. Lewin, "There is no better time to realize the power of vaccination to help terminate a public health disaster than the administration of a proven safe and effective vaccine as a means of helping to terminate this devastating pandemic caused by COVID-19. With the clear, uncontaminated vision of children to see the truth they are the essence of this effort. It is their time...." The leadership of the Junior Academy of Science is working with Dr. Lewin to identify interested classrooms across the Commonwealth to take part in this initiative.

To accompany this initiative, the Academy's Science Advocacy Committee is preparing an official Academy statement of support for public vaccination efforts. The Committee hopes to have a resolution prepared for adoption by the Academy's Council at their Fall meeting for public dissemination by the end of 2020.

Submitted by **Michael J. Wolyniak**

President, VAS
Associate Professor of Biology, Hampden-Sydney College

## 2020 Virtual VJAS Annual Meeting & Special Awards

Incredible efforts precede the submission of a research project to the Virginia Junior Academy of Science, and in fact require a commitment from the student, parent, teacher, school sponsor and the school and school division. Despite COVID-19, the Virginia Academy of Science and its Junior Academy wanted to recognize these commitments, although in a different manner than in prior years. Fortunately, students' research papers had been received prior to school closure and the existing procedure was modified to use the research paper as the basis for recognizing students' research projects.

Student research papers in 31 different sections (12 middle school sections and 19 senior high school sections) were reviewed by a team of VJAS Readers. Each reader scored the quality of the abstract, introduction, methods/materials, results, discussion/conclusion and overall quality of the written paper. Previously, the scoring criteria were published in the VJAS Handbook. Based upon scores and readers' recommendations, students were "accepted" for the 2020 Virtual VJAS Annual Meeting. On April 15, Accepted Papers were published on the VJAS Website.

Each accepted paper was reviewed by a team of VJAS Judges. In addition to the written paper, these judges considered the quality of the problem and its importance for the STEM discipline. Judges looked for evidence that the student did the work, understood the project, and was interested and invested in the project. Overall, judges looked for high quality projects for the age, educational background and work environment available to the student.

On Thursday, May 28, at 7:30 pm, a Virtual VJAS Awards Ceremony was held. For each of the sections, awards were made for first, second, third and honorable mention. The ceremony was live-streamed via YouTube, with the link available on the VJAS home page (www.vjas.org). After the ceremony, winners for each section will be posted on the VJAS website.

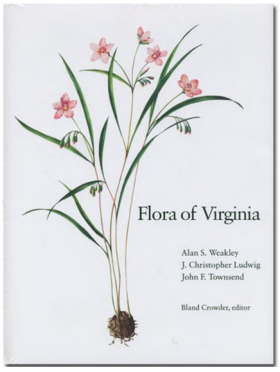
In June, all first place papers will be reviewed by designated teams of special judges. These judges will determine winners of various special awards and scholarships. The VJAS leadership expects to announce these -tual VJAS Special Awards Ceremony. Look on the VJAS website for the announcement of the date, and if you miss it, check out the listing of top award winners.

The 2020 Virtual VJAS Annual Meeting and Special Awards Ceremony reflect the leadership, ingenuity and hard work of the VJAS Leadership Team, as well as the readers, judges and special judges who adapted and used different strategies to make these events possible. The VJAS Leadership Team includes Susan Booth, Director; Robin Curtis, Associate Director; Se Jeong, VJAS Committee Chair; and, Mike Lovrencic, VJAS Committee Vice-Chair. These leaders created a workable solution by consulting with the Virginia Academy of Science, VJAS Student Officers, participating teachers and schools, and sponsors of various scholarships and awards.

Submitted by **Julia H. Cothron**

VJAS Representative to VAST Board and Chair of Special Judges

# UPDATE - Flora of Virginia

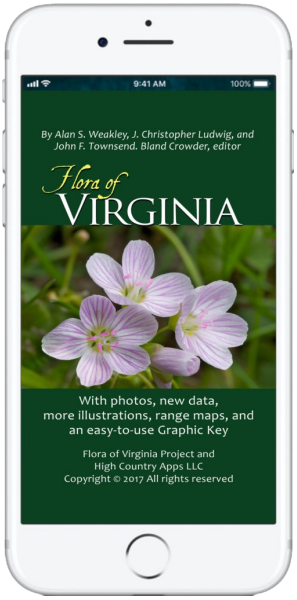



Work continues on the Flora of Virginia, despite the pandemic. Many changes are being made that will help us ***Keep the Science Current.***

For the first time since the Flora was published in 2012, we are adding treatments—for nearly 200 new species, as well as new families and genera. These changes will come out in December in a major update to the Flora of Virginia Mobile App, which we released in 2017. Some are new discoveries. Others are species that in the manual are not described but are listed as waifs—nonnatives documented for Virginia but thought not to have naturalized. That picture has changed for a number on that list.

In July, Sally Anderson, who represents the Virginia Native Plant Society on the Flora Project Board, and I gave a Zoom presentation to Northern Virginia members of the VNPS, offering an overview of the Flora Mobile App and the use of the Graphic Key. Both of us are members of the Flora Project's Education Committee, which is creating learning modules based on the print Flora and the App. These can be presented in person or online, on Zoom, for example. Our committee meets on Zoom, as do other committees of the Flora Project. Our recorded presentation can be found here: https://tinyurl.com/FloraTour-Zoom.

To accomplish this major update by the end of this year, funding is still very much needed to support work being done by the editor, the writer of new dichotomous keys (who often must also rework existing keys), and creators of new species descriptions. We also must cover programming and coding by our developer, High Country Apps.




With the distractions and crises of the Covid-19 pandemic, political campaigns, social concerns, and environmental issues, it is not the ideal time to seek individual donations for this major step. But we must ask.

Please make a donation in support of this vital work. You can give via PayPal at https://floraofvirginia.org/donate/donations/, on the Flora Project's website. Or you can mail a check to the Flora of Virginia Project, P.O. Box 512, Richmond, Va. 23218-0512.

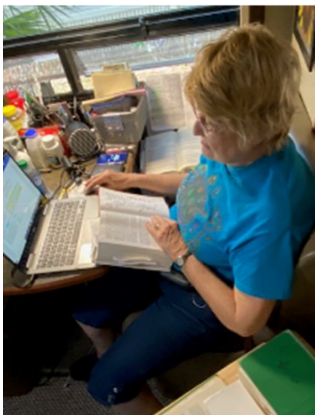
Please remember, the VAS is a valued designated partner of the Flora Project and has always been behind the effort. The goal of supporting the development for a modern flora dates to 1926, when the Academy established its Committee on Virginia Flora, in only its third year of existence.

The financial support of the Academy and its Fellows has been critical to the success of the Flora of Virginia and the Flora Mobile App. The App, which costs only $19.99 for either Android or iOS smart phones or tablets, contains all of the information found in the print Flora but uniquely offers photographs, additional illustrations, county dot maps from the Digital Atlas of the Virginia Flora, an easy-to-use Graphic Key, data on rare and invasive species, and tips on how to use the Graphic Key to select native plants for a garden or landscape. Updates to the App are free. And as much as I still use and value my print Flora, I also depend on and enjoy using my App.

Submitted by **Marion Lobstein**

Vice President, Foundation of the Flora of Virginia Project Inc.
Charter Member, Virginia Native Plant Society
Member, VAS Botany Committee

Marion writing descriptions for



incoming species, socially distancing in our RV office in March. (Photo by George Lobstein)

## Virginia Scientist in the Spotlight *Contd. from P 3.*

**Hobbies:**
My current hobbies include trout fishing and deer hunting. I love being in the woods so these activities are as much an excuse to get outside as they are to observe wildlife. Although I enjoy fishing near my home in Amherst County, my favorite trout fishing adventures are always in southwestern portion of the state in the town of Marion. I also enjoy being a handyman and working on the house, as well as, learning more about car maintenance as I work on the family vehicles.

**Advice for students?**
"Be humble, ask questions, and don't be satisfied with simple answers." Students sometimes think that they are the only ones who are confused by a scientific process, or they that when something is 'known,' it means there is nothing left to discover about that topic. Both of those thoughts are completely wrong. They have so much to offer to the scientific community (which includes their professors) by their questions and their pursuits into the deeper unknown.

**Advice for peers?**
"Be open to serendipity!" Many of what I believe to be the coolest times in science trace back to an experiment NOT working out the way we thought it would. Each of the three projects I mentioned above contained at least one conclusion that I didn't see coming. Sometimes we have difficulty thinking outside the box as we plan experiments, so we really need to be ready when those "serendipitous results" are staring us in the face.

**When did you join VAS?**
I joined VAS in 1999 as a senior undergraduate student. I gave a poster presentation at Old Dominion University of my attempted purification of a protein associated with amyloid plaques in Alzheimer's disease. I joined VAS as a faculty mentor in 2009 and have been an active supporter of the biology section ever since. Over the past 3 years that support has included roles in the executive council.

**Your Role in VAS?**
This past May I completed my tenure as President of VAS. I currently provide support to a variety of standing committees and try to assist whereever I am needed.

**Something "cool" about you**
Although I can play two musical instruments (clarinet and guitar), I think the coolest thing

about me is my family. I have a wonderful wife (Jami) who is my 'equal or better' in all things. We also have 5 wonderful children: Andrew (16), Mia (14), Rachel (12), Eden (5), and Adam (1). I cannot imagine having the same love for science and teaching without them.

Submitted by **Gary D. Isaacs**

Past President, VAS
Professor of Biology, Department of Biology & Chemistry, Liberty University, Lynchburg.

## An update from the Environment Committee, Virginia Academy of Science

Increasing the visibility of the Academy can be a positive thing, as it can energize some current members, demonstrating something that VAS does for Virginia, maybe attracting new members, and improving some conditions in Virginia. Understanding that VAS members have limited time to offer help to their local communities, some simple guidance regarding environmental issues might be planned and offered to those communities, especially when a locality does not have expertise in environmental issues.

As mentioned in previous Council meetings, the Environment Committee has been considering some kind of outreach to small Virginia towns and cities requesting help with environmental issues .
Several members of this Committee met via ZOOM this summer to discuss plans for their outreach to help requesting small Virginia towns and cities with environmental issues. An example of such a service might be to offer:
1) Reveal the environmental vulnerability of
2) Define climate readiness for localities,
3) Suggest best tactics for local individuals to be involved,
4) Suggested strategies for stakeholder coordination.
As the planning continues, this committee will present to Council of VAS what it will offer to local communities and how it might be accomplished within our means.

Submitted by **Richard Groover**

## President's Message *Cont'd from P 1.*

Commonwealth in a "Citizen Science" venture led by Longwood University Associate Professor and Academy Treasurer, Dr. Sujan Henkanaththegedara, to catalog the biodiversity of Virginia. Our Science Education Committee is working with several state organizations to virtually place Academy members as mentors in the Commonwealth's middle and high school science classrooms to engage in long-term authentic research projects that can be used to support submissions to the Virginia Junior Academy of Science in an academic year filled with uncertainty with respect in in-person education. The Science Advocacy Committee is working with the leadership of the Junior Academy to sponsor an initiative of a faculty member at the Georgetown University School of Medicine to chart novel and effective ways to instill the importance of vaccination in the Commonwealth's middle school students. I see education-focused initiatives such as these as the way forward for this Academy as it evolves to remain a premier force as a supporter of the scientific enterprise in Virginia. I am excited to play a role in this movement in the Academy and welcome your help, your support, and your guidance as we continue our critical work in service to this Commonwealth.

Submitted by **Michael J. Wolyniak**

Associate Professor of Biology, Hampden-Sydney College
President, Virginia Academy of Science

## Hanover County Coyotes Study Continues

The Hanover County Coyotes Study continues for its second year, with the assistance of a VAS Small Project Grant. Dr. Richard Groover is the principal investigator, and has been assisted by college and graduate students representing six different institutions.

"This field work gives students a chance to explore what field ecology research might involve," says Groover. "I let them help plan how and where we will locate our game cameras to capture coyote images."

Their research now has pinpointed 17 confirmed locations with coyotes in the 400+ square mile Hanover County. About one fifth of the county remains to be surveyed, and Groover says this additional VAS funding will help accomplish this.

Some early results are interesting. Coyotes are not just nocturnal, and this research has collected coyote images in the late mornings, nearly at noon. "We are seeing some definite movement patterns, such as along powerline right-of-ways," adds Groover.

This fall, when the puppies and adults begin to move around more, the research team will increase their surveys. Groover mentioned, "If any college students want to get a taste of this experience, have them contact me at rgroover@reynolds.edu ."

Submitted by **Richard Groover**


## Member Achievements

**Joseph S. Merola** is a latecomer to the Virginia Academy of Science, having joined in January of this fateful year of 2020. He received his Ph.D. in 1978 from M.I.T. In that same year, he joined the Corporate Research Laboratories of Exxon Research and Engineering Co in New Jersey. Joe then joined the chemistry department at Virginia Tech in 1987 and has held many roles at the university over the years. Joe was named a fellow of the American Association for the Advancement of Science in 2015 and a Fellow of the American Chemical Society in 2019. In May of 2020, one of the compounds synthesized in the Merola group was highlighted as the "Molecule of the Week" by the American Chemical Society. See https://www.acs.org/content/acs/en/molecule-of-the-week/archive/o/octamer-of-iridium-complex-cations.html

**Se Woong Jeong**, the current Chairman of the Virginia Junior Academy of Science (VJAS) and a member of the Virginia Academy of Science (VAS) since 2010, was nominated and recognized as a winner of the Regeneron Pharmaceuticals, Inc. 2020 Volunteers of the Year Awards. Each year, more than fifty nominations are submitted and about seven are chosen as final awardees. The Regeneron Volunteers of the Year Awards "honor exceptional employee volunteers who embrace the challenge and responsibility of tackling their community's unmet needs with passion, leadership, dedication, and consistent action". Jeong was recognized for his commitment to the Virginia Junior Academy of Science program by serving as a volunteer Chairman for the past six years. He was first appointed by the VAS President in 2015, and re-appointed in 2018. Jeong participated in the VJAS program all four years of his high school, representing Roanoke Valley Governor's School for Science and Technology in Roanoke, Virginia. He then went in to the University of Virginia for his undergraduate studies and has been involved as a volunteer judge and board member, before being appointed as the VJAS Chairman. He joined Regeneron Pharmaceuticals, Inc. based in Westchester County, New York in 2018, but has continued to serve the role as the volunteer Chairman of VJAS. Se Jeong was featured by Regeneron with a summary of his volunteer accomplishments. As part of the award, Regeneron will donate $500 to the Virginia Junior Academy of Science in Jeong's name.

## Updated Institutional Membership Guidelines

The Virginia Academy of Science recently passed new guidelines for Institutional Membership. These new guidelines are intended to encourage more institutions to support the Virginia Academy of Science through institutional membership and also to provide more benefits to institutional members. These changes to the by-laws were approved at the Spring 2020 Council meeting. Institutional and Business Membership is available to colleges/universities, businesses, and industrial organizations. Benefits included with institutional membership include:

- Listing on VAS webpage page as an Institutional Member (name, logo, and live link to webpage for Institutional Members)
- Acknowledgement (name/logo of Institutional Members listed) and one-page Ad in Virginia Academy of Science Program (Annual Meeting program) and in the VJAS Blue Book
- A complimentary subscription to the Virginia Journal of Science
- Two complimentary registrations to the Annual Meeting

Please encourage your college/university, business, or industrial organization to join the Virginia Academy of Science as an Institutional Member.

Submitted by **Amorette Barber**

President-Elect, Virginia Academy of Science
Associate Professor of Biology, Longwood University
Associate Professor of Biology, Longwood University

## Wetlands Partnership Receives State and National Awards

Located in the northern Shenandoah Valley and straddling the boundary between Frederick County and Winchester City, the Abrams Creek Wetlands (ACW) have been known to birdwatchers and botanists for four decades. More than 180 bird species have been noted by Shenandoah Audubon volunteers. Research by undergraduates in Shenandoah University's Environmental Studies Program – in collaboration with the Virginia Natural Heritage Program – showed that 20 state-rare plant species live in the ACW. No other comparable limestone-associated wetland in the Commonwealth has as many. Since 1999, Shenandoah University students and faculty have presented these findings at annual meetings of the Virginia Academy of Science.


As adjacent property was converted to residential neighborhoods, efforts to protect the wetlands began. The Opequon Watershed, Inc., (a citizens' organization) worked with Dr. Woodward Bousquet (professor of environmental studies and biology at Shenandoah University) to guide developers and the City of Winchester in establishing the Abrams Creek Wetlands Preserve. Developers delineated the wetlands portions of their properties and set them aside them as open space. The city's

Parks and Recreation Department agreed to manage these parcels. Dedicated in 2003, the 25-acre Preserve became Winchester's first formally protected natural area.

Environmental education programs – several led by Shenandoah University undergraduates – interpretive signs, and public field trips followed. The Abrams Creek Wetlands now attracts over 30,000 visits annually. It sits on the Winchester Green Circle, which is a walking-bicycling route being constructed around the city.

To coordinate community volunteers and further promote public understanding of the Preserve's special ecological qualities, the Winchester-Clarke Garden Club took a lead role as club members formed a partnership with Winchester City and Shenandoah University. In 2019, this partnership earned state and national recognition. Two first-place awards totaling $37,000 will help implement the property's management plan and educate school children, residents, and visitors.

The partnership won the Bessie Bocock Carter Conservation Award ($7,000) at the state level from the Garden Club of Virginia. After a national competition, the Garden Club of America presented its first-place Founder's Fund Award ($30,000) to the partnership. Club members and other volunteers are working with Parks and Recreation Department staff and Dr. Bousquet to remove aggressive plants. The awards will also fund an audio walking tour, observation platform, "good neighbor" booklet, brochure, and community celebration.

A plaque from the Garden Club of America will be dedicated in October 2020 to recognize the significance of both the Abrams Creek Wetlands site and the collaborative work that continues to manage, protect, and promote this special place. When organizations, government agencies, scientists, and citizens pool their energy and expertise for the public good, our communities thrive.

Submitted by **Woodward S. Bousquet**

Professor Emeritus, Environmental Studies and Biology, Shenandoah University
Past President, Virginia Academy of Science

Undergraduates in Shenandoah University's Environmental Studies Program have been investigating the biodiversity and ecology of the Abrams Creek Wetlands since 1997.

# Highlights of 97th VJAS Meeting

This was definitely an unusual year but the Virginia Junior Academy of Science (VJAS) held it's 79th Annual Meeting and Research Symposium in a virtual format in May and June 2020. Although the oral presentations were cancelled, students and their projects were able to be judged based on the submitted research papers. This year's theme was "Charting our Paths Forward", a certainly fitting idea to carefully consider, whether as a young or experienced scientist. Even during these times, we were able to grant the usual awards, including the two of the largest scholarships, provided by the Virginia Environmental Endowment .

In addition, VJAS awarded Benjamin Bankston of Central Virginia Governor's School and Chirayu Nimonkar of Godwin High School the prestigious opportunity to attend the next American Junior Academy of Science Conference in February 2021. The alternate winners were Shrinidhi Kittur of of Godwin High School and Caroline Klotz of Clover Hill High School.

Looking forward, VJAS is introducing many new and exciting opportunities and co-sponsored programs. Two different types of mentorship programs, the VAS Mentorship Assistance Program and the VJAS student-to-student guidance program, targeted for both middle and high school students, will be available this fall. VJAS is also promoting the VAS sponsored Virginia BioBlitz on Saturday, September 26. For more information on any of these programs, please visit http://vjas.org/resources.html.

As a closing note, the primary mission of the Junior Academy is to bring the best young minds of Virginia together to share research with their peers and to exchange ideas. Although there are competitive aspects, the Research Symposium shines as a conference where students from all backgrounds across the state

Please join us next year (as a student and/or school participant, a judge, a contributor, or a volunteer) at the 80th Annual Meeting and Research Symposium of the Virginia Junior Academy of Science. There are also many ways to be involved with the Junior Academy of Science. Please reach out to anyone below or visit us at www.vjas.org.

Submitted by
**Se Jeong**, VJAS Committee Chair, swj3af@virginia.edu

**Susan Booth**, VJAS Director, susan.science@gmail.com


PICTURE DESCRIPTION: VJAS held a mini virtual congratulatory Zoom meeting to award the two scholarship winners. Grace Shen from Blacksburg High School won the Henry MacKenzie Environmental Scholarship and Brooke Eby from Central Virginia Governor's School won the Frances & Sydney Lewis Environmental Scholarship from the Virginia Environmental Endowment).

## Obituary: D. Rae Carpenter Jr.

Longtime VAS member, officer and supporter, D. Rae Carpenter Jr., former head of the physics department at VMI, at the age of 92. He passed away on May 26 at Kendal of Lexington.

After graduating from Roanoke College in 1949, Rae earned an M.S. in experimental physics and applied mathematics from Cornell University. He then served at VMI in the physics department for 40 years. During his time at VMI, he earned a Ph.D. in experimental physics from the University of Virginia.

He is one of the creators of popular physics demonstrations for teachers and students. The Dick and Rae Physics Demo Notebook was purchased on every continent except Antarctica.

Faith and community were important to Rae, and both were woven into his everyday life. He was a long-time member of the Lexington Presbyterian Church, serving as a deacon, elder, and most recently Treasurer. He served on multiple boards: the Science Museum of Virginia, the VMI Foundation, and W.E. Skelton 4-H Conference Center at Smith Mountain Lake.

## Virginia Journal of Science (VJS) Update

One of several advantages to the online format for the Virginia Journal of Science (VJS) is that we can track reader activity. In the month of July, there were 1039 full-text downloads. A popular selection (65 downloads) was the article "Assessing microplastic pollution in Four Mile Run, an urban stream in Northern Virginia", https://digitalcommons.odu.edu/vjs/vol71/iss1/3. Three new submissions were posted in July; currently, four submissions are in the review process.

I am pleased to report that several members of the VAS Publications Committee have agreed to serve as Associate Editors for VJS. Included are: Sujan Henkanaththe Gedara (Longwood University); Gaylen Bradley (formerly at VCU); Michael Zimmerman (Shenandoah University); Ashley Artese (Roanoke College); Aylin Marz (Norfolk State University); and Son Nguyen (Hollins University). The addition of these Associate Editors will speed the review process and, I hope, will bring in new authors to VJS.

The Publications agreed that VJS can accept articles based on work done outside of Virginia. Further, we welcome opinion articles, reviews, and other submissions to extend beyond our focus on original research papers.

Submitted by **Chris Osgood**

Secretary, Virginia Academy of Science
Editor-in-chief, Virginia Journal of Science

VIRGINIA JOURNAL OF SCIENCE
OFFICIAL PUBLICATION OF THE VIRGINIA ACADEMY OF SCIENCE

**Readership Distribution: 6/2016-August/2020**


**1,698 Institutions**

65% Educational -- 21% Commercial -- 9% Governmental -- 2% Organizational -- 1% Military

## *Know your VAS logo*

**1. What is the flower depicted in the inner circle of the VAS Logo?**

**2. Who are the four famous Virginia Scientists listed in the middle ring of the Seal or Logo?**

**3. What is the Academy's Maxim?**

Answers: *1. The flower is the Dogwood. It is in full bloom at the top of the seal and as a bud at the bottom of the seal. 2. The four famous scientists are Walter Reed, a physician, Matthew Fontaine Maury, an explorer and cartographer, John Clayton, a botanist, and Thomas Jefferson, an agriculturist and educator. 3. Of course everyone should get the last question correct , the maxim is "Ignorantia Supremus Tyrannus" Ignorance is the greatest tyrant.*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Tuesday & Thursday ~11 am to ~1 pm


# 100 Years Old! (almost)

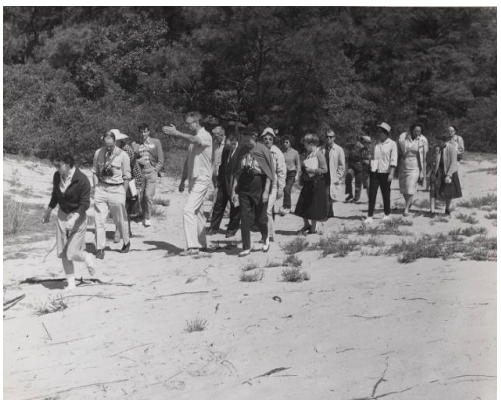
Yes, the Virginia Academy of Science will be celebrating the 100th birthday soon. The Virginia Academy of Science (VAS) is an organization first established at the College of William and Mary in 1923. Our members are active in STEM research and education. We promote the advancement of science in the Commonwealth of Virginia by providing financial support for research projects, and by providing a platform for the dissemination of research results. Our members come together at our Annual Meeting to share the results of their efforts over the year.

Our publication, the Virginia Journal of Science, publishes peer reviewed original research reports, as well as, abstracts of the Annual Meeting presentations. Dedicated to the advancement of science, VAS invites you to join them in promoting and expanding scientific inquiry and STEM education in Virginia.

VAS provides support, leadership, and supervision to the Virginia Junior Academy of Science (VJAS) (established in 1941) through the VA Junior of Science Committee. The yearly VJAS Research Symposium and Annual Meeting occurs in conjunction with the VAS Annual Meeting.

The Virginia Academy of Science 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.

Note adopted from the VAS website (vacadsci.org)



Virginia Academy of Science-Field Trip to Seashore State Park: Dr. David E. Delzell of the Norfolk College of William and Mary directs the Academy Field Trip to Seashore State Park (1962-05-12), Photo © Old Dominion University Digital Libraries Collection.

# We Invite You to Contribute to *Virginia Scientists*

Virginia Scientists is the official newsletter of the Virginia Academy of Science (VAS). This publication offers information for VAS members, such as upcoming events, past events, scholarships/awards information, accomplishments of VAS members and other timely information. We electronically publish Virginia Scientists twice every year and circulate to all current members and academic institutions.

We would like to extend an invitation to you to submit articles to Virginia Scientists and/or use the advertising space. We are currently accepting articles for the next issue.

The length of the article should not exceed 500 words. Any exceptions must be get approved by the editors prior to submission. Please consider the following categories to submit.

- Member achievements – your publications, awards and other professional achievements related to science
- Upcoming events –information about educational and professional events
- Historical notes – articles related to history of science and scientists in Virginia, and VAS
- Summaries of scientific studies related to Virginia
- Advertisements (commercial events, products etc.)

If you have ideas beyond these categories and think it is suitable for publication here, please check with editors before you proceed. Article and any accompanying high quality photographs must be electronically submitted to Sujan Henkanaththegedara (henkanaththegedarasm@longwood.edu).

If you would like more information about the advertising space, please contact Debbie Neely-Fisher (dneely-fisher@reynolds.edu).

Please let us know if you need more information and/or have any questions.

**Sujan Henkanaththegedara**
**Deborah Neely-Fisher**
Editors, Virginia Scientist