Chesapeake Chemist
Maryland Section American Chemical Society
100 years 1914-2014

Montebello Water Filtration Plant-I
Second Tour for Chemists

All chemists' members of the Maryland Section of the American Chemical Society are invited to tour the facilities of one of the most efficient water filtration plants in Baltimore.

The plant has been around for more than 100 years. It is still one of the major accomplishments of chemists, engineers, environmental scientists and scientists in STEM related fields. The plant was pivotal in the improvement of public health in early 1900's and along with two other filtration plants provides one of the most pure drinking water in the US to almost 2 million residents in the Baltimore area and surrounding counties.

The Maryland section celebrates the success of the last four years of high schools tours at the Montebello Water Filtration Plant-I in Baltimore. The tours are part of the *Chemists Celebrate Earth Day* which happens every year around the 22nd of April. The outstanding tour done by Robert Nuss, Director of the Water Quality Control Laboratories at the plant has created interest among the scientific community in the area. This year, two additional tours were prepared for adult chemists. Please join us in this second interesting tour where you, colleagues and college students can see chemistry as its best improving the life of the community.

Friday, July 27, 2018
9:00 A.M.
3901 Hillen Rd. Baltimore MD, 21218

No cost. RSVP Beatrice Salazar, Chair-2018
E-mail:beatricesalazar1@gmail.com

SPECIAL ISSUE

Bulletin for the Maryland Section Activities

July 2018 Issue: Articles by Chemists

Article No. 1.

Maryland ACS Chapter Tours Local Water Treatment Plant

By Marella Schammel (Towson University Class of 2020), Klein Arias (Towson University Class of 2022) and John Sivey, PhD (Assistant Professor of Chemistry, Towson University) page 6.

Article No. 2.

My Unusual Career Path as an Organic Chemist

By Ronald Berninger, PhD, ACS Emeritus Member. Page 8.

Article No. 3.

Materials and Human Creativity through Time and Place

Dr. Camilo Rojas is an Assistant Professor in the Department of Molecular and Comparative Pathology and Director of Assay Development and Screening at the Johns Hopkins Discovery Program. He discusses the June Tour for Chemists at the Baltimore Museum of Art (BMA), page 12.

Chesapeake Chemist
Maryland Section
American Chemical Society

2018 Section Officers:

Chair 2018..... Beatrice Salazar, beatricesalazar1@gmail.com
Vice Chair 2018.....Dana Ferraris, McDaniel College, dferraris@mcdaniel.edu
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Secretary 2018..... Louise Hellwig, Morgan State University, louise.hellwig@morgan.edu
Treasurer 2018.....Angela Sherman, Notre Dame of Maryland University, asherman@ndm.edu
Past Chair (2017).....Stephanie Watson, N.I.S.T., stephanie.watson@nist.gov

2018 SECTION COMMITTEE ON NOMINATIONS
Nominated by current Chair, Congratulations!

Chair of the Committee on Nominations..... James Saunders, jsaunders@towson.edu
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..... Dana Ferraris, Vice Chair (required), dferraris@mcdaniel.edu
.....Sara Narayan, Stevenson University, SNARAYAN@stevenson.edu
..... Sandra Young, RDECOM, sandra.k.young26.civ@mail.mil

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1.	2018-2020 Dana Ferraris	Chair of the Section Program Committee (McDaniel College),dferraris@mcdaniel.edu
2.	2018-2020 Jan Kolakowski	Member of ACS Committee on Economic and professional Affairs, Chair of Section Finance/Investment Committee, Retired, jek6042@gmail.com
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5.	2018-2020 Stephanie Watson	Member of the ACS Committee on Committees (ConC) Liaison on Nomenclature, Terminology and Symbols (NIST), stephanie.watson@nist.gov

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3.	2017-2019 Sandra Young,	Chair of Community Outreach Activities Committee, sandra.k.young26.civ@mail.mil
4.	2018-2020 Michele Foss,	Committee TBA, foss.michele@gmail.com
5.	2018-2020 Sarah Zimmerman,	Chair of Member Assistance Committee,* scatzim@gmail.com

*New 2018 Committee as per Maryland Section Governance Bylaws, nominated by current Chair, Congratulations!
https://www.acs.org/content/dam/acsorg/about/governance/charter/lsbylaws/maryland.pdf

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Message from the Chair

Dear colleagues:

June 2018 turned out to be a fun-filled month through experiences in education, art and writing. Our July 2018 Chesapeake Chemist includes an article on our first *Tour for Chemists* at the Montebello Water Filtration Plant-I in Baltimore. Three of the attendees, John Sivey, PhD, from Towson University and his students Marella Schamme and Klein Arias, share their experience at the June 22nd Tour and the relevance of the tour to their course of study. Another article by Ronald Berninger, PhD, Emeritus ACS member, is an overview of his career in chemistry, how he used organic chemistry in his various jobs; it is a story that some of us can recognize, younger chemists can appreciate and we can enjoy. The last article is an overview of the June Tour of the Baltimore Museum of Art (BMA) titled "*Materials and Human Creativity through Time and Place"* emphasizing the connection between materials and chemistry. I think I can speak for the 19 people in the tour when I say that we thoroughly enjoyed the experience while learning about art, materials and techniques. Camilo Rojas, PhD, from Johns Hopkins University provides a summary of the tour that hopefully will instigate readers to learn about materials and their relevance to creativity in art.

The Water Filtration Plant-I Tour continues to captivate the interest of many. Several professors from various universities have contacted the Maryland Section to request another tour. For this reason **we are providing a second tour of the water treatment plant on Friday, July 27, 2018 at 9:00 A.M**. Do not miss it this time; please Contact/ RSVP Beatrice_Salazar

Tour of the Montebello Water Filtration Plant-I - 3901 Hillen Rd. Baltimore, MD 21218. Join us and bring a friend or your students! See details in the HOME page of the Maryland section's URL http://www.maryland.sites.acs.org

Information is key continues with the special interest in keeping you informed in detail about activities at the Maryland local section. Our webpage is updated. Keep in touch with us and let us know what you want. Your views on past activities are welcome.

Beatrice Salazar
ACS Maryland Section Chair-2018

Information is Key

The following includes a background on ACS and the Maryland Local Section, information on our website, and executive committee meetings and more section's programs for 2018. Please check the ***2018 Year Events*** to see in detail each month of activities. For information on previous month's events or other past activities please refer to Chesapeake Chemist publications: January, February, March**,** April, May and June.

III. Executive Committee Meetings

Plans for this year include four regular executive committee meetings:

First executive committee meeting: **Monday Feb. 12, 2018** at Notre Dame of Maryland University

Second executive committee meeting: **Tuesday, April 24, 2018** at Stevenson University

Third executive committee meeting in September 2018, exact date TBA

Fourth executive committee meeting in December 2018, exact date TBA

Exact dates will be announced approximately two weeks prior to each meeting. Please allocate time in your schedules. An extra meeting will be assigned to discuss MARM-2019. Dates could change. Please use our website to stay informed on exact dates. For minutes of previous meetings please check the website.

If you have any event to be considered please contact us before each month's meeting.

The Maryland Section Program for 2018 continues…

All ACS members are welcome to our local section activities, lectures and events. They could bring new initiatives to us and ask for support on their activities. We are good at collaborating.

JULY

1. July 27, 2018 at 9:00 A.M. Montebello Water Filtration Plant-I Tour for Chemists. Speaker Richard Nuss, Chemist III, Baltimore City Department of Public Works, DPW

   The Local Maryland Section has been giving a tour at the Montebello Water Filtration Plant-I (MWFP-I) since 2015 to high school chemistry students, teachers and the community. This is the first year the tour is being offered to members of the local ACS Maryland section (adults only). The tour will include: history of the plant since its construction in 1915, its impact on public health and includes a guided tour through the plant following the process of water treatment and water purification. MWFP-I is the oldest of three water filtration plants in Baltimore. It is 100% operational and provides clean drinking water to more than 1.8 million residents of Baltimore and surrounding counties. Chemists will appreciate the science involved in each step of the process of water treatment and purification. This exciting and unforgettable tour showcases how chemistry is effectively applied for the benefit of the community. See home page or upcoming events.

   This is the second *Tour for Chemists* given this year due to the increased interest of Maryland section members in particular from Stevenson University and Johns Hopkins University. Those who couldn't make the first *Tour for Chemist* have a second opportunity this month. Welcome!
   Contact/RSVP Beatrice_Salazar Chair-2018 Maryland Section

Dr. Sivey's Chemistry Group, Towson University

Successful Activities

Maryland Section 2018

TOUR FOR CHEMISTS

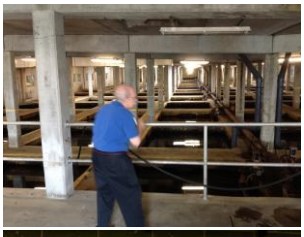
IN THIS ISSUE: MONTEBELLO WATER FILTRATION PLANT-I
June Event

Maryland ACS Chapter Tours Local Water Treatment Plant

By Marella Schammel (Towson University Class of 2020), Klein Arias (Towson University Class of 2022), and John Sivey, PhD (Assistant Professor of Chemistry, Towson University)

On June 22, approximately 16 members of the Maryland Section of the ACS toured the Montebello Water Filtration Plant-I in Baltimore, MD. This water treatment facility has been in service since 1915 and provides drinking water to approximately 1.8 million users. ACS members were able to view different stages of the treatment process, giving an in-depth view of what goes in to making our drinking water safe. The process begins with disinfection using chlorine. Alum is then added as a coagulant to convert small particles suspended in the water into larger particles using slow moving paddles. After that flocculation step, the water then enters a sedimentation tank where the larger particles settle to the bottom and are then removed several times a day by large rotating scrapers. To remove the finer particles as well as various microscopic pathogens, the water is passed through a sand filter. Before releasing the water to the distribution system, lime and fluoride are added. Lime serves to increase the pH and prevent corrosion; fluoride prevents tooth decay. If needed, additional chlorine is also added at sites across the distribution system to maintain the EPA-required residual concentration as it travels to consumers to prevent the growth of microorganisms. All of these steps ensure the cleanliness and safety of our drinking water.

As members of a research group that studies the formation of disinfection byproducts (DBPs) during the drinking water treatment process, it was both interesting and helpful to see this process in the "real world".



DBPs can form via reactions of chlorine with naturally occurring organic matter in the water. DBPs pose potential health risks, most notably increased incidences of bladder cancer. Due to these risks, some DBPs (i.e., trihalomethanes and haloacetic acids) are regulated in finished drinking water.

The Montebello Plant changes the depth from which intake water is obtained in reservoirs to lower the concentration of organic matter in the influent water, thus minimizing DBP formation. Water treatment plants seek to balance the risks associated with ingestion of pathogens versus exposure to DBPs. Even though the Montebello Plant has been operational for over 100 years and the technology is relatively simple, it is still successful in supplying safe drinking water to millions of local residents.

Photos: Courtesy of Beatrice Salazar, Chair-2018, ACS Maryland Section

Previous Successful Activities of 2018:

1. ***Leadership Institute: Kelly Elkins nomination and report*** (Chesapeake Chemist February issue, page 10)
2. ***Virtual workshops: OPIOIDS and other videos*** (www.maryland.sites.acs.org)
3. ***Poster presentations: 255th ACS National Meeting, NOLA*** (Chesapeake Chemist, March, page 16)
4. ***2018 Student Awards: Award ceremony, The History of Cinnamon, and Student Awardees to NOLA*** (Chesapeake Chemist April issue, page 7)
5. ***Earth Day Celebration: Montebello Water Filtration Plant for High School Students***, (Chesapeake Chemist May issue, page 15)
6. ***Tours for Chemists: Montebello Water filtration Plant-I*** in Baltimore Chesapeake Chemist July issue No.7 (this issue page5) and ***BMA Tour: Human Creativity through Time and Places*** (Chesapeake Chemist July issue No.7 (this issue page 12)

Chesapeake Chemist Volume 75, Number 7 2018

My Unusual Career Path as an Organic Chemist

Talk at the 50th Year Luncheon 25 May 2018
Ronald W. Berninger, Ph.D.

I graduated from Drexel University with a B.S. in Chemistry. Drexel is a Co-Op school in which a university partners with industry to facilitate learning in formal academic settings and in the real world of work so that basic knowledge is applied to practice. At Drexel students attended classes at the university for 12 quarters (36 months) and worked in industry for 6 quarters of paid Co-Op experience (18 months). My Co-Op job was at the Research Institute of Temple University in Philadelphia where my Supervisor and Mentor was the Head of the Organic Chemistry Division, Edward Nodiff. He insisted that I must attend Graduate School to earn a Ph.D. in the field of Organic Chemistry because I had a natural talent for organic chemistry and needed the three letters behind my name to work creatively and not be a technician following someone's directions.

Before completing my B.S. at Drexel, I applied to the University of Pittsburgh for the Organic Chemistry Doctoral Program, which was rated in the top ten Graduate Organic Chemistry Departments in the country at that time. I explained that Drexel had mandatory Army ROTC for all male students but because of the Vietnam War I had signed up for Advanced Army ROTC so that I could get a deferment of 4 years (the longest time the Army allowed) to get my Ph.D. after I graduated from Drexel.

The Problem of Selectivity

I received a call from the Chairman of the Chemistry Department stating that I was well qualified in terms of grades, GREs, and recommendations from Professors and my Industry Mentor BUT there was a concern with a statement I made on my application about earning my Ph.D. in four years. The problem, he explained, was that the average Organic Chemistry doctoral student was taking 6 to 6.5 years to complete the Ph.D. requirements and no one had finished the program in less than 5.5 years.

I asked how long the average Organic Doctoral Student works in an average week. Answer: about 50 to 60 hours. I asked if a student could graduate when they had fulfilled the requirements. Answer: Yes. I asked when did Ph.D. graduate students start their doctoral research? Answer: Second year. I explained that my mentor in industry had taught me how to use the library to find published literature; how to design an organic drug synthesis using the literature and creative thought; how to perform the work in the lab; how to run the various analytical instruments an

techniques (NMR, IR, UV, MS, GC-MS spectra, BP or MP); how to prepare samples to send out for Elemental Analysis; AND how to interpret all the experimental data. The point was that other students would need to learn all this and would be starting their research in their second year while I knew all this information and would start my research the first year instead of the second year. I did a quick calculation of approximate time for a Graduate Student working 50 hours a week for 50 weeks for 6 years for a total of about 15,000 hours. I pointed out that during my Undergraduate years at Drexel I carried typically 45 contact hours of classes/labs a week and worked 45 hours a week in industry. In addition, I worked part time in a gas station nights and weeks ends all year 20 hours to 40 hours a week for the whole 5 years in school and industry which comes out 16,250 hours to 21,250 hours over the five years. In Graduate School I would only work on Graduate School chemistry material 75 hours to 80 hours a week for 4 years resulting in a total of 15,000 hours to 16,000 hours. I explained I was very confident I could finish the program in a four years' time line that meshed with my Army Active Duty assignment. The Chairmen agreed and said that I was accepted into the program for Fall 1968.

After graduation from Drexel and Army Boot Camp I received my Commission as a Second Lieutenant in the Army Engineer Corp and a 4 year deferment for Graduate School. I did graduate in four years with more than enough work done for my Ph.D. meeting all the requirements (course work, Cumulative Exams, Oral Defense, Teaching, Thesis and original research, and Language Requirements). My record of 4 years for a Ph.D. in the field of Organic Chemistry from the Chemistry Department at the University of Pittsburgh Chemistry has not been broken yet, to my knowledge. My Doctoral work involved studying the mechanism, scope and synthetic utility of decarboxylation of cuprous carboxylates in quinoline and the effect of cupric ion on quinoline as well as organic synthesis.

When I was in the Fourth Year of Doctoral work, my Mother in Law, who did volunteer work at the Westminster, MD Church World Service Center, met a Colonel's wife from Ft. Detrick in Frederick, MD. My Mother in Law asked whether her husband could use a Ph.D. Organic Chemist at Ft. Detrick. The Colonel's wife responded that she did not know BUT here is her husband's contact information and she would let her husband know that someone would be contacting him about working at Ft. Detrick. I contacted the Colonel at Ft. Detrick and explained that I was finishing up my Ph.D. in the field of Organic Chemistry and was commissioned as a Second Lieutenant in the Army Engineer Corp but would like to do research at Ft. Detrick. The Colonel stated that he was in great need of an Organic Chemist. All he had to do was put in the paper work for a transfer for me from the Engineer Corp to the Medical Services Corp and then request that I be assigned to Ft. Detrick and promoted to Captain, if I gave him the authorization to proceed. Of course, I gave the Colonel the Authorization in writing per his instructions and events went just as he outlined. I would be promoted to Captain upon graduation with my Ph.D. and I went to Ft. Sam Houston for Advanced Officer Training in the Medical Service Corp and was posted to Ft. Detrick for three years of active duty.

The first assignment at Ft. Detrick was to prepare a proposal of research I would perform during the three year period. I proposed that I could measure a blood protein to determine the anxiety state and/or disease state of troops arguing that if you have soldiers that are highly stressed or ill but don't know it, you might want to get the troops help and/or treatment before combat so that they would be more effective. I proposed to use Rhesus Monkeys, of which Ft. Detrick had many, and did studies of diseases in the monkeys testing vaccines and other

therapies. My project was approved, along with a budget for equipment and supplies and personnel. I did research on the blood protein alpha-1-antitrypsin in diseases and stress in Rhesus Monkeys, developed a GLPC method to detect and identify bacteria quickly, and prepared manuscripts, presentations and quarterly and annual reports. There was a lot of research scientific equipment at Ft. Detrick and I got permission to use anything I wanted which was great for my research. I did work hard but not as hard as in graduate school. At one point the Colonel, an MD in the Army, called me into his office and stated "Captain Berninger, you are causing a big problem for me." I replied "Colonel I am so sorry to be causing you a big problem. What is the big problem?" He replied, "If you finish the work in the proposal then the Generals are going to want to know why everyone does not finish the work in their proposals."

Ronald W. Berninger

Near the end of my three year tour to complete my military duty, the Colonel called me into his Office. "Captain Berninger, if you stay in the Army at Ft. Detrick doing research you will be promoted to Major and continue your work OR you exit the Army and we'll keep you as a Civilian Government worker at GS-14 and you can continue your work." I thanked the Colonel for his generous career opportunities BUT stated "Colonel I have an opportunity to do Postdoctoral studies at the Pediatrics Department of The Johns Hopkins University School of Medicine and want to pursue that career opportunity." He wished me well and shook my hand.

Making Some Choices

At Johns Hopkins I continued my studies of alpha-1-antitrypsin and started research on Cystic Fibrosis as well as purification and characterization of several proteins from blood and tissue culture fluids. All this made use of my Organic Chemistry in a biological setting. I finished my Postdoctoral work at Hopkins Medical School and was offered a faculty position, which I accepted, and continued conducting research, writing research articles about the research, and submitting grants for funding to extend the research. Then I was recruited to the faculty of the Pediatrics Department at Tufts University School of Medicine to continue my research and grant applications there. My research at Tufts Medical School consisted of continuing cystic fibrosis research and making antibodies to monkey alpha-1-antitrypsin and looking at heterogeneity in monkey blood, and developing an HPLC assay for the drug indomethacin in neonatal blood. I used Organic Chemistry to do so.

While in Boson I was recruited to join the biomedical/biotechnology industry and relocate to Seattle, WA. At NeoRx my job responsibility was "to get the cancer clinical trials going again because the therapeutic antibody was precipitating (coming out of solution) and the trials were shut down." I had purified a lot of difficult organic molecules focusing on what is happening to the molecules and their environment. I made extensive use of my Organic

Chemistry background to redesign the purification of the antibodies and to conceptualize chemical modifications of the antibodies and fragments of antibodies. Such modifications must maintain their biological activities while using unique linkers for attaching materials (radioactivity, drugs, colored **marker molecules etc.) to antibodies or fragments of antibodies and maintaining immunoreactivity of the antibody and fragments for imaging and therapy reagents.**

I was then recruited to a stem cell company in Seattle to "purify, modify and stabilize an antibody that could select human stem cells from human bone marrow or blood and get it ready for clinical trials and eventually a product." Using my Organic Chemistry background, I was able to accomplish those goals and prepared a freeze dried version (easier to ship) of the unstable modified antibody for the clinical trials. I also designed a new, novel more stable linker to modify the antibody which could be used with diagnostic and therapeutic antibodies. I developed a new gel composition to be used to select the human cells. All of this work made extensive use of Organic Chemistry in a biological environment. I also provided data, wrote the antibody sections for documents, and reviewed drafts for the FDA and CE Mark submissions. I provided the QA/QC procedures and manufacturing scale up data.

I subsequently was recruited to work for three other start-up companies in the Seattle area. I do have publications from Academics and a few from Industry but most of the work in industry was to be kept as Trade Secrets and not published or patented. The corporate attorneys did not want anyone to know how I accomplished tasks where others had failed. I used my Organic Chemistry background to solve these issues.

About The Author

Awards and Honors have included the following: Certificate of Merit from the Philadelphia Science Council, Women's Club of Drexel Hill Scholarship, National Society of Scabbard and Blade (ROTC Honorary), Phi Lambda Upsilon (Chemistry Honorary), Achievement Award for outstanding work in Chemistry under the cooperative plan at Drexel University twice, NDEA Predoctoral Fellow Department of Chemistry University of Pittsburgh, Center of Excellence Research Fellowship Department of Chemistry University of Pittsburgh, Who's Who in West, 22nd Edition, Who's Who in Finance and Industry, 26th Edition and the R and D 100 Award 1992 for CellPro Ceprate SC Stem Cell Concentrator.

Overall, Organic Chemistry has been a great help to me in Academics, Industry and even my personal life (e.g., getting stains out of fabrics or joining materials together when conventional glues do not work).

Acknowledgement

Photograph courtesy of Beatrice Salazar, Chair-2018 ACS Maryland Section.

Maryland Celebrated its Senior Chemists

Twenty two honorees received a Certificate Award from ACS recognizing their loyalty, enthusiasm for chemistry and scientific research (see Chesapeake Chemist 2018, May and June issues). These Chemists are members of the American Society for more than 50, 60, 70 years and more! In the Picture we have Dr. George Peter Lozos (see his video presentation Dr. Lozos Power Point Presentation which is also available to all in our website. Dr. Lozos Power Point Presentation which is also available to all in our website. In the middle, Dr. Clare Milton and finally Dr. Ronald Berninger . We can enjoy the short video of this entertaining experience (virtual workshops).

Article No. 3

Materials and Human Creativity through Time and Place: Overview of the BMA Tour for Chemists.

Camilo Rojas, PhD, Assistant Professor in the Department of Molecular and Comparative Pathology and Director of Assay Development and Screening at the Johns Hopkins Discovery Program. crojas2@jhmi.edu. He has been a docent at the Baltimore Museum of Art for 15 years.

This Baltimore Museum of Art Tour was prepared with ACS members in mind. It focused on materials and techniques used in different masterpieces in the museum as an illustration of how artists expressed their creativity through time and place. There were eight stops; the tour turned out to be very interactive. Some of the discussion highlights are mentioned below.

1. Ceramic – Camel (8th century - Tang Dynasty 618-907CE) – Ceramic is made after a clay model is prepared and "baked" to 1000 -1200 ^{o}C. Heating (and cooling) is done gradually. As clay is heated through 573 ^{o}C there is an abrupt α to β inversion of configuration of the silicon-oxygen tetrahedra. There is a corresponding increase in volume that can easily fracture the clay model if heated too fast. Ancient Chinese may not have known about α to β inversions, but they did have efficient ceramic workshops that turned out remarkable ceramics of which this highly realistic and vibrant camel is an example.

2. Wood carving –Dance Headdress (late 1800's, Baga, Guinea)- Wood carving has been around for over 5000 years. Wood is largely made of cellulose, an inert carbohydrate. A vertical cut of heartwood, the central part of the tree, is often the material used in wood carving. The cut can be large enough so that the artist carves out "excess" wood and "liberates" his creation out of one wood piece. The Dance Headdress is a complex arrangement of animal and human forms and abstract designs. One interesting feature toward the center of the piece is the two story-building with arched colonnades representing a style of French architecture used by missionaries that lived in the area.

3. Marble - Antioch Mosaic (3rd century CE) – First time visitors are taken aback by the arresting view of the Antioch mosaics on the walls of the atrium on the second floor of the museum. They were originally designed to be on the floor of what must have been affluent homes. These mosaics are made

of small colored glass pieces and tesserae, little marble cubes of different pastel colors. Marble is limestone, calcium carbonate that has gone through high levels of heat under the earth's surface. Tesserae were painstakingly put together to create notable figures and scenes that give us a glimpse of private lives at the time. The central panel of the mosaic we observed shows a couple being served wine by a servant. Most interesting are the Greek labels OPORA (fruit), AGROS (field) and OINOS (wine) being used on a 3rd century mosaic in the Roman Empire.

4. Oil painting- "Rinaldo and Armida" (1629 - Sir Anthony van Dyck) – Oil painting during the time of Anthony Van Dyke was not as standardized as it is today. Van Dyke and his contemporaries went into explorations of right mixtures of pigment, oil and other additives in order to achieve the right tonalities, color stability and binding to canvas. That "Rinaldo and Armida" remains such a colorful masterpiece almost 400 years after its creation is a testament to the artist as an alchemist and as an artist. An infrared picture of a sheet of music held by the sea nymph on the right side of the painting revealed a musical composition that makes sense. The musical composition is in the style of Claudio Monteverdi, a composer known to have written "Armida", an opera that has been lost. Van Dyke beautifully captures the moment of Armida's transition from hate to love described in Torquato Tasso's poem "Jerusalem Delivered" written 50 years before the painting was made. This is an example to chemists who can capture intermediates but only dream of transition states.

5. Bronze- "The Kiss" (circa 1886 - Auguste Rodin) – Bronze, an alloy of copper and tin and sometimes other metals, has been used since 3000 BCE when the Bronze Age began in Greece and China. It is tangible proof of mankind's ingenuity that a metal that is so hard to handle and a technique that is so hard to explain never mind implement, has been around for such a long time. "The Kiss" was originally intended as part of "The Gates of Hell," a pair of doors for a new decorative arts museum in Paris. It was supposed to illustrate the precariousness of Paolo and Francesca's illicit affair described in the 2nd circle of hell in Dante's Inferno. Instead, "The Kiss," as it evolved into an independent work of art, became a resonant symbol of love where Rodin accomplished a beautiful balance between passion and tenderness.

6. A "conversation" between bronze sculpture and oil painting. "Blue Nude" (oil painting) next to "Aurora" (bronze sculpture), both by Henry Matisse, is a treat for visitors at the BMA. Matisse was working on the clay model of "Aurora" when it fell and broke. In frustration, the artist began to work on "Blue Nude." Even though scholars disagree on the exact details of the story, the two masterpieces were made the same year (1907) and provide a wonderful opportunity to compare and contrast two different techniques using the reclining nude as subject.

7. Acrylic and silkscreen ink on linen – "The Last Supper" (1986 – Andy Warhol) – Andy Warhol did not invent silkscreen printing nor the incorporation of photo stenciling into the process but he certainly made the most of these two. The technique along with the banal subject matter used in many of his works brought commercial art to fine art and to this day it makes us question the concept of uniqueness and originality. The "Last Supper" belongs to a series originating from a commissioned work to reference a new gallery across Santa Maria delle Grazie, the home of Leonardo Da Vinci's "The Last Supper." The BMA's work is among approximately 100 works using different variations on the subject that Warhol worked assiduously during the last year of his life. This has prompted art critics to draw attention to Warhol's interests in spirituality and death.

8. Stainless Steel Installation – Flower Observatory (2004 – Olafur Eliasson) – This installation underscores the interest of the artist to explore the misty boundaries between emotion and intellect through a manifest manipulation of space and light. "Flower Observatory" feels arid and industrial from outside and kaleidoscopically magic once we walk inside. Visitors are enchanted by the experience and continuously walk in-and-out in an effort to understand how the effect is achieved and how the senses respond to details of architectural design.

The eight stops were a bird's eye view of the BMA to whet the appetite. To keep things in perspective, the museum has over 95000 works of art, each with something for us to view, research, learn and enjoy.

MAY 5 – JULY 21, 2018

Chemistry in the Library: Chemists Celebrate Earth Week Events

Programs are for children ages 7 & up; 7-8 year olds must be accompanied by an adult.
Miller Library program on 9 May at 7pm is open to all ages.
60 min. Registration required. Please register with the appropriate library system.

Howard County Library System
Glenwood Branch
Sat, April 7 @ 11 am
https://hclibrary.org/

Enoch Pratt Free Library
Govans Branch
Saturday, April 14 @2pm
www.prattlibrary.org/

Howard County Library System
East Columbia Branch
April 21 @ 2 pm
https://hclibrary.org/

Howard County Library System
Savage Branch
Sat, April 28 @ 2pm
https://hclibrary.org/

Howard County Library System
Elkridge Branch
Sat, May 5 @ 2 pm
https://hclibrary.org/

Howard County Library System
Miller Branch
May 12 @ 1 & 3 pm
Wednesday, May 9th @ 7pm (adult/family program)
https://hclibrary.org/

Howard County Library System
Central Branch
Sat, May 26 @ 2 pm
https://hclibrary.org/

Carroll County Library System
Eldersburg Branch
Sat 21 Jul @ 1pm
https://library.carr.org/

SUCCESS STORIES

SUCCESS STORIES: 2018 U.S. National Chemistry Olympiad Participant Made Honors

High School student Kevin Wang received honors in his U.S. National Chemistry Olympiad. The competition took place at Catonsville Community College of Baltimore County, CCBC. Kevin participated in the Maryland section with other 13 nominated students. About 1300 students competed nationwide and Kevin scored among the first 144 students. He traveled from Pennsylvania to Baltimore to take the exam in the morning of April 14th. He is grateful to the Maryland section and USNCO coordinator for allowing him to take the exam in Maryland, his efforts paid off. Congratulations Kevin! The Maryland Section is proud of you.

SUCCESS STORIES Update on Student Travel Awards and its impact to Chemistry Safety

Sarah Ashleigh Wirick and her professor Christopher Stromberg research were featured in C&EN, March 26 edition. Congratulations!

Some safety eyewear fails to protect against ultrafast lasers

Users should test eyewear under their own working conditions, researchers suggest
by Jyllian Kemsley
March 26, 2018 | Vol 96, issue 13
C&EN website https://cen.acs.org/safety/lab-safety/safety-eyewear-fails-protect-against/96/i13

To Maryland Section Executive Board: ***"Thank you. That feature was a direct result of us being able to attend the meeting, which we couldn't do it without the Maryland Section's support! Thanks, Chris"*** Christopher Stromberg.

Abstract ID: 2860140
Femtosecond laser eyewear protection: Measurements and precautions Maximilian Riedel-Topper [1], Sarah Wirick[1], Joshua A. Hadler[2], Brian G. Alberding[3] Edwin J. Heilweil[3], Christopher J. Stromberg[1]

[1]Department of Chemistry and Physics, Hood College, 401 Rosemont Ave, Frederick, MD 21710
[2]Applied Physics Division, Physical Measurement Laboratory, NIST Boulder, CO 80305
[3]Radiation Physics Division, Physical Measurement Laboratory, NIST Gaithersburg, MD 20899

Unlike continuous-wave lasers, femtosecond pulsed lasers have wide spectral bandwidths and extremely high peak power. Lasers such as Ti:Sapphire oscillators also have an adjustable center wavelength. These factors become an issue when selecting eyewear protection, as the eyewear may not protect the user from the entire laser spectrum, and the integrity of the eyewear material may be compromised by the high peak powers. This study was a continuation of a previous study that measured the effective optical densities of commercially donated filter samples. In this study, the same samples were tested to characterize their potential modes of failure using a 1 kHz Ti:Sapphire regenerative amplifier which generated ca. 80 fs

pulses with various wavelengths, powers, repetition rates, and beam spot sizes. For some filters, the wide bandwidth and variable center frequency of the laser caused the observed optical densities to be significantly lower than the supplier's rating at the center frequency. The observed modes of failure included melting, burning, bleaching, and saturable absorption behavior. Several filters transmitted several orders of magnitude more light than the supplier's suggested optical density ratings without any physical signs of damage. In general, plastic lenses were considerably more likely to fail, while all glass samples tested maintained their integrity under the conditions tested. The results of these experiments indicate that eyewear protection should be tested under the given experimental conditions to determine their efficacy before use.

SUCCESS STORIES: Update on Project SEED Alumni

Corshai Williams, formerly a student at Western High School, was a Project SEED high school student at Morgan State University during the summer of 2013 (working with Dr. Yousef Hijji) and the summer of 2014 (Dr. Pumtiwitt McCarthy). We have now received word that she has been accepted at MIT for a PhD in Chemistry with a full scholarship and teaching assistant position! Congratulations Corshai! The ACS Project SEED summer research program allows economically disadvantaged high school students to intern in an academic, industrial, or government laboratory. https://www.acs.org/content/acs/en/education/students/highschool/seed.html Corshai's stipend was paid by the national ACS (50%) and by the Maryland Section.

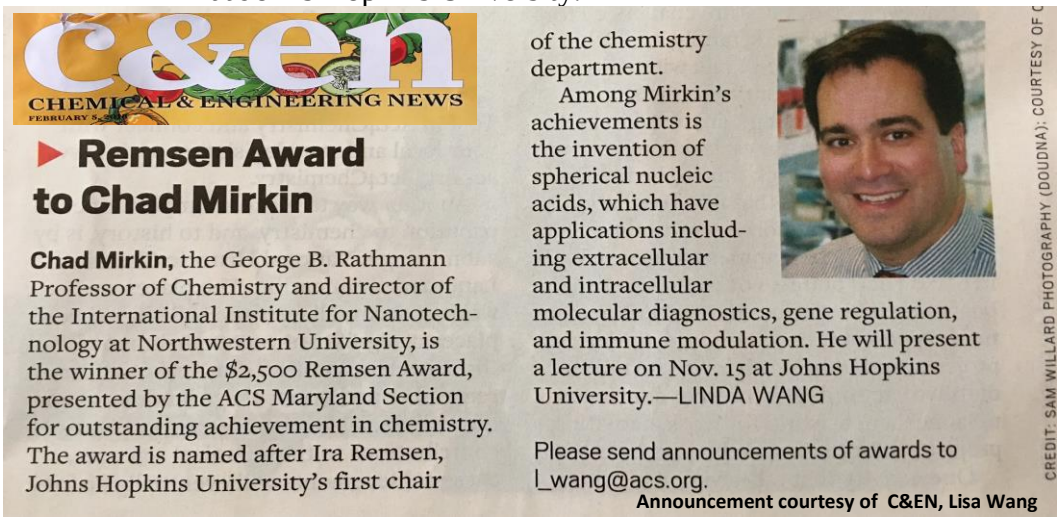
SUCCESS STORIES: 2018 Outreach Volunteer of the Year Award

Dr. Angela Sherman (Chemistry Department Chair at Notre Dame of Maryland University and Maryland Section Treasurer) has received the 2018 Outreach Volunteer of the Year Award for her commitment to the local section and the outreach programs. An announcement of the award and her picture came out in February 8th on the ACS website.

The Remsen Award is announced!

The Ira Remsen Award was inaugurated in 1946 in honor of Ira Remsen who was the second President of Johns Hopkins University.

The **73rd Ira Remsen Award (2018)** will go to Professor Chad Mirkin of Northwestern University. The award will be presented on November 15, 2018 at Johns Hopkins University.



C&EN CHEMICAL & ENGINEERING NEWS

Remsen Award to Chad Mirkin

Chad Mirkin, the George B. Rathmann Professor of Chemistry and director of the International Institute for Nanotechnology at Northwestern University, is the winner of the $2,500 Remsen Award, presented by the ACS Maryland Section for outstanding achievement in chemistry. The award is named after Ira Remsen, Johns Hopkins University's first chair of the chemistry department.

Among Mirkin's achievements is the invention of spherical nucleic acids, which have applications including extracellular and intracellular molecular diagnostics, gene regulation, and immune modulation. He will present a lecture on Nov. 15 at Johns Hopkins University.—LINDA WANG

Please send announcements of awards to l_wang@acs.org.

CREDIT: SAM WILLARD PHOTOGRAPHY (DOUDNA); COURTESY OF C

Announcement courtesy of C&EN, Lisa Wang

NEW PROGRAMS

New Program for Senior Chemists

ACS Local Section Maryland

Announcement from your Maryland Local Section:

ACS Senior Chemists: Message from the Senior Committee Chair

https://www.acs.org/content/acs/en/membership-and-networks/senior-chemists.html

Start a New Senior Committee at your Local Section:

https://www.acs.org/content/dam/acsorg/membership/senior-chemists/senior-chemists-starter-kit.pdf

Announcements

CALL FOR NOMINATIONS: MD ACS OFFICER POSITIONS

Nominations are solicited from the membership for positions as officers within the Maryland Section of ACS. Nominations may be send to the Chair of the Nomination Committee, Dr. James A. Saunders at jsaunders@towson.edu either as self-nominations or to nominate a colleague. Position that are elected in 2018 are: 1 Chair-Elect 1 Treasurer 1 Secretary 5 Members At Large 2 Councilors The Chair-Elect term is 3 years: candidate is Chair-Elect for one year, and then moves to Vice-Chair for one year, followed by Chair for the last year. Two Councilor positions are also open for a 3-year term in 2018. Members-at Large, Treasurer and Secretary are elected each year.

REMINDER:

Receiving the Chesapeake Chemist

Hopefully, if you are reading the Chesapeake Chemist this month, you are receiving it via e-mail from us. We went to electronic-only mailings to our MD ACS membership in October 2006.

Changing your e-mail address? Moving out of the MD ACS area? E-mail changes can be updated either by:

- E-mailing us at acsmarylandsection10@gmail.com – give us your member #, full name, and e-mail changes and we can ensure that your records are updated with National ACS.
- **Contacting the National ACS membership division: 800-333-9511 (US only)** or service@acs.org

To ensure that you receive the Chesapeake Chemist, please add the MD ACS e-mail acsmarylandsection10@gmail.com.

If you are a member who currently doesn't receive the Maryland ACS Chesapeake Chemist but download it from our website, it is possible that National ACS does not have your e-mail address on file. If you want to receive the Chesapeake Chemist via e-mail, please e-mail us at acsmarylandsection10@gmail.com – give us your member #, full name, and e-mail address and we can ensure that your records are updated with National ACS.

The current edition and previous editions of the Chesapeake Chemist can ALWAYS be obtained via our website: http://www.maryland.sites.acs.org – please see the Newsletter Archive link on the left-hand side of the website.

The Chesapeake Chemist is e-published monthly September through June by the Maryland Section of the American Chemical Society. Send submissions to the editor in electronic format. The Maryland Section is not responsible for opinions expressed herein. Editorials express the opinions only of the authors. The editor is not responsible for all unsigned material.