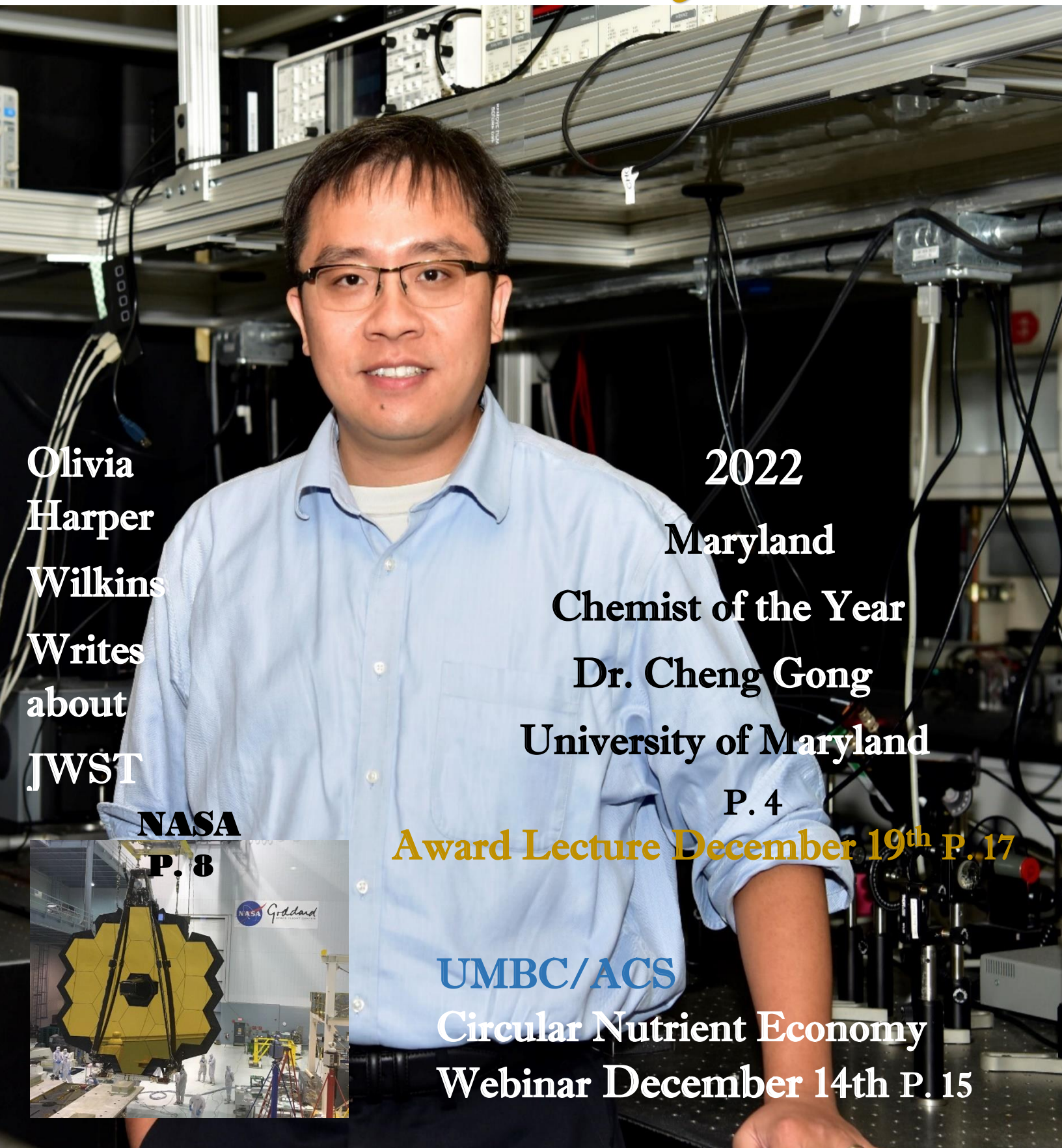
Chesapeake Chemist

Maryland Section
American Chemical Society

VOLUME 79 No. 6
December 2022

Congratulations!



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Chesapeake Chemist
Maryland Section American Chemical Society

ACS Local Section Maryland

Maryland Local Section Newsletter

Editor-in-chief: Beatrice Salazar

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From the Editor's Desk . .

Jingle bells…jingle bells…

The Maryland Section of the American Chemical Society will present Dr. Cheng Gong, Assistant Professor at the University of Maryland, with the 2022 Maryland Chemist of the Year Award on December 19, 2022. Professor Gong is being recognized for his work on nanosensors using 2D quantum materials. You can read about his work and details of the award ceremony on pages 4-6 and page 17.

The names of the new Maryland Section officers for the year 2023 have been announced. Congratulations to all volunteers. Your job for the local section is very much appreciated (page 13).

This year we are celebrating the first anniversary of the The James Webb Space Telescope (JWST), launched in December 2021. Olivia Harper Wilkins, Ph.D., a NASA Postdoctoral Program (NPP) Fellow at NASA Goddard Space Flight Center wrote a great article announcing the progress and results of the program. Read the article: First chemistry results from JWST on pages 8-12.

ACS members are invited to the December webinar titled: "Circular Nutrient Economy: Recovering nutrients from waste streams for reuse as fertilizers" on December 14 th at 2:00 P.M. The webinar was possible thanks to the effort of Professor Blaney's laboratory postdocs, and graduate and undergraduate students at UMBC (p15-16). We are grateful to the five panelists team. We expect this webinar will be the beginning of many other similar webinars.

Enjoy the Holiday Season!

Beatrice Salazar

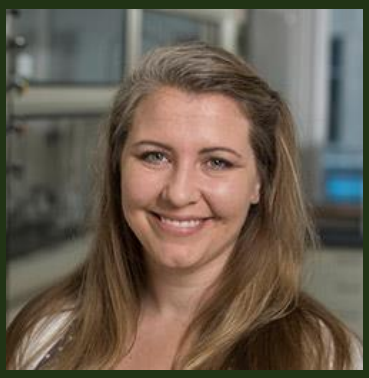
Editor-in-Chief, ACS Maryland Section
beatricesalazar1@gmail.com

Thank you all for the contributions to identify deserving candidates for the Maryland Section awards. Please continue nominating your colleagues and letting us know about their great work.

Chesapeake Chemist
Maryland Section American Chemical Society

ACS Local Section Maryland

CHAIR'S MESSAGE



Dr. Sarah Zimmermann Chemist, FDA

Chair, ACS Maryland Section - acsmaryland.org

Sarah Zimmermann, PhD
Chemist FDA
https://www.fda.gov
U.S. Food & Drug Administration
10903 New Hampshire Ave,
Silver Spring, Maryland,
20903, United States

(92) Sarah Zimmermann | LinkedIn

Recent publication Feb. 2021
Journal ONCOLOGIST

Happy Holidays Maryland ACS,

Our section been busy wrapping up our final goals for 2022. Thank you for voting on your 2023 executive members and updated bylaws. Once certified by National ACS our revised bylaws will be posted on the website. View the results of our election and get to know your 2023 executive board members in this December edition of the Chesapeake Chemist Newsletter. Additionally, we have two December events remaining:

- The launch of our webinar series begins with a presentation on Circular Nutrient Economy: Recovering nutrients from waste streams for reuse as fertilizers on December 14, 2022 at 2pm.

- The 2022 Maryland Chemist Award to Dr. Cheng Gong, Assistant Professor in the Department of Electrical and Computer Engineering at the University of Maryland. Dr. Cheng Gong will be celebrated with an Awards Ceremony and Reception on Monday, December 19, 2022 at 5:30 pm.

It has been my pleasure serving as your Chair for 2022. My hope is that in the New Year we can all find a new way to connect and stay current in our local section as our new 'normal' following the COVID pandemic. I have no doubt our 2023 executive board members will work hard to try to increase member engagement and help organize new seminars and events will be shared with you in the New Year. If you are interested in becoming more active with the Maryland Local ACS Section or have any ideas on how we can better serve the Maryland Chemist Community, please feel free to contact us at: acsmarylandsection10@gmail.com.

Thank you,

Sarah Zimmermann, PhD

Chesapeake Chemist — Maryland Section American Chemical Society

ACS Local Section Maryland

2022 Maryland Chemist of the year Award Lecture

Monday
Dec. 19, 2022
at 6:00 P.M.

RSVP Beatrice Salazar
(beatricesalazar1@gmail.com)

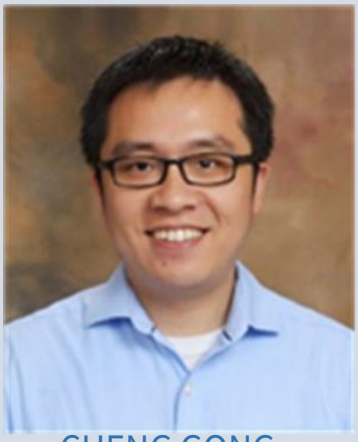
A.V, Williams Building R-2460
Reception starts at 5:30 P.M.
Campus Map

Speaker

Dr. Cheng Gong, Ph.D.

Assistant Professor in the Department of Electrical and Computer Engineering Quantum Technology Center, (QTC) University Of Maryland

Electrical and Computer Engineering
Quantum Technology Center
Materials Science and Engineering



CHENG GONG

Unconventional Sensing Enabled by the Convergence of 2D Quantum Materials and Artificial Intelligence

Abstract: Conventional sensing has long been confronted with the challenges in both sensing devices (hardware) and data processing (software). For the hardware aspect, the three-dimensional (3D) bulky materials cannot respond to influencing factors as sensitively as the low-dimensional materials can. For the software aspect, prior efforts have been heavily focused on reading the net signal "above the noise level" but can do little when signals are deeply buried in various noises. We implemented atomically thin two dimensional (2D) **m**ultifunctional **m**agnetoelectric **m**aterials (3M) for the development of **s**uper **s**ensitive **s**ensor **s**ystems (**4S**) - that is, **3M for 4S**. Due to the 2D nature of the quantum materials, the remarkable feature of "the whole material is a surface" lays the foundation for super sensitive response to influencing factors including gas molecules, biological entities, and electromagnetic fields, based on which we developed our sensor technologies for food security, disease early detection, and defense technologies. We analyzed the sensed data deeply buried in noise by state-of-the-art artificial intelligence (AI). We envision the convergence of 2D quantum materials and AI will blaze a path towards unconventional sensing for the years to come.

Biography: **Full PDF CV**

Dr. Cheng Gong received his Ph.D. in Materials Science and Engineering from the University of Texas at Dallas, and was a postdoctoral scholar in University of California, Berkeley till his joining of University of Maryland. He is currently an Assistant Professor in the Department of Electrical and Computer Engineering.

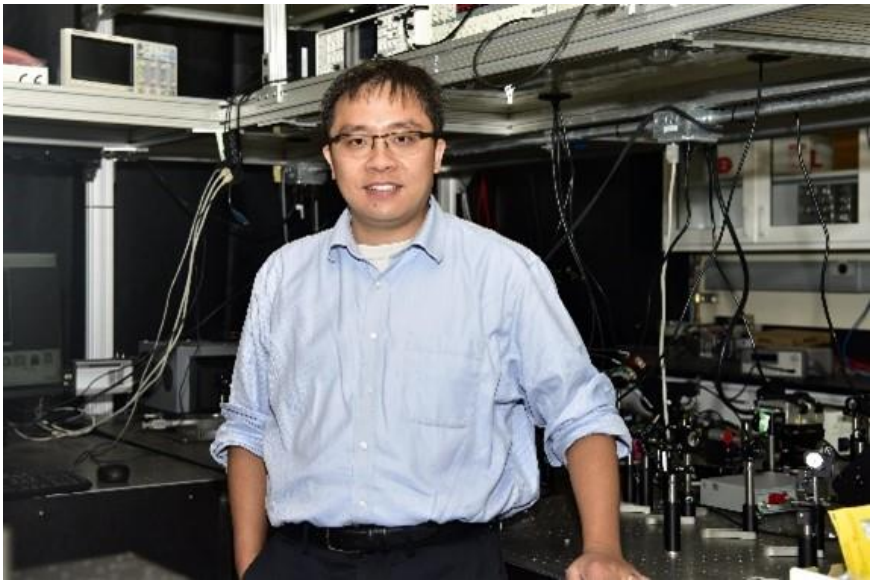
Publications:

Gong, Cheng | A. James Clark School of Engineering, University of Maryland (umd.edu)
Gong Lab: GONG LAB - Home (weebly.com)
Gong Paper on Ferroelectric Control of Half-Metallic 2D Electron Gas Published in *Nano Letters*
Assistant Professor Cheng Gong Wins IUPAP Young Scientist Award
2022 BBI Seed Grant Awards to Fuel Innovation in Aging and Development Research
Gong Lab Publishes Two Papers Related to 2D Quantum Materials Sensors and Receives MII Funding
Gong Wins UMD Invention of the Year Award

AWARDS:

- ACS Maryland "Chemist of the Year" 2022
- "Invention of the Year" across all disciplines 2022, UMD (1 out of 342 competing inventions)
- "Invention of the Year" in Physical Sciences 2022, UMD
- George Corcoran Memorial Award for Faculty 2022, UMD ECE
- Jimmy H. C. Lin Award for Entrepreneurship 2022, UMD ECE
- IUPAP Young Scientist Prize in Semiconductor Physics 2020 (1 per year worldwide)
- Minta Martin Award 2020

VOLUNTEER WORK:
Dr. Gong is a well round person, besides his busy work at his lab, he takes time to help the scientific community.



a) He actively serves as **the referee for over 50 journals** including Nature, Science, Nature Materials, Nature Physics, Nature Photonics, Nature Electronics, Nature Nanotechnologies, Nature Communications, Physical Review Letters, Nano Letters, ACS Nano, etc.

b) He serves as **the referee for multiple funding agencies** including National Science Foundation (NSF), Air Force Office of Scientific Research (AFOSR) and North Carolina Space Grant Faculty Research Grant.

c) He is organizing and **has organized multiple international conferences** including 2023 American Vacuum Society (AVS), 2022 American Physics Society (APS), 2021 Fifth Symposium on 2D and Low Dimensional Materials, 2022 Electronic Materials Conference (EMC), 2022 Magnetism and Magnetic Materials (MMM).

d) He gave **>50 invited talks** during 2019-2022 in universities, government labs, and international conferences.

e) He is **organizing an international workshop** entitled "Materials Science Research for Quantum Information Science" to be held at UMD in December 2022, in collaboration with the Air Force Office of Scientific Research (AFOSR) and Laboratory for Physical Sciences (LPS).

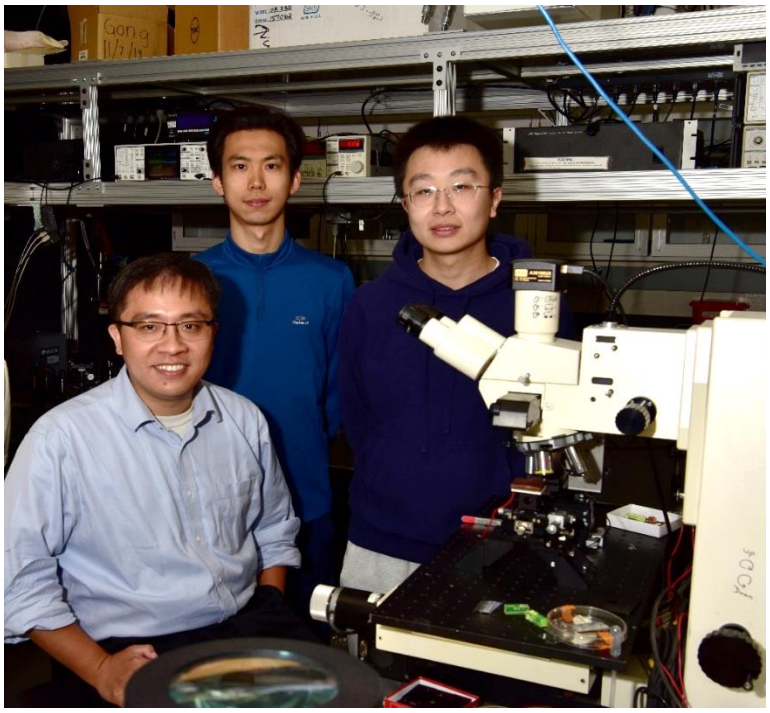
f) He is a **co-leader of the Quantum Sensor subgroup** under Maryland Quantum Alliance (MQA).

g) He is the **guest editor** for two journals - *APL Materials, Materials Today Electronics.*

h) He organizes **summer internships** for undergraduate, graduate, and high school students, in collaboration with Montgomery Blair High School and Army Research Laboratory.

Contact :Assistant Professor Cheng Gong at Electrical and Computer Engineering Quantum Technology Center Materials Science and Engineering 2216 Jeong H. Kim gongc@umd.edu - (301)-405-3739 - Website

Dr. Gong's research on 2D Materials-Based Nanosensors for Rapid Monitoring of Meat Freshness uses graphene, a two-dimensional quantum material that's a single layer of carbon atoms thick. He and his team developed a sensor to accurately determine the freshness of meat by determining the presence of gas emissions at the time degradation begins. He and his laboratory research team are improving science teaching and helping society by enhancing the nation's food security. According to the U.S. Department of Agriculture estimates, about 30-40% of the U.S. food supply goes bad, is ruined in production or is simply thrown out before it ever reaches a table. How much meet is thrown away? We hope to get some answers during Dr. Gong's talk on December 19th.



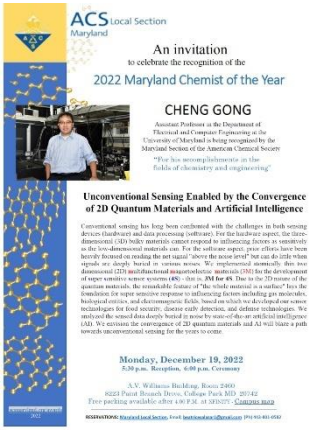
Dr. Gong, Zhihao Song B.S. Univ. Elec. Sci. Tech. China, and Ti Xie M.S. George Washington University. Photo courtesy: Gong's Lab

Professor's Gong research can be summarized in **3 categories of sensing research:**

- Food security,
- Health and diseases
- Defense such as aircraft related

"In the early stages of spoilage, meat produces an odor," says Gong. "That odor can be 'smelled' by our nanosensors."

His invention will inspire change on his students' science learning, entrepreneurship, and marketing. The recipient will receive award on December 19th. Around 5:30 P.M. We will celebrate with a colleagues, students, and staff from the University of Maryland, UMD, and with members of the ACS Maryland Local Section. Please let us know if you are interested in attending this ceremony.


ACS Local Section Maryland

An invitation to celebrate the recognition of the 2022 Maryland Chemist of the Year

CHENG GONG

Assistant Professor in the Department of Electrical and Computer Engineering at the University of Maryland is being recognized by the Maryland Section of the American Chemical Society

"For his accomplishments in the fields of chemistry and engineering"

Unconventional Sensing Enabled by the Convergence of 2D Quantum Materials and Artificial Intelligence

Monday, December 19, 2022
5:30 p.m. Reception, 6:00 p.m. Ceremony

Please send congratulatory remarks or anecdotes to ACS Maryland local section.

For more information, please see the Invitation flyer. See page 17

HISTORY…

Maryland Section
Of the
American Chemical Society
Maryland Chemist Award

When did the award begin? It is only speculation because there are no records of when this award was established; It is believed that it began in 1962 but the idea was born when the Maryland Section of the America Chemical Society was created. In the meantime, more research will be done on this subject to have a complete and accurate list of the awardees since the creation of the award. The Maryland Chemist of the year is one of the Maryland Section most distinguish award because it is at the State Level. What would be next? Could this award be at the national level? The Maryland Section has a great list of awardees since 1975 and it will be a matter of time that we extend this award to a national level by nominating a scientist to the American Chemical Society for a National Award.

Dr. George L. Braude (left) being presented with 1968 Maryland Chemist Award by Section Chairman Timothy F. Parr (right). In the center is George Steinberg, Chairman of the Awards Committee.

The oldest award recipient on record… 1968

Maryland Chemist of the Year Recipients in the last decade:

2022 Dr. Cheng Gong, University of Maryland
2021 Takashi Tsukamoto, Johns Hopkins University
2020 David R. Yarkony, Johns Hopkins University
2019 Andrew Coop, University of Maryland School of Pharmacy
2018 Jared DeCoste, US Army Research Development and Engineering Command, Edgewood Chemical Biological Center
2017 Thomas Lectka, Johns Hopkins University
2016 Katherine Seley-Radtke, University of Maryland, Baltimore County
2015 Jason Dworkin, National Aeronautics and Space Administration
2014 Angela Wilkes, University of Maryland School of Pharmacy
2013 Paul Mahaffy, National Aeronautics and Space Administration
2012 Shirish Shah (Service Award for his

contribution to the MD ACS Section)

AWARD LECTURE

BY

2022 MARYLAND CHEMIST OF THE YEAR RECIPIENT

CHENG GONG

ASSISTANT PROFESSOR AT THE UNIVERSITY OF MARYLAND

CONGRATULATIONS!

December 19, 2022

AWARD LECTURE
INVITATION see page 17

Meet Olivia H. Wilkins, Ph.D.

ACS Maryland section recently welcomed Dr. Wilkins as a new member of the section and as Member at Large. We hope Dr. Wilkins enjoys her volunteer work. The local section is already receiving her contributions to all chemists in the Maryland area.

Enjoy the following article: First chemistry results from JWST, written by Olivia Harper Wilkins, Ph.D. (NASA Postdoctoral Program Fellow, NASA Goddard Space Flight Center)
Contact information: olivia.h.wilkins@nasa.gov

Abstract:

The James Webb Space Telescope (JWST), which launched just one year ago in December 2021, has already given us exciting glimpses into extraterrestrial chemistry. Observations of Mars and planets orbiting other stars have demonstrated the power of JWST to pick up the faintest infrared signals originating from molecules in planetary atmospheres, including the first clear evidence of exoplanetary carbon dioxide in the atmosphere of a planet about 700 lightyears away. Observations of infant star systems and comets, among other objects, are underway and will bring us closer to answering astronomical questions that have remained unanswered for decades.

Chesapeake Chemist
Maryland Section American Chemical Society
ACS Local Section Maryland

First chemistry results from JWST

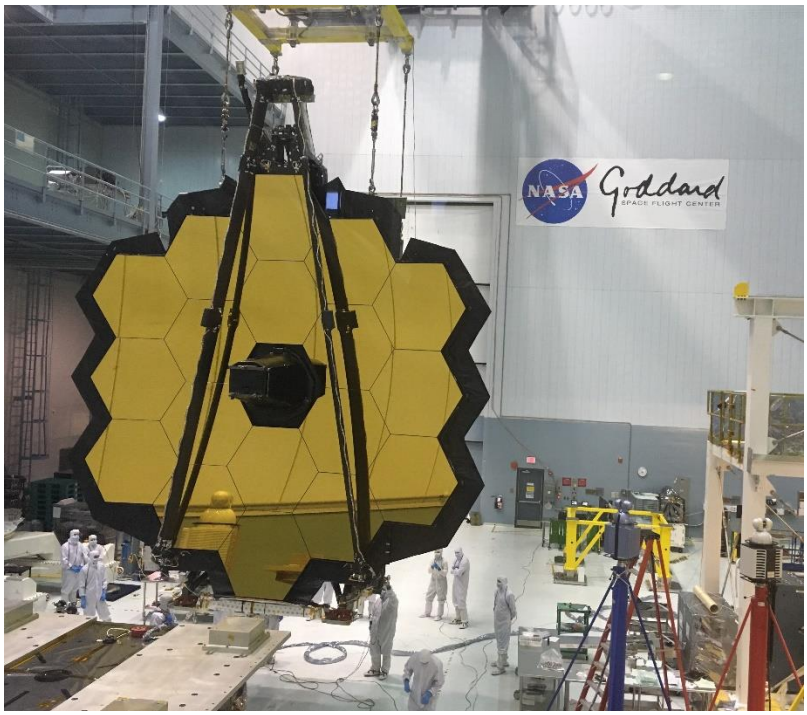
By Olivia Harper Wilkins

Over the three decades since the first exoplanet was discovered, it has become increasingly clear that the solar system is not a typical planetary system. Searches for planets orbiting stars other than the Sun have revealed many planets with short treks—as little as a few days or, for an exceptional few, several hours—around their stars, much different from our solar system in which Mercury, the planet closest to the Sun, has an orbit of 88 Earth days. These searches have also found that many of these close-in planets are not small rocky bodies but gaseous giants about the size of Jupiter.

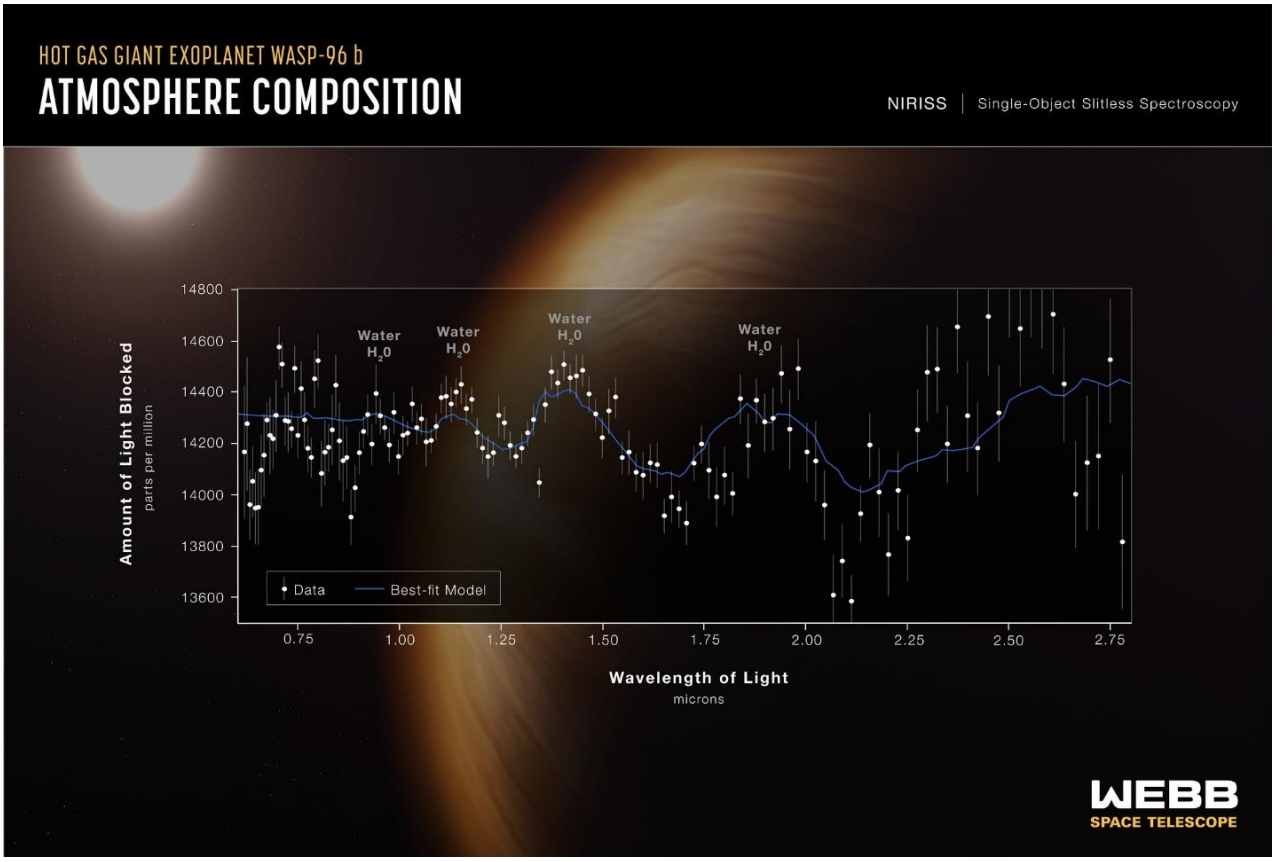
These discoveries have brought forth new questions about atmospheric chemistry. How common are planets with nitrogen-rich atmospheres like that of Earth? How does proximity to a star affect the chemical composition of a gas giant? What can atmospheric chemistry tell us about where a planet formed in its respective planetary system? Are signatures of life—or at least prebiotic chemistry—present elsewhere in the universe?

These are some of the very questions the James Webb Space Telescope, or JWST, endeavors to answer. Although JWST is nominally an instrument for astronomy, it will provide information about how chemistry proceeds under conditions much different from those on our own planet. The first data from JWST—which launched on December 25, 2021—were revealed only a few months ago but already the telescope shows promise for understanding the chemistry of distant (and some not-so-distant) worlds.

On the morning of Tuesday, July 12, 2022, NASA broadcast JWST's first full-color images and spectroscopic data to the world. I spent the morning in the NASA Goddard library in Building 21, across center from my usual workspace in Building 34. With each new



JWST at NASA GSFC during assembly
Maggie Masetti



Early release spectrum showing H_2O in the atmosphere of WASP 96 b
NASA, ESA, CSA, and STScI

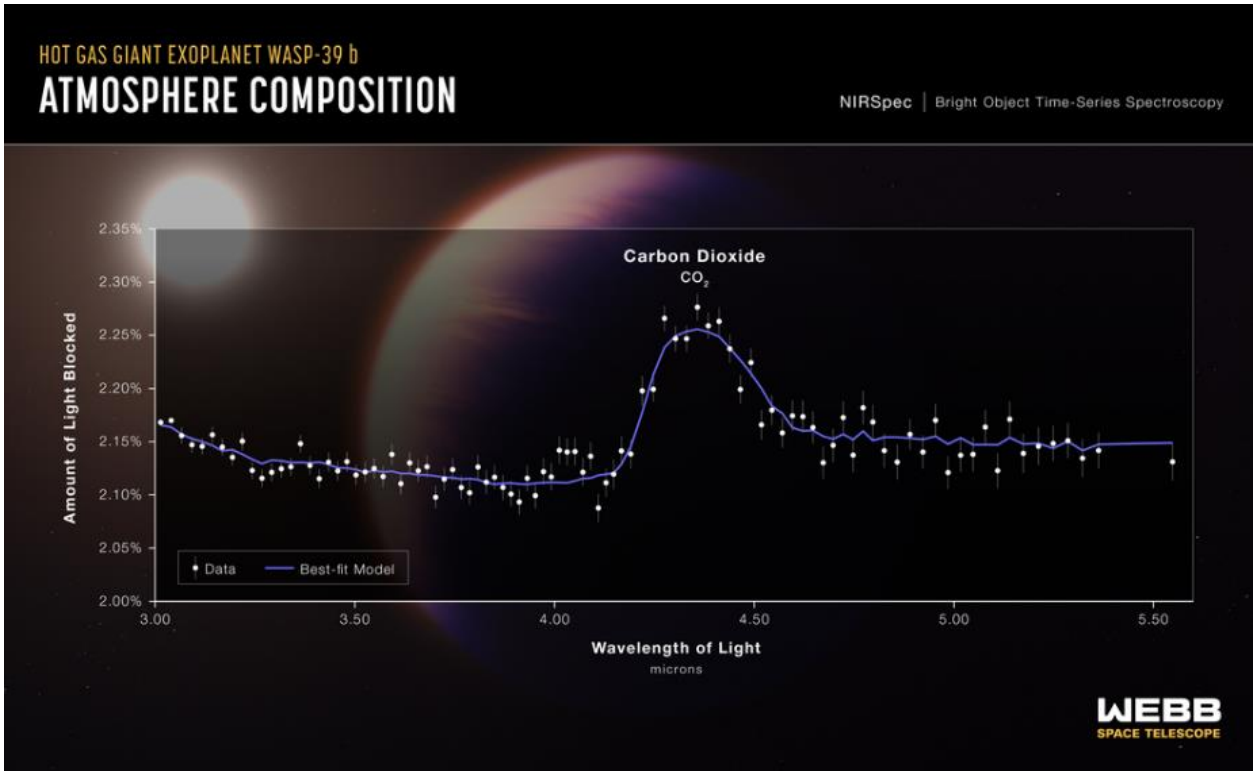
image shown on the large screen in the library, the gathered scientists and engineers let out small gasps—and even tears—of awe. The images shown were beautiful, showing us never-before-seen details of galaxies and clouds of dust and gas where infant stars are born.

The seemingly least remarkable reveal of the day was not an image but a spectrum: just a squiggly blue line passing over white datapoints. The spectrum showed water, a well-known constituent of gas giants, in the atmosphere of WASP-96 b, an exoplanet orbiting a Sun-like star about 1,150 lightyears away. While not a breathtaking glimpse of swirling cosmic dust nor a new molecular detection, the spectrum represents the remarkable spectroscopic capabilities of JWST that will enable us to detect faint chemical signatures from exoplanet atmospheres with unprecedented clarity and spectral resolution for a space-based telescope.

A spectrum of another gas giant exoplanet a bit closer to home demonstrates this power of JWST's spectroscopic instruments.

Observations of WASP-39 b, which orbits a Sun-like star about 700 lightyears away, revealed—for the very first time—indisputably clear evidence of carbon dioxide in an exoplanetary atmosphere.

Only a handful of molecular compounds, including water, carbon monoxide, methane, and ammonia, have been detected in exoplanet atmospheres so far, and the addition of carbon dioxide to this list bodes well for

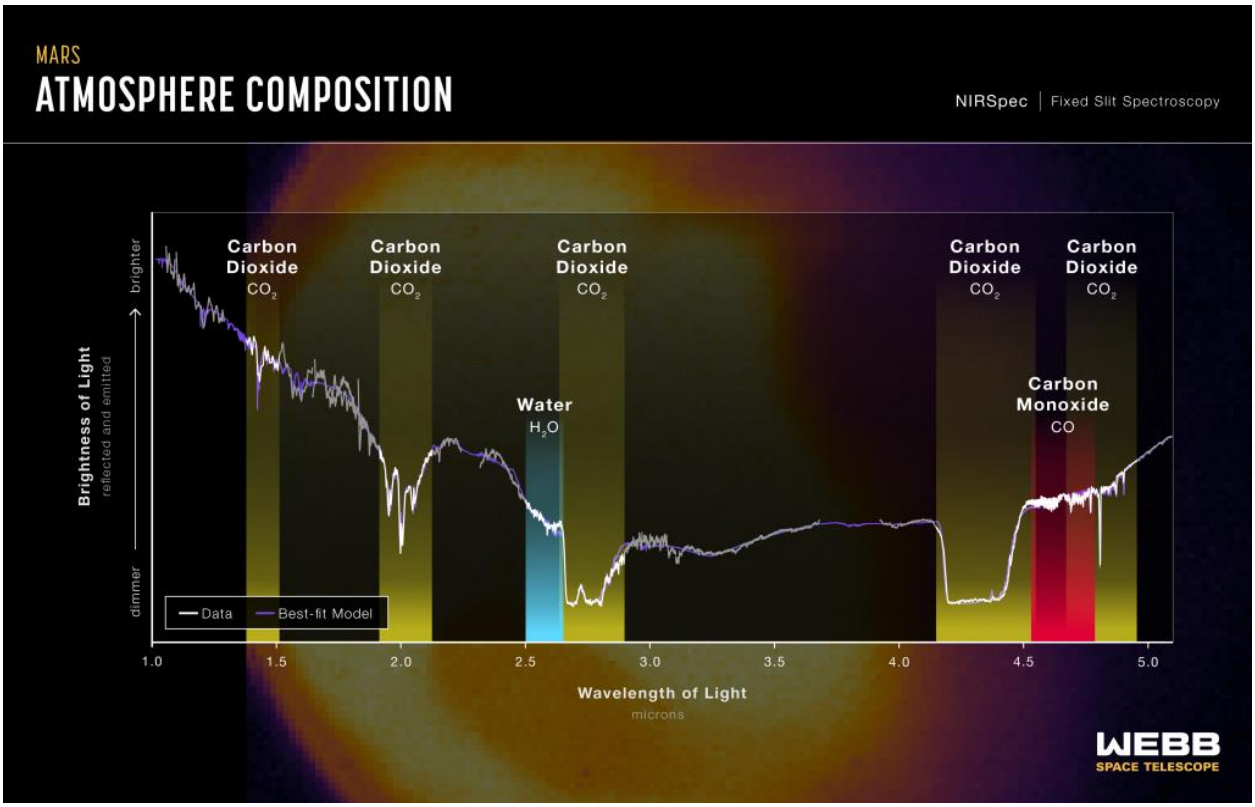


CO_2 in the atmosphere of WASP 39 b
Illustration: NASA, ESA, CSA, and L. Hustak (STScI)
Science: The JWST Transiting Exoplanet Community Early Release Science Team

studying the chemistry of exoplanets and how they form. The atmospheric compositions of planets could provide clues about where a planet formed around its respective star and whether it migrated toward or away from its star since its formation. This is possible because water, carbon monoxide, and carbon dioxide all have different temperatures at which they are frozen out onto the dust grains and (proto)planetesimals that grow into planets, meaning that the relative abundances of these species can provide insights into how much solid versus gaseous material was incorporated into the planet upon its formation.

JWST also shows promise for studying the atmospheres of planets in our own solar system. The first near-infrared spectrum of Mars, for example, revealed crisp absorption features attributed to carbon dioxide, carbon monoxide, and water. This high-resolution first look at the red planet is exciting because it demonstrates the spectroscopic capabilities of JWST, which will be used to search for trace gases such as methane in the martian atmosphere and investigate how chemical compositions vary across different regions—and seasons—on the planet. Searches for trace gases are slated for other planetary bodies, including Titan, the moon of Saturn well-known for its hydrocarbon lakes and methane rain.

Atmospheric chemistry isn't the only thing, however, that can be studied with JWST. The roster for the telescope's first cycle of observations is full of



The near-infrared spectrum of Mars showing H_2O, CO, and CO_2 in the red planet's atmosphere
NASA, ESA, CSA, STScI, and Mars JWST/GTO team

chemical investigations beyond studying (exo)planetary atmospheres. Some proposals aim to take a census of volatile ices in dust enveloping protostars and in the midplanes of circumstellar disks where new planets are built. Others aim to observe polycyclic aromatic hydrocarbons (PAHs), which are thought to contain as much as 60% of cosmic carbon but are notoriously difficult to identify from telescope data. Several accepted proposals will look at organic matter (including PAHs) in comets.

It will be a while before we see the results of these observations, which will continue well into 2023. In the meantime, all we can do is hope that JWST will bring us even a little bit closer to understanding the chemical heritage of the universe. Fortunately, from the first results that have been released within the first year since launch, it looks like the telescope will do just that.

Olivia Harper Wilkins, Ph.D., *is a NASA Postdoctoral Program (NPP) Fellow at NASA Goddard Space Flight Center. You can connect with her on Twitter and Instagram at @LivWithoutLimit. She can also be reached by email at olivia.h.wilkins@nasa.gov. Views expressed are the author's own.*

To check out more of the amazing science from JWST, check out the following:

- *https://jwst.nasa.gov/content/science/origins.html (mission overview)*
- *https://blogs.nasa.gov/webb/ (recent news from JWST observations)*
- *https://www.nasa.gov/webbfirstimages/ (first images released*

ACS	ACS Maryland Section
Dates to remember **December 1, 2022** ACS Officer Reporting **December 18, 2022** ACS Outreach Volunteer of the Year **January 20-22, 2023** ACS Leadership Institute	SUMMER RESEARCH **PROJECT SEED** PROGRAM AT MARYLAND LOCAL SECTION Future students and summer research participants, please check all information and CONTACT: https://acsmaryland.org/acs-maryland-research-project-seed/ Committee Chair / Program Research Coordinator **Louise Hellwig** Program Recruiter / Coordinator **Beatrice Salazar** Program Recruiter / Coordinator **Kelly M. Elkins**
https://www.acs.org/content/acs/en/education/outreach/celebrating-chemistry-editions.html	**INVITATION to MARYLAND SECTION EVENTS:** December 14, 2022 see page 15 December 19, 2022 see page 17 December 25, 2022 see page 8

Congratulations to the new 2023 ACS Maryland Section Officers

Beatrice Salazar
Chair-Elect
3-yr term

Louise Hellwig
Secretary
2-yr term

Lee Lefkowitz
Treasurer
2-year term

Kelly Elkins
Councilor
3-year term

Jillian Malbrough
Alternate Councilor
3-yr term

Nirupam J. Trivedi
Member at Large
1-yr term

Olivia Harper Wilkins
Member at large
1-year term

Saraswathi Narayan
Member at Large
1-year term

Rose Pesce-Rodriguez
Member at Large
1-yr term

C. Eric Cotton
Member at Large
1-yr term

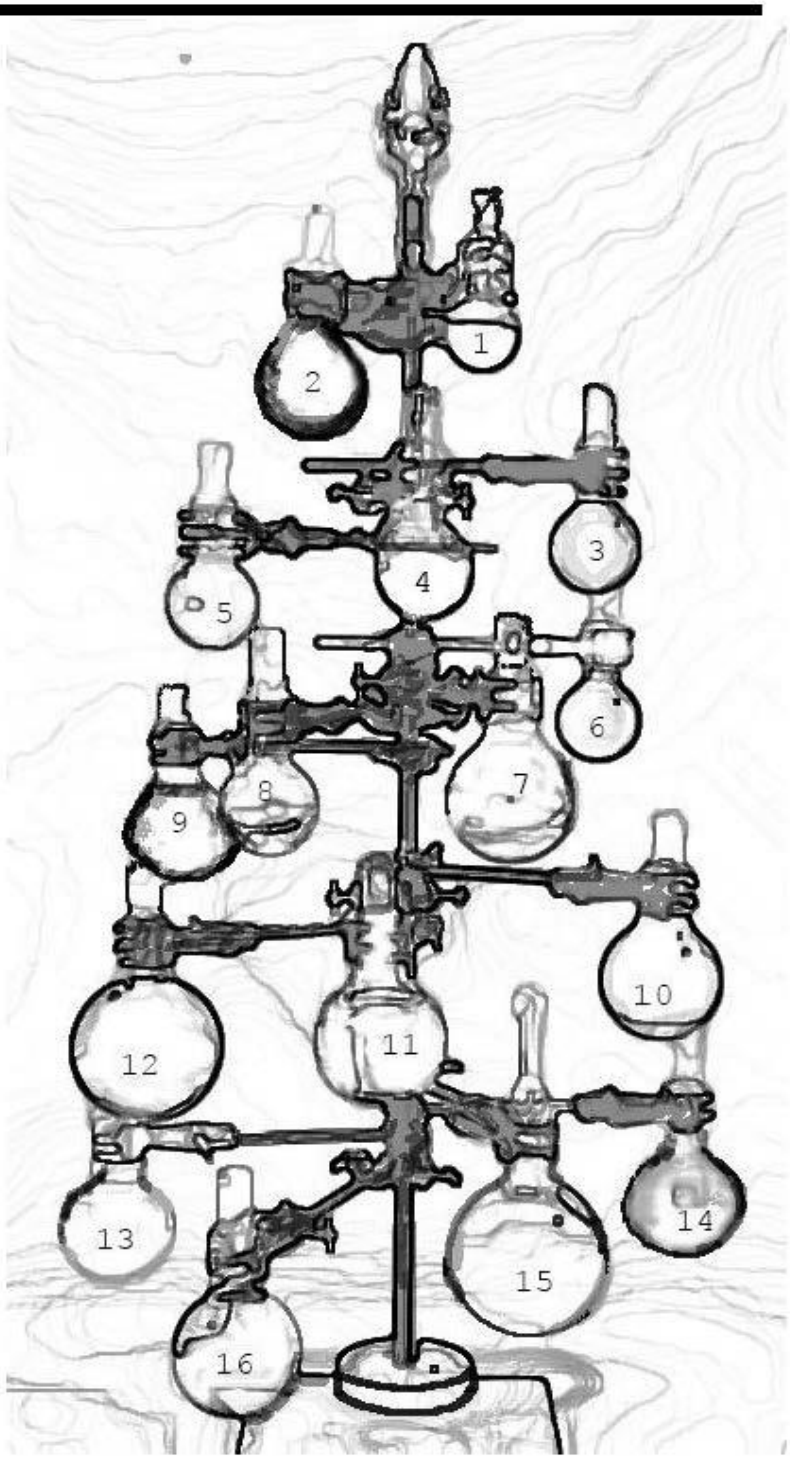
Vote for Changes in By-Laws "APPROVED"
acsmaryland.org

INTERACTIVE CHRISTMAS TREE

Colour-by-numbers chemis-tree

Use the following colours for each flask.

1. Sulfur
2. Potassium permanganate solution
3. $CoCl_2 \cdot 2H_2O$
4. Strontium nitrate flame
5. Copper(II) sulfate solution
6. $CoCl_2$
7. Bromothymol blue indicator in a neutral solution
8. Phenolphthalein in a solution with a pH above 10
9. Lead(II) iodide
10. Iodine gas
11. Copper(II) sulfate pentahydrate
12. Litmus paper when exposed to acid
13. $CoCl_2 \cdot 6H_2O$
14. Chlorine gas
15. Bromine liquid
16. Barium chloride in fireworks

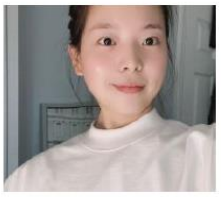


ACS Local Section Maryland

WEBINAR-1

December 14, 2022, 2:00 P.M.

UMBC CHEMICAL BIOCHEMICAL AND ENVIRONMENTAL ENGINEERING



Dr. Hui Chen (team lead) postdoctoral research associate at UMBC Dr. Blaney's lab. (Completed her Ph.D. in Chemistry at Stonybrook University)

Dr. Utsav Shashvatt postdoctoral research associate at UC Berkeley. (Completed his Ph.D. in environmental engineering at UMBC – Dr. Blaney's lab)

Mr. Michael Fleming Ph.D. candidate at UMBC, Dr. Blaney's lab (environmental engineering program)

Ms. Ouriel Ndalamba BS student in our lab at UMBC (chemical engineering major)

Ms. Kaylyn Stewart BS student in our lab at UMBC (chemistry major)

Circular Nutrient Economy

Recovering nutrients from waste streams for reuse as fertilizers

PANELISTS: Expert Environmental Engineers from UMBC

Overview

Nowadays, nutrient pollution such as eutrophication has become a major issue causing large scale harm to the environment. Therefore, it is necessary to understand how to mitigate the effects of nutrient pollution on the environment while sustainably recovering nutrients in valuable forms. Donnan dialysis can be a great strategy to recover nutrients from waste streams for reuse as fertilizers with minimal energy and chemical input. Learning the basics of Donnan dialysis is essential to apply this technology in larger scale waste streams treatment.

In this webinar, our panel of post-doc, graduate and undergraduate students from UMBC will discuss the applications of Donnan dialysis to achieve circular nutrient economy by recovering nutrients from waste streams as fertilizers. They are subject matter experts in environmental engineering who will give us a detailed explanation of how Donnan dialysis works and how to design sustainable nutrient recovery systems. The panel will present their current achievements in Donnan dialysis application in agricultural and municipal waste to address nutrient pollution.

Key Learning Objectives

- Importance of circular nutrient economy
- Basics of Donnan dialysis
- Current progress in Donnan dialysis technologies for nutrient recovery

Who Should Attend

- Analysts, technicians, engineers and chemists who are either currently involved in environmental issues
- Wastewater professions and farmers who are interested in employing new strategies to solve nutrient pollution
- Students and researchers working on environmental issues

Registration you may also register by e-mail:

mailto:beatricesalazar1@gmail.com? subject=Environmental Webinar - Maryland Community

WEBINAR-1 Information:

Date: December 14, 2022
Time: 2pm-3pm
Link: Circular Nutrient Economy
Webinar-1 ID: 921 9164 0078
Password: webinar-1

Contact:

Beatrice Salazar
Councilor, ACS-MD LS
Maryland Community Events
Coordinator and Webinar Moderator
Contact

ACS Local Section Maryland

Lee Blaney
Professor
UMBC

Contact us:
Chemical, Biochemical and Environmental Engineering on my UMBC

UMBC CHEMICAL BIOCHEMICAL AND ENVIRONMENTAL ENGINEERING

Sponsored by: **UMBC and ACS Maryland IPG program renovated in 2022**

Worth remembering: Contact any of our panelists or moderator for any questions you may have related to the topic discussed above. Feel free to share this information with your colleagues

ANNOUNCeMeNTS

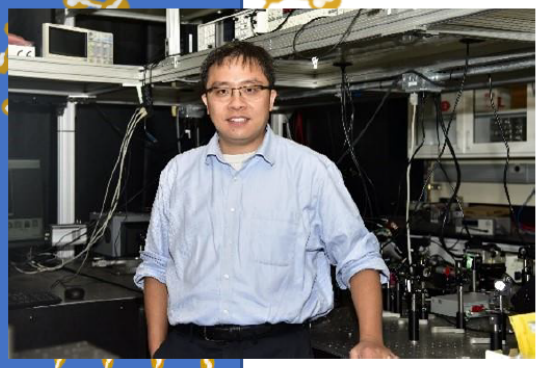
ACS Maryland Completed its IPG Grant responsibilities for more information see the website created for this purpose. The Maryland community website contains, movies, podcasts, webinar information and more.

ACS Local Section
Maryland

An invitation

to celebrate the recognition of the

2022 Maryland Chemist of the Year



CHENG GONG

Assistant Professor in the Department of Electrical and Computer Engineering at the University of Maryland is being recognized by the Maryland Section of the American Chemical Society

"For his accomplishments in the fields of chemistry and engineering"

Unconventional Sensing Enabled by the Convergence of 2D Quantum Materials and Artificial Intelligence

Conventional sensing has long been confronted with the challenges in both sensing devices (hardware) and data processing (software). For the hardware aspect, the three-dimensional (3D) bulky materials cannot respond to influencing factors as sensitively as the low-dimensional materials can. For the software aspect, prior efforts have been heavily focused on reading the net signal "above the noise level" but can do little when signals are deeply buried in various noises. We implemented atomically thin two dimensional (2D) **m**ultifunctional **m**agnetoelectric **m**aterials (3M) for the development of **s**uper **s**ensitive **s**ensor **s**ystems (**4S**) - that is, **3M for 4S**. Due to the 2D nature of the quantum materials, the remarkable feature of "the whole material is a surface" lays the foundation for super sensitive response to influencing factors including gas molecules, biological entities, and electromagnetic fields, based on which we developed our sensor technologies for food security, disease early detection, and defense technologies. We analyzed the sensed data deeply buried in noise by state-of-the-art artificial intelligence (AI). We envision the convergence of 2D quantum materials and AI will blaze a path towards unconventional sensing for the years to come.

Monday, December 19, 2022

5:30 p.m. Reception, 6:00 p.m. Ceremony

A.V. Williams Building, Room 2460
8223 Paint Branch Drive, College Park MD 20742
Free parking available after 4:00 P.M. at XFINITY - Campus map

RESERVATIONS: Maryland Local Section, Email; beatricesalazar1@gmail.com (Ph) 443-801-0582

acsmaryland.org/awards
2022

Councilors' Corner

Questions and answers:

Q: **How many councilor positions are offered at each ACS Local section?**

A: The number of councilors is directly related to the number of members in each local section .We need to increase the number of memberships if we want to increase the number of councilors.

Q: **What do councilors do at ACS National meetings?**

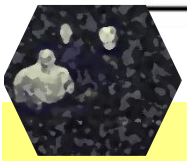
A: Councilors attend meetings at each one of the committees they belong to. They bring ideas suggestions and ask question to the committees that affect their local section members.
In addition, at the national meeting councilors vote for changes, initiatives, to removing what does not work and to supporting what works. More councilors will increase our vote.

Invite friends and colleagues to become ACS members. There are many inexpensive ways to join the society at this time. Then apply for councilor positions at your ACS Local section. The councilors position gives you the voice and vote for decisions made at ACS.

NEW:

Tentative program the ACS Maryland Local Section has in mind the creation of a committee for the YOUNG CHEMIST AWARD if any ACS member from the Maryland area is interested, please contact the Chair Sarah Zimmerman and attend one of our executive committee meetings.
The next meeting will be in December 2022, date TBA.

Chesapeake Chemist
Maryland Section American Chemical Society
ACS Local Section Maryland

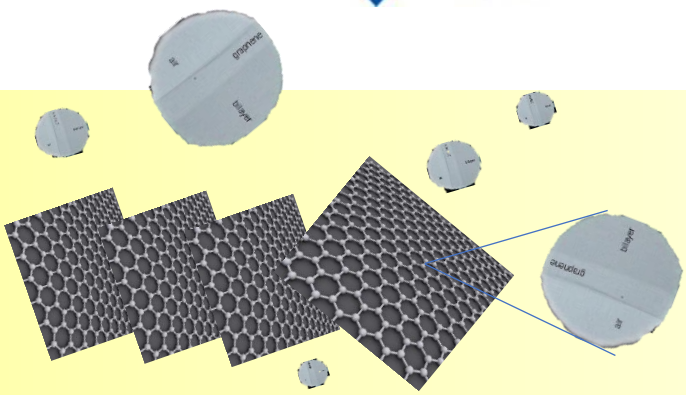


← Tesla Video 3/22

Let's talk chemistry

GRAPHENE

*Photograph of a suspended graphene membrane in transmitted light. This one-atom-thick material can be seen with the naked eye because it absorbs approximately 2.3% of light



An allotrope of carbon consisting of a single layer of atoms arranged in a two-dimensional honeycomb lattice nanostructure. Its name comes from "graphite" and the suffix - ene, it contains numerous double bonds.

A strong σ-bond connect each carbon atom and contributes to a valence band one electron that extends over the whole sheet. The valence band is touched by a conduction band, making graphene a semimetal with unusual electronic properties that are best described by theories for massless relativistic particles. Charge carriers in graphene show linear, rather than quadratic, dependence of energy on momentum, and field-effect transistors with graphene can be made that show bipolar conduction. The material exhibits large quantum oscillations and large and nonlinear diamagnetism. Graphene conducts heat and electricity very efficiently along its plane. The material does ot reflect the general black color of graphite; a single graphene sheet is nearly transparent because of its extreme thinness. The material is about 100 times as strong as would be the strongest steel of the same thickness; the thinnest two-dimensional material in the world.

Andre Geim (b. 1958)

Russia
United Kingdom
Netherlands [114]

Konstantin Novoselov (b. 1974)

Russia
United Kingdom
[114]

Learn more...

1962 Scientists observed graphene in electron microscopes , but studied only while supported on metal surfaces.

2004 The material was rediscovered, isolated and investigated at the University of Manchester, by Andre Geim and Konstantin Novoselov.

2010 Geim and Novoselov were awarded the Nobel Prize in Physics for their "groundbreaking experiments regarding the two-dimensional material graphene". High-quality graphene proved to be surprisingly easy to isolate.

2012 The global market for graphene was $9 million with most of the demand from a research and development in semiconductor, electronics, composites and electric batteries.

https://butchermagazine.com/wp-content/uploads/2016/07/cuts-of-raw-meat.jpg

The IUPAC (International Union for Pure and Applied Chemistry) recommends the use of the name "graphite" for the three-dimensional material, and "graphene" only when the reactions, structural relations, or other properties of individual layers are discussed.

Use By" Date, "Best Before" And "Sell By" Dates

Food dating is not a US federal law, except for infant formula and baby foods. Freshness dating and the terms used are voluntary by manufacturers, except for dairy foods and meat in some states.

The butcher uses a Sell-By date provided by the supplier. Sell-by dates are on the packaging delivered to the store. Best-Before dates mean fresh, the product, eaten after the date will be past prime condition.

A Use-By date means **DO NOT** consume after this date. Rigorous tests by health authorities establish the Use-By date of food sold by butchers.

https://butchermagazine.com/bad-meat-smell/

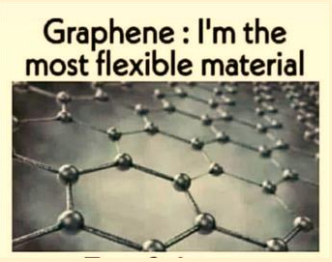
CAS 7782-42-5

Laugh a Little…

Courtesy of the artist
Pablo Rojas

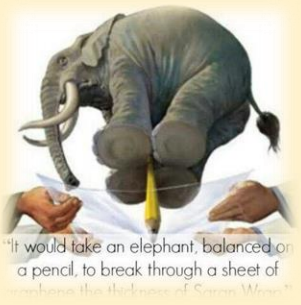
Carbon jokes

- **Graphene can do everything**... Except leave the lab.
  There is graphene on the floor...



Courtesy of 9gag.com/gag/a2Z3mEe 9gag.com

- **What do you call a mentally deranged, carbon-free transportation enjoying person?** A cycle-path
- **Did you hear that you can buy iron and carbon for the price of just 1 alloy?** What a steel!
- An archaeologist and his gorgeous new intern are in the lab checking the levels of carbon-14 in a skull they found. **The archaeologist's jealous wife walks in and demands to know what's going on**. "Honey, it's nothing! We're just dating!"



Seeking contributions of articles, stories, books of chemists' interest contact Chesapeake Chemist at ACS Maryland Section

BOOKS…

Have you read a book lately or want to read a book soon?
Share your thoughts and ideas with your colleagues.
We just have the right spot for you!

2022 ADMINISTRATION OFFICERS

2022 SECTION OFFICERS

Chair 2022..... Sarah Zimmerman, Web Master, scatzim@gmail.com
Vice-Chair 2022..... Kelly Elkins Kmelkins@towson.edu
Chair-Elect (Chair 2024).... Jiangnan Peng, jiangnanpeng@morgan.edu
Secretary 2022..... Louise Hellwig, Morgan State University, louise.hellwig@morgan.edu
Treasurer 2022..... Lee J. Lefkowitz, lee_lefkowitz@hotmail.com
Past Chair (2021)..... Eric C. Cotton, Community College, of Baltimore County, ccotton2@ccbcmd.edu

2022 SECTION COMMITTEE ON NOMINATIONS and ELECTIONS

Chair of the Committee on Nominations..... James A. Saunders jsaunders@towson.edu
Additional 4 members: ..... Dana Ferraris, Chair-2019, dferraris@mcdaniel.edu
..... Pumtiwitt McCarthy, Chair-2020, pumtiwitt.mccarthy@morgan.edu
..... Beatrice Salazar, Chair-2018, beatricesalazar1@gmail.com
..... Sara Narayan, Stevenson University, Chair-2015, SNARAYAN@stevenson.edu

COUNCILORS/COMMITTEES

1. 2020-2022 Kelly Elkins Kmelkins@towson.edu
2. 2021-2023 Beatrice Salazar beatricesalazar1@gmail.com
3. 2021-2023 Jan Kolakowski jek6042@gmail.com
4. 2021-2023 Stephanie Watson stephanie.watson@nist.gov

ALTERNATE COUNCILORS/COMMITTEES

1. 2021-2023 Alexander Samokhvalov alexandr.samokhvalov@morgan.edu
2. 2021-2023 Rob Clapper rob.clapper@scioninstruments.com
3. 2021-2023 Michele Foss foss.michele@gmail.com
4. 2020-2022 Paul Smith pjsmith@umbc.edu

MEMBERS-AT-LARGE

1. Nirupam J. Trivedi, nirupam.j.trivedi@mail.mil
2. Fasil Abebe fasil.abebe@morgan.edu
3. Nicole Carbonaro, ncarbonaro@towson.edu
4. Rose A. Pesce-Rodríguez, rose.a.pesc snarayan5@yahoo.com
5. Sara Narayan, Stevenson University, SNARAYAN@stevenson.edu

PROGRAM CHAIRS

AWARDS

Braude Award, L. Hellwig
Remsen Award, D. Ferraris
Maryland Chemist of the Year Award, B. Salazar
Senior Chemist Award, M. Eiss / L. Gonzalez
Student Award, S. Narayan

PROGRAMS

Women Chemists Committee, S. Narayan/K. Elkins
Student Travel, L. Hellwig
High School Outreach: National Chemistry Olympiad & Chemists Celebrate Earth Day, B. Salazar
Middle and Elementary School Outreach (National Chemistry Week, Earth Day Week), R. A. Pesce-Rodriguez
Publicity, P. McCarthy / B. Salazar/ R. Clapper
Entertainment/Tours, M. Foss / L. Hellwig

Maryland Section on the Website: www.acsmaryland.org

2022 Webmaster..... Nicole Carbonaro, ncarbonaro@towson.edu
Chesapeake Chemist Editor-in-Chief... Beatrice Salazar, Chair-2018, beatricesalazar1@gmail.com
Social Media Liaison..... Pumtiwitt McCarthy, Chair-2020, pumtiwitt.mccarthy@morgan.edu

CONTACT US: acsmarylandsection10@gmail.com

EVENTS CONTACT

The U.S. National Chemistry Olympiad USNCO MARYLAND URL: http://www.beatricesalazarusncocoordinator.webs.com	**Jan - April**
Student Travel Awards https://acsmaryland.org/travel-awards/ Email: Louise Hellwig <Louise.Hellwig@morgan.edu>	**Jan – March**
Student Award https://acsmaryland.org/student-awards/ Email: Sara Narayan, snarayan5@yahoo.com, SNARAYAN@stevenson.edu **Chemists Celebrate Earth Day** - beatricesalazar1@gmail.com	**April**
Senior Awards Email: Merle Eiss, meiss32@aol.com Email: Linda Gonzalez <linda_gonzalez@mccormick.com	**May**
National Chemistry Week / Earth Week Events Rose Pesce-Rodriguez **Chemists Celebrate Earth Day – Beatrice Salazar** http://acsmarylandevents2016.webs.com Beer & Social Tours: Louise Hellwig <Louise.Hellwig@morgan.edu> and Michele Foss <foss.michele@gmail.com	**May - Sept.**
Braude Award https://acsmaryland.org/braude-award/ Email: Louise Hellwig <Louise.Hellwig@morgan.edu>	**Oct.**
The Remsen Award https://acsmaryland.org/remsen-award/ Email: Dana Ferraris (dferraris@mcdaniel.edu) <dferraris@mcdaniel.edu>	**Nov.**
The Maryland Chemist of the Year Award https://acsmaryland.org/maryland-chemist-of-the-year/ Open position	**Dec.**

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