THE

CAPITAL CHEMIST

A Publication of the Chemical Society of Washington Section of the American Chemical Society

ACS Local Section
Chemical Society of Washington

Virtual CSW Meeting on March 29, 2022, 5:30-6:30pm ET featuring Leah Dodson

Leah Dodson, Ph.D.

Department of Chemistry & Biochemistry
University of Maryland College Park

"Exploring Astrochemically-Relevant Weakly-Bound Complexes with Matrix-Isolation Spectroscopy"

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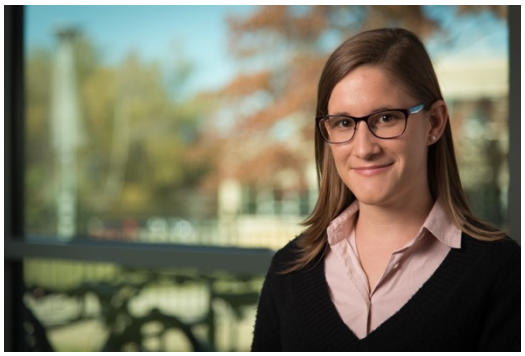
Inside this issue:

- Register for the March and April CSW meetings
- Learn about Kim Morehouse, one of our CSW Volunteers
- Attend the Committee on Minority Affairs Meeting
- Sign up for the Chemistry Olympiad

Registration

This will be a Zoom meeting. There is no charge to attend, but you must register in advance. Register Now: https://american-chemical-society.zoom.com/meeting/register/tZIkde6gqT4oHdEEs82V5A1yjg5DYgFzDhCo

Speaker Bio



Leah grew up in central Pennsylvania. For undergrad, she went to Case Western Reserve University in Cleveland, OH, where she majored in Chemistry (minor in Physics) and graduated with a BS in 2010. While she was at Case, she studied the photophysical properties of pharmaceutical water pollutants in the research lab of Carlos Crespo-Hernández.

Leah obtained her PhD in chemistry in 2016 with Mitchio Okumura at California Institute of Technology in Pasadena, CA. There she studied the spectroscopy and kinetics of radicals that are relevant to atmospheric and combustion chemistry, including several visits to the Advanced Light Source in Berkeley, CA and Sandia National Laboratories in Livermore, CA.

After completing her degree, she moved to Boulder, CO where she was a NIST NRC postdoc in the lab of J. Mathias Weber at JILA/the University of Colorado. She carried out experiments using ion spectroscopy and cryogenic systems to obtain detailed structural information about gas phase ions. In Fall 2019, she started her independent group in the Chemistry Department at the University of Maryland in College Park, MD (http://blog.umd.edu/dodson). Her group is focused on using cryogenic tools to study spectroscopy and kinetics of astrophysically-relevant molecules and ions.

Abstract

The exotic molecules and chemistry observed by astronomers in astrophysical objects have challenged chemists to rethink the molecular synthesis playbook. The extreme conditions in space—for example, temperatures that can go as low as 10 K—must be considered when seeking insight into the prevailing reaction mechanisms. In the absence of significant thermal energy, weakly-bound complexes that would normally dissociate rapidly under terrestrial conditions now become temporary sinks for astrochemicals and could

ultimately direct the chemistry occurring in low-temperature, low-density environments. In this talk, I will discuss the matrix-isolation instrument we have constructed in our new laboratory at the University of Maryland and how we are using it to study the formation of weakly-bound complexes through Fourier-Transform infrared spectroscopy and quantum chemistry calculations.

CSW Monthly Meeting on April 6, 2022, 7:00-8:30pm ET, featuring presentation of Hillebrand Prize, Gordon Award, and ACS Volunteer of the Year Award

Schedule of Events

7:00 - 7:30 pm: Recognition of the Gordon Award and ACS Volunteer of the Year Award
7:30 - 8:30 pm: Recognition of the Hillebrand Prize and awardee's presentation

Dr. Marino will present, "Biophysical Measurement Innovation and its Centrality to Advancing Biotechnology"

This will be a Zoom meeting. There is no charge to attend, but you must register: https://american-chemical-society.zoom.us/meeting/register/tZIlc--trj4rHtO7bEKIk6JGjFtBBzALuW87

Charles L. Gordon Memorial Award

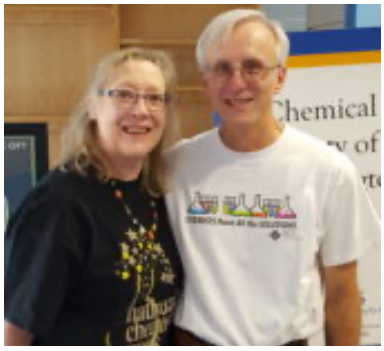
Sara Orski, PhD
Charles L. Gordon Memorial Award

Dr. Sara Orski is recognized for her exemplary service to the profession of chemistry and to the Chemical Society of Washington.

ACS Outreach Volunteer of the Year Award

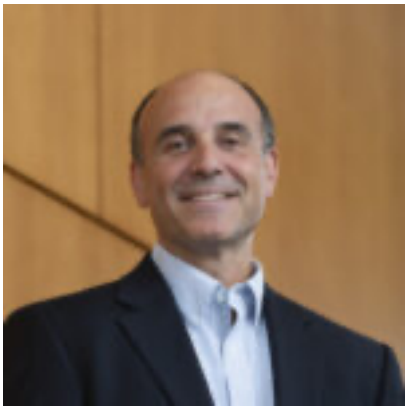
Kim Morehouse, PhD

ACS Outreach Volunteer of the Year Award



Dr. Kim Morehouse has been the driving force behind the Chemical Society of Washington's annual Chemists Celebrate Earth Week (CCEW) and National Chemistry Week (NCW) activities for the past 16 and 18 years, respectively. His efforts have impacted at least 3000 people in the past 5 years. He also ran the biannual illustrated poem contests (for K-12 students) for CCEW and NCW, actively recruited volunteers for the outreach activities, planned and prepared materials for demos and take-home bags, and partnered with other organizations for a broader participation. Kim has been instrumental in the success of these annual outreach events.

Hillebrand Prize



John P. Marino, PhD
Hillebrand Prize

Dr. John Marino is recognized for groundbreaking contributions to the field of biophysical characterization by high-resolution NMR and development of engineered protein reagents for next-gen proteomic measurements.

Dr. Marino will present, "Biophysical Measurement Innovation and its Centrality to Advancing Biotechnology."

Bio

Dr. John P. Marino currently serves as Co-Director of the Institute for Bioscience and Biotechnology Research (IBBR), a joint research institute of the University of Maryland and NIST and the Group Leader of the NIST Biomolecular Structure & Function Group at IBBR. He is also appointed Adjunct Professor in the Department of Chemistry and Biochemistry and is a member of the Molecular and Cell Biology Program at the University of Maryland. Prior to coming to NIST and the University of Maryland in 1997, Dr. Marino completed an A.B in Chemistry from Princeton University in 1989 and a Ph.D. in Chemistry from Yale University in 1995. He then held an Alexander von Humboldt post-doctoral fellowship for two years at the Goethe Universität in Frankfurt, Germany. Over his career, his research has involved the application of Nuclear Magnetic Resonance (NMR) and other biophysical methods to advance precision measurement of proteins and nucleic acids, with a particular focus on applications to therapeutics and vaccines. He has co-authored over 90 papers and 4 patent applications.

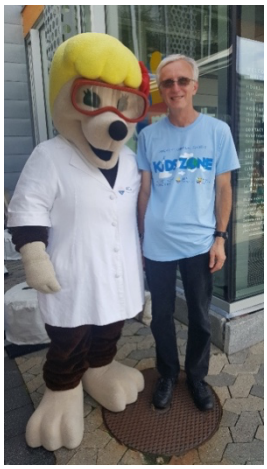
Abstract: "Biophysical Measurement Innovation and its Centrality to Advancing Biotechnology"

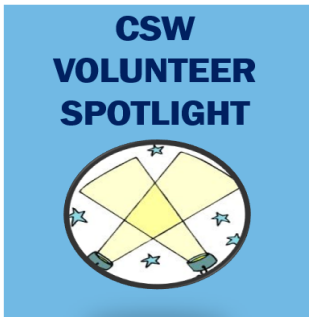
At the center of advances in biotechnology often lies new experimental approaches, analysis tools and models that address critical gaps in measurement. Innovative approaches developed to address these measurement gaps can be underpinned by standards that establish trust and accelerate broad adoption through benchmarking and harmonization. In this talk, I will highlight examples from our group at NIST of measurement innovation and standards that support protein therapeutic development and next-generation protein sequencing. Protein therapeutics are a highly successful class of drugs that are currently used to treat a number of serious and life-threatening conditions such as cancer, autoimmune disorders, and infectious diseases (e.g., COVID-19). A critical requirement unique to protein therapeutics is that these drugs must adopt and retain the correct structural fold without forming unintended aggregates. The development of precision tools for characterization of the structure of protein therapeutics has therefore emerged as a major priority in the pharmaceutical industry. To address this gap, I will describe high-resolution NMR methods developed by our group for producing spectral 'fingerprints' that can be quantitatively assessed to reveal and classify variations in structure, and how these approaches are paving the way for broad use of NMR in the industry for assessment of protein therapeutics via chemometrics and machine learning that is both objective and automated. In the second part of the talk, I will describe next-generation approaches for protein sequencing based on fluorescence imaging of immobilized peptides that are emerging and have the potential to revolutionize the field in proteomics. A key technical challenge in implementing the fluoro-sequencing approach is achieving high-fidelity, sequential recognition and detection of specific amino acids that comprise the peptide sequence. To address this challenge, I will describe how our group is leveraging naturally occurring biomolecules that can function through selective recognition of (N)-terminal amino acids (NAAs) as starting points for engineering NAA-binders (NAABs) that are suitable for use as biotechnology reagents.

February CSW Meeting Recording Available

The recording of the February 2022 meeting is now available and posted here: https://capitalchemist.org/wp-admin/post.php?post=440005&action=edit

Volunteer Spotlight: Kim Morehouse, PhD





Professional Experience: Retired, Research Chemist at the FDA/CFSAN

Education: Ph.D. in Chemistry from the University of Notre Dame

Volunteer Activities: I have been a volunteer for CSW on many committees and have been involved with several Outreach Activities; such as National Chemistry Week, Chemists Celebrate Earth Week, and Chemathon for several years. My favorite volunteer activities are those that provide hands-on activities for children/students and to see their excitement and enthusiasm as a result of the activities.

Why did you become a member of CSW? I joined ACS as a graduate student and when I moved to the DC area joined CSW. As a younger chemist at the FDA, I was encouraged to become active in CSW and was elected to the Board of Managers as a Manager. I consider it an honor and a privilege to represent the ACS and CSW to the public. The personal and professional interactions with other chemists are a major part of being a member of ACS. I really enjoyed the outreach activities and became very involved with National Chemistry Week and Chemist Celebrate Earth (Day) Week. The outreach programs allowed me to bring chemistry to a new generation and it is always a joy to see the excitement and enthusiasm that the students have for science.

CSW Committee on Minority Affairs Meeting March 9th

The Committee on Minority Affairs would like to invite you to their next meeting. It will be held Wednesday March 9th, 2022 at 6:30pm. If you would like to get involved, please email Carissa Hunter at chunte14@gmu.edu or Reyniak Richards at richarr1@pgcc.edu for more details.

The goal of the Committee on Minority Affairs hopes to increase membership and participation of underrepresented minority groups within CSW through the use of resources and volunteer efforts provided by the Board of Managers. The effort will promote CSW's involvement in advancing diversity and inclusion within the American Chemical Society and overall broader chemical enterprise.

Purpose Statement:
To advance diversity and inclusion in the Chemical Society of Washington (CSW) and the broader chemistry enterprise.

Objectives:

- Sustain and dynamically develop a programmatic presence within the CSW community
- Increase the number & participation of racially & ethnically underrepresented scientists within CSW membership
- Promote the recognition of the professional accomplishments of minorities
- Provide mentoring to minority students
- Identify and collaborate with minority-friendly educational institutions and businesses

Travel Award Applications for ACS Fall 2022 National Meeting Due June 1st

Note: the ACS Fall 2022 National Meeting will be a hybrid event – in-person and virtual.

The Chemical Society of Washington is pleased to announce a student travel award to defray travel and/or registration costs to the Fall 2022 National ACS meeting in Chicago. Eligible expenses include meeting registration, travel expenses, airfare and lodging. Applicants should submit the following by Midnight June 1, 2022 to CSW (email: CSW@acs.org):

- A cover letter stating how and why attending this ACS meeting will promote his/her career;
- The applicant's CV;
- A letter of recommendation from the student's mentor explaining why the student deserves the award and how this will help his/her professional development;
- An accepted abstract with proof of acceptance.

View the details to submit an abstract on the ACS website.

Within three weeks of returning from the ACS meeting, the awardees should submit receipts for any or all of the eligible expenses described above, after which the Treasurer of the Chemical Society of Washington will issue a check to each of the awardees.

The award is open to students who are graduate and undergraduate students in the jurisdiction of the Chemical Society of Washington. The award is not intended for post-doctoral fellows. There will be a maximum of four awards. Each award will be for up to $1,000 of eligible expenses based on the review of the above materials.

After returning from the conference, awardees will be asked to draft a short (1-page) summary of their experiences for posting to the Capital Chemist website and to present their posters, if applicable, at one of the upcoming CSW dinner meetings.)

U.S. National Chemistry Olympiad Registration Now Open

Registration for the Local Section Exam of the 2022 USNCO is now open. Once again, we are offering the exam digitally through the ACS Learning Environment with multiple options for proctoring.

The test will be administered on March 19 beginning at 10am in various locations throughout the region.

Teachers, students, and volunteers can all sign up via Google form: https://forms.gle/JT5Ezd5Kws31w3o18. Please email the coordinators at cswolympiad@gmail.com for more information.

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NEW MEMBER PACKAGES FOR 2022

The **Premium Package** provides member access to all benefits included with the Standard Package, plus:

- Weekly issues of *Chemical & Engineering News* (C&EN)
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Go to **www.acs.org/membership** to learn more about the new ACS membership packages.

**The benefits listed above are meant to be representative of each package, but are not completely inclusive of all benefits*

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The **Chemical Society of Washington** (**CSW**) is the local ACS Chapter for the Washington, DC area and serves approximately 3,500 members.

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CSW Calendar of Events

March 9: CSW Committee on Minority Affairs Meeting

March 19: US National Chemistry Olympiad

March 29: CSW Virtual Meeting

April 6: CSW Virtual Meeting

June 1: CSW Student Travel Award Deadline