

Department of Chemistry

# Chemistry Newsletter

Winter 2018-19/2019-20



Oregon State  
University

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**On the cover:** Winter Wonderland

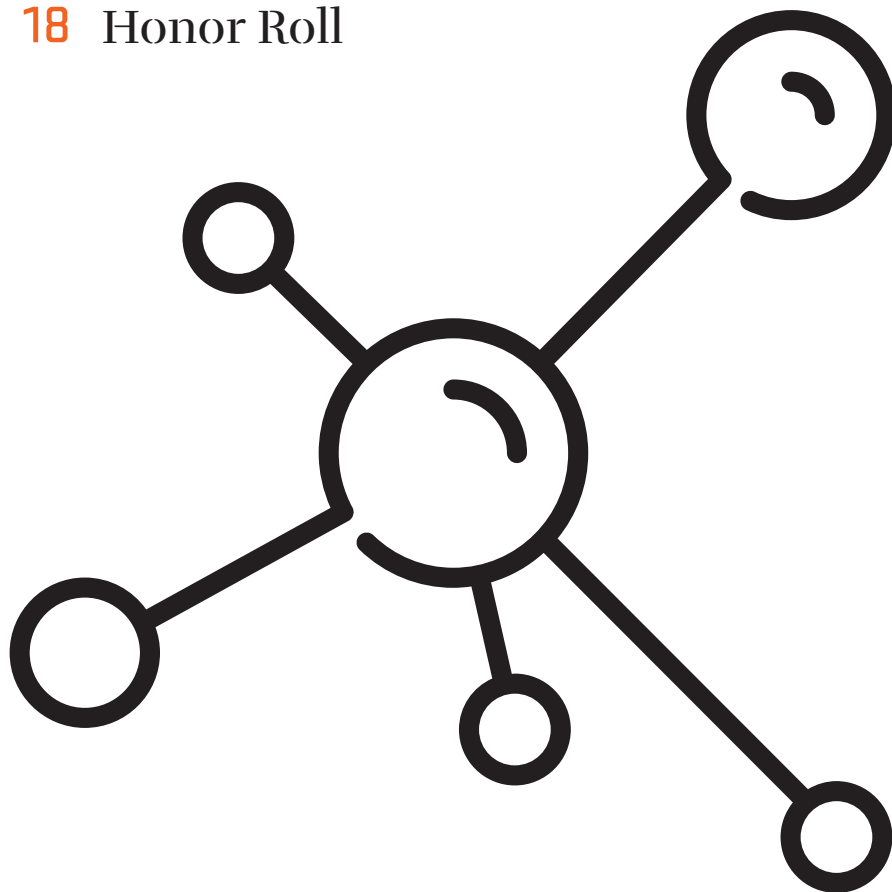


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**Expanded stories available online:**  
[blogs.oregonstate.edu/erlenmeyer](https://blogs.oregonstate.edu/erlenmeyer)

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# A MESSAGE: FROM THE DEPARTMENT HEAD

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Hi everyone –

I hope that you and all your loved ones are well.

It's been a tumultuous spring and summer, with too much unpleasant news received about the spread of the Covid-19 pandemic and all its consequences, and also with tragedies far and near. The events since mid-March, and the changes we've experienced, have made it clear that the unexpected can still rule our lives, and that our mission of teaching science, mentoring students, and creating knowledge remain critically important.

All of us, from entering freshman to my senior colleagues, yearn to regain the sense of community that derives from our usual physical presence on campus. But we won't get back to normal until we are confident that we can do so safely.

Of course, our core missions of education and research has and will continue until that happens. Our faculty worked long hours, starting with a rush to offer remote finals in March, and then to create and deliver a fully remote curriculum in spring and summer. Remote labs are especially challenging - but our students have been supportive and appear to be doing well overall. For Chemistry, the Fall term has again had very few classes and events on campus.

During Spring, research on campus stopped, but there is only so much research to be planned, analyzed, and written from home before we need to continue getting results. Fortunately, we were able to safely resume research and partially reoccupy labs, within Covid-19 safe practices, in early summer and ongoing.

There have also been many positive stories and individual and group successes this year; several are described in this newsletter. During the past year, and this fall, we are privileged, and thrilled, to welcome several new department members. Two new assistant professors joined us in September - **Tim Zuehlsdorff** (computational chemistry) and **Marilyn Mackiewicz** (materials/environmental/medicinal chemistry). There is 27 incoming grad students who have arrived to meet our new faculty as well as the rest of the department. We've welcomed one new full-time instructional faculty member this year, **Denis Drolet**, as well as new Chemistry Stores staff **Jacob "Jak" Packtor**.

A campaign to re-equip our advanced labs has raised funds even faster than planned. In winter term we purchased two new UV/Vis, two fluorescence spectrometers, two GC's, and a new Ar laser tube. The spectrometers were just installed and will be in high demand once we reopen Gilbert Addition. We're hoping to soon purchase an ICP OES (with microwave reactor) and two electrochemical workstations, and will then be more than half way to completing our ambitious equipment wish list. Many thanks to all our donors! (You can contribute at [osufoundation.org](https://osufoundation.org), type in "Chemistry Instrumentation Fund" under area).

Regards,  
Mike

# NEW FACES: RECENT HIRES



After **Kyriakos Stylianou** completed high school and his army duties in his home country, Cyprus, he moved at the University of Ioannina in Greece to study chemistry. As an undergraduate student, he fell in love with the inorganic chemistry classes, and while he was working in an inorganic lab, he developed strong synthetic skills. In 2006, he graduated with the highest GPA ever, and in 2007, he moved to the University of Liverpool to pursue

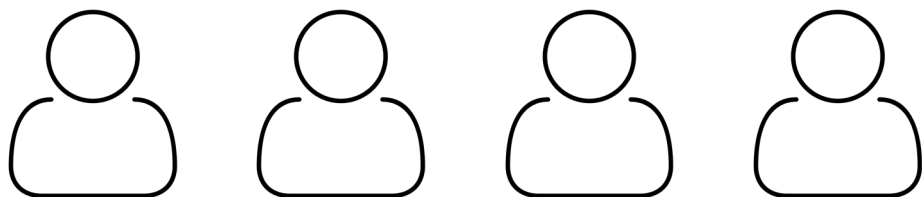
his Ph.D. thesis. His advisor, Prof. Matthew J. Rosseinsky, suggested that Kyriakos' thesis can be based on the synthesis of nanoporous materials namely metal-organic frameworks (MOFs) – constructed from biologically derived ligands such as amino acids and nucleobases, for enantioselective separation applications.

Three months after he started his project, he isolated his first MOF crystals, and this project was successfully completed and published in J. Am. Chem. Soc. This project and publication boosted his confidence, and throughout his Ph.D. he synthesized many new MOFs of which some of them have been published in impactful journals. Upon completion of his Ph.D. thesis, he was awarded with the Marie Curie Fellowship and moved at the Catalan Institute of Nanotechnology and Nanoscience (ICN2) in Barcelona to work with Prof. Daniel Maspoch. His application-oriented project was based on the integration of MOFs on surfaces for device fabrication. During his studies at ICN2, he had the opportunity to mentor graduate students, and seeing their development under his guidance, prompted him for the first time to start thinking to become a Professor in Chemistry. In 2014, he submitted his

first application for a faculty position at Ecole Polytechnique Federale de Lausanne (EPFL VS), and although he was not successful, he has still moved at EPFL VS as a team leader. He thought that this is the perfect opportunity to develop his skills further and eventually become a Professor in Chemistry. His stay at EPFL Valais was very successful: he supervise(s, d) the theses of eight talented graduate students (Sam, Andrzej, Arun, Bardiya, Alina, Mish, Serhii and Pelin) and mentored two post-doc fellows (Chris and Tu). His team members have developed several impactful projects; these were based on the discovery of new materials for carbon capture, photocatalytic hydrogen generation and the detection of analytes present in water.

Becoming a Professor in Chemistry was a dream come true for Kyriakos, and Oregon State University (OSU) made his dreams come true. Kyriakos brings to OSU expertise in the design, synthesis and characterization of nanoporous materials for energy, environmental and sensing applications. Kyriakos is very excited to be a part of the Department of Chemistry at OSU as he can collaborate with other strong Chemistry, Materials or Chemical Engineering groups and check the potential of nanoporous materials toward catalysis, batteries, conductivity, electrocatalysis, capture of radioactive ions, sensing and device fabrication. Currently, he supervises the theses of two bright graduate students, Kimia and Tara, and the projects of three super-talented Oregonian undergraduate students, David, Ian, Sam, Mat, Thao Mi and Isabelle at OSU. These young scientists aim to develop the next generation porous MOFs for carbon capture, CO<sub>2</sub> conversion, sensing of drugs, generate fuels from water or organic pollutants and the separation of noble gases.

Few highlights in Kyriakos' career include the interaction and supervision of talented graduate and undergraduate students, seeing their development as scientists (2015-present) and become Dr., the publication of impactful papers in Science (2010) as a graduate student, and in Nature (2019) as a corresponding leading author, and the dozens of friendships he has established over the many countries he used to work in. Kyriakos' moto is: 'Be A Leader and Not A Follower'.



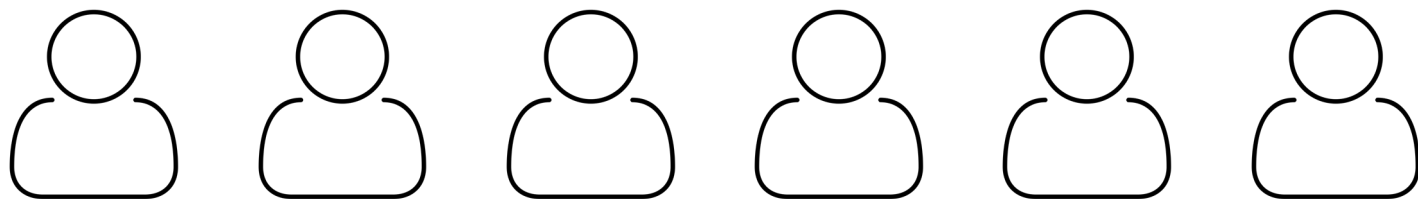
**Jacob “Jak” Packtor** grew up in New England, and drove all the way to Oregon from Boston in order to take a job at the Chemistry Stores. He says, he'll take rainy days over blizzards any time. He enjoys cooking, hiking, and gaming in his spare time.





**Marilyn Rampersad Mackiewicz** is a Trinidadian born-American Chemist working on all things small. She graduated from Hunter College the City of New York with her Bachelor of Arts in Psychology and Chemistry. She moved to College Station, Texas, where she earned her Ph.D. in 2005 at Texas A and M University working with Marcetta Y. Darensbourg in Bioinorganic and Organometallics Chemistry. After a very brief career as a process engineer at Intel, she returned to academia to do her post-doctoral studies in nanomaterials chemistry at Portland State University. Her roots began to bury deep in Oregon and for the last 10 years has been a primary investigator of a unique lab working with undergraduate students from diverse backgrounds doing interdisciplinary research in nanostructured materials, which she finds is the best part of her day. She brings with her a strong entrepreneurial and collaborative spirit with many partners from OSU, Oregon Health and Science University, the Devers Eye Institute, Casey Eye Institute, and Oregon Primate Center to lead cross-cutting research initiatives to solve convergent challenges in human health and the environment. Dr. Mackiewicz has received funding from the National Science Foundation and the National Institute of Health to pursue her research initiatives and was recognized for this in a research excellence award. She has a passion for mentoring, supporting, and advocating for students, particularly those from underserved communities, and received Portland State University Presidents Diversity award in recognition of her commitment to creating diverse and equitable research, teaching, and adaptive learning environments. As a pioneer of a unique capstone on empowering and advancing women and underrepresented students in STEM her goal is to build students' self-advocacy and resilience so they will have strong scientific and professional identities. On a personal note, her parents are her inspiration, she hates exercise however must do it, thinks Cheetos and expresso are brain food for writing, music is her source of creative freedom, and wants you to know that Trinidad has the best carnival on the planet. To learn more about Dr. Mackiewicz visit her website and follow her on twitter @Mack\_Lab. She will find space to connect with you and very much looks forward to being apart of the OSU community.

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**Tim Zuehlsdorff** obtained his BSc in Theoretical Physics and PhD in Theory and Simulation of Materials at Imperial College London. He then worked as a postdoctoral researcher in the Theory of Condensed Matter Group (TCM) under Professor Mike Payne at the University of Cambridge, before joining Professor Christine Isborn's group at the University of California Merced in 2016. His research interests involve the first-principles modeling of electronic excitations in complex environments, with a special focus on computing linear and non-linear optical spectra of solvated dyes and pigment-protein complexes. He is also a developer of the linear-scaling density-functional theory code ONETEP ([www.onetep.org](http://www.onetep.org)), capable of simulating complex systems containing tens of thousands of atoms.

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Want to keep up with everything happening in the department? Check out our **social media!**



# INTERACTIVE ORGANIC CHEMISTRY:

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**By: Prof. Kevin Gable**

Over the past 20 years, I have been exploring ways of introducing interactive Web materials into my courses. Organic chemistry is intrinsically 3-dimensional; stereochemistry lies at the heart of almost all transformations we discuss, and students often struggle with understanding both spatial relationships and the mental connections between “real” molecular shape and what we draw as 2-D representations. It’s also hard to visualize molecular orbitals, and it has become common to use electrostatic potential maps to illustrate where electrophilic or nucleophilic reactions might take place. Furthermore, use of spectra and the interpretation of fine structure in IR and  $^1\text{H}$  NMR spectra presents an area where more interaction provides a way to point out what the student should be recognizing.

You might be familiar with initial attempts to get this material onto the Web. In the 90s, we could use a browser plugin called Chime, that was based on an open-source visualization program called Rasmol. As support for dedicated browser plugins waned, the Chime technology evolved into open source java-based technologies called Jmol and JSpecView. The Java tool was serviceable, but not entirely reliable. The Java plugin had a string of security vulnerabilities that led to support being eliminated from Web browsers. Fortunately, the Jmol developers discovered a tool that in 2012 led to the translation of the Java code into javascript, removing the security issues and allowing modern HTML5-capable browsers of displaying molecules and spectra as interactive media.

Let’s see some of what I’ve implemented. While the 2-D views in this article give only a semblance of what the page experience is, I’ll include the actual URLs so you can play with these yourself. I generally put a spinning molecule that is selected based on the chapter contents on each page. This gets students thinking about molecules in 3 dimensions. Early on in the organic sequence, we step through various styles of rendering: sticks, ball-and-stick, spacefilling—in order to talk about how we translate our models into an understanding of molecular shape and behavior.

As I noted, 2-dimensional images of molecular orbital interactions and electrostatic potential maps are helpful but often of limited use to the student. The image on the left is mapped from blue (positive potential) to red (negative potential) to illustrate the electron distribution in an imminium cation and the consequences of the positive charge on nitrogen. The page shown to the right is an example showing how the p atomic orbitals on benzene lign up to allow formation of the  $\pi$ -bonding system; I also show the filled  $\pi$  molecular orbitals that result from this. This becomes particularly valuable when illustrating the necessary phase alignment in the Diels-Alder reaction. We can also animate reactions to allow students to follow what atoms go where; there is an animation of the cyclohexane ring flip, for example.

One example I like is illustrating how atomic orbitals interact to form sigma and pi bonds as one brings the component fragments together:

The animation starts with two separated  $\text{sp}^2$  carbons and then brings them together, showing how each pair of orbitals morphs sequentially into the sigma and pi bonds in ethylene.

Spectroscopy is another central element of organic chemistry. Often, in order to provide simplified pictures, spectra are presented out of context. The Web technology I am using allows the same interactions we use in the lab: we zoom in to see more detail without losing track of the overall appearance of the spectra. A further (and very neat) feature is that the spectroscopic feature can be linked to a 3-D structure. We can either highlight specific atoms associated with a peak (useful for  $^1\text{H}$  and  $^{13}\text{C}$  NMR) or animate the specific vibration associated with an IR peak. When I first saw this feature I immediately concluded that “this is the way we need to be teaching spectroscopy.” We are using the technology in CH 362 as a means of distributing NMR unknowns that students use to solve structural problems. We ask students to dig into these to the point of identifying coupling constants, either  $^1\text{H}$ - $^1\text{H}$  or  $^1\text{H}$ - $^{19}\text{F}$ .

Another really neat feature is that the whole thing is scriptable—we can insert specific links or web buttons to highlight molecular or spectral features. Both the 3-D structures and the spectra have a long menu-based set of manipulations available, but for a new learner it’s unreasonable to expect them to navigate these (especially when they don’t know what they are being expected to do). This capacity also makes the pages a little more user-friendly on mobile devices. I wouldn’t recommend these for a cell phone but I know more and more students are using tablet devices rather than laptops. The image to the left illustrates the links highlighting bond lengths and angles in cycloalkanes; I’ve applied similar approaches to comparison of transition state structures in different nucleophilic substitutions.



These tools are not without a learning curve; they are unfortunately not “drop ins” that can be directly used with content management systems like Drupal and Canvas (though the elements can be embedded in those systems). We do rely on a traditional Web server and my ability to write the HTML code in order to implement the technology. And there is some underlying computational chemistry needed, particularly for animating IR vibrations. One thing that has helped me a lot is that the distribution comes with a lot of examples of how to implement different features; I used these extensively in developing my own material.

Links: MOs and ESPs: [https://sites.science.oregonstate.edu/~gablek/CH334/Chapter1/resonance\\_MO.htm](https://sites.science.oregonstate.edu/~gablek/CH334/Chapter1/resonance_MO.htm)  
Benzene MOs: [https://sites.science.oregonstate.edu/~gablek/CH335/Chapter15/benzene\\_MOs.htm](https://sites.science.oregonstate.edu/~gablek/CH335/Chapter15/benzene_MOs.htm)  
Bonding orbital formation in ethylene: [https://sites.science.oregonstate.edu/~gablek/CH334/Chapter1/Ethylene\\_bonds.htm](https://sites.science.oregonstate.edu/~gablek/CH334/Chapter1/Ethylene_bonds.htm)  
Spectroscopic features: [https://sites.science.oregonstate.edu/~gablek/CH335/Chapter10/IR\\_vibrations.htm](https://sites.science.oregonstate.edu/~gablek/CH335/Chapter10/IR_vibrations.htm)  
An NMR unknown: [https://sites.science.oregonstate.edu/~gablek/CH362/NMR\\_Unknowns/UNK09/spectrum.htm](https://sites.science.oregonstate.edu/~gablek/CH362/NMR_Unknowns/UNK09/spectrum.htm)  
Bond length/angle measurements: [https://sites.science.oregonstate.edu/~gablek/CH334/Chapter4/cycles\\_strain.htm](https://sites.science.oregonstate.edu/~gablek/CH334/Chapter4/cycles_strain.htm)  
More about Jsmol: [http://wiki.jmol.org/index.php/Main\\_Page](http://wiki.jmol.org/index.php/Main_Page)

## College of Science

# Innovation of Scientists



The College of Science and the Department of Chemistry introduce a new course sequence that provides the vocabulary and skills required for successful translation of scientific ideas and research into commercial products.

The courses give you the ability to integrate the technical and professional skills needed for success along any career path - industry, small company, academe, government, or nonprofit.

The sequence combines the lens of science with the Lens of the Market to inform and validate the potential of scientific research and development as the basis for innovations with societal and commercial value. The sequence does not address marketing and sales. Rather, it creates skills based on your science major that are needed to help companies and organizations create new products and services. You acquire the professional skills sought by employers to become an innovator.

### Skills

Sustainability and resiliency are at the heart of the course sequence. The courses augment technical capabilities with boundary-crossing competencies: comprehensive professional, interpersonal, and leadership skills; the ability to communicate the value and relevance of scientific research; and recognition of the value of diverse thinking and approaches.

### Course Outcomes

**470/570:**

- Converse in the vocabulary of product market analytics
- Construct a platform diagram
- Integrate research and market intelligence to identify innovations
- Define potential competitors

**472/572:**

- Propose testable market hypotheses
- Select valid and aligned data sources
- Construct a product analysis process
- Demonstrate applicability of research for market analysis

**474/574:**

- Build valid grounded assumptions
- Conduct Star Market Analysis to evaluate research for commercialization
- Create a Competitive Product Score card
- Determine potential for a validated business case

### Course Sequence

SCI 470/570, 472/572, 474/574  
CH 470/570, 472/572, 474/574

**Fall 2020**  
470/570: Foundations of Innovation

**Winter 2021**  
472/572: Research to Innovation

**Spring 2021**  
474/574: Innovation to Impact

The sequence supports Chemistry majors Industry and Innovation option set to start in fall 2021.



### Course Instructor

**Douglas A. Keszler**  
Distinguished Professor of Chemistry, Associate Dean for Research, Inpria and nexTC co-founder - in conjunction with a network of STEM innovators across life science, physical science, and advanced technology organizations.

**Hear what others say about the value of a Lens of the Market**  
[vimeo.com/412360374](https://vimeo.com/412360374)



**Oregon State University**

For additional information contact  
[douglas.keszler@oregonstate.edu](mailto:douglas.keszler@oregonstate.edu)

# BUILDING A NEW RESEARCH PARADIGM OF STORAGE BATTERIES AT OSU

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In Prof. **Xiulei (David) Ji**'s research team at OSU, students are becoming leaders of the energy storage field. They investigate new chemical reactions defined by some highly controllable reactors, known as batteries. They search for solutions to store energy by electrochemical methods while aiming at the minimal cost. Energy storage in batteries entails the travelling of charges in the maze of basic particles, atoms or molecules, assembled by chemical forces.

Powered by the ambition to serve the entire battery field and to accelerate the pace of inventions, the Ji team has been constructing cornerstones of a new research paradigm for storage batteries, which uses a holistic and interdisciplinary approach that transcends different sectors of chemical sciences from inorganic chemistry to electrochemical chemistry, and physical chemistry besides numerous engineering disciplines. This new paradigm is buttressed by multi-dimensional considerations well beyond the conventional paradigm that rides on a unicycle of one discipline—the solid-state ionics.

Energy storage solutions are indispensable to tackle the devastating threats of climate crises. The humankind must transform our sources of energy and our ways of using energy. The senseless exploitation of the fragile ecosystems on Earth has already brought grave consequences; turning paradise into Yule logs with wildfires, and homes into wetlands by floods. Most recently, the spread of deadly diseases has destroyed the normalcy of life we used to take for granted. The ongoing pandemic coldly admonishes our concept of the world, revealing that our civilization is not as secure as we might think due to inherent faults. Among our greatest challenges, the extravagant combustion of fossil fuels is undoubtedly a 'burning' one, which we know is not a sustainable path forward. Solar and wind electricity has reached all-time-low prices; however, nearly all countries fail to deploy such clean energy to the extent that they need to simply due to the lack of suitable

storage solutions. A chemist can do nothing about this.

Chemists are, de facto, the first responders to solve the problem of energy storage with their in-depth knowledge and unique understanding of atoms, molecules, and their interactions. In the past three decades, one type of batteries—Li-ion batteries (LIBs)—has revolutionized our use of energy by putting high-density electrical energy into our pockets and in our cars. Unfortunately, despite the halo of successes of LIBs, this technology is limited by its usage of expensive and rare metal elements, including cobalt, nickel, and lithium, where a single supply chain accident could nix the manufacturing of LIBs. Given the mining of these metals can take a long period of time, it is still a big question mark whether LIBs can meet the exponentially growing appetite of the transportation market, letting alone to address the needs for energy storage in the grids.

However, the market growth potential for grid storage is huge. In the next 20 years, the world may witness its growth by increase twenty-fold, as estimated by Bloomberg ETF. What batteries can be used for the storage of renewable energy? The answer may seem disappointing and frustrating: we don't know yet. However, this is a once-in-a-lifetime opportunity for chemists to change the course of history and to benefit the future of humankind before nuclear fusion is finally commercialized.

For the market of storage batteries, the primary metric is the levelized energy cost, which is the expense of every Watt-hour delivered from the storage batteries over their entire lifetime. Yes. It is all about the cost. One can use the following equation, devised by Dr. Ji, to estimate the levelized energy cost. The numerator is the sum of all costs, capital, operation, and what was needed to purchase electricity, and the denominator calculates the total energy delivered, which is the product of cycle number, energy density, energy efficiency,

and the depth of discharge.

A chemist's job is to leverage our knowledge to design battery chemistries that minimize the numerator but maximize the denominator of the above equation so that the levelized energy cost is the lowest. The rule of thumb is to have the price of the electricity coming from battery facilities comparable to or even lower than that from utility companies that burn fossil fuels. This allows us to use the market to drive the fossil-fuel-burning out of business. The challenges are certainly intricate and are often intertwined, which demands ground-breaking ideas from all sectors, including engineers and the business world.

LIBs are known as power batteries, where its salient metric is the energy density. For storage batteries, energy density is no longer the king of the game. A chemist is allowed to explore beyond lithium chemistries, which sets free the field to look at the entire periodic table for practical solutions. The Ji team recognized this diverging-but-pivotal moment of the field around 2013 and has embarked on a journey to hunt for winning storage battery chemistries.

The Ji team's efforts have been guided by the vision of investigating the fundamental principles that govern the electrochemical properties of redox chemistries. The team has endeavored to acquire a panoramic view of the field, where the priority is set to discover the 'forests' instead of individual trees. In the vein of this philosophy, the team later learned that the battery field has been undergirded by the routines of the conventional paradigm, where the foundational assumptions that facilitate the inventions of LIBs have circumscribed the scientists in the strict thinking of solid-state ionics. In this conventional paradigm, the two basic assumptions are: the charge carriers in the batteries are the non-polarizable ions such as  $\text{Li}^+$  and  $\text{Na}^+$ , and the interactions between these charge carriers and the electrodes' structures are of pure iconicity.



The Ji team found these two assumptions should be re-considered carefully. The charge carriers do not necessarily have to be  $\text{Li}^+$  and  $\text{Na}^+$ ; larger and more polarizable ions such as  $\text{K}^+$ ,  $\text{NH}_4^+$ , and other molecular ions can serve as the charge carriers for batteries as well. In particular, when these larger and more polarizable ions are inserted into the host lattices of electrodes, the interactions are no longer purely ionic, where the extent of covalency can't be ignored. Such donor-acceptor interactions bring rich implications of redox behaviors of the entire battery systems. In other words, the electrodes' performance in batteries is determined neither by the electrode materials alone nor entirely by the ion charge carriers; instead, it is the interactions between the electrode and ion charge carriers that manifests the nature of the charge storage processes.

Among the genres of interactions between the ion-guests and electrode hosts, one stands out from the Ji team's research—the Grotthuss proton batteries, which is based on H-bonding. This original research at OSU has advanced the understanding of the community about the role of charge diffusion in battery's power performance. Briefly, a Grotthuss proton battery operates by structural diffusion, where the charges of protons are transferred without transporting protons themselves. It is free of ion

diffusion, but via cooperative vibrations, resembling a Newton's cradle, through the breaking and reformation of H-bonding and O-H covalent bonds. This fascinating mechanism, discovered by von Grotthuss in 1805, which is to explain why water conducts electricity, was demonstrated powerful in promoting the battery's rate performance for the first time in 2019 by this OSU team. Now, it is not impossible to envision that a battery can be charged in just seconds, albeit engineering barriers should be considered as well.

Besides electrodes, charge carriers, and their interactions, a battery chemist should consider how the battery operates in terms of the mass exchanges with cations as well as anions, where this rationale has led the Ji team to become a leader of designing new battery configurations. The team has laid out a series of original contributions to dual-ion batteries (DIBs) and reverse dual-ion batteries (RDIBs). Based on the new understandings, Dr. Ji defined the four fundamental battery operation configurations for the first time, which he later expanded into the definitions of sixteen types of batteries.

In addition to the above factors of battery design, a chemist cannot perform a wet-chemistry reaction without selecting a suitable reaction medium—a solvent, which is the electrolyte in a battery. To this end, the Ji team has made breakthroughs in formulating new cost-effective  $\text{ZnCl}_2$ -

based water-in-salt electrolytes. An OSU spinoff company, GROTHUSS, INC., was founded to commercialize Zn-batteries that use these electrolytes, and this company has recently won an NSF SBIR Phase I grant.

Over the years, the team has practiced the philosophy of using a chemist's thinking and methodologies to tackle the challenges of batteries, which is often considered a field of engineers and materials scientists. However, Dr. Ji's team has stepped up to herald the new paradigm with a five-dimensional roadmap for discovering storage batteries. The Ji team has actively provided new knowledge and approaches to the battery community; this represents a milestone of such efforts. This road map highlights a holistic view of battery design from a redox reaction's point of view, where electrodes, charge carriers, interactions between electrodes and charge carriers, the battery configurations, and the electrolytes, en masse, define the properties a battery system. In this roadmap, a battery is simply a reactor; electrodes and charge carriers are reactants; the electrolyte is the reaction medium; the battery configurations define how the reactor operates. Among the factors, the electrode-charge carrier interaction constitutes the nexus of battery design, which unites seemingly the balkanizing field with vastly different battery chemistries.



# UNDERGRADUATES OF THE QUARTER WINTER 2019

**Dillon Crook** has been named one of the Winter 2019 Undergraduates of the Quarter and we couldn't be happier for him. Dillon grew up in St. Helens Oregon just 30 miles north of Portland in an old lumber and paper mill town. He attended St. Helens High School for all four years and went on to Portland Community College to discover his passion in life and get his Associate of Arts.

Dillon's father earned his Master's in Education here at Oregon State which was one of the driving factors for him to attend school here. In addition, Dillon is a sixth generation Willamette valley resident, furthering his connection to the University. Coming to OSU allowed Dillon to grow his passion for chemistry and education.

For the last three years Dillon has been doing research under **Mas Subramanian**, he works on exotic crystal structure analysis of solid oxides; specifically methods using solid state synthesis. As well as characterization and instrumental techniques related to the research. His path to research started with the careers in chemistry course (CH 220) and a job shadow with one of Dr. Subramanian's graduate students, Sarah Synnestvedt. After the job shadow Dillon became fascinated with Dr. Subramanian's research and started working under **Sarah Synnestvedt** until she graduated in 2017 with her masters, when he then transitioned to working with **Joseph Tang**.

Post-graduation Dillon hopes to teach abroad in Macau, China for a term, through this experience Dillon hopes to be able to further his career in teaching chemistry or some other physical science at the middle or high school level. He has already made strides in reaching his goal by being an undergraduate teaching assistant for the general chemistry for non-science major's courses for the past year.

Outside of school Dillon likes eating Tacos and enjoying nature. He and his family have traveled across the United States and have visited places such as Mount Rushmore, the Grand Canyon, and many other national parks.

Students like Dillon are a huge part of what makes our Department so great. We wish him well in the future, and cannot wait to see what his next big adventure is.



**Conner Bailey** has been named one of the Winter 2019 Undergraduates of the Quarter and we couldn't be happier for him. Connor grew up in Beaverton Oregon just outside of Portland. He attended Southridge High School for all four years where he found his passion for chemistry through taking stem chemistry in school. His teacher was a chemical engineer before becoming a teacher so he was able to show the students a lot of analytical instruments which sparked his interest in analytical chemistry.

Conner's family has a long line of Beaver's from his Brothers to his Dad, Beaver pride runs in his family. Conner was also drawn to Oregon State University due to the chemistry program and the things it has to offer.

Last summer Conner did research under **Claudia Maier**, he worked on the preliminary research of gangliosides. Through the research they were trying to find methods to separate the gangliosides so that they could get a full analysis of the compounds. Conner received the opportunity to do research through the university's Summer Undergraduate Research Engagement program.

Post-graduation Conner hopes to go to graduate school to pursue a PhD in chemistry. Currently he has been accepted into a PhD program at Washington State University.

Outside of school you can find Conner either kicking a ball around on the soccer field or working on his magic trick skills. Conner has been a magician since middle school, maybe through his degree Conner will be able to hone his magic skills.

Students like Conner are a huge part of what makes our Department so great. We wish him well in the future, and cannot wait to see what his next big adventure is.





# UNDERGRADUATES OF THE QUARTER

## SPRING 2019

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**Jackson Wiley** is one of our Undergraduates of the Quarter in for Spring 2019 and we couldn't be prouder. Jackson grew up in Medford in Southern Oregon, attending North Medford High School. It was during his Junior year there that he took AP Chemistry and found a new passion. His teacher instilled an enthusiasm in his class and, coupled with his skill in Math, it set the course for his college career.

While originally he wanted to explore a number of interesting and far away campuses, when he stopped by OSU for a visit he immediately fell in love. He had heard about the amazing research the university is well known for and knew this was the place he wanted to be.

It was those opportunities that he first heard about during his Freshman year that got him into **Staci Simonich's** research group. When he'd learned about undergraduate research opportunities, he began exploring the listings to find something that caught his interest. Staci's group was working in environmental chemistry and toxicology, topics which Jackson was very interested in. After contacting Staci, they exchanged a few more emails and he was welcomed into the research group.

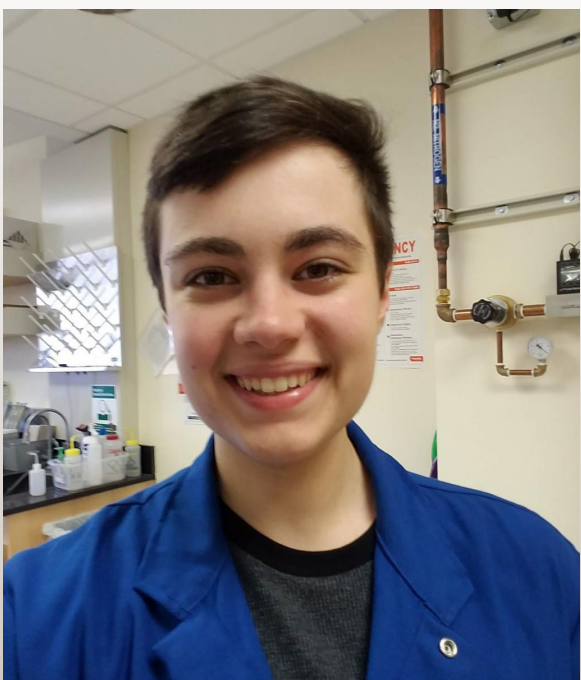
After graduation, Jackson knew he wanted to get into grad school. While he finalizes his plans, he is currently looking into a handful of schools to pursue Astrochemistry. This field is the crossroads of Astronomy and Chemistry, studying the effects of chemicals and materials in extraterrestrial environments. As the field often deals with poly-cyclic aromatic hydrocarbons,

the very chemicals he's currently studying in his research group, it seemed like an excellent fit. We hope it continues to fuel his passion in chemistry!

When not at school, he follows his native Oregonian roots and enjoys exploring and hiking through nature. He's also found of video games, fitting in some time between study sessions and school work. His favorite book is 2001: A Space Odyssey and his favorite food is sushi. Yum!

We wish all the best to Jackson from OSU to beyond!

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**Linus Yunitan** has been named one the Undergraduates of the Quarter for Spring 2019.

From Portland, Oregon and an alumna of Lincoln High School, Lindus had taken IB examinations that gave him the option to either take honors general chemistry or go straight into organic chemistry his first term at Oregon State. Although he decided to pursue the organic chemistry course, he became interested in **Vince Remcho's** work after reading through various group papers. After going to his office hours and expressing his interest, Dr. Remcho invited him to come observe a group meeting. Linus is now working with Dr. Remcho to develop microfluidic devices for medical diagnostics. Linus explained he loves chemistry because to him, chemistry felt like the "Goldilocks of the sciences." He described how chemistry had the best of both worlds, with the rich physical application of biology and logical mathematical structure of physics.

In addition to classes and his work in research, Linus worked as a peer advisor for the College of Science over the summer and is a member of the unicycle club. He also was a member of his high school marching band but after graduation, was not certain continuing would be an option in college. While touring Oregon State and first seeing Reser Stadium, he could not resist joining the band. For Linus, marching band became a major factor in his decision to attend Oregon State. Since then, he has earned a role as the drum major.

We are delighted to name Linus an Undergraduate of the Quarter for Spring 2019. After graduation, Linus hopes to attend medical school and work as a physician in Oregon. We wish him the best in his future endeavors and are excited to see what he accomplishes.



# UNDERGRADUATES OF THE QUARTER FALL 2019



**Jessica Brown** has been named Undergraduate of the Quarter for Fall 2020 and we couldn't be more proud! A native Oregonian, Jessy grew up in Portland and attended Cleveland High School. She enjoyed studying chemistry because it fits nicely in between biology and physics, two of many science subjects that she enjoys exploring.

She has always been close to her family and OSU seemed like the perfect fit with its broad offering of science majors. The opportunity to explore a variety of disciplines in science was also appealing. It also helped that many of her family members also went to OSU and shared their experiences with her.

She is currently working with the Nyman Research Group. She first met Dr. **May Nyman** during her second term of Inorganic Chemistry but she sought Dr. Nyman out at a Portland event where she discussed her research. In the group she is working on Uranium Sulfate chemistry with Ian Colliard, a graduate student.

The project explores the synthesis and solution properties of monovalent ion uranium sulfate clusters with group 1 ions and the ammonium ion. While she only just started late in the Summer, she is working hard to learn the techniques with her mentor.

Beyond OSU, she is still settling on which field of chemistry is most appealing. Her current plans are to move into graduate studies of inorganic chemistry. We know it can be hard to choose a field when chemistry encompasses and touches

on so many!

Outside of school, she enjoys ballroom dancing, painting, gardening and jigsaw puzzles. She also spends time working with a USDA plant pathology lab to maintain a greenhouse of hydroponic grape plants. Her favorite book is "All the Light We Cannot See" by Anthony Doerr and she enjoys blueberries most of all.

**Noah Tufts** was named one of our Undergraduates of the Quarter for Fall 2020 and we're thrilled to include him!

Noah is an Oregon native and grew up in Aloha before his family moved to Banks. He attended Forest Grove High School where he got a chance to apply his interest in chemistry. His father was a chemist and while he never pushed Noah into pursuing chemistry, he was always fascinated by what his father did as part of his career. He wound up enjoying his high school chemistry course and soon moved into honors chemistry. There he met another teacher who helped stoke his interest, Morey Miller. While TAing and attending AP Chemistry, Mr. Miller gave Noah the chance to run his own experiments and despite his limited success, it solidified his interest in both research and chemistry.

Wanting to remain close to his family and his home state, OSU was a clear choice for his academic pursuits. He felt that a local school meant he could keep costs low but still have the potential to get involved in research and other opportunities as he discovered them. In fact, it was in Dr. **Kevin Gable's** CH361 course that he discovered his

love of experimental chemistry and decided that research was where he wanted to be. He began asking around for opportunities, meeting TAs and generally getting to know who was looking for researchers. Befriending one of the TA's in Dr. Gable's class helped him to find a possible research home with Dr. **Chris Beaudry's** group. He made a point to attend every one of their group meetings and soon enough, a spot opened up and he was able to join.

Currently, he is working to develop additional methods of optimizing the production of homoherringtonine (a drug used to treat leukemia) from its primary intermediary, cephalotaxine-g. He's not alone in the project, as the lab often has a total of 6-10 people any given term, and it's an exciting chance to meet new people as the year progresses. He hopes to move into graduate studies after he has completed his degree and eventually move into Organic Synthesis.

When he's not in the lab, he is



an avid Taekwondo student and is a part of the OSU Taekwondo club. He enjoys the movie, "The Red Turtle" and eating any flavor of curry he can find. We wish Noah well in his pursuits and are glad to have such a passionate and dedicated undergraduate working in our research labs.

# UNDERGRADUATES OF THE QUARTER WINTER 2020

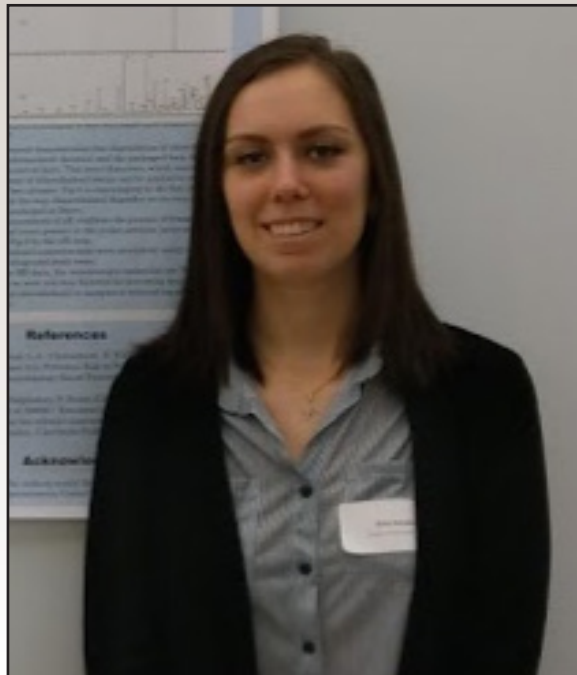
**Rony Kaluda** has been named one of the Winter 2020 Undergraduates of the Quarter.

Originally from Israel, Rony attended Sunset High School in Beaverton, Oregon where her passion for chemistry began. She found the experiments in her high school chemistry classes fun and blowing things up exciting. While Rony has always enjoyed science, these classes just seemed to make sense, leading her to believe it was a sign that she was most attracted to chemistry.

Rony wanted to stay in state and believed OSU was the best option to pursue chemistry and research opportunities. **Neal Sleszynski** reached out to Rony in her first term at OSU because she began her freshman year with 90 credits. He got her in touch with **Claudia Maier** to work in a research lab.

Rony applied for the SURE science program for the summer which was a proteomics based program. She is now working on projects looking at pesticide degradation in addition to pollen and phytochemical stability in different plants. These projects all vary but include mass spectrometry.

In her spare time, Rony enjoys hiking, Tae Kwon Do, and reading her favorite book, *Howl's Moving Castle*. Her favorite food is chocolate. After graduation, Rony hopes to become a graduate student in the Maier Lab seeking her Masters in Analytical Chemistry.



**Derek Munsterman** has been named one of the Winter 2020 Undergraduates of the Quarter.

Derek is originally from Bend, Oregon and attended Summit High School. After high school, Derek took a break between high school and college.

Instead, he went into the cannabis business which exposed him to hydrocarbon extractions and different types of reactions. The information he obtained originated from an open source provided by a community which inspired his passion for chemistry.

While attending community college and working full time, Derek originally wanted to be an Environmental Science. However, with no real end goal yet in site, he began fulfilling the Baccalaureate Core requirements. His work in the cannabis business helped solidify his passion to pursue chemistry.

As an Oregon native, Derek looked at Oregon State and University of Oregon for research opportunities in their STEM programs, ultimately deciding on OSU. Beginning at the endophyte lab, Derek was able to get his first OSU lab position. Using a letter of recommendation from Jennifer Durringer, he was able to move into a more research

focused group, getting in touch with Craig Marcus. At the end of the year, Marcus extended his info to different research labs, connecting him to **Jennifer Field**.

Derek now works in a research lab with Jennifer Field finding trace contaminants PFAS on suits. These traces are used to address preoccupational exposure to PFAS before workers are even exposed to it.

In his spare time, Derek enjoys snowboarding, fly fishing, and skateboarding. His favorite novel is *One Flew Over the Cuckoo's Nest* by Ken Kesey. Derek enjoys eating Thai or Southern food however, his favorite food depends on his mood!

After graduation, Derek plans on attending graduate school to earn a PhD. Although it took Derek a while to get his foot in the door for research, being involved has inspired him to be more motivated with chemistry, developing his passion. He urges those who would like to pursue research to keep pushing forward as OSU is an incredible school for it!



# UNDERGRADUATES OF THE QUARTER SPRING 2020

**Sophia (Jiani) Jiang** has been named one of the Spring 2020 Undergraduates of the Quarter.

Sophia grew up in Shanghai, China and moved to Beaverton, Oregon with her family in December 2014. She attended Westview High School in Portland. Although chemistry at times can be difficult to learn, she decided to pursue it because it is fundamental to everything in the world.

Ultimately, Sophia decided to attend Oregon State because it is a research-based university with an incredible science program. Additionally, she believes Corvallis is one of the best college towns in the US and has many places for her to explore.

Sophia is a part of Dr. **Vince Remcho**'s research group working on a thin-layer chromatography experiment for remote learning. Her work is part of a bigger project called "Making Introductory Courses Real while Online (MICRO)" which is funded by Howard Hughes Medical Institute.

With the help of her advisor, Dr. **Neal Sleszynski**, Sophia was able to get involved in research. He was able to help Sophia get in contact with several professors from the chemistry and biochemistry department. After reading papers and talking with professors, she decided to join Dr. Remcho's group because of her interest in microfluidics and its wide range of applications.

Aside from school and her work in research, Sophia enjoys hiking and playing fingerstyle guitar. Her favorite book is *The Lord of the Rings*. One thing Sophia believes stands out about herself is she is a tough person and her perseverance helps her achieve her goals.



**Sam Tanoeyadi** has been named one of the Spring 2020 Undergraduates of the Quarter.

Sam grew up in a city called Bekasi, located in West Java, Indonesia where he attended Don Bosco III high

school, a national-based curriculum school located in his hometown.

Sam wanted to pursue chemistry because in high school, he had difficulty mastering organic chemistry. In national chemistry competitions in his country, organic chemistry was the topic that was most challenging. This made him determined to master it both in practical lab work and in theoretical practices.

With plans of studying abroad in the United States, Oregon State became a clear choice when he saw the school represented in an international education abroad expo. Ultimately, Sam was determined to attend Oregon

State after seeing the chemistry program in the College of Science.

During Sam's undergraduate years at Oregon State, he was looking for an organic chemistry lab that could help him improve. With almost zero experience

in his early undergraduate career, Dr. **Taifo Mahmud** accepted him as a lab member. Since then, Dr. Taifo Mahmud had become his PI.

Currently, Sam is performing research as a part of Dr. Taifo Mahmud laboratory in OSU Pharmaceutical Sciences. His research focuses on natural product isolation, organic synthesis and microbiology alongside biochemistry that all focuses on the medicinal chemistry theme.

With the help of his PI, Sam has been accepted into the graduate school of Oregon State University Pharmaceutical Sciences Department and is now in his first year of graduate school in Medicinal Chemistry track.

Aside from his work, Sam enjoys fishing and playing video games. Additionally, he enjoys reading chemistry-themed books, short stories, and comics. His favorite food is anything that includes strawberries. In the future, Sam hopes to travel to Korea or Japan to celebrate his accomplishments.



# GRADUATES CLASS OF 2019

Alghamdi, Maha D. (PHD)  
Bailey, Conner F. (BS)  
Bandara, Gayan C. (PHD)  
Barnard, Breanna P. (BS)  
Borowicz, Rachel K. (BS)  
Brueckner, Alexander C. (PHD)  
Buchanan, Jacob (PHD)  
Bynum, Andrew D. (BS)  
Chen, Anqi (BA)  
Fantoni, Costanza (HBS)  
Fast, Dylan B. (PHD)  
Folliett, Jessica A. (BS)  
Foster, Paige M. (BS)  
Foster, Rebecca M. (BS)  
Fuller, Duncan D. (BS)  
Garcia, Raymmah (MS)  
Geringer, Mark K. (BS)  
Gonzales, Seth P. (BS)  
Goswami, Subir (PHD)  
Green, Alexander T. (BS)  
Grove, Markas A. (MS)  
Hatch, Madeleine M. (BS)

Hogan, Nicholas A. (BS)  
Hoy, Sara (BS)  
Hsiao, Austen (MS)  
Huffman, Lucy S. (BS)  
Koester, Michael S. (BS)  
Lee-Rouille, Taylor R. (BS)  
Leonard, Daniel (PHD)  
Li, Jinming (PHD)  
Li, Xin (PHD)  
Li, Zhifei (PHD)  
Liao, Martin W. (BS)  
Lopez-Arana, Jonathan M. (BS)  
Lu, Yi (PHD)  
Martinez, Ezri G. (BS)  
May, Jason E. (BS)  
Mc Quade, Ryan R. (PHD)  
Menon, Hari (BS)  
Namagoba, Elizabeth K. (MS)  
Oldfield, Mathew A. (BS)  
Peng, Muhui (BS)  
Qi, Yitong (BS)  
Renken, Scott J. (BS)

Renquist, Alexi R. (BS)  
Rodriguez Perez, Ismael A. (PHD)  
Sherwin, Tyler A. (BS)  
Shively, Matt A. (BS)  
Smith, Hannah R. (BS)  
Song, Zifeng (PHD)  
Stauffer, Darbi (BS)  
Svadlenak, Scott R. (BS)  
Ta, Nghi L. (BS)  
Tachibana, Sean (MS)  
Tang, Joseph (PHD)  
Vasquez, Alena M. (BS)  
Wallace, Maxwell (PHD)  
Walls, William G. (BS)  
Wise, Henry R. (BS)  
Xu, Wei (MS)  
Young, Ilsa J. (BS)  
Zhang, Lulu (PHD)  
Zhou, Lixia (PHD)  
Zirkle, Breeanna (BS)

# GRADUATES CLASS OF 2020

Alanazi, Ibrahim T. (BS)  
Aldous, Tanner J. (BS)  
Alharbi, Ashjan F. (MS)  
Ash, Kaitlyn (BS)  
Austin, Molly C. (HBS)  
Ayes, Coby L. (BS)  
Blaylock, Evan (BS)  
Brougher, Maylita N. (BS)  
Bryde, Ty C. (BS)  
Cayton, Kaylee T. (BS)  
Cedeno, Cynthia A. (BS)  
Conroy, Jocelyn J. (HBS)  
Crawford, Alexandra M. (BS)  
Culbertson, Charles M. (PHD)  
Cyganiak, Nora G. (BS)  
Duell, Brett A. (PHD)  
Estrada, Destiny (BS)  
Fathe Azam, Elmira (BS)  
Feng, Ching-Lei (MS)  
Fried, Zachary A. (HBS)  
Ghosh, Ankan (PHD)  
Gonzalez-Montiel, Gisela A. (MS)  
Gray, Katherine (BS)  
Haggerty, Caoilinn M. (BS)

Hebert, Joseph J. (HBS)  
Huang, Yu-An (MS)  
Hutchison, Danielle (PHD)  
Jayathilake, Nadeeshani M. (PHD)  
Jensen, Christopher S. (BS)  
Jin, Bei (MS)  
Jones, Kyle E. (BS)  
Ju, Xuan (PHD)  
Karslyan, Yana (PHD)  
Kenane, Nizan (PHD)  
Kim, Joyce P. (BS)  
Kosek, Alexander P. (BS)  
Kozma, Karoly (PHD)  
Kramer, Amber L. (PHD)  
Labastida Becerra, Ramses E. (BS)  
Lawson, Hannah E. (BS)  
Lei, Lei (MS)  
Lin, Yi-Chia (MS)  
Liu, Yu-Sung (MS)  
Makuch, Benjamin D. (BS)  
Markir, Aaron J. (BS)  
McKinnon, Rachel R. (BS)  
Nagasaka, Cocoro A. (HBS)  
Neuhaus, George F. (PHD)

Nord, Makenzie T. (BS)  
Olsen, Morgan R. (PHD)  
Overacker, Ross D. (PHD)  
Puryear, Madison M. (BS)  
Reeder, Eryn E. (HBS)  
Resch, Gunnar T. (BS)  
Rewerts, Justin (PHD)  
Reynolds, Tristan R. (BS)  
Reynolds, Tyelor S. (BS)  
Sha, Tianxiang (MS)  
Simpson, Avery M. (BS)  
Sobalvarro, Elizabeth M. (PHD)  
Spence, Kieran (BS)  
Srey, Jason (BS)  
Tanoeyadi, Samuel (BS)  
Thammabanvong, Justin A. (BS)  
Tomlinson, Kiara A. (HBS)  
Wade, Russell L. (BS)  
Williamson, Nakayla (BS)  
Wu, Yi-Jen (MS)  
Yang, Jasmin S. (HBS)  
Zhu, Chenxi (PHD)

# DEPARTMENTAL AWARDS: 2018-2019

|   |   |  |   |
|---|---|--|---|
| <b>May Nyman</b> won the FA Giffilian Award   | Chemistry winner was <b>Kenneth Koga</b>  | of the Quarter: <b>Dillon Crook &amp; Conner Bailey</b>  | Micky Leland Energy Fellowship and will intern at NETL Albany this summer   |
| <b>Liping Yang</b> was promoted to Senior Faculty Research Assistant I                                      | 2019 Colleen Spurgeon Scholarship awardee was <b>Jasmin Yang</b>  | Spring 2019 Undergraduate of the Quarter: <b>Jackson Wiley &amp; Linus Unitan</b>  | <b>Lauren Palys</b> was named one of the inaugural class of the OSU-PNNL Distinguished Graduate Fellowship  |
| <b>Chris Knutson</b> was promoted to Senior Instructor I  | 2019 ACS-Hach Land Grant Undergraduate Scholarships were awarded to: <b>Katlyn Ash, Sarah Connolly, Zachary Hamann &amp; Kiara Tomlinson</b>  | Fall 2018 TA Awards: <b>Jessica Hong</b> (CH 263), <b>Taylor Krueger</b> (CH 464), <b>Eliseo Quiroz</b> (CH 261), & <b>Yunkai Xu</b> (CH 461)                  | <b>Matthew Kremer</b> won the Genzo Shimadzu Best Poster Presentation at the 42nd International Conference on Capillary Chromatography  |
| <b>Sandra Loesgen</b> was promoted to Associate Professor w/ Tenure   | <b>Paul Blakemore</b> was promoted to Full Professor  | Winter 2019 TA Awards: <b>Katie Caspary</b> (CH 122), <b>Gisela Gonzalez-Montiel</b> (CH 362), <b>Vidhara Hapuraja</b>   | <b>Chandima Bandara</b> won the Top Poster Prize at the 34th International Symposium on Microscale Separations and Bioanalysis  |
| <b>Neal Sleszynski</b> was promoted to Senior Instructor II   | The 2019 Keith McKennon Undergraduate Research Scholarship winners were: <b>Madeline Bloom, Eryn Reeded, &amp; Linus Unitan</b>   | <b>Pathirannenhelage</b> (CH 262), <b>Wei Xu</b> (CH 462)  | <b>Saichon Sumantukul</b> was recognized with the Lumex Instruments Award for Excellence for her work at the 35th International Symposium on Microscale Separations and Bioanalysis |
| <b>Dipankar Koley</b> was promoted to Associate Professor w/ Tenure   | 2019 James D Ingle Chemistry Scholarship award winner was: <b>Lauren Cleary</b>   | Spring 2019 TA Awards: <b>Charles Culbertson</b> (CH 263), <b>Xuan Ju</b> (CH 337), <b>Chris Malmberg</b> (CH 263), <b>Ross Overacker</b> (CH 337)             | <b>Molly Austin's</b> work on 'Fish Slime Antibiotics' received media attention in news from The Guardian to the GT   |
| <b>Mas Subramanian</b> was named OSU Distinguished Professor  | The 2019 Undergraduate Excellence in Chemistry Scholarship were: <b>Jessica Brown, Caolinn Haggerty, Lindsey Huggland, Morgan Hoag, Savannah Justen, Madison Puryear, Mariya Ray, Tyelor Reynolds, Benjamin Skanes, Logan Traffas, John Vergis &amp; Derek Wong</b> | <b>Ana Arteaga</b> received the 2018 SACNAS Graduate Student Presentation Award  | <b>Donovan Adpressa</b> was awarded the CGS/ProQuest Distinguished Dissertation Award   |
| <b>Mas Subramanian</b> was awarded the Perkins Medal from the Society of Dyers and Colourists               | <b>Mas Subramanian</b> was named a 2018 AAAS Fellow   | <b>Cheng Chen</b> received a renewal of the Wei Family Private Foundation Scholarship  | <b>George Neuhaus, Paige Mandelare, Ross Overacker and Molly Austin</b> all received travel grants outside the department   |
| <b>Paula Christie</b> received the COS Gladys Valley Award for Exemplary Administrative Service             | <b>Jie Zhang</b> received the COS Outstanding Faculty Research Assistant Award  | <b>Sean Boulanger</b> has been an ARCS (Achievement Rewards for College Scientists) Foundation Oregon Scholarship since 2017                                   | Department of Chemistry Graduate Fellowships winners were: <b>Mehran Amiri, Taisiia Feoktistova &amp; Jason Nikkel</b>  |
| <b>Sandra Loesgen</b> was awarded one of the COS Research and Innovation Seed Program (SciRIS) Awards       | <b>David Ji</b> was awarded the COS Excellence in Postdoctoral Mentoring Award  | <b>Ana Arteaga</b> had the winning application package for Outstanding Community Outreach for Native American Activities from SACNAS's 2018 Role Model Chapter | The NL Tartar Summer Research Project winners were: <b>GilSoo "Ryan" Kim, George Neuhaus, Saichon Sumantakul, &amp; Xiaojie "Jay" Zhang</b>   |
| <b>Walt Loveland</b> was elected as a 2018 ACS Fellow   | 2019 Careers in Chemistry Award recipient was: <b>Joseph Hebert</b>   | <b>Paige Mandelaire</b> was featured on Inspiration Dissemination  | Milton Harris Graduate Fellowship winners were: <b>Elizabeth Converse Sobalvarro, Charles Culbertson, JungHwa "Jessica" Hong, Nizan Kinane &amp; Woochol Shin</b>                   |
| 2019 Peter B Culter Memorial Scholarship awardees were: <b>Kali Bravo, Kathryn Gerl, &amp; Lauren Lewis</b> | 2019 ACS Organic Chemistry Award Winner: <b>Molly Austin</b>  | <b>Longteng Tang</b> was awarded the 2018-19 OSU WAGS-ProQuest Innovation in Technology Award  |   |
| 2019 Carroll DeKock Scholarship awardees were: <b>Jiani Jiang, Jesse Johnson, &amp; Alden Sosnovske</b>     | ACS Inorganic Chemistry Award Winner: <b>Lucy Huffman</b>   | <b>Maha Alghamdi</b> received a Graduate School Travel Award to attend the 66th Pacific Conference on Spectroscopy and Dynamics                                |   |
| 2019 Linda May Oleson Scholarship of Excellence in  | ACS Organic Chemistry Award Winner: <b>Molly Austin</b>   | <b>Lei Lei &amp; Maha Alghamdi</b> received a scholarship to attend the 66th Pacific Conference on Spectroscopy and Dynamics                                   |   |
|   | American Institute of Chemists Award Winner: <b>Yitong Qi</b>   | <b>Morgan Olsen</b> received the DOE   |   |
|   | Computational Chemistry Award Winner: <b>Henry Wise</b>   |  |   |
|   | Merck Award Winner: <b>Tanner Aldous</b>  |  |   |
|   | Fall 2018 Undergraduate of the Quarter: <b>Tanner Aldous &amp; Yitong Qi</b>  |  |   |
|   | Winter 2019 Undergraduate   |  |   |

# DEPARTMENTAL AWARDS:

## 2019-2020

**Chong Fang**, as part of the 4-PI team at OSU, received NSF MRI funding (\$1.4M) for the development of an ultrafast spectroscopy and microscopy instrument for thin-films experimental research

**Chong Fang** received the 2019 OSU Impact Award for Outstanding Scholarship

**Daniel Myles** was named a 2020 Best Faculty Member

**Karen Wooley** (alum) was elected into the National Academy of Sciences

**David Ji** was selected as a 2019 Web of Science Highly Cited Researcher

Chemistry Scholarship/Fellowship Fund awardees were: **Kaitlyn Ash, Kiara Tomlinson, Sarah Connolly, & Zachary Hamann**

Careers in Chemistry awardee was: **Carlo Schettini Meji**

Peter B Cluter Memorial Scholarship winners were: **Chloe Ramsperger, Hannah Wold, Jacob Pankratz, Mariya Sandra, Nam Anh Pham & Noah Bach**

Carroll DeKock Scholarship winners were: **Jessica Etter, Rachel Jenck, & Savannah Harvey**

Linda May Oleson Scholarship for Excellence in Chemistry winners were: **Jessica Brown, Jiani Jiang, Kathryn Gerl, Linus Unitan, Logan Traggas, Madeline Bloom, Savannah Justen & Kailie Franco**

Colleen Spurgeon Scholarship winners were: **Basie Seibert, & Reno Hammond**

ACS-Hach Land Grant Undergraduate Scholarship winners were: **Kaitlyn Ash, Sarah Connolly, Zachary Hamann & Kiara Tomlinson**

Kieth McKennon Undergraduate Research Scholarship winners were: **Alden Sosnovske, Benjamin Skanes, Izabella Gonzalez Saunders, Karlie Wiese, & Skyler Kim**

The James D Ingle Chemistry Scholarship winners were: **Juan Altamira & Lauren Cleary**

Undergraduate Excellence in Chemistry Scholarship winners were: **Summer Estes, Keaton Knox, Jake Souza, Ava Thomas, Duncan Topham, Maria Alcazar, Sullivan Bailey-Darland, Owen Caleen, Jessica Li, Youngham Lim, Maria Meisenhelder, Kenzie Parsons, Samuel Sagal, Ethan Spear & Nicholas VanDerZwan**

CRC Award Winners: **Ebunoluwa Morakinvo & Rayan Taha**

PLU Award winner was: **Sullivan Bailey-Darland**

Top Physical Chemistry award winner was: **Samuel Tanoeyadi**

Top Analytical Chemistry Award winner was: **Linus Unitan**

Top Inorganic Chemistry Award winner was: **Cocoro Nagasaka**

Top Organic Chemistry Award winner was: **Kaylee Cayton**

American Institute of Chemists Award winner was: **Joseph**

**Hebert**

Merck award winner was: **Molly Austin**

Fall 2019 Undergraduates of the Quarter: **Jessica Brown, Noah Tufts**

Winter 2020 Undergraduates of the Quarter: **Derek Muensterman & Rony Kaluda**

Spring 2020 Undergraduates of the Quarter: **Jiani Jiang & Samuel Tanoeyadi**

Fall 2019 TA Awards: **Kiara Tomlinson (CH 261), Mehran Amiri (CH 263), Joe Harper (CH 361), Stephan Bradford (CH 464)**

Winter 2020 TA Awards: **Trenton Gallagher (CH 122), Alexa Singer (CH 261), Anh Tuan Nguyen (CH 324), & Wade Maresh (CH 462)**

Spring 2020 TA Awards: **Patrick Dey (CH 26X), Trevor Stockdale (CH 26X), Michelle Tran (CH 324), & Brenden Burke (CH 123)**

**Taylor Krueger** was awarded the 20-21 Oregon Lottery Graduate Scholarship

**Sean Boulanger** was recognized by the ARCS (Achievement Rewards for College Scientists) National Communications in 2020

**Janak Dunn-Wall** received the 19-20 OSU Provost's Distinguished Graduate Scholarship

**Michelle Tran** won a multiyear full fellowship as a NASA Space Technology Graduate Researcher

**Ian Colliard** received both the

GEM fellowship and the DOE Science Graduate Student Research fellowship to preform research at Lawrence Livermore National Lab

**Heng Jiang** won the Oregon Lottery Graduate Scholarship

**Jessica Hong** won the 2019 International Meeting of Sodium Batteries Best Poster Award

Department of Chemistry Graduate Fellowship award winners were: **Christopher Bahro, Stephen Bradford, Cheng Chen, Hannah "Camille" Richardson, Yunkai Xu, & Taisiia Feoktistova**

NL Tartar Summer Research Project winners were: **Lei Lei, Gisela Gonzalez-Montiel, Mona Khorani, & Partha Sheet**

Milton Harris Graduate Fellowship award winners were: **Mehran Amiri, Vidhara Pathirannehelage, Heng Jiang, & Lauren Palys**

Dorothy & Ramon Barnes Graduate Fellowship award winners were: **MD Nure Alam, & Sean Boulanger**

Bruce Graham Memorial Fellowship winner was: **Wade Maresh**

Dr. Sheng Chung Fang Fellowship winner was: **Yuzhong Yao**

Ingram Award winner was **Henry Wise**

Benedict Fellowship was: **Saichon Sumantakul & Yi Chia "Grace" Li**

Benedict Award winners were: **Wei Xu**

Continued from page 16

The Dorothy and Ramon Barnes Graduate Fellowship winners were: **Brett Duell, Taylor Krueger, Yuzhong Yao & Ashish Vaswani**

The Bruce Graham Memorial

Fellowship winner was: **Wei Xu**

The recipient of the Arnold Johnson Jr Graduate Fellowship, the Ken & Lise Hedberg Graduate Fellowship and the Dandeneau

Family Graduate Fellowship was: **Cheng Chen**

The 2019 recipient of the Ingram Fellowship and the Ingram Award was: **Michelle Tran**

The recipient of the Benedict Award was: **Sean Boulanger**

The winner of the David P and Clara B Shoemaker Fellowship was: **Danielle Hutchison**



# HONOR ROLL

## 2018-2019

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### Fall 2018

Tanner Aldous  
Nasser Alghumiz  
Kaitlyn Ash  
Molly Austin  
Lewis Ayres  
Conner Biley  
Rachel Berger  
Shayla Berrey  
Madeline Bloom  
Jessica Brown  
Anqi Chen  
Jasmin Chen  
Hannah Downing  
Chloe Finn  
Duncan Fuller  
Kathryn Gerl  
Seth Gonzales  
Lindsey Hagglund  
Mary Harrington  
Rachel Jenck  
Jesse Johnson  
Savannah Justen  
Michael Koester  
Kenneth Koga  
Ramses Labastida Becerra  
Taylor Lee-Rouille  
Jonathan Lopez-Arana  
Rachel McKinnon  
Cocoro Nagasaka  
Vivian Mguyen  
Mathew Oldfield  
Chloe Ramsperger  
Eryn Reeder  
Tyelor Reynolds  
Kaleb Roach  
Hannah Shupe  
Benjamin Skanes  
Alden Sosnovske  
Jason Srey  
Amanda Steinebel  
Samuel Tanoeyadi  
Keenan Tenoyo  
Kiara Tomlinson  
Lindsay Unitan  
John Vergis  
Alexander Villemeyer  
Rylee Whited  
Henry Wise  
Ian Wolf Beaton  
Derek Wong  
Makaela Yates  
Amber Young

### Winter 2019

Aldous Tanner  
Nasser Alghumiz  
Zoya Altuhova  
Kaitlyn Ash  
Conner Bailey  
Amanda Baker  
Rachel Berger  
Shayla Berrey  
Jessica Brown  
Jasmin Chen  
Jocelyn Conroy  
Hannah Downing  
Zachary Fried  
Duncan Fuller  
Kathryn Gerl  
Seth Gonzalez  
Lindsay Hagglund  
Zachary Hamann  
Rachel Jenck  
Jiani Jiang  
Jesse Johnson  
Savannah Justen  
Kenneth Koga  
Taylor Lee-Rouille  
Jessica Li  
Jonathan Lopez-Arana  
Cocoro Nagasaka  
Mathew Oldfield  
Madison Puryear  
Mariya Ray  
Eryn Reeder  
Samuel Sagal  
Benjamin Skanes  
Hannah Smith  
Alden Sosnovske  
Kieran Spence  
Jason Srey  
Ehman Tannenholz  
Keenan Tenoyo  
Kiara Tomlinson  
Lindsay Unitan  
John Vergis  
Philip Wallace  
Emma Weeks  
Ian Wolf Beaton  
Derek Wong

### Spring 2019

Tanner Aldous  
Nasser Alghumiz  
Kaitlyn Ash  
Molly Austin  
Conner Bailey  
Rachel Berger  
Kali Bravo  
Jessica Brown  
Andrew Bynum  
Gabriela Enrriquez  
Duncan Fuller  
Kathryn Gerl  
Seth Gonzales  
Lindsey Hagglund  
Zachary Hamann  
Stephanie Hillier  
Nicholas Hogan  
Jillian Holley  
Rachel Jenck  
Jesse Johnson  
Kenneth Koga  
Taylor Lee-Rouille  
Jessica Li  
Jacob Moore  
Cocoro Nagasaka  
Mathew Oldfield  
Alan Osborn  
Madison Puryear  
Jacob Rauenhorst  
Eryn Reeder  
Tyelor Reynolds  
Benjamin Skanes  
Alden Sosnovske  
Kieran Spence  
Jason Srey  
Ehman Tannenholz  
Keenan Tenoyo  
Lindsay Unitan  
Philip Wallace  
Ian Wolf Beaton  
Derek Wong

# HONOR ROLL

## 2019-2020

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### Fall 2019

Nasser Alghumiz  
Kaitlyn Ash  
Molly Austin  
Rachel Berger  
Madeline Bloom  
Maylita Brougher  
Jessica Brown  
Benjamin Gandy  
Kathryn Gerl  
Sarah Gernhart  
Erik Hakkila  
Zachary Hamann  
Reno Hammond  
Mary Harrington  
Savannah Harvey  
Jillian Holley  
Eshe Hummingbird  
Rachel Jenck  
Jiana Jiang  
Skylar Kim  
Kenneth Koga  
Jacob Lessard  
Jessica Li  
Younghan Lim  
Benjamin Liu-May  
Rachel McKinnon  
Cocoro Nagasaka  
Kenzie Parsons  
Nam Anh Pham  
Madison Puryear  
Eryn Reeder  
Tristan Reynolds  
Tyelor Reynolds  
Samuel Sagal  
Carlo Schettini Mejia  
Benjamin Skanes  
Alden Sosnovske  
Ehman Tannenholz  
Kiara Tomlinson  
Linus Unitan  
Nicolaas VanDerZwan  
Derek Wong  
Silvan Yang  
Phoenix de la Fuente

### Winter 2020

Maria Alcazar  
Nasser Alghumiz  
Juan Altamira  
Kaitlyn Ash  
Molly Austin  
Noah Bach  
Rachel Berger  
Madeline Bloom  
Jessica Brown  
Jasmin Chen  
Colby Cutris  
Jessica Etter  
Benjamin Gandy  
Kathryn Gerl  
Sarah Gernhart  
Izabella Gonzalez Saunders  
Reno Hammond  
Savannah Harvey  
Jillian Holley  
Rachel Jenck  
Jiani Jiang  
Skylar Kim  
Kenneth Koga  
Hannah Lawson  
Jessica Li  
Rachel McKinnon  
Derek Muensterman  
Nam Anh Pham  
Kelly Phan  
Jacob Rauenhorst  
Tyelor Reynolds  
Samuel Sagal  
Mariya Sandrea  
Carlo Schettini Mejia  
Basie Seibert  
Leigh Skala  
Benjamin Skanes  
Alden Sosnovske  
Jason Srey  
Amanda Steinebel  
Ehman Tannenholz  
Keenan Tenoyo  
Kiara Tomlinson  
Linus Unitan  
Nicolaas VanDerZwan  
Emma Weeks  
Derek Wong  
Silvan Yang  
Phoenix de la Fuente

### Spring 2020

Rahma Hamed Abdallah Al Rahbi  
Maria Alcazar  
Nasser Alghumiz  
Juan Altamira  
Samuel Aragon  
Kaitlyn Ash  
Noah Bach  
Rachel Berger  
Madeline Bloom  
Maylita Brougher  
Jessica Brown  
Regan Campbell  
Jasmin Chen  
Lauren Cleary  
Sarah Connolly  
Colby Curtis  
Jessica Etter  
Kathryn Gerl  
Sarah Gernhart  
Izabella Gonzalez Saunders  
Lindsay Hagglund  
Reno Hammond  
Jillian Holley  
Eshe Hummingbird  
Jiani Jiang  
Kyle Jones  
Savannah Justen  
Skylar Kim  
Hayley Lemke-Davis  
Jessica Li  
Benjamin Liu-May  
Rachel McKinnon  
Derek Muensterman  
Kenzie Persons  
Nam Anh Pham  
Kelly Phan  
Madison Puryear  
Chloe Ramsperger  
Jacob Rauenhorst  
Eryn Reeder  
Carlo Schettini Nejia  
Basie Seibert  
Benjamin Skanes  
Alden Sosnovske  
Crystal Still  
Mikayla Tsutsui  
Linus Unitan  
Nicolaas VanDerZwan  
Emma Weeks  
Karlise Wiese  
Makenzie Williamson  
Derek Wong  
Silvan Yang  
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# Oregon State University

Department of Chemistry  
153 Gilbert Hall  
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