

CHEMISTRY



2025

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2025 has been yet another exciting year in the chemistry department at UW. We are still building the department with the addition of another assistant professor Liane Moreau. Liane was hired to help build the recently established the Nuclear Energy Research Center (NERC) which is supported by the School of Energy Resources. This center has established a new Nuclear Energy Science certificate program which Liane will be helping to teach some foundational courses as well as collaborate on nuclear related research projects. Several faculty are actively involved in the Center for Energy Materials. This center is led by John Hoberg and Jing Zhou and is focused on research and development of new materials for energy sectors including separation and purification of rare earth elements as well as development of permanent magnets and catalysts using these elements.

In addition to building new centers and research areas, we are also renovating some teaching spaces in the Physical Sciences building. Last year we remodeled PS 334, which is a teaching room that had fallen into disrepair. This space was equipped with new tables and chairs that are modular supporting an active learning environment as well as a new podium and a large mobile video display to enhance the learning experience. This year, we also renovated the computer lab in PS 138. This included new computers and monitors as well as new desks and chairs which were greatly needed. I want to say a huge thank you to Franco Basile and Kui Chen for designing these spaces and working with operations to get these projects completed. They really enhance the student experience and will be beneficial to students for years to come.

As department head, I have been committed to increasing our connections to both high schools and community colleges across Wyoming. Elliott Hulley and I continue to lead our NSF funded Research Experience for Undergraduates (REU) program which brings in WY community college students for a 10-week research experience. We had another amazing group of students and went to the National Renewable Energy Lab (NREL), High Plains wind farm, and the Wyoming Public Health Laboratory in Cheyenne. Each of these trips were designed to expose the students to different applications of chemistry in the real world, as well as see high tech equipment and potential internships/jobs. We were also active in outreach activities including visiting elementary schools for Chemists Celebrate Earth Weeks (CCEW), and the UW STEM carnival.

We recently hosted Prof. Chrys Wesdemiotis from the University of Akron as our summer seminar speaker. He delivered a great series of seminars about his research on mass spectrometry with a special focus on polymer chemistry. We had a great departmental BBQ and several social events surrounding this event where the

speaker could interact with both the students and faculty to discuss research projects and chemistry in general.

We continued our annual graduate student poster session this spring where the students get to socialize and present the results of their research projects. This event is always a huge success, providing a platform for collaboration and networking opportunities well beyond our department. It was also great practice for several of our students who present their work at regional and nationals chemistry meetings. As an example, several graduate and undergraduate students from our department presented their research via posters and oral presentations at the ACS national meeting in Denver in the fall of 2024. They were supported through both the Wyoming ACS Local sections as well as gifts from generous donors. It is always nice to have the national meeting close to home and it was great to see strong representation from UW.

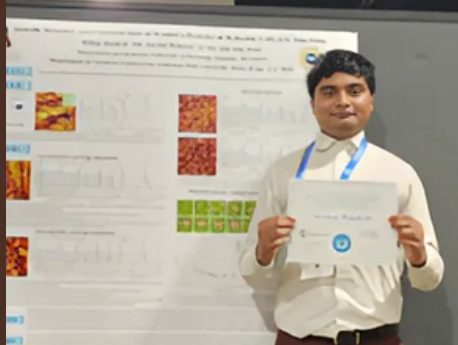
I always like to brag about members of our department. Tricia Olson our office associate recently won the UW employee of the quarter which was awarded during a reception by UW President Sidel. She also received the CEPS staff award and was recognized at the spring award ceremony. Additionally, Arul received his second consecutive Promoting Intellectual Engagement (PIE) award for excellence in teaching first year courses. Finally, I want to recognize a couple of our former undergraduate students who are starting their academic careers as assistant professors this fall. Jonathan Kephart recently started his independent career at Cornell University and Ken Madsen took a position at Baylor University. We are incredibly proud of all our students, and it is great to see UW Cowboys go onto successful careers.

To conclude, I wanted to thank all our generous donors for their contributions to the success of our department. Your previous support enables many of the activities mentioned above including student recruiting, events, and travel to conferences. This funding continues to have a significant impact on the level of education we can provide for our students and enhances their overall experience. I want to personally thank you for your ongoing commitment to the University of Wyoming Chemistry Department. Together we can show students from around the world what it means to be part of the Cowboy family.
Go Pokes!

Brian Leonard

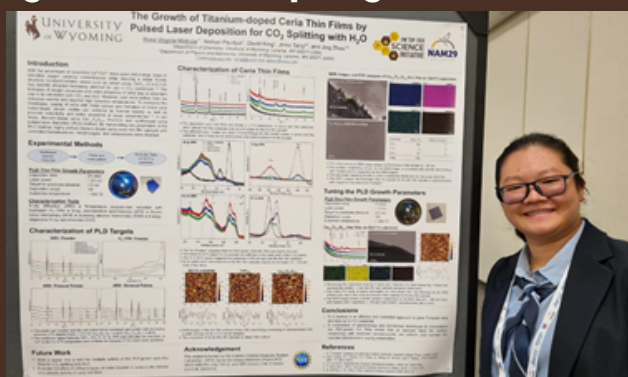
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In the past year, Zhou's group continued research efforts on the growth of ceria-based mixed oxides and ceria-supported metal particles as well as on the detailed characterization of physical and electronic properties for their applications in dry reforming of methane and CO₂ conversion. The group is thankful for the financial support of these research projects from the National Science

Foundation and Science Initiative Graduate Student Fellowship at UW. The group reported the results in three published articles in Journal of Physical Chemistry C. The group also presented research findings as posters and oral presentations at local, regional, and national meetings. In particular, we would like to congratulate Rosa Melinda who received the 2025 Kokes Award and presented a poster at the 29th North American Catalysis Society Meeting (NAM29). Nishan Paudyal received CATL-ChemCatBio Graduate Student Travel Award for Fall 2025 American Chemical Society (ACS) National Meeting, Best Poster Award (3rd Place) at Rocky Mountain Chapter – American Vacuum Society (RMCVS) Meeting, and Best Poster Award at UW Chemistry 2025 Graduate Poster Session. Congratulations to Jintao Miao for receiving the PhD this spring!



Jing Zhou

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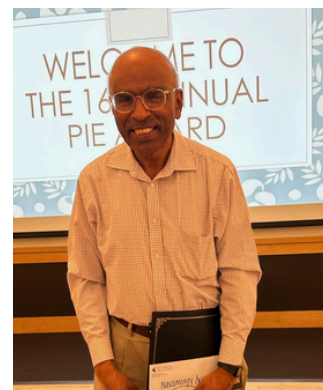
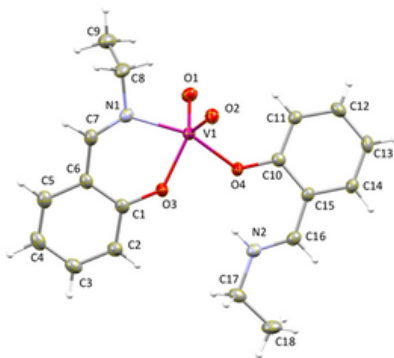
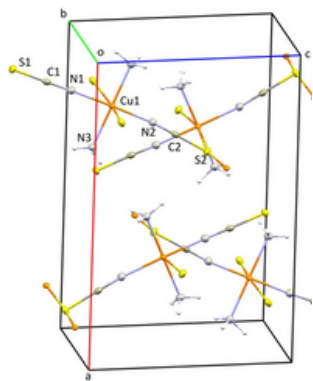
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On May 30, the chem department and Wyoming ACS chapter hosted a chem-bio collaboration research retreat at Curt-Gowdy State Park, which was attended by 21 researchers from chemistry, molecular biology, pharmacy, and chemical & biomedical engineering departments. The meeting included 16 presentations and discussions as well as social networking activities like "research bingo", where our student Omotolani won a bonzai kit as the prize! The attendees got to enjoy a BBQ picnic lunch with the backdrop of the beautiful state park. Unfortunately, the organizer forgot to take a group photo, but we have a picture from the hike that Tak and Alexander went on after the event. With all the positive feedback we received from the attendees and a few attendees/presenters who were unable to attend due to illness, we'd love to host a similar event next year!



I taught the General Chemistry I (CHEM 1020) and Advanced Inorganic Chemistry (CHEM 4100) courses in the Spring and Fall 2024 semesters. I ran the two X-ray diffractometers and the EPR spectrometer belonging to the Department. The new (2022) Bruker D8 Venture Duo Diffractometer performed the bulk of the diffraction for both single crystal and powder samples. I integrated the X-ray and EPR techniques into my CHEM 4100 with great success. In addition to inorganic and organometallic synthesis, this course introduces a variety of analytical techniques such as FTIR, UV-Vis, NMR and Cyclic Voltammetry. I included new experiments as I have done over the years. Last year, the class synthesized several new compounds, and below are the structures of two of them. Gen Chem I kept me busy all the time. But I am grateful that my students liked my teaching: I was awarded the PIE award for the second time in two years.



This website will give you more information about the PIE award
https://www.uwyo.edu/learn/fac_resources_recognition/pie/current-pie-awards.html.

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Dr. Liane Moreau is excited to be joining the UWYO Department of Chemistry this academic year. Dr. Moreau's research sits at the intersection of actinide chemistry, nanotechnology, and advanced X-ray characterization. She believes that the emergent behavior and materials properties that result as we make the largely unexplored 5f elements down to very small length scales will lead the path for the development of advanced accident tolerant nuclear fuels and understanding actinide migration in environmental systems. Dr. Moreau is a 2024 recipient of a DOE Early Career award, and has previously received funding through the NNSA Actinide Center for Excellence consortium as well as the M.J.Murdock Charitable Trust. She began her independent career at Washington State University and looks forward to further building up the Nuclear capabilities at UWYO, where she will introduce new expertise in Nuclear science to enhance the Nuclear certificate program. Dr. Moreau shares her name with an infamous mad scientist, and similarly to the Dr. Moreau of H.G. Wells, looks forward to combining her skills and background from materials science, physics and chemistry to create new and innovative areas of scientific exploration.

LIANE MOREAU
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The Basile group research continues to focus on measuring the lipid and metabolite compositions (lipidomics and metabolomics) of bees under temperature stress -i.e., climate change, characterizing the protein composition of invasive weeds in Wyoming and measuring the molecules released by plant roots, known as root exudates, via imaging-Mass Spectrometry.

Current members of the Basile lab include Hunter Taylor (bee metabolomics and lipidomics), Brandon Saiz (plant-microbiome-soil proteomics), and Nilay Saha (imaging-MS, bees and plant root exudates), who are all on track to defend their Ph.D. dissertations either in Fall 2025 or Spring 2026. Two undergraduate students, Cindy Robles-Garcia and John Larson, also joined the group this past year and summer, and both performed critical work in bee metabolomics (Cindy) and bee lipidomics (John).

This year Nilay presented research results on his blotting-filter paper sampling of root exudates at the 2025 ASMS conference in Baltimore. This was the first time since 1995 that I missed an ASMS conference, but for a good reason: the timing coincided with my stepson's wedding in England. We submitted several manuscripts on our bee and plant root studies that are currently under review.

I also had the privilege to host the 2025 Summer Lecture Series and invited Prof. Chrys Wesdemiotis (University of Akron, OH), an expert in molecular characterization of polymeric structures with Mass Spectrometry, and presented three wonderful and engaging lectures. It was fall of 2003 when I first stepped into the classroom at UW to teach CHEM4230 (Instrumental Chemical Analysis).

Now, 22 years later, I have decided to retire in the Spring of 2026. The main drive for this decision was a desire to spend more time with my wife Jane to travel and pursue "bucket list" items of my favorite hobbies, while still benefiting from relatively good health. I also plan on writing several backlogged manuscripts and perhaps a book chapter on the thermal degradation of proteins. Although the current political-scientific-funding shake-up did not precipitate this decision, it did somehow reassure me that it was the right move for me (all my projects are related to the effects that climate change has on insects and plants). However, I will miss the joy and honor of teaching and working alongside students, both undergraduate and graduate, and Postdocs who have devoted their time to pursue my crazy ideas and allowed me to shape their scientific knowledge. I am so grateful for this opportunity.



Franco Basile
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As a lecturer and lab coordinator in organic chemistry, I have spent the past year teaching the Organic Chemistry I and II sequence while also overseeing the associated teaching laboratories. I am still a strong believer in the benefits of a flipped classroom for teaching organic chemistry. Students not only find it more enjoyable than a traditional lecture but also benefit from a deeper understanding of challenging concepts. I am grateful for the support in the classroom provided by Learning Assistants (LAs) through the Science Initiative. LAs are students who have successfully completed the course in the past and now assist their peers by answering questions and providing hints during group problem-solving sessions. Given the large class sizes (around 100 students), their assistance is invaluable. To ensure that LAs are well-prepared for their role, we hold weekly meetings to discuss the concepts covered in class. Additionally, LAs are required to enroll in a pedagogy course that equips them with insights into effective teaching within an active learning environment.

In the labs associated with the lectures, students gain essential hands-on experience in organic chemistry. The use of bright colors, color changes, chemiluminescence, and real-life connections keeps students engaged during experiments. By replacing rudimentary polarimeters with more accurate instruments last year, I was able to deepen students' comprehension of optical rotation in organic compounds. I also received funding through a NASA Faculty Education Grant to redesign the lab manuals, making the experiments more engaging and exploration-based to enhance student learning in the lab. Students are no longer simply following a set of instructions; they are now encouraged to think critically about each step and its purpose, with active discussion among peers strongly promoted. I am excited to continue introducing our students to the challenges and joys of organic chemistry, providing a thorough and enjoyable learning experience, where students not only learn organic chemistry, but also practice critical thinking and problem-solving skills.

Ginka Kubelka

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Our computer lab received an upgrade this year, and our students and faculty are already putting it to good use. We also extend our gratitude to our donors, whose generosity continues to strengthen and support our department.



The Leonard research group welcomed Afnan Islam to the group in the fall of 2024. He joins Farjana Zhimi, John Samuel, and A K M Manjur Hossain as our current graduate students and RJ Tardoni and Brittany Loke as our undergraduates. Manjur defended his Master's degree and graduated in the spring of 2025 and is now heading to the University of Houston to continue his education. RJ and Brittany both graduated with their BS degrees in the spring of 2025.

Our research group is primarily focused on synthesizing two dimensional layered compounds and studying their intercalation chemistry which results in interesting crystallographic changes as well as changes in their fundamental physical properties. We are also continuing our collaboration with Jifa Tian in the physics department at UW on WS2 which is funded by DOE.

The group was quite active last year going to several conferences. Several group members attended national ACS meetings to present our current research findings. Dr. Leonard presented in New Orleans while students John Samuel, A K M Manjur Hossain, and RJ Tardoni gave presentations and posters in Denver. In the past year, we also published three papers in Chemistry of Materials and Nano letters (X2).

In addition to research projects, Dr. Leonard and Elliott Hulley were funded by NSF to host a research experience for undergraduates (REU) program at UW focusing on bringing in community college students to spend the summer conducting chemistry research. In 2025, we brought in 6 undergraduate students to spend 10 weeks in the department working with various faculty members. Carrie Schubert from Casper College worked in the Leonard lab on the intercalation of chiral molecules and produced some fantastic results. Hopefully she will return to UW after her time in Casper to continue with this project. Dr. Leonard continues to serve as an Advisory Board Member for the journal Materials Research Express. He currently serves as the Councilor for the WY section of the ACS and is on the national ACS Local Section Activity Committee.

Brian Leonard

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Throughout the 2024/2025 academic year, the Computational Design of Inorganic Materials Lab remained busy, beginning with the addition of a new graduate student, Ali Jalali, in Fall 2024. Among other work, the lab published two consecutive articles in the Journal of the American Chemical Society (JACS) in collaboration with the Hoberg and Parkinson groups. The first study, led by the Hoberg group, reported the first observation of screw dislocations in covalent organic frameworks. The second study, co-led by the Hoberg and de Sousa Oliveira (Computational Design of Inorganic Materials Lab) groups, demonstrated a one-pot synthesis of graphene-like materials with precise pore sizes and controlled doping.

The team was also pleased to secure two seed grants: the UW Research Excellence Fund Seed Grant and the School of Energy Resources (SER) Nuclear Fuel Cycle Grant. The first project, titled "Enhancing the Electronic Properties of Newly Developed Graphitic Covalent Organic Frameworks through Rare Earth Doping," seeks to discover new semiconducting materials. The second project is dedicated to "Multiscale Thermal Transport Modeling of UO₂ in the Presence of Fission Products", an essential aspect for improving nuclear fuel cycle efficiency. Masoumeh Mahmoudi Gahrouei was recognized with a poster award at the department of chemistry's annual poster session on April 5th. Alongside Alatheia Davies, Masoumeh also received the prestigious Bruce A. Parkinson Energy and Materials Research Scholarship. This accolade acknowledges their outstanding work and potential in materials science and energy research. Both recipients reflect the ongoing legacy of Dr. Bruce Parkinson's dedication to academic excellence.

The group attended the 2025 International Workshop on Computational Nanotechnology (IWCN) conference held in Salt Lake City, Utah en masse. de Sousa Oliveira delivered an invited lecture, and graduate students Ali Jalali, Masoumeh Gahrouei, and Oreoluwa Adesina, along with undergraduate students Alison Jensen and Nikiphoros Vlatos, gave talks and presented posters to showcase their research findings. During this period, Alatheia Davies attended a DOE Program Meeting in Washington DC on behalf of the group. de Sousa Oliveira and Alatheia Davies also attended the 2025 Nanoporous Materials and Their Applications Gordon Research Conference (GRC), in which Alatheia served as co-chair for the Gordon Research Seminar (GRS). Finally, the most exciting event of the year was Alatheia Davies' PhD defense. Dr. Davies is beginning her independent academic career as a research scientist in the School of Computing at the University of Wyoming.



Laura de Sousa Oliveira
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3-minute Thesis Competition

The College of Engineering and Physical Sciences hosted its first "3-minute Thesis Competition." Four of our graduate students participated. Congratulations to Acharzo Amit Kumar, Md Bony Amin, Nilay Saha, and Felix Gboyero!



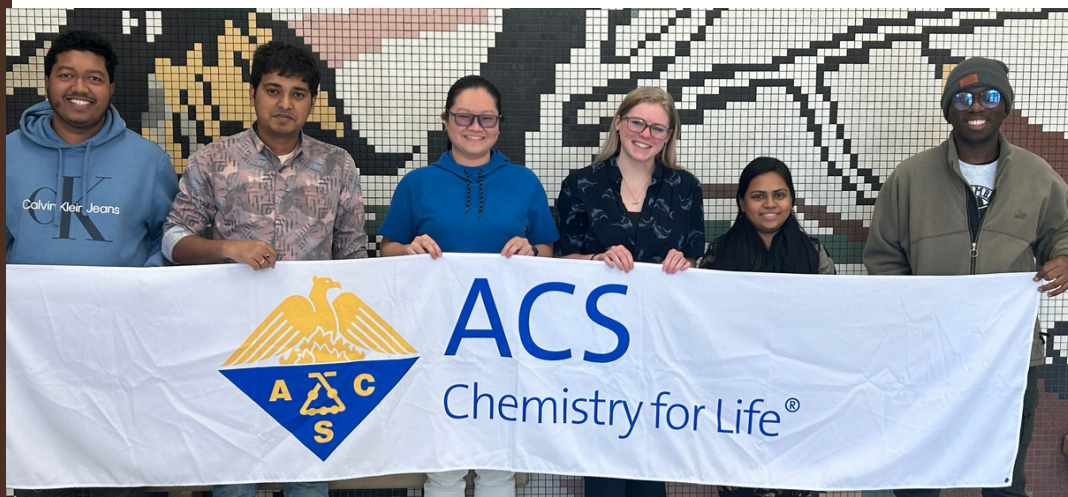
Malgorzata Maria Clennan

We are deeply saddened by the passing of Margaret, a cherished member of our community. Our hearts go out to her family and loved ones, and we send our deepest sympathies. May her memory bring comfort and peace during this difficult time.

Tricia Olson

Our Office Associate Sr, Tricia, was honored with two awards: UW Staff Employee of the First Quarter, Tau Beta Pi Outstanding Staff Award.





2025-2026 WY ACS Graduate Executive Committee

Pictured:
MD Amjad Hossain, Nilay
Saha, Rosa Melinda, Alison
Jensen, Synthia Rahman
and Olajide Ajibade

The ACS Graduate Chapter at the University of Wyoming had an exciting year so far, with regular CoffeeHours in both spring and summer, making connections and lively discussions among members. We hosted a Chemistry Poster Session, organized a fun Game Night, and assisted with the SummerSeminar BBQ. Looking ahead, we're keeping the momentum going into fall 2025 with Coffee Hour everyThursday at 9:30 p.m., providing a space to share ideas, knowledge, and camaraderie. Upcoming events include our participation in the Farmers Market on August 29, a career session, and a variety of colorful, engaging activities designed to bring our community together.

2025-20236 WY ACS Undergraduate Executive Committee

Pictured:
Kelsey Anderson, Jackson
Fouras, Orlando Gonzalez,
Kyra Waldron and Liam Kopp.



We are proud to announce the launch of a new chapter of the American Chemical Society (ACS) Undergraduate Organization here at the University of Wyoming! This student-led initiative brings together undergraduate students who share a passion for chemistry, scientific inquiry, and professional development. Our mission is to create a collaborative space where students can deepen their understanding of chemistry, explore research opportunities, and connect with peers and professionals in the field. Through guest lectures, hands-on experiments, community outreach, and social events, we aim to foster both academic growth and lasting friendships.

Whether you're a chemistry major, simply interested in learning more about the molecular world around us, and or looking for a organization, we welcome you to join our community. As we continue to grow, we're excited to share our journey, accomplishments, and future plans with you all.

CONGRATULATIONS 2025 GRADUATES

Doctor of Philosophy

- Alatheia Davies
- Tasnim Ara
- Michael Wenzel
- Anh Nguyen
- Kira Kirkham
- Jintao Miao
- Roshni Ramakrishnan
- Ibrahim Muddasser



Masters

- Oreoluwa Adesina
- Felix Gboyero
- Drew Rone
- A K M Manjur Hossain

Bachelors

- | | |
|-----------------------|-------------------|
| • Cindy Robles-Garcia | • Isabella Valdez |
| • Sean Clerkin | • Sawyer Winn |
| • RJ Tardoni | • Oryna Nechai |
| • William Gerdes | • David Tangeman |
| • Elijah Lacey | • Grace Ritchie |
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| ☐ Owen Asplund Prize Fund | ☐ Sara Jane Rhoads Graduate Research Award |
| ☐ Howard Heady Scholarship Fund (Chemistry) | ☐ Hans Peter Richert Memorial Fund |
| ☐ Arthur Gray Janssen Scholarship | ☐ Steik-Wilkie Graduate Fellowship in Chemistry Fund |
| ☐ Rebecca Raulins Undergraduate Research Fund | |

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| ☐ Frontiers in Physical Chemistry | ☐ Clifford C. Hach Gift Fund | ☐ Patrick Sullivan Memorial Fund |
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John Hoberg
Elliott Hulley
Ginka Kubelka

Teresa Lehmann
Xuesong Li
Michael Marshak
Liane Moreau
Laura de Sousa Oliveira
Takashi Suyama
Jing Zhou
Tricia Olson
Ed Clennan
Dean Roddick
Bruce Parkinson
Patricia Goodson



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Masoumeh Mahmoudi Gahruei
MD Amjad Hossain
MD Bony Amin
MD Mahmudul Hassan

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