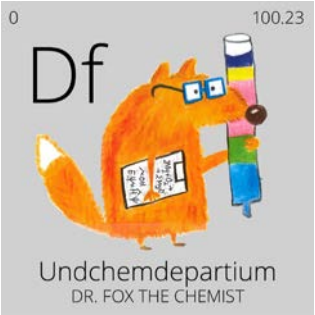
UNIVERSITY OF NORTH DAKOTA
CHEMISTRY

Fall 2022 Newsletter



WELCOME
FROM THE CHAIR

Alena Kubátová, Ph.D.

Best wishes in the upcoming holidays and New Year 2023! Looking back over the year, we have made significant accomplishments, thanks to a fantastic team of faculty, support from our college, friends, and Alumni. Many of the accomplishments will be shared in this Newsletter in detail, but I would like to specifically mention a few.

First and foremost, I wanted to welcome new people who joined us last year and are already significantly contributing to our efforts. On our staff, member **Aleta Krack** joined us in the office. Thanks to her efforts, we are up to date on social media, including this Newsletter, as well as on showing the work of our faculty and students, such as poster displays from our capstone senior class. **Andrew Greer** joined us just this summer as the equipment technician, yet already his enthusiasm and efforts to support our equipment needs and safety standards' updates are highly appreciated. **Dr. Binglin Sui** joined our faculty just a year ago, in the summer of 2021, and he has already landed a prestigious NSF grant. **Dr. Weixin Huang** is joining us in January 23, and we are excited to have him as a new faculty member.

The success of our faculty is reflected in many awards: **Professor Hoffmann** became an AAAS fellow, **Dr. Zhao** received the highest UND faculty award - Chester Fritz Distinguished Professorship, **Shaina Mattingly** received the UND Founders' award for excellence in online course development, and the **Chemistry Department** was recognized for excellence in teaching by receiving the corresponding award on the Founders Day.

As reflected in the awards, our faculty are both dedicated instructors and excellent researchers. We continue to improve our courses to enhance interactive learning and provide research experiences including both our faculty and adjunct professors. Our faculty also continue to provide support for summer research, including both faculty research funding and through various venues, such as NSF-funded research experience for undergraduates (REUs) and international research experience for students (IRES). The REU and IRES serve as recruiting tools. Yet, we are also looking for additional support for both graduate and undergraduate students' research through fundraising, and so here I would like to highlight our Chemistry Alumni fund. Another way to provide excellent training is through internships: Thus, I would like to ask our Alumni whether you know of any opportunities where companies could connect to UND. Please let us know – any/all support is appreciated!!

In our Newsletter, you will find many other details on the activities we pursue. We are continuously looking for new paths for improvement. So, we are eager to hear from you. Please, do not hesitate to share with me your ideas and suggestions.

Happy New Year, 2023!

Alena Kubátová

WELCOME
NEW FACULTY & STAFF

Weixin Huang
Assistant Professor

Dr. Huang's research will aim to develop new synthetic strategies for well-defined nanocatalysts with atomically precise surfaces that can lead to a fundamental understanding of their structure-property relationship and to use this new knowledge to design optimized nanocatalysts for responding to the current energy crisis and environmental problems.

Huang received his Ph.D. in Chemistry from the University of Notre Dame in 2017 under the supervision of Prof. Sylwia Ptasinska and Prof. Ian Carmichael. His thesis focused on the surface evolution of perovskite materials under gas environments using ambient pressure – X-ray photoelectron spectroscopy (AP-XPS). He was awarded the Chinese Government Award for Outstanding Self-financed Students Abroad. After graduation, he did his postdoctoral training at Stanford University advised by Prof. Matteo Cargnello and Washington State University advised by Prof. Yong Wang. His postdoctoral research focused on nanomaterials synthesis and heterogeneous catalytic reactions, including complete oxidation of methane for natural gas emission control. He has published 16 first-authorship papers in prominent scientific journals, including *Science, Angewandte Chemie, ACS Catalysis, Chemistry of Materials,* and *Journal of Physical Chemistry Letters*.

Paul Pansegrau
Part-time Instructor

Dr. Paul D. Pansegrau has been a part-time instructor of chemistry within the department beginning with the Fall semester of 2020. Courses led include CHEM 122 and CHEM 340. Dr. Pansegrau graduated from the University of North Dakota with a Bachelor of Science in Chemistry (ACS Certified) in 1981. He then proceeded with graduate studies at Colorado State University working under Prof. A.I. Meyers, earning a Ph.D. in 1985. He completed post-doctoral research with Prof. L.A. Paquette at Ohio State University.

Dr. Pansegrau launched an industrial career in 1987, which included research and management positions with Monsanto Agricultural Company, Bristol-Myers Squibb Company, Dakota Gasification Company, Ecology and Environment, Inc., and Energy and Environmental Research Center at UND.

Dr. Pansegrau retired from his industrial career in 2017 and began a pedagogical career at United Tribes Technical College in Bismarck, North Dakota. Dr. Pansegrau's research and scholarly activities have resulted in 20 peer-reviewed publications, 16 U.S. Patents, and numerous professional presentations.

In addition to chemistry, Dr. Pansegrau enjoys outdoor activities, including fishing. Dr. Pansegrau resides in Bismarck but hopes to relocate to Grand Forks in the near future.

Andrew Greer
Electronics Equipment Technician

I have lived coast to coast, border to border, and lots of places in between. I moved to North Dakota from North Carolina 10 years ago with my wife and absolutely love it here. I was born in Los Angeles, California and moved around a lot. I have worked in many industries over the years and learned a lot of skills. I have been an electrician, carpenter, plumber, mechanic, welder / fabricator / machinist, automation technician and even worked in sales and marketing. I have worked in clean room environments for the pharmaceutical industry, radiation worker trained for nuclear power plants, IT jobs and even had my own computer company many years ago. I was even a traveling art salesman for a short time just to name a few things I have done.

I have an A.S. in Electronics Engineering Technology and am currently pursuing a B.S / M.S. in Mechatronics Engineering with a prospect of also pursuing either chemistry or biomedical science in the future. Other educational experiences are lasers and photonics, computer sciences, and industrial maintenance technologies.

My hobbies are many but include reading, gaming, music, cooking, saltwater aquariums, and movies. I have a couple of 1974 Road Runners that I am currently restoring and drive one on occasion around town. I love learning new things and rarely pass up an opportunity to gain skills or insights into topics that I do not know. I have been known to play the guitar or bass when I have the time. I am not a master of anything but can do a little of everything.

Aleta Krack
Part-time Office Assistant

I joined the Chemistry Office Staff in April 2022 after retiring from teaching Family and Consumer Sciences at Thompson High School for the previous ten years. I am happy to be supporting education in a different way; working fifteen hours a week in the office here. Campus is a familiar setting to me. I graduated from UND's College of Education and Human Development in 1997 and worked in the Office of Admissions for two years. In my personal time, I enjoy gardening, sewing, cooking, exercising, camping, and spending time with my husband and two grown children.

CHEMISTRY PHOTO CONTEST

To share the excitement in science and chemistry with our community, we have launched a new tradition: The Chemistry Photo Contest. We announced our first winner this fall. A new contest is now open for submissions, with a deadline of **February 10, 2023**. The next winner will be announced at the Abbott Lecture on March 9, 2023. Visit the link below to learn more and submit your photo!
https://arts-sciences.und.edu/academics/chemistry/photo-contest

CONGRATULATIONS
PROFESSOR EMERITI

Irina Smoliakova

Dr. Smoliakova retired this year, but we are honored to have her join the rank of Professor Emerita. Dr. Smoliakova has been with the Chemistry Department for over 25 years. Her contribution to teaching, research, and service at UND is substantial in all three areas. Professor Smoliakova published more than 70 peer-reviewed papers and a book chapter. She was a research advisor to two postdoctoral researchers, eight successful Ph.D. students, three M.S. students, and more than 40 undergraduate students. For many years, Dr. Smoliakova was the Chair of the Chemistry Undergraduate Program Committee and chair or member of other departmental committees, including Chair Advisory. She was the Chemistry Undergraduate Club advisor (2001-2004) and the Research Coordinator of the Summer REU Program (2003-2010, 2012). Her work is reflected in a number of awards, including UND Foundation Award for Individual Excellence in Teaching (2001) and the Elmer & MinWest Faculty Award (2015), a UND Star Faculty (2006-2009, 2012), and an honorary member of the Golden Key International Honor Society (2010). She received a research award from the National Institute of Health, two instrument awards from the National Science Foundation, and several research awards from ND EPSCoR and UND. Dr. Smoliakova continues her association with the UND Chemistry Department as an immediate resource for expert opinion on teaching undergraduate and graduate organic chemistry classes and coordination of scholarships.

Lothar Stahl

Dr. Stahl has been awarded the Professor Emeritus status, and we are grateful to have an ongoing collaboration with him. Over his time at UND, Dr. Stahl published approximately 70 peer-reviewed papers in leading chemistry journals. He led graduate and undergraduate research in inorganic and organometallic chemistry relevant to both academia and industry. In fact, Dr. Stahl served as a role model with his industrial connections, receiving research support from Chevron Phillips Chemical Company. In research, he also provided valuable service when maintaining the X-ray diffractometer and providing support for other researchers. Dr. Stahl has been one of our best teachers, teaching high quality courses at every level. His first-year general chemistry courses were popular. He also successfully taught graduate courses in his specialty, particularly Organometallic Chemistry that other graduate students and even senior undergraduates regularly took as an elective. His ability to teach such a wide variety of classes made him a particularly valuable contributor to the teaching mission of the department, ensuring the rigorous quality of the curriculum. Upon his retirement, Professor Stahl shared his teaching materials for the advanced courses, which are still in use in the Chemistry curriculum. Dr. Stahl continues his association with the department following his retirement, with principal benefits being informal mentoring of students, connecting with our Alumni, and being a ready resource for expert opinion on theses and dissertations.

REMEMBERING
TOM BALLINTINE

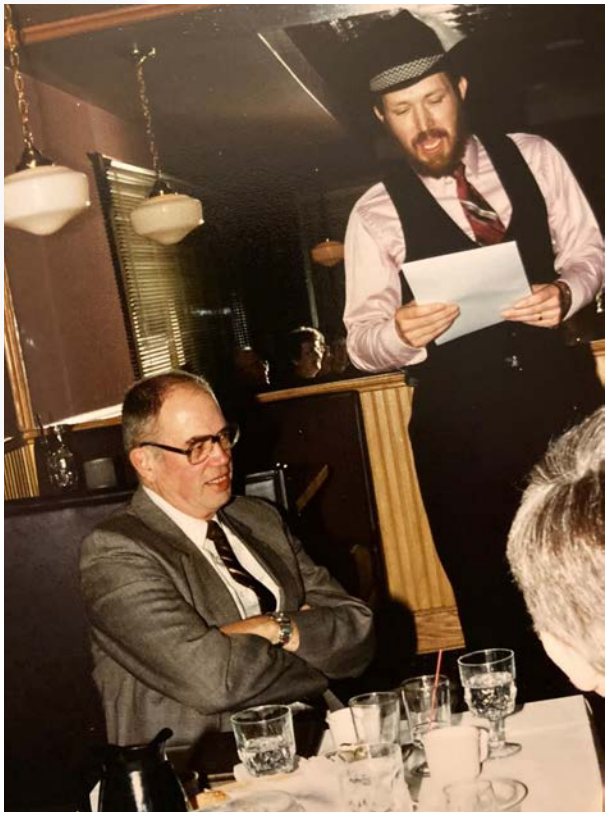
In honor and memory of Dr. Thomas (Tom) A. Ballintine, Emeritus Associate Professor of Chemistry, who died December 5, 2022.

Dr. Ballintine grew up in Ohio and earned his Ph.D. at Southern Illinois University at Carbondale in the early 1970s. He started his career at UND as a postdoctoral fellow working with Dr. Richard Baltisberger. In 1975, he was hired into a dual-role position, working half-time repairing and maintaining departmental instrumentation, and half-time teaching first-year undergraduate chemistry courses. His duties also included scientific glassblowing.

In 1987, the department received its first EPSCoR grant from NSF, which allowed the hiring of a full-time electronics technician to handle the veritable explosion of primarily in first year courses but kept up the glassblowing and helped guide a succession of electronics technicians through the fine points of the interface of chemistry and electronics.

Tom was known for his sense of humor, cracking jokes and puns at odd or opportune moments. Dr. Neil Woolsey was his joking rival, his partner in humor. He was also known to use (sometimes spectacular) demonstrations in class. Outside of work he liked the outdoors and was part of a faculty group that made an annual fishing trip to Lake of the Woods in the 1970s and '80s. He also enjoyed duck hunting with Drs. Baltisberger and Bartak in North Dakota.

He retired from the department in 2007, when he moved back to Ohio. His dedication to teaching and sense of humor will be remembered fondly.



Professor Ballintine singing the "Ballad of Roland" during Professor's Severson retirement festivities.

FACULTY UPDATES

Alena Kubátová

Professor

My research background is in the characterization of complex materials using chromatographic and mass spectrometric methods. These techniques are applied in two main areas, characterization of atmospheric particulate matter and renewable materials. My research group is currently focusing on characterization of lignin and its degradation products through awards from DOE EERE in collaboration with Dr. Seames in Engineering and USDA in partnership with Dr. J. Chu at SDSU. We also have a project on thermal breakdown of perfluorooctanoic acid, a perfluorinated carboxylic acid (PFAS), in collaboration with Dr. Xiao Feng, supported by DOD. Last but not least, we also work on aging of windows related materials, in collaboration with Dr. Kozliak; this project is supported by Marvin Windows, Inc.

Mark R. Hoffmann

Professor

I am a Chester Fritz Distinguished Professor and also currently serve as the Associate Dean for Research in the College of Arts & Sciences. Since this last summer, I also am the Science Co-lead of the current NSF EPSCoR grant to North Dakota. My research area is theoretical physical chemistry, and my graduate students and I seek to develop and apply new methods of computational quantum mechanics to describe the behavior of electrons in a molecule and the ensuing effects on the molecule as a whole (e.g., on the nuclei). Our preferred framework is a hybrid variational-perturbational approach in which the variational part captures much of the chemical intuition, and the perturbational part then obtains very high accuracy. One of our methods, dubbed the second-order Generalized Van Vleck Perturbation Theory (GVVPT2), has garnered a fair amount of attention and the computer program has been run on six of the seven continents (i.e., those penguins are tough skeptics). Our interests in specific molecules or molecular complexes are rather eclectic, but there are certain recurring areas; we look at combustion products and their atmospheric fates; we look at catalysts; and, most recently, we are trying to understand the binding between cellular proteins and the extracellular matrix from a quantum mechanical perspective. Together with other researchers in the ND-ACES NSF EPSCoR project, our goal is to develop substrates that will enable biomedical researchers to understand the movement of cancer cells in a way that was not possible before. At the university level, I am heavily invested in positioning the College of Arts & Sciences to contribute significantly to and benefit from the Space / National Security Initiative and Big Data Initiative.

David Pierce

Professor

I am a 30-year member of the Department and former chairperson. I joined as a classically-educated electrochemist with a rather narrow research focus in heterogeneous electron-transfer reactions. However, these interests soon expanded within the supportive and collaborative atmosphere of the department to yield other highly regarded publications in electroanalysis, surface acoustic-wave sensors, atomic spectroscopy, and trace analysis using nanomaterials. My most recent collaborations have utilized the ultrasensitive technique of inductively-coupled plasma mass spectrometry to study nanomaterials at the single-particle level and to translate this capacity into new analysis tools for biomarkers and environmental pollutants. I have also been a long-standing practitioner of effective chemical education while at UND, and one of a rapidly shrinking minority of faculty who regularly and eagerly teach courses at every disciplinary level.

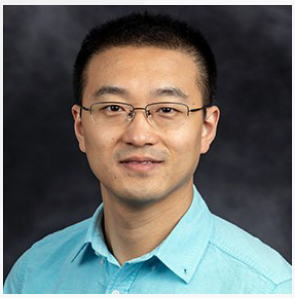
Julia Zhao

Professor

I have a broad background in the field of nanoscience and nanotechnology, with specific training and expertise in the development of fluorescent nanomaterials for bioimaging and biodetection, and porous nanomaterials for drug delivery. Currently, we have seven graduate students: Wen Sun and Kirby Huber (co-advised by Dr. David Pierce), Sandy Sun, Yingfen Wu and Yujie Xue (Co-advised by Dr. Diane Darland), Chiranthi Mahadurage (co-advised by Dr. Guodong Du), and Sultan Mahmud (co-advised by Dr. Hossain Khwaja). They have developed a number of novel fluorescent nanomaterials for cell imaging and nanocarriers for cancer therapy. Additionally, we have Dr. Sarah Reagen graduated on Aug. 2022 with her dissertation titled "Development of Biomass-Derived Nanoparticles for Biological and Medical Applications." Our research is currently supported by the National Science Foundation.

Binglin Sui

Assistant Professor



I specialize in organic and biological chemistry. The research in my lab focuses on developing superior diagnostic and therapeutic techniques for biomedical purposes, which involves broad interdisciplinary fields of organic synthesis, polymer chemistry, materials science, nanotechnology, cellular biology, and animal research. We synthesize biocompatible small organic molecules and biodegradable polymers with predesigned functions and then employ them to fabricate smart nanosystems loaded with various agents via stimuli-responsive and self-immolative linkers, serving as advanced therapeutic and diagnostic (theranostic), techniques for treatment of human diseases including cancers and neurological disorders.

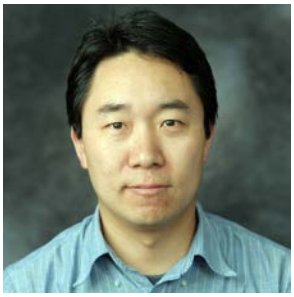
Evguenii Kozliak

Professor

I am an applied physical chemist. I use my broad knowledge of basic physical chemistry combined with physics, inorganic, even general chemistry to solve difficult interdisciplinary problems in multifaceted systems, e.g., coke formation upon biomass pyrolysis or penetration and retention of fungicides in wood. I usually collaborate with both chemists and engineers to offer interpretation of the complex phenomena observed. My papers are published in both academic and application journals; my current funding comes from Marvin Windows (with Dr. Kubatova). I am actively involved in freshmen orientation of Chemistry majors and teach physical, general and/or inorganic chemistry.

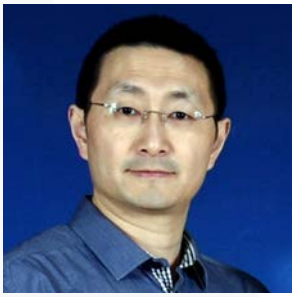
Guodong Du

Professor



I am an inorganic chemist by training working in the broad area of synthetic chemistry. I have been teaching both organic and inorganic chemistry courses in the last few years. The current focus of my research is polymer and materials chemistry, including synthesis and applications, such as nanomaterials. My group also works on catalysis in the context of green and sustainable chemistry, by designing and developing catalysts, reactions, and materials. These efforts have been supported by the NSF EPSCoR programs, including the current ND EPSCoR Track I grant (NDACES). Our findings have been published in academic journals.

Qianli Rick Chu
Associate Professor



I am a synthetic chemist in organic and polymer chemistry. My academic interests lie in sustainable materials, photochemistry, monomer design, crystal engineering, and organic synthesis. My research group has been focusing on the design and synthesis of novel monomers such as cyclobutane building blocks (CBs) using photoenergy for making advanced materials, including plastics suitable for chemical recycling and green metal-organic chemicals, for potential applications in sustainable science and technology.

Shaina Mattingly
Teaching Assistant Professor & Undergraduate Outreach Coordinator

I teach general chemistry in lecture and online formats and teach introductory chemistry online and as a self-paced course. I am the Undergraduate Outreach Coordinator and advisor for the Undergraduate Chemistry Club. I developed a course on microplastics that investigates the chemistry of plastics and microplastics and their health and environmental impacts. I enjoy working with undergraduate students to plan and organize outreach events to encourage children in the Grand Forks community to explore chemistry.

Justin Meyer
Teaching Assistant Professor

I am a physical chemist with a focus on teaching. I am currently teaching general chemistry, organic, and biochemistry to nursing students and some physical chemistry. I like to explore different teaching methods and try to make my classes interactive. I love working with students in class. Outside of teaching, I enjoy watching my children take part in sports and hunting on my ranch in south-central North Dakota.

Michael Whitney
Teaching Associate Professor

I teach general chemistry on-campus, on-line and via the on-line self-paced enroll anytime (SPEA) program. I run the general chemistry lab program on-campus, on-line and via the SPEA program. In addition, I produce the general chemistry lab manuals. I am also the chair of the Department Safety Committee.

2022 ABBOTT CHEMISTRY LECTURE

In April 2022, Dr. Wilson, the 2022 President of the American Chemical Society, the world's largest scientific society, presented two Abbott lectures.

Dr. Wilson is the John A. Hannah Distinguished Professor of Chemistry at Michigan State University. She is also the associate dean for strategic initiatives in MSU's College of Natural Science and director of the MSU Center for Quantum Computing, Science, and Engineering.

Angela earned a Ph.D. in chemical physics from the University of Minnesota and a B.S. in chemistry from Eastern Washington University. She was a postdoctoral fellow at the Environmental Molecular Sciences Laboratory (EMSL) at Pacific Northwest National Laboratory in theoretical physical chemistry.

In 2000, she joined the faculty at the University of North Texas where she ultimately became a Regents Professor and the Associate Vice Provost for Faculty and head of UNT's Office of Faculty Success. She was also the founder and Director of the Center for Advanced Scientific Computing and Modeling (CASCaM). From 2016-2018, she served as the Director (head) of the Division of Chemistry at the U.S. National Science Foundation (NSF). At NSF, she was responsible for nearly $1B in investments, and led the strategic direction and national funding priorities in chemistry for NSF.

Her computational/theoretical physical chemistry research spans quantum mechanics and quantum dynamics method development, heavy element chemistry, environmental chemistry, drug development, heterogeneous and homogeneous catalysis, thermodynamics, CO2 sequestration and

Dr. Angela K. Wilson

utilization, and modeling of ultrafast phenomena. Her computational chemistry methodologies including ab initio composite methods, Gaussian basis sets, multireference wavefunction diagnostics, and complete basis set strategies are utilized worldwide. These efforts have been enabled by over 150 students and postdoctoral fellows who have worked with Angela.

Among Angela's national and international honors are Fellow of the American Chemical Society, Fellow of the American Physical Society, Fellow of the American Association for the Advancement of Science, Francis P. Garvan-John M. Olin Medal (ACS), International Union of Pure and Applied Chemistry (IUPAC) Distinguished Woman in Chemistry, and the Wilfred T. Doherty Award (ACS Dallas-Ft. Worth Section). In 2018, she was inducted into the Michigan Women's Hall of Fame. She is on the editorial advisory board of the Journal of Physical Chemistry and Cell Reports Physical Chemistry, as well as the editorial board of Scientific Reports. She has served as President of the Division of Physical and Biophysical Chemistry of the International Union of Pure and Applied Chemistry (IUPAC), Chair of the Chemistry Section of the American Association for the Advancement of Science (AAAS), and as Editor for Computational and Theoretical Chemistry. She has edited six books including "Pioneers of Quantum Chemistry."

2021 HOMECOMING
ALUMNI LECTURE

Dr. Gelling obtained a B.S. in Chemistry at the University of North Dakota in December of 1996. She started her graduate studies in January 1997 under the direction of Dr. Dennis E. Tallman and completed her doctorate in Chemistry at North Dakota State University in 2001.

After graduation, Dr. Gelling continued at North Dakota State University within Department of Coatings and Polymeric Materials. The peak of her career at NDSU was obtaining the Gehrts Endowed Professorship in her position as an Associate Professor. During her time at NDSU, she secured 56 grants totaling over $7.2M.

Dr. Gelling joined industry in early 2014, first as Technical Director in General Industrial in Valspar. After the acquisition of Valspar by Sherwin-Williams in June of 2017, she began her current role as a Research Fellow in the Performance Coatings Group.

Dr. Gelling is the recipient of the 2020 Sherwin-Williams Woman of Professional Excellence award. She contributes to multiple professional associations, of note are her memberships on: Board of Directors of CCAI Finishing Education Foundation, ASTM Committees, ACA and AMPP award selection committees. She is also the current Chair of the Twin Cities Chapter of the Electrochemical Society.

In her career in the coatings and corrosion field, she has authored ~90 papers, chapters, and proceedings as well as presented hundreds of research and invited presentations and keynote addresses.

2021 HOMECOMING
ALUMNI PANEL

Dr. Inna Popova, '08
Assistant Professor of Chemistry
University of Idaho

Dr. Aize Li, '10
Product Engineering Lead for GG in Corning Inc.

Dr. Julius Ngwendson, '08
UFT Chemistry Professor
Normandale Community College

Dr. Jiao Chen, '14
Quality Senior Chemist in Edwards Lifesciences

RESEARCH CORNER

North Central Regional Sun Grant from USDA-NIFA

Dr. Qianli Rick Chu has received a North Central Regional Sun Grant from USDA-NIFA (United States Department of Agriculture - National Institute of Food and Agriculture) to support his research proposal entitled 'Synthesis of Biomass-derived Plastics Using Photoenergy'. The total $ amount of this two-year grant that started on August 1, 2021 is $404,804.00, which includes graduate students' tuition waivers. This is a collaborative project: Rick is the PI and Dr. Dean C. Webster (Coatings and Polymeric Materials Department, NDSU) is the Co-PI. 2/3 of the total budget are allocated to Rick's research group while Dr. Webster will use the rest. Both teams are excited about the funded grant and are enthusiastically working on this promising project.

NSF LEAPS-MPS Award

Dr. Binglin Sui received a Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS) award from the National Science Foundation (NSF), with a total amount of $249,118 for a research grant "Stimuli-Responsive Biodegradable Polymeric Nanomaterials for Biomedical Applications". The primary objective of this research project is to address the challenges that are currently preventing the majority of materials of nanoscale size from biomedical applications. With the support of this award, which started on July 15, 2022, Dr. Sui is leading his research group to develop a series of stimuli-responsive, biocompatible, and biodegradable polymers and polymer-based nanomaterials that can be extensively utilized in the biological and medical sciences.

UND COBRE for Epigenomics of Development and Disease pilot grant

On Oct 2022, Dr. Julia Zhao received an UND COBRE for Epigenomics of Development and Disease pilot grant with the project titled "Dual Functional siRNA Nanoplatform for Gene Therapy. " In this project, they will develop a novel tool for cancer therapy. Specifically, they are planning to develop a non-toxic fluorescent quantum dot as a nanoplatform to deliver siRNA specific to Vascular Endothelial Growth Factor (VEGF) that will not have unwanted indirect effects on chromatin. A graduate student, Sandy Sun, is working on this project being co-advised by Dr. Diane Darland from UND Biology.

Additionally, Dr. Julia Zhao's group research is continually supported by the National Science Foundation (NSF) grants. One project is "Graphene-based Near-Infrared Fluorescent Nanomaterials for Bioanalysis" from NSF CHE, and the other is the NSF competitive research infrastructure improvement (RII) Track-1 cooperative agreement to ND EPSCoR, titled "New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES)." As a co-lead in the material pillar of this ND-ACES grant, Dr. Zhao has worked with her students and collaborators to develop novel silicon quantum dots and polymer dots for biological and medical applications.

The nanoscience group with faculty, students and collaborators.

STUDENT RESEARCH TRAVEL
CZECH REPUBLIC

We are in the final year of the NSF-funded International research experience for students (IRES), providing summer research internships in the Czech Republic. This year, we were able to provide fellowships and support travel for 5 students from 5 Midwest institutions. The students first met in an online course learning about Czechia, and also prepared for their research experience by writing a literature review. During their 8-week research stay in renowned institutions of Charles University (CUNI), Institute of Chemistry and Biochemistry (IOCB) and University of Chemistry and Technology (UCT), they pursued the following projects:

- Ultratrace analysis of environmentally important metals by volatile compound generation atomic spectroscopy led by Dr. Hranicek, CUNI
- New green methodology using non-natural amino acid catalysts, led by Dr. Jahn, IOCB
- Development of analytical methods for quality control in the recycling of industrial coolants, led by Dr. Křížek, CUNI
- Biodegradability of polyurethane foams with adjustable rate of biodegradation, led by Dr. Halecky, UCT
- DNA-modified silver amalgam sensors for sensitive electrochemical determination of organic environmental pollutants, led by Dr. Vyskočil, CUNI

Students also had an opportunity to explore the country, visit famous castles, and cultural events, sharing their experiences at https://iresczechia.wordpress.com/.

IRES Group in XIII century Bezděz castle. From left to right: Yuliet Monatukwa (UND) Clara Lietzke (Indiana U.) Seth Almquist (Hope College), Matt Osmanski (Augustana U), Xavier Gatica (NDSU)

Excursion to a pharmaceutical company Zentiva – receiving a tour by UND Alumnus Josef Beranek. From left to right: Alena Kubatova (PI), Dr. Beranek (UND Chemistry Alumnus '2010), Matt Osmanski (Augustana U), Yuliet Monatukwa (UND), Seth Almquist (Hope College), Clara Lietzke (Indiana U.), Xavier Gatica (NDSU)

RETURNED TO IN-PERSON
SUMMER REU PROGRAM

The chemistry Interdisciplinary Renewable and Environmental Collaborative REU program, supported by National Science Foundation, returned on campus with in-person format after a two-year hiatus due to the pandemic. The program gives research opportunities to undergraduate students with priority to first generation college students, underrepresented minority students, and students from tribal colleges and other primarily undergraduate institutions.

Nine REU students were recruited from across the country from Florida to Hawaii and they spent ten weeks on campus working alongside UND faculty and students on interdisciplinary research projects at the intersection of chemistry, chemical engineering, and atmospheric sciences. Participants also visited various research facilities on campus (the picture was taken when students toured the UND Space Studies), and had a joint poster session with other REU programs in the medical school. This is the last cohort of the current IREC REU grant and a renewal proposal has been submitted to NSF for continued support.

GRADUATE
STUDENT ASSOCIATION

The Chemistry Graduate Student Association, abbreviated as CGSA, is a student organization comprised from students of the chemistry department in the Graduate program, whether Master's or Doctoral programs, and undergraduates in the accelerated BS/MS from the different fields of chemistry: synthetic, theoretical and analytical fields. Thus, the main goal of the CGSA is to develop a platform for students to interconnect with each other; creating a more connected department between the various departmental research groups led by our amazing faculty. Furthermore, the CGSA is indifferent to student home countries, faith and sexuality; hence, the neutrality of all events being conducted. The CGSA is always recruiting driven soon-to-be Chemists and is currently made of the following members: Mouhmad "Moe" Elayyan (President), Zach Bailey (Vice-President), Desmond Khan (Treasurer), Nafisa Bala (Secretary), and Sonia Tudjeu Chendjou (Officer).

The CGSA is not exclusive to only departmental connectivity; rather, the CGSA conducts various outreach programs and activities for communities and educational institutions despite the distance, as well as supports all graduates in the Chemistry department for research-related activities, i.e. conference traveling, and acting on the concerns of these graduates. Furthermore, the CGSA enables extra-curricular opportunities to undergraduates interested in the Chemistry department, such as research opportunities with esteemed faculty members, and leisurely activities in the form of holiday parties and outdoor gatherings. Lastly, the CGSA provides support to the department by taking on extra responsibilities the faculty and staff need, i.e. proctoring for tests, substituting for Teaching Assistants in Labs, etc. For more information, please visit the University of North Dakota's directory of Student Organizations, as the CGSA is listed there.

OUTREACH
ACTIVITIES

(prepared by teaching Assistant Professor Shaina Mattingly, the Undergraduate Chemistry Club faculty advisor)

The Chemistry Department and Undergraduate Chemistry Club was very busy in AY 2021 – 2022 and hosted several outreach events. Events included Science Day at the Grand Forks Public Library, Haunted University with Girl Scouts in Abbott Hall, Zero Waste Week on UND Campus, and Exploring Chemistry Summer Camp. Outreach events hosted fun, hands-on activities for elementary through middle school aged children.

Science Day at the Grand Forks Public Library is held every October around National Chemistry Week. This event is aimed at elementary students. In October 2022, over 60 students attended the event and learned about polymers, acid-base indicators, and vacuum applications.

From left to right, Kirati Tayutivutikul, Erica Nguon, Annabelle Jundt and Briana Krupinsky volunteered at the Science Fun Day at the Grand Forks Public Library in October 2021.

Haunted University is held on Halloween weekend every year. For this event, the Undergraduate Chemistry Club hosts local Girl Scouts troops. This year, 70 Girl Scouts aged 7 to 12 attended and made bouncy balls, created an articulated skeleton hand, and did other hands- on activities to learn about acid-base reactions and indicators, polymerization, and gas forming reactions that build up pressure. At the end of the event, the Undergraduate Chemistry Club members perform spooky-themed demonstrations including a self-carving jack-o-lantern and witches brew (aka elephant toothpaste), among many others.

A new event called **Zero Waste Week** that began in Spring 2022 was created and brought to life by recent Chemistry Alumna Briana Krupinsky. Zero Waste Week was held the week preceding Earth Day in April 2022 and was open to any students, faculty, and staff from UND. There was an activity for each day of the week that focused on the environment, sustainability, and upcycling materials. Events included plastic bag weaving to create blankets or tote bags, creating succulent planters out of used plastic water bottles, a UND Professor Seminar with Drs. Sean T. Hammond, Frank Bowman, and Wayne Seames who discussed their research on sustainability and the environment, and a documentary night where students watched the PBS documentary called “Plastic Wars”. The event also featured an Earth Day Seminar during the Chemistry Department weekly seminar on Friday afternoon. This event was a huge success and will become a yearly event for the Undergraduate Chemistry Club.

In Summer 2022 the Chemistry Department hosted a four-day summer camp called **Exploring Chemistry Summer Camp** for children entering 5th through 8th grade. This year 24 campers attended. Each day had a different chemistry theme with several activities for the students to explore. Themes included identifying chemical reactions, making paper, pigments, and dyes, batteries, and polymers. One highlight of the event was creating a lemon battery with over 50 lemons!

Overall, the Undergraduate Chemistry Club was busy planning and hosting events all year. The club members were thrilled to be able to spread the love and appreciation for chemistry to so many children and others in the Grand Forks Community.

SUPPORTING LEARNING & RESEARCH

INFRASTRUCTURE IMPROVEMENTS

We continue pursuing equipment updates; enabling quality teaching and research. This year, under the leadership of Dr. Du, we have installed a new NMR. We are also setting up various pieces of equipment through the development of a nanofoundry - led by Drs. Hoffmann and Oncel for multi-angle light scattering detector for gel permeation chromatography, e-beam lithography, multiprobe station and supporting instruments. These efforts also include obtaining a state-of-the-art transmission electron microscope and setup of a clean room, which are currently in progress.

We have also initiated several updates of our building. This year, we installed newer hoods in a teaching lab, Abbott Hall 204, serving pre-nursing students, as well as updates on key areas of the stockroom. We also work on visual updates of our space. With the A&S college support, we installed wraps on the 1st and 2nd floor main doors making a number of fire doors a little more welcoming. Yet among the highlights is the Chem 495 capstone poster display dedicated to the outcomes of our senior students.

New Hoods Installed

Stockroom and Lab Improvements

Chemistry 495 Capstone Display

Abbott Hall Fire Door Wraps

UNDERGRADUATE & GRADUATE STUDENT AWARDS

Dr. Ernest & Jennie Coon Scholarship
Di Sun, Wen Sun, Kirati Tayutivutikul

Dr. Ben G. Gustafson Scholarship
Mya Shorter

Dr. Walter H. Moran Memorial Scholarship
Amy Aldinger, Grace Bishop, Chloe Butler, Kate Kesler, Briana Krupinsky, Abbigail Larson, Yuliet Monatukwa. Cole O'Neill, Tess Sether, Andrew Simons, Sierra Thomson

Roy and Ann Multhaup Memorial Scholarship
Nicholas Mathias

Dr. C.A. Wardner Memorial Scholarship
Andrew Simons

US MASTER Scholarship NSF S-STEM, Chemistry
Amy Aldinger, Briana Krupinsky, Yuliet Monatukwa

Dr. Roland G. Severson Graduate Scholarship
Yingfen Wu

Dr. Robert A. Howard Chemistry Scholarship
Mya Shorter

Dr. Haldean & Bonnie Dalzell Scholarship
Amy Aldinger, Sena Dossou-Gouchola, Sean Glaholt, Devon Headdress, Thomas Iken, Lincoln Kranz, Briana Krupinsky, Vincent Ledvina, August Leopold, Sydney Menne, Anne Mitchell, Yuliet Monatukwa, Morgan Nelson, Carter Razink, Andrew Simons, Emmanuel Toah

Abbott Summer Research Awards 2021
Ali Sepehri, Amjaour Houssein

School of Graduate Studies Excellence in Teaching Award
Sarah Reagen

School of Graduate Studies Graduate Research Achievement Day; Natural Sciences
1st Place: Yinfen Wu
2nd Place: Nafisa Bala

ND EPSCoR Annual Conference; Best Poster Presentation
Yingfen Wu

North Dakota Academy of Science Annual Conference; Graduate Student Oral Presentation Award
Wen Sun, Di Sun

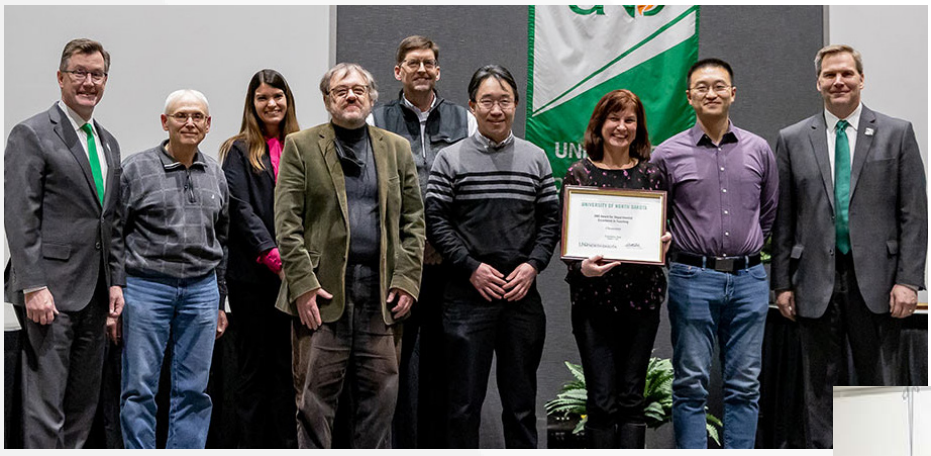
The Chemistry Department greatly appreciates all donations that allow us to educate students and award outstanding graduate and undergraduate Chemistry students with scholarships and funding support.

Please consider making a gift to the department and be a difference-maker for students in Chemistry programs at the University of North Dakota. Your gift will help provide a great learning environment and a distinctive student experience at an affordable cost for our students.

Gifts are welcomed online at UNDalumni.org/Chemistry or checks can be made payable to the UND Foundation and sent to the following address: UND Foundation, 3501 University Ave, Stop 8157, Grand Forks, ND 58202-8157. Questions about gifts to the Department may be directed to Department Chair, Dr. Kubatova at 701.777.0348. Thank You!

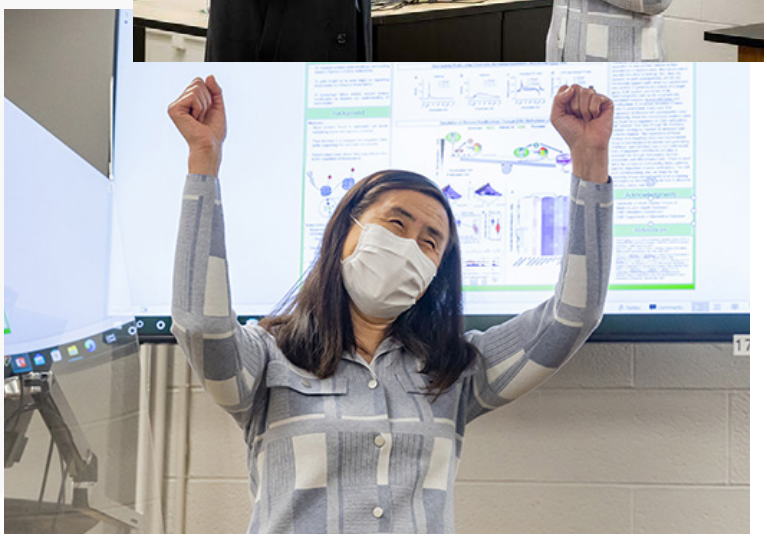
CONGRATULATIONS

FACULTY & STAFF AWARDS



The Department of Chemistry received the UND Award for Departmental Excellence in Teaching.

Dr. Shaina Mattingly received the 2022 UND Award for Excellence in Online Course Development & Innovative Teaching Strategies.



Professor Julia Zhao raised her arms in jubilation after she learned in a surprise visit from the president and provost that she had been recognized with UND's highest academic honor, being named a **Chester Fritz Distinguished Professor**. Andy Armacost presented her with a special presidential coin showing the Eternal Flame and the words "We raise our grateful song" from the alma mater. The pop-in visit happened while she was conducting a chemistry class, and her students erupted in cheers and applause.

Dr. Mark Hoffmann has been named a Fellow of the American Association for the Advancement of Science (AAAS) for distinguished contributions to chemistry.

CONGRATULATIONS

NEW CHEMISTRY ALUMNI

Fall 2021

- Popis, Minh Duong, Ph.D.

Spring 2022

- Azizov, Djavdat, B.S.
- Hopfauf, Jackson, B.S.
- Kranz, Lincoln, B.S.
- Krupinsky, Briana, B.S.
- Kumar, Ronak, B.S.
- Leopold, August, B.S.
- Mathias, Nicholas, B.S.
- O'Neill, Cole, B.S.
- Sether, Tess, B.S.
- Wallenta, Alyssa, B.S.

Summer 2022

- Amjaour, Houssein, Ph.D.
- Nkemngong, Dominic, Ph.D.
- Reagen, Sarah, Ph.D.
- Vasireddy, Purna, Ph.D.

"My time at UND was anything but short as I completed both my undergraduate and graduate degrees here. During my time as a graduate student, I was struck by the strong sense of community among the chemistry graduate students where everyone looked out for each other and were always quick to help. At UND I learned invaluable skills and became a better scientist as I completed both of my degrees, which in turn has given me numerous job opportunities and allowed me to become a proficient employee."

Sarah Reagen

"I am proud to be UND Chemistry alumni. I miss Grand Forks, especially snow. I thank faculty and staff of Chemistry Department for the support throughout my stay in UND."

Purna Vasireddy

WE'D LOVE TO HEAR FROM YOU!

Alumni are invited to share updates and news for future newsletters. Photos are always a welcome addition! Please include your program and year of graduation.

UND CHEMISTRY
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arts-sciences.UND.edu/chemistry

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