



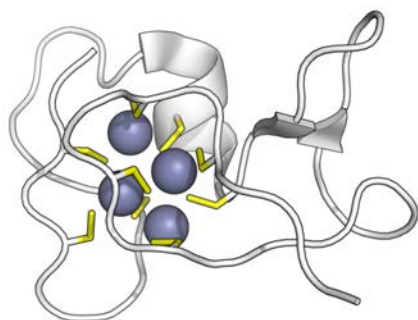
From The Chair's Desk



Joe Aldstadt

We hope that our biannual newsletter finds you well. The COVID-19 pandemic has certainly turned our world upside-down, too — major adjustments in how we teach our classes and do our research were made. But we've weathered the storm well! Our faculty, staff, and students are to be highly commended for adapting to the "new normal" — this took a lot of very hard work! We're particularly proud that we were still able to offer our instructional lab courses "in-person". The article on page 2 will give you a better idea of how things looked around here this semester.

Plans for the New Building continue to unfold on-schedule as we entered the "Final Design" phase earlier this semester. We continue to work with the architects and engineers to insure that the building will meet our requirements for effectively conducting our teaching, research, and service missions. The bid for construction is scheduled to be published in early 2021 with groundbreaking to occur by the Fall semester. See the story on page 3 for more details about the design.



Distinguished Professor Dave Petering will be retiring at the end of this semester. Anyone who knows our Department knows that Dave's remarkable scholarship and leadership over nearly five decades have been essential factors in building us into an R1-level Department. Dave's contributions to teaching, research, and service to the Department, College, and University are simply too numerous to list; I think Chancellor Mark Mone summarizes it best: "Few have made as significant an impact as Distinguished Professor Dave Petering on our campus, over a span of almost 50 years." I also note that Dave plans to continue his NIH-supported outreach efforts as well as contribute to our curriculum — both of these as a volunteer — during his retirement, further testament to his renowned magnanimity.

The support of our alumni & friends over the years has been incredibly generous — and particularly critical this year in this ghastly predicament in which we find ourselves. We hope you have a wonderful holiday season and look forward to returning to the "old normal" in the not-too-distant future!

Sincerely,



Dave Petering

Undergraduate classes during the Pandemic



Kevin Blackburn

While many classes operated on-line this semester, we have also been safely serving our student body in-person. The University and Chemistry Department have taken many precautions to be able to accomplish this. We're particularly proud that we were still able to offer our instructional lab courses "in-person"—the efforts of Department Manager/Building Chair **Kevin Blackburn** and Lab Manager **Morgan Smith** were outstanding in making things happen smoothly in that regard.



Morgan Smith

Below are some photographs of what these changes look like.

For the campus, ~50% of classes were held on-line, ~30% were held hybrid, and ~20% were held in person. The Chemistry Department worked closely with Classroom Services to utilize CHM 190 as one of the three live-streaming lecture halls on campus. These efforts greatly improved the student experience as they could watch the lecturer, the presentation slides, and the marker board simultaneously with the individual ability to expand their view of any one of the video feeds at any given time throughout the lecture. We are very thankful to **Kevin Janke** and **John Peine** of Classroom Services for their efforts in making this happen.



Lab Manager Morgan Smith works on a balance. In addition to goggles and gloves, students were required to wear masks while inside the building while maintaining social distancing.



Conference room 110, which along with Room 123 is mediated for live-streaming and has been utilized for Graduate Seminars and live-streaming of seminars, lectures, and discussions.



Lecture hall 190 as set up for socially distanced instruction. With this setup, 190 can seat 45 students.



All of campus has been equipped with hand sanitizer stations and designated entry and exit doors from both rooms and buildings.

New Building Update

The design of our New Building is on-schedule and continuing to progress very well. On December 15th, 2020 we reached an important milestone when the State Building Commission approved the UW-Milwaukee Chemistry project with the "Authority to Construct" (\$129,535,000). Our "User Group" — **Kristen Murphy, Nick Silvaggi, Doug Stafford, Kevin Blackburn, and Joe Aldstadt** — has spent many hours representing the Department in a series of monthly workshops that began in February 2018 and will continue through the Spring 2021 semester. With the COVID-19 pandemic, meetings had to be moved on-line and continued throughout the Summer and Fall semesters. The current schedule calls for the Final Design process to conclude in April 2021, the bid to be sent out in May 2021, and construction to start in June 2021 and continue until project completion in late 2023. The images below were prepared by the architects at **Cannon Design** (Chicago) and **Kahler Slater** (Milwaukee) for the Pre-Design Report (FEB20) — they depict a lecture hall, the second-level landing, the lobby, and a view from inside the SW Quad of the green space and outdoor seating areas that are planned. We are very excited about the prospect of moving to such a state-of-the-art facility to help our program continue to thrive!



Undergraduate Spotlight: Stephen Stevanovic



Stephen Stevanovic

Stephen Stevanovic, a pre-medical Biology major and Chemistry minor, was graduated summa cum laude and inducted into Phi Beta Kappa in Spring 2019. He served in the student government and as an undergraduate program representative at UWM. He is currently working as a medical assistant at the Stevanovic Family Clinic and Waterford Medical Clinic, serving the community during the current pandemic. At the same time, he has applied successfully to medical school and is considering several offers.

During his time at UWM, Stephen conducted research with Professor **Shama Mirza** in the Shimadzu Laboratory for Advanced & Applied Analytical Chemistry in the Department of Chemistry & Biochemistry. “My time working in the Mirza Lab has proven to be the most intellectually rewarding and beneficial experience during my education at UWM. Dr. Mirza and her group of highly motivated students value curiosity, independent-thinking, and welcome intellectual challenges that set a high standard for conducting advanced research” remarked Stephen.

The focus of Stephen’s project in the Mirza Lab was to analyze trace elements in pediatric biological samples using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) to identify elemental biomarkers for Ureteropelvic Junction Obstruction (UPJO) diagnosis. UPJO is a kidney disease characterized by blockage of the ureters and is the major cause of kidney failure in infants, affecting nearly 1 in 1,000 newborns. UPJO is often presented with hydronephrosis and can be characterized as unilateral (one kidney) or bilateral (both kidneys). Traditional diagnosis for UPJO, such as ultrasound, is difficult because UPJO is a congenital disease that usually occurs in the womb before birth and may go unnoticed. Other techniques such as tissue biopsy are invasive and therefore inconvenient for a newborn. Quantification of trace elements in biological samples using ICP-MS has been implicated in the diagnosis of diseases related to human excretory processes involving the kidney. Urinalysis using ICP-MS provides a relatively easy, cost-effective, and non-invasive method for UPJO diagnosis. The results of this investigation demonstrated that pediatric patients show a significant difference in the presence of certain elements. Compared to control groups, the UPJO group presented increased retention of some key elements and a corresponding decrease in others. These are some important findings that have never been observed before in UPJO and thus would pave the way towards developing a non-invasive diagnostic tool.

Stephen states: “I have always been interested in the practical application of science to improve the well-being of others. Working in the Mirza Lab has given me the opportunity to learn advanced analytical techniques that will be useful in my future career as a physician and medical scientist. I had the chance to practice and apply scientific principles in the laboratory setting, learned how to use advanced analytical equipment such as ICP-MS, and designed experiments to test theories on a topic that interests me. I gained valuable problem-solving and investigative skills that will aid me in future academic pursuits and research”.

Graduate Student Spotlight: Shawn Salske

Our graduate student “spotlight” falls upon Shawn Salske for this edition of the newsletter.



Our graduate admissions process was also adversely affected by the COVID-19 pandemic, with applications by domestic students down and those by international students “on hold” because of the unavailability of visas. Nevertheless, we were able to welcome a “new” graduate student this term, Shawn Salske. Shawn isn’t really “new” — he recently completed his M.S. degree and then decided to enter our doctoral program.

Shawn completed his Bachelor of Science in Chemistry at Carroll College in 2017. He entered our graduate program later that year, and began working in **Professor Aldstadt’s** lab shortly thereafter. He completed his Master of Science in June 2020; his thesis was entitled “Speciation, Transport, and Fate of Heavy Metals in Soils from a Civil War Battlefield”. The firearms used at the Battle of Second Manassas in 1862 left distinctive chemical signatures (e.g., percussion caps and bullets shown at right). Shawn developed, optimized, and validated a new method based on Microwave-Assisted Extraction (MAE) and Atomic Absorption Spectroscopy using a Graphite Furnace (GF-AAS) to determine Cu, Hg, and Pb. The GF-AAS method, based upon research done by **Scott Schlipp** (MS, 2012), used a spectrometer (donated by the **City of Milwaukee Health Department**) to measure the analytes at sub-parts per billion ($\mu\text{g L}^{-1}$) levels. The abundance, distribution, speciation, and transport of the various physico-chemical speciation forms were reliably measured and first-order rate constants for their transport over ~150 years were determined. The results also correlated with historical descriptions of the positions of infantry units, thereby providing archaeologically relevant information as well.



Photos of Cu percussion caps and a 0.58 caliber Pb bullet used in Civil War rifles — known as a Minié ball. The primary explosive used in the percussion caps was Mercury (II) Fulminate.

In **Professor Dietz’s** lab, Shawn will be developing novel supports for use in extraction chromatography, with the goal of improving the separation of trivalent f-elements (i.e., lanthanides and actinides) for application in nuclear medicine, bioassays, and nuclear forensics. Shawn remarks that: “I have enjoyed my time at UWM because it has developed me as a student and as a chemist, and to develop the ability to perform independent research. I am excited about my research in Prof. Dietz’s lab and becoming an expert in a new area of chromatography.”

Shawn was employed full-time at AirGas, Inc. in Waukesha for 11 years before moving recently to **Millipore Sigma** in Glendale. It was while he was at working in an industrial lab that he became inspired to attend UWM and study analytical chemistry. Recently, with MS degree in-hand, he accepted a position at Millipore Sigma as a Regulator Affairs Expert, which encompasses company operations for North America. In his spare time, Shawn enjoys pottery, motorcycling, and the outdoors — running, cycling, and swimming — as testament to the latter, last year he completed the “Ironman Triathlon” in Madison.



Photo of several of Shawn’s pieces annealing in a gas-fired Raku kiln.

Department in the News

- *Emeritus* Distinguished Professor **Jim Cook** was appointed as a Research Fellow at RespireRx Pharmaceuticals, Inc. Congratulations Jim! <https://bit.ly/37nEJdI>
- A second paper was published, based on COVID-19 research from Professor **David Frick's** lab, in the flagship *Journal of the Society for Laboratory Automation and Screening*. The research was done this summer with the help of **Nick Silvaggi, Eddy Tysoe**, and many students in the Chemistry & Biochemistry department. Congratulations, Dave, Nick, Eddy, and to the students involved! <https://bit.ly/3nrA2Fa>
- Professor **Kristen Murphy**, Director of the American Chemical Society's Examinations Institute here at UWM, was invited to participate in the US Copyright Office's "Sovereign Immunity Study" on December 11th, where she spoke regarding "Evidence of Actual or Threatened Copyright Infringement by States." Congratulations, Kristen!
- Professor **Anja Blecking** received the "UWM Faculty Distinguished Undergraduate Teaching Award" reflecting her "...deep passion for student learning in both her undergraduate teaching and her creative scholarship of science education, which is evident in her many outreach projects." Congratulations Anja! <https://bit.ly/3mgIUvW>
- Graduate student **Nemanja Vuksanovic**, a student in the **Silvaggi Lab**, recently published an article that is featured on the cover of *Acta Crystallographica F*. Congratulations Nemanja! <https://bit.ly/2K0EiNA>
- Two Professors from the Department of Chemistry & Biochemistry received Length of Service Awards from the university: Professor **Dave Frick** was recognized for his 10 years of service and Professor **Jian Chen** for his 15. Both were recognized at the 2020 Length of Service Ceremony which was held on December 9th. Congratulations to both!

Doctor of Philosophy Degrees Conferred in the 2019-2020 Academic Year

- **Alejandro Boscobonik** (Summer 2020). "Effect of Force and Confinement on Chemical Reaction Kinetics"
Major Professor: Eddy Tysoe
- **Charles Smith** (Summer 2020). "Fundamental studies of trivalent f-element separations using ionic liquids and extraction chromatography: Toward an Improved TALSPEAK process"
Major Professor: Mark Dietz
- **Resham Rana** (Spring 2020). "Mechanochemical Processes of Lubricant Additives Measured in Ultrahigh Vacuum"
Major Professor: Eddy Tysoe
- **Daniel Knutson** (Spring 2020), Part 1: "Design and synthesis of $\alpha 6$ -GABAAR subtype-selective pyrazoloquinolinones with improved metabolic stability and enhanced bioavailability"; Part 2: "Process development of $\alpha 2/3$ -GABAAR subtype-selective imidazobenzodiazepines: HZ-166 AND KRM-II-81"; Part 3: "Process development of $\alpha 5$ -GABAAR subtype-selective imidazobenzodiazepines: MIDD0301 and GL-II-73"
Major Professor: Jim Cook

MilliporeSigma Makes In-Kind Donation of Chemicals and Laboratory Supplies

In August, **MilliporeSigma** (formerly Sigma Aldrich) kindly donated six pallets of reagent chemicals and laboratory supplies to the Department. Millipore Sigma is the life sciences business unit of Merck KGaA, Darmstadt, Germany. The donation was initiated by MilliporeSigma's **Paul Griffin** and administered by MilliporeSigma's **Annie Mayrose**. Departmental faculty and students were able to select items from a list offered by MilliporeSigma. We are profoundly grateful to our friends at MilliporeSigma, who also sponsored two fellowships for two of our graduate students this past summer (**Rahish Roni** and **Tania Mutchie**).

The donated items will support our curriculum as well as our research activities in the coming semesters. This donation will thus reduce the financial burden that the pandemic has placed upon the Department.

Also, several visits to MilliporeSigma locations in Milwaukee and Sheboygan have resulted in the hiring of our graduates, so our strong relationship with MilliporeSigma continues to grow!



Department Manager Kevin Blackburn and Prof. Leggy Arnold sorting the donated items from MilliporeSigma.

Friends of Chemistry

Your contributions enhance the educational experience of our students and strengthen the research and development of our faculty and staff. Please join us in thanking our friends. Gifts were received from June 2020 to November 2020.

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