Chemistry Department News 2014–2015

Dr. Nina Contis is named a 2015 ACS Fellow

Beginning in 2009, the American Chemical Society has annually recognized a select group of members for their contributions to science and the chemical profession. Professor Ellene (Nina) Tratras Contis was one of this year's 78 honorees (out of a total ACS membership exceeding 158,000). <u>Read the ACS press release</u> about the ACS Fellows program. The ACS website listed the following contributions made by Dr. Contis:

Contribution to the science/profession: Recognized for vision and leadership in cutting-edge strategies to engage students into the STEM community and for work in studying short-lived fission products of uranium-235 and trace metal analysis of water.



Contribution to the ACS community: Recognized for leadership on the Committee on International Activities, chairing the Europe and Middle East Subcommittee, directing long-term global strategic planning efforts and International Chemical Sciences Chapter development, and co-organizing and chairing symposia and international conferences.

The Chemistry Department is proud to Professor Contis as a faculty member and of her significant contributions listed above. We sincerely congratulates her on her selection as an ACS Fellow.

Posted 7/24/15.

Bruce Graves, former Chemistry Department faculty member, passes away

Professor Graves was a member of the EMU Chemistry Department between 1967 and 1980. He specialized in physical and analytical chemistry, with a research program focused upon electrochemistry. He also was an expert glassblower (as he was demonstrating in the photograph at the right). Profesor Graves passed away in June. The department extends its condolences to his family and loved ones.



Posted 7/16/15.

Don Snyder attends international conference on advanced materials



Professor Don Snyder recently returned from the 4th Annual World Congress of Advanced Materials-2015 (WCAM-2015), held in Chongqing International Convention and Exhibition Centre, Chongqing, China on May 27-29. More than 300 world-renowned experts, professors, laboratory principals, project leaders and representatives of well-known enterprises attended the conference. Professor Snyder chaired a session on advanced polymers and also made an invited presentation entitled "Optical Phase Shift Dynamics in Transparent Polymers: Applications of Wavefront Detectors in Chemical Analysis and Sensor Design".

Posted 7/9/15.

Two Chemistry faculty members have recently moved into upper-level administration positions

Two former Chemistry Department Heads have recently moved into upper-level administration positions and one has returned to a familiar position. Dr. Wade Tornquist is the new Interim Associate Provost and Associate Vice President for Graduate Studies and Research. Dr. Tornquist moves into this new appointment having just completed three years of service as the Interim Dean of the College of Technology. Prior to that he served as an Associate Dean in the College of Arts and Sciences for seven years (interrupted by a brief assignment in the Provost's Office) and as the Chemistry Department Head for nine years (between 1996 and 2005). In addition to his administrative experience, Dr. Tornquist is an accomplished scholar with over 40 publications/presentations. Dr. Tornquist joined the Chemistry Department as an analytical chemist in 1986.



Dr. Steven Pernecky is the new Interim Associate Dean for Budget and Facilities in the College of Arts and Sciences. Dr. Pernecky joined the Chemistry Department in 1995 as a biochemist (with additional expertise in toxicology). Dr. Pernecky has served as the Head of the Chemistry Department for the past three years, after serving for five years as the Associate Chair of the department. For many years, Dr. Pernecky also served as the Undergraduate Advising Coordinator. He was especially good at helping students set long term objectives and designing academic plans that would help them achieve these objectives.

Dr. Ross Nord has temporarily returned to the Chemistry Department Head position, to replace Dr. Pernecky, until a new department head can be selected this fall. Dr. Nord previously served as Chemistry Department Head for five years, from 2007 to 2012. During this period, he was intimately involved in the addition to, and renovation of, the Mark Jefferson Science Complex. He originally joined the Chemistry Department in 1986 as a theoretical physical chemist. All appointments became effective as of July 1.





Posted 7/5/15.

Dr. Brittany Albaugh will join the department this fall as its newest biochemistry faculty member

Dr. Albaugh's research targets epigenetic proteins implicated in cancer development through drug discovery and gene regulation. She is excited to develop her cancer epigenetics research program at EMU and will be looking for motivated and enthusiastic students with an interest in learning a diverse array of techniques in cell and molecular biology, biochemistry, epigenetics and cancer biology. Additional information about Dr. Albaugh can be found on her <u>departmental webpage</u>.

Posted 6/8/15.



Dr. William Roush, an internationally-recognized organic, synthetic chemist, will present the Regent Beth Fitzsimmons seminars

The Regent Beth Fitzsimmons seminars are annually given as part of the Summer Science Research Initiative (SSRI). Dr. Roush is associate dean of graduate studies and executive director of medicinal chemistry at the Scripps Research Institute. ee the University press release with more information about Dr. Roush and the SSRI.

Posted 5/26/15.



Seven Chemistry Department Members Celebrate Service Anniversaries

Brian Samuels has been an important member of the Chemistry Department for thirty years in the role of Scientific Instrument Technician. In this role, he has been responsible for the care of upkeep of much of the department's invaluable instrumentation, such as the NMR. While faithfully carrying out these expected duties, he has served as a social ambassador to our students, especially those working within the department. These extra efforts to make the Chemistry Department a welcoming environment are part of makes Brian, and the department, special.

Joe Mason has been the Laboratory Services Supervisor for the past twenty-five years. This demanding position is essential to the smooth operation of the department. Joe trains and supervises a large group of student employees that is responsible for prepping almost all of the instructional laboratories. Prior to Joe, there had



been a lot of turnover in this position, and he has provided stability and organization. Thanks to his efforts, our instructional labs are able to run smoothly and provide our students with a high quality laboratory experience.

Carol Orlowski has served as the office secretary in the Chemistry Department for a little less than half of her twenty-five years at EMU. Prior to Chemistry, Carol had worked in a variety of offices across campus. This broad experience has given her knowledge of the university and lots of contacts that has been very valuable to the smooth running of the department. Carol works very hard to go the extra mile when students need assistance. Rather than sending them off to some other office, she will pick up the phone and do whatever she can to get them the information they need.

Steven Pernecky has been a member of the Chemistry Department faculty for the past twenty years, the last three of which he has been the Department Head. Dr. Pernecky has background in Pharmacology and has contributed to our programs in both biochemistry and toxicology. Prior to becoming Department Head, Dr. Pernecky also served for many years as Undergraduate Advising Coordinator and for five years as Associate Chair of the department. Despite the vast amount of time devoted to his current administrative duties, Dr. Pernecky is still very active as a student adviser. His dedication to our students and the department is continually demonstrated by his willingness to assume so many crucial roles in the department, and perform them to the best of his ability.

Cory Emal, Hedeel Evans, and **Dave Nickell** are all celebrating ten year anniversaries with the Chemistry Department. Dr. Emal is an organic/medicinal chemist with a very active program of research. His group synthetizes potential inhibitors of proteins associated atherosclerosis, blood clots, and myocardial infarction. These compounds are tested for biological activity by his collaborators at the University of Michigan. Dr. Evans is a biochemist who also has a very active research program. She is studying a protein implicated in both Alzheimer's disease and cancer and well as a receptor complex associated with depression. Dr. Evans has also been one the main forces behind the development of EMU's new interdisciplinary program in Neuroscience. Dr. David Nickell is an organic chemist who came to EMU after an extensive career in industry at Pfizer (Parke-Davis). Demonstrating his versatility, Dr. Nickell has been responsible for teaching and updating our graduate course on Information Retrieval, teaching courses in organic chemistry and organic/biochemistry for allied health majors, and he also taught and coordinated our main general education course for several years.

The Chemistry Department greatly values and appreciates the service, contributions, and loyalty of all of its members. In particular, we are proud to recognize these seven individuals, who have made a difference in the lives of so many students through their efforts over the past years. We look forward to many more years of their contributions to our programming.

Posted 4/22/15.

April 10, 2015 News Briefs

- Christopher Haskin (Edwards) was selected by the McNair Program as "McNair Scholar of the Year for 2014-2015."
- Ahmed Oudief (Lindsay), Bridget Kennedy (Backues), Andrew Durden (Milletti), and Amy Markowitz (Janser) were granted Undergraduate Research Stimulus awards for Summer 2015.
- Philip Elugbemi (Emal) and Rakeenja Fluellen (Emal) successfully completed their Honors Senior theses.
- Briana Sohl (Holmes) and Jasmine Winzeler (Holmes) received research fellowships at the University of Michigan to engage in summer research.
- Reshmi Gopagani (Janser) and Neeharika Pilli (Janser) received Dean's Student Travel Awards to present their research at the ACS National Meeting in Denver, Colorado.

- Nina Contis (PI) and Nirit Glazer (co-PI), were selected into the NSF Innovation Corps (I-Corps) program; "Gulliver Innovative Learning: a Platform for Managing Kinesthetic Activities", a 6-month grant award to engage with industry and translate our research innovation into products that benefit society.
- Harriet Lindsay (Wi '16), Ingo Janser (F '15), Debbie Heyl-Clegg (Wi '16), Hedeel Evans (F '15), Cory Emal (F '15), Steven Backues (F/Wi '15) and Ruth Ann Armitage (Wi '16), were awarded Faculty Research Fellowships for next year.
- Vance Kennedy was awarded funds from the Provost's Research Support Award for the project, "Spectroscopic Investigation of Subphthalocyanines."

Twenty-Eight Chemistry Students Present at the Undergraduate Symposium



The 35th EMU Undergraduate Research Symposium was held at the Student Center on Friday, March 27. The program included 23 presentations sponsored by the Chemistry Department representing the work of 28 chemistry students. See pictures and a listing of all of the <u>Chemistry</u> <u>Department presentations [PDF]</u>.

Posted 4/7/15.

Dr. Nirit Glazer has two articles published

Dr. Nirit Glazer, a part-time lecturer in the EMU Chemistry Department has recently published two research articles. The first article is titled "<u>Student</u> perceptions of learning data-creation and data-analysis skills in an introductory college-level chemistry course" and appeared in Chemistry Education Research and Practice. The second article is entitled "Formative Plus Summative Assessment in Large Undergraduate Courses: Why Both? [PDF]" and appeared in the International Journal of Teaching and Learning



in Higher Education. Dr. Glazer holds a Ph.D. in Educational Studies from the University of Michigan.

Posted 3/17/15.

March 13, 2015 News Briefs

• Amy Johnson is the recipient of a Sabbatical Leave Award for Fall 2015.

How a Pre-Law student became a Nuclear Scientist: Dr. Donald Wall reflects upon his time at EMU

Dr. Donald Wall graduated from EMU in 1990 with a chemistry degree. He received the Bert W. Peet Award in 1990 which is presented to the top graduating major. He subsequently completed his Ph.D. at Florida State University and is currently the Director of the Nuclear Radiation Center at Washington State University. Recently, he shared the following stories with us regarding his experience as a student at EMU.

My original educational goal was to go to law school after



finishing at EMU. In fact, I still think that would be an interesting career choice. I like a challenge. I had already taken some of the classes that I needed to go in that path, and in the fall semester of 1986 I had to take a laboratory science course to meet the general education requirement for my degree. I had taken AP biology a few years earlier when I was in high school so I thought that would be a good choice as I was already familiar with the subject and so it would not take up too much of my time that I would otherwise need for other classes. As it happened, the biology class did not fit into my course schedule. In fact, the only science class that did fit was chemistry. I was really chagrined. I had chemistry in high school and I HATED IT. Probably it was one of the courses that I disliked the most. Anyway, I sighed a sigh of

resignation and figured I could tough it out for one semester so signed up for the first-semester general chemistry class. Ronald Scott was the professor for the class. I was very surprised. Very, very surprised. I found the class extremely interesting and thought that Ronald Scott was a really good professor. This was not enough to get me to change my major, but I did decide to take the second semester of general chemistry, even though I was not required to do so. I thought it was interesting and challenging and I wanted to learn more. I found out that science is cool. I had a part time job over at the U of M, and between the semester break one of the things that I did was stay all night in the Ford Reactor/Phoenix Memorial Laboratory building during the holiday shutdown. Most of the time I sat at the front desk in the reception area, then walked through the building once per hour to check on things. I was the only person in the building all night long, so I had a lot of time on my hands. I brought the general chemistry textbook with me and studied it all night, night after night during the semester break. It was so interesting that I could not resist! There I was, studying a textbook all night, completely absorbed in the material. I could not wait for the spring semester to begin. Looking back on it now, it is also an amusing coincidence that this took place at the FR/PML facility, since I work in a similar facility now.

The second semester class was taught by Professor Masanobu Yamauchi. I really liked this class too. So much so that at the end of the Spring semester of 1987 I checked the course schedule and found that CHEM 281, Quantitative Analysis, was going to be offered over the summer and it looked like it would be really interesting, so I signed up for it even though chemistry was not yet my major. Probably I was the only non-science student who was in the class just because it was interesting. Well, that summer Charles Anderson was the professor for the class and laboratory. We used the book written by Professor Steven Brewer, which I still have and occasionally use. That summer I decided to switch my major to chemistry and I followed the professional chemistry curriculum with the group minor in mathematics and physics. I have always been glad that I made that decision. I



regularly tell that story to undergraduate students as a way to encourage them to keep their minds open to possibilities that they may not have considered.

Here is another anecdote that I usually keep to myself. I started a course here at WSU in nuclear reactor operations. The goal is for undergraduate students to study the fundamentals of reactor behavior, along with some basics of radioactive decay, standard operating procedures and other things that are necessary to know when working in a reactor facility. The goal is to prepare student to take the U.S. Nuclear Regulatory Commission examination to become licensed as Nuclear Reactor Operators. I teach the lecture section two evenings a week from 6:00 – 7:30. It's a little tiring coming right after a normal workday. The students also come to the facility during normal business hours to learn/train/study with full time staff members. Every once in a while a student will ask me why I do that. I only tell them if they ask me directly, which is not very often. I tell them that when I was an undergraduate I wanted to learn more about how to do research so I went to a professor and asked him if he was working on a project that I could assist with. I did not want any pay, I just wanted to learn about experiments,

laboratory equipment and so on, and I would be glad to do anything that there was to do. He was a very kind man, and did have some work doing x-ray fluorescence (XRF) on some medieval coins. It was very interesting and I really liked learning about XRF and x-ray diffraction (XRD), too. The Professor was Giles Carter. I asked him what graduate school was like, and did he think that would be a good idea for me. He was very encouraging, and due to our conversations as well as the fact that I liked working in the laboratory, I decided to go to graduate school.



Later I was in Professor Wade Tornquist's Instrumental Analysis class. That semester we went over to the Ford Reactor facility to do a neutron activation analysis (NAA) experiment. By that time I had already been in the reactor facility many times, but had never done an NAA experiment there. I really started to like the idea of working with radioactive materials and it did not make me nervous the way it does to some people. Maybe that was partly due to having had experience with XRD and XRF in the basement laboratory in Mark Jefferson. So, when I found out that I could study actinide chemistry at Florida State it was easy to decide where to go to graduate school.

Last summer, I went to Bowling Green State University to confer with a colleague and give a seminar. I was scheduled to fly back to Washington late in the day on the Wednesday after Labor Day. I had most of the day available, so I drove over to Ypsilanti and walked around the campus for the day. I had a really enjoyable time just walking around. I wanted to see the addition to the Mark-Jefferson building so I walked around in there for a while. It's really nice. I looked into the lecture hall where I had general chemistry with Ronald Scott all those years ago, and reflected on how it changed my life, for the better in every way.

The Nuclear Forensics Summer School is going to be held at Washington State University (WSU) this summer. Dr. Wall will be doing about one third of the lectures and the entire laboratory portion of the course will be conducted at the WSU Nuclear Radiation Center. Download a flyer [PDF] with information about the program.

The <u>WSU NRC website</u> has links to different news stories about the facility and program.

Posted 3/4/15.

January 30, 2015 News Briefs

- Steven Backues was a recipient of \$5000 Provost's New Faculty Award to support his research entitled "Identification of Novel, Biologically Interesting Mutations in Autophagy Related Protein 9".
- Donald Snyder will be giving a seminar entitled "Optical Phase-Shift Dynamics in Surface-Modified Transparent Polymers" at the University of Michigan, Dearborn on February 6.

January 9, 2015 News Briefs

- Tanya Johnson began her position today as the new Science Complex Manager.
- Brian Samuels celebrated his 30th anniversary as an EMU employee.
- Caitlin Baumer (Milletti), Sean Blackburn (Janser), Andrew Durden (Milletti), Philip Elugbemi (Emal), RaKeenja Fluellen (Emal), Jamie Reder (Lindsay), Mordechai Sadowsky (Milletti), Chelsea Swanson (Janser), and Jasmine Winzeler (Holmes), received winter 2015 Honors Undergraduate Fellowships.
- Nina Contis was selected for the Fulbright Specialist Program. This program promotes linkages between U.S. scholars and professionals and their counterparts at host institutions overseas. Read more <u>about the program</u>.
- Nina Contis was a co-organizer for the Global Innovation Imperative (Gii) Symposium, jointly organized by the American Chemical Society (ACS) and the Singapore National Institute of Chemistry (SNIC) in December 2014 in Singapore. At the symposium she presented a paper entitled "Water Treatment and Innovation: Background and Overview."

Professor Cory Emal is a recent patent recipient.

Dr. Cory Emal, along with colleagues from the University of Michigan and the University of Maryland, received U.S. Patent 8,759,327 on June 29, 2014 for the design of molecules linked to controlling the buildup of plaque that leads to blood clots and blocked arteries in the circulatory system. Read the full <u>University Press Release</u>.

Posted 1/9/15.

December 12, 2014 News Briefs

• Mariah Brito (Guthrie) and Chelsea Swanson (Janser) were granted Undergraduate Research Stimulus awards for Winter 2015.

December 5, 2014 News Briefs

- Caitlin Baumer (Milletti), Philip Elugbemi (Emal), and RaKeenja Fluellen (Emal) received Senior Thesis/Project and Symposium Awards.
- Nina Contis was appointed to a three-year term as the science's representative to the Women's Commission.
- Nina Contis had an article published: "Advancing Science, engaging STEM Learners", in The International Journal of Science, Mathematics, and Technology Learning, Volume 20, Issue 4.
- Divya, Ganti, Samanthi Gedara, and Nouf Alyami (Evans/Heyl-Clegg) and Pooja Kannegati (Heyl-Clegg) received Dean's Student Travel Awards to present their research at the ACS Regional Meeting in Pittsburgh.
- Ruth Ann Armitage was awarded funds from the Provost's Research Support Award for the project, "Radiocarbon Dating of Cuban Rock Art: Plasma-Chemical Oxidation and Accelerator Mass Spectrometry."
- Cory Emal was awarded funds from the Provost's Research Support Award for the project, "Chemical Synthesis of Inactivators of Plasminogen Activator Inhibitor-1 for in vivo Screening."
- Hedeel Evans was awarded funds from the Provost's Research Support Award for the project, "The Reciprocal Interplay of a Kinase-Substrate Pair in Breast Tumor Resistance."
- Debbie Heyl-Clegg was awarded funds from the Provost's Research Support Award for the project, "Sequence direction, stereochemical, and dual modification in a linear antimicrobial peptide."
- Heather Holmes was awarded funds from the Provost's Research Support Award for the project, "Identification of Feline Leukemia Proviral Insertion Sites in Mammary Tumors."
- Ingo Janser was awarded funds from the Provost's Research Support Award for a project on the synthesis of chalcone derivatives and their evaluation as radical scavengers and anti-oxidants.
- Don Snyder was awarded funds from the Provost's Research Support Award for a project investigating a novel technique for the analysis of material properties with potential applications in sensor design.

EMU MS Student, Shane Canaday wins Prize at Environmental Symposium



Shane Canaday, a second-year graduate student working under the direction of Professor Gavin Edwards, was awarded the \$500 first prize in the Poster Competition at the Environment Risk and Decision Making Symposium, sponsored by the Environmental Science and Policy program at Michigan State University. The symposium was held October 10, 2014 and symposium attendants came from nine different schools, and both private and government sectors. Shane's award winning poster is pictured at the right and a synopsis of his work is presented below.

Modeling of Volatile Organic Compounds Emission from Materials Used in Passenger Vehicle Interiors.

While the vast majority of us are aware of the tailpipe emissions from automobiles, we have a much weaker understanding of the emissions happening inside the vehicles we drive. The interiors of these vehicles consist primarily of plastics, glues, fabrics, and other materials capable of emitting volatile organic compounds (VOCs). VOC emissions are most prevalent after manufacturing, resulting in the "new car smell". These VOCs have been shown to cause eye and nasal irritations, while some are classified as carcinogens.1,2 Previous VOC emission models have been produced, but models tailored to the complex environment of the passenger vehicle have not yet been created. Our goal is to create an accurate vehicle interior VOC emission model.

When building our model, we decided to keep it simple. In order to do so, we constructed programs to model emission data from a polymer film that was placed into a small environmental test chamber. So far, two models have been created. One model predicts emission from a chamber with air flowing through it. The other model predicts emissions with no airflow. Results have shown high correlations between emission data and our models. Accounting for changes in airflow is just one of the many conditions that need to be addressed when attempting to model VOC emissions from vehicle interiors. In the next few months, we hope to receive emission data from Ford that will allow us to start addressing more complexities of the passenger vehicle interior.

References:

1. Chien, Y.-C. Variations in Amounts and Potential Sources of Volatile Organic Chemicals in New Cars. *Sci. Total Environ.* 2007, 382, 228–239.

2. Xiong, J.; Liu, C.; Zhang, Y. A General Analytical Model for Formaldehyde and VOC Emission/Sorption in Single-Layer Building Materials and Its Application in Determining the Characteristic Parameters. *Atmos. Environ.* 2012, 47, 288–294.

Posted 11/21/14.

November 7, 2014 News Briefs

- Jeff Guthrie had an article published in Analytica Chimica Acta. "Simultaneous Detection of Ultraviolet B-Induced DNA Damage Using Capillary Electrophoresis with Laser-Induced Fluorescence", by Jeffrey W Guthrie, Ph.D.; Robert T Limmer, B.S.; Eric A Brooks, B.S.; Chelsea C Wisnewski, B.S.; Nnekia D Loggins-Davis, B.S.; Abderraouf Bouzid, B.S.
- Ruth Ann Armitage had an article published: Ruuska, A. K.; Armitage, R.A. "Spider Man Cave: The Desecration of the Burnt Bluff Cultural Site and its Implications for Future Heritage Management", Wisconsin Archaeologist. In press, October 2014.
- Chelsea Swanson, Sean Blackburn & Zakee Azeez (Janser) presented at the Midwestern Symposium on Undergraduate Research in Chemistry at MSU (10/11).

EMU receives a \$2 million grant to institutionalize the CSIE program

In 2005, EMU received a major five-year grant from the National Science Foundation to develop the Creative Scientific Inquiry Experience (CSIE) project. The intent of the project is to implement interventions that support high academic standards, promote faculty collaboration across disciplines, and increase student performance and persistence in demanding fields. The initial project was highly successful and the U.S. Department of Education has recently awarded EMU a new grant to ensure the long-term sustainability of the initiative.



Professor Nina Contis of the Chemistry Department will be the project director. Professor Contis is pictured here with faculty associate, Professor Vites. Read <u>more about the grant</u> or <u>visit the</u> <u>CSIE website</u>.

Posted 11/3/14.

EMU Alumnus, Steve Fernandes, is on 2014 Winning Team for Merck's Innovation Cup

This summer, Steve Fernandes was one of only 30 students selected (out of 700 applicants) to attend the 2014 Merck Sereno Innovation Cup in Darmstadt, Germany. While there, Steve's international five-member-team won the first place award for the business plan they develop entitled "Changing the way cancer is treated by cancer cell burst". Steve is a recent MBA graduate of Johns Hopkins University and a 2007 graduate of EMU, where he received his MS under the direction of Dr. Deborah Heyl-Clegg. He is currently Laboratory Manager in the Department of Pharmacology



and Molecular Sciences at the Johns Hopkins School of Medicine. Read the full article.

Posted 10/27/14.

Professor Johnson Named to National Science Education Team

The National Science Teachers Association (NSTA), the largest professional organization in the world promoting excellence and innovation in science teaching and learning, has chosen Dr. Amy Flanagan Johnson, an Associate Professor at Eastern Michigan University, to serve on an expert team that will identify and vet high-quality resources to help teachers implement the Next Generation Science Standards (NGSS). Johnson is one of 55 educators who were selected out of 650 applicants to be an NGSS@NSTA Curator and help build a library of top-rated resources for teachers that support the new standards. Johnson will focus on resources related to chemical reactions for middle school students. Read the full NSTA press release [PDF].



Dr. Amy Flanagan Johnson is an associate professor in the department of chemistry at Eastern Michigan University. Her primary teaching responsibilities at EMU are general chemistry courses as well as courses for preservice elementary and middle school teachers, including CHEM 101: Chemistry for Elementary Teachers, CHEM 312: Teaching Elementary Chemistry, and CHEM 407: Nature of Science for Elementary Teachers. Professor Johnson holds a BS in Chemistry from Knox College in Illinois and an MS and PhD from Purdue University in Indiana. She resides in Ypsilanti, MI with her husband, Greg; son, Oliver; and dog, Molybdenum (a.k.a. Molly).

Posted 10/14/14.

Nanoparticles, Quantum Mechanics, and Tennis. A Profile of Dr. Timothy Brewer

Research

Work in the Brewer research group currently centers on the synthesis and characterization of nanoparticles of various metals such as silver, gold and their alloys. Different synthetic methods can be used to produce nanoparticles of various sizes, from 10 nm to 100 nm in diameter, and in various shapes such as spheres, rods, and wires. The figure below shows the variety of colors nanoparticles can form in solution. The wide array of colors allows the tailoring of nanoparticles for various applications based on their optical absorption properties.



The characterization of nanoparticles is important in determining their

suitability for use in applications such as photovoltaic cells, pigments for suntan lotions, and the development of biological sensors (e.g., measuring the glucose concentration in blood). The Brewer lab primarily utilizes absorption (visible) and fluorescence spectroscopic techniques in order to characterize the interactions between the nanoparticles and other chemicals.



The group's most recent activity has been to study the color change experienced by nanoparticles in various solvents. The particular solvent (e.g., water, toluene, or chloroform) surrounding the nanoparticles can cause a shift in the spectra of the nanoparticles. Insight into these solventnanoparticle interactions can be applied to the development of biological sensors. Another active project has been to measure the changes in the fluorescence intensity when nanoparticles interact with a variety of biologically important molecules. The first molecule studied was thiamine and it was possible to quantity the amount of thiamine present down to the parts per million range. Current investigations are ongoing utilizing amino acids such as tryptophan and phenylalanine.

Teaching

Dr. Brewer teaches general chemistry and physical chemistry. His favorite subject to teach is quantum chemistry because of its many applications in the world. For example, quantum mechanics is important in the fields of computer cryptography, laser development, and molecular & atomic imaging. Quantum mechanics is also a very thought-provoking subject where one has to ponder a realm where a particle's position is never certain and a particle may exist in two different states at the same time.



Hobbies

Dr. Brewer's favorite hobby is tennis and he is a tennis junkie during the summer months. This past summer, he captained two tennis teams at Huron Valley Tennis Club and both teams won the Ann Arbor league with 8-0 records. One of those teams came in second place at the Southeast Michigan districts. Recently he won a doubles tournament in Perrysburg, Ohio with his partner Noe Erasga, pictured at left.

Family

Dr. Brewer's lovely wife, Jennifer, pictured at right, is a graduate of EMU. She is presently a professor of early childhood education at Concordia University in Ann Arbor. About her, Dr. Brewer states, "She is my source of energy and encourages me in all my endeavors whether it be teaching, research, or even tennis. I have three wonderful children, Matthew, Katherine, and Lauren. My kids are a source of pride and I enjoy watching them grow up and spending quality time with them."

Quote

"I love my experience here at Eastern Michigan University and appreciate the opportunity to work with the development of young budding scientists." Posted 10/3/14.

Recent graduate, Jason Miller, was recently featured in the EMU Honors Newsletter.

Jason Miller Begins Ph.D. Program and Reflects upon his Time at EMU

More than 10 years removed from high school and after his military service, EMU Honors Alumnus Jason Miller finds himself studying at the University of Michigan.

"The Honors College staff, and opportunities the college gave me ways to not only set myself apart from others, but also gave me opportunities to explore other things, and experience things I only dreamed of," Miller said.

Studying in U of M's Ph.D. program for medicinal chemistry, Jason is fully funded for six years and has also received the Rackham Merit Fellowship. This first year he will be doing rotations with potential labs in which he has interest in future work. Once his studies are complete, he hopes to work in government research, research in general or the healthcare industry.



"I really want to work to make the world a better place and find ways to make everyone's health better," Miller said.

Jason credits the support and mentorship of Cory Emal and Hedeel-Guy Evans whose constant encouragement were paramount to his success.

"Eastern was the best college decision I ever made and am glad I did; it allowed me to excel, grow and really figure out what I wanted to do with my life," Miller said.

- This story originally appeared in the September 2014 EMU Honors College Newsletter.

Posted 9/30/14.

Alumnus Badrinath Dhakal's Research on Sustainability Draws International Interest

Alumnus Badrinath Dhakal's research on sustainability was recently featured on the <u>Oakland University website homepage</u>. Last July, Badrinath was selected to present his research, on developing catalysts to convert carbon dioxide into useful fuels, at an international conference on sustainability. Badrinath is currently a Ph.D. student at Oakland University. He earned his MS in Chemistry at EMU in 2011 under the direction of Professor Ruth Ann Armitage.



Posted 9/15/14.

September 5, 2014 News Briefs

- Gregg Wilmes and Maria Goodrich celebrated the birth of the newest member of the department family, daughter Elizabeth Erin, on July 22 (8 lb, 6 oz).
- Brianna Moe (Evans) received support from the CAS Dean's office for travel to the ACS National Meeting in Dallas.
- Caitlin Baumer (Milletti), Sarah Burke (Emal), Andrew Durden (Milletti), Chris Friebe (Lindsay), Brittany Jewell (Milletti), Jamie Reder (Lindsay), Darshani Weerakoon (Emal), Alyssa Winkler (Milletti), and Brandie Yambrosic (Lindsay), were awarded travel funds from the CAS Dean's office to support travel to the ACS National Meeting in San Francisco.
- Joshua Hunt (Lindsay) and Ailing Zhou (Lindsay)were awarded travel funds from the Graduate School to support travel to the ACS National Meeting in San Francisco.
- Larry Kolopajlo published a book chapter in the ACS series "What you Need to for the First Job, Besides the PhD."; Benvenuto, M. (Editor); ACS Symposium Series; American Chemical Society: Washington, DC, 2014.
- Larry Kolopajlo was awarded a grant by the American Modeling Teachers Association to attend "Modeling High School Instruction in Chemistry", a workshop held at Oakland University.
- Cory Emal was granted a patent (US Patent 8,759,327 "Plasminogen Activator Inhibitor-1 and Methods of Use Thereof to Modulate Lipid Metabolism"; Lawrence D.A., Cale, J., Warnock, M., Su, E.J., Emal, C.D., Strickland, D. – filed 4/16/2008; published 1/8/2009; granted 6/24/2014).
- Michael Martin (Guthrie) was the first recipient of the James R. Beach Summer Research Fellowship.