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Many companies have matching gift programs which may double your gift to the department.

If you would like to make a gift, you can donate online using the following link: <https://www.ndsualumni.com/college-of-science-and-math-donation>. To designate your gift, select "Coatings and Polymeric Materials" in the Designation box.

If you would like to learn about other ways to give to the department, please contact Becky Ruthenbeck, Director of Development, (701) 231-6800 becky.ruthenbeck@ndsualumni.com

We'd Like to Hear from You

We are always interested in hearing from our alumni and friends. You can drop us a line at ndsus.polycoat@ndsus.edu. If you give us permission, we can share your information in a future newsletter.

Contact Us

Give us a call for more information about our services and products

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CHAIR MESSAGE

Welcome to the Fall 2019 Coatings and Polymeric Materials newsletter! Yes, we know that you are getting this newsletter in the summer of 2020. It had already been a very busy year for us and then coronavirus came, and we all have experienced the upheaval that that has come with that. This newsletter describes our many activities in 2018 and 2019 and we hope to return to our normal fall schedule later this year. As you read on you'll find out about many exciting things that our faculty, staff, and students have been up to over the past year.

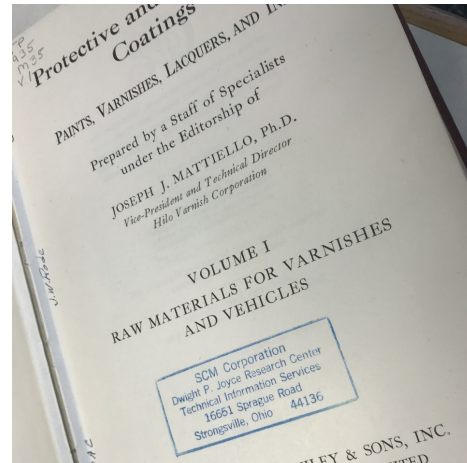
In this message, I would like to highlight the scholarship funds in the Department that are important tools for recruiting and retaining students in our program. Every year we award over \$40,000 in scholarships to both undergraduates enrolled in our minor program as well as our graduate students. We appreciate the generous provision of scholarships from the Tnemec company (Albert C. Bean scholarship), Northwest Society for Coatings Technology, and donors of our many endowed funds: Dallas and Eileen Zimmerman, Carl and Jerri Hall Pfiffner, and George A. Nichols, Lewis Thompson, Lowell Wood, and the Alfred Rheineck Memorial Fund. We are also very grateful for PPG and BASF who have recently provided annual scholarship funds for students in our programs. We have also set up a Coatings and Polymeric Materials scholarship fund, which is available for contribution by individual donors. Any funds donated to that fund will go directly toward student scholarship support. We also appreciate the many donors who support our General Fund. Among other department activities, those funds have helped support the NDSU-KU symposium, acquisition of our new drop shape analyzer in our instrument lab, and our SURE program, which you will read about in this newsletter.



Dean Webster, CPM Chair

PAINT TECHNOLOGY BOOKS RETURN TO NDSU AFTER 70 YEARS

AkzoNobel, located in the suburbs of Cleveland, Ohio, donated a number of archival journals and books to the department as part of a lab relocation. Among the books was a set of five volumes of Protective and Decorative Coatings, edited by Joseph Mattiello and published in 1941. These volumes represented the state of the art in paint technology through the early 1950s and consisted of chapters on drying oils, resins, pigments, and paint formulations for specific applications. Inside the front cover of the books, the name “John W. Rode N.D.A.C.” was found. The former name of NDSU was the North Dakota Agricultural College (NDAC). We checked with the university registrar and found that John William Rode of Walker, Minnesota, attended NDAC between Fall 1939 and Fall 1948 and completed a BS and MS in Chemistry. A search of the internet found that John Rode had served in the U.S. Navy during WW II, and had worked for the Glidden Company in Cleveland, Ohio. AkzoNobel is the successor company to Glidden and so that is how books owned by John Rode came into the possession of AkzoNobel. After retirement, John Rode returned to Walker area and passed away in 2008 at the age of 90. It is fascinating that a set of paint technology books used by a student here so long ago made their way to Cleveland, Ohio, and then returned back to NDSU!



CROLL RETIRES

Professor Stuart Croll retired from active service at NDSU in June 2019 and was named Professor Emeritus. He joined the department in 2000 and served as chair from 2006-2012. Before arriving at NDSU he had a career in industry, most notably with Millenium Inorganic Chemicals where he was Director of Pigment Research and Sherwin-Williams where he was Director of Research in the Coatings Division. With an educational background in physics, his research focused on rheology, film formation in coatings, adhesion, coating durability and lifetime prediction, colloid stability, art conservation, and polymer and material characterization. A number of his papers on stress development in coatings and coating adhesion are considered landmarks in coatings technology and continue to be cited. He and his wife plan on relocating to the Vancouver, Canada area.



CB² IUCRC

The Center for Bioplastics and Biocomposites (CB2) is a National Science Foundation (NSF) Industry-University Cooperative Research Center (IUCRC). Industry members of the center contribute an annual membership fee which is then used to fund projects of interest to the industry members in the field of sustainable materials. The center was initially founded by Iowa State University and Washington State University and in the past year both NDSU and the University of Georgia have joined as university partners. Since the center director, Dr. David Grewell, became the chair of the department of Industrial Engineering at NDSU, NDSU has become the lead institution. Dean Webster is the NDSU site director. The center is an excellent opportunity for industry to form partnerships with academia and leverage the expertise of faculty at four universities to solve problems and overcome barriers to the implementation of sustainable materials. The center currently has 30 industry members and companies can join at any time. More information can be found at <https://www.ndsu.edu/centers/cb2/index.html>

NDSU– KU SYMPOSIUM

The NDSU-Kagoshima University Joint Symposium on Biotechnology, Nanomaterials and Polymers was held at the NDSU Memorial Union from October 3-5, 2019. The symposium was jointly organized by Department of Coatings and Polymeric Materials (CPM) and Department of Chemistry. Since 2015, this symposium has been the meeting place for organic, polymers and materials chemists and coatings scientists from North Dakota State University (NDSU) and Kagoshima University (Japan), and has taken a strong initiative in establishing international collaborations. With more than 70 participants, the 2019 symposium was focused on identifying the key ideas and emerging areas of polymers, nanomaterials and biotechnology. With a plenary lecture from Professor Philip Boudjouk, several faculty members from CPM presented their research work. A student-focused poster session displayed the research activity of graduate students from CPM, as well as from other departments at NDSU and Kagoshima University. For the first time, the NDSU-KU event was followed by a week-long workshop where Kagoshima graduate students participated in classroom and laboratory based activities at different departments and facilities across NDSU.



SERDP 2019 PROJECT OF THE YEAR

Replacing exterior coating systems that no longer meet their performance requirements generates a significant amount of environmentally hazardous materials. That waste stream includes the removed coating material, solvents used to prepare surfaces, and other waste media used during the removal process. Specialty coating systems are proving to be much less durable in service than was predicted by current accelerated test methods, leading to increased frequency of replacing these coatings alongside increased costs and waste management issues for Department of Defense (DoD) depot maintenance and field operations. Understanding degradation and failures in these multilayer coating systems is critically important.

A team led by Dr. Karen Schultz that was comprised of personnel from Boeing, Luna Innovations, Air Force Research Laboratory, NAVAIR, and North Dakota State University CPM Department took on this challenge. Dr. Croll, along with Aaron Feickert and Mary Hedrick, represented the CPM department on Dr. Schultz's team. The team worked to develop a new test method that combines the effects of dynamic mechanical strain and relevant environmental stressors of cyclic temperature and humidity to produce coating cracking with features similar to that observed in-service over structural discontinuities. The test methodologies developed by Dr. Schultz and her team allows DoD a better means to predict performance of current and future coating systems, and to select more durable high performance coating components and systems. For their efforts in addressing this issue, Dr. Schultz and her team have been awarded the 2019 SERDP Project of the Year from the Weapons Systems and Platforms Program Area for their project titled, Standardized Test Methodologies for Specialty Coatings Durability.

SURE 2019

Each year 15-30 undergraduate students from the various universities in the United States submit their applications for Summer Undergraduate Research Experience (SURE) program offered by Coatings and Polymeric Materials Department at North Dakota State University. For many years, this Department offers summer research appointments for students between junior and senior years majoring chemistry, materials science, chemical engineering and related fields, who intend to pursue graduate study and with an interest in polymers and coatings. When admitted, students spent 10 weeks working under supervision of one of CPM graduate students on a project related to advanced topics in polymeric materials field in a professor's research group. SURE student participants receive a stipend to cover costs associated with staying in Fargo, ND for the period of program which is, as a rule, covered from the ongoing research grants of the hosting professor. In this regard, the Department is always looking to the opportunity to receive the contribution for SURE program for coming years.

During summer 2019, SURE program admitted 4 students from about 20 submitted applications. Andrew Vrabel Miles from Macalester College in Saint Paul, MN worked with Olena Shafranska in Dr. Dean Webster group on a research project entitled Modified Soy Triglycerides as Biobased Processing Oils in EPDM Rubber. Webster's group hosted also Morgan Murphy from College of Saint Benedict in St. Joseph, MN who carried research on Self-Stratifiable Amphiphilic Glycidyl-Carbamate Prepolymers as Modifiers in GC-Epoxy Resins with Alireza Rahimi. CPM graduate student Karan Bansal from Dr. Mohiuddin Quadir group supervised William Carstens from Michigan Technological University in Houghton, MI on Biobased Self-Assembling Nanostructures, and Sanjana Choudhary from University of Texas-Arlington was involved in research on Feasibility of Synthesis of Latex Materials Made from Fully Renewable Monomers with Zoriana Demchuk in Dr. Andriy Voronov's group.

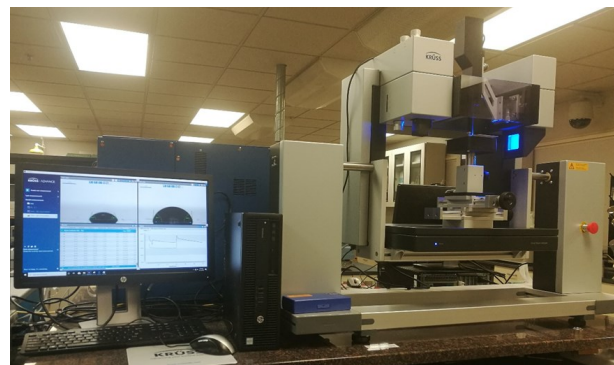
Many of the students who attend this program went onto graduate school, with some of them to NDSU Coatings and Polymeric Materials program and later became employees for companies in the polymers and coatings industries.

For additional information on CPM SURE program, please contact program coordinator Dr. Andriy Voronov, andriy.voronov@ndsu.edu



INSTRUMENT LAB UPDATE

Our Characterization Service Center is equipped with state-of-the-art spectrometric, microscopic, testing, and analytical equipment utilized in the coatings and polymeric materials area. Recently, we added a new DSA100 drop shape analyzer (Krüss) funded by EPSCoR and it can perform testing for both static and dynamic contact angle, surface/interfacial tension, and surface free energy measurements with a software-controlled dosing system and a tilt stage. We are dedicated to providing researchers and industrial partners a place to perform characterization and analysis to advance research in the use of the equipment on a fee basis. For instrumentation and contact information, please visit: <https://www.ndsu.edu/cpm/instrumentation/>.



2019 SHORT COURSES

The Fundamentals of Coatings Science Short Course was once again highly successful! It was held during the first week of June and was well attended. It began on Sunday with a welcome, introductions and first class and finished the following Friday. A graduation banquet was held on Thursday night.

The leading lecturers were Prof. Dean Webster and Prof. Stuart Croll. Although now retired, Dr. Croll's participation helped out in a huge way! Other industry instructors made their way to Fargo to assist us as well, which was very much appreciated by CPM students, faculty and staff alike. They were Alan Ekin (Covestro), Martin Kays (BYK USA Inc.) Ramesh Kumar (Clariant). Alan Ekin's lectures included urethane polymers and epoxy resins for coatings. Martin Kays spoke on additives (dispersing, wetting surface tension, defoaming, defect controls). Ramesh Kumar lectured on pigments and pigment dispersion. The end of the week evaluations strongly indicate that this course was highly regarded and participants said they learned a lot in this jam-packed week of instruction.

After a brief hiatus, the Corrosion Protection Short Course is back! This course was taught on June 7-11. Since it has been awhile since this course was taught, attendance was small. We are confident it will grow in numbers as word gets out that this popular course is being offered again each summer. It was co-taught by Dr. Dante Battocchi, a professor in the CPM Department, and Vinod Upadhyay, a CPM postdoctoral student. The topics included introduction, thermodynamics and forms of corrosion, corrosion testing and protection strategies. A hands on lab session was made available to any participants who chose to bring in and test and analyze their own samples.



NDSU ALUMNI FROM 3M DISCUSS CAREERS

Denise Barrera, JD Haas, and Bret Ludwig, alumni of the polymers and coatings program at NDSU, visited in early November to talk about their careers at 3M at a pizza and panel discussion lunch. After describing their career paths since leaving NDSU and progressing through different assignments at 3M, they were asked questions about career decisions and choices by the moderator and then the students in the audience. The panel discussion was a great opportunity for students to understand what their career might look like after leaving NDSU and how working for a large company provides a multitude of opportunities for career advancement. We are grateful that Denise, JD and Bret were willing to travel to NDSU and help our students understand what their future might look like.

50 YEAR CAREER AT NDSU

Professor Dennis Tallman will soon be celebrating a 50-year career at North Dakota State University (he joined the NDSU faculty in Chemistry in the Fall of 1970). Though now retired, he continues to maintain a level of professional activity, publishing the occasional paper and participating on departmental committees (he currently serves on the CPM Promotion, Tenure and Evaluation Committee and a graduate student advisory committee). Over his career, he has published ca. 200 refereed research papers and book chapters and has received over \$9 million in research grants from various funding agencies. He served several terms on the University Athletic Committee during the university's transition to Division 1 athletics, including the Subcommittee on Compliance (to ensure the athletic department and student-athletes are compliant with NCAA legislation). In 1978, at the encouragement of Dr. Kent Alm (the fifth Commissioner of the State Board of Higher Education from September 1978 to September 1981), Tallman organized a state-wide group known as the Council of College Faculties to serve as a channel of communication between North Dakota University System faculty and the State Board of Higher Education (SBHE). He served as the Council's first president from 1978 to 1980 and was the first faculty member to attend SBHE meetings as a non-voting member. He is proud of the fact that this group still functions today. His research career is summarized in an invited paper in the Journal of Solid State Electrochemistry, a journal he edited from 1997 to 2007 ("Microelectrodes for Voltammetry - A Personal Historical Perspective," Journal of Solid State Electrochemistry 15 (2011) 1703–1710).



Tallman's most recent travels (June, 2019) took him to China and Tibet and included spending a night at Mount Everest Base Camp at 17,000 feet. The view of the mountain from the Tibet (north) side is spectacular. The photo shows sunrise on the famous north face of Mount Everest.

PHD GRADUATES 2019

The department would like to congratulate our 2019 PhD Graduates. Ruvimbo Wright joined Intel in Portland, OR, Oksana Zholobko joined the mechanical engineering department at NDSU. Kyle Kingsley joined Sherwin-Williams in Minneapolis, MN. Eric Krall joined Axalta in Fridley, MN. Alison Rohly joined Sherwin-Williams in Minneapolis, MN. Samantha Silbert joined Tecton Products in Fargo, ND.

IAB SPRING MEETING

The Industrial Advisory Board of the department met in April 2019 with representatives from Sherwin-Williams, 3M, AkzoNobel, PPG, Tecton Products, IGM Resins, Bureau of Reclamation, Covestro, Naval Surface Warfare Center, Marvin Windows, and Adaptive Surfaces participating. During the meeting the highlights of the department's activities were reviewed, and future goals and opportunities were discussed. A highlight of the meeting is the poster session where students and postdocs in the department present and discuss their research work with the participants. We appreciate the time that our board members take out of their busy schedules to come to Fargo and help make our program better.

CPM WELCOMES BMRL

On March 1st, 2019, the Bioactive Materials Research Laboratory (BMRL) was welcomed into the department after migrating from its previous home within the Office of Research and Creative Activity. Known for its robotic wizardry and unmatched "barnacle ranching" prowess, the BMRL provides biological testing support and characterization services in the field of antifouling materials development for research grant and contract testing projects funded by the U.S. federal government, State of North Dakota and private sector partners, both domestic and abroad.

The earliest incarnation of the BMRL materialized in 2003 as a companion laboratory to the prestigious Combinatorial Materials Research Laboratory in the Center for Nanoscale Science and Engineering to develop next generation, ecofriendly antifouling marine coatings for the U.S. Office of Naval Research. A unique, innovative and game-changing feature of the BMRL's operational design was the utilization of laboratory automation, custom robotics and high-throughput screening methodologies to accelerate biological materials testing. In the intervening years, the BMRL's extensive use of these cutting-edge capabilities not only helped progress and mature the field of non-toxic antifouling materials development, but resulted in the successful launch of a commercial antifouling marine paint and the publication of over 70 peer-reviewed articles in professional trade and scholarly journals.

The BMRL resides in building R1A in NDSU's Research and Technology Park and is managed by Senior Research Specialist, Shane Stafslie, with assistance from Research Specialist, Lyndsi Vanderwal. Current research activities include testing of environmentally-benign antifouling marine coatings for the U.S. Office of Naval Research and durable antifouling ship hull coatings and antimicrobial water filtration membranes for the U.S. Army's Ground Vehicle Systems Center (GVSC). For more information regarding the BMRL's testing capabilities and related research activities please contact Shane by phone at 701-231-5826 or email; Shane.Stafslie@ndsu.edu.

