Welcome from the Chair

Greeting from Coatings and Polymeric Materials at NDSU! A lot has happened in the past year and our prospects for the future have never looked brighter. The department has experienced a number of personnel changes with more to come in future years. Jaci Wollan, our Administrative Secretary and receptionist, took a position in another department at NDSU. After being with the department in various capacities over the past thirteen years, she has been missed. Kathy Backen-Andersen has stepped in as department Administrative Secretary and receptionist. Also, after many years with the department, Carol Johnson stepped down as department Administrative Assistant this past year. Lynn Stadum has joined us as our new Administrative Assistant. Heidi Docktor, manager of our instrument lab, left NDSU to join Valspar in Minneapolis. Dr. Chunju Gu will be joining us in December as our new instrument lab manager. At the faculty level, Associate Professor Victoria Gelling left the department in May to join Valspar as a Technical Director. Vicki made many exceptional contributions to the department and NDSU and, while she will be greatly missed, we wish her well in her new endeavors. An international search is being carried out to find a replacement faculty for her position. We are focusing on recruiting a faculty member with similar interests in corrosion and electrochemistry. If you know of any exceptional candidates, please let us know.

With all of these changes in the department on the personnel side, there have also been a number of exciting new developments regarding the future of the department. Over the past few years, the department has been in a bit of a tight financial situation. However, the university has seen fit to step in and resolve these issues, putting the department on a firmer financial foundation. In addition, due to a new grant from the National Science Foundation along with substantial support from the university, the department has the opportunity to grow with the addition of three new faculty members. One of the science thrusts in our new five-year NSF EPSCoR grant is the formation of the Center for Sustainable Materials Science. As part of this initiative, three tenure-track faculty hires in CPM will be made over the next two years in the areas of Biobased Polymer Synthesis, Computational Polymer Science, and Life Cycle Assessment. This development is very exciting in that we will be able to expand the number of tenure-track faculty lines from five to eight, a 60% growth in the size of the department.

As you can see, these are exciting times for the department and there are other exciting new potential developments on the horizon that will have to wait for next year’s newsletter. In the meantime, you can keep in touch with the department through our website (www.ndsu.edu/cpm). And you are always welcome to call, email or visit the department at any time. Have a good year.
Upcoming 2015 Short Course

The Fundamentals of Coatings Science

This short course will be held June 7-12, 2015 and is designed for all levels of scientists and technologists working in the field of coatings. For those relatively new to the field, the short course provides a comprehensive discussion of the basic principles of coatings science. For more experienced chemists, the short course may provide a broader perspective and more fundamental understanding of coating science. Participants should have had some background in college level chemistry, including organic chemistry. For more information visit: www.ndsu.edu/cpm/short_courses.

2014 Coatings Short Course

June 1-6, 2014

The Coatings Science short course welcomed a wide variety of people from three countries and 10 states to Fargo the week of June 2nd. We hosted visitors from the United States, Peru, Sweden, Brazil and Pakistan from the coatings industry, suppliers’ industries, education and government. The course was taught by Dr. Dean Webster and Dr. Stuart Croll with Dr. Rick Roesler of Crystal Lake Consultants, Gary Larson of AkzoNobel Powder Coatings, Romesh Kumar of Clariant and John Du of BYK USA adding their expertise and knowledge.

CPM Featured in Video

Last fall the department was invited to be featured in a video to be shown during the fall Materials Research Society meeting. Working with a local video crew, we spent an entire day gathering footage which was edited down to a five minute video about the department with a focus on our materials science research. The result was a fantastic snapshot of our research and its impact on the world. You can view the video on our department homepage or at https://www.youtube.com/watch?v=YNlpBPDbIGc.

Industrial Advisory Board

A meeting of the Industrial Advisory Board was held May 29-30, 2014 with approximately 15 participating. The IAB consists of representatives from industry and government laboratories who visited with the department over one and a half days and provided feedback on our entire program of research, teaching and service. During the meeting, the IAB heard about our course offerings, faculty research areas, department plans for the future and had the opportunity to understand NDSU’s overall strategy from university administration. A poster session enabled our IAB members to interact with our students and postdocs. The next IAB meeting will be held in the fall of 2015.
PCI Scholarship Awardees

Three Powder Coatings Institute (PCI) Scholarships were awarded in 2014 with two of the recipients from the CPM department at NDSU. These students will be presenting their work at either the 2015 Powder Coating Show or the 2015 PC Summit. The PCI Scholarship provides funds to help defray travel expenses. Junren Lin will be presenting on “Corrosion Protection of Powder Coatings Using Metal Rich Primers” and Casey Orgon will be presenting on Electrochemical Investigation of the Corrosion Protection, Durability, and Effect of Exposure on Powder/Metal-Rich Coatings. Their advisor is Dr. Dante Battocchi.

Webster Research Group News

The Webster group research is currently focused in two main areas: biobased polymers and marine fouling-release coatings. The area of biobased polymers has expanded in recent years and is being funded by several different agencies and companies. The marine fouling-release coatings work is funded by the Office of Naval Research. There are seven graduate research assistants in the group and one postdoctoral associate, assisted by several undergraduate researchers. Professor Webster continues to travel to conferences around the world to present the group’s work and this past year traveled to meetings in countries such as Japan, Italy, France, and China. This year some students have had the opportunity to present their work in far away places. Graduate student Teluka Galhenage traveled to Dusseldorf, Germany and Singapore to give presentations on his work in non-toxic marine coatings. Graduate student Adlina Paramarta had the opportunity to travel to Karlsruhe, Germany to give a presentation on her work with biobased thermosetting resins for composites. In addition, a number of group members gave oral or poster presentations at the American Coatings Show in Atlanta.

Featured Student Alison Rohly

Prior to joining the Department of Coating and Polymeric Materials at North Dakota State University, I attended Bethel University in St. Paul, Minnesota, where I graduated with a B.S. in Chemistry. While pursuing my undergraduate degree, I was fortunate to work as a technical aide at 3M in St. Paul, where I was first exposed to the unique world of coatings within the Automotive Aftermarket Division. While at 3M, I gained valuable insight into coating formulation processes as well as characterization and testing techniques of coating systems. The mentorship I received while at 3M was instrumental in pursuing a career in coatings. After graduation, I worked at Valspar, where I gained exposure to coating performance testing through accelerated weathering and degradation methods. While at 3M and Valspar, I realized my desire to further pursue my education in the area of coatings and polymers. I am currently in my third year at North Dakota State University, pursuing my Ph.D. in Coatings and Polymeric Materials. My research is focused on using bio-based materials as alternatives to petrochemicals within thermoset coating systems, specifically concentrated on the use of lignin and lignin-derived materials.

“Tell me and I forget, teach me and I may remember, involve me and I learn.”

Benjamin Franklin
VORONOV RESEARCH GROUP

The Voronov group is currently working on three projects. These projects involve funded grant by United Soybean Board “Novel Soy-Based Nonionic Polymeric Surfactants (SBPS) for Personal Care Applications” (in collaboration with Dr. B. Chisholm, CPM/CNSE, NDSU) and two funded grants by ND Department of Commerce “Process and application research and development for Soy-based materials for industrial applications” (in collaboration with Renuvix LLC) and “Nanospheres to provide commercially important new properties to paints and coatings”. In addition, in year 2014, Voronov’s group received two grants from Oak Ridge National Laboratory and EP-SCoR (Experimental Program to Stimulate Competitive Research) Tennessee to attend small-angle-neutron-scattering facility in Oak Ridge, TN to carry out measurements on structure and properties of new biobased polymers developed in the group. Another research grant “New Polymeric Adjuvants for Peptide Vaccines” (in collaboration with Dr. Ramamoorthy, Department of Veterinary and Microbiological Sciences, and Shane Stafslien, CNSE/NDSU) was approved by Agricultural products Utilization Commission of North Dakota and begins in 2015.

The Voronov group consists of a Post Doctoral Associate, Dr. Ihor Tarnaychyk, and a Graduate Research Assistant, Andriy Popadyuk. Members of the group traveled to Dallas, TX this Spring to present at the ACS meeting. Professor Voronov presided at one of the sessions, four oral presentations were held and two poster presentations were made. Other invited presentations and conferences attended were in Washington, DC; Prague, Czech Republic; Caparica, Portugal; and Athens, GA. Voronov also organized a symposium on Bioengineering of Interfaces at the conference in Prague. Eight papers were published this year and Professor Voronov was invited and accepted the invitation to become a Member of the Editorial Board in Coatings journal. Professor Voronov’s group work was featured in Angewandte Chemie, a leading journal in general chemistry. He and co-workers also published an invited review article in Current Opinion in Colloid and Interface Science, one of the high-impact journal in the field.

Olena Kudina, a recent PhD graduate from the Voronov Group spent five weeks this summer as a research trainee working at the Mayo Clinic’s Department of Orthopedic Surgery. Olena finished her PhD in July, 2014, and is currently working and Postgraduate Fellow in University of Twente (the Netherlands).

CROLL RESEARCH GROUP

Our interest, from the last 2 years, in computer simulations of crosslinking coatings continues because we find that, on one hand it confirms the old statistical models of network formation, but it also forces us to think more clearly and visualize how the networks form. We now have a much clearer idea of the ultimate influence of the crosslinking chemistry on some of the physical properties of crosslinked networks. Simulations also allow us to degrade networks without actually making paint and setting it out on exposure. However, the original experimental research on coating degradation kinetics still haunts us and will probably be revisited to look more narrowly on the influence of moisture in a project starting in the Spring of 2015. By then we may have yet more work on photodegradation as well.

At present, Dr. Croll has no graduate students in the department, but has a graduate student in the Physics department where work on computer simulations of polymer systems seems to fit very well. The situation has caused an unintended increase in bureaucracy but the collaboration works well otherwise.

The student, Aaron Feickert, not only keeps the computers busy but is very active himself. He is part of the Talent Identification Program, Duke University, where he was an instructor in Delhi, India in summer 2014 on “Cryptography, Codebreaking, and the Mathematics of Spying,” and similarly for the Center For Talented Youth, Johns Hopkins University, again as an instructor on Cryptology. He has given talks:
(ii) North Dakota State University, Fargo, North Dakota, USA Apr 2014, “Losing Passwords Like a Boss”
(iii) North Dakota State University, Fargo, North Dakota, USA Feb 2014, “Riddle Me This: Exploring the Enigma Cipher”

Outside NDSU, Aaron is a volunteer for a number of organizations: North Dakota Women in Need Fund; Sanford Health; Great Rides Bikeshares; Red River Women's Clinic; FM Sheltering Churches and has been a member of the local paper’s readers board.

Trying not to be put to shame, Dr. Croll remains active on the Laboratory Safety Committee for the university and the Program Review Committee. The latter means he can poke his nose into many other department’s business but has to go to plentiful meetings. He is also leading the search for a new faculty member for the department in the corrosion arena.

Over the last 12 months, Dr. Croll has helped with the department’s short course at NDSU and at a company’s site and has given a few presentations, including a conference and summer school in Germany, in China, Taiwan and Turkey as well as several in the USA. The topics have included coatings’ degradation, adhesion, architectural fabrics, computer simulations, pipeline coatings, titanium dioxide and colored pigments.
New 4+1 MS Degree Approved

The department has received approval to establish a 4+1 MS degree program in Coatings and Polymeric Materials and students are now able to enroll in the program. This new program will allow highly qualified students to complete a BS and MS degree in five years. Students in the program will enroll in the graduate versions of the courses in our minor curriculum and up to 15 credits can be applied to both their BS and MS degrees. It is expected that students will begin their research work no later than their senior year so that their thesis work can be carried out over two years. We are excited about this program since it will allow students to accelerate their studies to obtain a MS degree in a much shorter timeframe than the normal route. Students in this program will typically not be provided with graduate assistantships, rather we are seeking to establish scholarship funds (such as the new Valspar Scholarship) to provide financial support. Contact the department if you would like more information about this program.

Bierwagen receives Roy W. Tess award from American Chemical Society

Dr. Gordon P. Bierwagen received the Roy W. Tess Award in Coatings for 2013. The Tess Award is presented annually by the Division of Polymeric Materials: Science and Engineering in recognition of outstanding contributions to coatings science, engineering and technology. It is funded by a grant to the Division from Dr. and Mrs. Roy W. Tess. The purpose of the award is to encourage interest and progress in coatings science technology and engineering and to recognize significant contributions to the field. The Award consists of a plaque and a $3000 cash prize. Gordon is the sixth recipient of the award from NDSU. The award was presented at the Fall 2013 National Meeting of the American Chemical Society held in Indianapolis, Indiana and a symposium was held in his honor. Papers from that symposium have been published in a special issue of Progress in Organic Coatings as a Festschrift in recognition of Gordon’s contributions both as editor-in-chief of the journal for twelve years and his contributions to research and education in coatings science.

Tallman Research Group

Although retired, Professor Dennis Tallman continues collaborations with colleagues in Australia and China and makes annual trips to those countries. He continues to advise a student (Sina S. Jamali) in Professor Gordon Wallace’s group at the University of Wollongong in Australia. Sina, who is completing his Ph.D., is studying magnesium alloy corrosion using scanning electrochemical microscopy. The goal of the research is to develop biocompatible materials that are also biodegradable for load bearing implants. This work has resulted in three publications this year (2014). Dennis continues to enjoy playing four-wall handball and building and flying radio controlled model aircraft.

Education is not preparation for life: education is life itself.

John Dewey
Valspar Scholarships

The Valspar Foundation has contributed $20,000 to support up to five graduate student scholarships and a new program for Summer Undergraduate Research Experience. The scholarship program is administered through the Department of Coatings and Polymeric Materials at NDSU and coordinated through the NDSU Development Foundation.

“These scholarships will further our relationship and build our pipeline of talent by supporting students to develop insights into fundamental performance drivers of coatings and polymers and provide them an experience associated with an industrial environment,” said Cynthia Arnold, Valspar senior vice president and chief technology officer. “Valspar and NDSU have a long history of technical collaboration. We recognize their deep technical expertise in many disciplines associated with coatings research.”

The first Valspar Graduate Scholars Program awards to Olena Kudina, Lviv, Ukraine; Casey Orgon, Bemidji, Minn.; Adlina Paramarta, Java, Indonesia; Andriy Popadyuk, Lviv, Ukraine; and Alison Rohly, Lino Lakes, Minn. Each graduate student will receive $3,000 to support the students’ studies at NDSU’s Department of Coatings and Polymeric Materials for the 2013-2014 academic year.

Chunju Gu joins Coatings and Polymeric Materials as Laboratory Manager

Dr. Chunju Gu has joined the Department of Coatings and Polymeric Materials as Laboratory Manager. Chunju has just defended her PhD in Materials and Nanotechnology here at NDSU under the supervision of Professor Kalpana Katti. Prior to that she received her MS in Materials Science and a BS in Polymer Science and Engineering from Donghua University in Shanghai, China, and then worked as a researcher in the State Key Laboratory for Modification of Chemical Fibers and Polymeric Materials also in Shanghai. Chunju brings her extensive background and experience in materials characterization to the position of Laboratory Manager.

Characterization Service Center

The Department of Coatings and Polymeric Materials at North Dakota State University is equipped with state-of-the-art spectrometric, microscopic, testing, and application equipment utilized in coatings and polymeric materials science. This equipment is included in our service center and is available for use on a fee basis. A majority of the instrumentation has attachments or modules for advanced measuring techniques. For further information regarding our specific capabilities and/or a price list, please contact Chunju Gu, Laboratory Manager, at (701) 231-8017 or chunju@ndsu.edu.
SURE Program
This summer our department had the honor to welcome four Summer Undergraduate Research Experience (SURE) students. The students were here for a ten-week period during which they were active participants in our department. All students were required to present their research findings to the department at the end of the program. For most it was their first experience with research and public presentations. Our students this year were: Minda Chen (worked in Battocchi’s group, Knox College, Galesburg, IL, majoring in Chemistry), Kelsie Eiler (worked in Voronov’s group, Carnegie Mellon University, Pittsburgh, PA, majoring in Chemical Engineering and Biomedical Engineering), Alireza Rahimi (worked in Webster’s group, Minnesota State University Moorhead, Moorhead, MN, majoring in Chemistry) and Samantha Silbert (worked in Webster’s group, Bryn Mawr College, Bryn Mawr, PA, majoring in Chemistry).

CPM Scholarships
The Department of Coatings & Polymeric Materials provides over $22,000 in scholarships to undergraduates each year; with individual awards typically varying from $500 to over $3000 per applicant depending on applicant qualifications.

NDSU Governor’s School Student
Noelle Cutshow from Central Valley Public School in Buxton, ND joined Professor Voronov’s group for six weeks in June – July, to work as a part of ND Governor’s School Program 2014. Noelle worked under the supervision of Andriy Popadyuk on the project entitled Soy Oil Monomer: Renewable Alternative for Polymer Latexes.

North Dakota Governor’s School in Science and Mathematics is a summer residential academic program for sophomore and junior high school students with an interest in science or mathematics. The six-week program is state-sponsored and funded and has been hosted at NDSU each summer since 1990. From June 2 to July 12, high school sophomores and juniors will live on campus to learn directly from NDSU faculty in areas such as laboratory science, mathematics, information technology, English and visual arts, which alternates each year with performing arts. The students learn through classroom experiences, discussion groups, labs and field trips.

SURE Program Funding
The success of the program is very dependent on the external funding we receive from industry and alumni. Because of this program we have provided a wonderful opportunity for students to become interested in coatings and materials.

If you are interested in donating to the Summer Undergraduate Research Experience Program, please contact:
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### Giving Back

Gifts to the department are essential as we move forward into the future.

Every academic department is faced with financial needs that are not met by funds provided by the University and research grants and Coatings and Polymeric Materials is no different. The Department benefits greatly from gifts from alumni, friends, and corporations to either the general fund or one of our many endowed funds. Unrestricted gifts to the department’s general fund can have an immediate impact and are used for such things as recruiting of undergraduate and graduate students, recruiting expenses for new faculty, startup packages for new faculty members, upgrading of instruments and computers, seminar speakers, student activities and awards, faculty and staff development, and more. The Department also has several endowed funds towards which you can give. Please contact us for more information. Many companies also have matching gift programs which would double your gift to the department.

You can donate online using the following link: [https://www.ndsualumni.com/NetCommunity/donate](https://www.ndsualumni.com/NetCommunity/donate). To designate your gift, select ‘Other’ as the Designation, and enter “Coatings and Polymeric Materials” in the Other box.

To donate by mail, you can send your gift to:

NDSU Annual Giving
NDSU Development Foundation
1241 North University Drive
PO Box 5144
Fargo, ND 58105-5144

If you would like to learn about other ways to give to the department, please contact Monique Anderson, Director of Development, 701-231-6131, [Monique.anderson@ndsu.edu](mailto:Monique.anderson@ndsu.edu).

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### Contact Us

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

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