

**Chemistry Alumni Newsletter**  
**University of North Dakota**  
**Fall 2004**  
**Volume II Number 1**

**Current Faculty**

Analytical: David Pierce, Julia Zhao  
Chemical Ed: Julie Abrahamson, Tom Ballintine  
Inorganic: Harmon Abrahamson, Ewan Delbridge, Lothar Stahl  
Organic: Anamitro Banerjee, Alexei Novikov, Irina Smoliakova  
Physical: Mark Hoffmann, Jenya Kozliak, Kathryn Thomasson  
Adjunct: Eric Murphy, Leroy Pazdernyk, Matthew Picklo

**A Message from the Department Chair,  
Mark Hoffmann**

Greetings, friends! The Department begins another year that promises to be as exciting as the last. With the generous support of the College of Arts & Sciences, the University, NSF EPSCoR, EPA EPSCoR, and NIH BRIN, we were able to assemble a start-up package that enabled us to recruit two outstanding new faculty members, Alexei Novikov and Julia Zhao, who are featured in this newsletter. We have seen continued research productivity with a second year in a row of \$1M in external research funding, additionally the preceding year has resulted in two patent applications submitted. Our commitment to teaching has not wavered, with the number of undergraduate majors and the number of graduate students climbing to record levels. The number of postdoctoral research associates has doubled in the past year. We are hoping that our friends and alumni will participate in this growth, visit the Department, and continue to spread the word that UND Chemistry is a great place with which to be associated.

**Dan Lemke, 2004 Alumni Lecturer**



From left to right: Mark Hoffmann, Tom Ballintine, Dan Lemke, Neil Woolsey, Harmon Abrahamson

Dan Lemke is the Technical Advisor, Industrial Oils and Lubricants, Cargill, Inc. He was born in Dallas TX in 1956. He spoke about "Vegetable Oil Boring? No way?" on October 15 as part of the pre-Homecoming festivities.

At the age of one year the family moved north to his father's hometown, Fort Atkinson, WI where his father started a fence construction business. Up to the age of eighteen Dan worked as a general laborer for his father. In 1975, he joined the US Navy and for the next four years spent the majority of it aboard ships stationed in the Indian Ocean and South China Sea. In 1979, after honorable completion of his service, he attended the University of Wisconsin Stevens Point and in 1983 received a BS in Chemistry. He continued with his education and under the mentorship of Dr. Neil Woolsey received a PhD in Organic Chemistry in 1988 from the University of North Dakota, Grand Forks.

From 1988 to 2001 he lived in Williamsport, PA and worked for the Swiss owned pharmaceuticals and specialty chemical company, Lonza Inc. Starting as a bench chemist, he progressed to managing a combined research team of seven chemists and engineers. The work consisted of product development, product improvement, plant scale up and plant support. In 1996 he received the company's highest technical honor, Innovator of the Year, for work conducted in the area of ester and surfactant synthesis. In 2001, with a desire to move back to the midwest, he accepted a position as technical advisor with Cargill, Inc. in Minneapolis MN. There he manages a research team for the Industrial Oils and Lubricants business unit. The work, similar to his previous position, consists of product development, product improvement and plant scale up. The major focus of his current work is on the development of vegetable derived coatings, lubricants and various performance products. He has six US patents and two pending.

Daniel lives with his wife, Janelle and his youngest daughter Rose on a rural farm near Cokato MN. Both of his sons, Samuel and Benjamin, attend local Minnesota colleges. Hobbies include most aspects of hobby farming, gardening, sausage and cheese making, fishing and reading.

### 2004 Scholarship Winners

The top Chemistry majors and graduate student were honored at the Alumni Lecture for their outstanding achievements at UND.



From left to right: Jessica Wood, Victor Waingeh, Tyson Bolinske, Mark Miller, Darrin Paulson

Darrin Mark Roger Paulson won the Harold Haugan Award for the outstanding chemistry major. The Ben G. Gustafson Award for the outstanding senior went to Jessica Louise Wood. The Walter H. Moran Scholarships for high scholastic achievement by upperclassmen went to Shaina Marie Dockter and Mark Michael Miller. Tyson Paul Bolinske was given the C. A. Wardner Award for the outstanding sophomore. Finally, Victor Foin Waingeh won the Roland G. Severson Award for excellence in graduate research.

### Position Open in Chemistry

The Department of Chemistry invites applications for a tenure-track Assistant Professor position in analytical or related area starting in Fall 2005. The successful candidate is expected to establish a vigorous, independent program of externally-funded research and should be able to teach graduate and undergraduate courses in analytical chemistry. The Department has research focuses in catalysis and biological chemistry. Candidates with interests that complement these areas and emphasize method development are especially encouraged to apply. A Ph.D. is required and postdoctoral experience preferred. Send resume, transcripts for all degrees, research plans, and three letters of recommendation to **Dr. David Pierce, Search Committee Chair, Department of Chemistry, University of North Dakota, P.O. Box 9024, Grand Forks, ND 58202-9024**. Completed applications must be received by November 15, 2004 for full consideration. Web site:

<http://www.und.nodak.edu/dept/chem/>.

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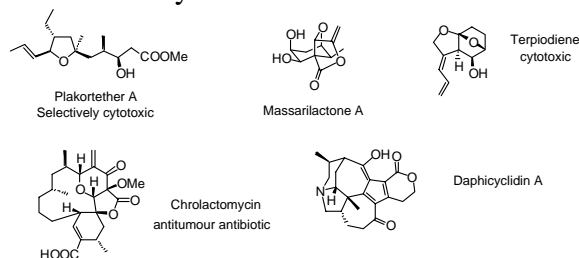
### Introducing New Faculty Member Alexei Novikov

Dr. Novikov is a synthetic organic chemist who received his M.S. in 1992 from the Higher Chemical College, Moscow, and his Ph.D. in 2001 from Emory University.



He was a Postdoctoral Fellow at the University of Arizona from 2001-2002 and at the University of Utah from 2002-2004. He joined the UND faculty this fall.

His research interests include development and applications of organic synthesis. Historically, organic synthesis includes two symbiotic fields - *target directed* synthesis and *synthetic methodology*. In the area of directed synthesis natural compounds are of particular interest as synthetic targets. Natural compounds often possess intricate chemical structure and promising biological activity. Below are some of the natural compounds that are being pursued and evaluated as synthetic targets presently. The efforts in other directions deal with synthetic methodology. The two chief directions presently are remote functionalization and cascade radical cyclizations.



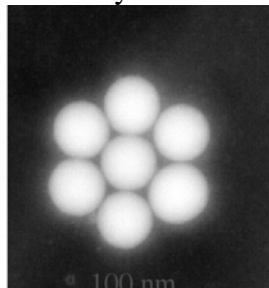
### Introducing New Faculty Member Julia Xiaojun Zhao



Dr. Zhao is an analytical chemist who received her B.S. in 1985 from Jilin University and her Ph.D. from Jilin

University in 1999. From 1999-2001 she was a visiting scholar at Hong Kong Baptist University. She was a Postdoctoral Research Associate at the University of Florida. She joined the faculty at UND this fall.

Her research interests focus on the development of bionanotechnology. Nanotechnology in combination with biomedical and other biotechnological developments promises to produce major breakthroughs and revolutionary tools in bioanalysis. One of the best ways to link biomolecules and nanotechnology is through the generation of bionanomaterials. Recently, nanoparticles have been rapidly developed and show great potential for use as efficient bionanomaterials. Our research activities involve developments that include: (1) Synthesis of different types of nanoparticles such as silica nanoparticles, fluorescent nanoparticles, and magnetic nanoparticles; (2) Characterization and surface modification of nanoparticles including nanoparticle size, shape, fluorescent intensity, magnetic properties, immobilization of biomolecules onto the nanoparticle surface, and characterization of amounts and properties of surface biomolecules on the nanoparticles. (3) Application of nanoparticles in bioanalysis including: sensitive detection of bacteria using nanoparticle probes, single strand DNA/RNA sequencing, and cancer cell recognition for early cancer detection.



#### **Harmon Abrahamson Renews GAAN Fellows Program**

The UND GAANN (Graduate Assistance in Areas of National Need) Fellowship program was successfully renewed in 2003, and we have just finished the first year of the renewal. Funding (\$491,940 for three years) is provided from the U.S. Department of Education for up to five fellowships, with money for a sixth provided by the university. A special emphasis is placed on recruiting women and minority students. Fellowship applicants should have a minimum of 3.5 GPA as undergraduates, and be interested in doing research leading to a Ph.D. in chemistry. The current annual stipend of \$30,500 is

supplemented by over \$10,000 additional for books, supplies, travel, and research expenses.

Our two current fellows are both women. One, Kristine Carlson, was selected to attend the prestigious Nobel Laureate conference in Lindau Germany. She is working with professors Hoffmann and Thomasson on theoretical developments of predicting circular dichroism for peptides and proteins. Our newest GAANN fellow, Sandra Hazleton, joins us from New York, where she did her undergraduate degree at Potsdam. She is working with professor Pierce.

We are beginning our recruiting for next year and still have some openings in the program. If you know of any talented seniors majoring in chemistry, have them contact Dr. Harmon Abrahamson, program director, for more details. E-mail: habrahamson@chem.und.edu.

#### **Mark Hoffmann Wins DOE Grant**

Dr. Hoffmann received \$439,613 from the Department of Energy to study "Development and Parallel Computer Implementation of Quasidegenerate Perturbation Theory for Molecular Electronic Structure."

#### **Dave Pierce Wins UND Teaching Award**

At Founders Day last spring, Dave Pierce was presented with the UND Foundation/Gamble Award and Saiki Prize for Individual Excellence in Teaching. He won this award for his enthusiastic efforts in freshman chemistry and his tireless work to revitalize the ACS track of our undergraduate curriculum.

#### **Julia Zhao Publishes High Profile Paper in PNAS**

Working with a team of scientists at the University of Florida, Julia Zhao has developed tiny hybrid particles that can speedily root out a single *E. coli* bacterium in ground beef or provide an early warning alarm for bacteria used as agents of bioterrorism and early disease diagnosis. She is first author on the paper about this project titled "A rapid bioassay for single bacterial cell quantitation using bioconjugated nanoparticles" in the *Proceedings of the National Academy of Sciences*, October 19, 2004, 101, 15027-

15032. The paper has been highlighted by several news websites including NewScientist <http://www.newscientist.com/news/jsp?ns99996513> and Medical News Today <http://www.medicalnewstoday.com/medicalnews.php?newsid-14792#>.

#### **Alumni News**

**Jie Song** has started a tenure track assistant professor position in Physical Chemistry this fall at the University of Michigan-Flint.

**Ray Dickie Receives 2004 FSCT George Baugh Heckel Award.** On Oct. 27, the Federation of Societies for Coatings Technology will present Ray A. Dickie, editor of JCT RESEARCH and JCT

COATINGSTECH, the organization's highest honor—the George Baugh Heckel Award. The presentation will be made at the Opening Session of the Federation's 82nd Annual Meeting, at McCormick Place North, Chicago, IL. Considered the most prestigious of FSCT awards, the George Baugh Heckel Award recognizes an individual whose contributions to the organization have been outstanding. Established in 1951, the award is dedicated to the memory of George Baugh Heckel, who served as temporary chairman when the Federation was organized in 1922, and as secretary for many years thereafter.

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