CHEM LETTER

UNIVERSITY
OF WASHINGTON

DEPARTMENT
OF CHEMISTRY

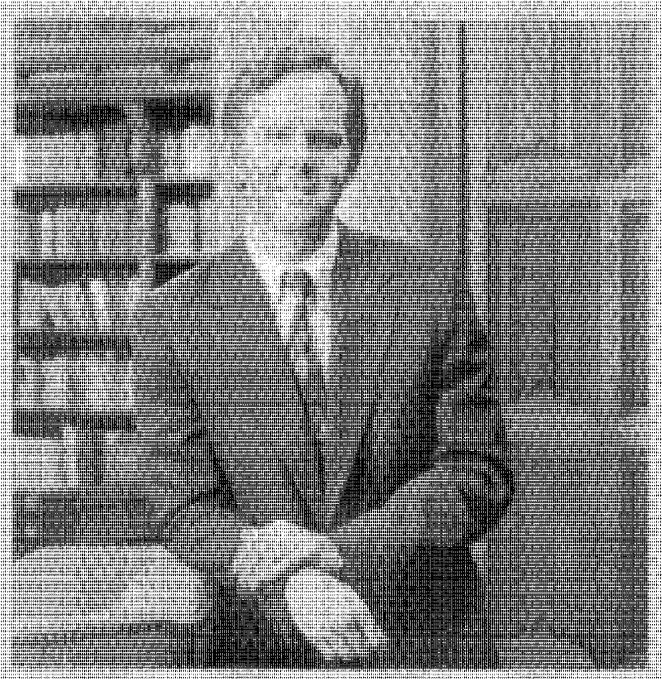
MAY 1997

VOLUME 21

Only Thing Missing Was The Champagne

Former UW President William P. Gerberding, in one of his last official acts prior to retirement, arrives in Chemistry to cut the departmental budget, but after conferring with outgoing Chair Bob Watts, cuts the ribbon to the new Chemistry Building instead. See page 15 for story.

Dear Alumni:



It has been over two years since the last issue of the Chem Letter. Our long absence from your mailbox reflects just how busy we have been with our teaching, research, and outreach activities. We hope you will take us back!

Much has changed since our last issue. The former occupant of this office has fled the country and returned "down under" from whence he came, where he is Head of the School of Chemistry at the University of Melbourne. He only rarely responds to my email requests for help and advice, so I must assume he has his own new problems. My first year and a half in the chair's office has been exhilarating; the learning curve is steep. I understand now more than ever the greatness of this department and university. It is the dedication and work of our faculty, staff, and students that makes it so.

The most visible change in the department is our expanded setting. We occupied our brand new building in the Spring of 1994. About half of our graduate research and teaching assistants now reside in this new annex, which also holds almost 100 workspaces for undergraduate laboratory coursework. The building is both beautiful and functional. The labors of the faculty and staff who saw this project from conception through construction have been richly repaid.

Many other changes are less visible, but no less important. We have added four new faculty members since we last wrote: Professors Craig Beeson, Karen Goldberg, Bari Kahr, and Phil Reid. Our undergraduate program is bursting at the seams: enrollments have risen steadily since 1988, up some 40% since that time. This is dramatically illustrated by the fact of our running six concurrent sections of our mainline freshman course, most with almost 300 students! Despite this almost overwhelming number of students, we strive to maintain and improve the quality of the program, with new courses too numerous to mention and plans on the drawing board to better coordinate entry-level lecture and laboratory, expand the use of computers in the classroom, and revamp our study center to better meet the needs of our students, most of whom work at least part-time.

Our graduate program continues in good health. It has been trimmed in size to better match the availability of financial resources, most of which are the result of grant applications to federal sources. Nevertheless, we published some 150 scientific articles this last year. We are proud of the new 750 MHz NMR spectrometer, which now resides in the Bagley basement, one of but a handful in the world. Our Center for Process Analytical Chemistry, which for several years struggled through a period of diminished industry funding for university programs, has reversed this trend, and is poised for a speedy recovery.

Our outreach programs continue to thrive. As I write, we are negotiating with NSF on the level of funding for our now four-year old Native American Science Outreach Network. Again this year, our undergraduate students gave hundreds of scientific presentations in high schools across the state promoting interest in science.

We at the University remain committed to providing a quality education to students at all levels, and are willing to work hard to rethink the cost-effectiveness of our practices. Nevertheless, the fact remains that it costs money to provide education at any level. It is my own opinion that the fiscal constraints under which this university and this state's K-12 system have in recent years operated have taken us beyond healthy belt tightening, and now threaten our educational system, and in turn our children. Give our children the same chance you and I have had: please support education at all levels.

With very best regards,

Paul B. Hopkins

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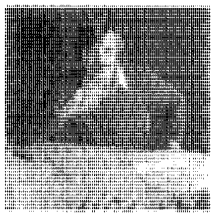
CHEM LETTER

Faculty Update

Every year chemistry faculty, graduate students, and staff participate in science fairs at schools, give tours of the Chemistry Department and/or perform chemistry demonstrations for K-12 students, each presentation tailored to a specific age group and grade level. These include working with the Pacific Science Center to serve as a host site for their Technology in Education program, hosting an American Chemical Society local chapter meeting with tours of the new building, and providing a weekend seminar for nearly one hundred Western Washington middle-school science students and their chaperones. During a typical year, several dozen of these events are hosted and impact over 10,000 K-12 students and adults. Here's what else we've been doing. . .

NIELS H. ANDERSEN Current areas of research concern the importance of initial secondary structure formation in protein folding and dynamics, the thermodynamics of peptide helix formation, the early stages of amyloid plaque formation, and the elucidation of the structures of peptides involved in the regulation of insulin dependent glucose metabolism. Andersen's group recently reported the first observation of cold denaturation of peptides (*J. Am. Chem. Soc.* , October 96), which provides new insights into the importance of the hydrophobic effect in secondary structure formation. Andersen presented his studies of pancreatic amylin structures at a plenary lecture at a joint ACS/American Peptide Society/Protein Society symposium in San Diego last fall and at an NSF Chemistry Division meeting in April 1996.



CRAIG C. BEESON was selected as one of two UW applicants to the highly competitive Searle Scholars Program. (see related story, page 8.)

WESTON T. BORDEN received an Alexander von Humboldt Senior Scientist Award, spending four months in Europe last spring and planning a three-month stay next fall. Borden was based at the Institute for Organic Chemistry in Heidelberg, but he gave talks in Germany, Norway, Sweden and Switzerland. He was the 1996 Troisieme Cycle Lecturer at French-speaking universities in Switzerland, and he also gave invited lectures at the Reaction Mechanisms Conference at Stony Brook, the WATOC Conference in Israel, the Radicals in the Rockies Conference in Telluride, and at a Symposium honoring Professor Philip Eaton at the University of Chicago.

JAMES B. CALLIS has turned much of his attention to undergraduate education and as such last Spring, lectured to the UW Department of Physics' Education Division and spoke as part of the UWired Teaching and Technology Series. The Science Learning Collaboratory, of which he is a co-creator, represents a new approach to the use of computer networks in science education. It provides a truly interactive, shared workspace in which the teacher and students can collaborate during coupled lecture/lab sessions and beyond, as students work together on projects or homework, or as they go out on internships at national laboratories or company sites. Within this 'laboratory without walls' the following activities are carried out: (a) Creation of liv-

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Donations Continue to Fund Vital Departmental Activities: Fellowships, Scholarships, Recruiting, Research Symposia, etc.

The following individuals, corporations, and foundations donated to the Department of Chemistry between June 1994 and November 1996. Chair Paul B. Hopkins expresses appreciation on behalf of the department for the generous support of all its donors. He urges people to call him at 800-869-2436 if any gifts were omitted from this list or if names have been inadvertently misspelled.

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Faculty Wives Establish Endowments

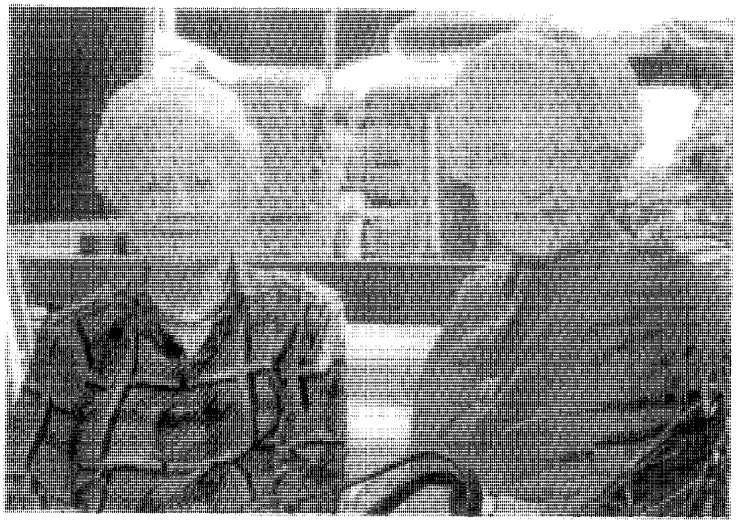
George Cady had just been widowed for a second time and as secretary of a Blue Ridge community group in North Seattle, it was Irene Hoving's job to send condolences. As she tells the story, she was out walking in the neighborhood one day and Cady pulled up in his car, leaned out the window, and sort of grunted at her "Are you the woman who sent me the card?" Irene admitted she was. George drove away saying "Good luck to both of us" and thus began a romance.

For Ruth Robinson, a marriage that lasted over 60 years and produced three sons who all earned Ph.D.s like their father, began with a blind date arranged by her cousin who was a fraternity brother of Rex Robinson's at the University of Wisconsin in Madison.

Now both widowed, these women hold much in common. Not only were they married to former chemistry faculty and frequently did things together as couples, the two women now live in the same retirement community, and both are significant philanthropists who have generously endowed fellowships in memory of their late husbands.

The Cadys had been married nearly eight years when George, an internationally recognized expert in fluorine chemistry, died at the age of 87 in 1993. Professor Rex Robinson, who was 88 when he passed in 1992, was an analytical chemist whose research in water chemistry made him an important contributor to the UW Department of Oceangraphy.

Ruth has always been an avid gardener and has enjoyed growing flowers, vegetables, and berries. For a time she belonged to a UW wives garden club. Although the Robinson's didn't do much traveling abroad, they were avid campers and mountain hikers within the United States and Canada.



Irene Hoving Cady and Ruth Robinson

Prior to marrying, Ruth Robinson taught high school chemistry for two years. Most of her married life was spent raising their children, serving on the faculty auxilliary, volunteering for the UW arboretum and her local PTAs, and doing time as a "den" and "fraternity" mother.

The three aforementioned sons produced five granddaughters and Ruth also has two great-grandchildren, a boy and a girl. Her son Neal received his Ph.D. from the University of Washington with Biochemistry Professor Ken Walsh (now that department's chair) and he currently is on the medical school faculty at the University of Texas in San Antonio. Her son Richard is a chemical engineer at Chevron who earned his advanced degree at the University of Wisconsin. Her youngest son Clark holds a doctorate in mathematics from the University of California at Berkeley and currently teaches at Northwestern University.

The study of color has been a life-long pursuit of Irene Hoving Cady's and she parlayed what started as an passing interest into a career. She studied art and art history at the University of Minnesota but it wasn't until she and her first husband, John Hoving, moved to Seattle that she opened a studio in her home at age 50, and began to both take and teach courses in a variety of media including oils, watercolor, acryllic, and drawing.

She likes to paint everything but specializes in mood paintings. Irene is continually trying to improve her style and believes that art enriches all our lives. She knows everyone will be alone at some point and it is wonderful to have something to fall back on to fill your time. Irene says she is never lonely.

Her first husband had been a civil engineer with Burlington Northern for many years and their early married life was literally spent on the road going from one assisgnment to another. While they weren't yet growing any roots, Irene had time on her hands and volunteered to learn Braille for the Red Cross so that she could translate books that were later donated to the Library of Congress. Irene remembers she would take the Braille machine, with its six keys and spacing bar, on the train to work and if she made one mistake, she needed to start all over again.

Irene and John, married for 57 years, had one child, Barbara. A retired nurse, she now lives on the Washington coast and was recently widowed, herself.

Irene and Ruth exercise three times a week in a class at the Ida Culver House, where they both live. They two women go for daily walks, and reguarly visit the residents who are no longer ambulatory in another part of the retirement community.

Although their fellowships were established at different times, it is a shared love of education and recognition that students and universities never have enough money that inspired them to endow their funds. In Ruth's case, the scholarship is directed toward undergraduate chemistry and/or biochemistry majors while the Hoving Cady endowment is earmarked for graduate student support. There already existed a graduate student fellowship in Robinson's memory which had been created by his first doctoral student, Lloyd West, and his wife, Florence. The Hoving Cady endowment recognizes both of her husbands, which was important to Irene since it was the stock she acquired during her first marriage which enabled her to start her fund.

FACULTY UPDATES,
continued from page 3

ing lecture notes. In the collaboratory, using digital video, data sharing and non-procedural mathematical languages, the development of learning materials becomes a cooperative enterprise. (b) Remote operation of scientific instruments. Students can operate sophisticated scientific instrumentation in a safe, cost-effective manner over the World Wide Web. Using the tools of modern science is of tremendous value in encouraging students to become involved in the authentic practices of the discipline. (c) A new type of internship now becomes possible. Using the collaboratory tools and the WWW, the students can work remotely with scientists in collaboration with their advisors at the UW.

. . . The Science Learning Collaboratory represents a new approach to the use of computer networks in science education. . .

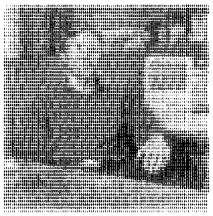
CHARLIE CAMPBELL held an Overseas Visiting Scholar Fellowship at St. John's College, Cambridge University, England last year. He gave invited lectures in England, Germany, Italy, Japan while on sabbatical. He continues on the editorial board of the *Journal of Catalysis*.

ROBERT J. CHARLSON His adjunct status in the department was changed to that of Professor. In the last year he has spoken at, among other places, the Johnson Space Flight Center and the Royal Swedish Academy of Sciences.

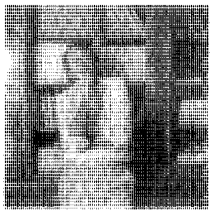
GARY D. CHRISTIAN continues in the College of Arts and Sciences' Deans' Office with the new title of divisional dean of the sciences. Last year he was also appointed as the acting faculty director of the UW Center for Process Analytical Chemistry (CPAC). He was a member of the International Scientific Committee of the Fifth International Symposium on Drug Analysis, held last year in Belgium and he has become a member of the editorial board of the *Journal of the Saudi Chemical Society*. Christian has given recent invited lectures at the University of Valencia in Spain and was the keynote speaker at the 45th Annual Meeting of the International Society of Electrochemistry in Portugal. Christian has recently been honored as the recipient of the Talanta Gold Medal and American Chemical Society Award in Analytical Chemistry.

GARY DROBNY worked throughout the year overseeing the installation of the new 750 MHz NMR spectrometer (see page 14 for story). He has spoken recently at Yale University, the University of Nebraska, the Gordon Conference on Magnetic Resonance, the Experimental NMR Conference, the Rocky Mountain Conference, the International Conference on Magnetic Resonance in Biological Systems, and at the ACS Symposium on Molecular Modeling and Structure Determination of Nucleic Acids.

TOM ENGEL was on assignment for two quarters representing the UW on the Hanford Advisory Board, helping to develop a proactive institutional position encouraging acceleration of the Hanford cleanup. He also serves on the Hanford Site Technology Coordinating Group which is charged with technology development for site cleanup, and on the advisory committee of the Environmental Molecular Sciences Laboratory at the Pacific Northwest National Laboratory. This is a new $250 million facility which is the US Department of Energy's basic science laboratory for research on environmental remediation. Within the UW, Engel helped coordinate a response by UW researchers to the Environmental Management Science Program, which is a new $50M program designed to bring innovative science to bear on cleanup issues at the national laboratory and is one of the leaders in the effort to estabish a Center for Environmental Technology at UW. He also worked with the Presidential Task Force on the Future of Environmental Studies to integrate environmental restoration into their recommendations for new UW programs.



NICHOLAS D. EPIOTIS completed work on and arranged for the publication of his new monograph, "Deciphering the Chemical Code, Bonding across the Periodic Table." Two advance reviews of this work concluded, "What a tour de force. Nothing as revolutionary has appeared since (Pauling's) The Nature of the Chemical Bond" (R. West, University of Wisconsin, Madison, WI), and the book "clearly is the work of a genius..." (E. R. Davidson, Indiana University, Bloomington, IN).



HEINZ FLOSS chaired the Research Services Committee. He received the White Magnolia Medal Award from the City of Shanghai last year and he has given talks in Germany, England, and throughout the United States.

RICHARD H. GAMMON received a Fulbright Travel Grant to Grenoble, France and was a Fulbright-Hayes Fellow there. Current research interests include the new work on trace gases (OCS) in polar ice cores, which he initiated during his sabbatical last year. Gammon also enjoyed serving on President McCormick's Task Force on Interdisciplinary Environmental Education this past year. The report expects to create and implement a new campus-wide Environmental Studies Program, which will have important implications for both the undergraduate and graduate programs in the Department of Chemistry.

MICHAEL H. GELB Perhaps the most significant research accomplishment in the Gelb lab over the past year is the purification of an enzyme that attaches the palmitoyl group to Ras proteins. Mutated forms of Ras proteins are thought to be responsible for 30% of all human cancers, and thus understanding the function of these proteins is important. Ras must be

FACULTY UPDATES,
continued on next page

. . . but nobody until now has ever purified a protein palmitoyltransferase. . .

attached to the membrane to function, and this is accomplished by the covalent attachment of a palmitoyl group (a 16-carbon fatty acid) to a cysteine residue near the carboxyl-terminus of Ras. Ras proteins as well as hundreds of other proteins in eukaryotic cells contain covalently attached palmitoyl groups, but nobody until now has every purified a protein palmitoyltransferase. Gelb has given several seminars at major universities in this country and in Europe. He also spoken at several conferences including the Gordon Conference in Enzymes, Co-enzymes, and Metabolic Pathways. The Gelb lab has expanded to 18 members, and the research is supported by four NIH grants. Members are continuing to work in the area of phospholipase A_2, protein prenylation and palmitoylation, structure-based drug design, and lipid tubules as novel drug delivery devices.

KAREN I. GOLDBERG has received numerous awards since joining the faculty a year ago. (see related article on page 9.)

MARTIN GOUTERMAN Last year, Gouterman chaired the Biotrack Committee, which seeks to reorganize the presentation of chemistry for biology majors. This is part of a department-wide effort at curriculum change which will also significantly alter the way in which chemistry majors pass through the undergraduate programs. Gouterman attended a Pressure Sensitive Paint Conference in Gainesville, Florida. The use of pressure sensitive luminescence paint to study pressure in wind tunnels is growing and may be moving into turbine research. Gouterman received a 1996-97 Arts And Sciences Curriculum Development Award. Gouterman was an invited speaker at the Symposium on Applications of Inorganic Photochemistry to the Chemical and Biological Sciences, which was held at the Orlando, ACS meeting. There he presented a review on the use of oxygen quenching of luminescence of pressure sensitive paints for wind tunnel research. The Symposium will be published in *Journal of Chemical Education*.

D. MICHAEL HEINEKEY chaired the successful Faculty Search Committee. He has lectured regularly in the United States and Canada in the last several years. Currently, he is developing a laboratory for the third quarter of honors entry-level chemistry.

PAUL B. HOPKINS was recently named a Fellow of the American Association for the Advancement of Science (AAAS) and in the past year, has given six invited lectures. His group has finished synthesis of a new probe for DNA dynamics in collaboration with Professor Bruce Robinson's group. Hopkins is currently serving on an NIH study section for review of grant proposals and continues to serve on the editorial advisory board for *Chemical Research in Toxicology*.

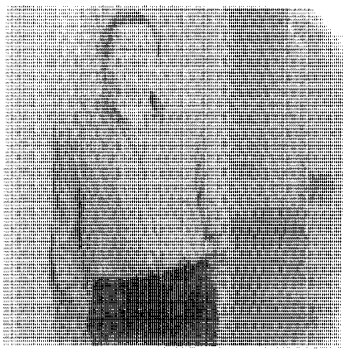
HANNES JÓNSSON received a DOE-UCES Undergraduate Computational Science Award during which time he created a senior-level computational chemistry course, a laboratory-style class providing hands-on experience with color graphics workstations (in the Chemistry Department's computer teaching facility) and research level software. Part of the course is available over the World Wide Web to those students who have Mathematica on home platforms. He spent last year on sabbatical in Denmark and gave several talks to European universities. Jónsson has also spoken recently to the American Vacuum Society, Sandia Laboratories, and Los Alamos National Laboratory.

JULIA A. KOVACS will be serving on a National Institutes of Health review panel, which meets three times a year in Washington, D.C., until Nov 2001. A new project involves the preparation of synthetic models for the enzyme nitrile hydratase—an enyzme which is found in bacteria near toxic waste sites. She was invited to talk about this work last December in Hawaii at the Metal Ions in Medicine symposium at the International Chemical Congress of Pacific Basin Societies and in June 1996 at the Inorganic Gorden Research Conference.

BRUCE R. KOWALSKI was named Director Emeritus of the Center for Process Analytical Chemistry in recognition of his guiding role in the creation of and many years of outstanding service to that organization. He has given recent lectures at Procter & Gamble, General Electric, and conferences in England and Sweden. Kowalski is the author of several book chapters, one of which is entitled "Multivariate Instrument Standardization" in "Computer Assisted Analytical Spectroscopy," S. D. Brown, ed., Wiley, NY 1996.

FACULTY UPDATES,
continued on page 13

New Faculty Added at Junior and Senior Levels



Craig Beeson

Imagine using the 20th Century Fox studio sets of "Lost in Space" and "Batman" as your own personal playgrounds growing up. Imagine having a mom who allowed your menacing alligator lizard to roam around the house making hissing noises. Imagine catching rattlesnakes with your bare hands.

Craig Beeson can. This is a reasonably accurate description of his childhood. That, and the fact that he was an excellent student in school.

Beeson's father worked at the giant movie company and on weekends, his mother would bring him and his four younger siblings to the studio to play around on the props. He remembers romping contentedly for hours inside Dr. Doolittle's giant snail.

Fast forward a few years and while Beeson retained his interest in reptiles, he also developed into a rock-n-roll band manager and a boy chemist in his parent's garage. The fact that he has become a professor at a major research institution is not a fact to be lightly passed over. Out of his 35 first cousins (his mother is from a family of 11 children and the daughter of migrant farm workers), only Beeson and three other cousins are college graduates.

He earned his chemistry degree from California State University in Northridge and then went on to finish an M.S. degree at San Diego State University. He remained there lecturing general and organic chemistry for three years until he decided to continue with his graduate education at the University of California at Irvine.

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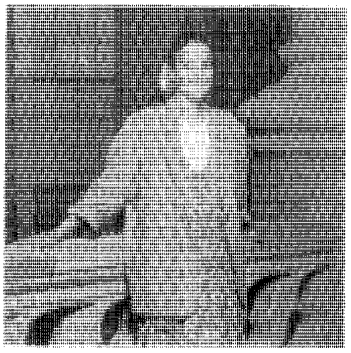

Karen Goldberg

Karen Goldberg is a coffee aficionado. This is a perfectly normal addiction in Seattle, where the municipal drink is a latte. However, one cannot say Goldberg is completely acclimated to Seattle, since she still mail orders her coffee beans from Berkeley, CA.

A New York City native who was raised in Teaneck, NJ, Goldberg earned a bachelor of science degree in chemistry from Barnard College, where she graduated summa cum laude. She received her Ph.D. from the University of California, Berkeley as a member of Bob Bergman's group and then took a postdoctoral position at Ohio State University, where she worked with Bruce Bursten for a year.

Although she had just received tenure at Illinois State University, Goldberg was eager to join a major research institution and given that she was familiar with Jim Mayer's work and seen how his career took off since joining the UW faculty as an assistant professor nearly a decade ago, she felt that coming to the UW would be a positive move for her, as well.

Goldberg's work at Washington is concerned with the energetics and mechanisms of fundamental reactions in organometallic chemistry. Many of these basic reaction steps occur in catalytic cycles and in homogenous transition metal catalyzed reactions of industrial importance. One company to recognize the significance of her work is Union Carbide, from whom she has received two research innovation awards. She has also recently received a Sloan Foundation Fellowship.

She received a Henry Dreyfus Teacher/Scholar award while still in Illinois but had to return the

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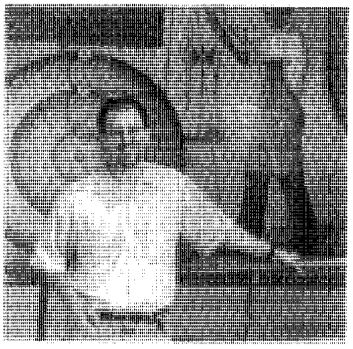

Bart Kahr

If Bart Kahr could spend less time in the laboratory, he would spend more time painting pictures. Kahr finds most appealing the structural aspects of chemistry and he makes little distinction between the crystals he grows in lab, some of which are featured on the cover of the November issue of *Advanced Materials*, and the paintings he makes at home.

The research in the Kahr laboratories is focussed on the design, growth, structure, reactivity, and physical properties of crystalline materials. Currently, his students are making crystals to stabilize reactive organic intermediates, to store bio-pharmaceuticals, and that function as lasers and other optoelectronic devices. While the applications of this work are clearly contemporary, Kahr and his students make an active use the history of chemistry and crystallography in order to identify important materials that were discovered and abandoned before their time.

Kahr has recently been elected chair of the Small Molecule Special Interest Group of the American Crystallographic Association and this past summer he gave a week-long invited lecture series on "Anomalous Crystals" to several Swiss universities. Kahr is also the recipient of a National Science Foundation Young Investigator Award.

A native of New York City, Kahr grew up on Long Island and attended Middlebury College in Vermont where he was a chemistry and art major. From there, he did his graduate work in stereochemistry at Princeton University with Kurt Mislow, followed by a postdoctoral association with Mike McBride at

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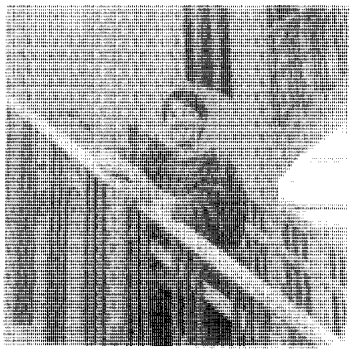

Phil Reid

- **Timothy Babowicz** "The Search for Rapid Chromatographic Analysis of Partially Resolved Peaks Using Temporally Integrated Samples and Simple Chemometric Techniques." Professor Robert E. Synovec. Autumn 1995.
- **Alan Barnes** "On Time and Spatially Resolved Measurements of Temperature Based Chemical Sensors." Professors Marvin P. Gustenson and James R. Gord. Winter 1996.
- **Pamela Baxter Palmer** "Three Dimensional Techniques in the Monitoring of Biomolecules." Professors Gary D. Christian and Jerome Ruzicka. Spring 1995.
- **Douglas Beck** "Theoretical Investigations in Vibrational Spectroscopy." Professor Robert G. Parker. Summer 1994.
- **Seth Brown** "Activation and Functionalization of Small Molecules in Electron Rich Complexes." Professor James M. Mayer. Summer 1994.
- **Xin Bu** "Surface and Alloy Mode Vibrations: Interactions in Simple Metals and Their Alloys." Professor Richard Lawrence. Autumn 1995.
- **Gerald Cook** "Ligand Activation by Metal Oxo Species: Oxo Ligand Scrambling of Alkane and Arylalkane." Professor James M. Mayer. Summer 1994.
- **Thomas Dean** "Advances in Multicomponent Instrument Standardization." Professor Bruce R. Kowalski. Winter 1996.
- **Paul Fleming** "The Biosynthesis of Lipid." Professor Henry C. Pitot. Autumn 1995.
- **Farhad Forouhar** "Physical and Chemical Studies of Monomeric and Polymeric Metal Complexes." Professor Peter H. Rieger. Summer 1994.
- **Kimberly Gardner** "Electrochemical Oxidation of Aromatic Hydrocarbons in Aqueous and Organic Solution." Professor James M. Mayer. Summer 1995.
- **Christine Gatlin** "Studies of Transition Metal Complexes by Electrospray Mass Spectrometry." Professor Frederick Turecek. Autumn 1995.
- **John Gelpke** "Structure and Thermodynamics of Complex DNA." Professor J. Michael Schurr. Spring 1995.
- **Alexander Goldstein** "Computer Simulations of Atmospheric Aerosol Chemistry." Professor Hanna Rosenfeld. Winter 1995.
- **Mary Hatcher** "A NMR Solution Structure and Dynamics Investigation of the Lys-8 Dynamic Switch Residue in the Lac9 Repressor Headpiece Binding Site." Professor Gary F. Thomas. Summer 1996.
- **Patrick Heath** "Fluorescence Polarization Anisotropy Study of the Dynamics of Small Linear and Circular DNA: Effect of Bending on the Torsional Constant." Professor J. Michael Schurr. Spring 1995.
- **Amber Schyule Hinsle** "Chemistry Mechanical Properties Complex in Indium Phosphide Compounds." Professor J. Michael Hercules. Summer 1995.
- **Ke Hong** "The Development of Flow Injection Chemical Sensors with Liquid Core Waveguides." Professor Bruce R. Kowalski. Autumn 1995.
- **Huilang Huang** "Studies of NMR Chemical Shift Tensors in Formaldehyde, Ethylene and Cyclopentadiene Single Crystals Oriented Inside Zeolites." Professor Paul D. Ellis. Autumn 1995.
- **Herbert Lancaster** "The Determination of Hydrogen Peroxide by Flow Injection Analysis Chemiluminescence Detection and Chemical Reactions." Spring 1995.
- **Scott Lewis** "Part I: Thermal Decomposition of Propyl Nitrate Stable Intermediate Complexes. Part II: Ab Initio Investigation of the CH3ONO Photodissociation Mechanism." Professor Michael C. Thurnauer. Summer 1995.
- **Marcel Liebermann** "Molecular Dynamics Helix Bundle Proteins." Professor Lionel Raff. Summer 1994.
- **Lawrence (Bob) Lima** "Separation and Detection of Chromophore Labeled Analytes." Professor Robert E. Synovec. Summer 1995.
- **Maureen Lin** "Photosynthesis of Lipid — The Very First Step." Professor Henry C. Pitot. Winter 1996.
- **Todd Miller** "Synthesis and Characterization of a Novel Nucleoside Containing Nucleotide for DNA Primer Studies by EPR." Professor Paul B. Hopkins. Autumn 1995.
- **Dan Mitchell** "One and Two Dimensional Radio Frequency Driven Optical Recordings: A Novel Distance Measurement Technique." Professor Gary P. Drobny. Winter 1996.
- **Pauline Murphy** "The Carbonate System in Seawater: Laboratory and Field Studies." Professor Richard Zimmerman. Summer 1996.
- **Tamara Nameroff** "Shallow Trace Metal Contamination and Paleoproxies in Continental Margin Sediments of the Eastern Tropical Pacific." Professor James Morison. Summer 1996.
- **Xin-Tan (Sandra) Ning** "Studies on the Biosynthesis of Rifamycin by Amycolatopsis Mediterranei." Professor Henry C. Pitot. Spring 1995.
- **Robert Palmer** "Conformational Studies of Dihydropyridine Calcium Channel Antagonists." Professor Mark H. Anderson. Autumn 1995.
- **Sierra Rink** "Structural Studies on the Interstrand and Intrastrand Cross-Linking of Guanines DNA by Nitrogen Mustard." Professor Paul B. Hopkins. Summer 1994.

- **Louis Scampavia**, "Flow Injection Cytometry for Kinetic Analysis of Cellular Activities," Professors Gary D. Christian and Jaromir Ruzicka, Spring 1996.
- **Paul Schomber**, "Experimental Studies of Sputtering on Zirconium Analyzed Using Modified Roosendaal Sanders Theory," Professor Robert O. Watts, Winter 1995.
- **Kurt Scudder**, "Flow Injection Techniques for Quantitative Fluorescence Microscopy of Living Cells," Professors Gary D. Christian and Jaromir Ruzicka, Summer 1994.
- **Scott Shaffer**, "Hypervalent Ammonium and Oxonium Radicals in the Gas Phase by Neutralization-Reionization Mass Spectrometry," Professor Frantisek Turecek, Winter 1995.
- **Michelle Shulman**, "Influence of Atmospheric Organic Compounds on Cloud Microphysics," Professor Robert J. Charlson, Autumn 1995.
- **Greg Spyridis**, "Kinetic and Thermodynamic Investigations of Tautomeric and Charge Transfer Reactions in the Solvent System Lithium Perchlorate-Diethyl Ether," Professor Yeshayau Pocker, Spring 1996.
- **Debbie Tahmassebi**, "Template Synthesis of Three Helix Bundles and Caged Complexes," Professor Tomikazu Sasaki, Autumn 1995.
- **Sam Tahmassebi**, "Hydrogen Migrations in the Rhenium Tris(Acetylene) System," Professor James M. Mayer, Spring 1995.
- **Marie Villarba**, "Atomic-scale Processes Relevant to Metal Crystal Growth," Professor Hannes Jonsson, Summer 1995.
- **Mark Voges**, "Cationic Dihydrogen Complexes of Rhenium with Isonitrile Coligands," Professor D. Michael Heinekey, Summer 1996.
- **Ziyi Wang**, "Nonlinear Multivariate Calibration," Professor Bruce R. Kowalski, Summer 1994.
- **Peter Weiss**, "The Oceanic Cycle and Global Atmospheric Budget of Carbonyl Sulfide," Professor Richard Gammon, Summer 1995.
- **Jian Wu**, "Theoretical Studies of Classical and Quantum Systems," Professor Robert O. Watts, Spring 1995.
- **John Zable**, "Operational Parameters of Sequential Injection Analysis and the Fundamental of Calculating the Dispersion at the Maximum Zone Overlap," Professors Gary D. Christian and Jaromir Ruzicka, Spring 1996.
- **Joseph Zaug**, "Determination of Macroscopic Properties of Solids and Liquids Up To Very High Pressure Using Impulsive Stimulated Light Scattering," Professor Leon J. Slutsky, Autumn 1994.

During the same period of time, these students graduated with baccalaureate degrees in chemistry and/or biochemistry.

Bachelor of Science
Biochemistry Degrees

Adrig, Christopher, 6/96
Aiello, Maria Orourke, 8/94
Antonich, Michelle A., 6/96
Arani, Veena, 6/96
Ardakani, Navid A., 12/94
Avakyan, Inna L., 6/96

Baldwin, Lisa Leilani, 6/95
Bassetti, Michael F., 6/96
Belyamani, Mona, 12/94
Bendana, Maria Elena Paola, 6/95
Bieker, Tor Michael, 12/95
Bloom, Steve M., 12/95
Boe, Michael D., 12/94
Bonga, Robin M., 8/96
Boxum, Michael S., 3/96
Briggs, Paul Dean, 6/96
Bui, Khuyen T., 12/94

Carlson, Justin Einar, 8/94
Carlson, Susan L., 6/96
Carrabba, Lisa A., 6/96
Chan, Li-Ching, 6/95
Chang, Dooyong, 6/96
Charurat, Man E., 6/96
Chen, Sherri, 6/96
Cheung, Ronald, 6/95
Chism, Dawn G., 6/96
Cho, Steven Sung-Tae, 8/96
Choe, Song Han, 6/96
Cole, Lanita L., 8/95
Cowan, Kristen, 8/94
Cowan, Rebecca E., 6/96
Critchfield, Jessica, 8/96

Dabestani, Ardeshir, 6/95
Dahl, Michael A., 6/96
Dang, Jeff Hai, 6/96
Dang, Thien-Lan Thi, 6/96
Dao, Tai Anh, 6/96
Davidson, Marie C., 12/94

Davis, John Evan, 12/95
Do, Nguyen Trong, 8/96
Dorr, Christopher C., 6/95
Downey, Julie M., 6/95
Dukelow, Anne J., 6/96

Echter, Anna Marie, 6/95
Enderlin, Harry T., 12/95
Epler, Jennifer A., 6/96

Fahey, Michael, 8/94
Fallon, Margaret G., 3/96
Filbin, Kellie Jean, 6/95
Fournarakis, Bill M., 6/96
Frame, Elizabeth R., 6/96
Fuller, Patrick A., 3/96

Gano, Kyle, 6/96
Garcia, Joanne, 3/96
Gilliland, William Dean, 6/95
Greif, Julie Ann, 3/95
Gruber, Tanja Andrea, 6/95

Hagelin, Suzanne T., 3/96
Hagen, Chris, 6/96
Hamacher, Nels B., 6/96
Harthan, Brenda A., 6/95
Heyer, Geoffrey L., 6/96
Higgins, Desiree A., 6/95
Hilton, Jeffrey L., 8/94
Hoeper, Alanna L., 6/95
Hughes, William N., 12/95

Jenson, Kaleb K., 6/96
Johnson, Kim Nicole, 12/95

Kang, Tae Kyu, 6/95
Kaykas, Ajamete, 3/95
Kearns, Patrick M., 6/95
Kester, Lisa Diane, 6/95
Kilpatrick, Kelly P., 8/94
Kim, Danielle H., 8/96
Kim, David E., 6/96
Kim, Jeong-Hee, 6/96
Kim, Joshua Won, 6/95
Kim, Sean, 6/95
Klosterman, Scott, 6/95
Kolashinski, Jason E., 6/96
Korenko, Michael R., 6/96

Lam, Dickson, 8/95
Lee, Lawrence, 8/96
Lewis, Lydia Joohyun, 12/94
Liberty, Gregory A., 6/95
Lindley, Gina G., 6/95
Lippincott, John, 6/96
Little, Anthony R., 6/96
Liu, Ernest L., 6/95
Lo, Vasuma, 6/95
Loch, Romanine, 6/95
Low, Justin J., 8/96
Lytle, Lloyd Elliott, 6/95

Maletta, John W., 3/96
Malik, Sundeep, 6/95
Martinez, Ryan J., 6/96
Mating, Narwhals, 8/95
McCallister, Wren V., 8/96
McWhorter, Mary E., 8/96
Miller, Sean R., 8/95
Miniken, Joshua A., 6/96
Mink, Karl D., 6/96
Mitchell, John, 3/95
Moesner, Patricia A., 6/96

Newkirk, Lee J., 6/95
Nguyen, Cuong B., 6/96
Nguyen, Cuong P., 8/95
Nguyen, Khanh, 8/95
Nguyen, Quynh-Giao, 8/94
Nguyen, Thieu, 12/95
Nguyen, Tien-Dat N., 6/96

Okino, Scott T., 6/96
Osborn, Tristan R., 6/96

Park, Miguel A., 6/95
Peto, Myron Frank, 8/94
Pham, Dao Gia, 6/96
Pham, Duc Gia, 6/96
Pham, Dung M., 6/96
Pham, Ngoc Trung, 8/96
Pham, Quynh-Nhu T., 6/95
Pham, Thao, 6/96
Plata, Cara, 6/96
Prevo, Laura Jean, 6/96

Rahman, Mohammed, 6/95
Ramos, Louis E., 12/94
Reynoso, Stefan T., 6/95
Roberts, Kenneth M., 3/96
Rose, Karl David, 6/95
Rustad, Tige, 8/96

Sanghera, Nivie, 6/95
Santiago, Jed V., 3/96
Schmidt, Bradley J., 6/96
Schwartz, Hillel T., 6/96
Shen, Charles Hao, 6/96
Sioson, Edgar L., 8/96
Sites, Jessica D., 8/96
Sjoberg, Sandra J., 6/96
Skovronsky, Sarah M., 6/96
Steczina, Ildiko O., 6/96
Stello, Carl Wayne, 8/96
Steward, Daniel J., 6/96

Tam, Edwin Quan, 6/95
Thompson, Chris, 8/95
Tobin, Sarina M., 6/96
Tran, David D., 6/96
Tsai, Nina, 8/94

Vanderwerf, Scott M., 8/94
Vanlandeghen, Megan, 8/95
Vermeulen, Anna M., 6/95
Vuong, Van C., 6/96

Wada, Akane, 8/96
Ward, Michael David, 6/95
Weigel, Nona Lyn, 12/94
Williamson, Keith A., 6/96
Winter, Brian, 12/94
Wong, Vincent, 6/96
Wong, Waishun, 3/95

Yang, See-Young, 6/95
Youngberg, Carrie L., 6/96

Double BS Degrees
Chemistry & Biochemistry

Buyama, Cheryl Reiko, 6/95
Fulton, Jennifer Robin, 6/95
Leng, Vuthy, 6/95
Miller, Gregory P., 6/96
Nhan, Thomas A., 6/96

Double BS Majors (Single Degree)

Cooper, John J., 6/96 (Biochemistry/Biology)
Dawson, Brian, 6/96 (Biochemistry/Biology)
Edfeldt, Fredrik, 6/95 (Chem/Biochemistry)
Kirol, Melanie D., 6/96 (Chem/Biochemistry)
Kwieciszewski, Bart, 6/96 (Biochem/Biology)
Lee, Allison An Shan, 6/95 (Chem/Biochem)
Owen, Michael P., 8/96 (Biochemistry/Biology)

Chemistry
BS and BA Degrees

Abulhosn, Makram S., BA 3/95
Anthis, Jeffrey W., BA 6/96
Aragon, Stacy Ann, BS 6/95
Asavalahaphun, Savarut, BA 8/94

Baker, Bradly M., BS 6/95
Ballard, Whitney M., BA 6/95
Barker, Scott Alan, BA 12/94
Barnes, David K., BS 6/95
Barnes, Melody C., BA 12/94
Bonham, Grant A., BA 8/95

Callahan, Sean D., BS 6/96
Calvetti, Mary Anne, BA 6/96
Campbell, Paul, BS 8/94
Cannard, Matthew J., BA 6/95
Carlson, William B., BS 8/95
Chen, Eliza T., BA 12/95
Chung, Alexander C., BS 6/95
Connell, Bret, BA 6/96
Coppa, Mark J., BA 3/96
Cosper, Steve R., BS 12/95

Dace, Daryl G., BA 8/94
Dale, Chris R., BA 6/96
Danner, Susan Lee, BS 3/96
Doughty, Judd W., BA 6/96

Giap, Binh P., BA 6/96

Haastrup, Morten G., BA 6/96
Harkness, John M., BS 6/95
Hendricks, Devin, BA 12/94
Heusser, Shannon L., BS 6/95
Ho, Joseph T., BS 6/96
Hodneland, Christian, BS 8/95
Hutterer, Katariina, BS 6/95

Jagmin, Jeffery A., BS 6/95

Kang, Won Ku, BA 12/95
Kincaid, Jesse J., BS 3/96
King, Julia Lynn, BS 3/95
King, Michelle, BS 8/94
Kobel, Michael John, BS 8/95
Koch, R. Scott, BA 12/95

Kogut, Megan B., BS 6/95
Ku, Cheng Hsien, BA 8/96
Kuehnert, Linda L., BS 6/95

Larsen, Delmar S., BS 6/95
Lee, Charles, BA 3/95
Lee, Sandi, BA 6/96
Lervold, Brian L., BA 6/96
Liu, Sai-Him Jeffrey, BS 8/94
Ly, Loreena P., BA 6/96

Mandel, Marla A., BS 6/95
Masui, Colin, BS 12/95
Mellen, Douglas Derke, BS 3/95
Messenger, Michael D., BS 8/95

Nguyen, Esme, BS 6/96
Nguyen, Michael Thuc, BS 6/95
Nguyen, Trieu Tan, BS 6/95
Nickols, Eric D., BS 12/94
Nielsen, Robert D., BS 8/95
Northcutt, Todd O., BS 6/96

Ojala, Sonja Maria, BA 6/95
Olivarez, Maria C., BA 3/95
Ordonia, Audrey M., BA 6/96
Osborn,James W., BS 8/96

Pesic, Ivana, BS 8/96
Pitzel, Carol M., BS 8/96
Plank, Thomas C., BS 6/95
Poyner, Sara Rae, BS 3/96

Rao, Ramesh David, BS 6/95
Riener, Jerome E., BS 6/96

Schroeder, Peter C., BA 6/96
Shen, Nancy H., BS 12/94
Skaggs, Sheldon A., BS 6/95
Smith, Heather M., BS 12/94
Smith, Steven Scott, BS 6/95
Snow, Lanee A., BS 6/96
Stanley, Robb G., BA 6/95
Stone, Steven M., BS 6/95

Tanner, Craig A., BA 8/95
Taylor, Marc R., BA 6/96
Trinneer, Jennifer, BA 6/96
Tseng, Su-Chen, BA 8/95
Tseng, Yu-Chun Jenny, BA 12/95
Tyler, Laurie A., BA 8/96

Wallace, Travis B., BS 12/95
Wieber, Nicholas A., BA 8/94
Wijewardene, Dulith, BA 8/94
Wong, Billy Somsat, BS 8/94
Wong, Timothy, BS 3/96
Woodworth, George, BA 6/95

FACULTY UPDATES,
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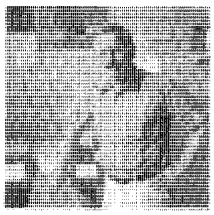
JAMES M. MAYER His recent work on the century-old problem of how permanganate oxidizes toluene (following work in the Wiberg labs in Bagley in the 1960s and 70s) was published in *Science* last fall. It has generated significant interest as he is traveling extensively this year (to talk about it to a bioinorganic meeting in Minneapolis, a conference on homogeneous catalysis in Princeton, an oxidation workshop in Hong Kong, two Gordon Conferences, and at several universities). He was also invited to speak at the Florida Catalysis Conference last April. Mayer's group has basically found that permanganate, which has no unpaired electrons, can act just like an oxygen radical and abstract hydrogen atoms from substrates. He continues to make outstanding contributions as chair of the Academic Personnel Committee.

YESHAYAU POCKER continues, now into his 11th year, to serve on the Board of Reviewing Editors for *Science*. Pocker delivered the 1996 3M Lecture, "Electrostatic Catalysis and Regulation by Ionic Clusters" and an invited paper at the 8th International Symposium on Enzymology and Molecular Biology of Carbonyl Metabolism.

BRIAN R. REID continued to provide leadership to the DNA Program Project which is now in its 14th year. While studying whether purines could pair with other purines instead of the A:T and G:C pairing of Watson and Crick, Reid's group found that G:A pairs are very stable when followed by A:G pairs, i.e. the sequence G-A on one strand of the double helix pairs with an antiparallel G-A on the other strand but the two purines pair "side-by-side" instead of "head-to-head." While trying to insert a third base in the middle the Reid group found that GGA "pairs" with GGA on the opposite strand without using the hydrogen-bonding face of any of the four G residues, creating a "sticky" surface to the DNA. The biological relevance comes from the fact that 6-7% of human "junk DNA" is TGGAA repeated hundreds of times and much of it is located in the centromere of each chromosome (the region by which each chromosome is dragged to the poles in mitosis). It looks like they've discovered the "sticky stuff" by which chromosomes get separated during cell division. The Reid group next found that the triplet GCA can also pair with itself (using G:A "pairs") and can turn 180 degree corners (again using G:A pairs) to form DNA "hairpins" instead of double helices. The excitement over this discovery stems from the fact that muscular dystrophy, muscular atrophy, Huntington's disease (and possibly some inherited human cancers) have all recently been discovered to involve exactly the same mechanism, which is the expansion of a short run of repeated GCA codewords in the affected gene.



PHILIP J. REID was the recipient of a Camille and Henry Dreyfus New Faculty Award. He was also selected as one of two UW applicants for the highly prestigious Packard Fellowship. (see related article, page 18.)

WILLIAM P. REINHARDT This year has seen the introduction of a new research field, studies of the Bose-Einstein Condensation (BEC), to the activities of the group. The BEC is a newly created and fully quantum mechanical gas at a temperature of 10^{-8} ^{o}K. This unusual substance is a gas, but "shatters" on being dropped, and spawns solitons when two "chunks" are combined. Reinhardt's group has gotten into this very fast moving area through a long standing collaboration with the

FACULTY UPDATES,
continued on page 20

750 MHz NMR Anchored

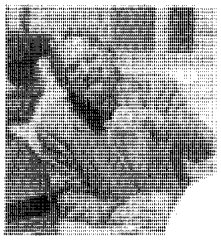
December is usually associated with family gatherings, gift exchanges, and caloric excess. For Gary Drobny, last December had him concentrating instead on the minutiae involved with the installation of a $1.8 million dollar, 750 MHz magnet seven feet below the ground level of Bagley Hall.

A trivial task this was not. A special pit was modified to accommodate the sensitive instrument and a large concrete pad was built to insure the stability of the magnet. A stairway into the pit was needed and a railing around the giant hole was also included for obvious reasons. A teaching laboratory is located above the pit and even though OSHA guidelines allow magnetic fields up to 100 gaus, signs need to be erected if the field exceeds five gaus. To minimize the area requiring warning signs for those wearing pacemakers, the pit was built deeper than originally anticipated.

Prior to any of this work, one of the outside walls of the ground-floor laboratory had to be removed and replaced with a door large enough to provide access for forklifts and huge chains required to lift a two-ton object. Wooden scaffolding was assembled and special cribpiles using four feet by five feet by six feet wooden planks were built so that pieces of the magnet could be lowered into place. The NMR could only be assembled in the pit.

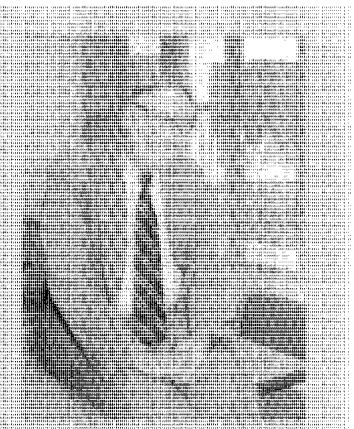
As if this all wasn't complicated enough, the first magnet had a cracked nitrogen dewar when it arrived and had to be sent back. The original crate had been stolen from the department's loading dock and it became a job for the machine shop to design and build another crate for the magnet's return trip.

In Drobny's laboratory alone, there are 500, 400, and 200 NMRs. He is a member of the advisory committee of the Battelle/Pacific Northwest Laboratories' Macromolecular Structure and Dynamics Program and he is chairman of the Outside Users Committee for the department's NMRs. Drobny is also a member of a separate 750 Users Committee. These other researchers include faculty from the medical school.



The new magnet and $200,000 Bruker Instruments DMX console will allow smaller samples to be used and larger molecular protein systems to be studied. The magnet is made by MAGNEX Scientific, Inc. Drobny says the department's 750 NMR is the only one of its kind at a university west of the Mississippi River.

Holm is Fourth Cady Lecturer



Harvard University Chemistry Professor Richard H. Holm spoke about "Chemical Approaches to Bridged Biological Assemblies" during the fourth annual Cady Lecture in June of 1995.

His research interests are in the inorganic chemistry of the transition elements. Among the recent contributions of the Holm group are those in the areas of static and dynamic molecular stereochemistry, applications of paramagnetic NMR to problems of structure and reactivity, multielectron transfer series, stereoselective, biomimetic synthesis of mono and polynuclear complexes, organometallic derivatives, magnetic properties of solid state, mixed valence and homometallic complexes, and bioinorganic chemistry with emphasis on synthetic analogs and reaction systems of the active sites of cytochrome P-450, iron-sulfur proteins and enzymes, molybdenum nitrogenase, and the Ni- and V-containing sites of nitrogenases.

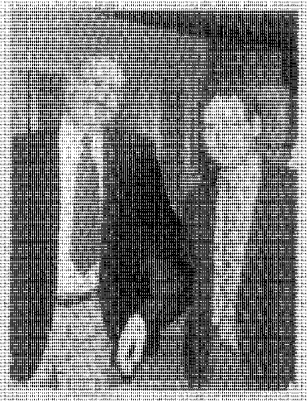
Current UM chemistry faculty member Julie A. Kovacs was a Holm student.

Dougherty Presents Dauben Lecture

"The Cation-π Interaction: From the Gas Phase to Cytochromes to Neuroreceptors" was the subject of Professor Dennis A. Dougherty's 17th Hyp J. Dauben, Jr. lecture in May 1995.

Dougherty is on the faculty at the California Institute of Technology, which he joined after doing postdoctoral work with Jerome Berson at Yale University.

Two separate areas of chemistry have been the targets of Dougherty's research. The first has involved high spin organic molecules and the development of organic materials with novel magnetic properties. The second has established the importance of the cation-π interaction in molecular recognition phenomena in aqueous media and in a variety of biological receptors, especially those of prominence in neurobiology. More recent work in Professor Dougherty's laboratory has sought to combine the tools of physical organic chemistry and modern molecular neurobiology to gain atomic-scale information on the workings of the brain.



Catalysis Subject of Cady Presentation

California Institute of Technology Professor John E. Bercaw spoke about "Processes: Polymerization: A Highly Efficient Asymmetric Catalytic Chemistry" when he delivered the 10th annual George H. Cady lecture this past May.

Bercaw's research interests are in synthetic, structural, and mechanistic organotransition metal chemistry, the activation of simple hydrogen bonds of hydrocarbons, olefin polymerization, catalytic hydrocarbon oxidation, the determination of bond dissociation energies for organometallic compounds and the mechanisms of stereochemical transformations in organometallic chemistry.

Cady was a distinguished inorganic chemist and on the faculty from 1928 until his retirement in 1972. He was department chair for four years in the mid-1950s.

Pictured Wayne E. Barnes and his former Ph.D. student, current UW faculty member, Jim Mayer.

Speaker Has Close UW Chemistry Ties

The 1998 P. C. Cross Lecturer, University of Southern California Professor Larry R. Dalton, earned his Ph.D. at Harvard with current UW Vice Provost for Research and former departmental Chair Alvin L. Kwiram (pictured with his hand on the railing). Under Dalton's tutelage, current UW chemistry Professor Bruce H. Robinson earned his Ph.D. at Vanderbilt University.

Dalton's career has focused on nonlinear magnetic resonance and optical spectroscopies and on the synthesis and characterization of new materials with novel electrical, magnetic, or optical properties. Along with Kwiram, Robinson, and others, he introduced a number of variants of saturation transfer magnetic resonance spectroscopy and applied these techniques to the characterization of molecular and supramolecular dynamics of red blood cell proteins and to the characterization of the rotational dynamics of DNA.

"The Role of Chemistry in Opto-Electronic Communications in the 21st Century" was the title of his May 1998 Cross Lecture. In addition to his position in chemistry at USC, Dalton is also professor of chemical engineering and the director of the Center for Nanoscale Materials and Processing.

Schreiber and Signal Transduction

The co-founder and co-editor of the prestigious journal *Chemistry and Biology* was the invited Hun J. Dauben speaker for 1996.

Stuart L. Schreiber received his degree at Harvard with E. J. Corey (an UW chemistry Chair Paul B. Hopkins, with whom he is pictured). He held his first teaching position at Yale University and then returned to Harvard in 1989, where he is presently on the chemistry faculty and an investigator at the Howard Hughes Medical Institute.

Schreiber's work fields synthetic organic chemistry with cell biology. He has identified, for example, calcineurin as a mediator of T cell receptor signaling and FKBP as a mediator of signaling that link antigenic pathways to the cell cycle machinery. His work led to the structure determination of SH2 domains complexed to natural and nonnatural ligands and to a general understanding of how these receptors function.

Start of a New Era

The tires have been kicked, as it were, and with the exception of a few minor perturbations, all reports indicate the new Chemistry Building is a huge success.

Open nearly two years, the building did seem to be haunted in its early days. Actually, only the elevator seemed to be possessed, as it often failed to stop level with the floor, didn't come when called, lurched while in operation, and, to coin an old Beatles' tune, occasionally took passengers on a "magical mystery tour."

These problems, however, have been fixed. So has the malfunctioning air conditioning system, which didn't shut off in the winter and the overactive heating system, which didn't shut off in the summer.

Not a letter of graffiti has marred the building's beautiful maple interior. The electric doors still are still functional (if you're tall enough to arouse the motion detector). There has even been an inaugural fire. Quickly extinguished, the explosion was in Professor Wes Borden's lab. He, it should be noted, served as chair of the new building committee for two years.

While not quite up to Hollywood standards, the new building has also been the site of a 30-second television commercial which is airing during nationally televised Husky sporting events this year. In addition, faculty meetings, guest lecturers, dissertation defenses, and group meetings are held in its seminar rooms.

The School of Public Affairs, which has been occupying the fourth floor of Bagley Hall recently moved back to their renovated space in Parrington Hall. Half of this vacated space will be given to UWEB (University of Washington Engineered Biomaterials), a new UW/Industry/NSF consortium. The other half becomes available space for employees throughout the university who are being affected by other campus renovations. The Center for Instructional Development and Research (CIDR) will remain on the third floor of Bagley Hall for the next several years.

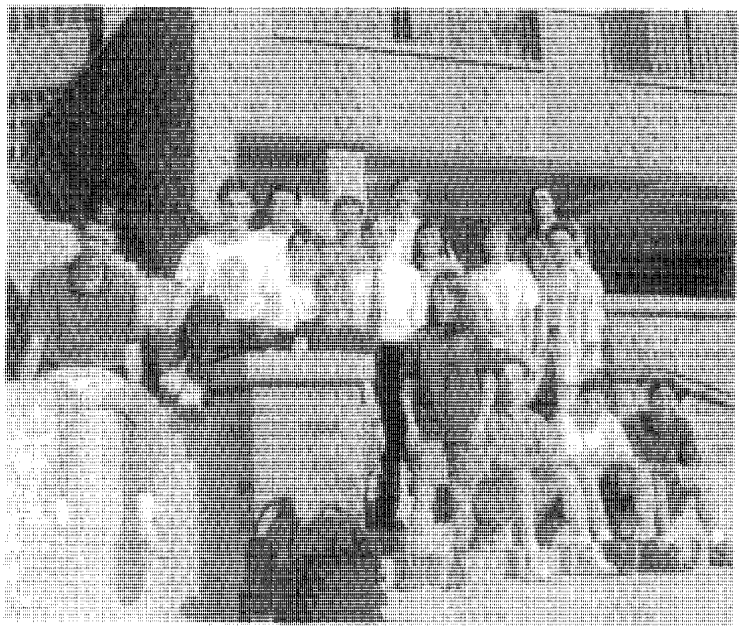
The most recent change in Bagley is with the physical chemistry laboratory, a longtime fixture on the first floor. Modern space on the third floor with more fume hoods has been renovated to house this required, senior-level laboratory.

Graduate

1994

Seated on steps from left: Jian Wu, Chevron Fellow; Mirjam van Roon, Ritter Fellow; Bodil Willumsen, Dow Fellow. Standing from left below the railing: Helen Powell, Weinstein Fellow; Brenda Woodward, West Fellow; John Stringer, Molecular Biophysics Training Grant Fellow; Paul Mobley, Kwiram/CCR Fellow; Steve Moskowitz, Outstanding TA Award, Steve Gerst, Outstanding TA Award; Paul Shelley, du Pont Fellow; Steve Alley, ACS Organic Division Fellow. Standing from left above the railing: Leon Slutsky, associate chair for graduate program; Scott Lewis, Saegebarth Fellow; Amy Szuchmacher, Ringold Fellow; Simonida Rutar, Mindlin Fellow; Tracy Baas, Biotechnology Training Fellow; Mary Hatcher, Hitchings Fellow; Nathan Oyler, Nist Fellow.

Student

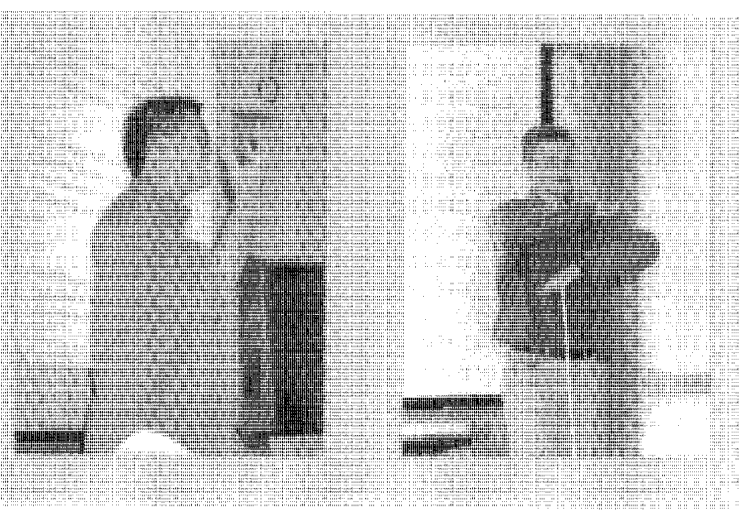


1995

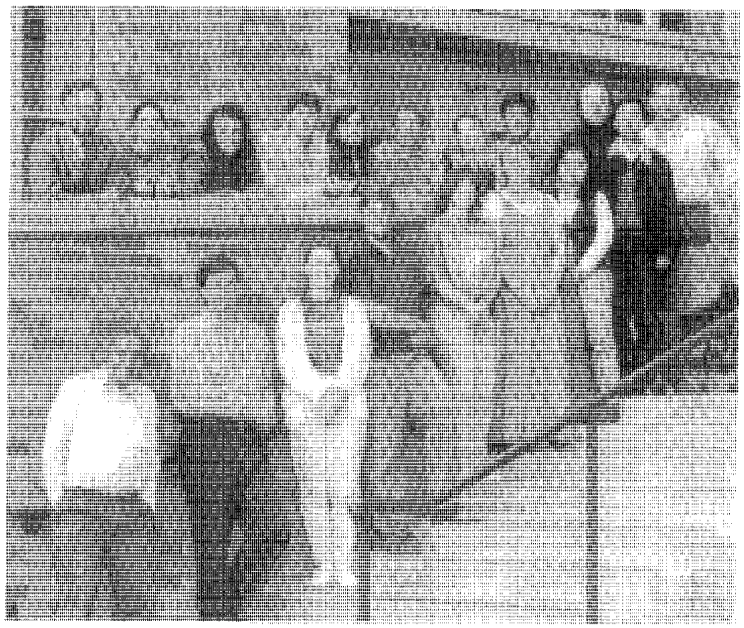
Seated or standing in the bottom row from left: Brett Goldston, Ringold Fellow; Scott Williams, Kwiram/CCR Fellow; Jennifer Tonkin, Mindlin Fellow; Kate Foster, Saegebarth Fellow; Jeff Marks, West Fellow; Tom Crevier, Ritter Fellow, Johnny Lai, Outstanding Teaching Assistant Award. Second row from left: Christopher Way, Hitchings Fellow; Paul Hopkins, departmental chair; Shannon O'Hogan, Nist Fellow; Cathy Radzewich, Ritter Fellow; Alex Aronov, Dow Fellow. Third row from left: Surya Wiryana, Saegebarth Fellow; Aaron Frank, Chevron Fellow, Kevin Bartlett, ARCS Fellow, David Bryant (far right), Weinstein Fellow. Not pictured is Outstanding Teaching Assistant Award winner Helen Powell.

A chance to share research results with their peers and faculty, a catered lunch, and gift certificates to the participants are the hallmarks of the annual springtime Undergraduate Research Symposium. Hosted by the Chemical Reactionaries (chemistry graduate student club), Free Radicals (undergraduate club), University Bookstore, and the Departments of Chemistry and Biochemistry, the symposia have also featured a graduate student panel which gives feedback to the speakers after each presentation.

From left, Ronald Cheung was a biochemistry and biology graduate who is now in the UW MD/Ph.D. program. His talk was entitled "The Creation of High Binding Capacity Metallothioneins Through Applied Molecular Evolution" and his research supervisor was Biochemist Milton Gordon. Nathan Leutke, a biochemistry major in Professor Paul Hopkins's laboratory, spoke on "Interstrand Cross-Linking of Nucleosomal DNA." He plans to attend biochemistry graduate school. John Lach, a math major working with Professor Bill Reinhardt, did research on "Configurational Bias Monte Carlo for Flexible Polymers." Lach now works in private industry.

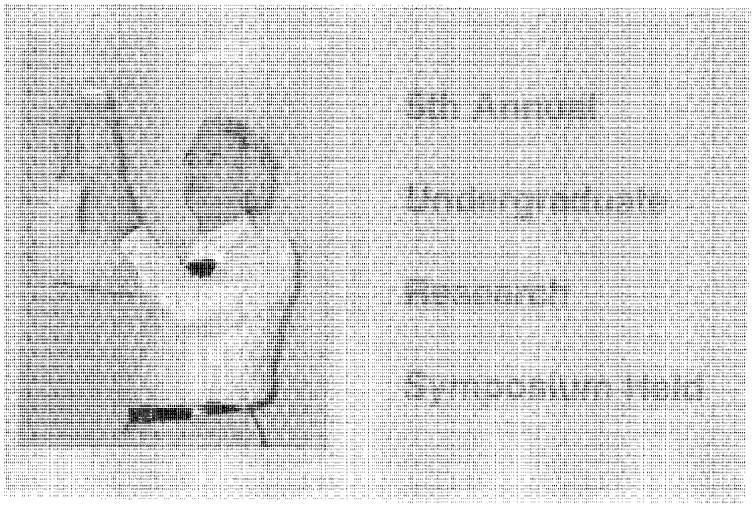


Fellows



1996

From left ascending stairs: Leon Slutsky, associate chair for the graduate program; Keith Miller, Saegebarth Fellow; April Getty, Ritter Fellow; Dan Brims, West Fellow; Amy Szuchmacher, Shain Fellow; Heidi Daigler, Ringold Fellow; Karen Lo, Nist Fellow; Jason Gao. Top row from right to left: Wes Quigley, Kwiram/CCR Fellow; Darin DuMez, Chevron Fellow; James Law, Weinstein Fellow; Adrienne Karpiel, Mindlin Fellow; Michael Hart, NASA Space Grant Fellow; Kristina Peterson, Dow Fellow; Adam Schafer, Outstanding Teaching Assistant Award; Helen Cargill, ARCS Fellow; Renee van Ginhoven, Hitchings Fellow; Paul Hopkins, chair. Not pictured is Henry Jackson, NASA Space Grant Fellow.



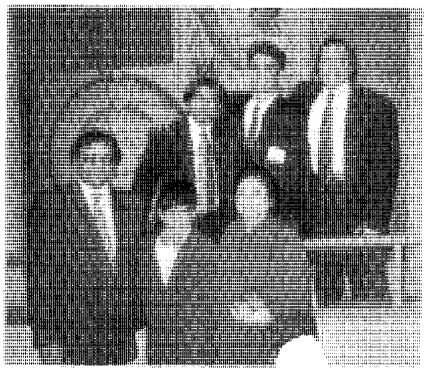
L'Affaire Commencement

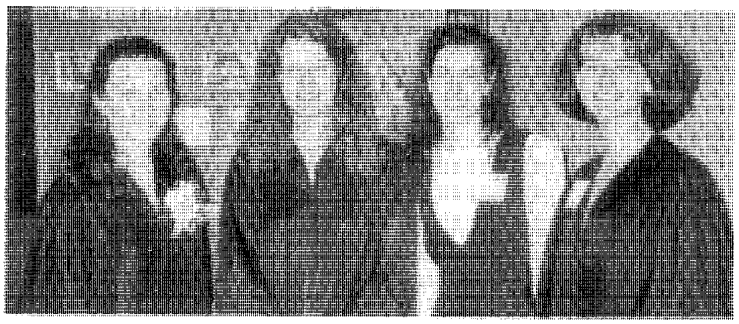
The exams are over, grades are in, and the pressure is off. It's time to party!

In recognition of students' accomplishments, the department hosts an annual commencement brunch to which the students and their families are invited. Parents get a chance to not only meet their children's professors, but are also given tours of research and teaching laboratories. Nearly all faculty attend although some good-naturedly grumble that they have to wear a tie and that compromises their academic freedom.

Former Chair Bob Watts is shown with his research student Delmar Larsen. Larsen is currently a second year graduate student at the University of Chicago, where he is a member of Professor Graham Fleming's research group. Larsen was a speaker at an undergraduate research symposium, where he discussed "Growth of Methanol Clusters within Helium Cluster Environments."

Winning the award for Furthest Distance Traveled is Mohammed A. Rahman's (top row center) family. Even though flying to Seattle from the United Arab Emirates takes approximately 30 hours, the Rahmans are frequent visitors to the United States and wouldn't have missed Mohammed's graduation.





Commencement exercises have become so popular to attend that students in natural science programs in the College of Arts and Sciences now graduate in the afternoon, along with the College of Engineering and various other colleges and schools. A&S humanities and social science majors continue to graduate in the morning. Pictured above are, from left, Anna M. Vermeulen, Brenda A. Harthan, Marla A. Mandel, and Kellie J. Filbin. Mandel earned her degree in chemistry and the other three women were biochemistry majors.

FOUR NEW FACULTY,
continued from page 9

Craig Beeson...

There he worked with Tom Dix and at Stanford University, where he did postdoctoral work, he was a member of Harden McConnell's group.

As a new assistant professor in the UW chemistry department, Beeson's work focuses on the chemistry of the immune system. He's interested in molecules that mediate cellular communication and one of the best systems in which to study such molecules is the immunological network. Much of his collaborative work with immunologists at the UW, Stanford, University of Minnesota, Washington University, and the Karolinski Institute has implications for the treatment of autoimmune diseases such as rheumatoid arthritis, diabetes, and multiple sclerosis.

Plants are another of Beeson's interests. He started out as a natural products chemist and as an amateur botanist, he's collected a large number of medicinally-important plants. While he no longer has a greenhouse (homes for his seven turtles have taken over that space), he does still collect plants, particularly those from early taxa.

Beeson and his fiancé, Gyda Gray, a medical technologist, enjoy hiking, camping, and fishing.

Karen Goldberg...

funding when she accepted her UW position, as this money is earmarked for faculty at schools without graduate programs. This past summer, Goldberg gave invited talks at the national ACS meeting in Orlando, FL and at the NSF Organometallics Workshop and last winter, she was an invited speaker at the International Chemical Congress of Pacific Basin Societies in Hawaii.

Goldberg's oldest sister is an art and archaeological conservationist at the Smithsonian and another sister is the artistic director for a dance company in Los Angeles. In fact, it was many years ago during a visit to this sister when she was a member of the Pacific Northwest Ballet that Goldberg saw Seattle for the first time and vowed to someday live here.

As to why she eventually chose inorganic chemistry as a career, it all comes down to d orbitals. The summer between her sophomore and junior years at Columbia, she did an NSF research project at Cornell. In looking through the book of projects, she just liked how d orbitals looked, so she decided to hook up with the professor in this area. She hadn't ever heard of Roald Hoffman but the fact that he won the Nobel Prize that fall meant her intuition hadn't failed her.

Bart Kahr...

Yale. In 1990, he joined the faculty at Purdue University and when he arrives next quarter in Seattle, it will be as an associate professor with tenure.

Kahr's mother is a historian of wrought ironwork, a subject that also combines art and chemistry. Prior to that, she was for many years a dance therapist, with formal training in ballet. His younger sister is the dean of the York School in Manhattan, and his older brother a London-based psychologist specializing in children, criminals, and how to prevent the former from becoming the latter. One of his specializations is in the treatment of serial killers and he is also a lecturer at Regents College. Kahr's father has worked in the New Jersey real estate industry in order to support these ecclectic activities.

Kahr's partner, Ann Kurth, the author of "Until the Cure: Caring for Women with HIV" (Yale University Press, 1994), is a midwife and public health specialist by training. She recently served as the president of the Association of Nurses in AIDS Care, and her principal interests are in reproductive and sexual health. Kahr and Kurth are expecting their first baby this coming August.

Phil Reid disproves Thomas Wolfe's philosophy that you can't go home again. Raised less than 20 miles away in the Seattle suburb of Bremerton, Reid has returned to the Emerald City as an assistant professor of physical chemistry at the UW. Which may surprise the teachers at Bremerton High School, since Phil never took any chemistry.

In a certain sense, Reid thinks he was fortunate not to have picked up any bad habits (or scarring memories) from high school chemistry and even though he skipped the chemistry majors' introductory year sequence, he was a committed chemist by the time he reached organic in his sophomore year at the University of Puget Sound in Tacoma, WA.

His mentor at UPS became 1976 UW Ph.D. alum Ken Rousslang and it was undergraduate research with Rousslang which got him interested in spectroscopy and associated biological problems. When it came time for graduate school, Reid said he applied to, and eventually attended, UC Berkeley on a dare. It was time to sink or swim with the big fish and Rich Mathes, a renowned spectroscopist on the Berkeley faculty, was a big enough lure to convince Reid the challenge was worthwhile.

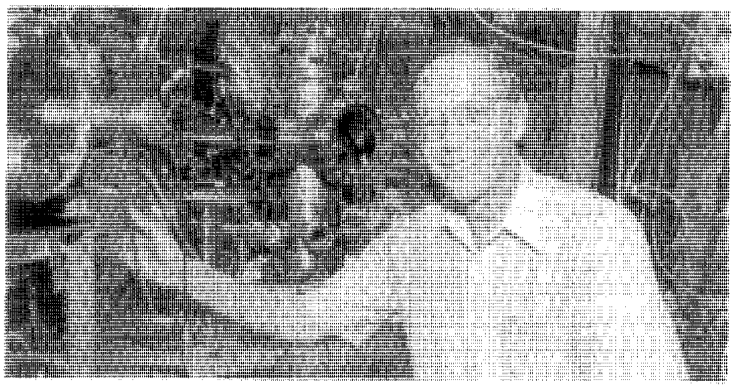
Combining the spectroscopic techniques learned as a graduate student with the chemistry he had been involved with in his postdoctoral work at the University of Minnesota with Paul Barbara, Reid is now looking at the dynamics of environmentally important reactions involving radicals in the condensed phase. The environment is relatively unexplored by physical chemists. Reid believes that his group can make significant contributions. Or, as he calls it, he does "p chem with a purpose."

Since coming to the UW, Reid has received a Dreyfus New Faculty Award and has been an invited lecturer at the Northwest Spectroscopy Association, Pacific Northwest Laboratories, and at the National Institute for the Advancement of Interdisciplinary Research in Japan he spoke on the ultrafast dynamics of the solvated electron.

Reid's 20-month old baby, Sierra, occupies what discretionary time he has. While he still occasionally runs and cycles a fair amount, he has no more time for swimming. As a former competitive triathlete, he competed more than anything else as a release from chemistry and felt it was good to beat himself to death in other areas for a change. Reid met his wife, Carolyn, a physical therapist, in a college chemistry course.

Reid admits he isn't someone with a set plan and his career trajectory has been influenced almost randomly at times. Having fun with his career is a priority and he's thankful he didn't take his last college course in ceramics as his first college course or he might have been an art major.

Outstanding Chemistry Staff Awarded Recognition



Ed McArthur, former Machine Shop supervisor, is the 1996 recipient of the Department of Chemistry's Outstanding Staff Prize.

Unofficially, he could also be the recipient of the "Employee Who Refused to Leave" award. Ed started as temporary staff in 1962, quickly turned that job into permanent employment, and 35 years and one official retirement dinner later, the Department of Chemistry still has Ed on the payroll. Taking advantage of state retirement regulations, he has remained in Bagley Hall on a 40% post-retirement basis.

It's been the non-hierarchical structure of Bagley Hall that has kept Ed happy for the last 23 years (his first ten years at the UW were in nuclear physics). Compared to other machining jobs he had prior to coming to chemistry, he's been able to make more equipment design contributions at the front end of a project because of the relaxed atmosphere. This, in turn, has transformed what can be the isolating job of machinist into more of a team effort. And a fulfilling career.

Ed's insatiable curiosity strikes one early on during a conversation. He's fascinated by most anything he doesn't already know and says he would love to learn how to sew. This burn to learn has led him to take fiddle lessons, an outgrowth of his love of folk dancing, and he has plans to build his own fiddle. Ed reads almost anything and everything he can get his hands on - from non-fiction books to the *New Yorker* to the *Economist* to survivalist literature and he takes full advantage of the library's magazine exchange.

Ed refers to his hobbies as addictions. When he isn't tinkering on his houseboat ("Winnebago on the water"), riding his bicycle, dancing, taking music lessons or attending fiddle camp (a middle-aged man's fantasyland, Ed has found) he can be found on the soccer field. He belongs to a "old man's league" and they've kicked that ball all around the world. Brazil, Hong Kong, and Spain are but a few of the faraway places they've played but lest you think this is an elite group of athletes, Ed says no skill level is required for his team. Participation is more a function of who has the plane fare to travel to the next game.

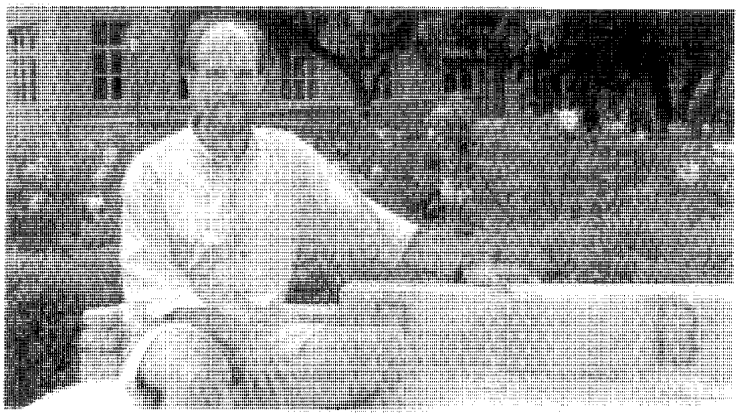
His addiction to folk dancing dates back nearly 40 years and it was at an open dance session on the UW campus that he met Sally, the woman who would become his wife. They enjoy Scandinavian, Scottish, French, Contra, and Swing dancing and have traveled to Europe on numerous occasions to attend dance festivals. When pressed, Ed does recall a few trips that he and Sally have taken - cruises, mainly - that weren't associated with his addictions.

Ed has always been a tinkerer and claims to have inherited that trait from his father, who was actually educated as a pharmacist (as was his mother). He rose from modest surroundings - he is the middle of seven children - and he remembers building home furniture when he was ten years old. Everytime his parents had a new kid, they just added a new room to their house and Ed learned some of his craft as a result.

His two children, a son and a daughter, have blessed him with three grandchildren. Sally has run a Montessori pre-school for nearly 20 years.

Ed says that luck has permeated his life. He's been lucky that his supervisors have been great guys who always took him under their wings and made sure he got interesting jobs. Raising his kids was pretty easy because he was lucky he had really good children. He's lucky he missed being shipped out to Viet Nam although his job in the Army reserve was to process other young men as they left for Southeast Asia in the early 1970s as tensions were heating up. And so on. While serendipity may have played some role in his life, Ed downplays the fact that he might have been an exemplary employee, wonderful father, and all-around good guy.

That certainly didn't escape the attention of the Department of Chemistry, which is "lucky" that Ed's retirement days are being partially spent in Bagley Hall.



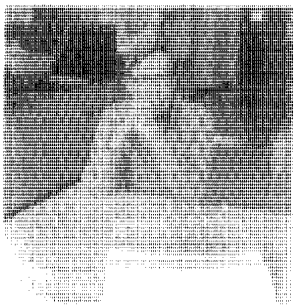
The first staff person in the Department of Chemistry required to carry a beeper is the 1995 recipient of the "Outstanding Staff Prize." After all, one should be rewarded for the willingness to give up one's freedom.

As the Director of Spectral Services, it can be said that as Jim Roe goes, so goes departmental instrumentation. He's responsible for keeping the mass spectrometers, FTIRs, the ICP, and other equipment in peak operating

OUTSTANDING STAFF AWARDS,
continued on page 22

Classic Experimentalist Dies, Member of Faculty For Nearly 40 Years

David Frank Eggers, Jr., 73, professor emeritus, died August 1995.



Eggers was born in Oak Park, IL in 1922 and received his bachelor's degree in 1943 from the University of Illinois. His doctoral work at the University of Minnesota (Minneapolis) was interrupted for three years while he worked on the Manhattan Project as a chemist for the Tennessee Eastman Corporation. There, he designed and maintained assay mass spectrometers and attended graduate school part-time at the University of Tennessee. Eggers returned to Minnesota in 1947, and shortly before receiving his Ph.D. in 1951, he took a position as instructor of chemistry at the University of Washington. He was promoted to full professor in 1963 and became professor emeritus at the UW in September 1990.

He was the coauthor of the highly respected book "Physical Chemistry" published in 1964 with UW colleagues Norman W. Gregory, George D. Halsey, Jr., and B. Seymour Rabinovitch. Eggers had nearly 60 published papers and was active in graduate and undergraduate education.

Eggers was an internationally recognized expert in the field of infrared spectra of species that were primarily in the gas phase. The main objective of this work was to determine the force fields that govern molecular vibrations. He was also known for his work on the analysis of rotational structure in infrared bands, the analysis of data on gas phase molecules, and the absolute intensities of infrared lines.

Eggers discovered the plastic crystal phase of ethane, which exists over an interval of about 1 degree C between the regimes where the ordinary crystalline solid and the ordinary liquid phase are the stable forms. A plastic crystal is one in which the positions of the molecules are regularly ordered, as in an ordinary crystal, but the molecules rotate almost freely in place. Eggers's collaborators say he was an extraordinarily talented experimentalist in the classical tradition: he synthesized his own compounds, he blew his own glass, and he built or modified much of his own instrumentation. Indeed, he built the first two lasers in the UW Department of Chemistry.

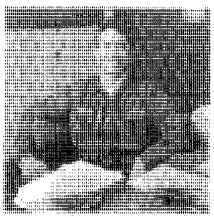
He was predeceased in 1981 by his son, Richard, who held a Ph.D. in nuclear physics. Eggers is survived by his wife, Vera and two other children: Daniel, a Ph.D. in computer science and Ann, a music teacher, all in the Seattle area. Donations in Eggers's memory can be made to the Department of Chemistry.

FACULTY UPDATES,
continued from page 13

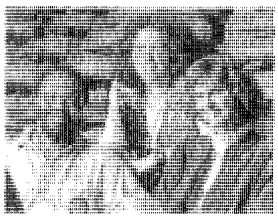
National Institute for Standards and Technology (NIST). Other ongoing areas of research include the freezing of water clusters, self assembly of two dimensional lipid layers, mathematical studies of the spreading of fluids on surfaces, efficient methods for carrying out simulations of polymers, and the microscopic origins of friction as it might arise when a polymer is pulled through a gel-like network. Other collaborations have resulted in trips to Copenhagen, Oxford, and Boulder, Colorado, the home of the BEC. Reinhardt has given several talks on "Chaos," most recently to the downtown Seattle Rotary Club, where he spoke to over 400 business leaders.

TOMIKAZU SASAKI coordinated the collection of data for the Department's upcoming Decennial Review.

J. MICHAEL SCHURR NIH funding was restored after a year's hiatus, and along with continuing NSF grant support, allows the Schurr group to pursue work in the general area of DNA dynamics. Among his many presentations, Schurr (sometimes accompanied by his students) presented posters at the National Biophysics Meeting last February in San Francisco, gave an invited colloquium and seminar at the University of Nebraska, gave seminars locally, participated in the winter Gordon Conference (Colloidal, Macromolecular, and Polyelectrolyte Solutions) where he presented a lecture, gave a lecture on "Long-Range Perturbations of DNA Secondary Structure by Coherent Bending and Sp1 Binding" at the Biological Fluorescence Subgroup Meeting at the Biophysical Society Meeting last February, spoke at the Laser Applications in the Life Sciences' 96 Conference in the former East Germany on "New Twists in the Thermodynamics of Supercoiled DNAs" and "Long-Range Perturbations of DNA Secondary Structure by Coherent Bending and Protein Binding." Schurr also participated in the annual Gibbs Conference on Biothermodynamics as the keynote lecturer, "Long-Range Modulation of DNA Tertiary and Secondary Structure by Protein Binding." Most importantly, Schurr became a grandfather again in June, this time via daughter Becky, who was also awarded tenure at Seattle University where she is on the biology faculty.

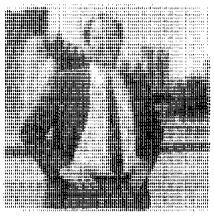


SARA SELFE The third annual Native American Science Outreach Network (NASON) summer program was another huge success in 1996 and NSF (and other) funding is pending for future years. The goal of NASON is to prepare Native Americans to succeed in the sciences at the university-level. Selfe and her staff have worked with tribal leaders, educators and com-



Chemical Education Faculty Frazier Nyasulu, Sara Selfe, and Deborah Wiegand

munity representatives to understand the many factors influencing both the successes and failures of education for Indian students, generally and in the sciences, specifically. Participants work with UW students and the NASON staff during a one-month summer institute. In addition, Selfe has toured the state visiting the schools of the NASON participants. Ten schools were visited and chemical demonstrations were presented at assemblies and/or NASON staff worked in the classroom with students on water monitoring projects. A total of over 2000 K-12 students were impacted by the fall visits. Selfe presented an invited lecture at the National Indian Education Association Conference in Arizona last fall and frequently travels to national Indian meetings.



ROBERT E. SYNOVEC A low-volume chemical sensor that can serve as a detector for liquid chromatography, flow injection analysis, and gas chromatography has been developed by Synovec and coworkers at CPAC. The sensor consists of an optical fiber within a transparent capillary tube, with an annular space for sample flow in between. Chemical species flow from a sample partition into the optical fiber cladding material, which functions as a chromatographic stationary phase. The partitioned chemical species modulate light propagating through the fiber, causing a phenomenon called mode filtering that can be detected and related to sample concentration. Traditionally, such mode filtered light has been measured as changes in transmitted beam intensity at the end of a fiber. But Synovec and coworkers introduced an alternative means of detection in which mode-filtered light is measured as it emanates from a small area at a right angle to the fiber's primary axis. This provides a signal-to-noise advantage over end-of-fiber detection because essentially the same signal is measured against a small background instead of a large blackboard.

Synovec and coworkers introduced an alternative means of detection in which mode-filtered light is measured as it emanates from a small area at a right angle to the fiber's primary axis. This provides a signal-to-noise advantage.

FRANK TURECEK continued as editor of *Journal of Mass Spectrometry*. He was appointed to the editorial board of *Spectroscopy Letters*.

BOB VANDENBOSCH traveled to Brazil last April to present a paper on near-barrier heavy ion fusion reactions at an international meeting. He is presently enthusiastic about a new program in atomic and molecular cluster science. He and his collaborators have developed a C_{60} beam and have made their first observations of two fragments from a single collision with a hydrogen gas target.

ROBERT O. WATTS accepted a position as head of the chemistry program at the University of Melbourne.

DEBORAH WIEGAND continues her successful Science Service Learning program, which provides service in both elementary and secondary classrooms. SSL students learn effective methods of interacting with students through training and observation of expert teachers. SSL courses are a way for students applying to the teacher certification degree program to meet the sixty-hour observation requirement.

DARRELL J. WOODMAN The NSF-REU (Research Experiences for Undergraduates) Site Grant, of which Woodman served as project director, was renewed for 1996 and 1997. His current focus is the development of a comprehensive library of computer graphics concept presentation units for classroom projection in general and organic chemistry to illustrate chemical phenomena involving complex three-dimensional relationships and structure and dynamic processes. The collection of approximately 100 units is in use by many instructors in the department and at test site institutions elsewhere. John Wiley & Sons, Inc., publishers this year has released two initial Macintosh version CD-ROMs for both general chemistry and organic chemistry, and has cross-platform CD-ROMs in preparation.

WILLIAM H. ZOLLER continues to be director of the Outreach Program to High Schools. The program sends undergraduate students across the State to deliver lectures on topics such as the Greenhouse Effect, Ozone Hole, Environmental Effects of the Space Shuttle, Water Monitoring, Mount St. Helens and Chernobyl. Last year the program reached over 10,000 students at 47 high schools in 126 talks. Also under Zoller's direction, the sixth annual Science Outreach Day was held last spring and allowed some 100 high school students and their teachers to explore the scientific capabilities of the University.

OUTSTANDING STAFF AWARDS,
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condition. He makes sure the senior-level instrumentation courses are supported and he works closely with research groups on specific problems. However, the perks of the job for him come from slightly different sources.

Jim enjoys building new instrumentation and modifying existing machines to fit the creative inclinations of the faculty. He also enjoys employing the variety of skills which are required for his position: from computer programming to optics to electronics, Jim's work requires a plethora of talents.

Also regarded as a job plus is the autonomy with which he works. The flip side of being spread thinly around the department, which he is, is that accountability to any one faculty becomes less of an issue. Jim also enjoys his graduate student contact and says the combination of these benefits outweigh salary considerations. Usually.

After receiving his BS degree in chemistry from Cleveland's Case Western Reserve University in 1974, Jim held a series of laboratory jobs, including working with medical products and working on air pollution abatement. While still in the midwest, he also did a lot of volunteer work at the Free Clinic, a street kid's shelter where he would counsel runaways on addiction treatments, venereal disease and pregnancy prevention, and other consequences arising from being young, poor, and homeless.

However, things just weren't happening in Cleveland and Jim took advantage of the fact this his sister was working in Seattle to move here in 1979. From then, things began to fall into place.

Jim met his wife, Susan Yount, playing Irish folk music at a party. While he plays the mandolin, guitar, clarinet, and saxophone, Susan, a CPA, plays the viola and violin. Although he plays mostly for fun and personal relaxation, Jim has played at the annual Folklife Festival at the Seattle Center and at numerous renaissance fairs in the Pacific Northwest. His musical tastes include Dixieland and ragtime.

Woodworking, specifically making furniture, is another hobby that Jim enjoys, when he isn't busy "doing" science at his seven year old son's elementary school. He realizes that if he is to change the way science is taught, he's going to have to be a regular presence at the school. Jim always participates in the Department of Chemistry's science outreach days as a further avenue for reaching school-aged children.

In his younger days, Jim enjoyed marathon running and would like to someday participate in a local triathlon. Also looking to the future, he can see himself doing his present job for some time to come, which comes as a relief to the chemistry faculty.

Outstanding Alumnus

"Fly Me to the Moon" Gets New Interpretation

Janet Kavandi's son thinks all adults fly. That's because this six-year old's father is an airline pilot and his mom is an astronaut, as well as a pilot, and most of his friends' parents make their living traveling to and from outer space.

But when this youngster and his three-year old sister get a little older, they'll understand that their mother is part of a very small group of highly talented people who have been selected by NASA to work as Space Shuttle mission specialists. What they'll also learn is that their mother is among the fortunate few who have realized a childhood dream.

Janet (1990 UW chemistry Ph.D.) remembers herself as a little girl sitting outside on warm Missouri nights watching the stars with her father and thinking that "up there" was where she wanted to be when she grew up. Yet, women weren't part of the space program then, and the astronauts who boarded the early rockets weren't generally scientists. Janet already knew, however, that she wanted to be both a scientist and an astronaut.

She was raised in Missouri and obtained her bachelor of science degree at Missouri Southern State College in Joplin. After earning her master's degree in chemistry in 1982 from the University of Missouri at Rolla, Janet took a job at nearby Eagle-Picher Industries, where she designed and tested batteries for aerospace applications. In 1984, Janet accepted a position at the Boeing Company in Seattle. It was early on at Boeing that Janet decided to apply for the position of a NASA astronaut but she knew in order to better qualify, she would need to obtain a Ph.D. She was accepted at UW's graduate school, where she attended classes and conducted her research while continuing to work full-time. Janet's dissertation, under Professors Martin Gouterman's and Jim Callis's supervision, dealt with the development of a porphyrin-based pressure sensitive paint used for aerodynamic testing.

After her 1990 degree, Janet returned full-time to Boeing and in 1994, the call from NASA came. Janet was one of 122 people selected to interview for the position of astronaut from a pool of nearly 3000 applicants. She was given less than a week to fly to Houston and prepare for a series of tests and interviews. At the Johnson Space Center, she underwent six days of examinations, including a general physical which included an EEG, EKG, x-rays, a complete blood screen, muscle and joint strength studies, hearing and vision tests (mission specialists must have uncorrectable vision no less than 20/150 and correctable to 20/20) and a psychiatric evaluation to determine, among other things, whether or not she was claustrophobic. The actual time she spent interviewing with the hiring committee was no more than an hour.

After four long months with no contact from NASA, Janet was notified that she had been selected for the astronaut candidate class of 1995, which consisted of 19 of the original 122 people who had been interviewed. Four additional international candidates were added to the class to make a total of 23. (The entire astronaut corps today consists of approximately 140 astronauts, about 20% of which are women.)

NASA gave Janet and her husband three months to wrap up work assignments, sell their home, and relocate to Houston. For the next 15 months, Janet trained. She graduated after a grueling program that consisted of survival training, high-performance jet training, underwater 'spacewalk' training, space shuttle simulator exercises, and of course, lots of classwork.

Ground survival training consisted of being taken out into the woods near Pensacola, Florida in April and left for nearly three days. The trainees were allowed to bring no food or water. They were taught to use the remains of their parachute to make a shelter and set traps to catch small animals. They were taught which plants were safe to eat and which could be used to make remedies for minor injuries. Water survival training involved being dragged behind a boat in a parachute harness, dropped into the ocean with a parasail, inflating a raft, and then using flares and other signaling devices to initiate a rescue.

Learning to fly a T-38 jet is required of all astronauts-in-training so that the pilots can develop crew coordination techniques that are applicable to the shuttle and to promote

Janet Kavandi

adaptation to the high 'g' forces encountered during launch. These small jets, capable of traveling up to 1.2 times the speed of sound, are also used by the Air Force to train military pilots. The jets have no autopilot so all navigation and communication systems must be mastered.

Janet's most physically challenging task during training was to learn how to maneuver underwater in her large, white spacesuit. The suit is pressurized (making it very stiff) and is weighed out underwater to be neutrally buoyant in order to simulate actual conditions in space. Those effects combined with the suit's bulk and limited visibility make tasks such as manual latching of the payload bay doors extremely difficult. Janet was already SCUBA certified before being selected, but additional training, including a Navy swim test, was required before the new candidates were allowed to dive in the pool or train in the spacesuit.

Janet was reminded of graduate school during the classroom time she spent as a trainee. The small group of students became very close as they learned how to operate the shuttle's systems. During simulations, the astronaut candidates worked on launches, entries, and in-orbit scenarios. The simulator integrated the shuttle's electrical and hydraulic systems, data processing and communications systems, and environmental control and life support mechanisms, allowing those inside to operate the shuttle under conditions similar to those they would find in space.

Any astronaut hoping to be assigned to the Russian MIR space station or the International Space Station must also be very familiar with Russian, and foreign language instruction remains an obligatory part of astronaut training, even after one passes out of the student ranks. Many of the astronauts have desk jobs until they are selected for missions. Janet is currently assigned to the Payload and Habitability Branch of the Astronaut office. Her job entails evaluation of the experiments that will fly aboard future Space Shuttle missions and those that will be housed aboard the International Space Station.

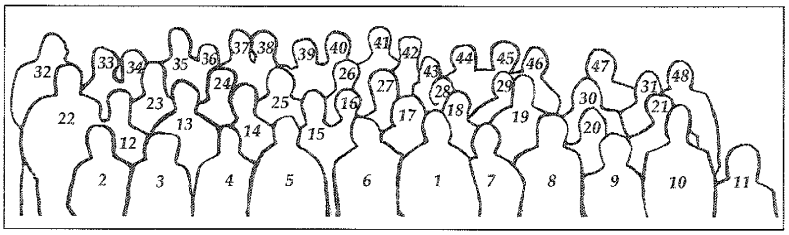
Janet expects her Space Shuttle mission assignment to be made within a year. Given the time required for specific mission training and the other tasks associated with the job of an astronaut, an average ten year career may include only three or four space flights. Each space shuttle mission requires at least a year of preparation (a space station mission will require three or more years of training). Even after astronauts no longer fly, there are still many fascinating jobs which require the practical knowledge and experience that only a seasoned astronaut possesses.

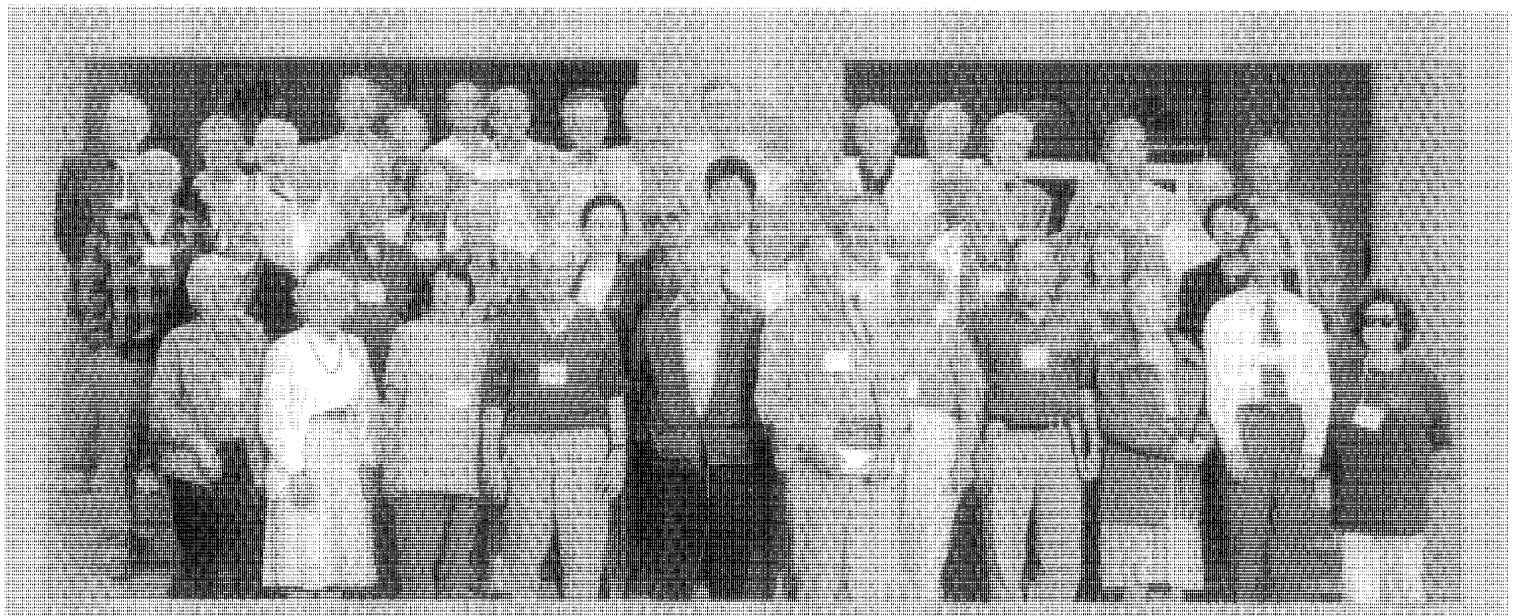
The possibility of peril invariably arises although Janet insists she is far from a risk-taker (she always wears her seat belt and regularly changes the batteries in her smoke alarm). She concedes that certain things, however, are worth taking risks for, and being among an elite group of people who navigate through outer space seems to be a reasonable trade-off.

Practical Jokes, Pranks, Romances and Research - Memories Stirred During Reunion

The Greeks restaurant. Cumulative examinations. Bert Rowland cracking the cement steps of Bagley Hall after inexplicably driving his car up the front entrance. Jack Breazeale helping to install the University's very first computer and in Bagley Hall, no less. Professor Paul Cross's omnipresent cigar. Not being able to afford $.35 science fiction magazines so splitting the cost between labmates. The regular Friday night Student Union dances where George Blomgren and his grad student buddies worked as ticket takers (and where George and Gerry first met). Monthly on-campus parking rates rising to $2.50! Professor Ritter yelling at the fire chief when he dared to question Ritter's lab protocol after an explosion. Profession Simpson's proclivity for fast sports cars. Spouses meeting for the first time. Successful careers. Retirement plans. Grandchildren. The stuff that reunions are made of.

1) Jay Erickson, 2) Jane Crosby, 3) Juanita Peterson, 4) Gloria Heller, 5) Jorge Heller, 6) Glenn Crosby, 7) Gretchen Anex, 8) Basil Anex, 9) Ellen Stern, 10) Paul Hopkins, 11) Nancy Cooper, 12) Bill Simpson, 13) Larry Wilson, 14) Ted Mill, 15) Susan Rowland, 16) Bertram Rowland, 17) Kay Montana, 18) Andy Montana, 19) Allan Osborne, 20) Harriet Wasserman, 21) Rosemary Harrar, 22) Barney Nist, 23) Seymour Rabinovitch, 24) Kay Looney, 25) Richard Teeter, 26) Carl Prenzlow, 27) Sharon Prenzlow, 28) Eric Kay, 29) John Lund, 30) Bill Wasserman, 31) Jack Harrar, 32) Lou Crittenden, 33) Eloise Crittenden, 34) Merle Simpson, 35) Andy Anderson, 36) Gene Skiens, 37) Frank Looney, 38) Merrill Muhs, 39) Ken Wiberg, 40) Ted Beck, 41) Tom Dunne, 42) Harris Kluksdahl, 43) Jack Breazeale, 44) Ed Boelter, 45) George Blomgren, 46) Gerry Blomgren, 47) Donald Peterson, 48) Jerry Levinson. Not pictured, but who attended other parts of the reunion include Kathleen Emerson, Mary Jane Erickson, Frank Karasz, Lorel Kay, Gerald Klein, Jackie Kluksdahl, Gary Lampman, Paul Lepse, Richard McDonald, Katharine Osborne, Janis Robins, Alan and Sally Sweeney, and Marguerite Wiberg. Among the emeritus faculty, current faculty,spouses and guests who participated were Andy and Sue Anderson, Wes Borden, Charlie Campbell, Gary Christian, Bob and Carroll Cross (P. C. Cross's sons), Vera Eggers, Tom Engel, Edith Fairhall, Heinz Floss, Karen Goldberg, Norm Gregory, George Halsey, Ed and Roberta Lingafelter, Joe McCarthy, Wells and Phyllis Moulton, Saya Pocker, Flora Rabinovitch, Mary Redding, Phil Reid, Bill Reinhardt, Fred and Carolyn Schubert, Mickey Schurr, Leon Slutsky, Frank Turecek, and Martin Gouterman.





What A Difference A Day Makes (Give Or Take About 40 Years)!

Over 80 alumni and emeritus or former faculty came together for a special weekend this past summer to relive and share memories of Bagley Hall in the 1950s. For the identities of those pictured above and more information about the reunion, turn to the back inside cover.

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