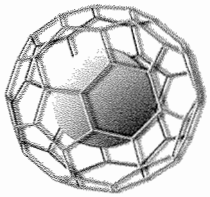
UO CHEMISTRY NEWS

UNIVERSITY OF OREGON • COLLEGE OF ARTS AND SCIENCES • DEPARTMENT OF CHEMISTRY • 2002

"Put Me In, COACh!"

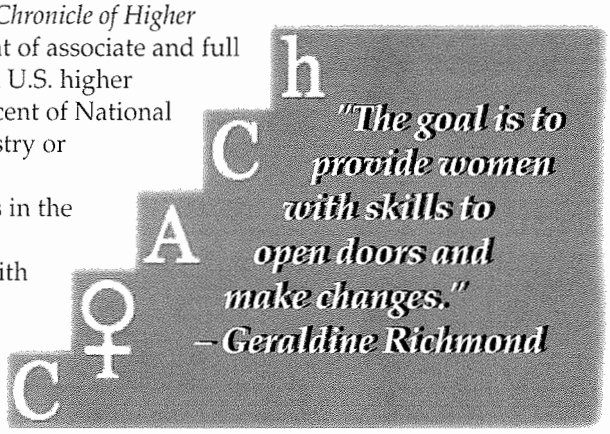


New Funding Helps Group Prepare Women Chemists for Success in Their Field

The National Science Foundation (NSF) has awarded UO Chemistry Professor Geraldine Richmond $1.5 million over five years to support the Committee on the Advancement of Women Chemists (COACh), an organization she founded in 1997 to promote gender equity in academia. COACh aims to improve the career prospects of female chemists and chemical engineers by sponsoring communication workshops, training opportunities and mentoring programs for its 20 members across the U.S.

In 1982, the NSF established the Women, Minorities, and Persons with Disabilities in Science and Engineering mandate. The resulting report concluded that a relatively small number of women earn science degrees, work in science and engineering-related fields, bring home equal pay to their male counterparts, and eventually gain full professor status. The 2000 report states that many of these inequalities still exist.

According to a recent article in the *Chronicle of Higher Education*, women hold only 12.5 percent of associate and full professorships in the natural sciences in U.S. higher learning institutions. Less than two percent of National Academy of Science members in chemistry or engineering are women.



Today, women starting their careers in the physical sciences can expect to receive $2,000 less in annual salary than men with similar job descriptions, qualifications, and experience. As men and women establish their careers, the salary gap widens considerably. The disparity between the number of men and women in these senior positions and their pay scales can be a source of frustration for women, who may feel overlooked, undervalued, and excluded by male peers.

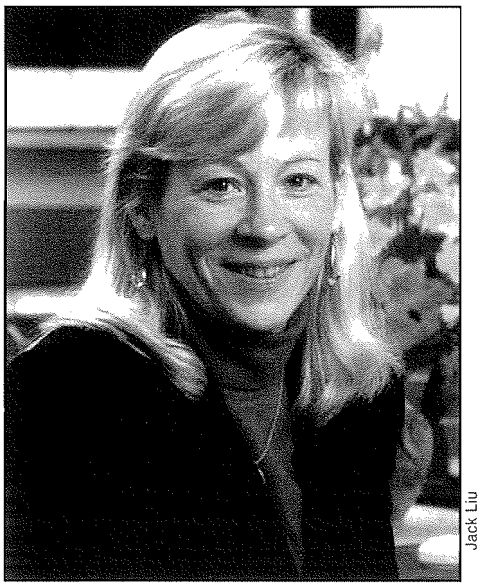
Richmond created COACh to identify the barriers senior-level female chemists face in academia, provide them with skills to recognize and overcome these barriers, and help them pursue career goals. The climate of academic departments will change as strategies emerge to help women gain equality, she says. COACh is run by an advisory board that consists of about 20 senior women academic chemists from around the country. They meet twice a year to plan and execute COACh activities.

COACh sponsors professional development workshops for women faculty in chemistry. These workshops are held in conjunction with the national meetings of the American Chemical Society and American Institute of Chemical Engineering. Workshop topics include improving skills in negotiation, management, leadership, and communication. Professional facilitators, who have long-standing experience with particular themes of the workshops, run the sessions. "The goal is to provide women with skills to open doors and make changes," Richmond says.

(continued on page 2)

(continued from page 1)

In addition, these workshops and COACh advisory meetings provide women faculty with networking opportunities. Scientists connect professionally and personally; they get to know each other's research interests and career aspirations. They alert each other to newly available academic positions, awards, or grants. "We have already seen the positive impact of these meetings on many of the women faculty that have participated," says Richmond. "It is a very powerful experience for many."



Jack Liu

Geraldine Richmond

But more personal topics are also on the table. Issues of pregnancy, family responsibilities, and the impact of these issues on the tenure clock and promotion are also discussed, says Richmond. Future COACh surveys and discussions may provide general recommendations to departments, but this subject is still in the development stage, says Richmond.

COACh also mentors junior-level chemists. If women at the associate and full professor level can make great strides forward professionally, female postdoctoral students may be encouraged to follow their lead. Mentors have the capacity to introduce mentees to colleagues at other institutions, become involved in joint research projects, teach successful grant-writing techniques and nominate mentees for awards. There is a social side to mentor-mentee relationships as well. Mentors can pass on their insight regarding appropriate behavior in academic environments, political land mines to avoid, and advice on long-term career strategies.

COACh recognizes the need for self-evaluation to ensure future successes. Kate Scantlebury, an associate professor of chemistry at the University of Delaware, and Ruth Fassinger, associate professor of counseling and personnel services at the University of Maryland, will conduct research relating to COACh's aims and activities. They will investigate workplace realities for women chemists and identify new gender-related concerns as they arise. Another research project will chart the impact of workshops, networking, and mentoring programs on career development. It's important to make these programs effective so they can be cloned and used on a larger scale to include all female scientists, says Richmond.

COACh is about helping women chemistry faculty achieve goals and gain recognition throughout their academic careers. It's about supporting them with home-career conflicts, destroying gender-related barriers, and creating a network of role models. Membership is open to anyone interested in helping women in chemistry and chemical engineering gain gender equality in academia. Further details can be found at http://coach.uoregon.edu

– Michele Taylor

Richmond Awarded Chemistry Department's First Endowed Professorship

Last spring, Geraldine Richmond became the first appointee to the Richard M. and Patricia H. Noyes Professorship in Chemistry. Patricia Noyes, a retired adjunct professor in the UO Department of Biology, established the professorship in honor of her late husband, an internationally acclaimed chemistry professor at the UO from 1958-84 who died in 1997.

Richmond is a widely published scholar in physical chemistry who is also nationally known for her support of women in the sciences. In 1997, her mentorship of female science students won her a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

Also in 1997, she founded a national organization, the Committee on the Advancement of Women Chemists (COACh), to help women in the sciences advance their careers. The organization, which includes women chemistry professors from universities such as Harvard, Brown, and the University of California at Berkeley, this year received $1.5 million in federal funding (see page 1).

Richmond received her B.S. in chemistry from Kansas State University in 1975 and her Ph.D. in physical chemistry from UC-Berkeley in 1980. Before coming to Oregon in 1985, she taught chemistry at Bryn Mawr College in Pennsylvania.

1992 Nobel Prize Laureate Delivers First Annual Noyes Lecture

Rudolph Marcus on *Strange Isotopes in the Ozone*

Rudolph A. Marcus of the California Institute of Technology presented the first Richard M. and Patricia H. Noyes Lecture on June 4, 2001. The title of his lecture was "Ozone Formation: Strange and Unconventional Isotope Effects." Professor Marcus' research ranges broadly over many areas of theoretical chemical kinetics. He has contributed valuable knowledge to the field, including theories of electron-transfer reactions, unimolecular reactions, RRKM (Rice, Ramsperger, Kassel, Marcus) theory, electrode reactions, various transfer reactions, the semi-classical theory of collisions and of bound states, intramolecular dynamics, solvent dynamics, and chemical reaction coordinates.

Richard J. Field, of the University of Montana, a former colleague of Dick Noyes and co-discoverer of the Oregonator model for oscillating reactions, introduced Professor Marcus, noting that "the extraordinary power of Professor Marcus' theoretical work has been in both its firm grounding in experiment and its remarkable usefulness in interpreting experiment.

"Indeed, his lifetime work is a shining example of the manner in which experimental and theoretical science march forward together, hand-in-hand; it's not possible for one to usefully get too far ahead of the other."

Rudy Marcus prefaced his talk with a few remarks about the man whom the lecture series memorializes:

"It is a great pleasure to give this lecture honoring our late colleague Dick Noyes, whom I knew and admired for many decades, ever since the time that he was at Columbia and I was at Brooklyn Poly. Dick was a chemical kineticist par excellence, and I hope that he would have been intrigued by some of the unusual phenomena that I would like to describe to you today."

In his talk, Professor Marcus explained that beginning about 20 years ago, "strange and puzzling isotopic effects" were being discovered in ozone formation from oxygen atoms and oxygen molecules in the stratosphere and in the laboratory.

"Approximately equal enrichments of the ^{17}O and ^{18}O isotopes occur, instead of the usual mass-dependent enrichment standard in the literature and expected from the usual transition state theory of chemical reactions," he said. When studying individual isotopic ozone formation reactions, they found that instead of a system where extensive isotopic exchange occurred, large unconventional isotope effects were observed, again not anticipated by standard theory. During the balance of the lecture, Professor Marcus presented a theory to explain such paradoxical observations, as well as others, such as pressure and temperature effects.*

Hayes Griffith

Rudy Marcus and Pat Noyes flanking a picture of Dick Noyes. This photo was taken at the reception following the first Noyes Lecture.

An interesting coincidence in the choice of the first Noyes Lecturer involves a cousin of Dick Noyes—Arthur Amos Noyes, also a prominent chemist. In fact, Rudy Marcus is the Arthur Amos Noyes Professor of Chemistry at Caltech, and his research group is located in the Noyes Building on the Caltech campus. Other prominent chemists in the Noyes family were Dick Noyes' father, William A. Noyes, Sr., and Dick's half-brother, W. Albert Noyes , Jr. All four men were inducted into the National Academy of Sciences.

– Hayes Griffith

*Interested readers can find the substance of Professor Marcus' lecture in: Gao, Y. Q. and Marcus, R. A. *Science*. 293, No. 5528, (2001) 259-263.

New Annual Symposium Spreads the News about...

Green Chemistry

At the University of Oregon

The University of Oregon, home of the world's first green chemistry teaching facility, played host last summer to a unique symposium, "Green Chemistry in Education." The four-day workshop, which was funded in part by the National Science Foundation, was the first symposium in what is expected to become an annual event. Organizers Jim Hutchison, Scott Reed, and Kristi Mikkelsen brought together educators from around the world to share insights about incorporating green chemistry principles and practices into their teaching.

"It's interesting how chemistry has developed," says Ken Doxsee, UO chemistry professor and one of the developers of the green chemistry program.

"You look at the types of reactions we use, and, to borrow Jim Hutchison's phrase, 'We use a sledge hammer to drive in a thumbtack.' We use agents that are highly reactive, highly non-selective, and generate tons of waste to do a simple transformation. We know enough chemistry now that, if you sit and think about it a little bit, you can find a lot better way to do it."

Indeed, the better ways of doing chhemistry are often safe enough to perform with minimal ventilation, heat, or toxic waste. One experiment developed here at the UO and presented at the symposium, makes adipic acid, a primary feedstock for the production of nylon.

The traditional way to make adipic acid is to use a very powerful oxidizing agent—nitric acid, which is corrosive, can be explosive, and contributes about 8 percent of the anthropogenic nitrous oxide to the atmosphere.

"It's a greenhouse gas and also an ozone depleter," says UO Chemistry Professor Jim Hutchison. Clearly, a substance that threatens environmental and human health is a prime candidate for replacement by a "greener" agent.

"What we've been able to do," says Hutchison, "is to use a much milder oxidizer—hydrogen peroxide."

By combining hydrogen peroxide with a catalyst, it is possible to effect the necessary reaction at significantly less risk and without harm to the environment.

While there are many green experiments from which to choose for educational purposes, limitations of the classroom setting, such as time and availability of materials, make some more suitable than others. The adipic acid experiment, for example, originally was not feasible for classroom application because the reaction time was 9 to 12 hours and the phase-transfer catalyst used was not commercially available. However, a University of Oregon graduate student changed all of that. Jim Hutchison explains:

Scott Reed

"Green Chemistry in Education" workshop attendees and presenters gather for a group shot outside Willamette Hall on the University of Oregon campus.

"One of my students, Scott Reed, found a way to prepare the phase-transfer catalyst by simply mixing two reagents together by stirring. He then figured out a way to reduce the reaction time so that the experiment could be accomplished in a normal laboratory period."

For his efforts, Reed won the Hancock Award, a national prize for green chemistry.

Participants at the symposium had the opportunity to spend two days in the laboratory, "getting their feet wet." The balance of the symposium featured prominant speakers from government, industry, and academia, including John Warner of the University of Massachusetts, Michael Cann of the University of Scranton, and Mike Lancaster of the Green Chemistry Network. All attested to the beneficial possibilities of green chemistry.

Robert Hembre, of Eastman Chemical Company, noted that "as soon as people interested in green chemistry articulate specifically what the problems are, they will be solved. There is no question that these are questions that can be solved."

"I really think that it couldn't be a more exciting time for green chemistry," said Richard Linton, Vice Provost for Research and Graduate Studies and Dean of the Graduate School, in his opening remarks. He also pointed out that the University of Oregon is the ideal venue for such a workshop.

"I think [green chemistry] is a great fit not just for the University, but also for the State of Oregon—a state with a wonderfully diverse, natural beauty."

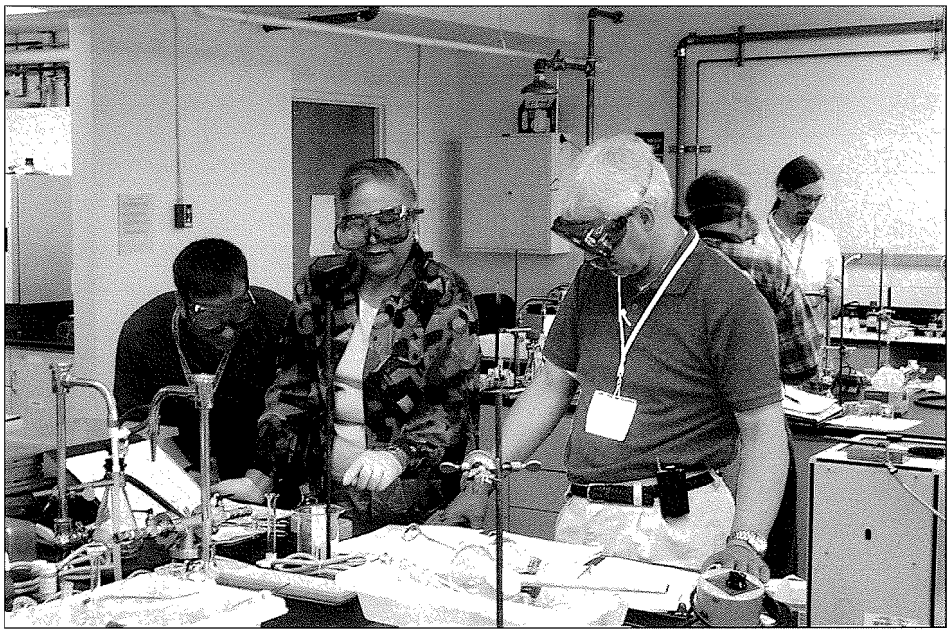
While not all of the presenters were educators, the pedagogical potential of green chemistry was not lost on any of them.

"One area that students are very concerned about is the sustainability of the planet," said keynote speaker Paul Anastas, from the White House Office of Science and Technology Policy. Anastas also pointed out that such a program provides strong potential for attracting new undergraduates.

"Green Chemistry can be used for the recruitment and retention of students," he noted.

Anastas is credited by many as the individual who first coined the phrase, "green chemistry." But, as many involved in the movement are careful to point out, the ultimate goal of green chemistry is to eliminate itself as a separate branch of the profession.

"Our goal isn't for this to become a special topic," says Ken Doxsee, who is co-authoring a green chemistry textbook with Jim Hutchison. "If it is, we've failed. By the time we raise the next generation of students, when they think about doing chemistry, it will happen to be green because that's how they've been taught to think. But it won't be something unusual, something deserving special comment. It will just be chemistry."



Scott Reed

Left to right: Ken Usher, Oregon Institute of Technology, Cornelia Gillyard, Spelman College, and James Hohman, Fort Hays State University, conduct "green" lab experiment in microwave porphyrin synthesis.

> ***"We've done a lot of work here, and the world's waiting to hear from us."***
>
> ***– Ken Doxsee***

For now, however, "green chemistry" is a concept whose time has come. Julie Haack, Assistant Head of the University of Oregon Chemistry Department and a green chemistry educator, points out that the growing need for environmentally responsible chemical processes combined with the current state of knowledge about those processes has created both a demand for *and* the capability to make significant change.

Many participants found that the symposium provided useful ideas for bringing green chemistry into their classrooms. Kwang-T Liu, a chemistry instructor, stated, "After this workshop I will not only incorporate green chemistry into my teaching of sophomore organic chemistry, but also will plan to give an upper-level course in green chemistry next spring."

Future green-chemistry symposia may feature poster sessions, where workshop participants can share new green experimental designs and report on their use in the classroom. Publication of these experiments is also anticipated, thus increasing the availability of the experiments. As a world leader in the green chemistry movement, the University of Oregon Department of Chemistry feels the need to disseminate information.

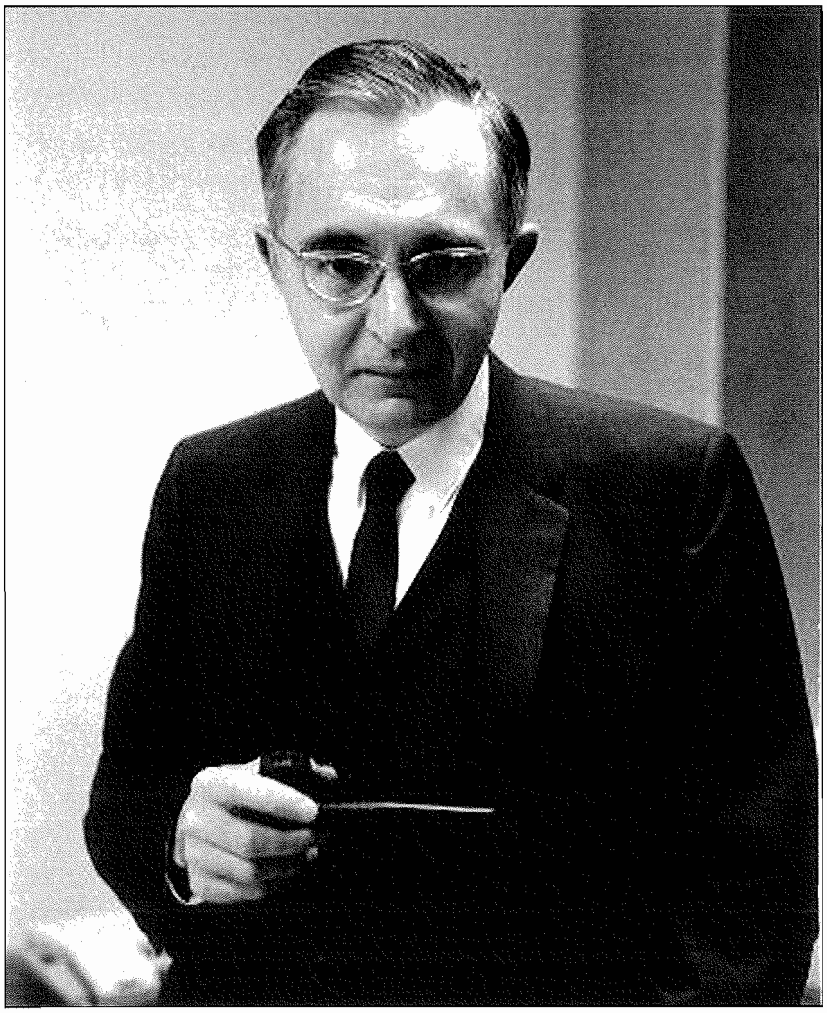
"We've done a lot of work here," says Ken Doxsee of the University's efforts in green chemistry research and education, "and the world's waiting to hear from us."

–Jerry Marr & Scott Reed

2001 Alumni Achievement Award in Chemistry

Paul Delahay: *Original Thinker in Electrochemistry*

Winners of the Alumni Achievement Award in Chemistry are a select group chosen for this honor on the basis of professional and personal achievements and service that exemplify the Oregon spirit and traditions of leadership and excellence.



Paul Delahay's life reflects the international nature of science. He was born in the Netherlands of Belgian parents. He received his undergraduate education, 1939-1944, at the University of Brussels, and when it was shut down during the war, he finished at the University of Liege. He earned his master's degree and, concurrently, an electrical engineering degree at the University of Brussels, 1945. Delahay received his Ph.D. in chemistry with Pierre Van Rysselberghe at the University of Oregon, 1948. At Louisiana State University, Baton Rouge, he rose through the ranks and became Boyd Professor in 1956. In 1965 he moved to New York University where he became the Frank J. Gould Professor of Sciences until his retirement in 1987. Paul Delahay is one of the most influential electrochemists of the twentieth century. Generations of young chemists studied his books, *New Instrumental Methods in Electrochemistry* and *Double Layer and Electrode Kinetics*. But Paul Delahay did far more than write influential books and journal articles spanning half a century.

"His experimental and theoretical contributions were so original and stimulating that he reinvigorated the field," writes Fred Anson, Elizabeth W. Gilloon Professor of Chemistry at Caltech. In his first major series of papers, observed Nicholas Geacintov, the current chair of the Department of Chemistry, New York University, Delahay formulated the principles and theories of several new instrumental methods of electrochemistry. He also produced a rigorous treatment of polarographic theory.

In a second group of classic papers (1955-62), Delahay developed theory and experimental methods for the kinetic study of fast electrode reactions by relaxation from a perturbation.

Then followed from 1958 to the late 1960s a series of papers on the correlation between electrode kinetics and the structure of metal-electrolyte interfaces. Delahay's last work from the late 1960s until his retirement dealt with the solvated electron and photoelectron emission spectroscopy by liquids and solutions.

He developed sensitive techniques for the study of emission by liquids in the vacuum ultraviolet range. The resulting extensive body of experimental results enabled him to establish and verify the theoretical correlations between optical and thermal (Marcus theory) electron transfer for a variety of processes, which are reviewed by him in *Electron Spectroscopy* (C. R. Brundle and A. D. Baker, editors, Academic Press, New York, Vol. 5, pp. 123-196 [1984]).

Delahay's work has been recognized with numerous international honors including the prestigious Award in Pure Chemistry from the American Chemical Society in 1955, the University Medal in 1963 from the University of Brussels, the Heyrovsky Medal in 1965 from the Czechoslovak Academy of Sciences, and the Palladium Medal in 1967 from the Electrochemical Society. In 1999 Delahay was named an Honorary member of the International Society of Electrochemistry. Paul Delahay and his wife Yvonne currently live in Paris, France.

–Hayes Griffith

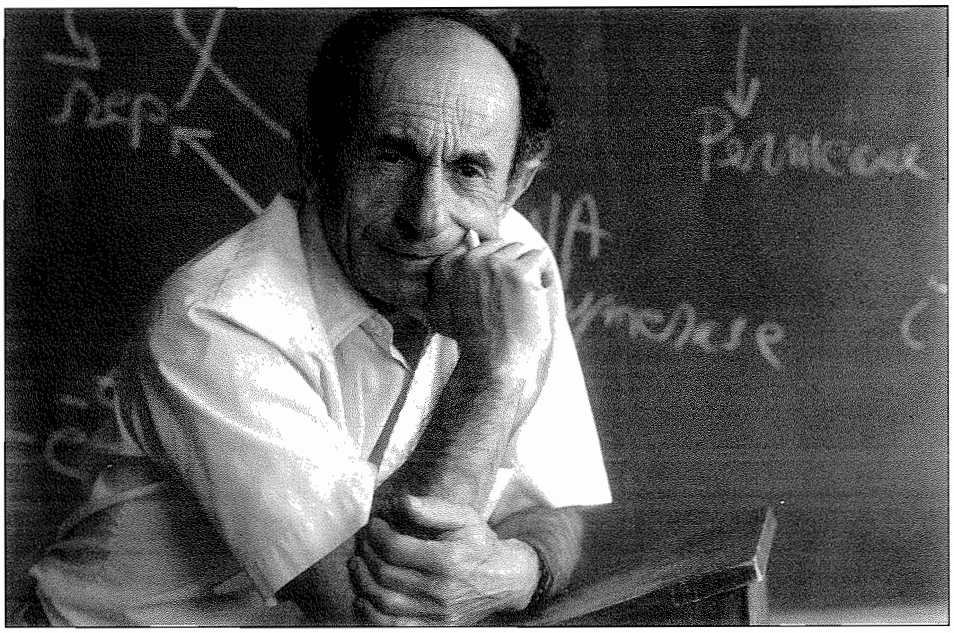
In *Memorium*

Judd Pond, a former University of Oregon Chemistry Department instructor and manager of the Chemistry Stockroom, died March 14, 2001, at the age of 78. The cause of death was pneumonia, which followed a stroke and a broken hip. A small gathering of friends met on Sunday, April 1, at the Four Seasons Club in Beaverton, Oregon, to celebrate his life.

Judd joined the faculty in 1968 and served as director of the General Chemistry Laboratory program for eight years, from 1968 to 1976. During that time he was also the manager of the Chemistry Stores.

Judd was born in Minneapolis, Minnesota, July 15, 1922. He graduated from the University of Minnesota with bachelors' degrees in both mechanical engineering (1943) and business administration (1955). He earned a Ph.D. in chemistry in 1964. From 1944 to 1946, he served in the U.S. Navy. Judd taught at Lane Community College while his wife joined the University of Oregon faculty in the Library School. In the summer of 1968, Judd came to the University of Oregon to teach general chemistry, and he continued to teach during the academic year. He left Oregon in 1976 to become Assistant Department Head of Biological Sciences at the University of Pittsburgh. He moved back to Oregon in 1984 to take the job of Assistant Director of Business Affairs under Ed Herbert at the new Vollum Institute for Advanced Biomedical Research, Oregon Health Sciences University. He retired from Oregon Health Sciences University in 1988.

Aaron Novick, Founding Director of the Institute of Molecular Biology, dies at age 81



Eugene Register Guard

Aaron Novick, June 24, 1919 - December 21, 2000.

The following was written for a Celebration of the Life of Aaron Novick, University of Oregon, January 22, 2001.

Aaron Novick was born in Toledo, Ohio, the third of four children of Sam and Rose Novick. He graduated from Woodward High School, where he was editor of the school newspaper. He was later named one of Woodward's outstanding alumni. Aaron attended the University of Chicago, holding down as many as three jobs at a time to pay for his education. He earned his B.S. in chemistry in 1940 and his Ph.D. in physical organic chemistry in 1943. At Chicago, Aaron worked with Leo Szilard and Enrico Fermi and moved to Los Alamos to work on the Manhattan Project. He was the first person to make appreciable quantities of tritium, was a witness to the explosion of the first atomic bomb, and was on the two-person team that collected the first samples from the blast site. After the war, Aaron Novick and Leo Szilard lobbied for civilian control of atomic energy, leading to the creation of the Atomic Energy Commission. Both men became life-long advocates for arms control and peace. Appalled at the way the bomb was used, they left physics and chemistry to enter the emerging field of molecular biology, building a laboratory in the basement of a Chicago synagogue. Aaron joined the faculty of the University of Chicago as an associate professor.

In 1948, Aaron married Jane Graham. They had two sons, David and Adam. In late 1958, the family moved to Eugene, Oregon, where Aaron founded the Institute of Molecular Biology at the University of Oregon. He worked with many gifted colleagues and students and served as director of the Institute, chair of the Department of Biology, and dean of the Graduate School. He also served as a trustee of the Oregon Graduate Center. Recipient of a Guggenheim fellowship in 1952, Aaron spent the 1952-53, 1962-63, and 1967-68 academic years at the Pasteur Institute.

In addition to his professional achievements, Aaron Novick was a dedicated gardener and became an avid hiker, camper, and cross-country skier.

–David Novick

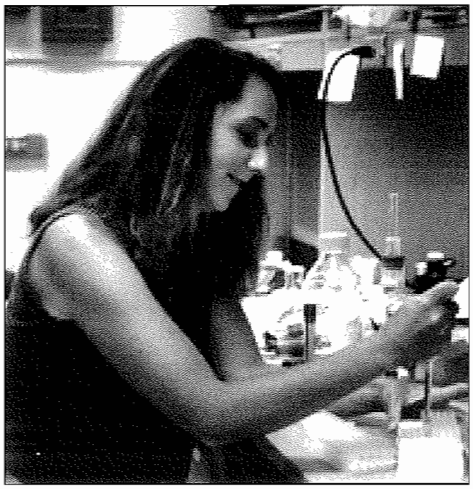
News *from All Over*

Pamela Bjorkman Elected to National Academy of Sciences

Pamela Bjorkman is one of 72 Americans from all fields of science elected this year to membership in the National Academy of Sciences. A native of Portland, Oregon, Bjorkman received her B.A. in chemistry at the UO Honors College, in 1978. She carried out her undergraduate research with O. Hayes Griffith's research group. Bjorkman earned her Ph.D. at Harvard University in biochemistry and molecular biology. She stayed on at Harvard as a postdoctoral fellow to complete her pioneering crystallographic study of a human class I Major Histocompatibility Complex (MHC) protein (Bjorkman et al., *Nature* 329, 506 [1987]). She then completed a second postdoctoral fellowship at Stanford University School of Medicine, Department of Microbiology and Immunology, before joining the faculty at the Division of Biology, California Institute of Technology in 1989. Bjorkman is currently Professor and Executive Officer for the Division of Biology at Caltech.

Bjorkman's research group continues to make major advances in molecular immunology by shedding new light on the structure and function of molecules involved in cell surface recognition. When viruses or bacteria invade human cells, fragments of the invader's proteins are bound to proteins of the MHC on the surface of killer T cells, initiating the cellular immune response. The mystery is how the MHC proteins can recognize and bind tightly to thousands of different foreign peptides. Bjorkman's group is providing a series of higher resolution structures that help to solve this mystery. Her results are important in medicine because these structures can provide the basis for rational design of new drugs. Bjorkman's group is studying a broad range of other structures using a combined approach of x-ray crystallography to determine structures, molecular biology to produce proteins for crystallization and to modify them, and biochemistry to study protein-protein interactions.

Bjorkman's list of academic awards and honors begins early-on with a series of honors while attending UO. She is one of only two scientists to receive the UO Foundation Young Alumna Award. This list continues with prestigious national and international awards including the Cancer Research Institute Investigator Award, 1989; Pew Scholar in the Biomedical Sciences, 1989; William B. Coley Award for Distinguished Research in Fundamental Immunology, 1993; James R. Klinenberg Science Award, Arthritis Foundation, 1993 and again in 1997; Gairdner Foundation International Award for achievement in medical sciences, 1994; the Camille Dreyfus Teacher-Scholar Award, 1994;. the Paul Ehrlich and Ludwig Darmstaedter Award, 1996; Investigator Award, American Association of Immunologists, 1996. Also in 1997 she was elected to the American Academy of Arts and Sciences. In 1989, Bjorkman became an Assistant Investigator of the Howard Hughes Medical Institute, and an Investigator there in 1999.



Caltech

Pamela Bjorkman in her laboratory at Caltech

Bjorkman's research group continues to make major advances in molecular immunology by shedding new light on the structure and function of molecules involved in cell surface recognition.

–Hayes Griffith

1930s

Charles Jacobs, Class of 1934, drove by himself all the way from San Diego to participate in the University and Chemistry Commencement Ceremonies, June 2001 *(see photo page 23).*

1940s

Marion Hill, B.A. '48, M.A. '49 visited the UO campus July 9, 2001, to attend a Presidents Associates meeting.

Paul Delahay, Ph.D. 1948 received the 2001 Alumni Achievement Award in chemistry *(see story page 6).*

1950s

The following is a brief career summary submitted by **Gerald G. Ohlsen,** Ph.D. '55.

I graduated in 1955 as a chemistry major, a member of the Phi Beta Kappa "senior six" and the recipient of what then seemed like a large scholarship—the Owen Fletcher Stafford scholarship in chemistry ($1,000 divided over the junior and senior years). I was an admirer of Don Swinehart, as were so many others, and worked with him on a senior project. I did not, however, take up his unfortunate habit of smoking a pipe.

After leaving UO, I changed fields and received a Ph.D. in physics at Stanford University in 1960 (in what was then called high energy physics, at the electron linear accelerator). My first job after graduating was at the University of Texas in Austin, as an assistant professor of physics. I left that job for a research fellowship in nuclear physics at the Australian National University in 1961, where I stayed for four years. I then worked as a nuclear physicist at the Los Alamos National Laboratory from 1965 through 1980, and, during that period, published one or two hundred papers,

reports, and so forth, primarily relating to polarized particle production and utilization in nuclear physics research. My swan song in that endeavor was to be the principal organizer and host of the 5th International Conference on Polarization Phenomena in Nuclear Physics, held in Santa Fe, New Mexico, in 1980.

In 1973, while still employed at the Los Alamos National Laboratory, I put together a land development partnership in Los Alamos and have been more or less active in land development and commercial real estate ever since. I have done development projects in New Mexico, Texas, and Georgia, and several of these are still in progress. In fact, it was my increasing involvement in these activities that led me to resign from the Los Alamos National Laboratory in 1980. I have been self-employed ever since.

In 1978 I acquired a real estate broker's license, which I have maintained ever since. I have used the license primarily to aid in acquiring and disposing of my own real estate.

In 1984 I became a certified financial planner and practiced in this area for a time, but my primary efforts were still directed toward development and management of real estate.

In 1992 I received a J.D. degree at the University of New Mexico and was admitted to the New Mexico bar the same year. Since that time I have practiced law primarily in the areas of estate planning and asset protection.

1960s

Paul Robisch, M.A. '63, with D. F. Swinehart, retired as a research chemist from the National Oceanic and Atmospheric Administration, July 5, 2000, completing 36.5 years. He studied the effects of pollution on marine life with emphasis on trace metals such as lead, arsenic, mercury, and cadmium.

Jim Nottke, Ph.D. '69 with Virgil Boekelheide. He is retired from full-time work but does a little consulting and a lot of volunteering: North Carolina Master Gardeners, Carolina Butterfly Society, Reynolda Gardens of Wake Forest University, Habitat for Humanity, Global Disaster Recovery Team. Jim also does some farming.

1970s

Peter Anderson, Ph.D. '71 with Virgil Boekelheide. A Fellow of the Academy of Clinical Biochemistry (FACB), Peter is the Scientific and Technical Director, Regional (Clinical) Laboratory Services Providence Health System, Portland. His responsibilities are in the three PHS hospitals in Portland (Providence St. Vincent MediCenter, Providence Portland Med Center, and Providence Milwaukie Hospital). March 2001 marks his 20th year in Clinical Chemistry with Providence System.

1980s

Gerry Funk, B.S. '82 and Suzanne Rose Funk, B.S. '82.. We met during physical chemistry lab, so I guess it had to be true love. It has been many years, but persistent debate remains about which one of us was giving and which was receiving help with that particular lab. We both graduated in 1982 with chemistry degrees, married in 1984, and have been blessed with two wonderful children, McKenzie (11) and Garrett (9). I (Gerry) came to college with absolutely no background in the hard sciences, but through my courses at the U of O I found that I enjoyed chemistry. The instructors I had did a tremendous job of drawing me into their fascination with chemistry. I worked in Warner Peticolas' lab for three years; Suzanne worked in Hayes Griffith's lab, but my true love was always organic chemistry. I attended Medical School at the University of Chicago from 1982 to 1986 and completed a general surgery internship and otolaryngology–head and neck surgery residency at USC, Los Angeles County Hospital from 1986 to 1991. After residency I did a one-year fellowship in head and neck cancer and reconstructive surgery at the university of Iowa, where I joined the faculty as an Assistant Professor in 1992. I am currently an Associate Professor of otolaryngology – head and neck surgery at the University of Iowa College of Medicine. My clinical work focuses on microvascular free tissue transfer reconstruction of head and neck defects following removal of head and neck cancers. This work involves moving tissue from distant areas of the body to the head and neck and anastomosing the blood vessels of that tissue to blood vessels in the neck so that the transferred tissue is vascularized. My research involves performance status and quality of life outcome evaluation following treatment for head and neck cancer. I look back on my time at the U of O very fondly. We wish everyone in the chemistry department the very best.

1990s

Sui Xiong Cai, Ph.D. '90 with John Keana, returned to campus August 6, 2001, to give a special organic/inorganic seminar titled: "Apoptosis Research: From the Development of a High-Throughput Screen for Apoptosis Inducers, to the Discovery of MX2060 as a Potent and Rapid Apoptosis-Inducing Natural Product and CV1013 as a Potent and Selective Pan-Caspase Inhibitor." Sui Xiong Cai is Senior Director of Chemistry for Maxium Pharmaceuticals, Inc.

Pamela Mouser, M.D., and **John Mouser**, Ph.D., stopped by to say hello on their way to Tacoma, Washington, where Pamela has joined the Group Health Cooperative HMO as a pediatrician. Pam worked in John Keana's laboratory and was the first to synthesize Acea 1021 (in 1991), a stroke drug in phase 1 clinical trials. John formerly taught our organic laboratories in the early 1990s, and, prior to that, he was a graduate student with Ken Doxsee. John recently completed seven years at UCLA teaching organic chemistry laboratories there. He plans to teach in the Tacoma area.

– John Keana

Kang Foon Lee, B.S. '93. Kang is currently an analytical chemist with a chemical manufacturing company. Prior to joining his current employer, Kang was a senior analytical chemist with an environmental analytical lab.

Mike Musialowski, M.S. '96. After working in wilderness programs with

(continued on page 11)

Broken Glasses, Buckets of Blood, and Ceremonial Sword Play

Reflections of a Chemistry Postdoc in 1950s Eugene

BY BOB SALOMON

Editor's note: *Bob Salomon attended the University of Oregon from 1957 to 1960 after his discharge from the Army. His service in Alaska provided his introduction to the West Coast. Salomon was born and raised in Brooklyn and earned his bachelor's degree from Brooklyn College. At Oregon, Wendell Graven was his advisor. He also did a short postdoctoral fellowship with Terrell Hill and proofread his book,* Introduction to Statistical Thermodynamics*—when they weren't playing tennis or basketball.*

After graduation, Salomon took a faculty position at Temple University in Philadelphia and remained there for 40 years. He retired in January of this year. During his tenure at Temple, he chaired the chemistry department for 10 years, supervised about 30 graduate students, and conducted research in various fields: the electrical properties of ice, solid state chemistry, alternate energy conversion, and high-temperature superconductivity. He was also a consultant for the Nuclear Regulatory Commission. He raised two sons—one is a pediatrician, the other, a businessman. He has become an avid sailor. He lives in Island Heights, New Jersey, a small town near the city of Toms River.

Here, Salomon reflects upon his time at Oregon and the people he met as a graduate student in the Department of Chemistry.

I loved Eugene, Oregon, though it was culture shock coming from Brooklyn. I remember the signs in the restaurants when I first arrived:"no logging boots." The first people I met were in the stockroom. They suggested I try to rent a room from a Mrs. Chamberlain, who liked to rent to chemistry graduate students. I showed up at her place, saw the room, liked the price (I think it was $35/month), and told her I'd take it. I never signed a lease, and when I asked her for the key she looked amazed. No one had ever asked for a key before, and she was hard-pressed to find one. After the first few nights I never locked my room again. I had become an Oregonian.

I took courses with Dick Noyes (He came from Columbia the same year I came to Oregon.). He appeared to fall asleep at every seminar, but after it was over, he always asked a good question, which belied his apparent state of mind. Don Swinehart taught a few courses and I spent endless hours in his office—he loved to gab. He was a marvelous experimentalist who built his own mass spectrometer. I had a close relationship with Terrell Hill. Terrell played basketball for Berkeley in his college days—he was 6' 6" tall. Once, while we were practicing, I threw him the ball when he wasn't looking—broke his glasses. I thought my graduate school days were over right there, but he was a good sport. Terrell had a tremendous work ethic. He would lock himself in his office in the mornings and do his theoretical work in statistical thermodynamics. I learned so much from him.

George Adams was my first advisor. He always appeared to be a shy "Casper Milktoast," but this concealed a man who had nerves of steel. During World War II he had the job of defusing unexploded bombs. Leroy Klemm was a fine teacher and a nice guy. My advisor of record was Wendell Graven. We used to have a few beers after I got through with my research—usually around midnight. He, too, was a fine experimentalist who did his own research without graduate students (except for myself and a student named Don Poole). Wendell left academia for a job in the aerospace industry. He's been retired for many years and now lives on a ranch in Northern California. He visited me in Philadelphia several years ago.

Sam Wolf, Juris Orle, and Roger Mann had the other rooms at Mrs. Chamberlain's and we spent a lot of time together. There were no cooking facilities, so every meal was a meal out. Fortunately for these guys, I had a car, thanks to the GI Bill and my Atomic Energy Commission Fellowship.

I remember hearing that Don Swinehart kept a telescope trained on his lab from his home. That way he could make sure his students were working late into the night. Eventually his students caught on and made silhouettes to fool him. But he wasn't fooled. I remember Tom Whatley, who worked for Swinehart. Tom would take his car apart every Sunday for entertainment. He helped Swinehart build that homemade mass spectrometer.

I took an organic chemistry course from Leroy Klemm and was nervous about it. Organic was not my forte, but Klemm was a wonderful teacher and had a surprising sense of humor. I enjoyed his course and always liked him. His graduate students were fiercely loyal to him.

Some of the other graduate students that I remember well include Bob Vreeland, who worked for Swinehart and smoked even more than I did in those days. His wife was a wonderful cook and always invited me to share dinner with their family. I remember Ken Emerson who did inorganic chemistry and went on to teach somewhere. I remember Don McQuarrie, the only student to receive his Ph.D. with Terrell Hill. Don went on to have a very successful career and write some excellent textbooks. I used his book on statistical thermodynamics when I taught that course at Temple. I remember Gordon Julian, who got his degree in biochemistry with Ray Wolfe. Ray was a very friendly guy, and all the graduate students really liked him. Gordon was also very friendly and always seemed to have a good dirty joke. I remember Gordon carrying buckets of blood, which he obtained at some slaughterhouse. He used hundreds of gallons of blood to isolate milligrams of some enzyme. He was always smiling as he carried the blood.

News from All Over (continued from page 9)

troubled teens for two years, Mike is now in a one-year Professional Residency in Environmental Education (PREE) at the Teton Science School in Jackson Hole, Wyoming. He is concurrently working on an M.A. in experimental education at Prescott College in Arizona (independent study). His goals are to develop experimental science education at the middle and high school level, in particular, empowering youth by facilitating research opportunities (teaching the research process).

Ken Usher, Ph.D. '96. Ken was hired last fall as an assistant professor in the Department of Natural Sciences at Oregon Institute of Technology in Klamath Falls. He teaches biochemistry, genetics, and general chemistry. Ken and his wife, Carol, had their first baby, Evelyn Hope Usher, on November 25, 2000.

Alex Rajeff, B.S. '99. Alex is working at Stanford University in the Interlibrary Loan Office and plans to attend San Jose State University in the fall working towards a master's degree in library sciences.

2000s

Charity Hansen, B.S. 2000, completed her M.S. in biochemistry at the University of California, Riverside in June, 2001. Charity is now a law student at Pepperdine University.

Sunil Kher, Ph.D., a former postdoc in John Keana's group, has been working for Tanabe Research Labs (TRL) in San Diego since last August in the area of drug discovery. TLR is owned by Tanabe Seiyaku (Tanaba). According to Sunil, Tanaba is the second oldest pharmaceutical company in the world, having started in 1678. Sunil and family are enjoying the San Diego area. He may be contacted at Tanabe Research Labs U.S.A., Inc., 4540 Towne Centre Court, San Diego, CA 92121. (858) 622-7069.

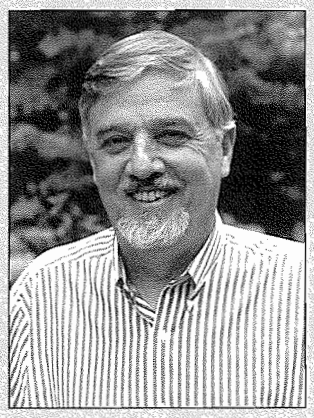
– Hayes Griffith

Brad Wan, Ph.D. '01 with Mike Haley, recently landed a postdoc at the University of San Diego Department of Medicine. Wan will be working in the laboratory of Dr. Karl Hostetler synthesizing anti-viral compounds for HIV, herpes, and other viruses. His work, funded by the U.S. Army, will include synthesizing large quantities of these compounds in order to combat the threat of chemical and biological warfare. Of course, now Wan will have less time to spend on his surfboard.

– Lynde Ritzow

Letter from Our Department Head

Rick Dahlquist



Jack Liu

As we complete this newsletter, the events of September 11, 2001, have tempered the mood in the department. Some of our students are likely to be called up for active duty in the armed forces. Invitations to participate in international meetings are being weighed carefully. Other priorities have changed. While there is a general sense that the world has evolved in some irreversible way, we look forward to a productive and more focused academic year.

The department has been eagerly anticipating this academic year with new faculty, remodeled research space, and the inauguration of the new green chemistry teaching lab. As you will see by reading this newsletter, there is progress in many areas and real optimism for the future of our teaching and research efforts.

Classes began this year as the contractor was furiously finishing the last details and the painting of the green lab. We will have a full complement of undergraduates in the green laboratory this term doing experiments!

Reflections (continued)

Dick Noyes had some interesting and excellent graduate students and postdocs. Dick Field did some excellent work with him on oscillating reactions, and I remember two English postdocs. One was George Salmon. George tried to teach us to play cricket at a department picnic. It may have been the prototype for some of the later English comedies like "Upstairs-Downstairs." Terrell Hill also had a number of postdocs; they came from all over the world. I remember two Japanese postdocs who would greet each other in the corridor with a ceremonial bow. The junior of the pair bowed first. Often at lunchtime, these two would go outside with big swords and flail away at each other without mercy. I never saw any blood. One of his postdocs, with whom I became friendly, was Igor Plesner from Denmark. Igor was huge but nevertheless performed with the Danish ballet as a spear holder.

Having taught for 40 years myself, and having twice chaired the department, I often try to make comparisons between Temple University and the University of Oregon—especially the chemistry departments. Although the Oregon faculty didn't always agree with one another, they were always civil and didn't bad-mouth each other to the students. They were collegial to the extreme. Even those who didn't get tenure didn't complain to the students. It may have been geography, or it may have been the 40 years in time, but I think there was a special magic about Oregon. It certainly made a difference in my life.

Practical Education in the Private Sector

Semiconductor and Polymer Internship Programs Prepare Students for Life after Grad School

When Don Upson went to work for the Willamette Valley Company three years ago as its Vice President for Technology and Purchasing, the company's research staff was half the size it is today. In the process of beefing it up, Upson worked with University of Oregon Professor David Tyler to ensure that the UO Chemistry Department's Polymer Internship Program could serve the needs of his company and the polymers and coatings manufacturing industry in the Northwest. Apparently, the collaboration worked. Of the 15 employees in the Willamette Valley Company's R&D staff, four are alumni of the internship program.

"I'm quite a fan of this program," Upson says. "I've got four people, and that's a good percentage of my research staff now."

The Polymer Internship Program is the younger of two highly successful educational enterprises sponsored by the UO Chemistry and Physics Departments. The Semiconductor Program is the first such program and was, in large part, the brainchild of UO Chemistry Professor David Johnson, who also is an instructor in that program. Fellow UO Chemistry Professor David Tyler is, in his words, the "nominal head" of the Polymer Program. Like Johnson in the Semiconductor Program, Tyler's endless hours working the phones and otherwise "schmoozing" potential corporate affiliates earn him the title.

"I'm the guy who goes out and beats the bushes and tries to find the companies," says Tyler, who is also an instructor in the Polymer Program. Willamette Valley Co., Dynea, Bend Research, Bordon Chemical, Forrest Paint Co., and Specialty Polymers all participate in the Polymer Internship Program. Intel, LSI Logic, TriQuint, Hynix (Hyundai), Micron Technology, and Novellus Systems participate in the Semiconductor Internship Program.

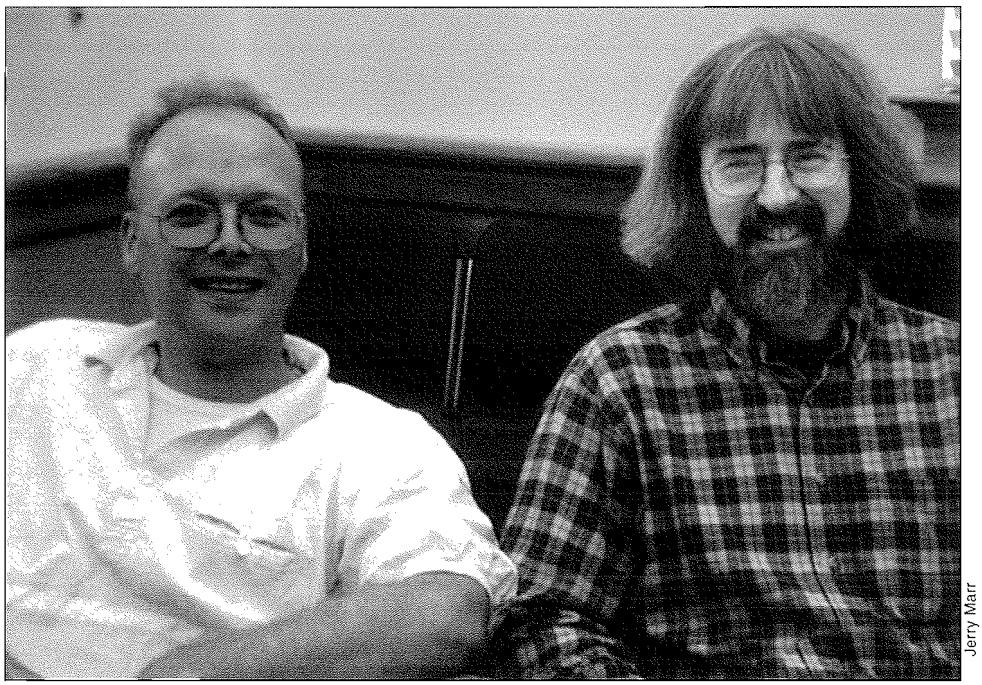
Other members of the Chemistry Department faculty contribute their time and expertise as program instructors. They include Mike Haley and Marina Guenza (polymer) and Jim Hutchison, Mark Lonergan, and David Cohen (semiconductor). Now in their third (polymer) and fourth (semiconductor) years, the two Internship Programs are thriving, each producing high-caliber scientists with the assistance of regional industrial affiliates. The companies don't simply employ the interns, but actively participate in their education.

"It's much more than a vocational training program," Jim Hutchison says. "We don't even try to teach these students specific details about what they'll ultimately be doing. What we really try to do is teach them to tap that wealth of knowledge that they have from their bachelor's degree and take that into this engineering environment and excel immediately in those areas."

When Jim Hutchison and David Johnson first began researching the idea of an internship program for UO chemistry and physics students, they queried the target industries to determine their needs.

"What we found is that the semiconductor industry really wanted to have chemists and physicists contribute to their research-and-development and production efforts," says Hutchison. "But, unfortunately, students didn't know much about the area. They had awesome fundamental skills but really didn't know how to apply them in these areas." In short, as David Tyler points out, there is a need for scientists with more than undergraduate degrees.

"The industries are just starving for people with master's degrees," says Tyler. "The master's degree provides the specialized training that they don't get at the B.S. level. Oregon industry wanted workers who were better trained in problem solving, how to work in teams, things like that—those industrial attributes. These programs put more emphasis on those things than maybe our classes would."



Jerry Marr

Chemistry Professor David Johnson (left) and Physics Professor David Cohen are both instructors in the Semiconductor Internship Program. Johnson is credited with originating the Semiconductor Internship Program and helping get it off the ground.

In 1997, with help from the National Science Foundation, the Dreyfus Fund, and, according to Tyler, "the enthusiastic support of our colleagues in chemistry and physics," the Semiconductor Internship Program began training students for that industry. A year later, the Polymer Internship Program, following the Semiconductor Program model, began training students as well.

Both programs consist of two components—an intensive summer curriculum of course- and laboratory-work focusing on theoretical concepts pertinent to the industry, followed by a nine-month, full-time placement in one of the industrial affiliates.

"In the lab, I tell students to expect to be here from 9 to 5. After all, that's what they'll be doing in the work world."
– Mike Haley

"Here, we work them pretty hard," says Mike Haley of the laboratory sequence he teaches for the Polymer Program. "For example, in the lab, I tell students to expect to be here from 9:00 to 5:00. After all, that's what they'll be doing in the work world."

By the end of the summer, students are ready for their assignments in the private sector. At that point, it is the company's turn to take part in the students' education by placing them in a real working situation.

"The types of jobs we have for interns are the types of jobs we would have for anyone who already has a bachelor's degree in chemistry," says Don Upson. "In other words, they're professional chemist positions. We're looking at people we want to bring on board with the full idea that we're going to train them and help them become as good as anybody we have in our entire R&D department, recognizing that they're young and that they still have things they need to learn in order to be as good as anybody that we have."

The corporate commitment goes well beyond simply providing a training environment.

"Somebody has to mentor these students," says David Tyler. "Somebody has to work with them and teach them things. It's part of their education."

The program instructors at the University of Oregon intend for their students to compete well with existing engineers. According to Jim Hutchison, they tell their industrial affiliates, "Don't coddle these students. These are valuable teammates for your engineering staff. Take advantage of all the skills they have to offer."

At the Willamette Valley Company, Don Upson points out the certain advantages of hiring interns.

"We get a chance to try on the pair of shoes before we buy them," he says. "We get nine months of looking at a candidate, and then we both decide whether it's good for us to go forward. We have a chance to hire somebody who is already partially, if not fully, trained. We already know them; we know their work habits, and we know their good points and their warts. It's a known quantity, and that's a big advantage when you're hiring somebody."

Indeed, the programs have worked so well that virtually all of the interns who completed them have been hired by the companies who trained them. Ironically, this level of success has made the placement of new interns all the more difficult.

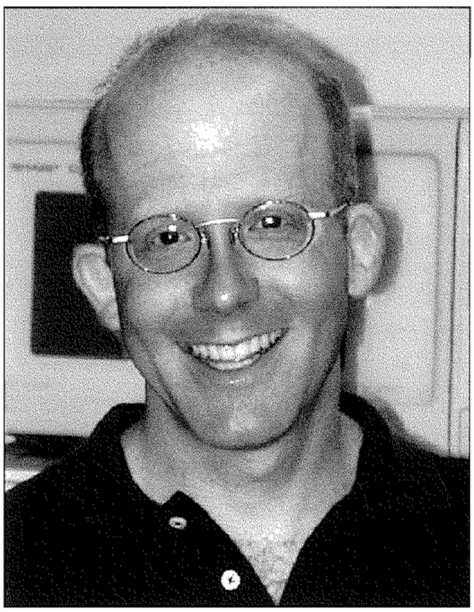
"Basically, they've all gotten jobs, and we're really happy about that," David Tyler says. "There's a good side to that and a bad side. We'd like to see some turnover so that next year we can go back to the companies and say, 'Hey, we have some more interns for you.' It's supposed to be educational, but if they keep hiring our people, eventually they'll be filled up. I say that tongue-in-cheek. We're actually very pleased."

It is, however, an ongoing challenge to get new affiliates.

"It's a Catch-22," says Mike Haley. "Companies like the interns we place with them so much, they get hired on as permanent employees. Then they may not need an intern the next year. For us, it's a continuous process to always try to line up more and more companies. It's tough, and especially now, given the economic downturn."

Jim Hutchison agrees. "Last year we had 16 students in the Semiconductor Program," he says. "This year we dropped back to eight just because the economy slowed. It didn't make sense to ramp the program up more if we weren't going to be able to find good positions for the interns."

From the corporate perspective, Don Upson notes, "It was bad enough when all we had was a down business cycle. Facing the uncertainties of the war on terrorism and all of that, that's further seeming to erode consumer confidence... and continue to depress our business."



Jack Liu

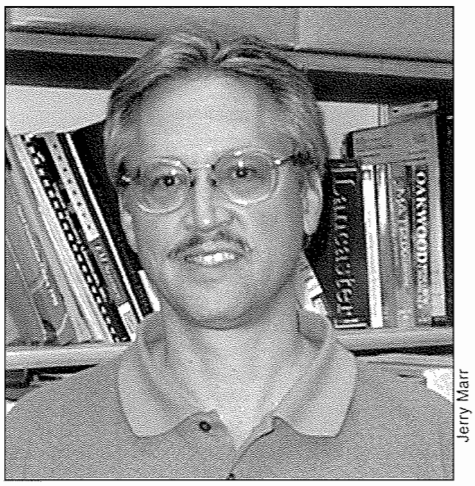
Chemistry Associate Professor Mike Haley teaches the laboratory sequence for the Polymer Internship Program.

"The types of jobs we have for interns are the types of jobs we would have for anyone who already has a bachelor's degree in chemistry... they're professional chemist positions."
– Don Upsom
Willamette Valley Co.

Upson points out, however, that even in such tough economic times, his company has retained the Internship Program in its budget. "We're very needs driven," he says, "so, if we have a real defined business need, I think the intern program is a fantastic way to meet those needs."

– Jerry Marr

Staff *News*



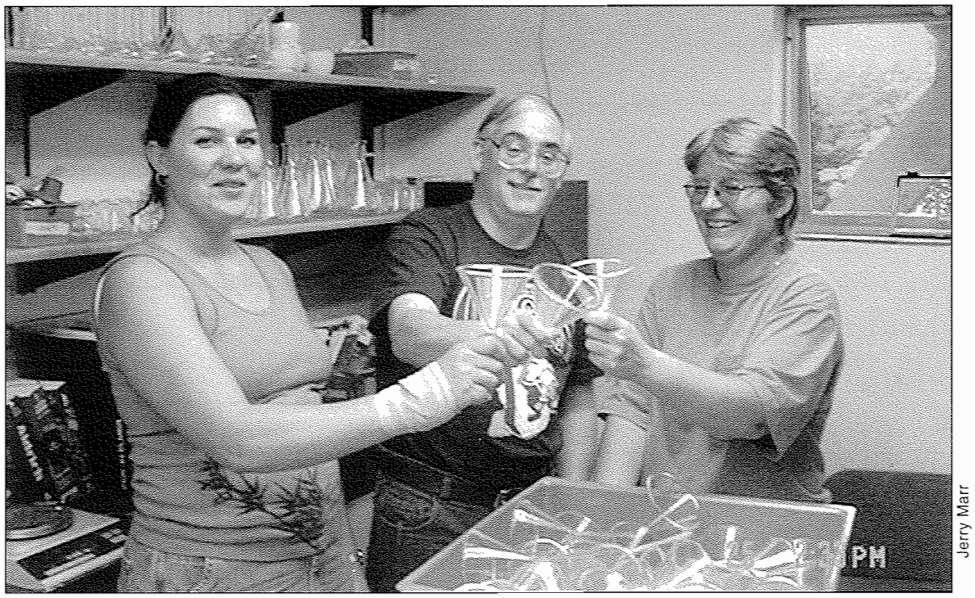
Jerry Marr

Jim Rasmussen

This year, **Jim Rasmussen** replaced **Arlene Taylor** as the new Chemistry Buyer. Jim has an extensive background as a buyer in both the medical and electrical industries and has additional experience in technical writing. He has organized and taught technical writing classes and was responsible for defining and creating documentation for ISO9001 certification. Jim received additional education in business administration, with concentration in marketing and management.

Lynde Ritzow, Graduate Recruiting Coordinator for the Chemistry Department, gave birth to a 7 lb. 15 oz. baby boy, May 11, 2001. Max Andros Ritzow had almost doubled his birthweight by age three months. Lynde spent the summer on maternity leave, lugging Max around the city and the department. She took a break from editing *UO Chemistry News*, but is currently back at work recruiting graduate students for fall 2002.

With the help of an intrepid crew of work-study students, lab preparators **Lynn Woolfe, Mary Dricken,** and **Sandi Smith** saved the Chemistry Department $170,000 in glassware costs associated with the incorporation of the new green organic chemistry curriculum this fall. As a result of renovations and curriculum changes instituted in the late 1980s and mid-1990s, the teaching labs were burdened with a large surplus of glassware and other equipment. Over the past 10 years, Lynn Woolfe has taken the initiative to inventory and store some 100,000 items. It was this inventory that enabled Mary Dricken and Sandi Smith to provide 225 green-lab students with glassware at a significant cost savings to the department. The new green organic lab curriculum will be taught in newly renovated laboratory space on the ground floor of Klamath Hall *(see story, next page).*



Jerry Marr

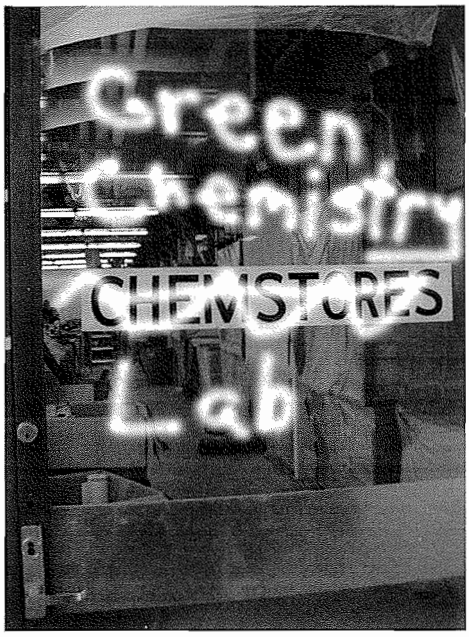
Sandi Smith, Lynn Woolfe, and Mary Dricken tip glass lab funnels in a toast to an inventory job well done.

Long-time Chem Staffers Honored at New 'Years-of-Service' Awards

Several members of the Chemistry Department staff were recognized for their contributions to the University of Oregon at the first annual "Years of Service Recognition Reception" held on March 5, 2001. The reception, sponsored by Human Resources, honored classified employees with five or more years of service at the University. The Department of Chemistry congratulates the following individuals for their dedication to the educational and research missions of our department.

Lew Athon – Accountant, 22 years of service
Clarisse Heinhorst – Lead Operator, Science Stores, 22 years of service
Linda Sappington – Records Coordinator, 20 years of service
Lynn Woolfe – Science Lab Preparator, 20 years of service
Sandi Smith – Science Lab Preparator, 9 years of service
Mary Dricken – Science Lab Preparator, 5 years of service

Reshuffling of Space Makes Room for New Labs



Jerry Marr

As the new Green Organic Chemistry Laboratory reaches completion, it is increasingly apparent that the lab will be a showpiece for visitors to the Department of Chemistry and a must-see stop on any UO campus tour. Its expansive space can easily be viewed from Klamath Hall's courtyard thanks to huge windows that admit ample daylight and a ceiling filled with overhead fixtures. From the beginning, the University has been a leader in the Green Chemistry movement, which calls for the discovery and invention of environmentally friendly ways to teach the fundamentals of chemical processes (*see story, page 4*). And now the movement has a place to call home—in the former Science Stores facility on the ground floor of Klamath Hall.

In fact, the establishment of the Green Lab where "Chemstores" used to be located was part of a "domino effect" of laboratory renovations throughout the department.

"It's really a very extensive project," says UO Chemistry Professor Jim Hutchison. "In order to make room for the Green Lab, we had to move our Science Stores. That meant we had to renovate space for Science Stores, and the space that we renovated for Science Stores was the space for the old student machine shop. So, in order to get that, we renovated space for the new machine shop.

"At the end of this we have a brand new, air-conditioned student Machine Shop and a modernized and safer Science Stores, with improved chemical storage facilities to store the chemicals we have to have on site."

Funding for this project came from several sources, including the College of Arts and Sciences, the University Planning Committee, and the Vice Provost for Research.

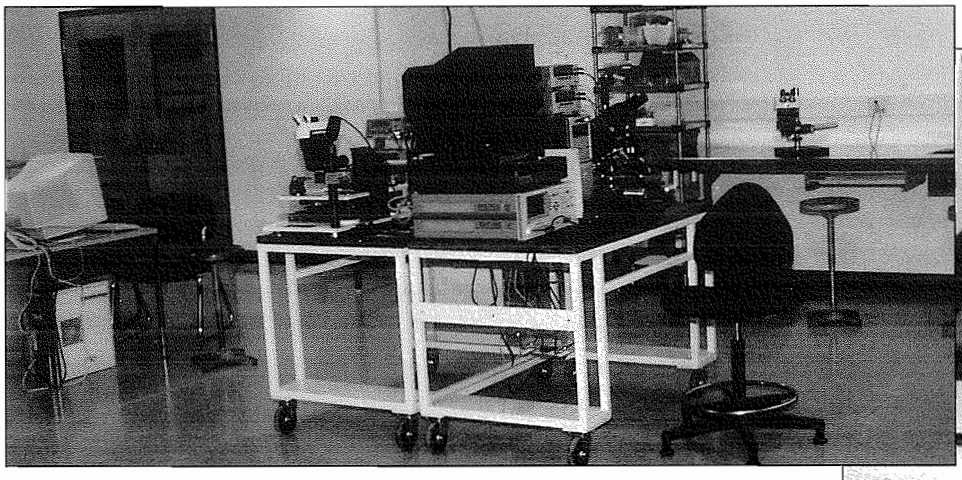
In addition to these improvements, an organic chemistry research laboratory has been renovated, with funding from the Vice Provost for Research, in preparation for hiring a new organic chemistry professor. Moreover, the old Honors General Chemistry Laboratory has been renovated with funding from Continuing Education and converted into a semiconductor processing laboratory for the Semiconductor Internship Program (*see story, page 12*).

Jerry Marr

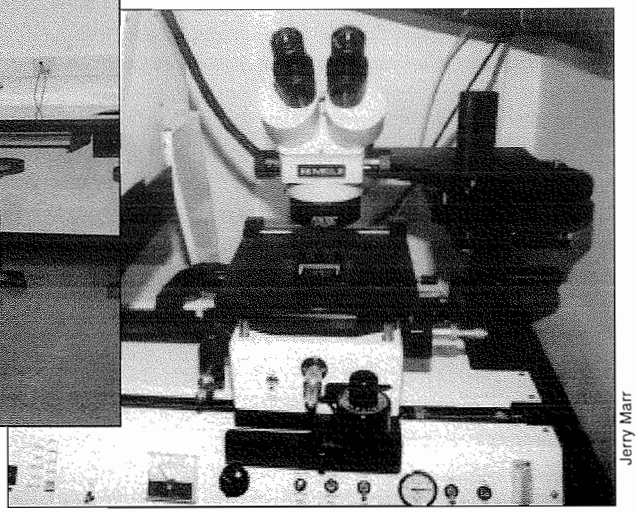
Shelves in the new Science Stores (formerly part of the student machine shop) stand ready to be stocked.

While this is not an unprecedented amount of renovation, it is an unusual amount, according to David Johnson. It reflects the department's and the University's commitment to remain on the cutting edge of innovation and improvement in science education.

– Jerry Marr



Jerry Marr



Jerry Marr

The renovated Semiconductor Laboratory boasts new instruments and plenty of space to accommodate both the equipment and the students who will use it.

Faculty *News and Awards*

Professor Bruce Branchaud has begun a new research program on "Single Molecule Motors." In nature many spectacular examples exist of nanoscale, molecular devices, including molecular switches and molecular motors such as actin, kinesin, and dynein. Branchaud and colleagues are pursuing the design and synthesis of the simplest and smallest possible molecular motors, consisting of single molecules. Their approach uses a series of energy-driven, diastereo-selective reactions in chiral molecules to drive bond rotation in a preferred direction to produce repeated 360-degree rotation around the bond in the preferred direction. Current work in this new area of research focuses on the testing and demonstration of fundamental principles of single-molecule motors. The results could lead to the preparation of working single-molecule, motor-driven devices.

Associate Professor Jeffrey Cina has been promoted to full professor. The theory of ultra-fast optical probes of molecular dynamics is the major focus of his research. Recent topics of special interest include strategies for wave function determination during light-driven chemical reactions, quantum mechanical effects in the coherent vibrational dynamics of low-temperature molecular crystals, and vibrational influences upon electronic energy transfer. These projects are being carried out in collaboration with graduate students **Travis Humble** and **Mary Rohrdanz** and postdoctoral associate **Dmitri Kilin**. Along with colleagues **Professor Tom Dyke** and **Professor Andrew Marcus**, Cina is also pursuing a joint theoretical and experimental initiative in nonlinear wavepacket interferometry, an exciting new endeavor with possible implications for the coherent control of chemical dynamics. Cina is a member of the Oregon Center for Optics, an interdisciplinary research center with members from both chemistry and physics. Among his favorite courses to teach are chemical kinetics and molecular quantum mechanics, at both the undergraduate and graduate levels.

Professors Ken Doxsee and **David Johnson** have received a GAANN (Graduate Assistance in Areas of National Need) Grant from the U.S. Department of Education. Titled "Expanding the Horizons: Increasing Opportunity for Non-Traditional Graduate Students," the grant provides support for six graduate students.

Professor Doxsee served as Acting Program Director for the organic chemistry programs at the National Science Foundation for Fiscal Year 2001. During his sabbatical year, he continued work on the development of laboratory-teaching materials for the "green" organic chemistry project (*see story, page 4*). His research group is currently exploring novel soft chemical syntheses of metal oxides and related materials, the dynamics of crystallization of self-assembling systems, and the design and synthesis of ion-selective chelating agents.

Senior Instructor Deborah Exton is one of two UO faculty members to be named a "Williams Fellow" for the 2001-2002 year. This award, sponsored by the Tom and Carol Williams Fund for Undergraduate Education, recognizes outstanding teaching and commitment to undergraduate education.

In addition, Exton hosted a faculty training workshop for the American Chemical Society's introductory undergraduate chemistry course entitled "Chemistry in Context: Applying Chemistry to Society (CiC)." This course for non-science majors introduces the phenomena and principles of chemistry within the context of socially significant issues, such as global warming, ozone depletion, alternate energy sources, nutrition, and genetic engineering. The 2001 workshop was held June 17-19 at the University of Oregon and was led by Conrad Stanitski, University of Central Arkansas; Cathy Middlecamp, University of Wisconsin – Madison, and Wilmer Stratton.

Professor David Johnson and co-principal investigators **Professor Steve Kevan** and **Professor David Cohen** have received a four -year $1,200,000 NSF research grant as part of the National Nanotechnology Initiative. This research applies their novel synthetic approach based upon modulated elemental reactants to kinetically trap oriented thin films of novel compounds, heterostructures, and superlattices based upon quasi-two-dimensional transition metal dichalcogenide compounds, three-dimensional transition metal intercalates, and phosphochalcogenide compounds. These materials provide unprecedented variability in the types of hetero-structures that can be formed, since the constituent materials range from wide-and narrow-gap semiconductors, to antiferromagnetic insulators, to semimetals to metals, some of which are ferromagnetic, antiferromagnetic, or superconducting. Students will be trained in cutting-edge research techniques and exposed to the challenges and rewards of industrial research through the Materials Science Institute's Ph.D. internship program.

Assistant Professor Mark Lonergan was recently selected as a Camille Dreyfus Teacher-Scholar. The award recognizes the recipient's dedication to teaching while continuing to demonstrate outstanding contributions to science. The $65,000 award will help support Lonergan's work to develop educational programs at Oregon that tie together chemical principles with the microelectronic industry. It will also support his research in the area of electrically conductive polymers toward their application in plastic electronic devices.

Senior Instructor Jim Long was voted Mortar Board's "Professor of the Month" for October, 2000. Mortar Board is a national senior honor society composed of undergraduate seniors exhibiting ability and achievement in scholarship, leadership, and service. Professor of the Month awards go to professors who are exceptional in their fields. Voting is open to all students on two days each month that an award is given. The election is write-in only, and all faculty are eligible to win. Professor

Long has received this award five times over the course of his career.

Professor Bob Mazo's book, *Brownian Motion: Fluctuations, Dynamics, and Applications*, is being published by Oxford University Press. It should be on the shelves in April, 2002.

Assistant Professor Ken Prehoda has joined the Chemistry Department faculty. Prehoda received his B.A. from California State University, Sacramento, in 1991. He completed his Ph.D. with John L. Markley at the University of Wisconsin, Madison, and his postdoc with Wendell A. Lim at the University of California, San Francisco in 1997.

Prehoda's research focuses on the molecular mechanisms of signal transduction, a process in which cells react to changes in their environment with an appropriate response. Responses to extra-cellular cues are mediated by a complex network of signaling proteins. His work looks at how these proteins are used to store and transmit information, as many disease states involve malfunctions in these processes. Prehoda approaches this problem by studying protein "domains"—reusable modules that perform specific functions, such as mediating interactions with other proteins. Signaling proteins often contain many different domains that work together to achieve the proper function. By studying these fundamental units of signaling, Prehoda hopes to uncover how cells process information.

The Oregon Academy of Science (OAS) named **Professor Geri Richmond** as its Outstanding Scientist of the Year 2001. The award is presented each year to a scientist in the state of Oregon who has made significant contributions to basic or applied research in the natural, physical, or social sciences. The award was presented at the OAS annual meeting in February at the University of Portland. In addition, Geri Richmond and the COACh Program have received a five-year, $1.5 million grant to address gender issues in the field of chemistry. The National Science Foundation, the National Institutes of Health, the Department of Energy, and the Camille and Henry Dreyfus Foundation are supporting this effort *(see story, page 1).*

Shane Ohline, a visiting faculty member on leave from Wellesley College, Wellesley, Massachusetts, is working in Professor Geri Richmond's lab with support from an American Association of University Women (AAUW) American Fellowship. She is conducting sum-frequency generation experiments and plans to examine the structure of a phospholipid monolayer at an oil/water interface when proteins are present within the monolayer. In addition, she is completing work on quantifying dye aggregation at solid/air interfaces using UV-Vis spectroscopy, singular-value decomposition, and an equilibrium model. At Wellesley, Shane teaches introductory chemistry, physical chemistry, and physical chemistry for the life sciences.

Lecture Demonstration Coordinator and Instructor **Randy Sullivan** has joined the UO chemistry faculty. Sullivan received his B.S. in secondary education and M.S. in chemistry at the University of North Texas. Randy has 20 years of teaching experience in both the high school and community college environments. Mr. Sullivan will be a member of our summer session instructional faculty and will be responsible for coordinating chemical demonstrations throughout the curriculum during the academic year.

Student News and Awards

Congratulations to **Austin Hayes,** an undergraduate in Mike Haley's lab, for being selected as a Pfizer Summer Undergraduate Research Fellow in Synthetic Organic Chemistry. This fellowship provides support for an undergraduate to conduct a summer research project that culminates in a poster presentation at Pfizer in October, 2001.

Shannon Boettcher, an undergraduate in Mark Lonergan's lab, gained recognition last spring as one of the nation's top undergraduates in science and mathematics when he received the prestigeous Barry M. Goldwater Scholarship. The endowed scholarship program was established by the U.S. Congress to foster excellence in science and mathematics by encouraging outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. This is the premier undergraduate award of its type in these fields.

Undergraduate Education

The following proposals were submitted to the National Science Foundation Division of Undergraduate Education, Course, Curriculum, and Laboratory Improvement Program (CCLI program) last fall. All three received funding.

"A 'Green' Program in Extraction and Separation Chemistry for Incorporation into the Undergraduate Curriculum," submitted by **Professor Paul Engelking** and Senior Research Associate **John Hardwick,** facilitates the development of a sequence of laboratory experiments that will introduce environmentally responsible techniques of chemical separations and extractions into the undergraduate laboratory curriculum. These laboratory experiments will be an integral component of a green laboratory curriculum in chemistry being developed by the Chemistry Department. The goals of the new curriculum are (1) to prepare chemistry majors for a changing emphasis in the chemical industry in which waste management at the source plays an increasingly important role in chemical processes and (2) to train chemistry students and others in the analysis of environmentally important field samples such as air and ground water. The laboratory courses constitute an essential component of the new program because they will expose chemistry majors to cutting-edge issues in extraction and separation using state of the art instrumentation in an area not traditionally covered in undergraduate chemistry curricula.

"An Environmentally Benign ('Green') Organic Chemistry Curriculum," submitted by **Associate Professor Jim Hutchison, Professor Ken Doxsee,** focuses on the development of educational materials that bring modern green chemical approaches, techniques, and thought processes to the large undergraduate organic chemistry teaching laboratory. These materials will be disseminated internationally through a variety of vehicles, including a published green organic chemistry laboratory textbook, workshops for teachers from all levels of educational institutions (K-12, community college, four-year teaching college, and university), a Web-centered database of green chemical experiments, and versatile complementary material for organic chemistry lecture courses.

"Acquisition of Enabling Equipment for a Physics and Chemistry Curriculum in Semiconductor Processing and Characterization," submitted by **Professor David Johnson, Associate Professor James Hutchison,** and **Assistant Professor Mark Lonergan,** will help prepare students for the technological workplace and provide effective links between higher education and industry. A new laboratory curriculum is being developed to prepare physics and chemistry majors for productive careers in the semiconductor manufacturing industry.

Graduate Education

The **Materials Science Institute** has received an IGERT (Integrative Graduate Education and Research Traineeship) grant from the National Science Foundation for a project entitled, "Doctoral Training at the Interface of Chemistry and Physics: New Materials for Electronics and Optics through Control of Nano-scale Structure." The IGERT program offers a unique, comprehensive package of new and tested approaches to graduate education in materials chemistry and physics. It is designed to prepare the next generation of graduate students for the challenges of an increasingly interdisciplinary research and development arena. The IGERT program has received wide support within the University and among MSI's industrial affiliates because it provides a multidisciplinary research experience, stimulates industrial/academic relations, and prepares students to be successful participants in diverse and changing job markets.

The **Materials Science Institute** also has been awarded funding from the Murdock Charitable Trust to establish a state-of-the-art shared instrumentation facility—the Center for Advanced Materials Characterization in Oregon (CAMCOR). CAMCOR equipment will be used extensively by research groups at the University of Oregon and also will be available to other Northwest institutions. The added capabilities in materials preparation and characterization provided by the equipment will dramatically enhance our research and educational programs and further position us to recruit outstanding new faculty and graduate students.

Dahlquist Named Knight Professor of Science

This past summer, Rick Dahlquist was appointed Knight Professor of Science by UO President Dave Frohnmayer in recognition of his scientific accomplishments and the distinctiveness of his work. The appointment provides funds to supplement research activities and help cover the costs associated with travel and teaching.

Rick Dahlquist is recognized internationally for his leadership in structural biology and microbiology. His Ph.D. in chemistry was awarded by the California Institute of Technology, and after a postdoctoral fellowship at the University of California at Berkeley, he came to the University of Oregon in 1971.

In his nearly 30 years at UO, Rick has worked on one of the central problems in quantitative molecular biology: trying to understand the molecular basis of the recognition and dynamics of interactions within macromolecular machines that control the function of living cells. In recent years, his interests have focused on the molecular mechanisms that allow proteins to process information. Specifically, he is interested in (1) how proteins fold into three-dimensional structures given the information encoded in their amino acid sequences and (2) how signals, such as the binding of a ligand to a trans-membrane receptor, can lead to changes in behavior or gene expression. He pioneered the use of nuclear magnetic resonance techniques to examine structural changes at atomic resolution. He has established that the structure and kinetics of structural changes are key to understanding how proteins function. His research has also led to a better understanding of how proteins recognize and interact with each other to carry out their biological function, research that has brought him to the forefront of his field.

Rick has also served in several administrative roles, including Directorship of the Institute of Molecular Biology and Head of the Chemistry Department. He is the recipient of a Sloan Research Fellowship and is a Fellow of the American Academy of Microbiology.

Nike CEO Phil Knight donated $15 million to create the endowed professorships in an effort to keep valuable faculty at Oregon.

Chemistry Gifts, July 1, 2000 to June 30, 2001

Chemistry Honor Roll: *Your Gifts, Our Thanks*

INDIVIDUALS

$10,000 or more

Karen Griffith-Hedberg '75 Ph.D. '80 and O. Hayes Griffith
Patricia H. Noyes
Sandra '63 and Maurice Schwarz '62 Ph.D. '65
Josephine and Peter von Hippel

$1,000 to $9,999

Joanne and Ernie Bush '75 M.S. '76
Carolyn and Steven Hadley '63
Teresa and William Herzog '70
Marion Hill '48 M.A. '50
Catherine Page and David Johnson
Joseph Owens Ph.D. '76
Della '47 and Rustum Roy
Evelyn '78 and Douglas Runckel '67
Janet Reis and Wayne Solomon Ph.D. '63

$999 and under

Lucia and Stanley Gill Ph.D. '89
Eva and Robert Johnson '80
Theodora '69 and Kwok-Chen Lee '69
Richard Chadwick Ph.D. '86
Miriam and Samuel Greenschlag M.S. '63
Kwang-Yee and Hee-Chol Kang Ph.D. '82
Judy and Herbert Kopperman '65
Dilipkumar Raval Ph.D. '62
Lorayne Thompson
Christine and Kendall Auel '81
Lara Ph.D. '99 and Gregory Baxley Ph.D. '97
Carol and Lawrence Cohn M.A. '72
Harold Davidson M.A. '49 Ph.D. '51
Sara M.A. '63 and Manuel Debono Ph.D. '63
Miles Edwards M.S. '56
Florence and Raymond Erickson M.D. '44
Charles Fredricks '52
Thomas Harris
Patricia and Gary Hedden '67
Carol and Ernest Hoidal
Carol Houk M.S. '93 Ph.D. '95 and Thos Crooks
Ann and Edwin Jacks, Jr.
Rodney Kemmis
Christine Kosydar
Wai Lau '95
Lisa Markov and Richard Ludescher Ph.D. '84
Vicky '74 and Gregory Lyon Ph.D. '75
Susan '69 M.A. '70 and Michael Magic M.S. '69
Mohammad Malekzadeh '85
Gwen and David McCoy Ph.D. '67
Russell Molyneux
Carla '63 and William Moring
Elsie '58 and Bruno Morosin '56
Kathleen and Stanley Myers '86
Margaret and William Nolan M.A. '65
Nancy and Daniel Olson Ph.D. '72
Mary '85 and Dean Otto '88
Wayne Parpala '52
Tammy and Russell Rolfson
Carolyn M.A. '68 Ph.D. '78 and Terrone Rosenberry Ph.D. '69
Teresa Schroeder
Catherine Smith '69
Marthe Smith '48
Jacqueline Steenhuis '91 and Adam Whiting Ph.D. '93
Pamela and Ronald Swisher Ph.D. '76
Gayle '66 and David Tompkins Ph.D. '68
Kathryn and Michael Uhler Ph.D. '82
Carolyn M.L.S. '68 and Richard Wolf Ph.D. '68
Timothy Aukett M.S. '93
Laura '84 and Kevin Bagin '86
Mary and Robert Ballman Jr.
Leona and Curtis Borchers Ph.D. '56
Jesse and Richard Bylund '54
Catherine '77 and Anthony Chanin '77
Janis Chebahtah
Jeffrey Cina
Paula and Arthur Daman
Sherry Dress
Pamela Fischer Ph.D. '95
Jean Halling '48
Sharron Fuchs and Richard Hayes
Carol and Daniel Heryford '52
Gudrun M.A. '71 Ph.D. '95 and James Hoobler Ph.D. '72
Evelyn and Myer Horowitz M.A. '49 Ph.D. '52
Margery and Leland Johnson
Clyde Kaneshiro Ph.D. '75
Joshua Kehoe '95
Jacklyn '63 and John King '64 J.D. '67
Chally and Dennis Kruse
Christopher Labunetz '94
Wai Lee '90
Donald Mack '47
Yoon Hwang Merrill M.S. '73
Patricia and James Miller
Patricia and Robert Moser
James Moulds '63
Kathleen Murphy
Paul Nixon '89
Pieter Paulson '89
Joanne and David Paxton
Puay Wah Phuan '95
Marilyn and Robert Pinschmidt Jr. Ph.D. '71
Rebecca Price M.S. '85 and Paul Jagodzinski
Katherine '66 and Chester Ramey Ph.D. '68
Peter Rasco '86
James Riddle '95
Mordecai Rubin
Wayne Stalick '64
Marian and Timothy Thomas Ph.D. '64
Carl Tjerandsen '98
Marilyn '77 and Ralph Vaughn '77
Heidi Wierman '91 and Brian Daikh '90
Pancras Wong '76

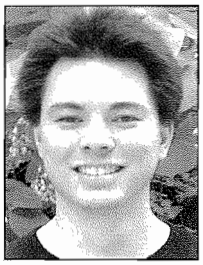
CORPORATIONS AND FOUNDATIONS

Air Products & Chemicals, Inc.
American Chemical Society
Dean Witter Reynolds, Inc.
Dow Chemical Company
Camille & Henry Dreyfus Foundation
Eastman Chemical Company
Eli Lilly & Company Foundation
Elsa U. Pardee Foundation
Hewlett-Packard Company
Hoffman-La Roche, Inc.
Intel Foundation
Mentor Graphics Foundation
Morgan Stanley Foundation
Neste Resins Corporation
Nike, Inc.
Rohm & Haas Company
Umpqua Research Company

Undergraduate *Research*

COMPILED BY DEBORAH EXTON

Students who completed undergraduate research projects under the guidance of faculty advisors during the 2000-2001 school year describe their work and their future plans.



A.J. BOYDSTON
EUGENE, OR
PROFESSOR MIKE HALEY, *SUPERVISOR*
GRADUATION DATE:
JUNE 2001

RESEARCH PROJECT:

Recently I have been working on a project involving annelated [2.2]paracyclophanes. These [2.2] paracyclophane/dehydrobenzoannulene hybrids (PCDBAs) are analogues to previously known macrocycles, but they now incorporate a [2.2]paracyclophane unit into the core of the conjugated system.

Our main goal in studying PCDBAs was to determine whether or not transannular delocalization was present across the two decks of the paracyclophane.

Professor Haley's lecture on undergraduate research during winter term organic chemistry initiated my desire to join a research team. This particular project excited me because it involved an interesting study topic that could be explored with high efficiency and very promising results. Many of the compounds I needed to synthesize were unstable and quickly polymerized, which was a very motivating challenge.

FUTURE PLANS:

I intend to continue work in the Haley lab for another year, allowing me to earn a master's degree. After that, I will enter a Ph. D. program, hopefully.

JENELLE BRAY

PORTLAND, OR
PROFESSOR MARINA GUENZA, *SUPERVISOR*
ANTICPATED GRADUATION DATE:
JUNE 2004

RESEARCH PROJECT:

We do computer simulations of protein dynamics and then analyze results to determine the properties of the proteins. I became involved in research when my chemistry teacher asked me at the end of freshman year if I were interested in doing research and sent out an e-mail recommending me. I then met with several professors to discuss their research. I decided on my current research because I have a lot of input about what I want to do, and I have to do a lot of independent thinking.

FUTURE PLANS:

I plan to go to graduate school in chemistry and earn a Ph.D.

RYAN CHIECHI
MEDFORD, OR
PROFESSOR MICHAEL HALEY, *SUPERVISOR*
GRADUATION DATE:
JUNE 2001

RESEARCH PROJECT:

Amidst characterization, optimization, and what not, I'm trying to synthesize a highly strained dehydrobenzoannulene (DBA) using synthetic techniques developed in this lab. Many attempts have been made through a variety of synthetic approaches, so far with limited success. Currently, the most promising method takes advantage of the introversion of alkynes with carbenes; if the appropriate carbene can be generated in situ, it should rearrange and insert an alkyne in the center of a butadiyne linker creating a strained (~161 degree) hexatriyne as part of a [14] DBA. This strained macrocycle should be reactive enough to undergo various 2+2 and 2+2+2 cycloadditions as well as some interesting transition metal mediated rearrangements. The strained alkyne should also give some insight into the reactivity of cyclo[18]carbon which has several 160 degree alkynes and cannot be isolated due to its instability.

I joined the lab when I was a sophomore in organic chemistry. This project has been passed from undergraduate to undergraduate and I would like to be the one to solve it.

FUTURE PLANS:

I will be joining a lab at UCLA as a graduate student in organic chemistry this summer.

MANDY DUTTON
HOOD RIVER, OR
PROFESSOR DAVE JOHNSON, *SUPERVISOR*
GRADUATION DATE:
JUNE 2001

RESEARCH PROJECT:

I am working with the antimony-tellurium binary system under the larger project of Sb-Bi-Te superlattices. I am studying the different compounds in the antimony-tellurium binary system that we are able to make using the modulated elemental layering reactant synthesis (thin layer deposition). I am also attempting to learn about the antimony-telluride system in general.

I became interested in research when I decided chemistry was the field I wanted to work in. I wanted to get as much experience in a lab as possible before graduating. I became interested in this project due to the interesting uses that superlattices have in many different areas.

FUTURE PLANS:

I plan on taking a year or two off to travel and relax before going into graduate studies.

GREG ELLER
PITTSBURGH, PA
PROFESSOR CATHY PAGE, *SUPERVISOR*
ANTICIPATED GRADUATION DATE:
JUNE 2002

Research Project:

Cathy Page was my first term general chemistry professor. I got to know her through office hours and began talking about research. She told me about the wonderful opportunities for undergraduate students at the U of O, so after completing organic chemistry, I approached her about working in her lab.

Marcus Helfrich, a Ph.D. student in her laboratory, was working on a model system for in vivo delivery of cancer drugs. As a pre-health student, I was very interested in working on the project. My goal was to synthesize 1-dodecynyl-phosphonic acid. This was a challenging synthesis, and I was unable to complete it fall term. My schedule did not allow me to continue on this project winter and spring terms. Another student picked up the project and is nearing completion.

Future Plans:

I resumed research this past summer with work on another aspect of drug delivery systems involving solid-state chemistry in the Page Lab. I investigated how phosphonic acid aggregates bind to hydroxyapetite (the mineral in teeth and bone). The project related nicely to my interest in a career in dentistry.

Chelsea Hamilton
Eugene, OR
Professor Nathan Tublitz, *Supervisor*
Anticipated graduation date:
June 2002

Research Project:

I study behavioral plasticity in the regeneration of the chromatophores of the European Cuttlefish. Chromatophores endow cuttlefish with the ability to change the patterns on their skin in response to changes in their surroundings.

I first met Dr. Tublitz in BI 264 and, after learning about his studies with cuttlefish, began my time in his lab. I selected this project because I am fascinated by cuttlefish and their amazing ability to respond so instantaneously to their environment by altering patterns and textures on their skin.

Future Plans:

I hope to attend medical school directly after graduating in 2002.

Samantha Kehoe
Eugene, OR
Professor Dave Johnson, *Supervisor*
graduation date:
June 2001

Research Project:

I have been performing a Kissinger Analysis on the Sb-Se system in which the samples are nucleation limited. This is a study that looks at the effect of composition on the relative nucleation energies for the Sb-Se system. There is only one compound in the phase diagram for this system; however, the phase diagram only shows thermodynamically stable compounds, and the chance of nucleating kinetically stable products is a possibility. Because of this, I have been looking at what crystallizes during these nucleation events. So far, I have only found thermodynamically stable products.

The samples for this project are being made using a modulated elemental reactant technique in which thin layers are deposited onto a silicon substrate and are subsequently annealed into amorphous precursors. A nucleation event then transforms this into a polycrystalline compound. The compositions of the samples are determined using an electron probe micro-analyzer, and the nucleation energies are determined by shifts in the exothermic peaks seen while performing differential scanning calorimetry. High Angle X-ray diffraction is then used to characterize what crystallizes by performing scans of the sample before and after annealing.

I became interested in this research after meeting with Professor Johnson and reading papers that he has published. My motivation for my project began as characterization for a larger project working on superlattices that involve Antimony and Selenium.

Future Plans:

I am going to medical school next year at George Washington University.

Seren Lanza
Eugene, OR
Professor Michael Haley, *Supervisor*
Graduation date:
June 2001

Research Project:

I am working on synthesizing new metallabenzene molecules from novel cyclopropene precursors. The goal is to prepare an unsubstituted metallabenzene by exploiting the versatility of trimethylsilyl substituents. I have also been characterizing metallabenzenes prepared by members of the Haley Lab for publication.

As a sophomore in organic chemistry, I became interested in doing research in an organic chemistry lab. Michael Haley was my professor at the time and I ended up joining his lab so that I could work on an independent research project. Of the two main projects in the lab, I chose the metallabenzene project because I wanted to gain exposure to organometallic chemistry.

Future Plans:

After graduation I am moving to Los Angeles for a year off and then attending medical school (hopefully UCLA).

Melissa Marr
Springfield, OR
Professor Bruce Branchaud,
Supervisor
Anticipated graduation date:
June 2002

Research Project:

We're working on the synthesis of (+)-pancratistatin, which is a known anti-cancer agent. Pancratistatin is found naturally in the bulbs of some daffodil species, but in concentrations too small to make extraction practical as a source. Our synthesis starts from d-glucose, which is very inexpensive. We hope to develop a synthesis which will make it relatively inexpensive to make gobs of this stuff.

I became interested in research when I took the organic lab sequence here at the

U of O. I'm very interested in how chemistry relates to people and medicine, so this seemed like a good project to work on.

Future Plans:

I plan to either attend dental school or a graduate program in the study of chemistry.

Vanessa Muller
Wilsonville, OR
Professor Ken Doxsee, *Supervisor*
Anticipated Graduation date: June 2002

Research Project:

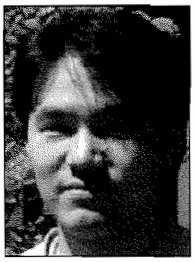
My research project involves synthesis of an ion-selective binding agent. This agent will be used for binding calcium and other related ions. Previous experiments have established that phenacyl alcohol can bind with calcium ions. My synthesis incorporates two phenacyl alcohol groups into one molecule (2-Hydroxy-1-[2''-(2-hydroxy-acetyl)-[1,1',3',1'']terphenyl-2-yl]-ethanone). The goal of this incorporation is to reduce the entropic cost (Chelate effect) of complexation between the phanacyl alcohol groups and calcium. The generation of my binding agent (2-Hydroxy-1-[2''-(2-hyroxy-acetyl)-[1,1',3',1'']terphenyl-2-yl]-ethanone) is achieved through a simple six-step synthesis from the starting material alpha bromotoluene. The plan incorporates several commonly practiced reactions (e.g., Grignard rxn, Benzyne coupling rxn, Swern type oxidation, etc.) to achieve the final goal. Following successful synthesis, attempts will be made to produce an organocalcium complex via metathesis (i.e., ligands exchange rxn) for structural analysis by x-ray diffraction. The main theme of this research is to address the calcium ion affinity and selectivity of the synthesized complex.

Long-term goals for the project include several biomedical applications. Another interest involves selectivity modifications, which could accommodate heavy metal extractions such as strontium from nuclear waste sites.

After completing my freshman and sophomore year chemistry courses I was eager to participate in research. I was interested in organic synthesis and my project presented an interesting challenge.

Future Plans:

After completing my undergraduate degree I plan to attend graduate school. In the future I hope to apply my education and experience to a career in research or teaching.



Hirokazu Okada
Mie, Japan
Professor Tom H. Stevens, *Supervisor*
Graduation date: June 2001

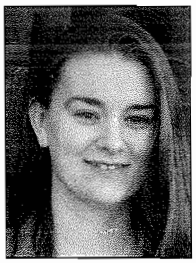
Research Project:

I am doing research in the Stevens Lab, where one of the research themes is the elucidation of the mechanism of protein trafficking in yeast cells. My project is to investigate the function of a protein called Grd19, which is known to be crucial in order for some Golgi-resident proteins to be retrieved from the endosomal compartment. I work with a postdoc, Dr. Youngseok Kweon, who has identified five proteins that interact with Grd19 using the yeast two-hybrid system. I have been investigating what protein complexes Grd19 forms with these five proteins, using the yeast two-hybrid system.

My friend told me a year ago that there was a system for undergraduate students to take part in real research activity. Since I was thinking of entering a Ph.D. program later, I thought that it was important to learn how to do research. At that time I was taking a biochemistry class taught by Professor Tom Stevens. Since I was deeply impressed by his lecture, I visited his lab web site, and there I found this project.

Future Plans:

I hope to elucidate the mechanism by which Grd19 helps Golgi-membrane proteins get retrieved from endosomes.



Sonja Reid
Everett, WA
Professor Peggy Saks, *Supervisor*
Graduation date: June 2001

Research Project:

My work focuses on which elements of a tRNA molecule are required for it to work efficiently and accurately.

I wanted to get involved in undergraduate research, both to supplement my classroom education and also to put towards a thesis in the Honors College. I heard about an opening in the Saks Lab and have been working there since July of 1999.

Future Plans:

After graduation, I'm looking to continue lab work, working in either an academic setting or in the pharmaceutical or bio-tech industry.

James Sampietro
Eugene, OR
Professor Tom Stevens, *Supervisor*
Graduation date: June 2001

Research Project:

My main focus in the Stevens Lab is to look at the structure and function of membrane bound proteins in the Vacuolar ATPase in yeast. This large protein complex has been implicated in several eukaryotic processes/pathways, such as renal acidification, bone re-absorption, neurotransmitter accumulation, etc. Specifically, I look at subunit interactions within the membrane bound portion of the V-ATPase complex. By introducing various mutants (fusion proteins, point mutations), I can look at the stoichiometry of the binding of the subunits and how the activity of the protein is affected.

After taking the biochemistry laboratory course here at the U of O, I was sure that I would enjoy lab work in the field of molecular biology. I e-mailed the professor for whom I wanted to work, and the rest is history.

Future Plans:

This summer I started attending the University of Washington/Fred Hutchinson Cancer Research Center to pursue my Ph.D in molecular and cellular biology.

Graduating Class *of* 2001

BACHELOR OF SCIENCE

Chemistry
Andrew J. Boydston
Jonah Cannoy
Matthew G. Cooper
Mandy R. Dutton
Michael J. Gonzales
Lauren M. Huffman
Jason D. Mead
Robert C. Muller
Hyeong-Kae Park
Brian C. Phillips
Lewis S. Roach
Brandi L. Stone
Hye-Jin Uh

Biochemistry
Jeremia D. Bernhardt
Laura M. Breshears
Ryan C. Chiechi
Hannah J. Grubb
William C. Hallows
Daniel P. Harms
Samantha L. Kehoe
Seren Lanza
Leland L. Mason
Mikenzie S. Matteson
Alison B. Mecklem
Kristi H. Piehl
Sonja M. Reid
Marla E. Rendell
James L. Sampietro
Corinne A. Stauff

MASTER OF SCIENCE

Kenneth V. Adair
Jonathan R. Bingham
Jason P. H. Bouwman

MASTER OF SCIENCE

Calvin H. W. Cheng
Danielle M. Della-Selva
Walter R. Duncan
Michael C. Fink
John W. Foley
Eric J. Hanson
Fred R. Harris
Jacob M. Jensen
Matthew B. Kraynyak
Christopher S. Larson
Jeremiah A. Marsden
Bervil E. Marsh, Jr.
Moreen R. Minkoff
Laura M. Murphy
William J. Oldham
Lucius M. Rivers, III
Justin H. Sato
Mary E. Schmidt
Satoko Shimamura
Andrea D. Sieg
Jonathan D. Sowins
Craig B. Stolarczyk
Christopher T. Sweeney
Tricia M. Tighe
Yan Zhang

DOCTORATE

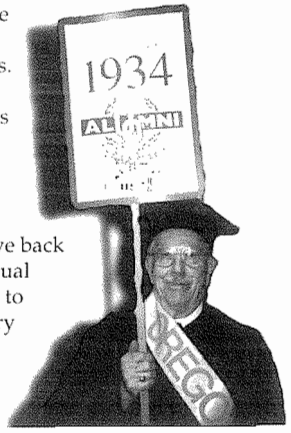
William A. Deutschman
Ian J. Griswold
Bonnie J. Hanson
George T. Hanson
Andrew C. Hausrath
Brandi L. Langsdorf
Maria J. Martinez
Scott M. Reed
Heike Sellinschegg
William B. Wan

Samantha Kehoe and Daniel Harms explain the "Ten ways you can tell we are Chemistry Majors" at the departmental commencement ceremonies.

"We yell in movie theaters when they make glaring scientific errors," "We know that Beer's Law wasn't invented by frat boys," "I have a favorite pair of safety goggles, and I think I look pretty good in a lab coat," and "We know that P-Chem isn't the study of urine."

The Chemistry Department commencement ceremony and reception were held on Saturday, June 16, 2001, in the Paul Olum Atrium. We had an extraordinary class this year. Fifty percent of our graduates finished with a GPA greater than 3.5, and 90 percent finished with a GPA greater than 3.0. In addition, three quarters of our graduating seniors participated in undergraduate research. After graduation, half of our graduates will be continuing their studies at graduate schools across the country, while a third will be heading to medical school, and a fifth will be starting positions directly. Of our currently 160 chemistry and biochemistry majors, 14 percent are enrolled in the Robert D. Clark Honors College. Over the past five years the department has awarded 24 degrees with departmental honors, recognized four Goldwater Scholarship winners, had 23 individuals invited to join Phi Beta Kappa, and had four individuals selected as members of the "Oregon Six."

Charles Jacobs**, Class of 1934, greeted graduates at the commencement ceremonies with this message:* "What you have achieved here is probably the most important base for your future social, professional, and financial success. The State of Oregon has supplied 21 percent of the cost of your education, your tuition and fees account for 30 percent of the cost, much of the remaining 49 percent has been made available through contributions and donations of former students who appreciated what they had received from the University and wanted to give back to help future students. Plan on making an annual contribution, no matter how small, giving back to your university and particularly your Chemistry Department." *Mr. Jacobs then presented the American Institute of Chemists Foundation Award to* ***Hannah Grubb *and* ***Marla Rendell.***



CHEMISTRY AWARDS AND HONORS

Chemistry Major with Honors
Hannah J. Grubb
Sonja M. Reid
Corinne A. Stauff

Biochemistry Achievement Award
Laura M. Breshears
James L. Sampietro

Organic Chemistry Achievement Award
Andrew J. Boydston

Richard M. Noyes Physical Chemistry Achievement Award
Jeremia D. Bernhardt
Marla E. Rendell

American Institutes of Chemists Foundation Award
Hannah J. Grubb
Marla E. Rendell

UNIVERSITY ACADEMIC HONORS

Magna Cum Laude (Top 5 percent)
Hannah J. Grubb
Marla E. Rendell

Cum Laude (Top 10 percent)
Jeremia D. Bernhardt
Alison B. Mecklem
Corinne A. Stauff

Phi Beta Kappa
Jeremia D. Bernhardt
Hannah J. Grubb
Marla E. Rendell

2001 Oregon Six
Marla E. Rendell

Chemistry Teaching Assistant Award
Kathryn Parent

UNIVERSITY OF OREGON

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