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Chemistry Newsletter

Volume 24 - Fall 2004

Oregon Research Center Opens



The Chemistry Department is an active partner in Oregon's new joint research center, the Oregon Nanoscience and Microtechnologies Institute (ONAMI), which was dedicated in May by a host of dignitaries, including Governor Ted Kulongoski and Senator Ron Wyden. ONAMI is an unprecedented collaboration between the state's three major research universities, Pacific Northwest National Laboratory, the State of Oregon, and private industry. Industrial partners include such Oregon giants as Hewlett-Packard Co., Intel, Tektronics, FEI Company, and Electro Scientific Industries. Chemistry Professor **Vince Remcho** became involved with ONAMI through his participation in the OSU/PNNL Microproducts Breakthrough Institute. Part of the ONAMI concept is to encourage small business growth in the Oregon high-tech sector. The ONAMI facility at HP will be an incubator for OSU/UO/PSU interactions with small business start-ups; space will be available for these businesses to undertake work of mutual interest to ONAMI principals. It will be located in Building 11 of the Hewlett-Packard Company's Corvallis campus for two to three years, until the OSU ONAMI team can move in to a renovated Graf Hall.



Vince Remcho

Research at ONAMI should bring millions of federal research dollars to Oregon and could give Oregon the national recognition it deserves in the world of nanotechnology and microscale research and development. Remcho comments, "This is an inviting environment to work in as a researcher, and I hope that it will be a means of involving graduate and undergraduate students in work that leads to employment opportunities. The facilities are excellent: safe, purpose-built, and inclusive of researchers from various units on campus. Equipment will be co-located to facilitate design, micromachining, micromanufacturing, and subsequent device testing and validation. This fosters new collaborations with OSU colleagues and others, and also enhances existing collaborations." Remcho already has begun joint projects with Chih-Hung Chang of Chemical Engineering and Brian Paul of Industrial and Manufacturing Engineering.

Lab-on-a-chip: ONAMI researchers in the Chemistry Department are harnessing molecular recognition processes to build lab-on-a-chip systems and microreactor components that make high-value, low-volume measurement, synthesis, and delivery a reality. This may, in turn, lead to great advances in medical diagnostics, pharmaceutical manufacturing, custom drug delivery systems, or environmental clean-up.

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From the Chair...

Greetings from Corvallis!

Enthusiasm during the past year paid off in our faculty recruitment with the addition of Paul Blakemore as Assistant Professor. He will be joining us in January 2005 from the University of Leeds, where he is currently a Royal Society University Research Fellow. We look forward to his contributions in augmenting our activities in organic chemistry.

I am pleased to report that Rich Carter has been promoted to Associate Professor with tenure. Rich has established a considerable research presence in the Department, and he has recently initiated an effort to upgrade our NMR facilities. He has also dedicated considerable energy to our graduate program, working with other members of the faculty to recruit the largest entering graduate class of the past 20 years.

The faculty continues to be successful in garnering funds to purchase equipment in support of our education and research activities. The Department was the most successful among all units on campus in securing funds from a recent University instructional equipment initiative. This support will be used to improve access of all students to our NMR facilities, enhance the general chemistry laboratory experience, and promote instructor-student interaction in our large lecture courses. To support the research effort, funds were awarded during the past year to purchase a new mass spectrometer and a hot isostatic press/pulsed laser deposition system.

Considering the central role of chemistry in areas from biology to materials and the increasing reliance of society on new technologies, it is not surprising that the services of the Department are in high demand. Our chemistry major enrollments continue to climb, providing us with challenges in terms of available personnel and facilities to meet the demand. We offered organic chemistry for science majors during the summer for the first time; the offerings were well received, as more than 75 students were enrolled in each course. And we go 'on-line' in the fall with a web version of one of our general chemistry courses (CH 121), providing students with additional access to chemistry in

pursuit of their educational and professional objectives.

I wish to extend my personal thanks to Joey Carson, Art Sleight, and Jim White for their considerable efforts in organizing the visits of Sir John Meurig Thomas and Barry Trost for the Linus Pauling and Büchi Memorial Lectures respectively. These lectures were certainly major highlights of the year.

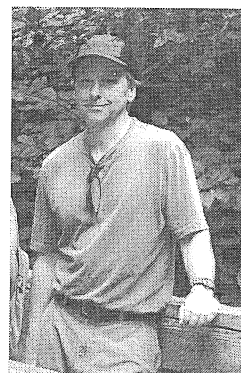
On behalf of the Department, I also wish to extend to Carolyn Brumley our deep appreciation for her contributions to our graduate program and this newsletter during the past eight years. We wish her the best in all of her future endeavors.

We are proud to keep you informed of exciting developments in the Department. We encourage you to write, phone, e-mail, or visit to provide us with your input. Our spring departmental awards banquet will be scheduled to coincide with the College of Science award activities in May 2005, and all alumni and friends of the Department are invited to attend and celebrate the many accomplishments of our students.

DOUGLAS A KESZLER

Casey Bennett, 1949-2004

We are sad to report that Casey Bennett passed away February 6, 2004 at age 55. Casey was a valued member of the Chemistry Department Advisory Board for over 5 years. He was born in 1948 in Thief River Falls, MN and graduated from San Jose State University. He earned an MS from UC Davis and his PhD at OSU. At the time of his death from cancer, he was Vice President of Engineering for FEI Co. in Portland. Casey will be missed at OSU.



Department News

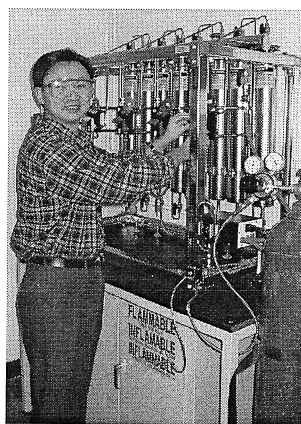


John Westall was elected to a 3-year term on the Governing Board of the Council for Chemical Research (CCR). He was an invited participant at the following workshops: NSF workshop "Postdoctoral Appointments: Roles and Opportunities;" ACS workshop "Exploring the Molecular Vision;" NAS workshop "Challenges for the Chemical Sciences in the 21st Century - Workshop on the Environment," Gordon Conference on Environmental Bioinorganic Chemistry, and The U.S. Geological Survey Biogeochemistry Workshop.

Douglas Keszler was honored in 2003 as Sigma Xi Researcher of the Year. He gave the annual Sigma Xi lecture in May titled, "From a Small World to High Power Light: An Excursion in Solid State Chemistry."

Rich Carter and postdoctoral associate Xiao-Ti Zhou published a 'hot article' featured on the cover of *Chemical Communications* detailing their highly efficient route to the ABCDE ring system of azaspiracid-1, a potent shellfish toxin found in edible European mussels and oysters. The structure of azaspiracid-1 was, until recently, mis-assigned. Carter and Zhou correctly hypothesized that the majority of the stereochemical errors in the original structure resided in the CD ring system.

Carter recently purchased four Solvent Purification (SP) Systems for the third floor of Gilbert Hall. SP systems are significantly safer than old-fashioned solvent stills. They will reduce water and power consumption, chemical waste and fire hazards. OSU is the first state institution to acquire the SP systems. Wei Zhang is shown here using the new SPS.



Senior Instructor **Richard Nafshun** coordinated the creation of the Chemistry/Physics Computer Center in Weniger 226 with 50 networked computer stations

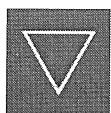
for use in general chemistry. The Center opened Fall 2003. For the ninth year, Rick facilitated a two week summer chemistry program for Talented and Gifted 4th and 5th grade students. Rick also won the 2003 Frederick Horne Award for Excellence in Teaching.

In June, the provost's office announced the award of funds for instructional equipment as part of the Strategic Plan. Four Chemistry faculty members received grants. **John Loeser** and **Margie Haak** were awarded \$62,697 to upgrade the equipment used in the science majors, engineering, and Honors general chemistry courses. This will allow the implementation of new laboratory experiments and make it possible for all students in these courses to have hands-on experience with the equipment. **Rich Nafshun** was awarded \$20,000 from OSU to introduce Personal Response Systems (PRS) into Gilbert 124. Each student is issued a small transmitter. The room is fitted with receivers. Students use these to respond to questions during the lecture and the results are tabulated in real time. The instructor can use this data to immediately identify students' misconceptions. **David Horne's** grant for \$30,000 will expand the NMR Facility computing capabilities through hardware and software purchases. This will enhance both undergraduate and graduate level education in NMR spectroscopy and data analysis.

The Department of Chemistry presented activities at the Intel - International Science and Engineering Fair (INTEL-ISEF) in Portland in May 2004. Instructor **Margie Haak** took the Department exhibit to the ISEF event. **Heather Petcovic** and **Alicia Lyman-Holt** helped and **John Loeser** contributed ideas and gathered equipment. Over 7,000 students visited the interactive displays over a two-day period. Intel - ISEF, the world's largest pre-college celebration of science, brings together students from 40 nations to compete for scholarships and other prizes.

Chemistry students took part in Discovery Days. School groups from western Oregon were treated to chemical demonstrations and hands-on chromatography and polymer activities. **Kathy Van Wormer** and

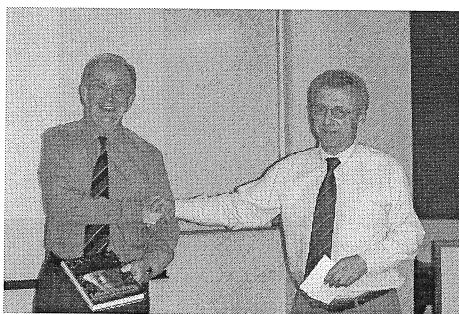
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Pauling Lectures Presented by Sir John Meurig Thomas, K.B.E.

This year's Pauling Lecturer was Sir John Meurig Thomas, formerly head of the Department of Physical Chemistry at the University of Cambridge and the Royal Institution of Great Britain. The Department of Chemistry and the Linus Pauling Institute sponsor these lectures. Sir John is well known as an engaging speaker on his own research and on the history of science, and he frequently appears on radio and television in the United Kingdom. He was knighted in 1991 for his services to chemistry and his popularization of science. Among his numerous awards are Pauling Awards from both Stanford University and the California Institute of Technology.

Sir John's first lecture, "Unpredictability of Science and its Consequences", was for the general public. Various examples of serendipitous discoveries were given. For example, X-rays were discovered



accidentally, although an appreciation of the many uses of X-ray required several decades. His second lecture was "The Genius of Michael Faraday." This included a demonstration of Faraday's discovery of the generation of electricity using a magnet and a coil of wire.

The third lecture, "New Catalysts for the Environmentally Conscious Age", was based on the results of Sir John's research group. He gave examples of the rational design of heterogeneous catalysts. Such rational design has only been possible in the last couple of decades. Sir John has been the leader in this area both in advancing the science and in producing new catalysts that have great practical impact. Art Sleight, who has known Sir John well for many years, is shown above presenting Sir John with a biography of Linus Pauling by OSU's Cliff Mead and UO's Tom Hager.

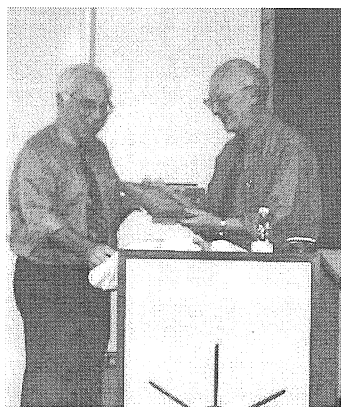
Carter and Kong Recruit in China

In March, Rich Carter and Wei Kong spent two weeks in China, giving talks at eight universities and meeting prospective chemistry graduate students. Their visits opened up avenues of contact and will provide future cooperation for both research and recruiting. Carter's talks in organic synthesis generated excitement at Fudan and Lanzhou Universities. He spent time with host Liu Dongzhi at Tianjin University (photo) and interviewed and recorded sessions with approximately 25 students at a total of 5 schools. He comments, "China is developing amazingly fast. Every campus I visited had at least one new chemistry building under construction and at least one recently completed. Government seems committed to supporting the



growth of fundamental science. Overall English skill levels in the universities were surprisingly strong. All of my seminars were presented to very large audiences. The organic division at Nankai University is very well-regarded and has a State Key lab with excellent instrumentation. The Shanghai Institute of Organic Chemistry was, of course, very impressive."

Wei Kong's visit coincided with her sabbatical work at USTC in Hefei. She also interviewed students and presented seminars at Dalian Institute of Chemical Physics and Beijing University. As a result of these trips to China, five new PRC students will begin graduate studies at OSU this fall.



Barry Trost Delivers First Büchi Memorial Lecture

The Chemistry Department hosted its first George Büchi Memorial Lecture in June with Barry Trost doing the honors. His seminar, *New Synthetic Strategies to Bioactive Targets*, was extremely well received by a full house of students and faculty. Barry Trost, the Tamaki Professor of Humanities and Sciences at Stanford University, is best known for his chalk talks, but also for an infectious enthusiasm for his subject, organic synthesis.

Much of Trost's work involves novel methodology employing transition metals and applications of these methods to the synthesis of complex molecules. He is a leader in the development of organopalladium reagents as catalysts and has recently turned his attention to ruthenium reagents for the same purpose. He has been working on enantioselective catalysis via the rational design of "chiral space" and, in the course of this work, has designed and constructed a new class of ligands for asymmetric catalysis which spontaneously form dinuclear complexes.

Trost completed his PhD under Büchi at M.I.T. in 1965 and began his academic career at the University of Wisconsin. He joined the faculty at Stanford University in 1987 and accepted the Tamaki endowed chair in 1990. His contributions to organic chemistry have been immense, and recognition includes the prestigious ACS Cope Award, membership to the National Academy of Sciences and a Fellow of the American Academy of Arts and Sciences.

The Lectureship was appropriately established at OSU where three former Büchi graduate students, Dave Horne, Steve Gould, and J.D. White, have been a part of the OSU organic chemistry division over the years. Next year's Büchi Lecturer will be Professor Gilbert Stork of Columbia University.

New Scholarships Established In 2003/04

Hach Scientific Foundation Scholarship – Kathryn Hach-Darrow and her late husband, Clifford, founded the Hach Company in 1947, in Ames, Iowa, with the mission of making safe drinking water available to all. They experienced their first success with the development of a simple method for measuring hardness in drinking water. As the product line expanded to include more parameters and instruments, the company continued to find ways to put analytical chemistry at the service of the general public. Today, Hach products and services are used worldwide to test and assure water quality.

The Hach Scientific Foundation, a private foundation established in 1982, is committed to improving access to and quality of science education, particularly in the field of chemistry. The foundation supports initiatives that encourage today's youth to explore the sciences. The foundation is especially interested in increasing the number and quality of science teachers; to support this effort, at least one Chemistry Department Hach Scholar each year will major in our Chemical Education Option. The first Hach Scholarships were awarded in May to Ryan Kanter (Chemistry Education) and Luke O'Rourke (Chemistry).

Linda May Oleson Chemistry Scholarship – Jennifer Niven Shepherd, who earned her BS here in 1993, established an endowment in memory of her aunt, Linda May Oleson, the woman who encouraged her to study science. Shepherd went on to earn a PhD at UCLA in 1998 and is now Associate Professor of Chemistry at Gonzaga University. Her gift to the department funded its first undergraduate scholarship in chemistry this year. She gave an entertaining presentation about her career at the spring awards banquet in May.



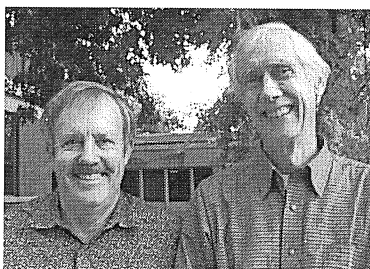
Oh, The Places You'll Go! - A Chat with Tom Hardy, OSU Alum and Chair of the Chemistry Department Advisory Board

When we asked Tom Hardy, Advisory Board Chair, what lead him to OSU, to a career, and then brought him back again, he quickly responded.

I grew up in California. I was a senior at San Jose State and planned on going to graduate school at UC Davis. Caroll DeKock came into my inorganic chemistry class and gave a pitch for OSU. I applied to OSU (why not?) but still intended to go to UCD. John Kice called me out of the blue one evening just to talk about the department and to ask if I had any questions. The contrast with UCD was so great, I decided that night to attend OSU. The next morning UCD called and offered me the assistantship and I told them they were 12 hours too late.

After graduation in 1972 and a post-doctoral position at Michigan State University with Harold Hart, I accepted a job with Stauffer Chemical Company. During my 11 years at Stauffer, I worked as a chemist developing a new flame retardant, in new business development, and then as a marketing manager in pharmaceuticals. Generating new business with a pharmaceutical company really requires understanding what drugs are in development, determining what raw materials might be needed, developing an economic process to make those materials, and then convincing the customer that we could deliver. Stauffer decided to take a risk on someone with a PhD in organic chemistry instead of the usual marketing type. Meanwhile I went back to school for an MBA.

In 1983 I joined Amgen, overseeing molecular biologists making specialty chemicals using recombinant DNA technology. I raised about \$10 million from corporate partners to support the work, a large sum in the mid '80's! The work was technically successful but the financial returns of the chemistry industry pale compared with the pharmaceutical industry, so once Amgen launched its first pharmaceutical product, Epogen®, we shut down (out-licensed) all the non-pharmaceutical work.



“An increase in communication skills has a huge leveraging effect on the effectiveness of a chemist’s technical skills.”

I remained as the company’s “utility infielder” until my retirement from Amgen in 2003. From 1998 through 2004 I also taught finance, marketing research and economics at California Lutheran University and Azusa Pacific University. I now teach finance at Cleary University in Ann Arbor.

From OSU, I developed skills in rational and critical thinking as applied to problem solving. From Pete Freeman I learned the importance of striving for excellence in every endeavor. From Caroll DeKock I learned the importance of taking off the blinders and looking around. While I enjoyed organic chemistry, it is only a small part of life and the world.

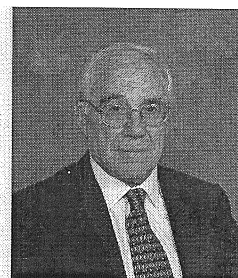
I was delighted when Caroll asked me to join the Chemistry Department Advisory Board. The wealth of experience and knowledge of the people on the Board is tremendous. All of them have been successful in their fields and have brought substantial insight to the issues with which the Chemistry Department wrestles. I have derived a great deal of satisfaction from seeing the results of implementing some of the recommendations of the Advisory Board, including focusing the research efforts of the Department into areas of emphasis, developing a strategic vision and a long range plan, and the Options program. Incidentally, the Advisory Board is in need of OSU graduates who are willing to share their expertise and experience with the Department. Anyone who is interested should contact Doug Keszler.

OSU does an excellent job in the technical preparation of students for careers in chemistry. It certainly did for me. The consensus of the Advisory Board, however, is that there are two areas where the Department should redouble its efforts in preparing students. First is communication. An increase in communication skills has a huge leveraging effect on the effectiveness of a chemist’s technical skills.

Continued next page.

J. D. White Honorary Symposium

September 25, 2004



To celebrate Jim White's retirement from OSU and to honor his 39 year career in organic chemistry, an honorary symposium will be held September 25th, 2004, in Gilbert Hall Seminar Room. Invitations have gone to 160 of his present and former students and co-workers. M.C. Kang, of Redmond, WA, is organizing the daylong program with help from Rich Carter.

Jim White has established an international reputation for organic synthesis research at OSU and has been recognized by many organizations and agencies through the years for his outstanding contribution to the field. A graduate of Cambridge University, White earned an MS at University of British Columbia and a PhD at M.I.T. where he studied under the late George Büchi. Most notable among his many career citations are the Centenary Medal, awarded by the Royal Society of England in 1999 and the Arthur C. Cope Senior Scholar Award from the American Chemical Society in 2003. During his tenure at OSU, White was Associate Editor of the *Journal of the American Chemical Society* (1989-1994) and North American Associate Editor for the Royal Society's *Chemical Communications* (1996-present).

In conjunction with this symposium, Jim White donated \$10,000 and endowed the **James D. White Graduate Fellowship in Organic Chemistry**. The award will benefit a full-time PhD student each year who has accomplished significant research in the area of organic or bioorganic chemistry. In honor of White's commitment to chemistry research, gifts of cash, stocks, or other appreciated property are being solicited. Multi-year commitments to this fund are welcome. For more information about making a gift in White's honor, contact Maya Abels, Director of Development (Tel: 800-354-7281; E-mail: maya.abels@oregonstate.edu).



Years of Accumulated Wisdom!..Emeritus faculty members share a laugh with Advisory Board members. L to R: Jim Krueger, Barry Sudbury, Dwayne Friesen, Ken Hedberg, Tom Hardy and Pete Freeman. Now who gets to give the advice?

Tom Hardy.....Continued from page 6

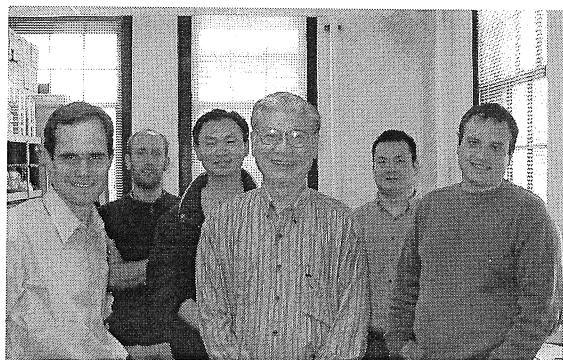
The second area is safety. While OSU may be typical of its peer universities in regard to safety, most new chemists are shocked at the very strong emphasis on safety in industry. The Advisory Board feels that OSU's graduate students especially would be well served by an even stronger emphasis on safety in the graduate research labs.

When asked to share an anecdote about OSU, Hardy replied, "Well, there was the time Pete (Freeman) went on vacation for a week and made the mistake of saying we could take out his Sunfish sailboat while he was gone. Tim Ziebarth, Brian Stevenson and I went sailing every day while he was away!"

Alumni News

Jay Burreson, BS '64, General Manager of MegaTech in Corvallis, has written *Napoleon's Buttons, How 17 Molecules Changed History*. He and Penny Le Couteur teamed up to provide a surprising history of the world—told on a chemical continuum of why things happened rather than when.

David Wong, MS '64, visited OSU and was honored with an OSU Alumni Fellow Award in November. He presented a seminar in which he described his career at Eli Lilly and more than 16 years of work bringing Prozac to FDA approval. He visited again in May to talk to researchers and students. Wong will be a new member of the Departmental Advisory Board.



L to R. Prof Rich Carter, Dan Furkert, Wei Zhang, David Wong, Xiao-Ti Zhou and Charles Wells.

W. Lloyd Allen, BS '67 (Parsons), is Senior Staff Scientist at MicroEnergy Technologies, Inc. As a consultant for 15 years, he works in new technology development for small companies. He is now developing sensors for Homeland Security and a separation process for desired components in natural oils.

Gary Olson, PhD '67 (Freund), is President & CEO of Provid Pharmaceuticals, Inc. in Piscataway, NJ.

Roger Heusser MS '68 (Parsons), retired and moved to Salem after 35 years on the East Coast. He stays active in Friends of Salem Library, is Vice President of Deepwood Historic Estates, and is Chairman of the Crime Prevention and Public Safety Committee.

Wing Lam Sung, MS '74 (White), is Senior Research Officer in the Institute for Biological Sciences for the National Research Council of Canada in Ottawa. Sung recently contacted Jim White and reported on a successful career in organic chemistry since completing his PhD at University of British Columbia under Jim Kutney in 1977.

Scott Chambers, PhD '78 (Thomas), received the 2004 E.W. Mueller award for outstanding research in surface science at Pacific Northwest National Laboratories in Richland, WA. He was honored for his work in molecular beam epitaxy and its applications to studies of the structural, electronic, and magnetic properties of metal oxide films, surfaces, and interfaces. Chambers spent 26 years in surface science and electronic materials. His current research includes the synthesis and properties of a new class of ferromagnetic oxide semiconductors that have potential in spintronics.



Dan Herting, PhD '79 (Krueger), received the Burke Hayes Technical Innovation Award in July 2004 for 'excellence in engineering and scientific contributions.' Dan is a Principal Scientist at CH2M Hill Hanford Group in Richland, WA. His award is one of the company's prestigious Founder's Awards.

Guy Schiehsler, PhD '80 (White), is Director of Chemistry at Jacobus Pharmaceutical Company, Inc. in Princeton, NJ.

Brian Bozlee, PhD '87 (Nibler), is Professor of Chemistry at Hawaii Pacific University. He and wife Sena now have two grandchildren.

John Wityak, PhD '88 (Gould), is Associate Director of Chemistry at the Genomics Institute of the Novartis Research Foundation in La Jolla, CA.

Nancy Triggs Breen, PhD '90 (Nibler), and family visited OSU and Oregon in August, including a water ski outing at Haag Lake with the Niblers and her contemporaries **Scott Mokler** (PhD '90) and **Robert Waddle** (MS '89). Nancy teaches at Roger Williams University in Rhode Island. Scott is with Intel Corp. in Aloha, OR. and Robert is Operations Superintendent for the Water Department in Everett, WA.

Shyh-Chen Ju, PhD '91 (Gould), co-founded and is President and CEO of Genemed Synthesis, Inc. in San Francisco, a leading peptide synthesis company and custom antibody service provider for academic, industrial and government research.

James Pavlovich, PhD '93 (Barofsky) is Mass Spec Administrator in the Department of Chemistry and Biochemistry at UC Santa Barbara.



More From our Alumni

Mark Jensen, PhD '95 (White), is Research Fellow at Merck Research Laboratories in Rahway, NJ.

Chris Herring, PhD '97 (Piepmeier), works for a small biotech company in protein mass spectrometry in San Diego, CA.

Pat Woodward, PhD '97 (Sleight), was promoted to Associate Professor of chemistry at Ohio State University and was awarded an Alfred P. Sloan Fellowship early this year.

Nadine Lee Becknell, PhD '98 (White), is Research Scientist for Cephalon, Inc. in West Chester, PA.

Matthew Cresswell, BS '98, works at Oregon's Wild Harvest doing research on drying methods and herbal supplement product quality.

Darren Williams, PhD '98 (Nibler), is Assistant Professor at Sam Houston State University in Huntsville, TX.

Zhenqiu Hong, MS '99 (Somoza), is Associate Research Scientist in the Pharmaceutical Division of Bayer Corporation in New Haven, CT.

Ivana Radosavljevic, PhD '99 (Sleight), came from the UK as an invited speaker at a Gordon Conference this summer.

Ryan Moser, BS '99, MS (Sci. Ed) '02, is a high school chemistry and physics teacher in Eugene.

Tom Gannon, PhD '00 (Watson), and Hua Qi have bought a new home in West Newbury, MA. Tom is a process scientist for FEI Company. They announced the arrival of their first daughter, Emma Juliet in September '03.

Engelene Chrysostom Oberdorfer, PhD '01 (Nibler) and husband Georg now live in Vienna, Austria, where Engelene is mastering her German.

Dominik Reusser, MS '01(Field), graduated this year from the University of Osnabrück with a Diplom in Applied System Science.

Jungchul Kim, PhD '01 (White), is Senior Scientist in synthetic chemistry, Schering-Plough, Union, NJ.

Catalin Doneanu, PhD '02 (Barofsky), is Postdoctoral Research Associate in the Mass Spectrom-

etry Center, Department of Medicinal Chemistry at University of Washington in Seattle.

Ana Barrios, PhD '02 (Horne), is a research scientist for Wyeth Research in Pearl River, NY.

Sangmoon Park, PhD '02 (Keszler), made headlines in January in the Materials Synthesis and Characterization Group at Brookhaven Laboratories.

Sangmoon is credited with developing a safer, easier, and more environmentally friendly way to create an experimental type of superconductor, a material that conducts electricity with zero resistance.

Jeff and Megan Barber, PhD '03 (Nibler), were married in Portland in May and now reside in Los Alamos, NM, where Jeff is a postdoctoral fellow.

Tony Masiello, PhD '03 (Nibler), presented a talk at the Molecular Spectroscopy Symposium at Ohio State University on his postdoctoral research at the Pacific Northwest National Labs in Richland, WA.

Kim Hageman, PhD '03 (Field), won the 2004 National Outstanding PhD Dissertation Award sponsored by the Universities Council on Water Resources. She received a \$750 cash stipend plus \$1,000 travel funds to attend the UCOWR meeting in Portland where the national award was presented.

Ju Zhou Tao, PhD '03 (Sleight), has a postdoctoral position at Intense Pulsed Neutron Source at Argonne National Laboratories in Chicago.

Heidi Zhang, PhD '03 (Deinzer), is a Staff Scientist at the Fred Hutchinson Cancer Research Center in Seattle.

Sunghwan Kim, PhD (Ohio State University, '03) who began his graduate work in Max Deinzer's lab, now has a postdoctoral position at the National High Magnetic Field Laboratory in Tallahassee, FL.

Christian Ion, BS '03, attends Monterey Institute of International Studies. He recently returned from an internship at the United Nations in Geneva where he attended conferences in disarmament affairs and was able to practice his French. Next he has an internship at The Hague, The Netherlands. He is earning a Masters in International Policy Studies, focusing on international security and nonproliferation.



Contributions

We wish to thank the following donors whose generous support during the 2003/04 year funded the seminar series, the Pauling Lecture Series, graduate recruiting, and scholarships and fellowships for chemistry students. In spite of budget shortages, your gifts allowed us to build the quality of our program at OSU. This year we added equipment and new scholarships with your ever more valuable donations.

Chemistry Unrestricted

3M

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Karen Jernstedt & Anthony Barkovich
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Laurence G. Ladwig
Ronald & Judith Lerch
Thomas Hoi-Chow & Susan Young Li
Douglas & Gina Marie Lorenz
Charles Luehr
Danny & Mary Kay McCloskey
Kevin McKennon
Charles McMurdo
Edward & Helen Brown Mead
Frank & Nancy Meserole
J. Bartley Miaullis
Gary J. Miller
Michael & Maria Miller
Frend Miner
Monsanto Fund
Ryan Moser
Dewey Murdick
Prabu Nambiar
Michael & Tracy Lentsch Nashner
George Jr. & Eleanor M. Neilson
John & Marilyn J. Nickel
Gerald Nordblom
Northrop Grumman Litton Corporation
David & Gara Lee Hutchin Nyberg
Carl Ekio and Cynthia Oda
Laurance Oden
Mikhail Orlov & Nadejda Orlova
Robert Stanley & Barbara Ottinger
James & Kala Lapidus Paul
Greg & Ann Peterson
Donald Petitmermet
Phillips Petroleum Co.
Norman & Rheta Potter
PPG Industries Foundation
Christina Pyle
Irene Rau
Mary Klock & John E Rauch
Cathleen Rawson & Glen Hopkins
Harry & Patricia Clifton Renouf
Thomas R. Riggs
Esther Petzoldt Rimbault
Celia Rockholt
Evan Rougeux

Ronald Rusay
Daberath Kouts Ryan
John & Thelma Sacklin
LCDR Robert Dean & Lynn Schmidt
Edith Schrader
Bernard Sheldon
Clara Shoemaker
Robert Small
Kevin Lee Smith
Wendy R. Smith
John L. & Charlene Gunnell Stephenson
Jennifer Stone
John Thomas Stoner
Melissa Marie Strait
Arden & Linda Strycker
Harry & Carol Studer
Jeffrey & Carol Stultz
Leonard Subotnik
Barry & Dianne Sudbury
Fred Shigeru & Fella Maria Tanaka
Milton & Joanne Mann Thompson
Ed & Judy Torgerson
David & Lynn Trammell
Richard & Angela Treinen
Nancy Triggs & John Breen
Scott & Amy Truksa
Junming Tu
Jerry Unruh
David & Catherine Vieira
Kent & Tammy Watson
Thomas R. Webb
Suzanne Heisler & Steven Weissman
Doreen & Dwight Weller
James D. White
Barry G. Willis
Robert & Patsy Woodley
Shan & Lee Wong
World Reach, Inc (Terence Mattoon)
Chiyun & Michelle Wun
Xerox Foundation
Nancy Yan

George Büchi Lectureship

Jian Eric Hong

Instrumentation & Facilities

Abbott Laboratories Fund
John D. & Anita Hansen
John L. & Pamela Sanderson
Thomas R. Webb

Bert Christensen Fund

World Reach, Inc.(Suraj Hindagolla)

Carroll DeKock Scholarship

Carroll & Gerry DeKock
Ralph E. Miller
Lyle (Smokey) McAfee
Michael & Brandy Schuyler

Contributions

Graduate Education

Abbott Laboratories Fund
John & Anita Hansen
Joseph & Karen Nibler
Jeffrey Jerard Posakony
Thomas R. Webb

Bruce Graham Memorial Scholarship

Arvon & Marian Griffith

Arnold Johnson Jr. Fellowship

Sharon Ervin Johnson

J. Krueger Chemistry Education

Boeing Company (Wm Johnson match)
Claudia & Scott Hein
Hewlett-Packard, Co. (Jay Shields match)

Linda May Oleson Scholarship

Jennifer Shepherd Niven

Linus Pauling Lectures

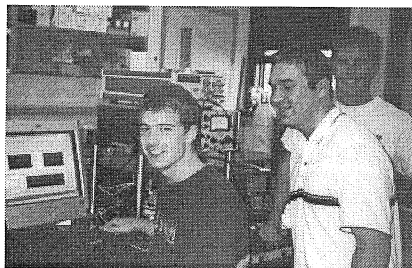
David & Beth Stresser

Colleen Spurgeon Scholarship

Colleen Spurgeon

J.D. White Scholarship

James White



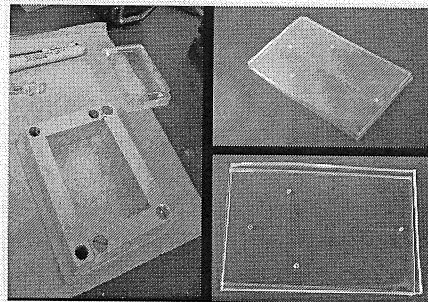
L to R. Jason Warkentin and Dane Smith are undergraduate research interns in the Remcho lab during the summer. Graduate Student Jack Rundel supervises.

ONAMI...Continued from page 1

The Remcho research group is working with aptamers to harness their unique molecular recognition properties in lab-on-a-chip devices. Aptamers are oligonucleotides which are isolated and amplified based on their recognition of a target molecule. In Remcho group studies, an RNA aptamer, isolated and amplified based on its affinity for flavin mononucleotide (FMN), and a DNA aptamer that binds thrombin, a blood protein, have been attached to surfaces in fused silica capillaries and on monoliths in microscale separations devices. These are subsequently used as components of lab-on-a-chip devices.

Polydimethylsiloxane (PDMS) Chip

PDMS chips are produced by vacuum casting PDMS onto an SU-8 (thick resist) mandrel and bonding a PDMS cover by functionalizing the surface through plasma oxidation. Package size is 50 x 75 mm and channel dimensions are nominally 50 μ m in cross-section.

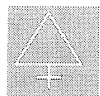


Microreactors for Nanoscience: The field of nanoproduction could be advanced using improved process control made available within highly-parallel, process-intensified microsystems. Microsystems technology has the capacity to transform current batch nanoproduction practices into continuous processes with rapid, uniform mixing and precise temperature control. Remcho Graduate students **Jack Rundel, Yolanda Tennico, and Angela Doneanu** report progress in developing high-throughput nanoextraction technology for implementation in microsystems. In particular they explore methods for surface immobilization of monolithic sorbents in microfabricated fluidic pathways and the subsequent use of these sorbents in a novel nanoextraction technique. Implementation of the nanoextractor is within a polycarbonate (PC)/polydimethylsiloxane (PDMS) architecture with the capability to integrate pneumatic valves for physical injection and extraction. The fabrication architecture bears the added advantage of providing an economical pathway to “numbering up” for high-throughput production. Remcho’s other students **Myra Koesdjojo, Carlos Gonzalez, and Dana Hutanu** will soon begin ONAMI research.



Three Alpha Beta chapter members of Pi Sigma Upsilon each received \$250 from the National Society for travel to meetings to present their research in 2004. They are **Ben Figard** (ASMS, Nashville, TN), **Sascha Usenko** (SETAC Europe, Prague, Czech Republic), and **Luke Ackerman** (Annual International Conference on Brominated Flame Retardants, Toronto, Canada). **Keith Schwartz**, on behalf of the chapter, was awarded a \$250 National PLU Activity Grant to provide refreshments at the first George Büchi Memorial Lecture.

The officers of Alpha Beta chapter of PLU organized the annual initiation at Woodstocks Pizza in May and welcomed ten new members: Nathan Bonn Savage, Sarah Bassett, Gretchen Clark-Scannell, Edgar Lee, Brad Ashburn, Richard Scheri, Sarah Sowell, Carl Isaacson, Cynthia Villwock, and Maryam Moussaoui (sophomore PLU award winner). PLU Officers are: Melissa Schultz, President; Martha Stapels, VP; Carin Huset, Secretary; Ben Figard, Treasurer; Chris Pastorek, Councilor.



Advanced Degrees 2003/04

Master of Science

- Robert Killin** *Atmospheric Transport of Anthropogenic Semi-volatile Organic Compounds to the Olympic Peninsula of Washington State.* (S. Simonich) Robert teaches at Lewis and Clark University in Portland.
- Darrell Ziemski** Non-thesis (J. White) Darrell is working in an analytical laboratory in Portland.
- Cynthia Villwock** Non-thesis (W. Gerwick) Cynthia teaches at Chemeketa Community College in Salem.
- Laura Lessard** *Employing Capillary Electrophoresis as a Separation Method for Pharmaceutical Analyses* (V. Remcho). Laura is in the PhD program at University of Vermont in Burlington.
- Kriangsak Khownum** *Direct Atom Transfer Versus Ring Expansion in Reaction of Rhenium Oxo Complexes with Cyclooctene, Epoxides and Episulfides* (K. Gable). Ake is in the PhD program at Kansas University in Lawrence.

Doctor of Philosophy

- George Law** *Surface Composition and Orientation of Room Temperature Ionic Liquids* (P. Watson). George is employed by the U.S. Army at Dugway, UT.
- M. Sundaram Shanmugham** *Synthesis of Furanoeremophilane Sesquiterpenoids* (J. White). Sundaram has a postdoctoral position at University of North Carolina, Chapel Hill.
- Punlop Kuntiyong** *Studies Toward the Total Synthesis of Phorboxazole A* (J. White). Punlop is teaching at Silpakorn University in Thailand.
- Mohammad Khasawneh** *Natural and Semi-Synthetic Compounds with Biocidal Activity Against Arthropods of Public Health Importance* (J. Karchesy). Mohammad has a teaching position at University of Wisconsin, Eau Claire.
- Martha Degen Stapels** *Proteomic Approach to the Analysis of DNA-Binding Proteins Using Mass Spectrometry* (D. Barofsky). Martha is a Senior Research Chemist in the Life Sciences Division at Waters Corporation in Milford, MA.
- Stacey Clark** *RNA and DNA Aptamers as Affinity Stationary Phases for Liquid Chromatography and Capillary Electrochromatography* (V. Remcho). Stacey has a position at International Flavors and Fragrances in Union Beach, New Jersey.



Mark Abel engaged in research in the Nibler laser lab and will co-author at least one publication. Abel received Honorable Mention for an NSF Fellowship this year.

Undergraduate Research, Innovation, Scholarship, and Creativity (URISC) Program

Elizabeth Camp (Carter)
Jessica Page (Maier)
Spencer Porter (Keszler)
Tony Tong (Stevens)

Undergraduate Research

Mark Abel (Nibler)
Nathan Bonn-Savage (Ingle)
James Brookhyser (Loveland)

Kasey Carlson (Stevens)
David Chan (White)
John Dollhausen (Loeser)
David Ellis (Loeser)
Absar Faruqui (Drapela, Horne & Stevens)
Nicholas Lockard (Kong)
Joanna Lynn (White)
Kevin Marnell (Evans)
Spencer Porter (Keszler)
Sundara Rector (Loeser)
Jason Warkentin (Remcho)
Dane Smith (Remcho)
Andrea Voorhees (Nibler)

2003/04 Bachelor of Science



June 2004

Mark Abel (HBS, ACS advanced chemistry) attends graduate school in physical chemistry at UC Berkeley.

Elizabeth Camp (BS, biochemistry) attends graduate school in organic chemistry at University of Pennsylvania.

Kasey Carlson (chemical education)

John Frieh (ACS advanced chemistry) works at Intel in Hillsboro, OR.

Susan Gino (HBS, forensic science) is a QC Chemist at Sierracin in Sylmar, CA.

Michael Herndon (pre-medicine) works in emergency medical services in Portland.

Ryan Holcomb (BS, ACS advanced biochemistry) has an internship at Bend Research.

Chris Holm (BS, ACS advanced chemistry) will attend graduate school in Oceanography at OSU.

Nickolas Lockard (BS, ACS advanced chemistry) is an intern at Pacific Northwest National Labs in Richland, WA.

Dan Olson (BS, business) will attend Atkinson Graduate School of Management at Willamette University.

Rebecca Parker (HBS, ACS advanced biochemistry) will attend graduate school in molecular biology at University of Utah.

Nicholas Sabrowski (HBS, pre-medicine) will pursue studies in medicine.

Winter 2004

Natlya Azadeh (BS, pre-medicine) will pursue studies in medicine.

Theresa Berger (BS, forensic science) has joined the Army.

Heather McNicholas (BS, forensic science) has an internship at Lacamas Laboratories in Portland, OR.

Nanako Ogi (BA) has moved to New Jersey to pursue graduate studies.

Yung-Wei Josh Pan (BS, forensic science) works at OHSU in Hematology/Oncology doing research on hematopoiesis and stem cell gene transfer.

John Yan Jr. (BS, biochemistry) will attend graduate school in pharmaceutical chemistry at University of Arizona.

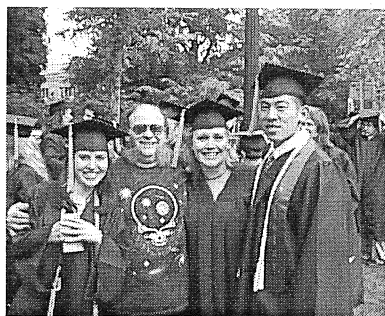
Fall 2003

Sarah Robinson (BS, pre-medicine) attends graduate school in pharmaceutical chemistry at UC Santa Cruz.

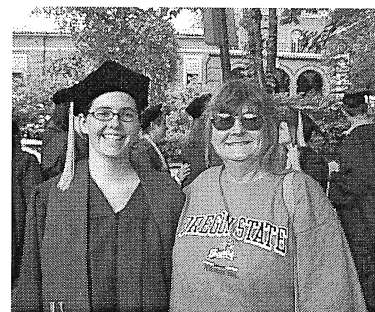
Summer 2003

Sara Breitenbach (HBS, ACS advanced biochemistry) is Director of Dr. Rockey's Microbiology Laboratory at OSU.

Takashi Suyama (BS, biochemistry) is a graduate student in Bill Gerwick's research group at OSU.



Graduation day wouldn't be complete without a congratulatory hug from Emile Firpo and Chris Pastorek! Heather Parsons, Heather McNicholas, and Josh Pan enjoy their final day at OSU (left). Susan Gino (right) gets a farewell photo with Chris before going off to California.





Honors and Awards

College of Science Undergraduate Scholarships for 2004/05

Peter Culter Memorial Scholarship
Maryam Moussaoui
Abdul Hackim

Carroll DeKock Scholarship
Jessica Page
Danny Martinec

Colleen Spurgeon Scholarship
Joel Klein

Milton Harris Scholarship
Joel Klein

Linda May Oleson Chemistry Scholarship
Katherine Van Wormer

Hach Scientific Foundation Scholarship
Education - Ryan Kanter
Chemistry - Luke O'Rourke

Excellence in Science Scholarship
Katherine Fordyce

James A. Riley Health Occupations Scholarship
Luke O'Rourke

Aitkenhead Memorial Scholarship
Kathy Van Wormer

Chemistry Department Awards, Sept. 2003

'02/'03 Employee-of-the-Year Award
Karen Kelly

'02/'03 Teacher-of-the-Year Award
Jeff Walker

James Krueger Excellence in Teaching Award
Phil Watson

'02/'03 Harris GTA Award
Jack Rundel
Cynthia Villwock
Jason Stowers

Chemistry Department Awards, June 2004

William J. Ingram Memorial Award
Bradley Ashburn

Courtney & Dorothy Benedict Fellowship - Research
Nick Kesinger

Fall 2003 Laboratory TA Awards
Brett Palama
Laura Lessard
Stacey Clark

Winter 2004 Laboratory TA Awards
Brad Ashburn
Toby Primbs
Heather Swinger

Spring 2004 Laboratory TA Awards
Elliot Ennis
Wei Yan
Chris Lincoln

Shirley Kuse Fellowship
Johanna Perkins

Ray Dandeneau Fellowship-summer 2004
Chad Teters

Ray Dandeneau Fellowship 2004/05
Brent Matteson

Bend Research Fellowship-summer 2004
Heather Conway

Molecular Probes Internship-summer 2004
Damien Kuiper

N.L. Tartar Summer Research Fellowships
Brad Ashburn Carlos Gonzalez
Carin Huset Nick Kesinger
Eric Korf Chris Lincoln
Jack Rundel Keith Schwartz
Tony Scott Jennifer Sfetku
Gretchen Clark-Scannell

Milton Harris Summer Research Fellowships
Angela Doneanu Yonggang He

David Shoemaker Award
Cheol-Hee Park Melissa Schultz
Helmars Smits Wei Zhang

Minority Pipeline Graduate Student Support 2004/05
Brad Ashburn

Ford Foundation Fellowship-Honorable Mention
Brad Ashburn

E.P.A. - STARS Fellowship 2004/05-2006/07
Toby Primbs

CRC Press Freshman Chemistry Awards
Megan Jurasek (CH 221/222)
Erin Rieke (CH 224/225)

Phi Lambda Upsilon Outstanding Sophomore
Maryam Moussaoui

Outstanding Analytical Chemistry Student
Kristi Tompkins

American Institute of Chemists - Graduating Senior
Mark Abel

Merck Index Award for Outstanding Senior
Rebecca Parker

More Department News...From page 3



Lindsey Crawford, co-presidents of SAACS, organized the volunteer effort. Chemistry, under **Margie Haak's** able direction, offered two workshops at the Apprenticeships in Science and Engineering Mid-summer Conference at OSU in July.

In Summer 2003, **Rick Nafshun** developed and instructed a six week chemistry course for 24 first-generation and/or low income college-bound high school juniors and seniors. The general and organic chemistry course was intended to prepare students for college or allied health professional schools. One student was admitted to OSU for this fall!

Chris Pastorek ran a two day lab session "Crime Scene Investigation through Chemistry" in March with twelve high school students for OSU's Saturday Academy. The chemical sleuths tested samples collected at a crime scene using solubility tests, pH, and luminol, and analyzed metals by ICPOES and organics by GCMS. Chris hosted two groups of K-12 students in April as part the OSU Science Math Investigative Learning Experiences/Challenge weekend. She was assisted by two chemistry majors, **Kathy Van Wormer** and **Josh Pan**.

Chris Pastorek mentored two students in July as part of the Summer Experience in Science and Engineering Youth, organized by **Skip Rochefort** in Chemical Engineering. The chemistry SESEY group helped Chris debug an HPLC separation of vitamins, a new experiment in the Integrated Lab.

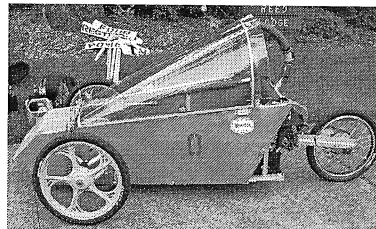
Joe Nibler, **Margie Haak** and **Chris Pastorek** were recipients of a TRF grant that helped to upgrade the PCs and some software in the computational chemistry lab, general chemistry and the integrated labs.

Alex Yokochi, Director of the Department's Crystallography facility, accepted a tenure-track position in Chemical Engineering at OSU.

Graduate student **Melissa Schultz** was honored by ACS with a 2004 Graduate Student Award in Environmental Chemistry in January.

Bob Boyer, Chemistry Network Administrator, mentored a group of 20 students of the Oregon State Electric Racing Team (OSERT) during the '03/'04 academic year. With help from Chemistry's **Rick Nafshun** and electronic shop manager **Joe Magner**,

and with the use of the Physics Department shop, these dedicated young people were able to build an impressive electric vehicle, achieving speeds approaching 50mph. Boyer elaborates, "We designed and built an electric vehicle (pictured below) using specifications required to compete in *Electrathon America* events. We then hosted our own race with forty-five entrants in May."



The OSERT car won awards for its innovative suspension design. The team will construct a prototype solar powered vehicle next year, while continuing to race and refine this year's production car.

Rick Nafshun collaborated with **Barbara Edwards** (Mathematics), **Corinne Manogue** (Physics), and **Ellen Momsen** (Engineering) to develop and instruct Chemistry 109X, a freshman course where students are required to articulate simple physical relationships using their mathematics skills. Many students reach college-level physical science courses lacking robust conceptual understandings and the ability to use their mathematical knowledge flexibly. Mathematics and science education research confirms the existence of a "transfer" difficulty among students: students may have successfully completed prerequisite mathematics courses, but they face real challenges when asked to transfer this knowledge to another field.

Additionally, **Nafshun**, **Manogue**, and **Momsen** designed and implemented an interdisciplinary graduate course for teaching assistants in chemistry, engineering, mathematics, physics and science education that raises awareness of the problem of transfer difficulties. In small groups the graduate students designed activities. This work provided the springboard for class discussions on teaching methods, content issues and the nature and subtleties of the interface between mathematics and the physical sciences. Four interdisciplinary teaching assistants were supported with a grant of \$55,000 from the William and Flora Hewlett Foundation.



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There were many first-time players on **The Atoms**



And **The Alchemists** fielded their largest team this year.

Milestones in Service to OSU Chemistry

5 years - Emile Firpo, Instructor

15 Years - Art Sleight, Milton Harris Chair and Distinguished Professor of Inorganic Chemistry

20 years - Doug Barofsky, Professor of Analytical Chemistry

20 Years - Doug Keszler, Department Chair and Professor of Inorganic Chemistry

20 Years - Phil Watson, Professor of Physical Chemistry