

The George Washington University Department of Chemistry Newsletter

Volume 19

Summer 2000

CHAIRMAN'S REPORT

Michael King

As the quality of our program and the reputation of our faculty increases, we similarly note the increasing accomplishments of graduate students attracted to our program. This year, as I prepared the annual departmental report for the Dean, I was struck by the number of honors and the breadth of recognition that our graduate students garnered this past year. It was truly an inspiring display of excellence, demonstrating to the University and the chemistry community what a gem of a program we have been building. Consequently, I have chosen this year to share with you, our alumni and friends, these successes from the past couple of years.

These award winners are listed alphabetically with their mentors.

Student	Mentor
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<i>Acon, Billy</i>	<i>Montaser</i>
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- Travel Award and participation in the Meeting of Nobel Laureates at Lindau, Germany
- Best Poster Award, Winter Conference on Plasma Spectrometry
- Travel Award to the FACSS meeting in Vancouver

<i>Allen, Kerry</i>	<i>King</i>
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- National Institutes of Health (NCI) Predoctoral Fellowship

<i>Canavan, Heather</i>	<i>Ramaker</i>
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- Travel Award to the American Vacuum Society Meeting

<i>Dulaney, Kim</i>	<i>Wagner</i>
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- Achievement Reward for College Scientists Foundation



Graduation Reception, May 2000
Jeffrey Chang, Michael M. King

- Endowment Fellowship
- FORWARD in SEM Fellowship
Galicia, Marsha Vertes
- FORWARD in SEM- Research Grant
- Honorable Mention, NSF Graduate Research Fellowship
Jeffries-El, Malika Tarkka
- Mendenhall Fellowship, Smith College
- Jessie Ball Dupont Fellowship, Sweet Briar College
- Dr. Theophilus Sorrel Award, Eastman Kodak
- Travel Award, ACS Women Chemists Committee
Minnich, Michael Montaser
- Best poster award at FACSS meeting in October
- Travel scholarship to FACSS meeting in Vancouver
- Society for Applied Spectrometry Student Award
McLean, John Montaser
- ACS Division of Analytical Chemistry Graduate Fellowship for 1999-2000
- FACSS Student Award presented at its 25th Annual Conference
- Best poster award at 26th FACSS

- meeting
- Travel scholarship to FACSS meeting in Vancouver
Nelson, Jennifer Wagner
- Grant-in-Aide Research Support, Sigma Xi
- Travel Award, ACS Women Chemists Committee
Olumee, Zohra Vertes
- Featured twice in "News" section, Analytical Chemistry
- Travel award, American Society for Mass Spectrometry
Sadeghi, Mehrnoosh Vertes
- Society for Applied Spectroscopy Student Award
- Travel award, Society for Mass Spectrometry
Schull, Terry Knight
- NRL Postdoctoral Appointment
Souza, Glauco Miller
- Grant-in-Aide Research Support, The Cosmos Club

Even with these successes, I must also share a rising sense of concern as we strive to continue our efforts to recruit the best and brightest for our program. As you may have read in the various alumni publications recently, the University has been accelerating its improvements of space and facilities for several other components of the University. These actions have delayed the expected improvements in resources for GTA's, both in terms of the number and the size of the financial packages. However, GTA's play a critical role in the enrichment of the undergraduate laboratory program and are the means of initial recruitment of new graduate students to our program. It is important that

we maintain a level of competitiveness in our offer packages. Soon we will be announcing an effort to target improvements in this area. As you have so generously responded in the past, we will again be calling on you to continue to step up and participate.

Departmental Highlights

In addition to the accomplishments of the graduate students listed above, I am pleased to report to you on a few of the honors the faculty received this past year. Among them are the election of Nicolae Filipescu as an Honorary Member of the Romanian Academy of Sciences and the appointment of David Ramaker as a Columbian Distinguished Professor of Chemistry. Created by Dean Lefton in 1998, Columbian Professors hold their titles for four years and receive a special stipend which can be used to further the faculty member's research.

In addition, Akbar Montaser and his student, John McLean, were honored as winners of one of R&D Magazine's R&D 100 Awards in July of 1999. Described by the Chicago Tribune as the "Oscars of Invention," this award for their invention of the Direct Injection High Efficiency Nebulizer (DIHEN) honors the 100 most technologically significant new products of the year. The DIHEN was featured on the cover of the September issue of the Magazine.

Since May 1999, colleagues submitted twenty-two new multiyear grant proposals totaling almost \$7 million to external granting agencies and organizations, of which over \$2 million in new multiyear funding was actually awarded by the External Sponsors during that cycle. External research dollars in the Department for 1999 totaled more than \$1.2 million according to By George. Additionally, \$16K was received from Internal GWU funds by chemistry faculty, who submitted three proposals totaling \$19K.

Colleagues published 40 papers, journal articles or conference proceedings during the year. An additional seven papers were accepted

and 12 more were submitted as well during the past year. Furthermore, colleagues gave 31 contributed talks or posters at meetings and conferences, and delivered some 19 invited talks at conferences, Universities and other sites.

Personnel Changes

I am pleased to report that two faculty searches were successfully completed with the recruitment of Dr. Christopher Cahill, a postdoctoral fellow at Notre Dame, and Dr. Martin Zysmilich, a lecturer in the Department of Chemistry at the Massachusetts Institute of Technology. Dr. Cahill received his undergraduate degree from SUNY, Stony Brook in 1999 with John Parise before joining Peter Burns' group at Notre Dame as a post-doctoral fellow. He will contribute to the Institute of Material Science through a research program in solid state chemistry, focusing on the synthesis and characterization of framework materials. Dr. Zysmilich received his doctorate from Columbia in biophysical chemistry with Ann McDermott in 1997 and then served for three years as a lecturer at MIT. He will be taking on major teaching responsibilities in the department, eventually inheriting full responsibility for the program for non-science students.

Fred Abramson, Professor of Pharmacology, joined the Department with the courtesy title of Professor of Pharmacology and of Chemistry. Fred is an internationally recognized mass spectrometrist, who has developed a technique for the selective detection of certain elements or stable isotopes in a way that competes with detection of some radioisotopic labels. This type of element or isotope selective analysis has applications in the pharmaceutical and biotechnology industries, environmental studies, as well as plant and human metabolism. Winner of the Trachtenberg Prize for Scholarship, he is the holder of several large NIH grants to study DNA synthesis rates, proteins and drug metabolism and pharmacological assays.

Andy Knight will be leaving in

August for Loyola University of New Orleans, where he will take up an appointment as Associate Professor. Research Professor Jay Hickman received an appointment as Associate Professor and Hunter Chair in the Department of Bioengineering at Clemson University. He will continue an association with this department in an Adjunct status. Deborah Levin, another of our Research Faculty, has taken a tenure-track appointment in the Department of Areomechanical Engineering at Penn State and will also be leaving in August. She, too, will maintain collaborations with the Department with a research appointment.

Regretfully, Stephen Barone resigned from the University effective June 30, 1999 to return to his native Colorado and the NOAA Aeronomy Laboratory. We expect to recruit for his position this coming year.

Alumni News

Congratulations to Alexander Fatiadi for being included in 2000 Outstanding Scientists of the Twentieth Century in honor of an outstanding contribution in the field of organic and bio-organic chemistry and for receiving a Twentieth Century Achievement Award from the Board of Directors of the American Biographical Institute.

Daphne Henkin, a physician working in a family practice in the area, sends her regards. She recalls fondly the days as a TA in chemistry and the time spent serving the department in the main office.

Christa Marandino will be starting graduate studies in Earth Systems Studies at UC, Irvine in September. She expects to concentrate on soil and water chemistry.

Karl Miller, who has been a research associate in the Department of Psychiatry at UMB, reports that he has decided to apply for graduate studies in Cognitive Neurosciences/ Artificial Intelligence.

Dr. Vivek Navele, reports that he was selected to be a senior staff member at the NASA Jet Propulsion Laboratory.

Congratulations to Dr. Mary Tungol, who was married in January to Dr. Mike Carrabba. Dr. Carrabba works for Chromex, Inc. and is the program chair of FACSS-2000.

Dr. Ying Zhang, and husband Paul are working for ArQule Corporation in Massachusetts doing organic synthesis. With newly won large contracts, they are kept pretty busy with meetings, reports and due dates. Daughter Jessica is growing fast, speaking in full sentences and recognizing letters. Like her mother, she is a nice girl with a pleasant personality.

Elaine Weiner is a psychiatrist working in Baltimore.



Dr. Michael M. King, Chair

FACULTY NOTES

Dr. Akbar Montaser

- Review Panel member for the DOE's Environmental Management Science Program: Research related to Subsurface Contamination/Vadose Zone Issues, Panel 4 (Analytical Chemistry and Instrumentation); Gaithersburg, MD, June 7, 1999.
- FACSS Conference invitation to organize and chair two half-day symposia on Micro and Nanonebulization: Concept, Devices, Fundamentals, and Novel Applications, Vancouver, British Columbia, October 24-29, 1999. The sessions included 16 invited lectures by key scientists from several countries. Acquired \$6,000

from 6 firms to support invited speaker program.

- Plenary Speaker at the 2000 Winter Conference on Plasma Spectrochemistry, Fort Lauderdale, Florida, January 10-15, 2000.
- Chaired the session Sample Introduction, Transport Phenomena and Flow Processing, 2000 Winter Congerence of Plasma Spectrochemistry, Fort Lauderdale, Florida; January 10-15, 2000.
- Colloquium Speaker at University of Missouri-Rolla, Rolla, Missouri; February 7-8, 2000.
- The book (inductively Coupled Plasma Mass Spectrometry, 964 pages, Wiley, New York, 1998) was translated into Japanese and published by the Chemical Daily Co, LTd. (Tokyo, Japan) in March 2000. This effort was initiated in 1998 when Dr. Montaser invited Dr. Masaaki Kubota (National Institute of Materials and Chemical Research, Tsukuba, Japan) to serve as the Translation Editor. The translation team consisted of 21 prominent Japanese scientists.
- An invention from Montaser's laboratories received one of the 1999 R&D-100 Award (with the co-inventors J.A. McClean and J.M. Kacsir) for the direct injection high efficiency nebulizer (DIHEN) as one of the 100 most technically significant products of the year.
- An illustration of the DIHEN on the Cover Page of September Issue of the 1999 R&D Magazine. The DIHEN was one of the four inventions that appeared on the cover page on the occasion of 37th R&D-100 Awards presented at the Chicago Museum of Science & Technology on September 23, 1999.
- Graduate student, John A. McLean, received the prestigious (\$15,000) 1999 American Chemical Society Division of Analytical Chemistry Graduate Fellowship sponsored by Glaxo Wellcome.
- Three graduate students (B. W. Acon, J. A. McLean, and M. G.

Minnich) received travel scholarships for invited presentations at the 1999 Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Meeting held in Vancouver, British Columbia, Canada during October 24-29, 1999.

- Graduate students (Mr. M. G. Minnich and J. A. McLean and) shared the best Poster Award for presenting a new aerosol diagnostic technique at the FACSS meeting (Vancouver, Canada; October 1999).
- Graduate students (Billy W. Acon) received the best Poster Award for fundamental research presented at the Winter Conference on Plasma Spectrochemistry, Fort Lauderdale, Florida, January 10-15, 2000.
- Dr. Montaser served as the External Examiner for the Ph.D. Dissertation (Micro flow separation techniques coupled to inductively coupled plasma mass spectrometry for the determination of metal species) of Anders Tangen at the Chemistry Department, University of Oslo, Oslo, Sweden; April 5-10, 2000.
- The research team published 12 papers (including a book translated into Japanese) and have submitted 7 manuscripts. The group presented 19 papers at national and international meetings (including 11 invited or plenary lectures).
- Montaser's grants from DOE, J. E. Meinhard Associates, CETAC/ Transgenomic, Inc were renewed. New funds were obtained from Central Department for Analytical Chemistry, Research Center Julich, Germany to support research efforts of two graduate students in Germany.

Dr. Michael Wagner

The lab has now grown to include 3 graduate students, Jen Nelson, Kim Dulaney and Mike Harrell. Jen is finishing her 3rd year of study. Her research has gone very well. In fact she

was awarded two fellowships this year, one from the ACS and one from Sigma Xi. She received rave reviews for her presentation at the National Meeting of the ACS at San Francisco in March. Kim, a Bell Atlantic Fellow this past year, a FORWARD Fellow this summer and a ARCS Fellow next year, joined our group this past fall and already has been a co-author on a presentation at the ACS meeting as well. Mike, a very bright and promising student, is a very recent addition, joining just in June. Ed Prandt and Yvette Thomas, two extremely talented freshmen, volunteered their time in the lab during the school year and have expressed interest in returning in the fall.

I am very pleased to report that former students are all doing very well. Alejandra Echezuria finished with an MS last summer and is now working at Blacklight Power Inc in New Jersey. Bhoomi Brambatt, received her baccalaureate degree last spring and chose to attend GW's medical school, turning down a very prestigious full fellowship in public health. She recently treated the lab to dinner and is obviously thrilled with her decision to become a medical doctor. Former students from previous years are also doing very well. Ram Singh decided that his love for



Dr. Michael Wagner

medicine was stronger than for chemistry and is leaving Cornell with a MS in Chemistry for the Robert Wood Johnson Medical School. Susie Wilson received her MS in Chemistry from Johns Hopkins and is now working for a local law firm. Khalid Hanif is finishing his second year at UC Santa Barbara and is well on his way to his Ph.D. in Chemistry.

The hard work of all of these students has resulted in the funding of another major grant this year, this one for 3 years from the EPA to make advanced materials for room temperature magnetic refrigeration. Hopefully, we can contribute to the eventual replacement of current inefficient and environmentally harmful refrigeration/cooling technology. Along with our 5 year grant from the NSF to make advanced catalysts that may result in cleaner automobile emissions, we have our hands full with the research we hope will improve the lives of everyone.

Dr. Richard Tarkka

1999-2000 was an exciting year for the Tarkka Group. Kate Ambrosio, a graduate of Smith College, joined us in the fall and started working on the synthesis of Schiff secondary amine dendrimers. She was a recipient of a



Dr. Richard Tarkka

FORWARD grant for the Summer of 2000 to pursue her research. Preethy Kolinjivadi joined us as an A.D. Britt scholarship winner and is spending the Summer of 2000 supporting our efforts aimed at preparing 2-photon absorbing dyes. Brian Benneyworth won a number of awards before graduating and he is undecided about his future. Either he will hike the Appalachian trail in the fall and head to medical school at Tennessee in Fall 2001, or he will go straight to medical school at Emory in Fall 2000. Malika Jeffries-El won a number of awards and has chosen to accept an offer for

an ABD internship at Smith College, starting in the Fall of 2000. She will use her year there to finish up some experiments and write her dissertation. While there, she will receive mentoring on writing papers and grant proposals, teaching and other aspects of being a college professor. Malika, Brian and Prof. Tarkka attended the ACS meeting in San Francisco in March and presented 2 papers, one of which is published in Polymer Preprints.

Dr. Akos Vertes

There was a change of guards at the group this year. The finishing students and postdoc had found exciting jobs in academia and in industry. Dr. Vivek Navale is with the Jet Propulsion Laboratory of NASA in Pasadena, CA, Dr. Zohra Olumee develops new instruments at Stanford Research Systems in Sunnyvale, CA, Dr. Mehrnoosh Sadeghi works for the University of California at Riverside, Riverside, CA and Dr. Eugene Moskovets has an appointment at the Barnette Institute of the Northeastern University in Boston, MA. After the departure of the previous crop of students, the new postdoctoral research associate, Dr. Sandor Kristyan, and the two new graduate students. Ms. Marsha C. Galicia and Ms. Jennifer M. Gauntt, had to carry the torch. The two students have rapidly embarked on exploring individual research projects in matrix-assisted laser desorption



Dr. Akos Vertes

mass spectrometry - a cutting-edge bioanalytical method- and electrospray characterization. In

addition to their research endeavors, Marsha and Jennifer shared the 2000 Van Evera Memorial Prize for Most Effective Graduate Teaching Assistant in Chemistry. Dr. Kristyan concentrated his efforts on the molecular dynamics description of laser desorption.

Dr. Vertes spent the fall of 1999 on sabbatical leave. The primary objective on this leave was to extend his existing research on matrix-assisted laser desorption ionization mass spectrometry beyond its current scope utilizing unique possibilities at the host institutions. There were three major activities associated with this objective: a/ presentation of his current results at a conference on laser-solid interactions in Potenza, Italy; b/ developing groundbreaking pump-probe experiments using picosecond (10^{-12} sec) pulse-length lasers and an optical delay line at the ETH in Zurich, Switzerland and c/ preparing for the title of *Doctor Academiae Scientiarum Hungaricae* (D.Sc.) in Budapest, Hungary. Invigorated by the successes in all three areas during the sabbatical leave, Dr. Vertes is back at the Department working with his research group.

The research output of the group has been impressive. This year we published three peer-reviewed papers in journals like *Analytical Chemistry* and *Rapid Communications in Mass Spectrometry*. You can read these publications at the Web page of the group: <http://www.gwu.edu/~vertes>. In addition, our results on MALDI mass spectrometry and electrospray formation have been reported in three conference proceedings and seven conference presentations.

Dr. David Ramaker

Professor Ramaker continues his work on the utilization of X-ray absorption spectroscopy (XAS) to obtain electronic structure information in situ. He applies this work to supported metal catalysts in collaboration with Prof. Koningsberger and his group at the University of Utrecht and to fuel cells with Dr. O'Grady at the Naval Research Lab. He will be spending 6 weeks in Utrecht again this summer, when the third of four students who he is co-promoting, will defend his dissertation.



Dr. David Ramaker

Dr. Ramaker's group had another successful year with 6 refereed papers published, 9 presentations, and major new funding from NRL received.

One of the highlights of the year was Ramaker's talk at the 1999 Joint International Meeting of the Electrochemical Societies of America and Japan in Honolulu, Hawaii in October.

As co-director of the Materials Science Institute here at GWU, Dr. Ramaker is particularly pleased that during this past year, the Departments of Geology (STM/AFM on minerals), Physics (theory of soft materials), and Chemistry (X-ray diffraction on mesoporous materials) each have successfully hired new faculty in the research areas indicated, who will join MSI this Fall. This will increase the MSI faculty from 8 to 11 coming from 5 different departments.



Prof. Joan Hilderbrandt

Prof. Joan Hilderbrandt

Professor Hilderbrandt continues as the Coordinator of the laboratory courses for Honors Chemistry (Honors 33/34), Contemporary Science (Chem 3/4/3m/4m) and General Chemistry (Chem 11/12).

Professor Hilderbrandt currently

lectures both Chemistry 11 and Chemistry 12. Last year she introduced a new course sequence (Chemistry 3M and 4M). This sequence was offered only on the Mount Vernon College Campus of GWU. Mrs. Hilderbrandt has remained active in the Columbian School Freshman Advising Workshop Program and will teach a new section in August. She continues as the advisor for Chemistry Majors who will graduate in May 2001

Dr. Houston Miller

During the last year our group continued its development of tunable diode laser diagnostics for application to problems in combustion and atmospheric chemistries.

As regular readers of this newsletter will note, tunable diode laser absorption spectroscopy has been the main tool in our optical diagnostics arsenal for almost a decade. During most of that time, we have used lead



Dr. J. Houston Miller

salt lasers, which emit light in the mid infrared, a region more typically associated with Fourier Transform infrared spectroscopy. Because line widths of these lasers are much narrower than the resolution possible with FTIR spectrometers, molecular transitions can be probed at their natural widths (i.e., Doppler and collisionally broadened lines). More recently, we have been exploiting the lower costs and room temperature operation of semiconductor lasers generally used for communications. Most of these lasers, like the lead salt lasers that operate at longer wavelengths, operate only over very narrow spectral ranges, which limits their util

ity for “survey” applications in the laboratory. Last summer we were able to acquire an external cavity diode laser which operates over a much wider tuning range.

Support for our work during this past year came from a variety of Federal Agencies including the Environmental Protection Agency, the National Science Foundation, the National Institute of Standards and Technology, and the National Aeronautics and Space Administration. For the latter, we are developing an optical sensor based on Cavity Ringdown Spectroscopy, which might be used to monitor spacecraft air quality. Results of our first few months on this project were presented at the International Conference on Environmental Systems in Toulouse, France.

Group members during the last year included graduate students Andy Awtry, Kathleen Gordon, Glauco Souza, Frances Scott, and Emily Wilson. They were joined by undergraduate researchers Jay Brenner and April Jewell. We also have enjoyed the stimulating collaboration provided by our work in the Center for the Study of Combustion and the Environment. In particular we have profited from the regular input into our program by Drs. Arnaud Trouvé and Catherine Mavriplis of the School of Engineering and Applied Science. Center funding, which comes partially from the University through the Research Enhancement Fund, has helped sponsor a new Seminar series as well as provided funding for graduate travel to scientific meetings. Seminars this past semester were presented by Brian Haynes of the University of Sydney, Volker Ebert of the University of Heidelberg, and Anne Bourlioux of Université de Montréal.

Dr. Michael King

Research continues on the two major problems of concern to us. Kerry Allen, my graduate student, has been working to extend the initial results on prodrugs obtained by Ying Zhang. Kerry has a strong background

in biological chemistry and has been learning techniques in the Department of Pharmacology on growing and harvesting hypoxic cells. The reductive environment of these cells will, we trust, provide the *in vivo* environment to demonstrate how “stereopopulation control” can be harnessed to release suitably tagged drugs. Undergraduates Leanna Roche (during the academic year) and Alison Clegg (a Britt scholar this summer) have contributed to our exploration of the regiospecific alkylation of imidazoles. The focus of that work is to extend our studies to include functionalized side chains. I am pleased to report that we have had some success of late with this endeavor.

The complexity of the Department and University seems to entangle me more each year. I have spent considerable time this year on several administrative committees, reviewing (and testing) the new financial management system and participating in discussions about upgrades of the information enterprise system and formulation of a new data warehouse systems that will help to make information needs more accessible to the community. All of this service is both necessary and fascinating to be involved with. But what a time sink this can be. We look forward to implementation and return to normalcy. Improvements in the physical space, graduate student support and public relations are among my priorities for the coming year.

Special Announcements

Special congratulations to Akos Vertes upon promotion to Professor of Chemistry. An effective instructor, who has strengthened our offerings in analytical chemistry, he has also garnered international recognition for his achievements in research, particularly in understanding the processes involved in MALDI (matrix assisted laser desorption ionization) mass spectrometry and extension of this analytical technique. This well-earned promotion was endorsed at all levels of the University and went into effect July 1.

Thirty Years and Going Strong

It is always a special time when we are able to celebrate milestones for departmental per-

sonnel. Such an occasion occurred this year when Russell Kingsbury, our Stockroom Manager celebrated his thirtieth year of association with George Washington. Not many faculty, let alone staff, reach this particular milestone and so it is with great pride that we join in the tributes and accolades.

Russell started in the Department when Professor Sam Wren was still teaching Qual Organic and “Preps.” Gradually he moved forward to his current position. His wide-circle of friends at the institution is astonishing. He seems to know everyone in the University. But Russell’s loyalty and abiding concern has always been with the Department and its students. Thousands of students have met him at the stockroom window, where he holds forth with authority and care. One way to illustrate this is to repeat a statement he made when introduced at a departmental gathering. “And I **AM** your Stockroom Manager.” The gentle tease was there, along with the calm tone of authority. But most importantly it was a statement that he was there to serve the needs of the Department. Thanks Russell, we don’t always say thank you, but we do appreciate your efforts.



Russell Kingsbury

Graduation Reception May, 2000



Commencement Reception.
Awardees

Graduate	Plans
Brian Benneyworth	Hiking Appalachian Trail, then Medical School
Tracy Berkowitz	Law School, Boston College
Jennifer Cozeolino	Teach high school Chemistry in NY, then Grad school in Illinois
Jeff DeGrasse	Work for a year, then Grad school
Jeanne Garcia	Peace Corps, Tanzania
Preethy Kolinjivadi	Peace Corps, Mali
Letitcia O'Toole	Working for Pharmakinetics, Baltimore, MD
Leanna Roche	Working for Sciences International Arlington, VA
Sarah Slachetka	Master of Forensic Science, GWU
Danielle St. Ulme	Master of Forensic Science, GWU
Chistine Testaverde	Grad school, U of Kentucky
Minh Truong	



Commencement Reception
Jennifer Gauntt and Dr.
Michael M. King



Commencement Reception
Brian B. Benneyworth



Commencement Reception
Marsha Galicia and Dr.
Michael M. King

ALUMNI GIFTS

We are deeply appreciative of the Alumni gifts to the Department. Each gift, whatever the amount, allows us to further our research and education goals. If your check is made out to the E&R Account, the money comes to us for our use. If not, we never see it. So please cite the Chemistry Department E&R Account. Finally, many thanks to each of you and a special thanks to donors who gave \$1000 or more.

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Percy Wells
Mr. William Worthy, Jr.**

* = \$100 or more, ** = \$500 or more, *** = \$1000

CHEMISTRY DEPARTMENT PRIZES AND AWARDS

2000

ALPHA CHI SIGMA: Awarded to the graduating senior with the highest record in chemistry courses (with at least 16 hours at GWU).

JEFFREY CHANG

AMERICAN CHEMICAL SOCIETY: Awarded to a student completing his or her junior year and who has demonstrated excellence in Analytical Chemistry.

LEAH CARNEY

A.D. BRITT MEMORIAL SCHOLARSHIP: Awarded to one or more outstanding junior or senior undergraduate majors to carry out research in the summer.

ALLISON CLEGG, LAURA HAUCK, APRIL JEWELL, PREETHY KOLINJIVADI

CHEMICAL SOCIETY OF WASHINGTON PRIZE: Awarded to the outstanding junior majoring in chemistry.

MATTHEW GUMMERSON

BYRNE THURTELL BURNS MEMORIAL PRIZE: Awarded to the graduating chemistry major who has shown the greatest proficiency in organic chemistry as demonstrated by a written examination.

BRIAN BENNEYWORTH

WILLIAM E. FITCH PRIZE: Awarded to the graduating chemistry major with the best written comprehensive examination in chemistry.

BRIAN BENNEYWORTH

CHEMICAL RUBBER COMPANY FRESHMAN CHEMISTRY ACHIEVEMENT AWARD: Awarded to one or more freshmen who have achieved the highest records in their respective sections of Introductory Chemistry.

NIDHI GUPTA, ARNAB MUKHERJEE, AMELIA POTTER, BATUL RAZVI, UHA REDDY

BENJAMIN D. VAN EVERA MEMORIAL PRIZE: Awarded to the most effective Graduate Teaching Assistant in Chemistry.

MARSHA GALICIA, JENNIFER GAUNTT

CONGRATULATIONS TO ALL THE AWARD RECIPIENTS