

# ChemNotes

{ TUFTS UNIVERSITY CHEMISTRY DEPARTMENT }

2007 • SPRING



## Education and Research

The Tufts University Department of Chemistry continues its dual mission of education and research

### EDUCATION

*David Walt*

During the Fall 2006 semester an exciting new course was offered—CHEM-0193 Interdisciplinary Research: Computer Science Problems in Biology, Chemistry, and Bioengineering. The course was team taught by Professor David Walt from the Chemistry Department and Professor Carla Brodley from the Computer Science Department. Approximately 20 students attended the course with half from Science departments and the other half from Computer Science.

The course was designed to promote collaboration between computer science students and Chemistry/Biology/Bioengineering students. The course consisted of a weekly two-hour seminar. Each week, one of the Science students in the class presented a research problem that involved intensive data acquisition and/or data generation. The presentations started out at a very basic level because many of the Computer Science students did not have an extensive background in the scientific areas that were covered including Biology, Chemistry, and Bioengineering. The presentations from the students were designed to teach everything a Computer Science student needed to

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### Chair's Corner

*Krishna Kumar*

Last September, I took over the chairmanship of the department from Prof. Mary Jane Shultz who served the department in this capacity for six years with boundless energy and enthusiasm. The Shultz years saw several major projects including a complete makeover of the large lecture classroom, Pearson 104, and renovation of the Pearson east-wing research laboratories. Last spring, the faculty had a retreat meeting to initiate a discussion of the entire curriculum in the Chemistry department – several interesting ideas emerged and were discussed, and further meetings will refine these ideas for implementation.

The coming year will mark a milestone for Tufts Chemistry. It is the 125th anniversary of the department. Arthur Michael, the great American chemist, established his laboratory in the basement of Ballou Hall in 1882. The work from that laboratory had a dramatic and transformative effect on organic chemistry. Today, the department is healthy as ever, and the research once again promises to have a paradigm bending influence on biomedical, materials and fundamental

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understand to be able to contribute to the problem. The presentations were informal enabling lots of questions to be answered. Oftentimes, the class found that language was the most vexing problem with jargon that most science students take for granted being either not understood or misinterpreted by the computer scientists in the class. After each scientific presentation, a general discussion ensued in which ideas about how to handle the data were suggested.

## The Science students learned a lot about data mining and machine learning and how these methods could be applied to research problems.

Following each class, Computer Science students who were interested in a project and thought they had a possible solution to data processing would meet with the scientist presenter and learn more about the project and visit the scientist's laboratory. If sufficient synergy existed, the Science student and Computer Science student would team up. In some cases, multiple Computer Science students would work on the same science project. Computer Science students would then work closely with the data generating students by visiting their laboratories and getting their hands on the raw data being produced. Scientific presentations continued each week until all the Computer Science students found a project that appealed to them and to which they would ply their skills. In some cases, the data handling issues being experienced by some scientists were solved easily by a Computer Science student just pointing the scientist in the right direction to the proper software that would not have been obvious to most researchers. Consequently the number of really difficult data problems identified was limited and, as a result, scientific problems had to be solicited from the broader Tufts research community with numerous faculty and graduate students from across the university presenting their research to the class.

After projects were selected, each week several of the teams presented their approaches to solving the data processing needs of the scientific problems. These

presentations were designed to be understandable to the Chemistry, Biology, and Bioengineering students in the class but often went into some of the nitty-gritty problems understood by the hard-core computational people.

Projects included: Analyzing fluorescence images of single cells to determine the nature of their chemical communication pathways; developing methods for connecting muscular movements with nerve cell responses in caterpillars to understand how neural signals lead to coordinated movement; processing complex sensor array responses to vapors to determine if algorithms could be developed that enable recognition of unknown vapors; developing gene analysis software to select sequences containing the most information for inclusion in a DNA array; analyzing images of stem cells to identify key cellular components automatically without human intervention; developing an algorithm for following single molecules moving on a surface using atomic force microscope images.

The Science students learned a lot about data mining and machine learning and how these methods could be applied to research problems. Computer Science students learned a lot of science. Most important was that all students learned to work collaboratively and realized that it takes a lot of hard work and effort to learn one another's problems and the specialized language of each discipline.

Students gained an appreciation of the value of working on interesting interdisciplinary problems that generate large data sets and solving complex problems that require sophisticated Computer Science solutions. Students learned how to explain their approaches to non-specialists in a way that conveyed all the necessary information in a way that was understandable.

For many of the projects, the course was only the beginning. Numerous collaborative integrated research projects between Computer Science and Chemistry, Biology, and Bioengineering students were stimulated by the class. Indeed, there is a high likelihood that some of the Computer Science students will be continuing to work on the projects for a Master's or Ph.D. thesis. It is expected that the course will be offered again in the Fall of 2007.

## RESEARCH

### Bond-Selective Surface Chemistry

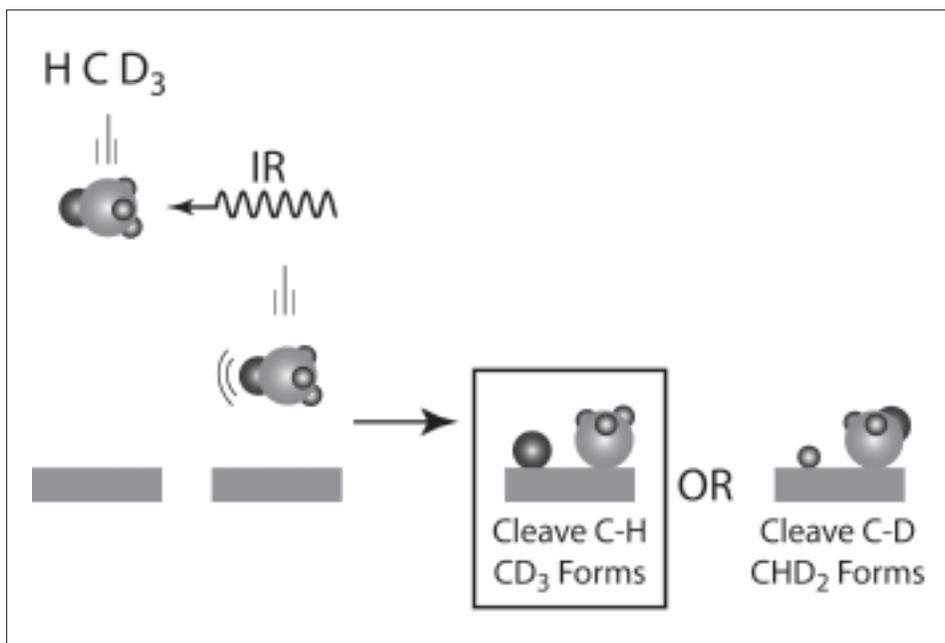
*Arthur Utz*

Most chemists encounter the Arrhenius equation at an early stage. The equation predicts that reaction rates increase dramatically with increasing temperature. At a molecular level, this dependence arises from a need to invest energy and distort reagents into the critical geometries that transform reactants to products.

Tufts chemists in the Utz group have been studying the catalytic activation of a C-H bond in methane ( $\text{CH}_4$ ) on a nickel surface. The reaction products are a methyl ( $\text{CH}_3$ ) and an H atom chemically bound to the metal surface. Methane dissociation is the rate-limiting step in the industrial production of hydrogen gas, a potentially important fuel in our future energy economy. For methane dissociation to occur, two motions are critical. First, a C-H bond in methane must stretch. This positions the C and H atoms above favorable binding sites on the metal surface. The molecule must also bend to position the breaking bond nearly parallel to the surface while minimizing steric interactions between the methyl group and the surface.

Raising the temperature increases the reaction rate because more available energy increases the chance that methane will bend and stretch enough to undergo reaction. Chemists have long wondered whether it might be possible to selectively deposit energy into just the right motion to efficiently drive a reaction to products. In the most favorable case, this could involve selectively driving the reaction down one of several available reaction pathways, as would be the case for selective cleavage of a unique bond in a molecule. In most chemical reactions, though, energy is supplied indiscriminately to the reactants. Chemists are left to rely on random chance for energy to pool in the right part of the molecule and excite the key motions that transform reactants to products. In many other cases, even when energy is selectively deposited in the

The molecule must also bend to position the breaking bond nearly parallel to the surface while minimizing steric interactions between the methyl group and the surface.



molecule, fast energy redistribution processes spread the energy around the molecule before reaction occurs, thus preventing bond selective control. The many energy exchange channels available on a metal surface increase the challenge of performing bond selective chemistry on technologically important metal catalysts.

Tufts chemists have recently found a new way to circumvent these limitations and have successfully demonstrated the first example of bond selective control of a heterogeneously catalyzed reaction on a metal surface. They use an isotopically substituted methane molecule,  $\text{CHD}_3$ . Infrared laser light selectively excites the C-H stretching vibration of  $\text{CHD}_3$  in the gas phase. The excited molecules then impinge on a clean nickel surface. By identifying the isotopic identity of the methyl reaction products, it is possible to identify which bond (i.e. C-H vs. C-D)

broke. Experiments reveal that selectively excited molecules dissociate via C-H cleavage at least 30 times more often than by C-D cleavage. In contrast, thermal excitation of  $\text{CHD}_3$  vibrations yields a two-fold excess of C-D cleavage products. The group's experimental observation and accompanying theoretical framework provide key insights into the energy flow dynamics that govern gas-surface reactivity, and they suggest a widely applicable strategy for controlling vapor deposition processes involving small molecule precursors.

Research in the Utz group is supported by a grant from the National Science Foundation. You can learn more about this work, take a virtual laboratory tour, and find recent publications at the Utz group website, <http://www.tufts.edu/~autz/index.html>

# Chemistry Degrees and Awards

## Presented 2005–2006

### **The R.M. Karapetoff Cobb Chemistry Fund**

Katherine M. Dunn  
Nina N. Sainath  
Jennifer L. Torpey

### **The M.D. Angell & H.B. Durkee Scholarship Fund**

Mimi Cho

### **The Durkee Scholarships**

Mimi Cho  
Mina T. Fung

### **The Max Tishler Prize Scholarship**

Nina M. Sainath  
Stacey M. Watkins

### **Summa Cum Laude Graduates**

Timothy Bassell  
Mimi Cho  
Ashiyana Nariani

### **Magna Cum Laude Graduates**

Daphne Anastasiades  
Margaret McGuigan Flook  
Mina Fung  
John Kuan Chi Liu  
Jeremy Setton

### **Cum Laude Graduates**

Sara Buzak  
Sophia Kogan  
Vincent Unanue

### **Graduate Student Research Excellence Award**

Laila Dafik  
He Meng

### **2006 Undergraduate Award in Analytical Chemistry**

Julie M. Nogee

### **Doctoral Degrees Awarded 2005–2006**

#### **Nilanjana Chakraborty (d'Alarcao)**

"Chemistry and Biology of Anionic  
Inositol Phosphate Glycans"

#### **Kerin Clow (Kenny)**

"Natural Water Fingerprinting by  
Multidimensional Fluorescence  
Regression analysis"

#### **Yina Kuang (Walt)**

"Optical Fiber Microwell Arrays with  
Living Cells"

#### **Stefan Robert Lukow (Kounaves)**

"Development and Characterization of  
Ion Selective Electrode Arrays for Analysis  
of Terrestrial and Martian Soils"

#### **Sonia Taktak (Rybak-Akimova)**

"Biomimetic Amino-Pyridine Iron  
Complexes for Catalysis and Small  
Molecule Activation"

#### **Jenny Mimi Tam (Walt)**

"Development of Optical-Based Array  
Devices Using Imaging Fiber Bundles:  
Optical Tweezer Arrays"

#### **Cheryl Wong Po Foo (Kaplan)**

"Genetic Engineering and Structural  
Characterization of Recombinant Spider  
and Silkworm Proteins"

### **Master's Degrees Awarded 2005–2006**

#### **Christopher J. Di Cesare (Walt)**

"Analysis of cell migration and biomarker  
presence using fiber optic arrays"

#### **Kenneth Joseph Fountain III**

**Xiaorong Fu**  
**Eugene Nebelitsky**

### **Bachelor's Degrees Awarded**

#### **Daphne Anastasiades**

Honors thesis "Molecular  
characterization of salmonella enterica  
serovar. Typhi PhoP/PhoQ activated  
gene (PagC)"

#### **Timothy Bassell**

**Sara Kay Buzak**

**Mimi Cho**

**Margaret McGuigan Flook**

**Mina Fung**

**Jacqueline McDonough Haker**

**Samantha Jordan**

**Pranav Kumar Kapoor**

**Rafeya Khan**

**Sophia Kogan**

**John Kuan Chi Liu**

**Ashiyana Nariani**

**Adrienne Ngar-Yee Poon**

**Daniel E Sauerstrom**

**Jeremy Setton**

**Hiral N. Shah**

**Vincent Unanue**

# Faculty and Staff News

## Semester Achievement Awards

The awards for Outstanding Achievement are given semi-annually to a teaching assistant, staff member and faculty member for extra-ordinary contributions to the department.

### FALL 2005

#### FACULTY

Krishna Kumar

#### STAFF

Debbie D'Andrea

#### TEACHING

##### ASSISTANT

Ivan Korendovich

Dr. Sergiy Kryatov

### SPRING 2006

#### FACULTY

David Walt

#### STAFF

Justin Cronin

#### TEACHING

##### ASSISTANT

Qun Gu

## Faculty Awards

**Robert Dewald** Robert R. Dewald  
Undergraduate Student Research Fund

**Jonathan Kenny** Recipient of New Directions in Research Award (FRAC) at Tufts University

**Samuel Kounaves** 2006 K.D. Wood Colloquium Speaker, University of Colorado, Aerospace Sciences Division, April 21, 2006

**Krishna Kumar** 2006 Global Indus Technovators Award from the Indian Business Club @MIT

**Mary Shultz** Elected to the Council for Chemical Research (CCR) Governing Board

**Charles Sykes** Selected as one of 15 young US professors to participate in the US-Japan Young Researchers Exchange Program in New Instrumentation for Nanoscale Structures

**Arthur Utz** Appointed CELT (Center for the Enhancement of Learning and Teaching) Fellow at Tufts University

**David Walt** Named a Howard Hughes Medical Institute Professor;  
Alexander Cruickshank Lecturer, University of Rhode Island;  
Tufts Faculty Outstanding Achievement 2005–2006 Academic Year

## Student Awards

**He Meng** and **Laila Dafik** recipients of the Graduate Student Excellence Travel Award, Tufts University, Department of Chemistry, Spring 2006

**Laila Dafik** received the Outstanding Academic Performance Award, Tufts University, Spring 2006

**Daniel Killelea** Finalist, Morton M. Traum Surface Science Student Award, AVS 53rd International Symposium and Exhibition, San Francisco, CA, Fall 2006

**Daniel Killelea** recognized for Best Graduate Student Talk, 8th Northeast Student Chemistry Research Conference, sponsored by NESACS (Northeastern Section of the American Chemical Society), Cambridge, MA, Spring 2006

**Daniel Killelea** Third Place, Best Oral Presentation, 10th Tufts Graduate Student Symposium, Medford, MA, Spring 2006

**Daniel Killelea** Third Place, Best Oral Presentation, 8th Frühjahrsymposium, Konstanz, Germany, Spring 2006

**Daniel Killelea** AVS Dorothy M. and Earl S. Hoffman Travel Grant for the AVS 53rd International Symposium and Exhibition, San Francisco, CA

**Olena S. Rabotyagova** Graduate Women in Science Award, 8th Annual Northeastern Student Chemistry Research Conference sponsored by NESACS (Northeastern Section of the American Chemical Society), Cambridge, MA, Spring 2006

**Deniz Yüksel** received the Symposium/Workshop Fellowship, National AUC Facility, University of Connecticut, Storrs, Connecticut, 2006

## Alumni Awards

**Michael Carrabba** (Ph.D. 1985) received the 2007 Williams Wright Award from the Coblenz Society present at the Pittcon Conference and Expo 2007 in Pittsburgh, PA

**Tianmei Ouyang** (Ph.D. 1990) received a Volwiler Society Award at Associate Fellow Level in 2006 given by Abbott Laboratories presented in Chicago, IL

## Staff

**Charlene Charles** is the newest staff member of the Chemistry Department. Prior to her employment at Tufts, she worked as a financial assistant at MIT. Charlene earned her Bachelors Degree in accounting at Suffolk University. Her amiable disposition and professionalism make her a wonderful addition to the department.

## Work hard, Play hard



*David Rissin*

While all graduate students in the Chemistry Department work hard in the lab, some carry that work ethic over to the softball field. The Tufts Summer Softball League has been in existence for ages, offering university-wide bragging rights to those departments willing to field a team. With 15 squads in the running this past summer, the competition was fierce, but the Isotopes were up for the challenge.

After an impressive regular season record the Isotopes worked their way through the Medford Division bracket defeating Student Services, Arts, and the Education Department. As Medford Division Champs the 'topes were set to square off against perennial powerhouse 'Nutrition' in the League Championship.

Capping off a momentous season, the Isotopes captured the League Championship winning a nail-biter 14-13. Congratulations to all those that took part in the games during the 2006 season!

### **Team Roster:**

Adam Collette	Ivan Korendovych
Ashleigh Baber	Jonathan Rissin
Blaine Pfeifer	Kyle Bake
Casey Cable	Matthew Aernecke
Christian Zeigler	Nicholas Yoder
Daniel Killelea	Ryan Hayman
David Rissin	Nicholas Shuman
Deno Del Sesto	Stacey Watkins
Kim Del Sesto	Subrahmanian Tarakkad Krishnaji
Erin Iski	Timothy Blicharz
Ginevra Clark	Victoria Campbell

## Younger Chemists of the Northeastern Section of the American Chemical Society

*Laila Dafik, Chair 2007–2008 NSYCC*

The Northeastern Section of Younger Chemists Committee (NSYCC) was honored to host Professor Gregory Verdine from Harvard University as the keynote speaker at the 2007 Northeastern Student Chemistry Research Conference (NSCRC). The talk titled "Drugging the Undruggable" met with high praise and enthusiastic questions. This year, two Tufts chemistry graduate students received awards for their presentations in different categories, Ragnhild Dragøy Whitaker for best poster and Olena S. Rabotyagova for best oral presentation.

The NSCRC is organized for students, by students. It is devoted to the research of undergraduate, graduate, and post-doctoral chemistry researchers, providing a relaxed atmosphere for students to share their work and discuss science. The daylong NSCRC event

featured student posters and oral research presentations, a keynote lecture and the awards ceremony. The conference encourages students to network and get feedback from their peers. NSYCC is also proud to be part of the annual German exchange program between the GDCh–JCF and the Northeastern Section of the American Chemical Society (NESACS) Younger Chemists Committee (YCC). This year NSYCC will be hosting a group of 14 students traveling from Germany. This group will present their research at the national American Chemical Society (ACS) meeting in Boston (August 19–23). Also as a part of the weeklong program, the students will visit local laboratories, tour companies in the area, and participate in networking events and time permitting, get some sightseeing in as well! Next year, 12 students from NESACS will be traveling across the Atlantic to participate in a week long conference in Germany. These are exciting events and the organization hopes to make more happen for intercontinental exchange programs and in promoting chemistry.

For more information, please visit our website: [www.nsycc.org](http://www.nsycc.org).

## CGSC News

*Victoria Campbell*

The 2006–2007 CGSC members (Ashleigh Baber, Victoria Campbell, Faith Dukes, Erin Iski, and Deniz Yüksel) have been busy planning fun social activities for the graduate students in the Chemistry Department. This past summer brought with it many achievements within the department. The most crowning victory was the success experienced by the Chemistry Department 'Isotopes' who finally managed to win the Championship title in the Tufts Intramural Summer Softball League. The end of summer was celebrated with our annual rafting trip. The rafting trip is both an excellent opportunity for incoming first year students to socialize with members of the department and for all parties involved to have an exciting and adrenaline filled adventure in the great outdoors. The CGSC also sponsored a Q&A session for the first year students, giving them an

opportunity to ask questions about the department, research groups and classes. As the year progressed, the CGSC hosted several Café Chem's, giving all members of the department the opportunity to get together and socialize. The CGSC purchased chips and cards for the monthly Texas Hold-em Poker Tournament organized by Christian Zeigler. These tournaments can get quite competitive and last into the late hours of the night. In the coming months, the CGSC has

some exciting activities planned for our grad students. The annual RSMBT (Richard Smith Memorial Bowling Tournament) in January provides a fun and entertaining outing for the graduate students during the dead cold of winter. The CGSC is also planning several movie nights in the coming winter months. As the momentum of the CGSC continues to grow we can all look forward to a busy and exciting spring and summer.



# Alumni Weekend and The Robert Dewald Student Research Fund

*Albert Robbat, Jr.*



**Robert Dewald**

Last year the Chemistry Department sponsored its first alumni reception during Alumni Weekend. The social was well attended, with more than 100 current students and graduates attending. The social offered alumni an opportunity to reacquaint and reestablish contact with one another and faculty. Current undergraduates had a unique opportunity to meet, learn, and exchange experiences about Tufts and the department from

former students. Most importantly, they had an opportunity to speak with alumni about their life experiences after Tufts.

Many of the alumni in attendance, undergraduates and graduates alike, came to honor Professor Dewald, who has served Tufts and the department faithfully for 42 years. Mark Latina, MD and his classmates endowed the Robert Dewald Undergraduate Student Research Fund. In addition to Mark, the following alumni also contributed to the fund: Thomas Amoroso, David Ayers, Michael Bresnahan, Carol Burd, David Calcagno, Paul N. Casale, David Gannon, Craig Goldberg, Scott Josephs, David Kline, Gayle Schwartz, Brian Schwartz, and Deborah Yates. The endowed fund will provide support for one undergraduate student during the summer months.

The Robert Dewald Student Research Fund is an important new initiative established by the alumni for students within the department. The department would like to extend funding so that additional deserving students, who are in financial need, can experience research.

If you would like to contribute, please send your donation to the Robert Dewald Student Research Fund, c/o Brigitte Bryant, Senior Director of Development for A&S, Tufts University, Medford, MA 02155. Should you have questions please contact Brigitte

(brigitte.bryant@tufts.edu) or me (albert.robbat@tufts.edu).



**Mark Latina, MD**

We plan to host this event annually. I personally benefited by reconnecting with the alumni who attended last year's reception. Hopefully, you will benefit as well by reconnecting with classmates, faculty and staff, and by mentoring new graduates you may meet as they enter the workforce. Looking forward to seeing you at next year's event.

## Faculty



## Sergiy Kryatov

*Lecturer*

Sergiy Kryatov received a Diploma in chemistry (equivalent to a Master's

Degree) in 1991 from Kiev State University and a Ph.D. in inorganic chemistry in 1997 from Piszhevsky Institute of Physical Chemistry of the Ukrainian Academy of Sciences, where he completed a thesis "Heteroligand Complexes of 3d-Metal Aminopolycarboxylates with Ammonia and Hydrazine as Materials for Chemical Sensors" and published six peer-reviewed papers in Ukrainian and Russian chemistry journals.

In 1998, Dr. Kryatov began his post-doctoral research at Tufts University in the laboratory of Professor Elena Rybak-Akimova studying kinetics and mechanisms of small molecule reactivity at metal centers. In one project, binding and activation of oxygen ( $O_2$ ) by synthetic iron complexes was studied, which modeled the analogous processes with native non-heme iron enzymes. In another project, an unusual mode of binding of urea to complexes with two close metal ions was discovered that shed light on the mechanism of urea activation by enzyme urease. During his post-doctoral years, Dr. Kryatov coauthored about 20 research papers in prestigious American and international journals, i.e. *Journal of the American Chemical Society*, *Chemical Communications*, and *Angewandte Chemie*, and also two review articles, in *Chemical Reviews* and in *Accounts of Chemical Research*.

During graduate school and post-doctoral years, Sergiy Kryatov was always involved in teaching. From 1992 to 1997, he served as a mentor to the National Ukrainian Team to the International Chemistry Olympiad, where his students won gold, silver, and bronze medals. Sergiy was also recognized by the Ukrainian Ministry of Education and by the International Soros Foundation. As a post-doctoral researcher at Tufts University, he spent two semesters as a part-time teaching assistant for organic and introductory chemistry classes. In 2005, Dr. Kryatov worked as a temporary lecturer in the Department of Chemistry and a year later he was hired as a full-time Lecturer in Chemistry. His main teaching responsibility for the next three years is to teach introductory chemistry, with occasional upper-level inorganic chemistry courses. Dr. Kryatov will also spend time researching new and better approaches to chemical education.

## Chair's Corner

*Continued from page 1*

science. The department is planning a series of events to commemorate this anniversary of the founding of the department. I encourage you to send any suggestions that you may have about events that you think should be organized.

The department's alumni gathering on May 17th was very well attended and a new alumni group has been formed. If you would like to join this group, please mail the form on the last page and indicate your interest.

The major news from the past year is that Prof. David Walt was named a Howard Hughes Medical Institute Professor, an honor bestowed on only 20 individuals worldwide once every

four years. The million dollars accompanying this award will be used to bring the excitement of research and discovery to undergraduates. There will be 15 undergraduates in the Walt lab working this summer under the auspices of this program.

In other areas of research, this August, Prof. Samuel Kounaves and his group will be sending equipment aboard the Phoenix Mars Lander to look for signs of present or past life on Mars.

Our students have always been front and center in the department's flourishing research program. This year was no exception. The community of researchers at Tufts is going full throttle: the two journal clubs in the department have firmly established themselves and frequently have participants from the

Medical and Engineering Schools; the number of undergraduates pursuing research in Chemistry has been steadily increasing; about half of the graduate students attended a conference to present their work last year, and many of them garnered special acclaim in the form of national and international prizes.

While the department has made significant strides, some challenges remain. The number of faculty in the department needs a serious boost for us to remain competitive. To this end, the department plans to significantly expand its faculty ranks in the coming years. Just as Arthur Michael's work spawned an internationally recognized department 125 years ago, an infusion of fresh scientific talent and new discoveries will lead Tufts Chemistry to new heights in the next phase of its history.

# New Instrumentation for Chemistry 53–54 Organic Lab

*David Wilbur*

Infrared spectroscopy has been used for many years by organic chemistry students to verify the structure of the compounds they synthesize. Infrared spectrometers, like most chemical instrumentation continues to evolve rapidly, making keeping the instrumentation in the Tufts teaching labs up to date a constant challenge.

Thanks to a generous gift from Elizabeth Tishler, J31, this year the Department was able to purchase a new FTIR spectrometer for the exclusive use of the undergraduate organic teaching lab (Chem 53–54). Mrs. Tishler, and her late husband Max Tishler, are both distinguished Tufts alumni who have generously supported the University for many years.

The new instrument, a Thermo IR-100, replaces a 15 year old instrument that was seriously outdated. The new instrument is faster, more compact, more sensitive, and easier to use than the old one. The attached computer produces

either electronic versions or printed copies of spectra that can be easily incorporated into student lab reports. The new instrument was used by students for the first time Fall semester 2006. Comments from students and teaching assistants have been universally enthusiastic.

With 130 students enrolled in Organic Chemistry lab Fall semester 2006 alone, we expect that Mrs. Tishler's gift will enrich the lab experience of thousands of Tufts students in the coming years. The Chemistry Department is truly fortunate to have benefactors such as Mrs. Tishler.



Teaching Assistant Jeff Wikstrom and Chem 53 students Michelle Miller and Danielle Peereboom with the new FTIR.

# Max Tishler Award

*David Lee*

On March 16, 2006 the Department of Chemistry awarded the inaugural Max Tishler Award to George M. Whitesides, the Woodford L. and Ann A. Flowers University Professor at Harvard University. In honor of this occasion, Prof. Whitesides gave a lecture entitled, "New Tools for Bioanalysis. The Development of Microsystems for Use in Cell and Molecular Biology." This award is made possible by Mrs. Elizabeth Tishler, and is given in honor of her late husband, who made an enormous impact on the field of drug discovery and modern day healthcare. A Tufts alumnus, Dr. Tishler received an M.A. and a Ph.D. in chemistry from Harvard before joining Merck and Company. At Merck, he led successful efforts to synthesize, for the first time, large-scale quantities of riboflavin, which had a major impact on human nutrition. Dr. Tishler also set the stage for modern day drug design and discovery by devising routes to the large-scale production of cortisone as well as even more potent *non-natural* steroids. His successes were recognized with his election to the National Academy of Sciences and with promotions that led him to become the first president of Merck Sharp & Dohme Research Laboratories. A recipient of the National Medal of Science in 1987, the nation's highest scientific honor, it was stated in his citation that he was, "... a giant on the chemical scene these past fifty years. . . The importance of Dr. Tishler's specific contributions to the nation's health can scarcely be exaggerated . . ."

It is appropriate then, that the Max Tishler Awardee be a chemist who also has made significant contributions to science and society. In this regard, Prof. Whitesides is a fitting recipient. Like Dr. Tishler, Prof. Whitesides is a prolific scientist. His research interests span physical, organic, and biochemistry, as well as materials science and microfluidics. He is a pioneer in the field of molecular self-assembly and in using enzymes for organic synthesis. His inventions also include soft lithography, which holds great promise for the manipulation and delivery of

cells and drugs. Among his many awards, Prof. Whitesides, like Dr. Tishler, also enjoys the rare distinction of being recognized for his scholarship and contributions to the country with the National Medal of Science, in 1998.

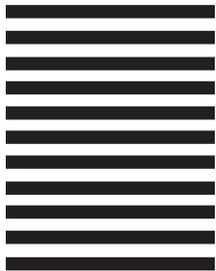
On a personal note, Prof. Whitesides related during his lecture that when he was a young professor at MIT he first met Dr. Tishler and credited the former Merck President with meaningful support and encouragement during the early stages of his career. This interest in the well-being and development of others was characteristic of Dr. Tishler. He was well known to care for those around him and their families. He was the consummate leader. Thus, this award is also an acknowledgement of the intangible impact that Dr. Tishler had on the scientific community.



George M. Whitesides



Max Tishler



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## ChemNotes

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## Alumni Reply Form

Please complete and return this form for our alumni files, or send an email to [eileen.coombes@tufts.edu](mailto:eileen.coombes@tufts.edu). Please include news of your current activities or suggestions for the next newsletter.

Name \_\_\_\_\_

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Email Address \_\_\_\_\_

Phone Number \_\_\_\_\_

Degree/Year/Adviser \_\_\_\_\_

Business Name \_\_\_\_\_

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City, State, Zip \_\_\_\_\_

Business Phone \_\_\_\_\_

Position \_\_\_\_\_

Business Email \_\_\_\_\_

Name of Spouse \_\_\_\_\_

## 125th Year Anniversary

Tufts University Department of Chemistry was established in 1882. This fall, we plan to host a 125th Year Anniversary Celebration. Details of the event will be forwarded to all alumni in the coming months. Please use the space below to share with us your thoughts or suggestions regarding this event or your time at Tufts.

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We are also seeking to expand our advisory group. The advisory group consists of chemistry alums who have gone on to assume leadership positions. While we have been in touch with a few of you to be part of our advisory group, we would be very pleased to have more of you join in this endeavor.

You may write your responses on this form, fold it and send it back by mail. Or you may send your thoughts by email to [eileen.coombes@tufts.edu](mailto:eileen.coombes@tufts.edu).

Thank you in advance for being in touch with us!

*cut on dotted line*

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