

the chemists club

Magazine. The Core's editor, Laura Demanski, hopes that the drawing's anonymous artist will step forward. If you are the artist, or know who he or she might be, please drop Laura a line at lademans@uchicago.edu. We all hope to solve this long-standing mystery.

The Chemistry Department held a mini reunion at the Spring 2011 ACS meeting in Anaheim. You can see a picture from this successful event below. Thanks to all who attended. If you couldn't come this year, we hope to see you at our next open house, which will be held at the Spring 2012 ACS meeting in San Diego. And next time you're back in Hyde Park, please stop in to visit us. You may be surprised at all of the changes since you were here last. We would be pleased to welcome you to the department's lectures and other activities, which are listed in the University's online events calendar (found at event.uchicago.edu).

Best regards,



Richard F. Jordan
Professor and Chairman
Department of Chemistry



Alumni socialize during the Chicago reception at the ACS conference this spring.

Chemistry events

The calendar of named lectures for the 2011–12 academic year, as well as the most up-to-date information about Department of Chemistry lectures and events, can be found online at <http://event.uchicago.edu/chem/index.php>.

Let's keep in touch

The Department of Chemistry is updating its records. Send your current e-mail address and other contact information to Vera Dragsich at v-dragsich@uchicago.edu.

What's new with you?

Do you have news? Want to reconnect with fellow alumni or share memories from your time at the University of Chicago? Send an e-mail to chemistsclub@uchicago.edu or a letter to the editor of the *Chemists Club* in care of the Department of Chemistry.

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Faculty kudos

Jared Lewis has been named a 2011 Searle Scholar. The award, consisting of \$300,000 over three years, is given to provide research support to outstanding young scientists who have recently started tenure-track positions.

Gregory Hillhouse won a 2011 Norman Maclean Faculty Alumni Award. Named for Norman Maclean, PhD'40, who taught English at the University of Chicago for 40 years, it recognizes emeritus or very senior faculty members who have made outstanding contributions to teaching and to the student experience of life on campus.

Chuan He has been named the recipient of the Akron Section Award. This award is given by the Akron section of the American Chemical Society to a scientist or engineer under 45 years of age working in any branch of chemistry and residing within a 300 mile radius of Akron, Ohio, who "demonstrates exceptional promise for making significant contributions to chemical science." He also received the Society of Biological Inorganic Chemistry Early Career Award. This highly competitive award is presented annually to an early career scientist who has accomplished distinguished research in biological inorganic chemistry.

Steven Sibener and **Seth Darling**, PhD'02, won first prize in the 2010 *Science*/NSF International Science and Engineering Visualization Challenge. Their image—featured on the cover of the February 18 *Science*—was captured with an atomic force microscope and shows waves in self-assembled monolayers on a surface of gold.

Dmitri Talapin has won the 2011 Materials Research Society Outstanding Young Investigator Award for his methodological developments of synthesis and self-assembly of inorganic nanocrystals and for fundamental studies transforming colloidal nanostructures into electronic and optoelectronic materials. He also received a Camille Dreyfus Teacher-Scholar Award from the Camille and Henry Dreyfus Foundation, which recognizes outstanding young scholars who demonstrate leadership in research and education in the chemical sciences, primarily through their work as independent investigators.

Talapin was also included in the Thomson Reuters list of the world's 100 most influential chemists based on the highest citation impact scores for chemistry papers published during the period 2000–10.

the chemists club

Summer 2011

Dear friends,

There is a kind of symmetry to this issue of the *Chemists Club*. In it, you can read about Dugan Hayes, a graduate student; Alan Vaughan, PhD'90, an alumnus who works in industry; and Stuart Rice, a faculty member who was recently awarded the Wolf Prize for his many contributions to physical chemistry. Along with our dedicated staff, this triad—students, alumni, and faculty—makes up the chemistry community at the University of Chicago. It is my hope that this newsletter helps that community grow closer.

We are entering a period of profound change in the Chemistry Department. Two senior faculty members have decided to leave Chicago. During the 2011–12 academic year, Milan Mrksich will move his group to Northwestern University and Rustem Ismagilov will relocate his program to the California Institute of Technology. Both will continue their exciting work in fundamental chemistry while pursuing new opportunities in engineering made possible at their new institutions. We thank Milan and Rustem for their years of superb service and wish them the best of luck in their new professional homes.

At the same time, with the strong support of the University's administration, we are embarking on an aggressive effort to expand the faculty to a target size of 28. Taking into account upcoming retirements, this will entail hiring seven to eight new faculty members over the next three to five years. We plan to recruit both junior and senior faculty in materials chemistry, chemical biology, synthesis, physical chemistry, and other interdisciplinary and core areas to achieve this goal.

I am pleased to report that during the past year we successfully recruited two new organic chemists to the faculty. Jared Lewis joined the department January 1. Jared did his PhD in organic and organometallic chemistry at University of California, Berkeley under the joint mentorship of Robert Bergman and Jonathan Ellman. As a postdoc, he switched fields to pursue research on the directed evolution of enzymes for catalytic applications at California Institute of Technology with Frances Arnold. Jared and his group occupy space in the newly renovated Searle Chemistry Laboratory and are investigating new approaches to catalytic C-H bond activation and other challenging reactions using transition metal catalysts, enzymes, and artificial metalloenzymes.

Yossi Weizmann joins the department July 1. Yossi did his graduate work at the Hebrew University of Jerusalem with Itamar Willner, where he investigated fundamental aspects of the synthesis and detection of DNA and the use of DNA as a building block for nanomaterials and sensors. He is currently studying the synthesis and properties of nanomaterials as a postdoctoral fellow with Timothy Swager at MIT. At Chicago, Yossi will explore new areas of bio-nanomaterials chemistry. We will include feature articles on these new colleagues in future newsletters.

The famous chalk drawing of a tiger that started out on a chalkboard in Searle and has since been moved to a prominent location in the central Chemistry Department office in Searle was featured in the Winter 2011 issue of *The Core*, a supplement to the *University of Chicago*



New Student Fellowships

Benjamin Ball Freud Fellowships

James Dama
Nathan LaPorte
Kayoko Beth Shimmyo

McCormick Fellowships

Karan Bhuripanyo
Michael Boles
Dmitriy Dolzhenkov
James Kurley III
Wing-Yeung (Wayne) Lau
Anthony Martinez
Patrick O'Kane
Andrew Sand
John Savage
Mijo Simunovic
Kin S. Yang
Hao Zhang
Haibin Zheng

University of Chicago

Alumni Association Fellowship

Dugan Hayes

NSF Graduate Fellowships

Dugan Hayes
Nicole Tuttle

NIH Predoctoral Training Grants

Courtney Sobers
Benjamin Zalisko

DOE Computational

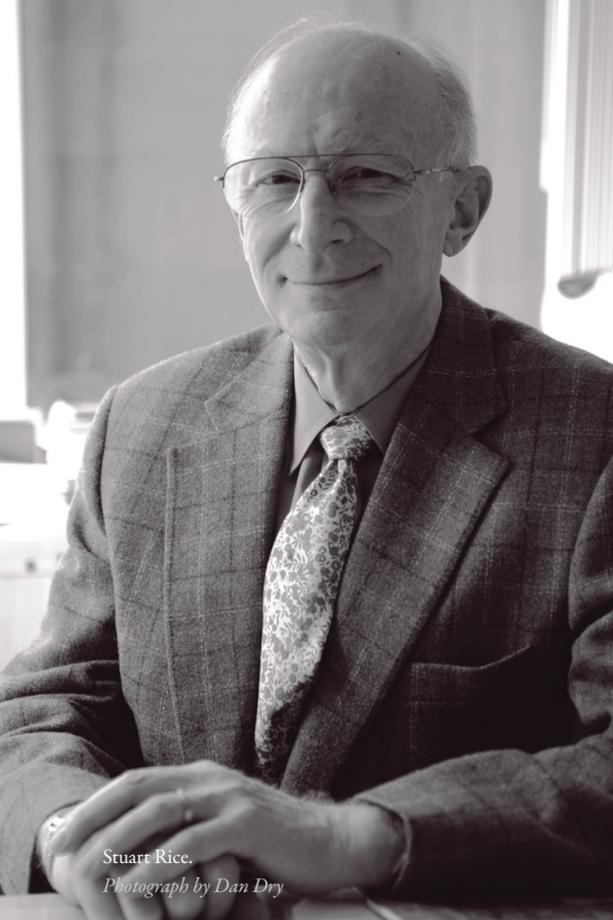
Science Fellowship

Andrew Fidler
Kenley Pelzer

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THE UNIVERSITY OF
CHICAGO
DEPARTMENT OF CHEMISTRY





Stuart Rice.
Photograph by Dan Dry

Investing in Innovation

UChicago chemist Stuart Rice honored with 2011 Wolf Prize

by Steve Koppes, News Office

Stuart Rice, the Frank P. Hixon distinguished service professor emeritus in chemistry, shared the 2011 Wolf Prize in chemistry with the University of Rochester's Ching Tang and Carnegie Mellon University's Krzysztof Matyjaszewski. The trio was cited "for deep creative contributions to the chemical sciences in the field of synthesis, properties, and an understanding of organic materials; for exploring the nature of organic solids and their energy profiles, structures, and dynamics; and for creating new ways to make organic materials, ranging from polymers, to organic based devices that capture energy from the sun and light our way in the dark; and for groundbreaking conceptual and experimental advances that have helped to create the research field of organic materials."

Rice joined the Department of Chemistry in 1957. He served as

the director of the James Franck Institute from 1961 to 1967, chairman of the Department of Chemistry from 1971 to 1976, and dean of the Physical Sciences from 1981 to 1995. Over the course of his career, Rice has also found time to advise more than 100 doctoral students. In 1970 he was awarded the Llewellyn John and Harriet Manchester Quantrell Award for Excellence in Undergraduate Teaching by the University; in 1999, he received the National Medal of Science, the highest scientific prize awarded in the United States.

Rice is one of ten scientists and artists scheduled to receive 2011 Wolf Prizes from Israel's president and minister of education during a special May 29 ceremony at the Knesset Building.

The Wolf Foundation was established by the late German-born inventor, diplomat, and philanthropist Ricardo Wolf. A resident of Cuba for many years, he became Fidel Castro's ambassador to Israel, where he lived until his death in 1981. Since 1978, the Wolf Foundation has awarded five annual Wolf Prizes, each of which carries a \$100,000 prize, to scientists and artists "for achievements in the interest of mankind and friendly relations among peoples, irrespective of nationality, race, color, religion, sex, or political view."

Alumni profile:

Alan Vaughan

Building a better mousetrap,
one monomer at a time

Since becoming a manager at ExxonMobil's research facility in Bay City, Texas, Alan Vaughan, PhD'90, doesn't get to do much lab work; his involvement in research has been limited to directing funding to academic labs and attending the occasional scientific conference. That doesn't mean that Vaughan's left the lab bench for the office desk completely: he manages a group of more than 20 research chemists and technicians exploring catalysts used to make plastics. Their focus, he explains, is on developing "higher-performance materials, so that the customer can use less of the material in the same application and save money."

Vaughan, who has worked at ExxonMobil since 1993, and his group work almost entirely in basic research, although they do sometimes get the call to help troubleshoot problems in industrial facilities. Recalling one such experience from his early days with the company, he says, "I was involved in a new catalyst that made a much stronger, higher performing polyethylene. They were having manufacturing problems, and I had to go out to the plant and review all the processes and interview people and see if we could track down the problem. It really opens your eyes when you see where your science is being used and applied in the real world and in a commercial manufacturing environment."

Vaughan notes a few differences between his industrial lab and an academic one. For instance, only a small fraction of Vaughan's

lab's work ends up published in journals or presented at conferences. Instead, he says, a majority of its research is published via patents, "which often don't get noticed by people in the academic environment." Some results never get published, remaining trade secrets or what Vaughan calls "know-how."

In addition, he sees a stronger emphasis on safety in an industrial lab than an academic one. It's not that the academic labs are lax, he explains, but in a large-scale manufacturing environment "you have a different viewpoint from managing those bigger-magnitude risks," where a single accident can have greater consequences. "It just permeates the whole company down to the smallest thing everybody does."

Vaughan has a strong interest in sustainability issues; while at first glance this seems contradictory for a man working for ExxonMobil, he doesn't see it that way. "Everything we have and use has a footprint of raw material that goes into it and emissions that are associated with its manufacture," he says. That way of thinking has suffused into not just his personal life but his entire field as well. Just as he has come to recycle his garbage and create a compost pile in his backyard, the chemical industry has become much more interested in recent years in using fewer raw materials and less energy in its processes.

And in that way, chemistry is much like life itself: "To get the right answer, you have to dig in," he says. "It usually takes several rounds of analysis to get good information and make good conclusions."

Graduate student profile:

Dugan Hayes

Dugan Hayes, SM'09, earned a bachelor's degree from MIT in 2008. In 2010, he won a National Science Foundation Graduate Fellowship to support his research with his adviser, Professor Greg Engel.

What have you been doing with your NSF Graduate Fellowship over the past year?

Of course, it's an honor to have an NSF fellowship. But having funding from the NSF didn't change my day-to-day operations much—it just means that my stipend comes from the NSF instead of my adviser. I do plan on using the travel allowance that comes with the fellowship this summer to go to a conference overseas, most likely the Quantum Effects in Biological Systems conference in Germany.

What research are you working on right now? How does it fit into the broader research interests of the Engel Group?

I use ultrafast nonlinear optical spectroscopy to study energy transfer dynamics in photosynthetic systems. Ultimately we're trying to understand how biological systems—specifically, photosynthetic antennae—exploit quantum effects to optimize energy transfer efficiency so we can export those principles to the design of materials for collecting solar energy or sensing radiation. Photosynthetic organisms absorb photons and transfer those excitations with remarkable efficiency, and we're

hoping to learn something from the pigment-protein complexes that have evolved for billions of years to do just that.

We've recently shown that electronic coherences—superposition states—survive in a particular antenna, the Fenna-Matthews-Olson complex, for hundreds of femtoseconds at room temperature by following quantum beats as they dephase in two-dimensional electronic spectra. But we still don't know exactly how these coherences survive for so long and what role they play in the energy transfer process.

What excites you about your work?

I've always found photosynthesis fascinating. Typically when people think about photosynthesis they think of the light and dark reactions, which ultimately produce sugar. But for us, the most interesting part is what happens within the first few picoseconds after a photon is absorbed, before any reaction occurs. So much of the energy transfer process is still unknown because it happens so quickly, and because it happens in spectrally congested systems. Our job, then, is to develop new analysis techniques to complement our two-dimensional experiments and pull apart the vast amount of overlapping information contained in a single data set.

I also think so many of our simple day-to-day tasks are really exciting because they demonstrate physical principles that seem unbelievable when I see them, even if I understand how they occur. Things like using frequency doubling to overlap laser pulses in time—I know it should work in theory, but it still amazes me every time I actually see it happen in front of me!

Thinking beyond the fellowship, what are you planning after earning your doctorate?

I'm still not entirely sure at this point. I've loved teaching every time I've done it—I taught general chemistry here for two years and thermodynamics as an undergrad—so I would like to have that be a part of my career at some point, but I think I could be happy doing anything that involves chemistry research.

Congratulations



AB & SB Recipients

Winter 2010

Jeffrey Lee
Chang-Beom Yu

Spring 2010

James Banigan
Carl Brozek
Jaemin Chin
Vanessa Copeland
Amanda R. Corcos
Kevin Dalton
Stefan Erickson
Stephanie Fronk
Ariel Furst
Yihe Gao
Mohammad Haidar
Jason Hao
Nicholas Hernandez
Adam Johnson
Vasilios Kalas
Maria Kleshcheva
Dorea Martin
Travis Miller
Yiannis Moses
Steven Mudroch
Caroline Patenode
Carla Penicka
Adam Petterson
Issra Rashed
Claire M. Ray

Ryan Schuering
Jonathan Sellon
Anna A. Sopol
Hee Won Suh
Allison Tovo-Dwyer
Angelica Wong
Brian Young
Hong Seok Yun

Summer 2010

Karolina Kalita

Winter 2010

John Scotti

SM Recipients

Spring 2010

Adam Johnson
Hong Seok Yun

Summer 2010

Dmitry Baranov
Brian Bayes
Joseph Bitetto
Ryan Booth
Michael Bosscher
Matthew Brynteson
Nathan Contrella
Zachary Gates
Charles Heffern
Gail Hernandez

Hao Huang
Quanjiang Ji
James Kornacki
Hsin-Yu Kuo
William Minsterman III
Matthew Montney

Qichao Pan
Jaime Cabrera Pardo
Kenley Pelzer
Srikant Raghavan
Robert Robinson
An Shi
Nathan Siek
Courtney Sobers
Ye Tian
Benjamin Zalisko

Autumn 2010

Anton Sinitskiy

Winter 2011

John Scotti

PhD Recipients

Winter 2010

Benjamin FitzPatrick
Liang Li
Joshua Payette

Spring 2010

James Boedicker

Cheol Hong Cheon
Gerri E. Hutson
Xing Jian
Pingfan Li
Seraphine Wegner

Summer 2010

Chad Brouwer
Changle Chen
Wenxun Gan
Mason Guffey
Praket Prakash Jha
Hee Young Kim
Jasmina Marjanovic
Chengqi Yi

Autumn 2010

Zachary Gurard-Levin
Carl Laskowski
Jing Li
Michael Newsom
Jelena Pesic
Sergey Pronin
Feng Shen
Murat Sunbul
Olesya Ulanovskaya

Winter 2011

Loren Greenman
Yihan Lin
Ralph Petty III
Zhongliang Shen