

THE MOLE STREET JOURNAL

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

SEPTEMBER 2011

VOLUME 10, ISSUE 9

In Memory of Art Fry

University Professor Emeritus **Arthur Fry** died August 23, 2011.

Arthur Fry's Research Accomplishments

Arthur Fry was a professor of organic chemistry at the University of Arkansas from 1951 to 1991, eventually attaining the rank of University Professor.

His research involved the effect of isotopes to discern the mechanism of chemical reactions, a focus that grew out of his Ph.D. at Berkeley and his work at the University of California Radiation (later Livermore Laboratory and the Oak Ridge National Laboratory).

He directed at least 25 Ph.D. dissertations and 18 M.S. theses. Many of these students have had significant scientific careers in academia, industry, and government.

He perfected processes to insert isotopes (particularly ^{14}C) into specific positions of substrate molecules and to measure the resulting effect upon the rate of a particular substitution, elimination, addition, rearrangement or exchange reaction. The magnitude of the Kinetic Isotope Effects (KIE) depends upon the degree of involvement of the substituted isotopic atom in the rate-limiting step of the mechanism for transformation from substrate to product.

Fry's experimental studies earned significant acclaim from colleagues and editors, as well as the Atomic Energy Commission, which awarded research grants of over \$1 million from 1951 to 1972 (some supported projects were jointly directed by Fry and colleagues Ray Edwards and R. Fink, with whom he collaborated.) Most of Fry's work during this period consisted of meticulous experiments from which mechanistic details were deduced.

By the 1970's computers became available that allowed

detailed calculations of reaction rates and KIEs. From 1972 to 1987, Fry and Professor of Physical Chemistry **Leslie B. Sims** collaborated on an experimental-theoretical effort to measure and calculate KIEs in order to derive quantitative aspects of reaction mechanisms.

This work began with development of a program, BEBOVIB, to calculate KIEs from substrate and assumed transition state structures and bonding (utilizing prevailing **Bond Energy – Bond Order** relationships to derive structure and force constants needed to calculate **VIB**ration frequencies). This productive collaboration resulted in many publications, students jointly trained in theory and practice and significant international collaboration: e.g., student and post-doc exchanges and visiting professorships between Arkansas and Japan, Australia, New Zealand, England, Poland, and India. The research was funded by National Science Foundation grants of over \$1.5 million from 1972 to 1990.

The BEBOVIB program was distributed by the Quantum Chemistry Exchange Program at Indiana University and was widely adopted as the basis for a significant expansion of KIE research as a diagnostic tool for organic reaction mechanisms.

The reputation of Fry continued to grow, leading to many invited plenary lectures and presentations at international conferences and symposia. In 1985, he received the American Chemical Society Southwest Regional Award for research achievement.

In 1987, alumni **Ves** and **Holly Childs** established the Arthur Fry Lecture Series in recognition of his many accomplishments and contributions to the department.

Fry retired in 1991 but continued until recently to attend department seminars, lectures and other events.

The above was written by Les Sims, former professor and department chair, and **Frank Millett**, distinguished professor with edits from Gene Fry, son of Arthur Fry.

A memorial service will be held in Fayetteville in 2012. His ashes are interred beside those of his wife in the columbarium at the First Presbyterian Church at Fayetteville. Memorial gifts may be made to the University of Arkansas Foundation for the Fry Scholarship Fund for undergraduate students in chemistry (c/o the Department of Chemistry and Biochemistry at the University of Arkansas, Fayetteville, AR 72701).



Arthur Fry

McIntosh Promoted



Matt McIntosh

Last spring the Board of Trustees approved the promotion of **Matthias McIntosh** to rank of professor, effective in August. The promotion to professor recognizes the significant contributions made to the university in the areas of teaching, research and public service.

More about McIntosh inside.

Faculty News

Research News

Julie Stenken has received a two-year \$375,187 NIH Exploratory Developmental Research Grant (R21) entitled "In Vivo Brain Dialysis of Neuropeptides and Neuroimmune Signaling Proteins."

This work seeks to develop analytical chemistry methods to collect and detect cytokine proteins to allow for rapid translational medical treatments for humans.

R21 grants are meant to encourage high risk/high return research efforts.

On the Go

Fall 2011 ACS National Meeting & Exposition Denver, August 28-Sept. 1

Bob Gawley attended as the program chair for the ACS organic division.

Matt McIntosh attended a graduate recruiting session.

Colin Heyes presented a poster "Connecting the Physical Chemistry of Biofunctional Quantum Dots at the Ensemble and Single Molecule Level."

Postdoc **Jose Aldana** presented a poster "Tailoring the Synthesis of CdTe Quantum Dots for Fluorescence Imaging Applications."

Undergraduate **Ashley Rosenburg** presented a poster "Toward a Scalable Asymmetric Synthesis of (4R,5S,6R)-Trihydroxycyclohexen-2-one."

Graduate student **Benard Omogo** attended.

Cell and molecular biology graduate student **Nicole Vanderbush** will present a

poster "Expression and Characterization of Cytochrome c6 from *Chlamydomonas reinhardtii* Using a Designer Gene," at the European Molecular Biology Organization (EMBO) meeting September 10-13 in Vienna, Austria.

Department Seeks Applicants

The department is seeking both a theoretical physical chemist and an organic chemist to fill tenure-track professor positions.

Julie Stenken is the physical search chair. Review of completed applications will begin on November 1.

Matt McIntosh is the organic search chair. Review of completed applications will begin on October 15.

Alumni News

In Memory of Limuel Parks

The **Rev. Limuel G. Parks, Jr.**, B.S. '51, M.A. '56 of Batesville, died September 2. Mr. Parks was born July 11, 1929, in Batesville.

After college, he worked in the U.S. patent office in Washington, D.C., and later with nerve gas experimentation at Dugway Proving Ground in Utah.

He also served in the U.S. Air Force and was stationed in Korea during the Korean War. He was promoted to the rank of Major.

He was ordained as a priest in the Episcopal Church in 1959. His work as an Episcopal clergyman was in the dioceses of Arkansas and Mississippi.

Hutchison Goes East

John Hutchison, Ph.D. '07, has joined the faculty of Auburn University at Montgomery as assistant professor of chemistry.

Ong at Georgia State

Grace Ong, B.S. '05, Ph.D. '10, is a visiting lecturer at Georgia State University.

Swepston Continues with Rigaku

Paul Swepston, Ph.D. '76, has a new position within Rigaku as Chief Marketing Officer working in new product development.

Since 1995, he has served as president of Global Life Science Division at Rigaku Corporation, president and CEO at Rigaku Americas Corporation and director of marketing at Molecular Simulations.

Swepston was a graduate student under **Wally Cordes**.

McIntosh Promoted continued

His research is in the area of natural product synthesis and related methods development but his creativity extends beyond the laboratory.

He and colleague Ralph Henry (BIOS) developed a new honors colloquium entitled "Drug Discovery," a case-study course that discusses not only the synthesis/preparation of the drug process but also examines larger issues including the topics of human trials, off-label marketing, pharmaceutical tort litigation, and others.

In 2009, McIntosh co-wrote a documentary video "Total Synthesis – from Chemistry to Medicine," which describes how organic chemistry and the synthesis of new compounds fit into the development of new drugs.

Since 1998, he has maintained a site he created that links all U.S. synthetic organic academic research groups <http://www.organiclinks.net>. The site averages 25,663 hits per month.

He has a bachelor's degree in chemistry from Virginia Tech and a Ph.D. from the Pennsylvania State University, where he received a Ruth and August Homeyer Graduate Fellowship.

Following the completion of his doctorate, he then was an American Cancer Society Postdoctoral Fellow at Stanford University.

He first joined the department as assistant professor in 1996 and was promoted to associate professor in 2002.

The awards he has received since joining the university faculty include a Cottrell Scholar Award from Research Corporation, the University of Arkansas Convocation Award and a Scholar Lecture Award from the National Science Council of Taiwan in 2007.

Student News

Graduate Student Defends



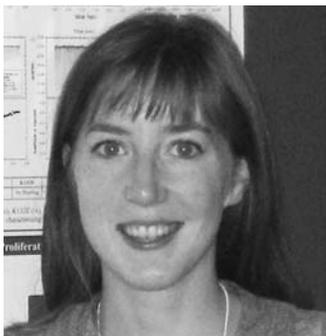
Sasi Muruganantham

Sasirekha Muruganantham defended her master's thesis "Visualizing the Spatial Localization of Active Matrix Metalloproteinases (MMPs) using MALDI Imaging MS," under the direction of Julie Stenken, August 15.

Muruganantham is from Coimbatore, Tamilnado, India and has a B.Sc., and M.Sc. Bharathiar University.

Kerr Selected for Duff Doctoral Fellowship

Alumna **Rebecca Kerr**, B.S. '07, has been selected as the recipient of the 2011 Barrett S. and Peggy S. Duff Doctoral Fellowship in Chemistry. The fellowship is given to highly qualified doctoral students in the Fulbright College.



Becky Kerr

Kerr was awarded a Doctoral Academy Fellowship (DAF) in fall 2008. The Duff Fellowship will fund her DAF during her 4th year.

Her research in the Kumar lab involves determining the role of heparin in acidic fibroblast growth factor (FGF-1) signaling. FGF-1 is a protein that is involved in many cellular functions, such as, cell proliferation, cell differentiation, angiogenesis, tumor growth, and wound healing. The structural and functional consequences of these mutations were studied to deduce the exact role of heparin.

Skidmore Named to All-Academic Team

Senior chemistry major **Ben Skidmore**, a member of the Razorback Track and Field, was among 16 university athletes to earn a place on the 2011 Division I All-Academic Track and Field Team. The team members are chosen by the U.S. Track and Field and Cross Country Coaches Association. To qualify student-athletes must have a 3.25 GPA and have met athletic standards during the season.

In July, he was one of 70 Razorback athletes to make the 2011 Southeastern Conference Spring Academic Honor Roll. Selection includes a minimum 3.0 GPA or above and student-athletes must have been a member of a varsity team for the sport's entire NCAA Championship segment.

Honors Freshman Arrive on Fellowship

The following undergraduate Honors College chemistry majors have started their collegiate careers on fellowship.

Sturgis Fellowship

Three of the four incoming Sturgis Fellows are chemistry majors. The 2011 Sturgis class boasts an average of a 34 composite on the ACT and a 4.0 high school grade point average. It is the oldest fellowship on campus and is unique because it requires the students to pursue a major in Fulbright College.

- **Caroline Chen** - Southside High School in Fort Smith
- **Dorothy "Jet" Currey** - Lake Hamilton High School in Hot Springs
- **Carson Leavitt** - a graduate of homeschooling from Durango, Colo.

Honors College Fellows

Three of the 61 students to join the 10th class of Honors College Fellows are chemistry majors. Students must score at least 32 on the ACT exam and have a 3.8 grade point average just to be eligible to apply.

- **Layne Bernardo** - Cabot High School in Cabot
- **John Ozdemir** - Pulaski Academy in Little Rock
- **Vasupradha Suresh Kumar** - Fayetteville High School in Fayetteville

Graduate Students Marry

Graduate students **Scott Morris** and **Jacqueline Greer** were married August 13 in Rogers.

He works in the Gawley lab and she works in the Kumar lab.

Both are from Texas and have bachelor's degrees from Steven F. Austin University.



Mr. and Mrs. Scott Morris

Safety Tip by Bill Durham

Do Not Ignore the Problem

If there is a problem with the buildings (CHEM, CHBC or SCIE) i.e., floods, very high temperatures in the labs, quenched magnet, etc., that appears to be related to a failure in the building equipment contact the building executive - Bob Gawley at 521-8073 or 422-5150 (cell) or the alternate building executive Bill Durham at 521-8317 or 841-9644 (cell).

Calendar of Events

September

- 02..... Last day to drop a full semester class without a "W"
 05..... Labor Day holiday, university closed
 09..... CUME
 12..... Department seminar - Haw Yang, Princeton University
 16..... Undergraduate department scholarship application deadline
 19..... Department seminar - Scott Feller, Wabash College
 26..... Department seminar - Paul Williard, Brown University
 29..... Special organic seminar - Vassil I. Elitzin, GlaxoSmithKline
 30..... Arkansas INBRE Research Conference registration deadline
 30..... CUME

October

- 01..... Application deadline to graduate at the end of fall 2011
 03..... Department seminar - Richmond Sarpong, UC Berkeley
 05..... Early Progress grade reports for 1000 and 2000 level classes will be
 e-mailed to student's university e-mail account
 06..... Annual department picnic at the Gardens
 10..... No department seminar
 10..... Faculty and staff meeting
 14..... CUME
 17..... No department seminar
 17-18 Fall break - no classes, the university will be open
 20..... VWR campus vendor show
 21-22 Arkansas INBRE Research Conference
 24..... Department seminar - Tehshik Yoon, University of Wisconsin
 31..... Priority registration begins for spring 2012
 31..... Department seminar - Susanne Striegler, Auburn University

November

- 01..... Scientific Solutions vendor show
 04..... CUME
 07..... Department seminar - Greg Hartland, University of Notre Dame
 14..... Department seminar - Michio Kurosu, University of Tennessee
 18..... Last day to drop a full semester class with a "W"
 21..... No department seminar
 23..... Thanksgiving break, no classes, the university will be open
 24-25 Thanksgiving holiday, the university is closed
 28..... Department seminar - alumnus Tom Goodwin, Hendrix College

December

- 02..... CUME
 05..... Department seminar - David P. Giedroc, Indiana University
 08..... Last day of the fall 2011 semester and last day to officially withdraw
 from all full semester classes
 09..... Dead Day - no classes
 09..... Annual department potluck
 12-16 Final exams
 17..... Fall commencement

September Birthdays

- 01..... Wes Stites
 03..... Becky Kerr
 07..... Jeff Havens
 08..... Denise Greathouse
 10..... Marti Scharlau
 13..... Srinivas Jayanthi
 14..... Reena Chandrashekar
 16..... Vishal Sahore
 16..... Ryan Tian
 19..... Luti Salisbury
 20..... Peter Pulay
 26..... Judy Sluppick
 29..... Heather Jorgensen
 30..... Roland Njabon
 30..... Mengjia Hu

The publishing of birthdays is not intended to invade the privacy of anyone. If you prefer not to be included, please let us know.

Library Hours

CHBC Library (CHEM 225)
<http://libinfo.uark.edu/chemistry>
 575-2557

Fall hours

Monday - Thursday....8 a.m. to 9 p.m.
 Friday8 a.m. to 6 p.m.
 Saturday - Sunday.....CLOSED

Note: the CHBC library will be closed Saturdays and Sundays this fall.

CUME Dates 2011-2012

Cumulative exams for graduate students will take place the following Fridays from 5 p.m. to 6 p.m. in CHEM 144.

September 9
 September 30
 October 14
 November 4
 December 2

January 27
 February 17
 March 2
 April 6
 April 27

New Graduate Students



Cameron Crane

Hometown: Hiwasse
- *B.A. in chemistry from Hendrix College*



Rory Henderson

* Doctoral Academy Fellowship
Hometown: Fayetteville
- *B.S. in chemistry with the biophysical concentration and a minor in math from the University of Arkansas*



Benjamin Jones

Hometown: Fayetteville
- *B.S. in chemistry from the University of Arkansas*



Beatrice Kachel

Hometown: Nuremberg, Bavaria, Germany
- *B.S. University of Regensburg, B.S. University of Arkansas (Atlantis Exchange Program)*



Ashley Martfeld Henderson

Hometown: Pea Ridge
- *B.S. in chemistry and a minor in math from the University of Arkansas*



Kyla Morinini Morris

Hometown: Rogers
- *B.S. in chemistry with the biochemistry concentration and a minor in Spanish from the University of Arkansas*



Dharma Nannapaneni

Hometown: Andhra, Pradesh, India
- *Bachelor's degree in pharmacy from Acharya Nagarjuna University, master's in pharmacy from Annamalai University*



Theresa Nguyen

Hometown: Hot Springs
- *B.S. in chemistry with a minor in math from Henderson State University*



Sarah Phillips

Hometown: Lee's Summit, Mo.
- *B.S. in chemistry with a minor in biology and an M.S. in chemistry from Missouri State University*



Venkatesan Rajagopalan (CEMB)

Hometown: Navi Mumbai, Maharashtra, India
 - B.Sc. in microbiology from the University of Mumbai and an M-Tech degree in biotechnology from Padmashree Dr. D. Y. Patil University



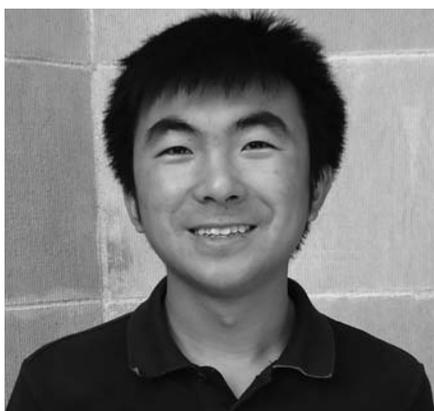
Hiroko Takeuchi

Hometown: Tokyo, Japan
 - B.S. in chemistry with the biophysical concentration and a minor in math from the University of Arkansas



Osman Uner

Hometown: Manisa, Turkey
 - Bachelor's degree in chemistry from Karadeniz Technical University



Jiang Wang

Hometown: Lanzhou, Gansu Province, China
 - General chemistry degree from Lanzhou University

Get Involved!

Below are undergraduate organizations in chemistry and biochemistry with contact information listed.

Alpha Chi Sigma, Alpha Sigma Chapter

Alpha Chi Sigma is a professional fraternity, drawing its membership from chemists and those in allied sciences, including chemical engineering, biochemistry, biological engineering, food science, agronomy, biology, metallurgy, polymer science, materials science, textiles and petroleum engineering.

The fraternity may initiate faculty members and qualified students who

are pursuing a professional degree. Membership has a minimum scholastic requirement and is elected by secret ballot.

Kristin Ross, Master Alchemist
 kmr010@uark.edu

Alpha Epsilon Delta (AED)

AED encourages and recognizes excellence in premedical scholarship. They seek to stimulate an appreciation of the importance of premedical education; to promote communication between medical and premedical students; and to use its resources to benefit organizations, charities and the community. There is a listserv for all premedical students. The Web site contains a list of upcoming events, officer information, and sheets for people who are applying to medical school.

To be officially inducted into the society, you must have completed at least 45 hours and have at least a 3.2 GPA. Inductions occur in the spring, usually in the student's sophomore year. You do not have to be an officially inducted member in order to participate in any and all of the activities.

<http://www.uark.edu/studorg/alepdelt/>

American Chemical Society Student Affiliate (ACS SA)

The Student Affiliates of the ACS brings together students of chemistry, biochemistry, chemical engineering, and anyone at all who has an interest in the chemical

sciences for the benefit of the chapter, the university and the greater community as a whole.

Arshan Dehbozorgi, president
 adehbozo@uark.edu

Co-SIGN (College Student Interest Group in Neurology)

This chapter of Co-SIGN was created to serve as an interdisciplinary student organization with the purpose of exploring the brain from medical, physiological, philosophical, and psychological perspectives. Our ultimate goal is to create a "neuro-niche" at the University of Arkansas where students can learn and discuss the underlying mechanisms and characteristics of the brain that accompany their formal education. As an interdisciplinary organization, we welcome all students and majors to join and participate in our special events and monthly meetings.

Nick Killingworth, president
 nkillings@uark.edu

Pre-Pharmacy Society

Pre-Pharmacy Society coordinates and promotes communications between pre-pharmacy students, stimulates interest in matters pertaining to pharmacy, and prepares its members for admission to the College of Pharmacy.

Morgan Newton, president
 menewton@uark.edu