



AMERICAN CHEMICAL SOCIETY DIVISION OF ENVIRONMENTAL CHEMISTRY

2009 Undergraduate Student Award in Environmental Chemistry

The Division of Environmental Chemistry sponsors annual awards to full-time undergraduate students currently enrolled in an United States education institution in chemistry, environmental engineering or other programs emphasizing environmental chemistry. These students must have completed or completing one full year of study at their current institution by the date of announcement of the awards (May).

The award consists of a one year membership in the ACS Division of Environmental Chemistry and a certificate. Awardees will be publicized in the Preprints, *EnvirofACS*, the Division web site and *C&EN*.

The Division of Environmental Chemistry is pleased to announce this years awardees.

Kelly E. Daumit

Department of Chemistry
Seattle University

Kelly is a top student in the chemistry department at Seattle University. In addition to her exemplary academic record, Kelly has displayed a real knack for scholarship. She has made tremendous progress on her research into the photochemical fates of a suite of endocrine-disrupting pollutants. Kelly has measured degradation rates under a variety of light and water quality conditions, and is in the process of determining reaction pathways for the set of sixteen analytes being studied. Kelly has presented her research at conferences on multiple occasions, including at the ACS National Meeting in Salt Lake City.

Douglas E. Latch
Assistant Professor

Ryan Espy

Department of Chemistry
Gustavus Adolphus College

Ryan Espy is a senior chemistry major (ACS certified) at Gustavus Adolphus College. Ryan has been working with Dr. Amanda Nienow on the photolysis of imazethapyr, an imidazolinone herbicide, in natural water systems for nearly a year. He has made great strides in the project and is currently working on a manuscript for submission to a peer-reviewed journal. He has also mastered liquid chromatography, UV-Vis spectroscopy, and iron analysis, and has extensive experience with LC-MS. Ryan took Environmental Chemistry in the spring of his junior year and conducted an independent project on the determination of Bispheno-A in nalgene and baby bottles for that course. ryan plans to

attend Purdue university to obtain a Ph.D. in chemistry and hopes to continue to work on problems related to the environment.

Amanda Nienow
Assistant Professor

Kavita D. Hardy

Department of Chemistry and Biochemistry
Swarthmore College

Kavita Hardy is a senior chemistry and economics double major at Swarthmore College. She is interested in sustainable development, and has thus been active in both environmental research and activism. In 2008, she presented a poster on measuring heavy metals in soils at the 236th ACS meeting in Philadelphia; this was part of the research component of a course in environmental chemistry. For the past two summers, she has worked in environmental research opportunities provided by the Department of Energy's Global Change Education Program (GCEP). Two summers ago, she worked with Dr. Neil Sturchio at University of Illinois at Chicago on research on using carbon isotopes to characterize the age and possible sources of carbonaceous aerosols in Mexico City. Last summer, she worked with Dr. Ron Cohen at University of California, Berkeley, using a coupled atmosphere-chemistry model (WRF-Chem) to predict the quantity and transport of secondary organic aerosols from isoprene emissions. We recognize her talent for identifying and facing environmental issues with a scientific perspective.

Alison Holliday
Assistant Professor

Jason Krumholt

Department of Chemical Engineering
Louisiana State University

Jason is conducting laboratory experiments measuring particle mixing rates due to soil being "bioturbated" with earthworms. These and other macrofauna residing in the top most layer of soil are aggressive particle mixers. So aggressive is the soil-side chemical transport process, theory suggests that for hydrophobics the air-side boundary layer controls. Using appropriate models of the incline-plane and "collapsing cone" microcosms, tracer vs. particle mixing derived effective bioturbation are being measured. The results obtained may explain large PCB penetration rates into soil from atmospheric deposition.

Louis J. Thibodeaux
Jesse Coates Professor of Chemical Engineering

Michael Mashtare

Department of Natural Resources and Environmental Sciences (NRES)
Purdue University

Mr. Michael Mashtare was selected this year for our outstanding Undergraduate Research Award in the Natural Resources and Environmental Sciences (NRES), which is an interdisciplinary undergraduate program at Purdue University. Mr. Mashtare selected environmental chemistry as his focus within the NRES program. He received an A grade in the lecture/lab course titled Environmental Soil Chemistry (AGRY 385) in Fall 2007 and obtained the highest course average in the class by over 5%. He then took a graduate course in Environmental Organic Chemistry (AGRY 544) in Spring 2008, which was a lecture-based course with heavy computational problem solving for which Michael was one of 3 undergraduates in a graduate class of 16 and obtained a course average in the top 20% of the class. Upon completion of AGRY 544, Michael chose to do his Capstone Senior project with Dr. Linda S. Lee (Environmental Chemist) on assessing the stereospecific sorption by surface soils of different estradiol isomers. All published work on estradiol focused on 17 β -estradiol; however, 17 α -estradiol is the form that is often times present and at much higher concentrations. Michael recognized that assuming that both of these isomers behaved the same in the environment could lead to considerable errors in predicting fate and transport of estrogens from manure-applied fields. Michael designed his experiment to be conducted at what would be environmentally relevant concentration, which required he learn to use our LC/MS/MS system in addition to learning all new experimental techniques for assessing chemical interaction with soils. His results show that the 17 α - and 17 β -isomers do have different sorption characteristics with soil properties affecting the magnitude of difference. Michael was awarded Outstanding Abstract in Life Sciences in the 2009 Undergraduate Research Symposium and is currently drafting a manuscript from this work to be submitted sometime this summer, which will be the first to report on any aspect of the behavior of 17 α -estradiol in the environment.

Paul Schwab
Director of NRES

Ashley Mertens

Department of Biology, Chemistry and Environmental Science
Christopher Newport University

Ashley received an outstanding grade in our Environmental Chemistry course in fall, 2008. She has been involved in environmental research for two years. She was selected for the DEVELOP Program at NASA Langley research Center where she did research with NASA Langley scientists. She continued research at NASA for course credit with Dr. Margaret Pippin on the development of an ozone sensor. She then started working with Dr. Gau Chen at NASA Langley analyzing data from airborne science missions. Ashley intends to pursue graduate studies in chemistry.

Kathleen Brunke
Professor of Chemistry; Coordinator of Chemistry Program

Kevin E. Shuman

Department of Science
Wesley College

The Wesley College (WC) Science faculty overwhelmingly supports the nomination of senior Kevin E. Shuman (B.S. Biology 2009, WC-Honor's Program) for this award. Four years ago, Kevin joined the first group of students in the newly initiated Wesley College Honors Program and decided to major in Biology with a Chemistry minor. In this short span of time, his achievements are truly outstanding! He began in our Directed Research Program in Science during his freshman year, completed 2 projects in Physical Organic Chemistry with Dr. Malcolm J. D'Souza at Wesley; one with Dr. Kirk Czymmek and Dr. Elizabeth Adams in Confocal Microscopy, at the Delaware Biotechnology Institute (DBI); and is in the process of completing a second Environmental Microbiology project with Dr. Keka Biswas at Wesley College. One of his Physical Organic Chemistry projects has been published as a peer-reviewed article in the International Journal of Molecular Sciences, and earned two "National Recognitions" when presented as posters at National Conferences. A joint Environmental Microbial Chemistry project mentored by Dr. Biswas and Dr. D'Souza recently earned a Certificate of Merit from the Division of Environmental Chemistry at the 237th ACS National Meeting. Support for his research endeavors were provided by NSF-EPSCoR and NIH-INBRE grants obtained under the leadership of the Delaware Biotechnology Institute. Kevin has been accepted into the Chemistry-Biology Interface Ph.D. program at the University of Delaware.

Malcolm J. D'Souza
Professor of Chemistry

Louis Sigtermans

Department of Chemistry
University of St. Thomas

Louis is a senior biochemistry major with an outstanding GPA who has also taken several courses in environmental studies and environmental science. He has performed research over the past two years working to understand the impacts of low-level exposure to antibacterial compounds on environmental bacteria. He intends to pursue graduate education in environmental chemistry or environmental engineering.

Kristine Wammer
Assistant Professor

Laura K. Simone

Department of Chemistry
Wheeling Jesuit University

Last year, Laura went on an immersion trip to the southern part of West Virginia to see the effects of mountain top removal mining. This had quite a profound effect on her that she became involved in an environmental research project that I wanted to get started. she then presented a poster of the data from this project at the Spring ACS Meeting in Salt Lake City. In addition to this, Laura completed a self-study course on environmental studies last fall.

Michael D. Hoops
Assistant Professor of Chemistry

John Stegemeier

Department of Chemistry
Chapman University

John has conducted important research as an undergraduate on the uptake and retention of heavy metals onto iron oxyhydroxide nanoparticles both before, during, and after their aggregation under environmentally-relevant conditions. His work has been presented at the national ACS and AGU conferences and, most recently, has focused on conducting real-time studies of Cu(II) adsorption and desorption from nanoparticle aggregates to study changes in metal release rates as a function of aggregation method. These studies have important implications for both natural attenuation of metals in contaminated environments and the development of engineered strategies for removing metals from aqueous systems.

Christopher Kim
Assistant Professor