



AMERICAN CHEMICAL SOCIETY DIVISION OF ENVIRONMENTAL CHEMISTRY

2010 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 *EnvirofACS*, the Division web site and *C&EN*.

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

Kristen N. Ballard

Chemistry Department
Transylvania University

For her self-designed project on conversion of mechanical energy to electrical energy using piezoelectric crystals.

George K. Kaufman
Assistant Professor of Chemistry

Matthew Coggon

Department of Chemical Engineering
University of Massachusetts, Amherst

Matthew Coggon is a truly exceptional undergraduate Chemical Engineering student. He earned the highest GPA in his graduating class while regularly working 15-20 hours a week as a driver for the campus bus service and performing cutting-edge environmental research. Matt is capable of working at the interface between chemical and environmental engineering, geosciences and microbiology, to make a contribution to our understanding of the worldwide environmental problem of acid mine drainage (AMD). Matt began his research as a sophomore, helping a doctoral student with fieldwork in an investigation of AMD bioremediation. He later worked as an REU in Dr. Joanne Silverstein's lab at the University of Colorado, Boulder, investigating the microbial processes responsible for generation of AMD. For his honor's thesis, Matt conducted a study that investigated the bioavailability of jarosite minerals to Fe(III) reducing bacteria at Davis Mine, an abandoned pyrite mine in Western Massachusetts.

He worked closely with faculty and students from environmental engineering, microbiology and geosciences to characterize the mineralogy and microbiology at the site and to conduct controlled experiments to investigate the effect of jarosite, organic substrate and nutrient addition on shifts in geochemistry, mineral composition and morphology, and microbial community structure. He will be presenting two conference papers this month on his research (see below) and is currently 90% finished as the lead author on a journal article that will be submitted to the journal Chemosphere. Matt accomplished all of this with hard work and a positive attitude that is contagious.

Coggon, M., Miller, K., Bacerra, C.A., Nüsslein, K., Yuretich, R. and Ergas, S.J. (2010) Bioavailability of jarosite as an electron acceptor at Davis Mine in Rowe, MA, Institute of Biological Engineering Annual Conference, March 4-6, Cambridge, MA.

Coggon, M. and Ergas, S.J. (2010) Bioavailability of jarosite as an electron acceptor at Davis Mine in Rowe, MA, American Chemical Society Ann. Meeting, March 21-25, San Francisco, CA.

Sarina Ergas
Associate Professor

David Ford
Professor

Anthony M. Darrington
Chemistry Department
Wesley College

The Wesley College Science Division overwhelmingly supports the nomination of Anthony M. Darrington (B.S. Biological Chemistry, May 2010) to this award. Tony excelled academically and began participating in our NIH-NCRR-INBRE sponsored research program during his sophomore year. He completed 2 research projects in physical organic chemistry under my direction and one of these has been submitted for publication in the peer-reviewed journal Organic Chemistry International. The second project evaluates the mechanism of reaction of some phosgene derivatives used in the agricultural chemicals industry. This project when presented as a poster at the 239th ACS National Meeting earned a Certificate of Merit from the ACS Division of Environmental Chemistry. This research was supported by grant number 2 P2O RR016472-010 from the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH). Additionally, Tony acknowledges the receipt of a Tuition Scholarship from the NASA Grant NNG05GO92H Delaware Space Grant College and Fellowship Program.

Malcolm J. D'Souza
Professor of Chemistry

Easar Forghany

Chemistry Department
Saint Mary's College of California

Excellent academic record; outstanding research in the field of atmospheric ozone monitoring; and strong interest in environmental chemistry.

Kenneth J. Brown
Chair of Chemistry

Ashley Hountz

Department of Natural Resources and Environmental Science
Purdue University

Ashley Hountz is a senior majoring in Natural Resources and Environmental Science at Purdue University. She has demonstrated excellent academics coupled with outstanding research in the area of remediation and reclamation of blast furnace slag. The slag material is highly alkaline (pH>12) due to the presence of alkaline earth oxides originating from the high-temperature degradation of limestone during the production of steel. The extreme pH is toxic to most plants and imposes a serious impediment to plant-based stabilization against wind and water erosion. Ms. Hountz recognized that exposure of the slag to elevated carbon dioxide will convert the oxides to carbonates and decrease the pH into a non-toxic range. High-carbon amendments to the slag, partial dilution with soil, and balanced moisture contents led to ideal conditions for microbial activity and elevated carbon dioxide in the slag. The pH rapidly dropped below 10 allowing establishment of tolerant plants which led to further decreases in pH. Through the clever application of chemistry and plant biology, Ms. Hountz was able to find a beneficial use of highly alkaline material that was previously phytotoxic.

Paul Schwab
Professor

Benjamin Kamark

Department of Environmental Engineering
University of Colorado at Boulder

The Environmental Engineering Program at the University of Colorado at Boulder is pleased to nominate Benjamin Kamark for the Undergraduate Student Award in Environmental Chemistry from the American Chemical Society's Division of Environmental Chemistry. Ben is a senior and will graduate in December 2010 with his B.S. degree in Environmental Engineering. Ben has taken a wide range of courses related to environmental chemistry including water chemistry, environmental organic

chemistry, and physical chemistry. His engineering professors selected Ben on the basis of his course performance, demonstrated mastery of environmental chemistry principles, and mentoring of other students. Ben has performed both field and laboratory research with the Mountain Research Station, the Institute of Arctic and Alpine Research, and the U.S. Geological Survey. He is currently studying the effects of fires on mercury release from forest soils into water. Ben has successfully written two proposals to fund this research, has sampled soil from prescribed burn and wildfire sites, and performed various chemical analyses.

Angela R. Bielefeldt
Director of the Environmental Engineering Program and Associate Professor

Trevor Lynch

Department of Allied Health Sciences
University of Cincinnati

In addition to being a full-time undergraduate student at the University of Cincinnati, Trevor Lynch is spending significant time conducting research in Dr. Dionysiou's laboratory related to environmental nanotechnology and the development of biosensors for monitoring cyanobacterial toxins in water. He is also involved in the fabrication of novel visible (solar) light activated TiO₂ materials immobilized on appropriate supports for the development of water purification systems using solar light. Trevor is a creative, self-motivated, and hard working individual. In all his projects so far, he has learned several analytical techniques and has made important contributions in all the projects involved. He is nominated for this award for his dedication to conduct research in the field of environmental chemistry, and in particular in the area of environmental applications of nanosystems and nanodevices.

Dionysios D. Dionysiou
Professor of Environmental Engineering

Annie Opseth

Department of Chemistry
Gustavus Adolphus College

Annie Opseth is a senior chemistry major at Gustavus Adolphus College. Since her sophomore year, Annie has conducted environmentally related research with Drs. Nienow and Jeremiason. Initially, Annie focused on measuring ions in local watersheds (the MN River and Seven Mile Creek) with Dr. Jeremiason and then began a research project with Dr. Nienow exploring the rates and mechanism of photochemical degradation of imazethapyr, a pesticide used in the Seven Mile Creek Watershed on

corn and soybeans. Annie will be a co-author on a paper coming out of Dr. Nienow's research group. Next year, Annie will attend graduate school for Chemical Oceanography at the University of South Carolina.

Amanda Nienow
Assistant Professor

Jeff Jeremiason
Associate Professor

Becca Putans

Chemistry Department
Albion College

Becca is a top senior chemistry major at Albion College. She has coupled her interests in the environment and materials chemistry by performing research on the synthesis and characterization of palladium nanoparticles supported on polymeric filtration membranes for applications in water reuse and remediation. Her research has resulted in her mastering various synthesis techniques as well as a suite of instrumental techniques, including scanning electron microscopy, optical spectroscopy, vibration spectroscopy and electrochemical techniques, for characterization. Becca has presented the results of her research at the 239th National Meeting of the American Chemical Society in San Francisco, CA, as well as at various symposia in Michigan. To add greater understanding to her research, Becca has augmented her chemistry curriculum coursework with directed studies in environmental organic chemistry and environmental modeling. Becca is planning on attending the University of Wisconsin-Madison to pursue a Ph.D. in chemistry, and hopes to continue to work on problems related to the environment.

Kevin M. Metz
Assistant Professor

Jose A. Saltos

Department of Chemistry
The College of Staten Island

Research work in synthesis of eco-friendly corcomin-derived diesters.

Achwen-Yang Shew
Acting Chair

Amanda Stemig

Department of Chemistry
University of St. Thomas

Amanda is a senior chemistry major with an outstanding GPA. Since the summer after her sophomore year, she has been performing environmental chemistry research in Kris Wammer's lab, studying the activity of transformation products of antibacterial compounds in natural waters. Following her graduation this spring she will be attending graduate school to further her study of environmental chemistry.

Kristine H. Wammer
Assistant Professor

Katherine Stencel

Department of Chemistry
The College of Wooster

Katy is pursuing a chemistry major and environmental studies minor at Wooster. She is engaged in environmental research (investigating the aerobic degradation of sertraline). She is planning to pursue graduate studies in environmental chemistry.

Melissa M. Schultz
Assistant Professor of Chemistry

Sarah Tufaro

Department of Environmental Science
Rutgers University

Outstanding performance in environmental chemistry coursework.

Peter Strom
Undergraduate Program Director

Christopher M. Whidbey

Department of Chemistry
Seattle University

Christopher M. Whidbey is a senior chemistry, biology, and philosophy triple major at Seattle University. In addition to maintaining a superb GPA while juggling diverse coursework, Chris has been active in undergraduate research in environmental

chemistry. In the past year, he has initiated a project to measure the estrogenic activity of photoproducts formed when estrogenic hormones are exposed to sunlight under different water quality conditions. Chris has made great strides on this project, and he works with the thoughtfulness and productivity of a first or second year graduate student. His work is likely to form the foundation of a manuscript for publication in a peer-reviewed journal. In addition to being an engaged, productive undergraduate student researcher, Chris is also a fantastic mentor to new students as they begin their research experience. He has presented his work multiple times, including as a talk at the ACS National Meeting in San Francisco. Chris will be attending graduate school in the fall.

Douglas E. Latch
Assistant Professor of Chemistry