

# Environmental Science and Biology

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Spring 2003

## Dr. Joseph Makarewicz, Chairman

Welcome back for the spring semester! With the snow falling outside my window, using the term spring seems a bit premature. Nevertheless, warm sunny days are somewhere in our future as is graduation for several students. This will be our first large contingent of students graduating from the major in Environmental Science. Thus it is a joyous occasion for students and for faculty an occasion touched with some sadness as they depart. This semester there are many events planned for you. **Guest lecturers** from the University of Waterloo and United States Geological Survey (See below) are expected in February and April. **Scholars Day**, SUNY Brockport's annual full-day celebration of scholarship and creativity by students, faculty and staff, is scheduled for 2 April 2003. Many of the undergraduate students will be presenting. BEAN, Brockport Environmental Awareness Network, the undergraduate environmental club, will have a host of programs. The Department also intends to host the ever popular pizza party during the spring. Finally, near the end of the term, the Awards Ceremony will be held, a Department Scholar will be named and the Ken Damaan Award will be presented. It makes for a busy and interesting semester.

## Calendar

**Guest Lectures:** Rooms and times to be announced.

13 February 2002. **Ecological and Evolutionary Traps.** Dr. Michael Runge. USGS, Pawtuxent, Maryland.

2 April 2002. **Scholar's Day.** Edward's Hall

25 April 2002. **Pesticides that suppress the immune system of leopard frogs.** Dr. Brian Dixon, University of Waterloo.



## Green Chemistry - *How Physical Chemistry relates to Pollution Prevention* Markus Hoffmann, Ph.D.

Society as a whole has taken for granted the continued use of chemical products such as paints, plastics, oils, ceramics or detergents, often overlooking the fact that manufacturing these products contributes to pollution of the environment. Could products and chemical processes be reformulated to lessen the impact on the environment? I once asked myself how could I contribute my expertise to prevent pollution? I began studying chemistry in 1989 and soon discovered that others had the same thoughts.

In the early 1990's, Paul Anastas of the U.S. Environmental Protection Agency formulated twelve principle guidelines for designing chemical processes that are now referred to as "Green Chemistry" (see *Chemical & Engineering News*, Vol. 79, #29, 201, pp. 27-34). In the past few years, this new and growing field started a new journal titled "Green Chemistry" and

developed the Presidential Green Chemistry Challenge Award. This award recognizes new innovative processes or projects that significantly reduce pollution.

One goal of Green Chemistry is to come up with chemical processes that use solvents (or no solvents at all!) that are less harmful to the environment. Usually, a solvent is required in which all reactants can dissolve in and, therefore, can come in contact with one another to react to the desired product. Solvents are also widely used to separate the desired product from the unreacted starting material and unwanted side-products. A wide range of possible solvents exists but many of them have high vapor pressures (they are almost boiling) and because of that can easily be combusted and can also easily escape into the environment and contaminate the environment.

Ionic liquids, salts that have a melting point near room temperature, have vapor pressures that are immeasurably small and thus make good candidates for "Green Chemistry". At the last 224<sup>th</sup> National Meeting of the American Chemical Society in 2002, a demonstration showed that a welding torch does not ignite an ionic liquid compound in an open atmosphere. New classes of ionic liquids were discovered in 1992 that were stable in moisture and air. An increasing number of scientists realized the potential application of ionic liquids as an environmentally friendly solvent system. However, ionic liquids are complex solvents that are poorly understood. Here is where I as a Physical Chemist can help by carefully studying the inner workings of these fascinating solvents.

Please stop at my office in Smith Hall, Room 228. I would welcome discussion on "Green Chemistry" and related subjects. I am always looking for students to be part of my research efforts on ionic liquids.

## Kudos to Ted Lewis



In recognition of 20 years of dedication and scholarship as a research scientist and for continued contribution to the environmental quality of the region, Ted Lewis was awarded a Certificate of Appreciation from Provost Timothy Flanagan and Chair, Joseph Makarewicz at reception held in November 2002.

## Haynes, Norment, Zollweg, and Dilcher Receive Grant

A \$50,000 grant titled The Biological Study of Irondequoit Bay was awarded to Drs. Haynes, Norment, Zollweg, and Dilcher. The award from the Monroe County Department of Planning and Development requires a comprehensive survey of aquatic and terrestrial animals and plants in and around the Bay and will be used to support a Harbor Management Plan being prepared by the Towns of Irondequoit, Penfield, and Webster, Monroe County and the NYS Department of Environmental Conservation. Several students played vital roles in the effort. Nicholas Parnell (BS, '98, MS, '02) lead field crews that used GPS to map aquatic vegetation for identification.

Ryan Walter (BS, '00, MS, '02) and Sue Rakowski (undergraduate volunteer from SUNY Morrisville) assisted aquatic fieldwork, and George Cook (MS, '98) identified benthic macro invertebrates. Dr. Ronald Dilcher, Professor Emeritus of Ecology, identified aquatic macrophytes and surveyed and identified terrestrial vegetation. Dr. Christopher Norment, Associate Professor of Environmental Science and Biology, supervised amphibian and bird surveys conducted by graduate student David Porter and bat surveys done by local expert Martha Zettel. Dr. James Zollweg, Assistant Professor of the Earth Sciences and GIS expert, constructed detailed resource maps of six aquatic and nine terrestrial habits considered of critical importance in the Harbor Management Plan. Mary Arnold (MS, '01) collected sediment samples from four potential dredging sites in Irondequoit Bay for particle size analysis by Dr Whitney Autin, Assistant Professor of Earth Sciences. Dr. Haynes' role in the project was to organize the data collected, write a report, and present the report at public meetings in the three towns.

### **Wild Wings, Inc. Volunteers**

Sue Schultz (MS '04) and Sarah Donovan have volunteered their biological knowledge and service to Wild Wings, Inc. Wild Wings is a not-for-profit corporation whose mission is to promote a better understanding of the natural world using birds of prey as a teaching tool. If anyone is interested in volunteering, please contact Ellen Post at (595) 392-7500 or fax (585) 391-1805.

### **Nominations for the Kenneth Damaan Award in Aquatic Ecology**

The Damaan Award in Aquatic Ecology honors a student for excellence and potential in aquatic-related research. Nominations by faculty and students are due by 7 February to Dr. James Haynes in Room 119 Lennon Hall.

## **Students In the News**



**Sarah Wasson ('04) and Sarah Davidson ('03)** (above) have applied for one semester of study at the James Cook University, Australia. Sarah Wasson is pursuing her interest in marine biology while Sarah Davidson has applied to their environmental regulatory and policy program.

**Nick Parnell (MS '02)** has accepted a position as Senior Biologist at Mote Marine Laboratory Center for Fisheries Enhancement in Florida. Nick will be heading up a project detailing the population structure of Red Snapper in the Gulf of Mexico. This project involves collecting data from specimens caught on charter boats and commercial boats. The project is a joint venture between Mote and the National Marine Fisheries Service.

**Stephanie Abbink (BS '04)** is the 2002 co-winner of the O'Reilly Environmental Science Scholarship for incoming freshmen majoring in Environmental Science. Stephanie is a transfer student from FLCC where she majored in Environmental Science. She is now pursuing her bachelors in Environmental Science and Biology with an emphasis on terrestrial ecology. Stephanie plans on pursuing a masters degree upon completion of her coursework at Brockport.

**George Berghorn (BS '96)** is currently employed in New Jersey with an engineering and construction firm where he has the responsibility of designing and building large water and soil treatment systems. Next fall, he will be attending Michigan State University on a Distinguished Doctoral Fellowship. His graduate work on determining the role that human decision making plays in large-scale fishery management policy will be undertaken in the Department of Fisheries and Wildlife. **"It was the interdisciplinary nature of my Brockport education that weighed heavily in acceptance into the program at MSU."**

### Proposed Fall 2003 Schedule

#### ENV 201/202 Env. Sci.

Dr. Haynes  
MWF 1:15-2:15  
Lab W or F 9:30-Noon

#### BIO 303 Ecology

Dr. Gardner  
T/R 9:45-11:15  
Lab M or W 1:15-4:15

#### BIO 406 Wildlife Ecology

Dr. Norment  
T/R 9:45-11:15  
Lab F 1:00-5:00

#### BIO 419 Limnology

Dr. Makarewicz  
T 6:00-9:00

#### BIO 421 Limnology Lab

Dr. Makarewicz  
R Noon-5:00

#### BIO 427/527 Animal Behavior

Dr. Norment  
T/R 1:15-2:45

#### BIO 437 Biological Investigation Data Interpretation

Dr. Gardner  
M/W 5:30-7:00

#### BIO 457 Marine Biology Bahamas

Dr. Haynes  
M/W 3:45-5:15

#### BIO 459/559 Mammalogy

Dr. Norment  
T/R 9:45-11:15  
Lab F Noon-5:00

#### BIO 490/590 Fish Techniques

Dr. Haynes  
T Lab Noon-5:00

#### BIO 614 Experimental Design

Dr. Gardner  
M/W 5:30-7:00

### New Environmental Science Course

Starting this spring "Environmental Science" (ENV 201) will be offered by Dr. Haynes. This interdisciplinary course combines ideas and information from the natural sciences (biology, earth science, chemistry) and the social sciences (economics, politics and ethics) in a lecture and case study approach. The eight integrated themes of the course are (1) biodiversity, (2) sustainability, (3) connections in nature, (4) pollution prevention, (5) population growth, (6) energy and energy efficiency, (7) solutions to environmental problems, and (8) the importance of individuals working together to bring about environmental change. It will be offered again in fall of 2003.