



EARS IGERT Newsletter

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Inaugural EARS IGERT Newsletter

Hello, everyone

This is the first in the series of newsletters for the EARS IGERT. NSF IGERT “Environmental Aquatic Resource Sensing (EARS): Basic Science, Business Education and Outreach”

The EARS IGERT is part of the NSF foundation-wide interdisciplinary doctoral student training program. The theme of the EARS IGERT is training of doctoral students in environmental sensing, focused on freshwater resources, accentuated with business experiences, to develop professionals equipped for diverse careers. Students eligible for traineeships are those that will be, or have already been, successfully admitted to doctoral programs in one of the participating science departments (Kent: Biological Sciences,

Chemical Physics, Chemistry, Geography, Geology; Miami: Chemistry, Geography, Geology, Microbiology, Zoology);.

We will send out a newsletter once per semester with details of accomplishments and upcoming events. If you have stories or information to submit, please send them to Margie Nagella via e mail at: mnagell@kent.edu.

We also need pictures! Please send us photos from your work.

Copies of the newsletter can also be downloaded from our web page at <http://bioweb.biology.kent.edu/igert/>



Upcoming events:

- Buoy launches—the Acton Lake buoy has been launched and the Sandy Lake buoy will follow shortly
- The Wireless Sensor Technology course will be offered for the first time this summer. This course provides hands on experience in wireless communications as it applies to sensors and will be taught by a College of Technology faculty member (CHITRA RAJAGOPAL)
- The professional development workshop series will resume in Fall

Our cohorts

Our first cohort includes six students. Three students are from Miami and three from Kent. This cohort is currently participating in the Introduction to Environmental Sensors class taught by Darren Bade. For their cohort project, they are working on an outreach component for EARS-IGERT...stay tuned for more

details.

The second cohort has been selected and will start in the Fall. Over the coming issues of the newsletter, we will provide some information about each student, their interests, and background.

EARS IGERT is funded by NSF.



Kent State University Press Release

Kent State University has been awarded a training grant in the amount of \$2,756,719 by the National Science Foundation (NSF) under its Integrative Graduation Education and Research Training (IGERT) program. This is the first IGERT grant to be awarded to Kent State. The grant, which is funded under the American Recovery and Reinvestment Act of 2009, runs through 2014.

The grant funds an IGERT project that focuses on environment aquatic resource sensing (EARS). The purpose of the program is to train doctoral students in environment sensing to learn how to protect and sense things in aquatic environments. The training provided by this project will prepare graduate students for a variety of future careers relevant to freshwater resources.

"The use of sensing technology allows us to monitor and understand what's going on in our environment," says Laura Leff, professor and assistant chair of Kent State's Department of Biological Sciences and principal investigator of the program. "Humans are dependent on freshwater resources, and there is not much freshwater on the Earth's surface. There are many diverse threats that can impact our aquatic systems, and technology, such as sensors, allows us to ask questions we couldn't ask before."

The EARS project



UV Radiometer in Lake Tahoe

is interdisciplinary and involves Kent State and Miami University. "We want students to collaborate across disciplines to get a real hands-on experience and business experience in terms of technology transfer," Leff says. "The project provides a unique opportunity to bring together people in sciences, business and technology, serving as a catalyst of new partnerships to form not just between the sciences, but also with the colleges of business and technology."

A highly competitive program, Kent State was one of more than 400 pre-proposals for the grant award. Ultimately, only 25 were funded.

"This grant brings a lot of prestige to the university since it's a highly competitive award, endorsing the quality of our students and our sciences," says James

Blank, chair of Kent State's Department of Biological Sciences. "This is a highly coveted award that will help transform graduate programs."

Currently, three doctoral students from Kent State and three doctoral students from Miami University are participating in the EARS project. The students recently conducted a workshop at Lacawac Sanctuary in Pennsylvania where they tested sensors and

"This grant brings a lot of prestige to the university since it's a highly competitive award, endorsing the quality of our students and our sciences"

collected data. They also will design an education outreach project that they will implement together, using what they are learning to educate students in local schools. IGERT is an NSF-wide program intended to meet the challenges of educating U.S. doctoral scientists and engineers with the interdisciplinary background, deep knowledge in a chosen discipline and the technical, professional and personal skills needed for the career demands of

the future. The IGERT program is intended to catalyze a cultural change in graduate education by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries. For more information on IGERT, visit www.IGERT.org. For more information on the IGERT Environmental Aquatic Resource Sensing, visit <http://bioweb.biology.kent.edu/igert/>

Introduction to Environmental

We are offering this new course for the first time this spring 2010.

This course examines use of automated sensors in the field of aquatic ecology/environmental science. Much of the course is about the use of different sensors and what information and insight these sensors can pro-

vide in our field. Hands on experience will be provided. There is an emphasis on the scientific process throughout the course. For example, identifying whether a sensor is used as a monitoring device in an applied setting versus a tool to answer a fundamen-



Sensors

tal scientific question will be evaluated critically.

This course is open to IGERT trainees and other students. It will be offered again in Fall 2010.

Buoy update

Over the winter months, while the lakes and reservoirs throughout Ohio were ice and snow covered, design and construction of the Kent and Miami buoys was underway.

Kevin Rose, a Miami IGERT student, is currently interning at Fondriest Environmental; part of his duties have been to build and test the IGERT buoys, sensors, and communications systems. The final phases of this work were recently completed and on April 24th, Miami IGERT students Jeremy Mack, Kevin Rose, and Susanna Scott worked with Steve Fondriest and other engineers from Fondriest Environmental to deploy a data buoy and meteorological station on Acton Lake. The buoy contains a number of sensors to measure water quality and lake metabolism including a full meteorological station (light, wind speed, wind direction, humidity, barometric pressure, precipitation, temperature) as well as underwa-

ter sensors including dissolved oxygen, temperature sensors, turbidity, pH, conductivity, and chlorophyll. The buoys will be used for both training and research to understand lake metabolism and disturbance events. Data from the buoy is telemetered back to Miami via cellular transmission and will be publicly available for education and outreach.



Above: Kevin Rose works on data-logger with buoy in the background. The data logger controls power to the sensors and sampling frequency, stores data, and sends data back to a central server on user defined intervals.

Left: The deployed buoy on Acton Lake. Image by Jeremy Mack.

First Professional Development Workshop

Our first professional development workshop was Monday April 5th at 4PM and included remarks from Dr. John West and a cross-disciplinary faculty panel. The topic of this workshop was grantsmanship.

John West, VP for Research at Kent State, delivered and overview of funding. The panelists then responded to a se-



ries of questions submitted by graduate students and post-docs. Panelists were: Robert Twieg (chemistry), Robin Selinger (chemical physics), Derek Damron (biology), and Mary Ann Raghanti (anthropology).

The workshop series resumes in fall with an orientation for new science graduate students and then on September 13th Robin Selinger will do a presentation on applying for graduate and post-doctoral fellowships. In October, we

will cover career pathways in academia.

The students have created a facebook page and a web page about the workshops....details are at:

Facebook:
<http://www.facebook.com/topic.php?topic=4&uid=102798126423790#!/group.php?v=wall&gid=102798126423790>

Webpage:
<http://sites.google.com/site/ksumentoringworkshops/>

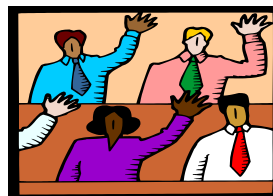
Internal Advisory Committee

Thanks to the members of the EARS INTERNAL COMMITTEE! We've got one representative in each of the participating departments and Kent State and Miami.

Miami-Zoology, Williamson
 Geology, Dong

Geography, Renwick
 Chemistry, Pacey
 Microbiology, Rachael Morgan-Kiss

Kent-Geology,- Smith
 Geography,-Munro-Stausik



Thanks to the internal advisory committee.

Biology,-Leff
 Chemistry - Twieg
 Chemical Physics, Wei



EARS IGERT

Want more information? Contact us at the address, phone number or e mail below. You can also go to the web page to get contact information for our faculty participants and find links to our participating

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Environmental
Aquatic Resource
Sensing

[http://
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igert/](http://bioweb.biology.kent.edu/igert/)

This Integrative Graduate Education and Research Training (IGERT) program (funding by the National Science Foundation) represents an interdisciplinary, dual-institution (Kent State and Miami University) program focused on Environmental Aquatic Resource Sensing (EARS). The theme of EARS is training of doctoral students in environmental sensing, focused on freshwater resources, accentuated with business experiences, to develop professionals equipped for diverse careers. This program started in July 2009 and runs for five years. Freshwater resources are critical for global function and human survival representing < 2% of Earth's surface; this provides a glimpse into their vulnerability and demonstrates the need to understand them. Threats to aquatic systems are diverse; understanding these changes requires new tactics and technologies. In response, there is increasing use of automated sensors to collect environmental data creating a new need for training of environmental scientists. Melding of business, materials science, aquatic science, and environmental sensors is the primary goal of EARS. EARS uses a model emphasizing concentrated courses coupled with hands-on experiences to accomplish the main educational goals: environmental research education based on hypothesis testing and exposure of students to sensor development and business principles. To foster community development, cohorts will participate in multi-disciplinary workgroups.

Participating Science Departments include:

- *Biological Sciences- Kent State
- *Chemistry -Kent State and Miami
- *Geology-Kent State and Miami
- *Zoology-Miami
- *Chemical Physics-Kent State
- *Geography-Kent State and Miami
- *Microbiology-Miami

Latest News and Accomplishments

PRESENTATIONS

Hicks, S.E.*, Yang, Y.C. & Yang D.K. (2009, July). Polarization Freezing by Polymer Network in Nematic Liquid Crystals. Poster Presentation given at the 2009 Polymer and Chemical Engineering Innovation Northeast Ohio, Case Western Reserve University, Cleveland, OH.

Hicks, S.E.*, Yang, Y.C. & Yang D.K. (2009, June). Polarization Freezing by Polymer Network in Nematic Liquid Crystals. Poster Presentation given at the Liquid Crystals Gordon Research Conference, Colby-Sawyer College, New London, NH.

Johnson, L.T., T.V. Royer, L.G. Leff, J.M. Edgerton*, A.M. Baxter, M.P. Brennan & Oviedo-Vargas D.M. (2009, August). The influence of dissolved organic matter on denitrifier community composition and denitrification rates in an agricultural headwater stream. Poster presentation at Ecological Society of America annual meeting, Albuquerque, NM.

Mack, J.S.*, Williamson, C.E., Fisher, J. M., & Olson. M.H. (2009, October). The importance of fine-scale temporal monitoring in

alpine lakes: An example of transparency from the Canadian Rockies, Lake Oesa, British Columbia, Canada, Poster presenta-



IGERT student presentations-2009 to present

tion at Global Lake Ecological Observatory Network Meeting. Boulder Junction, WI.

Rose, K.C.*, Williamson, C.E., Saros, J.E., & Kissman, C.E.H. (2010, May).

What can dissolved absorbance tell us about lake ecology? Oral presentation at Global Lake Ecological Observatory Network Torres, Brazil.

Rose, K.C.*, Williamson, C.E., Saros, J.E., & C. Kissman. (2009, October). Indicators of Allochthony in High Mountain Lakes. Poster presentation at Global Lake Ecological Observatory Network Meeting. Boulder Junction, WI.

Scott, S.E.*, Mercado, G., Batt, R. & Vanni, M. J. (2009, October). Reservoir Metabolism: Response to Storm Events. Poster presentation at Global Lakes Ecological Observatory Network Meeting, Boulder Junction, WI.

Sarah Hicks, Laura Leff, and Qi-Huo Wei were panelists at a Graduate Student Senate event (April 2010) on "Interdisciplinary research in the sciences.

Laura Leff was a panelist an event on the experimental college at Kent State (April 2010) on Interdisciplinary teaching.