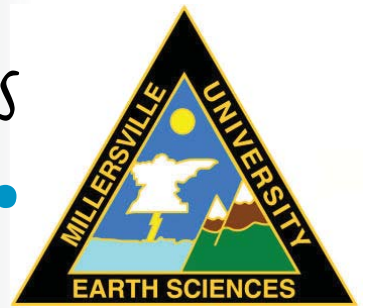


SPRING 2010

DEPARTMENT OF EARTH SCIENCES newsletter



PROVIDING A LEARNING EXPERIENCE IN THE EARTH SCIENCES THAT IS SECOND TO NONE

DES Welcomes Geophysicist Researchers Immerse in Virtual World

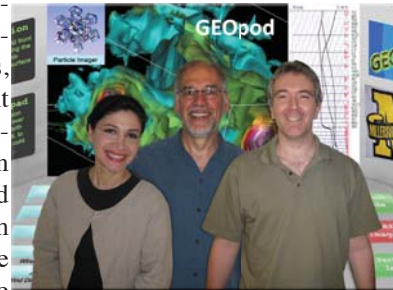


Dr. Sam Earman is the newest member of the Department of Earth Sciences, entering in August 2009 as a tenure-track Assistant Professor of Geology. Dr. Earman received his BA degree from Macalaster College with majors in Geology, Environmental Studies, and Anthropology; his MS degree in Water Resources Management from the University of Nevada, Las Vegas; and his PhD in Earth and Environmental Science with dissertation in Hydrology from the New Mexico Institute of Mining and Technology.

Between his MS and PhD degrees, he worked as a Staff Hydrologist for Desert Research Institute in Las Vegas, Nevada. After receiving his PhD, he worked at the Desert Research Institute's Reno, Nevada office, starting as a Post-Doctoral Research Associate, then as an Assistant Research Professor. He has taught classes at University of Nevada, Las Vegas, New Mexico Institute of Mining and Technology, and University of Nevada, Reno. Dr. Earman's current research interests include potential impacts of climate change on hydrologic systems, and groundwater recharge and movement through mountainous terrain. He uses natural chemical and isotopic tracers and geophysical techniques to help understand water movement and the geologic factors that affect it. He is currently leading a research project investigating groundwater recharge in the Sierra Nevada in California, and participating in a project examining incorporation of climate-change-related uncertainty into flood risk assessment and flood control structure planning. His past research experience includes studying water quality impacts from waste rock at gold mining operations, investigating the source of nitrate responsible for wild horse deaths in central Nevada, determining the portion of groundwater recharge derived from snowmelt at sites in the southwestern US, and modeling potential migration of radionuclides from underground nuclear detonation sites around the US. Dr. Earman will be the instructor of record for courses in groundwater geology, geophysics, geodynamics, and engineering geophysics. He replaces the position vacated by the recently retired Dr. Ramana.

Imagine being able to fly inside weather fronts and jet streams; visualizing the atmosphere in ways that are not currently available, and in the process, learn things that would not have been apparent using conventional learning paradigms. Three Millersville University of Pennsylvania researchers set out with the goal to develop a virtual experience that will allow meteorology students to go 'inside' the map and explore the weather features using a guided instruction approach.

Drs. Gary Zoppetti, computer science and Sepideh Yalda and Richard Clark, both from earth sciences, recently received a \$350,000 grant from the National Science Foundation Division of Information and Intelligent Systems-Advanced Learning Technologies Program (NSF-IIS-ALT) to develop a module that will provide a student with the ability to explore real-time data interactively at the controls of their personal virtual platform. The project is called "Geosciences Probe of Discovery."



"Working with a team of undergraduate students, we will collaborate on the development of software that implements an interactive, intuitive interface called the "GEOpod," explained Clark. "The GEOpod will serve as the control interface that will allow students to probe a 3 D immersion world of authentic geophysical data and use virtual devices to collect data and record observations, while guided by an instructional approach that can be customized for individual learners, added Zoppetti."

The researchers envision that this will lead to enhanced learning and discovery by allowing students to become part of the exploration process. This technology has applications for other fields as well. An example, according to Yalda, "might be navigating around a 3-D rendering of the human brain, or flying deep below the surface of the Earth exploring tectonic plates."

The GEOpod team plans to build and release successively more sophisticated and visually enticing beta-versions of the GEOpod, culminating with the global release of a plug-in that can be installed with an existing open-source application called the Integrated Data Viewer (IDV), developed by software engineers at the Unidata Program Center in Boulder, Colo. IDV is currently being used for 2-D and 3-D visualization of the atmosphere by thousands of students at the 100-plus U.S. universities that offer programs in atmospheric and related sciences, and is making inroads at universities and operational meteorology centers throughout the world.

The Department of Earth Sciences received a scholarship challenge: In November, anonymous donors initiated the *Cirrus Scholarship in Atmospheric Science*. When fully endowed, the scholarship will be awarded to incoming freshmen majoring in meteorology. In establishing the fund, the donors also offered a challenge: a \$1 for \$1 match to all contributions to the endowment up to \$30,000. Until the endowment reaches the required minimum of \$25,000, the donors will provide \$1,000 annually so the scholarship can be awarded beginning in fall 2010.

Support the Challenge! Give on-line at <http://www.millersville.edu/services/development/givingforms/gift.php>. Select "Other" as the designation and in the block provided type *Cirrus Scholarship in Atmospheric Science*. You may also send your gift, payable to Millersville University Foundation to Millersville University, PO Box 1002, Millersville PA 17551-0302. Write Cirrus Scholarship in the memo section of your check.

The Cirrus Scholarship
in
Atmospheric Science
"Achieving the high étage"

Earth Sciences Students: carrying on a tradition of excellence

Earth Sciences students continue to be recognized for their high achievements on national, regional, and local levels

Honors and Awards



Alex Davies has been awarded the Bhanwar Lal Bahethi Scholarship. Alex is a double major in meteorology and ocean sciences and coastal studies. He is interested in tropical meteorology, coastal physical oceanography, air-sea interaction, and climate change.



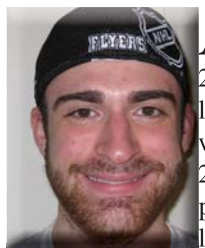
Mack Jones has been awarded The Werner A. Baum Endowed Undergraduate Scholarship. Mack's interest is in space weather. He aspires to pursue graduate studies in space science concentrating on space weather and the study of the relationship between the upper and lower atmosphere.



Shawn Gray prevailed over a field of 1000+ students from meteorology programs across the U.S. to win the WxChallenge National Collegiate Forecasting Tournament. Congratulations Shawn!



Justin Gilchrist (ocean sciences and meteorology) is participating in the NASA Undergraduate Student Research Program this spring, working with NASA scientist at Wallop's Island on hyperspectral radiometry.



Adam Gonsiewski, is a recipient of the 2009 NOAA Ernest Hollings Scholarship. He will spend his summer 2010 internship compiling and analyzing lightning data looking for temporal and spatial variability. Adam will be at the Mt. Holly, NJ WFO.

The Department of Earth Sciences emphasizes undergraduate research as a means of fostering maturity, independence, and creativity, and enhancing problem solving ability and skills. We are proud to spotlight a few of the current students involved in research activities.



Phil Bergmaier spent his summer at the NOAA National Climatic Data Center in Asheville, NC working to facilitate tropical cyclone analysis of Hurricane Satellite (HURSAT) imagery with Google Earth. This capability is now freely available.

Samantha McGraw presented a poster on her research on how municipalities can be more effective in implementing climate action plans. This research was conducted while Sam was an intern at the Colorado State University Center for Multi-scale Modeling of Atmospheric Processes.



Nikole Rutters, Courtney Robbins, and John Dougherty have been involved in a "Green Roof" demonstration project investigating differences in the volume



of storm water runoff, nitrates, and atmospheric fluxes before and after a vegetated roof application. Their results were presented at a Geological Society of America conference and a conference on Weather, Climate, and the New Energy Economy. Increasingly, students are working together on transdisciplinary research projects.



Erica Dolinar wants to know if reduced vehicle miles driven affects a decrease in pollutants. Her research investigated the meteorological conditions and air quality across the U.S. and in major cities in 2008 and 2007. Even with 79 billion fewer miles driven in 2008, her results, which were presented at the AMS meeting in Atlanta, GA, indicated no discernable reduction in pollutants because weather patterns completely overwhelmed the air quality.



Patrick Selmer and Matt Potter presented at the AMS Student Conference on their investigation of a prolonged sleet event in Feb 2007 due to a persistent cold pool and LLJ.



ROCK SOLID PREPARATION

Millersville University prepares geology majors to succeed in the workforce. One line of evidence is our alumni success in passing nationally administered exams for the professional geologist license. To become certified as a professional geologist, geologists must gain five years experience in the field and pass two required exams administered by the National Association of State Boards of Geology. The four hour Fundamentals of Geology Examination is the first of these exams established to assess the knowledge and skills typically learned in an undergraduate geology program. Millersville University geology graduates over the last five years have passed the Fundamentals of Geology Examination at a rate of 80% by far exceeding the national average of 58%. In nearly all content domains of the exam, the Millersville geology alumni exceeded the national average, in some cases by more than 10 percentage points.

CLUB ACTIVITIES

The Department hosts four clubs: The Geology Club, Ocean Sciences Club, the MU Student Chapter of the American Meteorological Society, and the Student Chapter of the National Science Teachers Association. Each club is extremely active; holding fundraisers, trips to conferences, social events, speaker series, and community activities. This year the Geology Club will make its annual excursion to the Adirondack Mountains and Niagara Falls, NY. The Ocean Sciences Club spent spring break cleaning up the beaches along Chincoteague Bay, the AMS Chapter is about to host its 3rd Annual Public Weather Awareness Day in Pucillo Gym, and the NSTA Chapter is participating in the Annual Conference of the NSTA in Philadelphia. Find out more at: www.millersville.edu/esci/