



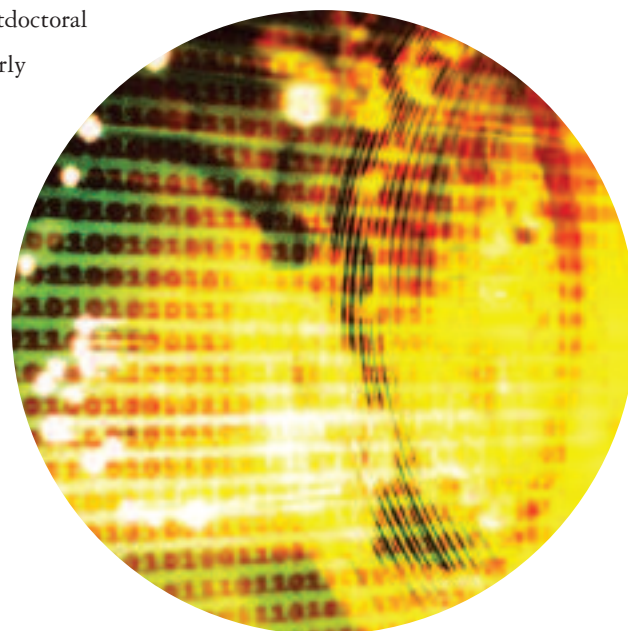
Message from the Physics Chair:

If you do not recall my name, it does not mean you have been gone too long. I started September 1 of this year as Chair and Professor of Physics, taking over from Dr. Gust Bambikidis. Dr. B. has served the department well, and I hope I can do at least as much.

I come to WSU after nine years as a member of the faculty at Worcester Polytechnic Institute, Massachusetts. I was educated in England, Canada, and the U.S.A. and did postdoctoral research in Germany. My research interest is in mathematical physics, particularly applied to the field of semiconductor nanostructures and acoustics.

I look forward to getting to know many of you. Should you be in the area, please drop by the department. This newsletter from the college is a great way for us to not only inform you of what is going on here but also for us to broadcast alumni news. Please do write to us!

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Physics Department Hosts an NSF/DoD Research Experience for Undergraduates Program

The Physics Department hosted a 10-week long summer Research Experience for Undergraduates (REU) program that provided opportunities for 11 undergraduates from around the nation to participate in ongoing research at Wright State University, the Engineering Physics Department at the Air Force Institute of Technology, and the Air Force Research Laboratory. Each student was mentored by a faculty member or research scientist on a project that focused on experimental or computational aspects of basic and applied research in atomic, molecular and optical physics, chemical physics, plasma physics, solid state physics, materials science, and biological physics. At the end of the summer, each student presented a poster highlighting the research accomplished during the summer. A photo, list of students, research mentors, and poster titles are shown to the right. The program also included a series of workshops and seminars that complemented the research projects and allowed students to explore the different fields of research and discuss the educational and career opportunities in the physical sciences. Many activities were coordinated with a similar program that was hosted by the Engineering Physics Department at the Air Force Institute of Technology and funded by the Directed Energy Professionals Society. Each program was intended for undergraduates considering a career in science or engineering. Students in the WSU program were granted stipends, housing in a WSU dormitory, and assistance with travel and food expenses. This REU site was supported by a grant from the National Science Foundation in collaboration with the Department of Defense and will continue for the next two summers. For more details about this program, feel free to contact Doug Petkie at doug.petkie@wright.edu or (937) 775-3124, or visit the departmental Web site.



From left to right, starting with Name of Student (Home Institution), Research Mentor/s (Affiliation), Title of Poster.)

Front Row: **Ashley M. Jones** (University of California at Santa Cruz), Douglas T. Petkie (Wright State University), Brian J. Drouin (Jet Propulsion Laboratory), *Analysis of v_9 , v_7 , v_6 , and v_8 Rotational Spectrum of $H^{15}NO_3$* ; **Audrey Sederberg** (Harvey Mudd College), Glen Perram, and Carl Druffner (AFIT Department of Engineering Physics), *Optical Diagnostics for Monitoring MOCVD Deposition of Super-Conducting $YBa_2Cu_3O_{7-x}$ Films*; **Adam Dally** (University of Minnesota), Won B. Roh, Capt. Brent Grime, and 2Lt. Nathan Terry (AFIT, Department of Engineering Physics), *Stimulated Raman Scattering in a Multi-mode Phosphor Doped Fiber*; **Mark Cross** (Wright State University) and Gregory Kozlowski (Wright State University), *The Future of "Small" Nanoparticles (Solution Phase Method)*.

Middle Row: **Angela R. Blissett** (University of Wisconsin-Madison) and Brent Foy (Wright State University), *Stochastic Simulation of a Substrate-Enzyme Reaction*; **Tara White** (Fort Hays State University), Won B. Roh, Capt. Brent Grime, and 2Lt. Nathan Terry (AFIT Department of Engineering Physics), *Properties of an SBS Beam Produced in a Long Fiber by a CW Nd:YAG Laser*; **Rachel Kirby** (Scripps College) and Steven F. Adams (ARFL/PRPE), *Energy Density Analysis of a Commercial Pulse Capacitor*.

Back Row: **Scott Little** (Taylor University) and Gary Farlow (Wright State University), *Computer Interfacing the Van Der Graff Generator*; **Eli Visbal** (Carnegie Mellon University) and John Ferguson (AFRL/MLBP), *Time of Flight Mobility Measurement on Conducting Polymers*; **John Vickers** (University of Arkansas), Gregory Kozlowski (Wright State University), R. Biggers, J. Jones, R. Kerns, and T. Peterson (Air Force Research Laboratories), *Epitaxial Growth of CeO_2 Buffer Layer on Textured Nickel Substrate*; **Joshua Rouse** (Anderson University) and Jerry D. Clark (Wright State University), *Low Cost Electroreflectance for High Band Gap Semiconductors*



Sarah Tebbens and son Nicholas on Mount Washington, New Hampshire

New Faculty Profile: Sarah Tebbens

Dr. Tebbens joined the WSU Physics faculty in September 2004. She received her undergraduate education at Vassar College in Poughkeepsie, New York. She went on to earn two master's degrees (1989, 1991) and a Ph.D. (1994) in geophysics from Columbia University, New York. She was a member of the faculty at the University of South Florida (USF), College of Marine Science in St. Petersburg, Florida from 1994 through 2004. At USF she earned awards for her research and for excellence in teaching and mentorship at the doctoral level. She moved to the Dayton area in the summer of 2004, and is very happy to be further from the many recent hurricanes. She is currently teaching an introductory physics course (PHY 111) and is moving her research program to Wright State.

Her nonlinear research focuses on determining the scaling laws that describe forest fire areas, seamount volumes, earthquake magnitudes, fault length, fault offset, and other geophysical systems related to natural hazards. She develops simple cellular automata models to understand



the geophysical processes that create the observed distributions. Ongoing research funded by NASA involves analysis of high-resolution LIDAR data to determine and quantify the pattern of shoreline change through time. Work with students has identified a nonlinear relationship between beach width and the annual amount of dune erosion. Her geophysical data analysis has been aimed at understanding the tectonic evolution of the Chile ridge and the tectonic evolution of the major mid-ocean triple junction in the southeast Pacific. These tectonic studies identify the processes involved in plate tectonic evolution over the past 30 million years. Student participation is an integral aspect of the data collection, data analysis, data interpretation, and journal publication.

Dr. Tebbens is married with two children, Nicholas (9 years old) and Kate (7 years old). Her hobbies include being a soccer mom, Girl Scout leader, hiker, triathlete, and active competitor in Tae Kwon Do. Her favorite kitchen tool is the cuisinart.

Department News

In the last year, we hired two other new faculty in the area of Geophysics and Environmental Sciences (**Drs. Allen Hunt**—who was already featured in last year's newsletter—and **Sarah Tebbens**); Dr. Hunt holds a joint appointment with the Department of Geological Sciences. This allows us to participate even more rigorously in the interdisciplinary Environmental Sciences Ph.D. program.

In addition to the teaching our faculty does, many are also involved in cutting-edge research and are being internationally recognized. **Dr. Allen Hunt**, in the past year alone, has given numerous invited talks at the University of Illinois, Urbana-Champaign, and the Canadian Geophysical Union conference in Montreal and will be giving more invited talks at the Geological Society of America National Meeting in Denver (on hydrogeology), Soil Science Society of America National Meeting in Seattle (on soil—what else?!), and the American Geophysical Union Fall Meeting in San Francisco (on El Niño).

Dr. David Look, a research faculty, had his paper on a new light emitting material selected in August/September as the dominant

emerging research front in physics by the prestigious publication Thompson ISI (Citation Index). He has also been invited to speak at five of seven national and international conferences after hosting two of them in 1999 and 2002. The material, zinc oxide, can be used for DVDs, laser printers, and solid-state devices.

This past summer, we hosted a 10-week long summer Research Experience for Undergraduates program that provided opportunities for 11 undergraduates from around the nation to participate in ongoing research. This program was led by **Dr. Doug Petkie**.

Being new to Ohio, I quickly found out that much here is centered around festivals. In the Physics Department, we have our own fall festival in the form of a chili cook-off late in October. We also choose this moment to reward some of our meritorious undergraduates. This year, we are awarding the Merrill Andrews Memorial Scholarship to **Amir Motamedi**, the Campus Scholarship Campaign scholarship to **Mark Cross**, and the book prize to the top student in the PHY 240 series to **Omar Abousoud**.

On an international note, 2005 has been proclaimed the International Year of Physics by the United Nations. It has been timed to coincide with the centennial celebration of **Albert Einstein's** "miraculous year," in 1905 when he published three seminal papers (on light quanta, Brownian motion—for which he was awarded the Nobel Prize in 1922—and the special theory of relativity). We are planning a local celebration tentatively in spring 2005 (updates will be posted on our Web site at <http://www.wright.edu/academics/physics>).

