



# The Printed *Physics* *Astronomy* *Geology*

A Newsletter of the IUSB  
Department of Physics & Astronomy

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## ***First Class of CTS Scholars Named***

The first recipients of the CTS Scholarships in Physics at IUSB were named in June 2004. **Rachel McKenzie** and **Tim Salvador**, 2004 graduates of Concord H.S. and South Bend Clay H.S., respectively, were named as recipients of CTS Freshman Scholarships, and **Sabrina Huggins**, a 2003 graduate of Penn H.S., now an IUSB sophomore, was selected to receive a CTS Continuing Student Scholarship. The CTS Freshman Scholarships carry stipends of \$1000, while the Continuing Student Scholarship carries an award of \$500.

The CTS Scholarships were made possible through the generosity of the CTS Foundation, a charitable arm of CTS Corporation of Elkhart.

We express once again our gratitude to the CTS Foundation for endowing these scholarships, and we congratulate Rachel, Tim, and Sabrina on their awards.

## ***More Scholarship Opportunities...***

Remember, junior and senior physics majors are eligible for the Gerkin Scholarships and the Dean's Scholarship in the Natural Sciences, as well as the CTS Continuing Student scholarship. Watch for application deadlines in February, 2005.

## ***Dr. Scott's Paper Makes a Splash***

A paper published by IUSB's Henry Scott, along with collaborators from the Carnegie Institution, Harvard U. and Lawrence Livermore Natl. Lab., has generated considerable media attention. The paper, "Generation of Methane in the Earth's Mantle: In situ High P-T Measurements of Carbonate Reduction," was published the week of Sept. 13 in the *Proceedings of the National Academy of Sciences*. It reports the formation of methane, the principal constituent of natural gas, from common materials when subjected to pressures and temperatures found in Earth's mantle. Among the news outlets that have picked up on the story are the *New York Times*, the *San Francisco Chronicle*, United Press International, and Nature News Online. Go to [http://mypage.iusb.edu/~hpscott/Research/PNAS\\_PR](http://mypage.iusb.edu/~hpscott/Research/PNAS_PR) for links to the news stories.

## ***3/2 Agreements Signed with PUC, IPFW***

Formal agreements creating the 3/2 physics+engineering dual-degree programs with the Calumet and Ft. Wayne campuses of Purdue have now been signed. Under these agreements students will be able, after at least three years of study at IUSB and at least two years of study at the Purdue campus, to graduate with both a BS in physics from IU and a BS in engineering from Purdue. Both the Calumet and Ft. Wayne campuses of Purdue offer ABET-accredited degree programs in electrical and mechanical engineering, and are working on accreditation for degrees in computer engineering. For more information about these dual-degree programs, and for plans of study that show how the two degrees can be earned in five years, contact Dr. Monika Lynker, the principal faculty advisor for physics majors.

## ***Brenda Borntreger Named Lecturer***

Ms. Brenda Borntreger joined the resident faculty of the department in August as a Lecturer in Earth Science. Brenda has taught geology at IUSB for 13 years, first as an adjunct lecturer and since 2001 as a full-time visiting lecturer. The College of Liberal Arts and Sciences was able to create a permanent lectureship in earth science last winter, and Brenda was hired into the position after a regional search.

Brenda has the responsibility of creating a new course for elementary education majors, GEOL T106 *Earth and Space Science for Elementary Teachers*. GEOL T106 will have the same inquiry-based structure as the companion course, PHYS/CHEM T105 *Physical Science for Elementary Teachers*, developed jointly and offered alternately with the Department of Chemistry.

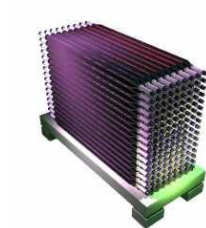
## Research Opportunities Abound

IUSB students interested in getting involved in physics research have lots of options...



Prof. Ilan Levine leads the IUSB group that is part of the PICASSO dark matter search. The IUSB group has been given the responsibility of constructing a large number of transducer/preamp units, utilizing a design developed here, in the next few months. These devices will be part of the dark matter detectors that will be deployed in the mine in Ontario that houses the Sudbury Neutrino Observatory (SNO). The PICASSO experiment will continue to offer opportunities for involvement by IUSB students for the foreseeable future. Contact Dr. Levine for more information about PICASSO and its research opportunities.

Do you like working in high-pressure environments? IUSB is part of COMPRES (Consortium for Materials Properties Research in Earth Sciences). The IUSB group is particularly interested in what happens to Earth materials when they are subjected to the extreme pressures and temperatures of the Earth's interior. Samples are squeezed between gem-quality diamonds, and analyses are conducted using the synchrotron x-ray source at Argonne National Lab. Contact Prof. Henry Scott if you'd like to experience this sort of work at a National Lab.



The Modular Neutron Array (MoNA) is now in use in experiments at the National Superconducting Cyclotron Laboratory (NSCL) at Michigan State University. MoNA was constructed by a consortium of MSU, Florida State University, and six primarily undergraduate institutions, including IUSB. Scott Marley (BS '04) and Jim Evans, now a senior physics major, assembled and tested one of the nine layers of MoNA here at IUSB in the summer of 2002, under the supervision of Prof. Jerry Hinnefeld. The next MoNA experiment is scheduled for mid-October. Contact Dr. Hinnefeld if you are interested in participating in this or future experiments with MoNA at MSU.



The Joint Institute for Nuclear Astrophysics (JINA) is a NSF Physics Frontier Center centered at the University of Notre Dame. Notre Dame's principal partners in this grant are MSU and the University of Chicago. A number of primarily undergraduate institutions, including IUSB, have signed on as "participating colleges" in JINA, which means they intend to participate in JINA's research and outreach activities. One upcoming JINA initiative is the construction of a recoil mass spectrometer for the KN Van de Graaff accelerator at Notre Dame. Undergraduate students will be involved in the assembly of this apparatus, beginning probably in January of 2005. Participation in the construction phase will position students to take part in nuclear astrophysics research at Notre Dame using the mass spectrometer once it is operational. Contact Prof. Hinnefeld for more information about this or other nuclear physics opportunities at Notre Dame.

## Spring 2005 Courses for Physics Majors

Upper-level physics courses to be offered in the Spring 2005 semester include PHYS P303 - *Digital Electronics*, PHYS P324 - *Physics 4*, PHYS P334 - *Fundamentals of Optics*, and PHYS P453 *Introduction to Quantum Mechanics*. PHYS P324 and PHYS P453, which are both required for the professional track of the BS in physics, are offered on a two-year cycle, so be sure to sign up for these courses in the spring if you intend to graduate with a physics major (professional track) before May 2007 (and if you have satisfied the prerequisite, PHYS P323).



## World Year of Physics

The International Union of Pure and Applied Physics (IUPAP) has declared the year 2005 as the World Year of Physics, in celebration of the 100th anniversary of Albert Einstein's "miraculous year." In 1905 Einstein published three important papers, on special relativity, brownian motion, and the photoelectric effect. The goal of WYP 2005 is to raise the worldwide awareness of physics and physical science. If you have ideas on how the IUSB Dept. of Physics and Astronomy should celebrate WYP 2005, please send them to Jerry Hinnefeld (jhinnefe@iusb.edu). You can learn more about WYP 2005 at <http://www.physics2005.org>.

## Contact us!

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