

Physics Newsletter

Vol. III

Winter 1997-98



$$E=mc^2$$



CREIGHTON UNIVERSITY

Response to Physics Newsletters Is Encouraging

This is the third annual physics newsletter for the Winter of 1997-98 and again we rely for assistance on the skills of **Bob Guthrie** in the Public Relations Office for newsletter design and layout.

We have received encouraging responses to Newsletters one and two and continue to look for input from our graduates, who are a major part of our department family. In particular we would like help in locating **Dr. Hiroji Noguchi** (B.S. '82, M.S. '83, and M.D. '87). He seems to have left the Los Angeles area where he was a resident in surgery and may have returned to Japan.

The Family Grows: A year ago, we had a total of 207 B.S. graduates. On May 17, 1997, these were joined by B.S. graduates **Andrea L. Schiemann** of Plattsmouth, NE, **Brian D. Struby** of Coppell, TX, **Michael A. Torres** of El Paso, TX, and **Timothy E. Volcheck** of Omaha, NE.

Andrea is in the physics Ph.D. program at the University of Wisconsin-Madison. **Brian** is applying to Medical School and is doing osteoporosis research at St. Joseph's Hospital in Omaha. **Michael** is a physics M.S. student and TA at Creighton. **Tim** plans to pursue a career in medicine or optometry.

New Master's Graduates: Also a year ago, we had a total of 81 Master's graduates, of whom 27 had previously received B.S. degrees from Creighton. Additional M.S. grads this past year were **Peter R. Colarco** from Omaha, NE, **Paul J. Teeter** from Coronado, CA, **Tracey E. Tessier**

from Bellevue, NE, **Kendall E. Bond**, from East Wenatchee, WA, **Jeffrey D. McClure** from Northglenn, CO, and **John E. Stahl** from Winnebago, IL.

Peter is a Ph.D. student in atmospheric science at the University of Colorado in Boulder. **Paul** is in the Physics Ph.D. Program at the University of California-Irvine, but

is also considering graduate work in English. **Tracey** is in the Air Force at Albuquerque, NM. **Kendall** is in the astrophysics program at the the University of Arizona - Flagstaff. **Jeff** is a High School science and math teacher in French Gulch, CA. **John** is a data analyst with Mutual Indemnity in Omaha.

Michael Anderson Aboard Shuttle

Physics Alum on Space Flight

Two recent news items involved Creighton physics M.S. graduate **Major Michael Anderson** and junior physics major **Jennifer Seby** (see pages 2 and 4).

Creighton's Astronaut: On January 22, 1998, Creighton Physics alumnus **Major Michael P. Anderson** was one of the

seven-member crew on the Space Shuttle Endeavor that was launched for a rendezvous with the Russian Mir Space Station. He was a mission specialist on the nine-day flight, monitoring shuttle instruments during launch and reentry and doing scientific experiments in orbit.

Major Anderson graduated from Creighton with an M.S. degree in physics on December 15,

1990 while he was stationed at Offutt Air Force Base. At Offutt, he piloted the Airborne Command Post (Looking Glass). He completed a Master's thesis with **Fr. McShane, S.J.**, entitled "Fractal Interpolation and Affine Transformations Applied to Syntactic Pattern Recognition". He is currently

stationed at the Lyndon B. Johnson Space Center in Houston, and is assigned to the NASA space shuttle program through 2001.

Present at the launch at Cape



Creighton alum Maj. Michael Anderson

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Physics Pupils See Alumnus Blast Off

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Canaveral in Florida were Physics faculty **Dr. Alan DeWeerd**, **Fr. Tom McShane**, and **Dr. Tom Zepf**, graduate TA's **Paul Nienkamp** and **Kevin Welsh** and junior physics majors **Alicia Dwyer** and **Jennifer Sebby**. The Creighton Society of Physics Students (Physics Club) hosted a launch party in the Reinert/ Alumni Memorial Library Union Pacific Room that included a live TV broadcast of the launch.

A visit to Creighton by **Major Anderson** is planned for later in the year. He took into space a telescope spectrometer from the Creighton Observatory and a Creighton pennant (draped over his locker) which will become part of Creighton memorabilia. The **Public Relations Office**, directed by **Steve Kline**, cooperated with **Fr. McShane** and the **Creighton Physics Club** in organizing Creighton's participation in this event.



Physics majors Jennifer Sebby (left) and Alicia Dwyer went to the Space Shuttle launch to see Creighton alum Michael Anderson blast off. Here they are seen in their atom trapping research.

Creighton Physics Department Recognized for Excellence

The *U.S. News and World Report* for several years has ranked Creighton highly among Midwestern Regional Universities. The 1998 Best Colleges Edition lists Creighton as #1 in this category. Specific recognition of the sciences was given when the departments of atmospheric sciences, biology, chemistry, and physics were invited to submit descriptive listings in the 1996 edition of *Peterson's Top Colleges for Science*.

Undergraduate Physics Research has been getting increased emphasis in the department. The Council of Undergraduate Research (CUR), based at the University of North Carolina in Asheville,

had an impressive listing of Creighton's activity in this area in the 3rd Edition of *Directory of Research in Physics/Astronomy at Primarily Undergraduate Institutions* (1994). The picture above shows junior physics majors **Jenni Sebby** (left) and **Alicia Dwyer** (right) in their laser cooling and atom trapping research.

Recognition for Dr. Zepf: At a Faculty Luncheon on Feb. 18, 1997, **Dr. Thomas H. Zepf** was recipient of the Dean's Award for Excellence in Teaching. As a department, we rejoice in this highly-deserved honor to our former Chairman of 22 years.



Alicia Dwyer captured the Endeavor launch in this photograph.

The *Physics Newsletter* is published periodically by Creighton University's Department of Physics. Editor is Clarence M. Wagener, S.J.

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News About Alums from Around the World

Arthur G. Bucknell (B.S. '67) visited the department early in January during a visit to his father, who died on January 25 in Omaha. Art is Superintendent of Maintenance at Ferro Corporation in Cleveland, OH. Ferro is a heavy industry manufacturer.

Timothy C. Ingoldsby (B.S. '69) visited in July. He is Director of New Products Development for the American Institute of Physics and lives in Shoreham, NY.

Dale A. Whittaker (B.S. '74) stopped in while visiting relatives in Council Bluffs, IA. He is a Reliability Engineer with Lucas Nova Sensor in Antioch, CA.

Paul A. Marquard (B.S. '79) sent an e-mail inquiry whether solutions to **Dr. Kennedy's** famous (infamous?) "Terrible 20" mechanics problems were available. Paul has been assigning these problems to his engineering students at Casper College in Casper, WY. **Fr. Clarence M. Wagener, S.J.** sent what he had with the warning to "take as is". Paul has an MS degree in E.E. ('82) from USC and an M.S. degree in physics ('86) from UNL at Lincoln, NE.

Kevin A. Ingoldsby (B.S. '80, M.S. '82) visited in September. He is a Launch Operations Engineer for Martin Marietta at Titusville, FL.

Mark E. Mildebrath (B.S. '81, M.S. '83) visited June 5, 1997. He works with optical coatings at Esseler of America, St. Petersburg, FL.

Dr. Nan Marie Jokerst (B.S. '82) is kept busy with her 18-month-old son Nathaniel and her teaching duties in the Dept. of Electrical Engineering at Georgia Institute of Technology in Atlanta. Her husband, **Dr. Martin A. Brooke**, who like Nan has a Ph.D. in E.E. from USC, is also on the E.E. faculty. His parents came from New Zealand to help with baby-sitting.

Dr. Brian J. Hopkins (M.S. '88) visited in December. He has

moved to Houston, TX where he works for CRC Evans Automatic Welding, as does **Shankar Rajagopalan** (M.S. '89). Brian has a Ph.D. in Physics from Texas Christian University at Fort Worth.

Dr. Dulip A. Welipitia (M.S. 1989) received a Ph.D. degree in physics from the University of Nebraska-Lincoln in 1997. He has a research staff position at Applied Magnetics in Santa Barbara, CA and lives at 403 Elwood Beach Drive, Goleta, CA 93117.

Dr. Sudhir S. Malhotra (M.S. '90) received a Ph.D. degree in physics in 1996 from the University of Nebraska-Lincoln. He is a member of the technical staff at HMT Technology Corporation in Fremont, CA.

Mrs. Susan Hoefler Coster (B.S. '91) wrote of her recent marriage. She is working at Raytheon in Dallas, TX. While at Texas Instruments (purchased by Raytheon) she was a member of the Defense group working with

Gallium Arsenide Semiconductor Technology, qualifying chips for satellite applications. She has MS degrees ('95) from the University of Oklahoma-Norman in Physics and in Industrial Engineering and Management.

Patrick N. A'Hearn (B.S. '92) stopped by while visiting relatives in Nebraska City and taking a break from ocean research on an Arctic Ocean ice floe. He received an M.S. degree ('96) in oceanography from the University of Washington in Seattle. Besides his North Pole address, he has a residence at 6755 27th Avenue NW, Seattle, WA 98117.

Capt. Michael W. Dolezal (M.S. '95) visited the department recently and presented a special seminar on "The Spectroscopy of Diatomic Molecules". He is working toward the Ph.D. degree in physics at the Air Force Institute of Technology at Wright Air Force Base in Ohio.

Meetings Held to Consider Building, Curriculum Changes

For six months the department has been holding meetings with **Dr. Michael Cherney** as coordinator to deal with two related long-term issues: updating our entire physics program and remodeling the present Rigge Science Building. The first issue has priority since how the building is to be remodeled will depend on what the science departments located in the building plan to be doing ten years down the road.

Planning for our general program revision has been guided by Project Kaleidoscope (PKAL), based in Washington, DC, which does research on science teaching, including content, techniques, equipment, and facilities. Faculty have attended Project Kaleidoscope conferences held at Louisiana State University in Baton Rouge, LA (1996) and at the Uni-

versity of Nebraska at Lincoln (1997) and plan to attend the 1998 conference at Grinnell College in Grinnell, IA. Grinnell College is the alma mater of **Dr. Seger**, who is a member of the PKAL Faculty For the 21st Century. Project Kaleidoscope research has shown the importance of active student participation in the learning process.

Plans for the remodeling of the Rigge Building have reached the stage of making a selection of an architect for planning the project. Though we still think of the Rigge Building as the new science building, the fact is that the first classes there were offered in February, 1968,—thirty years ago,—and features such as plumbing show the familiar signs of creeping deterioration associated in humans

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B.S. Program Changes for Med Side

Many Creighton undergraduates plan careers in the health sciences. Few of these have chosen either our B.S. or our B.S. PHY program for their major, partly because of scheduling problems with pre-med prerequisites. The Creighton University Bulletin for 1997-99 includes a new special

track in our Bachelor of Science Program (B.S.) which is designed for such students. The new B.S. track, which appears in the catalogue as **Physics Major—Health Sciences Program**, will be specially suited for students considering fields like medical research and medical physics.

Curriculum, Building Changes Debated

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with incipient senility. It is anticipated that this remodeling might begin as early as 2000. One of the problems that needs to be faced is where to offer courses and where to store large equipment during the reconstruction process. This problem could be eliminated by constructing a new building in another location. Construction costs for a new building could be

comparable to those of remodeling the Rigge Building.

Search for New Faculty: The Dean of the College of Arts and Sciences, the **Reverend Michael Proterra, S.J.**, has approved a new tenure-track physics faculty position and also renewed a one-year faculty position. **Dr. Janet Seger** is coordinator of the search committees for these positions.

Junior Physics Major Moves in Nobel Circles with Dr. Phillips

Junior Physics major **Jennifer Sebby** has been moving in Nobel circles. This past summer the physics major from Clarion, Iowa, participated in the Summer Undergraduate Research Fellowship (SURF) at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD.

The area of her research was the Cold Atom Fountain Clock, a next generation atomic clock which uses the principles of laser cooling and trapping of atoms. Applications of a more precise atomic clock include greater security in message transmission and improvement of the



Dr. Phillips

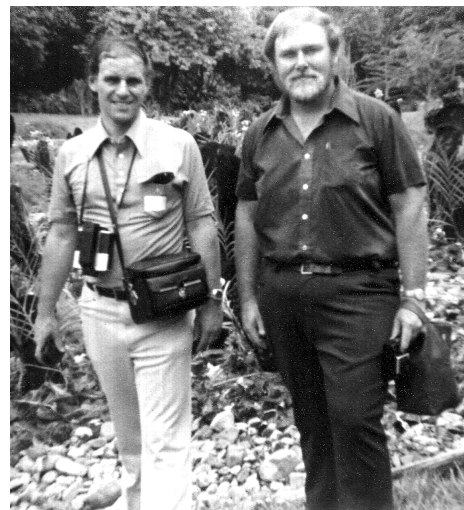
Global Positioning System. **Jenni's** specific contribution to the project

was the design and construction of the optical and electronic components of the laser launch beams.

During the current academic year, **Jenni** is continuing work in the Laser Physics Research Group at Creighton with graduate student **Matt Szymczak**, junior physics major **Alicia Dwyer**, **Dr. Alan DeWeerd**, and **Dr. Tom Zepf** on the construction of a Magneto-Optical Trap (MOT) for laser cooling and trapping of rubidium-85 atoms.

Jenni plans to return to NIST next summer and either continue working on the Fountain Clock or begin research on the Bose-Einstein condensate. Her future plans are to attend graduate school and pursue a career in atomic physics research.

Of particular interest is the fact that the director of **Jenni's** project at NIST, **Dr. William D. Phillips**, was awarded the 1997 Nobel Prize in Physics. The accompanying picture (taken by **Jenni**) shows **Dr. Phillips** at a party in **Jenni's** apartment.



Dr. Cipolla (left) and Fuchs in 1977.

Obituaries

Iwasaki, Fuchs Among Latest Deaths Known

In our Second Newsletter, we reported the deaths of our first two physics Masters Graduates, **Marie Savickas** (M.S. '70) who died 11/14/96 in Carnegie, PA and of **Alan J. Blotcky** (M.S. '71) who died 1/1/97 in Omaha, NE. An earlier but recent death was that of **Fumiaki Iwasaki** (B.S. '87 and M.S. '89) who died of cancer 4/7/94. He was doing graduate work in biophysics, we believe, at SUNY in Buffalo, N.Y.

The **Alumni News** announced the death in St. Louis, MO on 7/16/95 of another physics graduate, **Eugene B. Fuchs**, (B.S. '70). **Gene** received an M.S. degree in physics from St. Louis University. He taught physics and math and directed drama at Mehlville Senior High School in St. Louis.

The Physics Department gratefully acknowledges a \$10,000 gift left in **Gene's** will to the Department of Physics of Creighton University. The picture above, taken in June, 1977, shows **Gene** with **Dr. Sam Cipolla** at the AAPT Summer Meeting in San Juan, Puerto Rico.