



Physics Newsletter



CREIGHTON
UNIVERSITY

Vol. II

Winter 1996-97

Much News Amid the Swirling Snows of Winter

We were gratified by the favorable response to the first issue of the Physics Newsletter, dated Winter 1995-96. As of late November, the chilly winds and wisps of swirling snow are a reminder that Winter 1996-97 is fast approaching and that it is high time to get moving if the second newsletter, as intended, is to reach our graduates in Winter 1996-1997.

In this second issue, we plan to give a brief survey of the department of physics

during the past year; a report on our first two master's graduates, **Marie Savickas**, who died of cancer on November 14, 1996 and **Alan Blotcky**, who also died of cancer on Jan. 1, 1997; and finally, news we have received from you, our graduates dispersed over four of the seven continents—we have no graduates in Africa, Australia or Antarctica.

One of our objectives has been to keep our address lists complete and up-to-date.

If you move, please share with us your new address, phone number, and e-mail address. At the suggestion of **Paul Marquard** (BS '79 of Casper, WY who teaches physics at Casper College), we included available e-mail addresses in our June 4 mailing of current physics graduate addresses. Since none of our mailings were returned, we presume that our addresses were correct at that time. The only graduate who is "lost" is **Kazue Tackiguchi** (BS '86). Perhaps some of our Japanese grads can locate him. About four years ago, he dealt with foreign affairs at Wakayama City Hall.

The physics department can be contacted by mail, by FAX at (402) 280-2140 or by e-mail at cmw@creighton.edu (Fr. Wagener, alumni contact).

Physics Web Page. Some of you on your own have found the Physics Web Page at the address: <http://www.creighton.edu/Physics>. This site was created and is maintained by **Mike Lopez**, a junior physics major from El Toro, CA. In addition to general information about the physics department, programs of study and course descriptions, the web site includes the *Physics Newsletter*.



Members of current faculty, shown at Creighton's Iowa Retreat Center: (from left) Cherney, Cipolla, Seger, Fr. McShane, DeWeerd, Kennedy, Fr. Wagener, and Zepf.

What's New in the Department?

The faculty and staff are only slightly changed from last year. Continuing full-time faculty are: **Sam Cipolla**, **Mike Cherney**, **Bob Kennedy** (Chairman), **Tom McShane, S.J.**, **Janet Seger**, and **Tom Zepf**. A new full-time faculty member is **Dr. Alan J. DeWeerd**—he has a Ph.D. from the University of Wisconsin-Madison in theoretical nuclear physics and, in the fall semester, taught mechanics and a section of general physics.

Continuing part-time faculty are: **Katherine Becker** (Natural Science), **Dave Krieglger** (Astronomy), **Dave Stuva** (General Physics), and **Clancy Wagener, S.J.** (semi-retired aide to the chairman). A new part-time faculty member is **Mrs. Nancy E. Blazek**, who took over the new Medical

Physics degree program when **Dr. Semih Kumru** accepted an attractive position as a health physicist at Brooks Air Force Base in San Antonio, TX. **Baz Lazure** stops in frequently and keeps our audio-visual arsenal polished and functioning. **Dr. Jan Chrin**, stationed at Berkeley, CA, continues as a Research Associate working with the Creighton University Relativistic Heavy-Ion Physics Group. **Katherine Becker** plans to retire from teaching Natural Science after the spring semester-- in 81 days, she says, as of 2/11/97.

Continuing full-time staff are **Bonnie Kelley** (Departmental Secretary), **Bob Stoffel** (Laboratory Manager), and **Brad Walters** (Research Technician).

Grant Received for Heavy-Ion Research

Good news came with the announcement that a research proposal renewal prepared by the Creighton University Relativistic Heavy-Ion Physics Group has been funded by the Department of Energy: Office of Energy Research (OER). The grant for *A Study of Ultra-Relativistic Heavy-Ion Collisions* is for \$430,000 and runs from 7/1/96 through 7/1/99. Personnel involved are **Michael Cherney** (Program Director), **Jan Chrin**, **Alan DeWeerd**, **Tom McShane**, and **Janet Seger**. The grant is a continuation of a previous grant of \$300,000 for the period 7/1/93 through 7/1/96 and deals with the monitoring and control of the STAR detector and simulation of physics interactions.

The STAR detector is one of two main

(Continued on Page 2)

Physics Graduates Write to Say: They Work . . .

We receive regular communications from our physics graduates. What follows is a sampling arranged in chronological order about graduates with whom we have had such contacts.

Alfred L. Vampola, BS '56 (MTH and PHY): Al has a Ph.D. in physics from St. Louis University. From 1962 to his retirement in 1990, he was at the Space Science Laboratory of The Aerospace Corporation in Los Angeles, with the title of Senior Scientist from 1978 to 1990. His work involved experimental studies of magnetospheric particle morphology, wave-particle interactions, and environmental effects on satellites. He has had 21 recent publications (1987 to 1992). From 1984 to 1988 and again after 1990 he was an Associate Editor of the *Journal of Spacecraft and Rockets*. He now works as a space consultant.

Robert J. Whitaker, BS '58: Bob has a M.S. degree in physics from St. Louis University and a Ph.D. in science education from the University of Oklahoma. While teaching general physics at Creighton in 1959-60, he spent a lot of time in the old library on the second floor of the Administration Building where his future wife Eleanor Mannlein happened to be employed. He teaches physics at Southwest Missouri State University in Springfield, Mo. He has had a steady stream of publications on the history of early scientific instruments.

Anna Mary Lyons Delaney, BS '62: Anna Mary was the first of our 30 female physics graduates. She worked at the Naval Ordnance Laboratory in Silver Spring, Md., and taught high school physics in Minneapolis before finding her niche as a trust officer at IDS Trust, also in Minneapolis. Her CPA associates are intrigued by her physics-based problem-solving approach to investment decisions. She is married to her general physics classmate **Jack Delaney** and lives in Plymouth, Minn.

Richard E. Keating, BS '63: Since graduation from Creighton, Dick has been an astronomer in the Time Service Division at the United States Naval Observatory in Washington, D.C. As a student, he renovated the solar and sidereal clocks that Father Rigge had installed in the Creighton Observatory. In October, 1971 he and Dr. Joseph C. Hafele of Washington University in St. Louis, Mo., carried four atomic clocks both east and west around the earth on commercial jet planes. Their results were consistent with Einstein's relativity predictions about moving clocks. They published two articles on predicted and observed results in *Science* for July 14, 1972, pp. 166-170.

Robert J. Curran, BS '64: Bob has a Ph.D. in physics from the University of Arizona. Currently he is visiting senior scientist at NASA Headquarters, through the California Institute of Technology's Jet Propulsion Laboratory, and also research scientist/scholar, Cooperative Institute for

Research in the Atmosphere, Colorado State University at Fort Collins. A NASA employee for 28 years at the Goddard Space Flight Center and at NASA Headquarters in Washington, D.C., he has broad experience with satellite and aircraft remote sensing. His research deals with atmospheric radiation, radiation energetics, and the role of clouds in the radiation budget of Earth. In 1989 he attended the 25th anniversary of his Creighton graduation with his wife Debbie, who has a law degree from the University of Maryland.

Morris B. Pongratz, BS '64: Morrie has a Ph.D in physics from the University of Maryland and has been active in space physics research with NASA. He was the Principal Investigator for NASA-sponsored CRRES (Combined Release Radiation Effects Satellite) experiments in 1991, and was Chief Scientist for the SDIO-sponsored BEAR experiment—a spaceflight test of a 1 MeV neutral particle

Cipolla, Zepf Continue Studies

Research in Atomic and Laser Physics

Sam Cipolla for many years has been using our 200-kV positive-ion accelerator for studies in inner-shell ionization from ion-atom collisions. With support from the Research Corporation and NSF he has acquired a new Si(Li) x-ray detector and a high-purity Ge detector for detecting gamma rays. His atomic collision research group is currently investigating M-shell ionization in heavy atoms struck by low energy protons. He has continued his collaboration with the University of Nebraska-Lincoln using their 350-kV accelerator to extend the range of his studies.

Tom Zepf has continued to develop the department facilities in lasers and quantum optics through financial support from the University and grants from the 3M Foundation and Control Data Corporation. In the fall of 1996 he formed the

Laser Physics Research Group to bring focus to research projects in the department relating to lasers. Participation is open to undergraduates, graduate students and faculty. For instance, several students are working with Dr. DeWeerd and Dr. Zepf on laser cooling and trapping of neutral rubidium-85 atoms. In another project, students are working with Dr. Zepf on the formation of superconducting thin films of yttrium barium copper oxide by laser ablation. Meetings provide a forum in which participants working on different projects can share ideas and information. Activities that are occurring or are planned include updates on work in progress, new project proposals, live demos and videos on laser fundamentals, and speakers on laser research and applications. So far about ten students are involved in the group.

Heavy-Ion Research Funded

(Continued from Page 1)

detectors being constructed for the RHIC (Relativistic Heavy Ion Collider) superconducting collider which is scheduled to begin operation in 1999 at Brookhaven National Laboratory on Long Island. The STAR detector has a diameter of more than 4 meters

and a length of 4 meters and has a weight of approximately 1,200 tons. Members of the Creighton group regularly attend collaboration meetings of institutions participating in the RHIC Project. Five students joined faculty members attending such a meeting at Berkeley in early January during the semester break.

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

Creighton University
Physics Department
2500 California Plaza
Omaha, NE 68178

. . . for NASA, Industry, Educational Institutions

beam accelerator. Daughter Karin graduated from Creighton in 1991 and son Dan as a physics major last May. With **Nan Jokerst, BS '82**, he is on the Creighton University College of Arts and Sciences external advisory board. He has been elected to five terms on the City Council of Los Alamos, N.M.

Jeanne Slaninger Hutchison, BS '64: Jeanne has a Ph.D. in mathematics from UCLA and is a long-time member of the math faculty at the University of Alabama-Birmingham. She was married to **Dr. Gerald Hutchison**, former math chairman at Creighton, who was also on the UAB faculty until his death from a brain tumor about 10 or more years ago. In 1996, she received a university-wide teaching award which a sizable accompanying check made specially appealing. The check paid for a delightful trip to Scotland, England, and a math conference in Prague, Czechoslovakia. She visited us on her 25th graduation anniversary in 1989.

David K. Bruening, BS '66: Dave has a Ph.D. in physics from St. Louis University. He received the first bachelor of science in physics degree issued by Creighton on Jan. 23, 1966. He is a nuclear technical training instructor at OPPD (Omaha Public Power District) in Fort Calhoun, Neb., and is president-elect of the Omaha Chapter of Sigma XI, the national scientific honor society.

Michael P. Keating, BS '66: Mike has a Ph.D. from Indiana University. He is a professor in the College of Optometry at Ferris State University in Big Rapids, Mich. His textbook *Geometric, Physical, and Visual Optics* was published by Butterworths in 1988.

Paul W. Lehn, BS '67: Paul teaches physics at North High School in Omaha. He and his students are regulars at the annual Physics Field Day.

Terence J. Sullivan, BS '68: Terry has an M.S. in physics and a Ph.D. in Nuclear Engineering from Iowa State University and is a graduate of the Harvard Advanced Management Program. He is executive vice president of the Institute of Nuclear Power Operations (INPO) in Atlanta, Ga. INPO, sponsored by the nuclear industry, is an independent, non-profit organization whose mission is to promote the highest levels of safety and reliability in the operation of nuclear electric generating plants. He oversees INPO's training and accreditation activities, communication with member utili-

ties, and interactions with the government and other industry associations. A registered professional engineer, he is a member of the American Nuclear Society and the Health Physics Society.

Ronald J. Bruno, BS '70 and MS '73: Ron has a Ph.D. from the University of Nebraska-Lincoln in Administration, Curriculum, and Instruction. After some years teaching physics chiefly at Creighton Preparatory School in Omaha, he became active as an educator and manager of technical personnel and projects. Currently he is VicePresident-Training and Management Services, with EXITECH Corporation, a firm based in Columbia, MD that specializes in simulation, engineering, project management support, and training for the nuclear industry. He has served on the Academy Council of the National Academy for Nuclear Training and is a member of the American Nuclear Society Committee for Nuclear Power Plant Simulators. With his wife LaRae and four daughters, he lives in Knoxville, TN.

Eldon J. Zorinsky, BS '73: Eldon has a Ph.D. in electrical engineering from Southern Methodist University. He has the position of new business ventures manager with Texas Instruments in Dallas, Texas. He is past president and co-founder of the Texas Chapter of the American Vacuum Society. He has been issued 11 patents on semiconductor devices.

Rev. J. Michael Liebl, OSB, BS '74: Father Michael teaches physics at Mt. Michael High School in Elkhorn, Neb. At Mt. Michael, he teaches a section of our general physics course for which his students receive Creighton University credit. He is currently secretary of the Nebraska Section of the American Association of Physics Teachers.

William J. Gallagher, BS '74: Bill has a Ph.D. in physics from MIT and is research manager of the Exploratory Cryogenics Research Group at the Thomas J. Watson Research Center in Yorktown Heights, N.Y., and lives in Ardsley, N.Y. He is nationally recognized for his research on superconductivity and has published extensively in scientific journals. He serves on the board of directors of the Applied Superconductivity Corporation and is director of the Consortium for Superconducting Electronics. He was the recipient of the 1991 Alumni Merit Award from the Creighton College of Arts and Sciences.

Timothy M. Niebauer, BS '80: Tim

has a Ph.D. in experimental gravitation physics from the University of Colorado. His doctoral research with very sensitive gravimeters put new limits on a reported fifth force and showed that such instruments can be useful in such geophysical studies as earth tides and water table monitoring. He spent 2.5 years at the Max-Planck Institut für Quantenoptik in Garching, Germany, working with one of the best gravitational wave detectors in the world. Currently he is chief scientist and part owner of AXIS Instruments Company in Boulder, Colo. New products from the company are an absolute gravimeter, an iodine-stabilized He-Ne laser, and a polarization stabilized laser.

Nan Marie Jokerst, BS '82: Nan has a Ph.D. in Electrical Engineering from USC, where she was an American Education Association Hewlett-Packard fellow. She and her husband, Martin A. Brooke of Auckland, New Zealand, are both tenured faculty members at Georgia Tech in Atlanta, Georgia. His parents came from New Zealand to babysit for their infant son. Since 1993 Nan has been on the Creighton University College of Arts and Sciences external advisory board.

Visitors from New Jersey, Venezuela

During the Alumni Reunion Weekend in October, **Marilyn Stangl (BS '71 and MS '73)** and **Christopher Kennedy (BS '86)** gave a joint physics seminar. Both received Ph.D. degrees in physics from Notre Dame, and both are employed by Lucent Technologies, the new manufacturing division of AT&T in New Jersey. In their physics seminar, both noted that though they are not working as physicists, their physics problem-solving experience is a valuable asset.

Another regular visitor is **Jay Bilbao (BS '71)** from Caracas, Venezuela. Jay is with the South American Branch of Tensor Geophysics, based in Houston, TX, which deals with oil exploration. Son Damian is a third-year law student and son Matias is a third-year Arts and Sciences student. On a recent visit, Jay was accompanied by his wife Christina, a lawyer from Argentina.

Parle Moves

In our first issue, we high-lighted our earliest living physics graduate, **Francis X. Parle (B.S. '49)**. He has moved from Shelton, WA, and now lives at 9119 Classic Drive NE, Lacey, WA 98512.

First Two Master's Grads Die in Pennsylvania, Omaha

Our **first** Master's degree was awarded to **Marie Savickas** on May 30, 1970 and our **second** was presented to **Alan J. Blotcky** on Dec. 12, 1971.

Both died recently of cancer, Marie on Nov. 14, 1996 in Carnegie, Pa., and Alan on Jan. 1, 1997 in Omaha.

Marie worked with Dr. Zepf on her master's thesis: *Preparation and Analysis of Molybdenum, Tantalum, and Tungsten Single Crystals for Electron Emission Studies.*

After leaving Creighton, Marie was involved in science education. She worked for Curriculum Development Associates in Washington, D.C., taught teacher education at the University of Minnesota, and chaired mathematics and science committees for dioc-



Savickas

esan schools in the Archdiocese of Milwaukee. Her most exciting and mind-expanding job was working for Rand McNally helping teachers understand educational programs. In this work she acquired a broad experience in school philosophies, the varieties of approaches to a given educational program, faculty interactions, and school discipline. Failing health was a major factor in her decision to retire in 1990.



Blotcky

Alan worked with Dr. Cipolla on his master's thesis: *The Determination of the Thermal Neutron Flux in a Research Reactor.*

Before coming to Creighton, Alan had received his BS degree in Physics from

Carnegie Institute of Technology in 1952. After two years each at Goodyear Atomic Corporation in Portsmouth, OH and as a physics consultant in Omaha, he began in August 1957 a forty-year period at the Veterans Administration Hospital in Omaha as a nuclear physicist, reactor supervisor, and radiation health officer. A grant proposal that he submitted resulted in the construction of a Triga water-moderated nuclear reactor as a part of President Eisenhower's Atoms for Peace Program. The reactor, which is the only hospital-based reactor in the world, was dedicated in his name last July. Alan taught nuclear physics at Creighton, presented seminars on his research, and conducted tours of the reactor facility for our students.

Hubble Astronomer

Purpose of Life: 'Not a Dreary Accident...'

An interesting quotation about Hubble-associate astronomer Allan Sandage taken from Dennis Overbye, *Lonely Hearts in the Cosmos*, (Harper Collins, New York, 1991, page 393) appeared in the *American Journal of Physics*, December, 1996, page 1530, under the title **The Purpose of Life:**

"As the universe of galaxies and stars became more dead numbers, like salt from an evaporated sea of mystery, Sandage remembered and mourned the wonder with which he had viewed the universe as a kid. That sense of wonder had vanished, he complained, after two weeks at Caltech. There followed 30 years of duty, inertia, and discontent. Astronomy, once an escape from the human morass, led back into it.

"About the time he received his Ph.D., he told me, he remembered having asked his father what the purpose of life was and being disturbed at not getting an answer. His father didn't know, and that seemed ominous. The question Daddy couldn't answer had come back to haunt him. One day, he says, somebody told him, 'The purpose of life is to glorify God.'

"That sounded right", said Sandage. Sometime around 1980, Sandage said, he converted to Christianity. He would not divulge any more details. He didn't want to be a nihilist. Life was not a dreary accident. He repeated it, 'Life is not a dreary accident.'"

Curriculum Revision Continues

The Physics Department is continually adjusting the physics program with a view to improving efficiency and effectiveness and adjusting to changes in the field of physics. An indication of the change in the job market was the appearance in July, 1995, of a new supplement to *Physics Today* entitled *The Industrial Physicist*.

Our most important courses, from the viewpoint of number of students and the attraction of majors, are the two general physics courses. In the fall of 1993, these became 4-hour courses that included integrated lecture, discussion, and laboratory sessions, with the new course numbers PHY 211-212. In the fall of 1995, the general physics enrollment had an unexplained increase of 50

that has continued to the present. This increase necessitated adding a fourth lecture section, two additional graduate teaching assistants (we now have eight), and a major readjustment of office space.

To accommodate general physics students who have expressed interest in more advanced topics, an honors section under the direction of **Dr. Cherney** has been introduced in the spring semester of 1997. Members of this honors group and undergraduates in the Relativistic High Energy Physics Group are working with **Fr. McShane** on the construction of a portable cosmic ray detector. It is expected that the detector will accompany Fr. McShane during his summer pilgrimages to the Rockies.

Rigge Science to Be Remodeled

In the summer of 1996, the interior of the Eppley College of Business Administration was gutted and rebuilt. A similar remodeling of the Rigge Science Building is planned for the near future. In anticipation of this remodeling, faculty, staff, and students have been meeting to discuss desirable changes. These include more offices for faculty and teaching assistants, new and modified teaching and research laboratories, adequate space for the Physics Club, a

lounge area to promote informal interaction, and possibly a planetarium.

Our building plans are guided by concurrent discussions on anticipated directions of department teaching and research. For instance, recent research suggests that groups of three students per laboratory station in general physics are more effective than the traditional groups of two which we have been using. This change would reduce the number of 18 laboratory sections now required.