

EDITOR'S STATEMENT

The primary objective of this newsletter is to establish better communication between the University of Kansas Physics Department and its alumni, and in addition provide a mechanism by which the alumni can remain in contact with each other. This report will come out annually, and consist of two types of news items. The first section will be devoted directly to current news in the department. In this first edition I have made no attempt at a comprehensive survey on all departmental activities. Rather, I have concentrated only on "newsworthy" events over the past twelve months. Future editions will follow this example, so that over the next few years our readers should be well informed about departmental activities.

The second section contains news of our alumni. Last year I sent a questionnaire to our Ph.D. alumni (Ph.D.'s only were contacted because the department has a nearly complete address register for them) to find out about their current employment and activities. A summary of the response is included in this report. Last November I was informed by the University Alumni Association that a complete list of our alumni now be made available from a computerized format. Consequently, this report should reach nearly all our alumni regardless of the attained degree.

The word "nearly" in the last sentence comes from the fact that some of the addresses in the alumni office are doubtlessly incorrect. So I need your help. On the last page of this report you will find a brief questionnaire. Please fill it out and send it back to me. I need it. Even if we have your correct address in our files, we need to know that you are interested in this newsletter in order to justify future editions.

In addition to your address the questionnaire has space for you to include a news item for our next report. Now here you could be of great help to me. On the last questionnaire I received many long and interesting letters. My primary problem was digesting them into the "capsules" for publication. I fear that I did not do all of them justice. Solution: From now on you write the news item in capsule form yourself. Use the format employed in this report and we will print it just the way you write it!

Remember that the success of this annual alumni report depends on the news items I receive from you. I'll handle the local news, but you must help me to obtain the alumni news which is really the most important part of this report.

The section on internal departmental news is constructed by soliciting individual reports from the faculty, and then editing them into final form for this report. Thanks are due to Professor R. C. Bearse for assisting in this latter stage of the project.

Paul Goldhammer
Editor

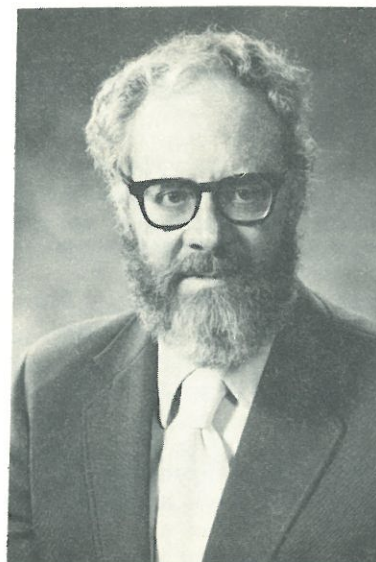
DAVIDSON NEW CHAIRMAN

Professor John P. Davidson has been named chairman of the Department of Physics effective the Spring semester 1977. He has been on the faculty at the University of Kansas since 1966, and is widely known for his research in the Theory of Deformed Nuclei. After receiving his Bachelor's degree at the University of California, Berkeley, he did graduate study at Washington University in St. Louis, and received his Ph.D. in 1952. He worked at Columbia University as a research associate before taking up a two year appointment as assistant professor at the Brazilian Center for Physical Research. He spent some time at the Establishment for Nuclear Research in Norway and then went to Rensselaer Polytechnic Institute as an assistant professor.

In his eight years at Rensselaer he achieved the rank of full professor before coming to KU. He is a Fellow of The American Physical Society, a member of the Norwegian Physical Society, The Kansas Academy of Sciences, Phi Beta Kappa, and Sigma Xi.

BEARD TO DISTINGUISHED PROFESSOR

David B. Beard, Professor of Physics at the University of Kansas since 1964 has been named University Distinguished Professor. This honor was bestowed upon him in recognition of his many significant contributions to physics. After receiving his bachelor's degree from Hamilton College, N. Y., Beard did graduate study at California Institute of Technology before receiving his Ph.D. under Professor Bethe at Cornell University in 1950.



Since receiving his Ph.D. he has worked for the Catholic University of America, The Oak Ridge National Laboratory, Pratt Whitney Aircraft Corporation, The University of Connecticut at Storrs and was on the faculty at the University of California, Davis from 1953 to 1964. In 1964 he came to KU as full professor and Chairman of the department. He served as chairman of the department until December of 1976, when he retired from that position to return full time to teaching and research.

Professor Beard is a Fellow of the American Physical Society, the American Association for the Advancement of Science, a member of Sigma Xi and Sigma Pi Sigma, The Federation of American Scientists, The American Geophysical Union, The Kansas Academy of Sciences, The Society of Engineering Science and the American Society for Engineering Education. He has written over seventy articles and his textbook on quantum mechanics has been widely used (as it was here at the University) in introductory courses in quantum mechanics. Professor Beard becomes the first member of the department to receive appointments as University Distinguished Professor.

His present research program concerns structure of the solar wind. Convection currents deep within the sun bring hot ionized gas boiling up to the surface in a turbulent noisy flow. The magnetoacoustic waves thereby generated travel outwards and are absorbed in the solar corona heating it up and driving it farther outwards in a supersonic stream called the solar wind. When this wind of ionized hydrogen encounters a planetary magnetic field it is deflected and a large bubble called a planetary magnetosphere is formed in the wind. This bubble has an interior diameter of 30-300 planetary radii. Some of the solar wind eventually finds its way down to the planet surface near the magnetic poles and causes aurora, magnetic storms, radio blackout, weather and climate changes, power failures, and other important geophysical effects.

Currently his research program (Beard, Sams, Propp, Reimer, with the mutual interest of Armstrong, Briggs, Ahmadian, Decker, and Wainright) is (i) examining recorded observations of the solar corona with the objective of learning more about the origin of the solar wind; (ii) calculating the magnetic structure caused by large electric currents (particularly antisolarwards from the earth) surrounding the earth resulting from the interaction of the solar wind with the geomagnetic field; (iii) detailing the structure of Mercury's magnetic field; and (iv) calculating the external sources of Jupiter's magnetic field, the shape of the Jovian magnetosphere, and the complete description of Jupiter's magnetic field. Comprehension of planetary magnetospheres, in general, enhances our understanding of our own magnetosphere and how changes in the solar wind result in weather and climate changes and other important geophysical effects here on earth. The NSF has renewed its support of this program with an award of \$72,800 for two years.

NEW FACULTY MEMBER

Dr. Ronald Bass has been named assistant professor at The University of Kansas beginning with the academic year 1976-77. Professor Bass received his Bachelors Degree from Imperial College, London, and his Ph.D. from the University of Rochester in 1974. He served

as a post-doctoral research associate at Rutgers University from 1973 to 1975. From 1975 to 1976 he was an acting assistant professor at KU as a temporary replacement for faculty who were on sabbatical leave. When the department was authorized a new position, more than 150 applicants responded, and Professor Bass emerged as the person to receive the position. His prior research has been in the solid state theory of metals, but he is now directing his efforts along lines more consonant with those of the experimental scientists in the solid state field at K.U. In particular, he is collaborating with Professor Wesley Unruh, an experimental physicist on the properties of magnesium oxide crystals and their damage from radiation.

HIGH ENERGY RESEARCH FUNDED AGAIN

The National Science Foundation grant for research in high energy physics was renewed in September, 1976. The amount granted this year was \$139,800, an increase of almost 8% over the previous year's grant. The following physicists are engaged in the research: Professors Raymond Ammar, Robin Davis, Nowhan Kwak, and Robert Stump; Post-doctoral Research Associates: Charles Eklund and Douglas Zacre; Research Assistants: Garpin Chan, Lee Herder, and Robert Riemer. Hassan Chafoori completed work for the Ph.D. degree in October and was replaced by Mr. Chan.

There have been several recent developments in the experiments of the high energy group. During March, 1976, in a record-setting run at the Argonne ZGS they took almost 600,000 photographs in the 12-foot bubble chamber. These completed the data for a million-picture experiment on the interaction of K^- mesons in hydrogen. Several institutions are involved in the analysis of this film. Our physicists are collaborating with others from the Argonne National Laboratory to analyze all events of the topology "two prong plus V." This topology is produced by K^-p interactions with final states $K^0p\pi^-$, $\Lambda\pi^+\pi^-$, ΛK^+K^- , $\Sigma^0\pi^+\pi^-$, and $\Sigma^0K^+K^-$ and others containing one or more missing neutral particles. Scanning of KU's share of the film is almost completed. With the help of Argonne's automatic measuring machine POLLY, good progress is being made on the measurements.

The proposal to study multi-particle production by high energy protons in a hydrogen-neon mixture has recently been approved at Fermilab. The proposed analysis of 25,000 pictures from the 15-foot bubble chamber filled with a hydrogen-neon mixture will yield data both on proton-neon interactions and on proton-proton interactions. The decreased radiation length of the mixture compared with that of pure hydrogen will increase the probability of pair-production by γ -rays, and thus improve the statistical accuracy of KU's recent results concerning γ -ray production in p-p interactions.

One of the first hadron experiments in the 15-foot bubble chamber at Fermilab (The National Accelerator Laboratory) is nearing completion. In collaboration with physicists from the State University of New York at Stony Brook, from Tufts University, and from Argonne the KU group has analyzed the production of γ -rays (from π^0 decay) in proton-proton interactions at 300 GeV/c. Previous work had indicated a serious discrepancy between the number of charged particles produced in high energy proton-proton interactions and the number of γ -rays. The present results indicate that this previous work was in error, and one of the theoretical models of neutral particle production is consistent with the KU data.

One of the most exciting recent developments in high energy physics is the discovery of a series of particles starting with the J/ψ . Particles with similar properties had been expected on theoretical grounds and the discovery was hailed as a triumph of the theory. The same theory predicts the existence of other particles, the "charmed" mesons. The high energy group is at present working on a proposal for a combined bubble chamber-emulsion experiment with the hope of discovering these elusive particles. The suggestion being explored is to place an emulsion stack inside the 15-foot bubble chamber at Fermilab. The emulsion would occupy only a small fraction of the bubble chamber volume and would not affect the normal operation of the chamber. The emulsion would be left in place during one of several extended neutrino runs; during the exposure, many neutrino interactions would occur within the emulsion. The experimenters should thus be able to determine the momentum and direction

of each outgoing particle by standard bubble chamber techniques, and should be able to examine the primary neutrino interaction by emulsion techniques. The high spatial resolution provided by the emulsion would make possible the detection of very short-lived particles—particles with mean lives of 10^{-14} sec. or less. Since this is within the expected lifetime of charmed particles, this experiment hopes to see the decay of most of the charmed particles produced and thus have indisputable evidence of their existence and properties.

ASTRONOMY AT THE UNIVERSITY OF KANSAS

Faculty of the Department presently engaged in astronomical teaching and/or research are Thomas P. Armstrong, David B. Beard, Robert J. Friauf, Richard Sapp, Stephen J. Shawl, Wesley P. Unruh, and Edward J. Zeller. These faculty are assisted by graduate students; Pat Briggs, Robert Decker, Betsy Wainright, and Jay Reimer.

Fewer faculty are engaged in astrophysical research. Professor Armstrong, assisted by several students, continues his work on the analysis of data from NASA's IMP 7 and 8 spacecraft. Principal new results were the discovery of a new and unusual type of heavy charged particle radiation associated with the terrestrial magnetosphere. Also, a study of the solar flare particle event of 4 July 1974 revealed a structure-temporal and spatial variability in the Fe/O composition. Interplanetary particle fluxes from this flare showed a high degree of filamentation of intensity and composition, suggesting substantial chromospheric chemical inhomogeneity.

Armstrong is organizing and coordinating the analysis effort at the University of Kansas and other co-investigator's institutions for a charged particle experiment to be launched aboard NASA's Mariner-Jupiter-Saturn space probe in August 1977.

Professor Beard has modeled the magnetic field of Mercury and is able to fit the space probe measurements of the magnetic field components with an rms deviation of theory from 295 experimental measurements of only 4%. The model was derived by reducing the length scale of the dipole magnetosphere calculated for the earth to fit the space probe observations of the crossings of Mercury's magnetosphere. The enhanced pressure of the solar wind at the orbit of Mercury was taken into account and the tilt of Mercury's dipole was left as an adjustable parameter to be fit to the data. It was necessary to add an intrinsic planetary quadrupole moment to obtain a fit as good as 4%. He is also deriving a more complete description of the earth's magnetotail.

Professor Shawl has continued his collaboration with J. E. Hesser of Cerro Tololo Observatory in Chile on a systematic reinvestigation of the radial velocities of the galactic globular clusters. Data have been obtained with a single etalon Fabry-Perot interferometer for 42 of the galactic globular clusters. Detailed analysis of these data has not yet been carried out. Preliminary reductions show good agreement with previous experiments in most cases. A couple of possible important discrepancies may be present, however.

A new course has been added to the BA curriculum entitled Astrogeophysics and Planetary Geology. This upper division course for astronomy and geology majors had an evenly split enrollment between astronomy and geology students. The course was team taught; instructors and subjects covered were comets, magnetospheres and the solar wind (Beard), celestial mechanics (Shawl), the moon and meteoritics (van Schmus-geology), and planetary geology (Zeller).

A monthly radio program on the astronomical events for the month has continued as has a monthly press release on the same subject. Professor Shawl was also technical advisor and the main participant in a radio program called "The Edge of the Universe" which is a "poetic" view of cosmology. This program received an award from the Aviation and Space Writers Association.

THE ASTRONOMY CAMP

Last year we started an Astronomy Camp within the Midwestern Music and Art Camp program which has attracted talented high school students to our campus for 40 years. Last year's two week (June 20-July 3) camp was small and attended by high school students from Missouri and Kansas. On the other hand this year's camp (June 26 - July 9) is almost three times larger and so far youngsters from ten states, including Kansas plan to attend. The program consists of activities in observational and theoretical astronomy, films on the physical sciences including astronomy as well as practical experience in photography. All of the campers learn to use the many telescopes of the observatory including the 27 inch William Pitt reflector. When they return to their homes they have not only mastered the mysteries of the telescope but take with them pictures of various celestial objects which they have taken, developed and enlarged themselves. The most unusual feature of the camp is its hours. Afternoon sessions are devoted to solar observations, work in the optics laboratory and the dark room while the evening sessions concentrate on stellar observing often until 3 A.M.!

VAN DE GRAAFF AVAILABLE

The department has announced that the facilities of the Nuclear Structure Laboratory are available for use by other University departments, state agencies, and outside users (with a University participant). Radiation from Van de Graaff accelerators has proved useful in such diverse areas as trace element analysis in water for pollution control, production of short-lived radioisotopes for biological studies, and the study of radiation damage in crystals and potential reactor materials. It is hoped this will prove a useful service to the scientific community as well as help maintain the laboratory for use in nuclear physics research, because it is clear that federal funding for small university laboratories has ended.

PROFESSOR KWAK VISITS SWITZERLAND

During the past three summers (1974-76), Professor Kwak was a visiting scientist at CERN (European Organization for Nuclear Research) in Switzerland. He participated in experiments performed at the Intersecting Storage Ring using the SFM (Split Field Magnet) facility. These included 1) pp elastic scattering at large angles which looked for the second diffractive peak; 2) the total cross section measurement for the reaction $pp \rightarrow \Delta^{++}n$ at several ISR energies which indicated that a pion-exchange appeared to be still dominant, and 3) Search for the double pomeron exchange process in the reaction $pp \rightarrow pp\pi^+\pi^-$ which showed that the double pomeron process did exist.

PROSSER TAKES SABBATICAL

Professor F. W. Prosser, Jr. spent the 1975-76 academic year on sabbatical leave as a Faculty Research Participant at Argonne National Laboratory. His primary purpose was to become better acquainted with and involved in the rapidly growing new field of heavy-ion physics, a misnomer for the study of the interactions of complex nuclei. He was successful in this and has returned to Argonne several times this year to participate in further experiments in fusion in light heavy-ion systems and has programmed the IBM 1800 in the KU Nuclear Structure Laboratory to analyze the data tapes from these experiments. He hopes to receive federal funding to continue these activities in coming years. He co-authored a paper, "The Fusion of ^{16}O and ^{40}Ca ," at the Washington APS meeting.

CULVAHOUSE ON LEAVE

Professor Culvahouse was on leave for the fall semester which he spent mostly in residence at Iowa State University working with magnetic resonance groups in the Physics and

Chemistry Departments there. The Chemistry group, directed by Professor Gerstein is developing multiple-pulse nuclear magnetic resonance techniques for the non-destructive testing of coal for chemical content. The physics department group directed by Professor Barns is using magnetic resonance to study diffusion in metallic hydrides. Professor Culvahouse's efforts were directed toward the development of techniques for efficient multiple quantum magnetic resonance which was of interest to both of these groups as well as for the problems in electronic magnetism which is carried out here at the University of Kansas. Professor Culvahouse received his Bachelors Degree at Oklahoma University, and his Ph.D. at Harvard. He joined the faculty at the University of Kansas in 1964, and has been here since with the exception of a sabbatical year to England in 1969-70.

During professor Culvahouse's absence, Henry Glotfelty and John Tarvin brought the research for their theses to a successful conclusion. They will be presenting their theses during the spring semester. Their work represents the conclusion of the first phase of a program of electron-nuclear double resonance (ENDOR) studies of ^{17}O in magnetic complexes. These are the first such and the preliminary reporting of these results have aroused considerable interest which is re-enforced by the increasing availability of the ^{17}O isotope and many obvious applications to chemistry, solid state physics and biology.

Dwight Baldwin is concluding his study of hot phonons in spin lattice relaxation of concentrated electronic magnetism. At the same time he is serving as the chief operator for the Chemical Physics Computer Network developed under an NSF grant several years ago which now provides on-line computing service for five laboratories in physics and chemistry as well as interactive computing service for parts of the space physics program.

McKAY WORLD TRAVELER

Douglas W. McKay, Associate Professor of Physics is spending the 1976-1977 academic year on sabbatical leave pursuing his research in theoretical particle physics. He spent the summer of 1976 collaborating with the high energy theoretical physics group at Ames Laboratory in Ames, Iowa and then spent one month at Deutsches Elektronen-Synchrotron in Hamburg, Germany. From November through June he was resident at the Stanford Linear Accelerator Centers, Palo Alto. Professor McKay received his Bachelors Degree at the University of Pennsylvania and his Ph.D. at Northwestern University. He did post doctoral work at the Ohio State University before coming to the University of Kansas as assistant professor in 1969. He was promoted to associate professor in 1974.

VISITING POLISH SCIENTIST

The University of Kansas has for several years and in many disciplines exchanged undergraduate and graduate students with Polish Universities. The program is coordinated by Professor William Fletcher of the Department of Slavic Languages. This year the Department of Physics at K.U. was particularly fortunate in being able to host Andrzej Radlinsky who is a doctoral candidate at the University of Warsaw. He is a specialist in the area of solid state physics and has done extensive work on optical and photoelectrical properties of zinc telluride doped with Ti-V impurities. While at KU he has been collaborating with Professor Robert Friauf on problems involving crystals of the alkali halides. He is expected to remain at Kansas University through the summer of 1977 and then return to finish his doctoral work at The University of Warsaw.

FRIAUF NAMED TO ADVISORY BOARD

Professor Robert J. Friauf has been invited to join the Advisory Board of Diffusion and Defect Data. This is a semi-annual review series and completion of data on Diffusion and Defect Properties of Crystalline and amorphous solids.

Professor Friauf also attended the second Europhysical Conference on lattice defects in ionic crystals which was held in Berlin, West Germany from August 30 to September 3, 1976. While at this meeting he presented a thirty minute paper on Determination of Ion Transport properties in Silver Halide Crystals. He also chaired a session on chemical aspects of defect crystals. At home he attended a conference on super ionic conductors-chemistry physics and application at the General Electric Research and Development Center, Schenectady, New York. This conference was May 10-12, 1976. There he presented a contributed paper on "Studies of Ionic Conduction and Diffusion in Solid Silver Halides".

Professor Friauf also attended the Midwest Solid State Conference held at Purdue University in Layfayette, Indiana in October of 1976.

Professor Friauf this year is President of the Kansas University Chapter of the American Association of University Professors. In this role he attended the annual meeting of the AAUP which was held at the University of California in Santa Barbara June 24-26, 1976. He is also chairman of the College of Liberal Arts and Sciences Committee on Educational Policies and Procedures. This is the committee which must approve all new courses of modifications thereto before they can be offered by departments within the College.

Friauf offered Philosophy of Science 204 "The Ascent of Man", during intersession. This course involved viewing and discussing the highly acclaimed series of television programs produced by Dr. Jacob Bronowski.

WISEMAN REVIEWS PROPOSALS

Professor Wiseman, associate chairman of the department, was selected to serve on a review panel of the National Science Foundation to evaluate proposals for their program, Local Course Improvement (LOCI). The panel met in Denver on December 1976 and reviewed proposals from physics departments throughout the nation.

In addition to these duties he gave an invited talk, "Negative Absolute Temperature--Less is More," at the annual Physics Education Symposium held this year on March 18-19 at Emporia Kansas State College. His commentary on a gross error in a physics text was accepted for publication in the "Would you Believe . . . ?" column of the American Physics Teacher.

FACULTY RECEIVE UNIVERSITY RESEARCH AWARDS

Nine Physics faculty have had research proposals approved for funding by the Kansas University Faculty Senate Research Committee. Each year the University makes a number of small research awards to enable faculty to start, continue or finish research projects. This year the physics department fared extremely well in the competition. The successful faculty, their projects and size of their awards are:

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| Bearse (with L. Angino of Geology) | Trace Metal Uptake from Rocks and Minerals in Aqueous Solutions | \$2,000 |
| Bass | Surface & Body Properties of Irradiated MgO | \$5,240 |
| Beard | Electron Density in the Solar Corona | \$1,284 |
| Davidson | Calculation of Vacuum Polarization Corrections for Deformed Muonic Nuclei | \$3,600 |
| McKay | Analysis of Charmed Particle Decay into Three Uncharmed particles | \$3,228 |

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| Prosser | Analysis of Heavy Ion Nuclear Physics Data | \$3,760 |
| Shawl | The Velocities of the Galactic Globular Clusters: A systematic Reinvestigation, Part III | \$1,054 |
| Unruh | Light Scattering from Defects in Refractory Oxide Single Crystals | \$4,635 |

The awards are effective July 1, 1977 and run for one year.

GRADUATE STUDENTS AT KU

At the present time there are 37 Physics graduate students enrolled at the University of Kansas. Eleven are from foreign countries and 15 are Kansas residents. The average age of our graduate students is 26 years and slightly more than 1/3 of them, 13, are married. As in the past they have backgrounds that vary widely. 24 of our 37 undergraduates did their undergraduate work at a university and 13 of them did undergraduate work at a college.

REPORT OF THE GRADUATE COMMITTEE

Professor Davidson has reformed the work load in the department into three major committees. The shop committee (Prof. Unruh, Chairman), deals with problems of the building, laboratories, and of course the shop; while all academic matters are handled by a graduate (Prof. Goldhammer, Chairman), and an undergraduate committee (Prof. Krone, Chairman). These committees have now been in operation for about three months.

The graduate committee has been reviewing matters of graduate examinations, advising, curriculum, and the grading system. Major actions taken are as follows:

(1) Quantum Mechanics II has been deleted from the Ph.D. preliminary exam. Many of our graduate students will be able to take the prelim six months or even a year earlier under this new rule.

(2) The committee will institute a placement examination for new graduate students in an attempt to start them off in appropriate courses their first semester. In the part advising problems frequently would not appear until halfway through the first semester, and this has worked a hardship on many students who were not adequately prepared for our first year graduate courses.

Problems of curricula and the grading system are very complex. The Committee will doubtlessly still be discussing these issues next semester.

REPORT OF THE UNDERGRADUATE COMMITTEE

The recently formed Undergraduate Studies Committee has spent the spring semester reviewing some of our curricula in an attempt to make them attractive to physics majors of varying interest. In March the department approved a recommendation by the Committee to allow our undergraduates to count up to 16 hours of research participation towards the requirements of the various degree programs. Students availing themselves of this option will be allowed to make substitutions of some of the more advanced courses currently required. The department expects that extensive research experiences in one of our laboratories will appeal particularly to those students who are planning to pursue a career in industrial research where the more advanced formal courses now required may be less useful. The Committee plans to continue this review during the fall semester. It is hoped that more flexible requirements, particularly in the B.S. degree, may accommodate students with an interest in areas of applied physics, medical physics, geophysics and others.

The department has continued to serve the University Community by offering a number of courses for students only peripherally interested in physics. The course for Art students is now required for all students majoring in the department of Design; the School of Education is currently considering requiring the Physical Science course for all those majoring in primary education. The increased enrollment in these service courses has substantially increased the department's teaching load over the past few semesters and the Undergraduate Committee is considering ways to deal with this problem in the future.

THE CHAIRMAN'S STATEMENT

The past year has been truly a year of transition and we expect to pursue our research and teaching efforts in the period ahead with renewed vigor. The addition of a young theorist in the solid state area and the recognition of the preeminence of Professor Beard point to the continued excellence of our research program. We now have \$269,000 in outside funding and I would hope that we would be able to double this in the next five years.

We have responded rapidly and vigorously to requests for new courses both for majors and non-majors and our "Physics for Artists" has been especially well received. We are making changes in our majors programs which will prepare those not wanting to work immediately for advanced degrees to compete effectively in the job market upon graduation. Because the student enrollment continues to grow at a healthy rate, we are again facing space problems which will be resolved as the university-wide building program continues to progress. However, we have not let today's large enrollments lull us into a false sense of security and we are vigorously pursuing our contacts with high school students in Kansas and elsewhere. Our new and rather successful Astronomy Camp is one important example of this important effort.

The pressure to try new programs, to do new things, and walk where we have not trod before has put severe pressures on our traditional sources of financial support. Therefore, I am especially pleased to tell you that we have established the Physics Department Development Fund with the Endowment Association which will help us support some of these new endeavors.

In closing, let me express my gratitude and appreciation to all of our faculty, as well as to our students for making our progress so successful. With this report we are sharing with you our achievements and our goals and I hope you will take the time to drop us a line and tell us of yours.

LATE BULLETIN: BEARSE WINS AWARD

Professor Robert C. Bearse was awarded an AMOCO Award for Excellence in Teaching by Chancellor Archie R. Dykes at the All-University Supper during Commencement Week in May.

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ALUMNI NEWS

Jacob Aboagye (Ph.D. 1972), is currently a lecturer at the University of Cape Coast in Ghana, and is also a member of the Board of Directors of the Ghana Publishing Corporation.

Bill Adams (Ph.D. 1972), is Associate Professor of Physics at Baylor University.

Mike Bird (Ph.D. 1972), is a Research Associate at The University of Bonn. He now has a three year old son named Daniel.

David Brice (Ph.D. 1963), a member of the technical staff at Sandia, spent last year on sabbatical at the H. C. Oersted Institute in Copenhagen.

Mark Bruels (Ph.D. 1969), is employed at the VA Hospital in Minneapolis, treating cancer patients.

Roosevelt Calbert (Ph.D. 1971), is Program Manager, Office of Program Integration, at the National Science Foundation.

Don Close (Ph.D. 1972), is Staff Physicist at Los Alamos in the Nuclear Safeguards Division R-1. He recently co-authored a paper with Professor Davidson, "Nuclear Polarization Deduced from Muonic Pb Measurements."

Emmett Gary Corman (Ph.D. 1961), is a Research Physicist at Livermore. Most of his work is on the development of computer codes that simulate nuclear explosions. He now has four children.

Jean Delord (Ph.D. 1951), is Professor of Physics at Reed College. He was Director of Research at Tektronix from 1951 to 1964.

Gene Feaster (Ph.D. 1954), is a Research Associate at the University of Virginia Medical School.

Don Foster (Ph.D. 1968), is Assistant Professor of Physics at Wichita State University.

Manus Foster (Ph.D. 1953), is Senior Scientist at Mobil Research and Development in Dallas, Texas.

Charles Lee Francis (Ph.D. 1973), is a Physicist with the U.S. Army Aberdeen Proving Grounds (Maryland).

Jim Gordon (Ph.D. 1968), is a staff member at Los Alamos working on problems of radiation transport, and weapon effects.

Harlan Graber (Ph.D. 1964), is Associate Professor of Physics at Cornell College in Iowa. He recently spent seven months at the University of Utrecht working in experimental nuclear physics.

Martin Gutzwiller (Ph.D. 1954), is Director, General Sciences Department with IBM in Yorktown Heights, New York.

Dean Halderson (Ph.D. 1974), is a Postdoctoral Research Fellow at Queen's University in Kingston, Canada. His wife Cynthia recently gave birth to a girl.

Gale Harris (Ph.D. 1962), is Associate Professor of Physics and Radiology at Michigan State University.

Jim Head (Ph.D. 1968), is Captain U.S. Air Force, currently on assignment with the Defense Intelligence Agency.

Mike Hennessy (Ph.D. 1972), is a Development Engineer with Intermagnetics General Corporation.

Dennis Hewett (Ph.D. 1973), is a Staff Member at Los Alamos in the theoretical support group for controlled thermonuclear research.

Roger Hill (Ph.D. 1967), is manager of the Albuquerque division of Science Applications Incorporated.

Gerald Holmberg (Ph.D. 1972), is a postdoctoral research associate at the University of North Carolina.

Louis Huang (Ph.D. 1971), is plant manager for private chemical company in Taipei.

Denis Johnson (Ph.D. 1971), is now "Chercheur agree a l'Institut Interuniversitaire des Sciences Nucleaires" in Brussels.

Gerald Jones (Ph.D. 1962), is Professor of Physics at the University of Notre Dame.

Harold K. Knowles (Ph.D. 1932), retired in 1972, after forty-one years of teaching at the University of Florida. He was Chairman of the Physics Department from 1934 to 1968, and co-authored two text books in the Physical Sciences.

Loren Lockwood (Ph.D. 1971), is Professor Agregado, Universidad de Griende, Venezuela.

Dave Maharry (Ph.D. 1971), has been at Franklin College (Indiana) since 1971. From 1972-1974, he worked as Assistant Academic Dean. Since then his primary responsibility has been teaching in computer sciences and mathematics.

Jim Manweiler (Ph.D. 1972), now does systems analysis work for United American Bank.

Carl McElwee (Ph.D. 1971), is working with the Geological Survey (in Lawrence) doing research in hydrology and computer modeling of groundwater supplies.

Indira Murthy (Ph.D. 1971), has held a teaching post at Bombay University since receiving the Doctorate at K.U.

Dean Neher (Ph.D. 1964), is Chairman of the Physics Department and Director of the Computing Center at Bridgewater College (Va.)

Vaughn Nelson (Ph.D. 1967), is Head of the Department of Physics at West Texas State University.

John Norton (Ph.D. 1970), is a staff member at Los Alamos in the numerical hydrodynamics division.

James Patterson (Ph.D. 1962), is Professor of Physics at South Dakota School of Mines and Technology. He has been a Visiting Professor in Brazil, married a Brazilian, and now has one child.

Jim Pintar (Ph.D. 1974), is a geophysical analyst with Phillips Petroleum.

Daryl Preston (Ph.D. 1970), is Associate Professor of Physics at California State University (Hayward). He is now on sabbatical at Berkeley.

William Read (Ph.D. 1956), is Vice President for Academic Programs at Murray State College.

Bill Reardon (Ph.D. 1953), is a Senior Research Associate/Staff Engineer in Richland, Washington.

News items, suggestions and comments: _____