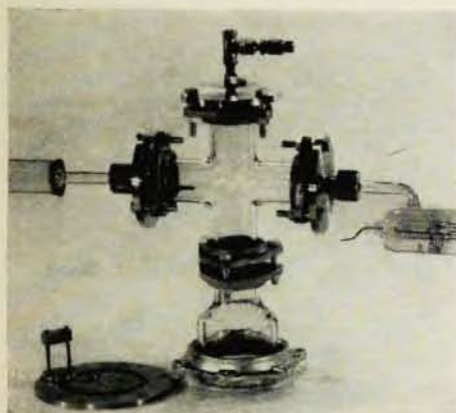


Undergraduate vacuum science

The University of Illinois physics department is offering undergraduates special instruction in vacuum techniques as part of its new experimental modern physics course (Physics 303-304). The first semester is devoted to experiments in nuclear physics and other areas, including one required experiment in vacuum techniques. During the second semester the student chooses a single experiment for detailed study, which may concern vacuum science or some other interest.



Student vacuum equipment

Students receive five hours credit for two four-hour labs and one two-hour lecture or seminar session per week. Current enrollment for the course is 13, made up of engineering physics seniors and several liberal arts physics students.

"It has been our intention," says associate professor R. N. Peacock, "to try to design physics experiments where the vacuum aspect is basic to the problem. This allows us to introduce good high-vacuum practice naturally." Pressures as low as 10^{-7} torr are obtained by the students, who follow either of two techniques in building apparatus. The principal approach is the solder-glass method (also introduced at the MIT science teaching center), which uses prefabricated components and a special sealing glass to form high-vacuum glass joints. The second system employs standard flanged

glass components originally designed for use in the dairy and chemical industries. With such apparatus students go on to study the motion of electrons in electric and magnetic fields, the principle of the mass spectrograph, surface adsorption, pressure measurements and other phenomena.

New programs

PhD degrees in physics and chemical physics are being offered under new programs at Drexel Institute and the University of Colorado, respectively.

The Drexel physics department now consists of 22 full-time members, and faculty groups are active in nuclear, solid-state, theoretical and atmospheric and space physics. The department also has close ties with the electrical engineering department in plasma and electrophysics. Current staff research interests, according to Francis K. Davis, head of the physics department, include nuclear spectroscopy, nuclear reactions, optical properties of solids, magnetic properties of thin films, relativistic quantum field theory, elementary particle theory, atmospheric turbulence, acoustics and optics, and plasma stability and turbulence. Financial aids are available in the form of research and teaching assistantships as well as NDEA, NSF and other fellowships. Further information can be obtained from Dr. Davis at Drexel Institute of Technology, Philadelphia, Pa. 19104.

The University of Colorado departments of chemistry and of physics and astrophysics are inaugurating an interdepartmental doctoral program in chemical physics. Research fields will include atomic and molecular radiative processes, nuclear and electron magnetic resonance spectroscopy, x-ray crystallography, molecular quantum mechanics, statistical mechanics and quantum chemistry. Participants in the program will be able to use facilities of the two departments as well as of the graduate school computing center

and the Joint Institute for Laboratory Astrophysics. The National Center for Atmospheric Research, National Bureau of Standards and Environmental Science Services Administration will also cooperate in the program.

Each candidate's course of study will be determined by the chemical physics committee administering the program. Students with undergraduate training in either physics or chemistry may apply for admission as well as for research and teaching assistantships and fellowships. Further information and application forms can be obtained from the Chemical Physics Committee, Department of Physics and Astrophysics, University of Colorado, Boulder.

Summer programs

Summer courses have been announced in space physics, hyperfine interactions, interstellar gas dynamics, radiation science, and infrared and optical emission techniques.

Columbia University's fifth annual summer institute in space physics, directed by Dr. Robert Jastrow, will be held 5 July to 12 August. The first five weeks will be devoted to morning lectures on planetary and plasma physics and afternoon lectures on astrophysics. During the final week field trips will be conducted to major facilities of the National Aeronautics and Space Administration. Grants will be awarded to about 30 undergraduates majoring in the physical sciences (math through advanced calculus essential). Applications, to include a transcript of college courses and grades, statement of professional goals and three academic letters of reference, should be addressed to Director, Summer Institute in Space Physics, Columbia University, New York, N.Y.

A NATO advanced study institute in hyperfine interactions in matter will be held at Aix-en-Provence, France, from 8 to 26 August. The program will cover nuclear orientation, atomic

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beams, Mössbauer effect, nuclear magnetic resonance, electron paramagnetic resonance, nuclear specific heat, optical hyperfine measurements, perturbed angular correlation of gamma rays, scattering of polarized neutrons by polarized nuclei, theory of hyperfine interactions and theory of relaxation phenomena. Lecturers will be A. Abragam, B. Bleaney, M. Blume, S. G. Cohen, A. J. Freeman, S. Geschwind, V. Jaccarino, W. Marshall, C. M. Moser, R. L. Mössbauer, I. Rabi, A. Steudel and R. E. Watson. Advanced predoctoral and young postdoctoral students can obtain admission applications from A. J. Freeman, National Magnet Laboratory, MIT, Cambridge, Mass. 02139 (application deadline 1 April).

An interstellar gas dynamics seminar, sponsored by the National Science Foundation, will take place from 20 June to 15 July at the University of Wisconsin. Intended for graduate students and recent Ph.D's in astronomy and astrophysics, the course will cover theoretical and observational methods and results. Visiting professors will include H. C. Arp, G. B. Field, T. K. Menon, W. W. Morgan and E. A. Spiegel. Grants for travel and living expenses will be available for qualified applicants. Further information and application forms (deadline 15 March) can be obtained from D. E. Osterbrock, Washburn Observatory, University of Wisconsin, Madison, Wisc.

The Atomic Energy Commission, in cooperation with the National Science Foundation, will support 33 summer institutes in radiation science during 1966. Approximately 800 college and high-school science teachers will be enrolled for six- to eight-week periods at 26 colleges and universities and two large AEC installations. Further information can be obtained from the Division of Nuclear Education and Training, AEC, Washington, D.C.

This summer Arizona State University will offer programs in infrared and ultraviolet absorption spectroscopy (1-5 August) and in modern industrial spectroscopy (15-26 August). Each program will include morning lectures in theory and the application of various

spectroscopic methods. Afternoons will be spent working in the laboratory under experienced technical supervision. Costs include \$125 for the infrared program and \$200 for the emission program. Further information can be obtained from Dr. Jacob Fuchs, director, Modern Industrial Spectroscopy, Arizona State University, Tempe, Ariz.

USC science center

The University of Southern California is building a multi-story structure covering 106 000 square feet for research and teaching in solid-state science. About half the center's space will accommodate the physics teaching program headed by Maurice Pryce, physics-department chairman. The other half will house researchers in solid-state phenomena and a science-engineering library that will consolidate collections in the physical and other sciences.

FORGE

The Fund for Overseas Research Grants and Education (FORGE) offers a continuing program of research support to younger science teachers in emerging countries. Talent loss in science persists as a serious problem in developing countries, and FORGE grants are intended to encourage young scientists to remain in their home institutions and perform independent research. Supported mainly by private business, the program is guided by panels of scientific advisors including representatives from countries under consideration. Proposals are judged by scientific merit, capability and training of the applicant and prospects for effective prosecution of the research in his university. Grants can cover modest equipment, student support and other direct costs of a project. Although amounts granted are usually small by US standards (averaging about \$2000), they can be used to great advantage in developing nations. At the present time FORGE operates mainly in Latin America. More information can be obtained from the Executive Director, FORGE, Room 4310, 60 E 42nd St, New York, N. Y. 10017.