

Science Education

The National Science Foundation is sponsoring sixteen Summer Conferences for College Teachers of Science and Mathematics this year, of which five are open to physics teachers. The programs are designed to give a better understanding of new scientific developments and to help increase teaching effectiveness in the classroom. Participants will receive travel allowances plus stipends (up to \$15 a day) and will not have to pay tuition or fees. Applications for the following programs, which are open to physics teachers, should be made directly to the schools.

Carleton College will present (from June 19 to July 1) a conference in solid-state physics for teachers of undergraduate college physics who have had no formal training in solid-state physics. Six outstanding physicists will present an introduction to selected areas. Robert A. Reitz of Carleton will serve as conference director. Applications should be sent to Prof. William A. Butler, Department of Physics, Carleton College, Northfield, Minn.

Cornell College will offer a conference on radioisotopes and their uses (June 13-24) for college and junior college teachers of physics, chemistry, and biology. This program is aimed at helping participants to gain sufficient background in radioisotope techniques to enable them to introduce some of this technology into their own undergraduate courses. Apply to Dr. Cecil F. Dam, Physics Department, Cornell College, Mt. Vernon, Iowa.

The University of Detroit conference topic is graphics in scientific engineering. Open to college and university teachers of engineering graphics, mechanics, physics, and mathematics, the conference discussions (July 11-22) will involve graphical solutions of mathematical and scientific problems and will be conducted by educational and industrial engineering personnel. Apply to Prof. Paul M. Reinhard, Chairman, Department of Engineering Graphics, University of Detroit, Detroit 21, Mich.

The University of Florida conference (June 7-18) will deal with nuclear resonance and is open to college teachers of physics and chemistry with at least two years of experience. It will be devoted to the principles, instrumentation, and applications of nuclear magnetic and quadrupole resonance. Lectures by experts and some laboratory work will be included. Apply to Dr. Wallace S. Brey, Jr., Department of Chemistry, University of Florida, Gainesville, Fla.

Georgetown University will conduct its conference (August 1-24) on recent advances in astrophysics for college teachers of physics and astronomy. Included in the subjects of the lectures, to be given by experts, are satellite tracking, radio astronomy, planetary spectra, high-altitude balloons, lunar surface, rocket studies, cosmic rays, and interstellar medium. In addition there will be observational and experimental work at the Observatory with telescopes, computers, spectrographs, etc. Visits to research centers in the Washington area will also be included. Applications should be sent to Rev. M. P. Thekaekara, S.J., Director Summer Conference, Georgetown University, Washington 7, D. C.

Grants have been awarded to a large number of educational and research institutions under three other NSF summer institute programs, including the institutes for elementary-school supervisors and teachers, the research participation for teacher training program, and

Accelerator	Max energy GeV	Mean intensity Particles per sec.	Completion date
Brookhaven proton synchrotron (COS-MOTRON)	3	2.10^{10}	1952
Saclay proton synchrotron (SATURNE)	3	10^{10}	1958
Princeton-Pennsylvania proton synchrotron	3	2.10^{12} *	1960
Berkeley proton synchrotron (BEVATRON)	6	2.10^{10}	1954
Rutherford Laboratory proton synchrotron (NIMROD)	7	10^{12} *	1961/62
Russian A.G. proton synchrotron	7	$\approx 2.10^{10}$ *	1960
Russian proton synchrotron (Synchrophasotron)	10	$\approx 10^9$	1957
Australian proton synchrotron	10	10^{10} *	1962/63
Argonne zero gradient proton synchrotron	12.5	2.10^{12} *	1962
CERN proton synchrotron	28	2.10^9 *	1959
	25	3.10^9 *	
	6-10	10^{10}	
Brookhaven A.G. proton synchrotron	30	$\approx 3.10^{10}$ *	1960
Russian A.G. proton synchrotron	50	$\approx 10^{10}$ *	1961/62

Comparison of proton accelerators in operation or under construction is given in table compiled by CERN. Energies are given in giga (10^9) electron volts. Asterisks indicate target figures.

(1.61), Sweden (4.23), Switzerland (3.29), United Kingdom (25.00), and Yugoslavia (1.95).

As an experiment in international scientific cooperation, CERN has been a glowing success. The foresight of its planners, the enthusiasm of its staff, and the quality of its research equipment have combined in providing the European community with one of the world's great centers of fundamental nuclear research. It is doubtful whether any single Member State might have realized such an achievement alone, even if it could have afforded the financial burden involved, for CERN's strength comes from the combined efforts of talented scientists from many countries. This view has been widely expressed, but was stated perhaps most succinctly and optimistically by E. Amaldi of Italy, the chairman of CERN's Scientific Policy Committee, in speaking at the inaugural ceremony. "We know," Professor Amaldi said, "that this success is due to the research ability of the new generation, but also that it has its roots in the unimpaired scientific tradition of Europe which found new stimulus for development and which will flourish in the future in an atmosphere of cooperation between many countries on an unprecedented scale. We know that CERN is not only the result of the efforts of thirteen nations to solve technical and scientific problems that would far exceed the resources of any single European country. It is also the meeting point of scientists working in their national institutions. The simple existence of CERN has greatly stimulated the construction of accelerators in many national institutions of the Member States, while a larger part of the work done in the CERN laboratory is due to teams coming from national institutes with their own equipment. The exchange of ideas between the CERN physicists and physicists from national institutes constitutes the basis on which the research program is ultimately worked out."

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the secondary-school student training program. In all cases applications must be made directly to the participating institutions. Lists of the institutions involved in each of the programs may be obtained by writing to the National Science Foundation, 1951 Constitution Avenue, N.W., Washington 25, D. C.

The Quantum Chemistry Group of the University of Uppsala in Sweden, in collaboration with the Quantum Theory Group at the University of Florida, is arranging its third international summer institute in quantum chemistry. To be held in Uppsala, the institute will be divided into two sessions, of which the first, an introductory course, will be given from July 17 to August 6 and is intended as a basic course for beginning and advanced students in the field and to provide orientation for theoretical and experimental scientists in neighboring fields of physics and chemistry. It will be mainly devoted to a study of the mathematical structure of modern quantum theory of the electronic structure of matter. The second and more advanced course will follow during the period August 7-21 and is open to both experimental and theoretical scientists doing research in fields where the methods of quantum chemistry are essential. It will have the character both of a course and a small conference, and all activities will be conducted in English. Preliminary applications to attend a specific course should contain name, postal address, affiliation, educational background (examinations, degrees), field of studies or research, publications, age, citizenship, sex, and information about accompanying dependents (for students a letter of recommendation is desired). The applications should be sent immediately to the Director, Summer Institute, Quantum Chemistry Group, Rundelsgränd 2 A, Uppsala, Sweden. The deadline for final applications is May 15. A few stipends are available and may be applied for by submitting a statement of need, supporting evidence, and letters of recommendation.

The four Scottish universities are arranging a summer school in physics to be held August 1-20 under the sponsorship of the Advanced Study Institute Program of NATO. This year's school, on elementary particle dispersion relations with emphasis on the applications, will be directed by N. Kemmer (Edinburgh) and will include as lecturers G. F. Chew (Berkeley), M. L. Goldberger (Princeton), J. D. Jackson (Illinois), J. C. Polkinghorne (Cambridge), and W. Thirring (Vienna). The program is open to about 40 students of immediately predoctoral and postdoctoral standing. It will be presented in Newbattle Abbey, a mansion about 10 miles outside of Edinburgh. Further details and application forms may be obtained from D. J. Candlin, Tait Institute of Mathematical Physics, 1 Roxburgh Street, Edinburgh 8, Scotland.

The use and effects of radioactive isotopes in biology, medicine, and related fields is the subject of a course to be offered (August 1-26) by the Radiation Medicine Department of the Queens Hospital Center in New York. The faculty will include several guest lec-

turers as well as staff physicists and radiation experts from the Department. The course is open to teachers (including those from secondary schools) and to college science and pre-med students. The tuition is \$150. All inquiries regarding application forms and further details should be sent to Dr. Philip J. Kahan, Supervising Medical Superintendent, Queens Hospital Center, 82-68 164th Street, Jamaica 32, N. Y.

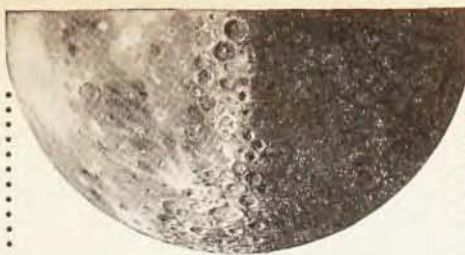
Among the special summer courses to be offered this year by the Massachusetts Institute of Technology are one on industrial photoelasticity (June 27-July 1), a pair of integrated courses on the technique (August 8-12) and applications (August 15-19) of infrared spectroscopy, and a program on techniques in high-speed photography (August 15-19). Complete information (course content, fees, etc.) on these and other summer courses is available from the Office of the Summer Session, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

Illinois Institute of Technology will offer two summer courses designed to provide training in the utilization of x-ray diffraction methods in the analysis of commercial materials. A course on the powder method in x-ray analysis (June 20-24) is designed for beginning students, and the other, on advanced methods in x-ray analysis (June 27-July 1), will be open to students already familiar with the fundamentals of x-ray diffraction. Complete information may be obtained from Dr. Leonid V. Azaroff, Illinois Institute of Technology, Technology Center, 35 West 33rd Street, Chicago 16, Ill.

Polytechnic Institute of Brooklyn is again offering a series of intensive summer laboratory courses geared to the interests of the industrial scientist. This year the Institute courses will cover x-ray diffraction (May 31-June 10), polarography and related techniques (June 6-10), applied infrared spectroscopy (June 6-10), and organic and physical chemistry of macromolecules (August 29-September 2). The fee for the x-ray diffraction course is \$250, for the others \$150. Further information on any of the above may be obtained from Mrs. Doris Cattell, Secretary, Summer Courses, Polytechnic Institute of Brooklyn, Brooklyn 1, N. Y.

A course intended particularly for scientists from industrial laboratories having spectrographic and spectrophotometric equipment will be offered from August 22 to September 2 by Arizona State University. The program for the 5th annual course in Modern Industrial Spectroscopy will include basic theoretical considerations and practical instrumental training. For complete information write to Dr. Jacob Fuchs, Director, Modern Industrial Spectroscopy, Arizona State University, Tempe, Ariz.

An interdisciplinary study in chemical and solid-state physics will be conducted at the Massachusetts Institute of Technology under two National Science Foundation grants totaling \$599 200. Principal investigator for the project is John C. Slater, institute profes-



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sor and director of the newly established Laboratory of Chemical and Solid-State Physics. He will be assisted by members of the Physics, Metallurgy, and Chemistry Departments in collaboration with members of the Department of Mechanical Engineering. The nature of various low-temperature phase transitions, such as changes in crystal structure, will be studied in selected ferromagnetic, ferroelectric, and organic materials through measurement of specific heat anomalies, by x-ray and neutron crystal-structure studies, by nuclear magnetic resonance techniques, and by other special methods. In addition, the elastic properties and the nature of the chemical bonding in these materials will be investigated from both a theoretical and experimental approach. Research in neutron physics will be conducted by the Physics and Metallurgy Departments, which will study crystallographic and magnetic phenomena in selected materials with a polarized beam neutron spectrometer.

A graduate program in the history and philosophy of science is to be offered for the first time next year by the Princeton University Graduate School. The program, leading to the Doctor of Philosophy, will be supervised by a five-man committee consisting of one historian, three philosophers, and one physicist. The latter is Valentine Bargmann of the Department of Physics and Mathematics.

E. I. duPont Nemours and Company has awarded grants totaling more than \$1.3 million to 143 universities and colleges for 1960-61 under its annual aid to education program. The program covers grants for unrestricted fundamental research in the physical sciences, for strengthening the teaching of science and related subjects, and for assisting with the cost of constructing and equipping new science and engineering facilities or renovating existing facilities.

Fritz London Award

Nominations for the Second Fritz London Award are being solicited from all low-temperature scientists by the Committee assigned to select the next recipient. If a suitable candidate is found, the presentation will be made at the Seventh International Conference on Low-Temperature Physics to be held from August 29 to September 3, 1960, in Toronto. The first such Award was made in 1957 to Nicholas Kurti of the Clarendon Laboratory, Oxford, England, at the Fifth International Conference on Low-Temperature Physics and Chemistry in Madison, Wisconsin.

The Fritz London Award is intended to honor the memory of Fritz London for the important advances he made in low-temperature science and to inspire others to important work and contributions in that field. Presented at an international conference on low-temperature science sponsored by the International Union of Pure and Applied Physics, it is made for outstanding research and for advances in the science of low-temperature physics and chemistry of great importance. A

distinction is made between research that advances low-temperature science and research that only makes use of low temperatures as a tool or a means to advance science in a different area. An honorarium of \$1000 has again been provided by Arthur D. Little, Inc., of Cambridge, Mass. In addition, there is a travel allowance of \$500 if needed.

The award is international and selections are made without regard to nationality. It is made for recent work without specifying a time limit since it is realized that some important work cannot be properly evaluated in a few years; this is especially true of theoretical work. It is expected that the recipient will have published important research papers in low-temperature science over a period of years, although that is not a requirement. Nominations should be accompanied by a description of the principal contribution or contributions of the candidate and his related work, together with a discussion of the importance of the candidate's work, and should be submitted promptly to any of the members of the Second Award Committee. They are: W. M. Fairbank (Department of Physics, Stanford University Stanford, Calif.); M. D. Fiske (Research Laboratory, General Electric Co., Schenectady, N. Y.); H. O. McMahon (Arthur D. Little, Inc., Acorn Park, Cambridge 40, Mass.); J. R. Pellam (Department of Physics, California Institute of Technology, Pasadena, Calif.); R. T. Webber (Department of Physics, Rutgers University, New Brunswick, N. J.); and the chairman, F. G. Brickwedde (College of Chemistry and Physics, The Pennsylvania State University, University Park, Pa.).

Prizes

The Research Corporation Award for 1959 was presented on January 21 to Melvin Calvin, professor of chemistry and director of the Bio-Organic Chemistry Group in the University of California's Lawrence Radiation Laboratory, in recognition of his investigations which constitute "the closest approach to the full resolution" of the mechanism of photosynthesis. Research Corporation, a foundation devoted to the support of scientific research, has given the award since 1925. It consists of a plaque, a citation, and a \$2500 honorarium. By tradition it recognizes achievements for which other major honors have not previously been received.

Dr. Calvin, who is a fellow of the American Physical Society, is known for studies of the chemical processes of photosynthesis in which he and his co-workers at Berkeley used radioactive carbon to trace the chemical mechanisms by which plants convert water, carbon dioxide, and sunlight into sugars, proteins, carbohydrates, and other energy-bearing materials. In accepting the award, Dr. Calvin stressed the value of collaborative research among scientists from different disciplines and pointed to the work for which he was honored as being an example of research involving the