

from the Office of Institutional Programs, National Science Foundation, Washington 25, D. C.

The Foundation has also announced two series of grants to aid summer study by teachers. Amounts totalling \$711 500 have been given to colleges and universities this year to support 21 summer institutes for elementary-school teachers, supervisors, and principals who are concerned with science instruction in grades 1-6. The program provides opportunities for about 700 individuals to obtain supplementary training in science and mathematics with a view to improving the quality of elementary instruction. The grants cover all costs, including subsistence stipends to the participants.

To aid teachers at an advanced level, approximately \$405 000 has been awarded by NSF for 25 summer conferences for college teachers of science, mathematics, and engineering. The conferences are of short duration (up to four weeks) and are intended for college staff members who must teach during the summer session. Participants will be selected by the individual conference directors, to whom inquiries and applications should be addressed. Conferences on physical subjects include the following:

Case Institute of Technology, Cleveland, Ohio: Molecular Structure and Spectroscopy (Gordon M. Barrow, Dept. of Chemistry)

University of Florida, Gainesville: Nuclear and Electron Spin Resonance (Wallace S. Brey, Jr., Dept. of Chemistry)

Georgetown University, Washington, D. C.: Recent Advances in Astro-Geophysics (Rev. Matthew P. Thekaekara, S.J., Dept. of Physics)

Princeton University, Princeton, N. J.: Non-Ideal Mechanical Behavior of Solids and Liquids (A. J. Maruca, Office of Dean of Graduate School).

The full list of conferences is available from the National Science Foundation, Washington 25, D. C.

Grants

The DuPont Company has announced that grants amounting to more than \$1.69 million have been awarded to 161 colleges and universities in the company's annual aid-to-education program. A total of \$654 700 was expended in direct support of teaching, including funds for assistantships and scholarships. Fundamental research grants totaled \$490 000 for unrestricted research in physics, chemistry, chemical engineering, mechanical engineering, and metallurgy. Ranging in amount from \$5000 to \$20 000, they may be used in any way desired, including the support of graduate students and thesis research. An additional \$48 600 was awarded by DuPont for summer research activities this year, and capital grants amounting to \$500 000 were made to help with the cost of new buildings, equipment, or renovation of existing facilities.

The Division of Radiological Health of the US Public Health Service has awarded a grant to the De-

partment of Radiology of Columbia University's College of Physicians and Surgeons. The award will provide financial aid to qualified students in the department's master's-degree program in radiological physics. Preference will be given to candidates sponsored by public-health agencies for work in their areas of responsibility or in closely related fields. Inquiries about the graduate program should be addressed to W. Gross, 630 W. 168th St., New York 32, N. Y.

Summer Programs

Massachusetts Institute of Technology will offer as one of its special summer programs a one-week course on "Signal Detection and Identification: Theory of Human Observers" from July 30 to August 3. The program is intended for those interested in research in psychophysics, in the design of man-machine systems, and in teaching general and engineering psychology. It will be directed by John A. Swets of the MIT Psychology Section and the Research Laboratory of Electronics. Lectures will be given by members of the MIT faculty and by guests from other universities.

Other summer courses to be conducted this year at MIT include two-week programs on radio astronomy, infrared spectroscopy, the structure of materials, and optical masers.

The course on radio astronomy (July 23 to August 3) is planned for engineers and scientists who desire a general survey of the techniques, results, and interpretations of radio astronomical observations. Discussions of the application of radio methods to atmospheric physics, planetary atmospheres, and space experiments will be included. Among the lecturers will be D. S. Heesch (National Radio Astronomy Observatory), A. E. Lilley (Harvard), A. Maxwell (Harvard—Fort Davis), K. Menon (Ohio State), H. J. Smith (Yale), J. Evans and J. W. Meyer (MIT Lincoln Laboratory), and J. W. Graham, R. P. Rafuse, and A. H. Barrett of the MIT faculty. The program is under the direction of Prof. Barrett.

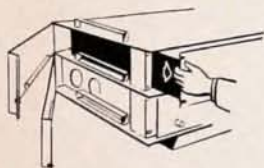
Two consecutive one-week courses at MIT will be devoted to infrared spectroscopy. The first, with the emphasis on technique, will be held from August 6 through August 10; the second, on the applications of infrared spectroscopy, will take place during the week of August 13-17. The course on technique will cover optical and electronic systems of infrared spectrometers, infrared spectrophotometry, techniques used to obtain spectra, and qualitative and quantitative analytical procedures. The course on applications will be devoted to a systematic study of the applications of infrared spectroscopy to the solution of chemical problems. Both programs will be directed by Dana W. Mayo, lecturer in chemistry at MIT. Lecturers will include Richard C. Lord (MIT), Foil A. Miller (Mellon Institute), Ellis R. Lippincott (University of Maryland), and, for the second course only, Lionel J. Bellamy (British Ministry of Aviation) and Robert S. McDonald (General Electric Research Laboratory).

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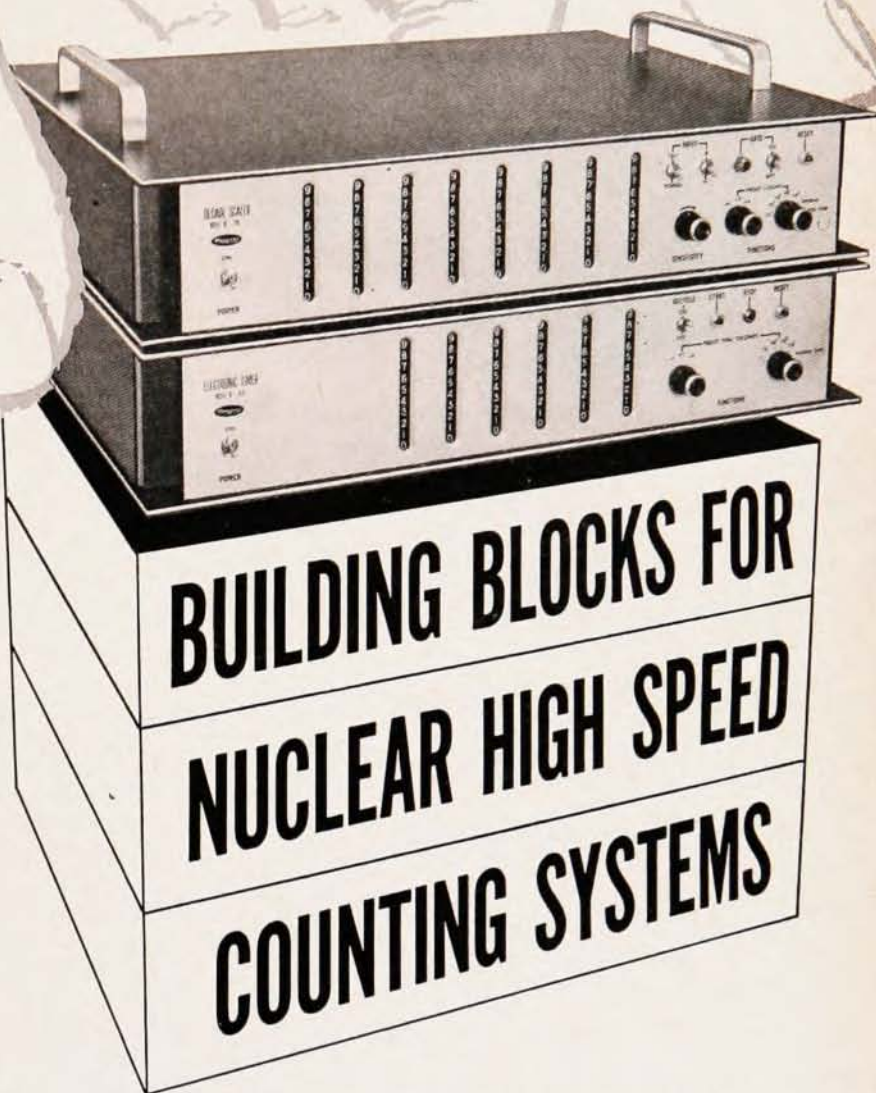
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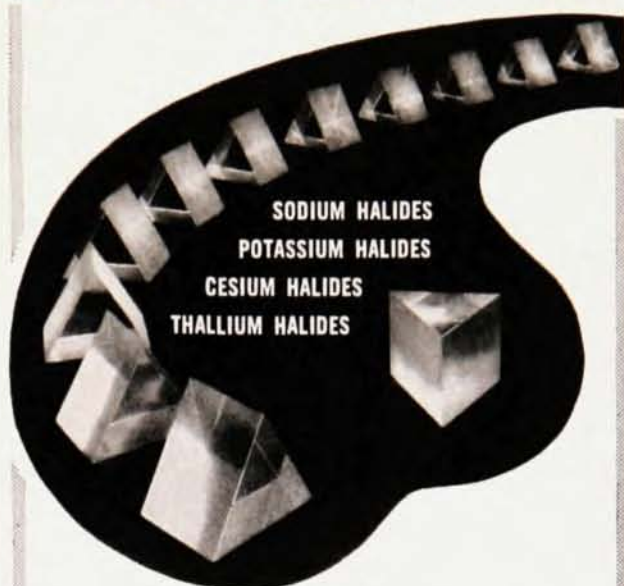
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The MIT course on the structure of materials will be under the direction of Arthur L. Loeb, associate professor of electrical engineering, and George W. Pearsall, assistant professor of metallurgy, and will review theoretical and experimental techniques for studying and describing crystalline configurations.

The course on optical masers will deal with the recent development of sources of coherent radiation in the visible and infrared spectral regions, leading to a new field of physics research in which future progress depends upon "a synthesis of concepts and techniques already familiar in radiofrequency engineering, physical optics, spectroscopy, and atomic and solid-state physics". The course, under the direction of Perry A. Miles, assistant professor of electrical engineering at MIT, will provide a broad introduction to this synthesis, to the theoretical bases of stimulated emission devices, and to a detailed analysis of the state of the art of continuous and pulsed wave generation. The modulation and detection of coherent light and the response of crystalline solids to high-intensity optical fields will also be discussed. Lecturers will include members of the MIT staff and guests who are active in the field in other universities and in industry.

Further information concerning the above courses can be obtained from the Director of Summer Sessions, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

A three-day course on the theory and practice of thermal neutron scattering diffraction, as applied to the study of solids and liquids, is to be held September 25-27 at Imperial College, London, under the auspices of the British Institute of Physics and Physical Society. It will be followed by a one-day conference on current neutron work on September 28.

The course is designed to provide physicists with a coherent account of the uses of thermal neutrons in the study of solids. It is expected that the lectures will cover the following topics:

1. Elastic scattering and structure determination; magnetic structures and hydrogen bonds.
2. Inelastic scattering from systems containing moving nuclei; phonon and spin-wave scattering.
3. Scattering from fluctuating systems; liquids, magnetic critical scattering.
4. Scattering from disordered solid solutions; magnetic form factors.
5. Crystal defect scattering.
6. The experimental techniques peculiar to these fields.

Both the course and the conference will be nonresidential, and those wishing to attend are urged to reserve accommodations in London as soon as possible. Inquiries should be addressed to the Administration Assistant, The Institute of Physics and The Physical Society, 47 Belgrave Square, London, S.W.1, England.

Courses on infrared and ultraviolet absorption spectroscopy (August 6-10) and modern industrial spectroscopy (August 20-31), will again be offered in 1962

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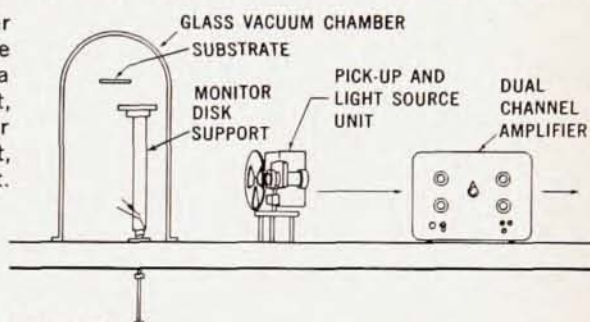
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by Arizona State University. Each of the programs will cover basic theoretical considerations, instrumentation, and practical applications of various spectroscopic methods in a series of morning lectures supplemented by afternoon laboratory sessions devoted to practical instrumental training. Emphasis will be placed on infrared techniques in the first course and on optical-emission techniques in the second; both will be conducted by members of the Departments of Physics and Chemistry at the University and by guest lecturers from industrial laboratories. For further information, write to Dr. J. Fuchs, Arizona State University, Tempe, Ariz.

A professional advancement course in nomography, stressing methods of constructing nomograms and including the underlying mathematical theory, will be given July 9-20 at Lowell Technological Institute under the direction of L. Ivan Epstein of LTI's Department of Physics and Mathematics. Designed for both beginners and experienced nomographers and for all scientists and engineers who are concerned with the construction of graphical devices for use by mathematically untrained personnel, the course will deal with projective and nonprojective transformations to attain a prescribed accuracy, to make full use of available page space, and to prevent the user from running off scale. Details can be obtained by writing to Prof. Epstein at the Lowell Technological Institute, Lowell, Mass.

The annual Fisk University Infrared Spectroscopy Institute (August 14-24) will devote one of its three sessions to gas chromatography this year. Participants will receive training in the use of gas chromatography units, in the preparation of columns and samples, and in the interpretation of chromatograms. This session will run concurrently with the first infrared session, with the lectures so scheduled that participants in one session can audit half the program of the other. The first infrared session will be designed to provide beginners with an introduction to theory and practice through lectures and a laboratory program; the second session, intended for those with some familiarity with the subject, will emphasize chemical interpretation of the infrared spectra in lectures and in a daily afternoon workshop. Lectures will be given by members of the Fisk Faculty and by visiting specialists from other institutions and industrial laboratories. Full information is available from Dr. Nelson Fuson, Director, Fisk Infrared Institute, Fisk University, Nashville 8, Tenn.

Boston College will again conduct its annual summer course in modern industrial spectrography, this year's dates being July 16-27. The course is intended for chemists and physicists from industry who wish to learn the techniques of emission spectroscopy for use in analytical work. Those interested should write to the Rev. James J. Devlin, S.J., Department of Physics, Boston College, Chestnut Hill 67, Mass.