

place again this year at the Little Theater of the Cloudcroft Lodge in Cloudcroft, N. M. The dates are June 19-30 and the subject is astrophysics. The program will consist of five lectures on ergodic theory by Eberhard Hopf, five lectures on celestial mechanics by R. S. Richardson, and two lectures each by Otto Struve, Donald H. Menzel, Gerard P. Kuiper, Carl Sagan, Seth B. Nicholson, John D. Strong, Herbert Friedman, N. U. Mayall, John D. Kraus, and George Gamow. A day-by-day program is available and arrangements to attend any or all of the lectures may be made by writing to Dr. J. R. Foote, P. O. Box 1053, Holloman AFB, N. M.

Arizona State University is planning a one-week (August 7-11) summer course in Infrared and Ultraviolet Absorption Spectroscopy designed particularly for persons from industrial laboratories which employ spectrophotometric equipment. From August 21 to September 1, Arizona State will offer its annual intensive summer course in Modern Industrial Spectroscopy for persons from industrial laboratories using optical emission techniques. Both programs will include basic theoretical considerations and practical instrumental training and both are to be under the direction of Jacob Fuchs. Additional information on the courses is available from Dr. Fuchs at Arizona State University, Tempe, Ariz.

Polytechnic Institute of Brooklyn will again conduct a series of intensive summer courses in the use of specialized tools in physics and chemistry. Designed for industrial scientists, this year's program includes a two-week course (May 29-June 9) on industrial application of x-ray diffraction and three one-week courses (June 5-9) on applied infrared spectroscopy, polarography and related techniques, and the chemistry of high polymers. Inquiries should be addressed to Mrs. Doris Cattell, Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn 1, N. Y.

Boston College has announced plans for its annual two-week (July 17-28) intensive course in modern industrial spectrography. The course is designed for chemists and physicists from industry who wish to learn the techniques of emission spectroscopy for use in analytical work. Correspondence should be directed to the Rev. James J. Devlin, S.J., Department of Physics, Boston College, Chestnut Hill 67, Mass.

Among the summer programs being offered by the Massachusetts Institute of Technology for 1961 are a course on fundamentals and applications of selected surface phenomena (June 26-July 7) under the direction of H. J. Bixler of the Chemical Engineering Department and an intensive course in infrared spectroscopy (July 17-24) under the direction of Richard C. Lord, director of the MIT Spectroscopy Laboratory. Enrollment is in progress. Application forms and additional information on these and other

courses can be obtained from the Director of the Summer Session, Dr. James M. Austin, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

The Twelfth Annual Fisk University Infrared Spectroscopy Institute will be divided into three sessions, two on infrared spectroscopy and one on gas chromatography. The first infrared session (on an elementary level) and the gas chromatography session will be conducted during the same four-day period (August 23-26). The second infrared session (August 28-September 1) is for those with experience in the field as well as for those who have completed the preceding first session. Address requests for further information to the Director, Fisk Infrared Institute, Fisk University, Nashville 8, Tennessee.

A two-week course in electron microscopy for research workers in the physical sciences will be given from September 3 to 15 by Pennsylvania State University's Electron Microscopy Laboratory. The program will consist of lectures by laboratory staff members and personnel from industrial and government research laboratories. Topics covered will include basic theory of electron optics, instrumentation, electron diffraction, specimen preparation techniques, applications, etc., and instruction will be given on both the RCA EMU-2D and Hitachi HU-11 microscopes. Further information can be obtained from Prof. Joseph J. Comer, College of Mineral Industries, Pennsylvania State University, University Park, Pa.

NATO Advanced Study Institutes

Under the sponsorship of the North Atlantic Treaty Organization, a number of advanced study institutes will be held in NATO countries during the coming summer and fall. Those dealing with physics and related areas are listed below. Requests for further information should be sent directly to the individual institutes.

Theoretical Physics, August, Montreal, Canada (Dr. L. E. H. Trainor, Theoretical Physics Division, University of Alberta, Edmonton, Alberta, Canada)

Solid-State Theory, July, Gent, Belgium (Prof. W. Dekeyser, Laboratorium voor Kristallografie en Studie van Vaste Stoffen, Rijksuniversiteit-Gent, Gent, Belgium)

Statistical Mechanics, August 1-16, Breukelen, Netherlands (Prof. B. R. A. Nijboer, NUFFIC, 27 Molenstraat, The Hague, Netherlands)

The Influence of Meteorological and Astronomical Factors on the Propagation of Radio Waves in Communication, August, Corfu, Greece (Prof. M. Anastasiades, University of Athens, Solonos Street 104, Athens, Greece)

Physical Oceanography, Especially Hindcasting Problems, August or September, Hamburg, Germany (Prof. W. Hansen, Institut für Meereskunde, Abteistrasse 15, Hamburg 13, Germany)

Fluctuations and Irreversible Processes, July 31-August 19, Newbattle Abbey, Dalkeith, Scotland (Dr. G. A. P. Wyllie, Natural Philosophy Dept., The University, Glasgow W.2, Scotland)

Elementary Particle Theory and the Many-Body Problem, June 26-August 5, Cargese, Corsica (Prof. M. Lévy, Université de Paris, Physique Théorique et Hautes Energies, B. P. No. 12, Orsay (S.-et-O.), France)

Cosmic Radiation and Space Research, May 23-June 3, Varenna, Italy (Prof. B. Peters, Universitets Institut for Teoretisk Fysik, Blegdamsvej 17, Copenhagen, Denmark)

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Professional Employment Manager
Bell & Howell Research Center
360 N. Sierra Madre Villa
Pasadena, California
SYcamore 6-9381**

Evidence for Gravitational Theories, June 19–July 1, Varenna, Italy (Prof. C. Möller, Universitetets Institut for Teoretisk Fysik, Blegdamsvej 17, Copenhagen, Denmark)

Liquid Helium, July 3–15, Varenna, Italy (G. Careri, Istituto di Fisica dell'Università, P. le Delle Scienze 5, Rome, Italy)

Semiconductors, July 17–August 5, Varenna, Italy (Prof. C. A. Hogarth, Dept. of Physics, Brunel College of Science and Technology, Woodland Avenue, London W. 3, England)

Nuclear Physics, August 7–26, Varenna, Italy (V. F. Weisskopf, CERN, Geneva 23, Switzerland)

Underwater Acoustics, July 24–August 4, London, England or La Spezia, Italy (Prof. V. E. Neilly, Pennsylvania State University, University Park, Pa.)

Exploitation of Solar Energy, August, Corfu or Rhodes, Greece (Adm. G. Spanides, Greek Atomic Energy Commission, Merlin 5, Athens, Greece)

Many-Body Problems, May 22–June 3, Bergen, Norway (Prof. B. Trumpp, Fysisk Institut, Universitetet i Bergen, Bergen, Norway)

NSF Programs

The National Science Foundation has awarded 357 new grants totaling \$3.2 million under its undergraduate research participation program, which is now in its third year. The grants, together with 165 awards made last year, will give several thousand undergraduate science students an opportunity to work alongside established scientists in college and university laboratories and in other research institutions. During the summer, 2400 students will take part in the program, and about 1900 will participate during the 1961–62 academic year. Of the total number of students, NSF estimates that 12 percent will work in physics, 37 percent in chemistry, 26 percent in the biological sciences, 13 percent in engineering, and the remainder in astronomy, mathematics, and other fields. The stated aims of the program are to help build the interest of superior students in research, to widen their understanding of scientific method, and to improve their ability to employ scientific investigative procedures.

Students receive nominal stipends while engaged in the programs, and are chosen on the basis of applications made to the individual institutions. Those scheduled to conduct undergraduate participation programs in physics and astronomy are listed below, together with the names of the program directors:

Physics

Spring Hill College, Mobile, Ala. (W. J. Rhein)
University of Arkansas, Fayetteville (G. T. Clayton)
University of California, Riverside (R. D. Archer)
Pomona College, Claremont, Calif. (A. L. Beilby)
San Diego State College, San Diego, Calif. (P. B. Sogo)
University of Santa Clara, Santa Clara, Calif. (J. B. Drahmann)
Stanford University, Stanford, Calif. (E. Hutchinson)
University of Colorado, Boulder (D. G. Burkhard)
University of Georgia, Athens (L. A. Rayburn)
University of Idaho, Moscow (M. M. Renfrew)
Illinois Institute of Technology, Chicago (P. Chiarulli)
De Pauw University, Greencastle, Ind. (J. L. Warren)
Earlham College, Richmond, Ind. (W. K. Stephenson)
Grinnell College, Grinnell, Iowa (G. O. Gale)
Iowa State University, Ames (D. E. Hudson)
University of Kansas, Lawrence (F. E. Samson)
Kansas State University, Manhattan (A. B. Cardwell)
Kansas Wesleyan University, Salina (C. B. Creager)
University of Kentucky, Lexington (J. R. Meadow)
Loyola University, New Orleans, La. (Rev. F. A. Benedetto)
Northwestern State College, Natchitoches, La. (F. L. Judd)
University of Maryland, College Park (H. Laster)
Boston College, Chestnut Hill, Mass. (Rev. W. G. Guindon)
University of Massachusetts, Amherst (P. R. Jones)