

Hans A. Bethe Wins Nobel Prize in Physics

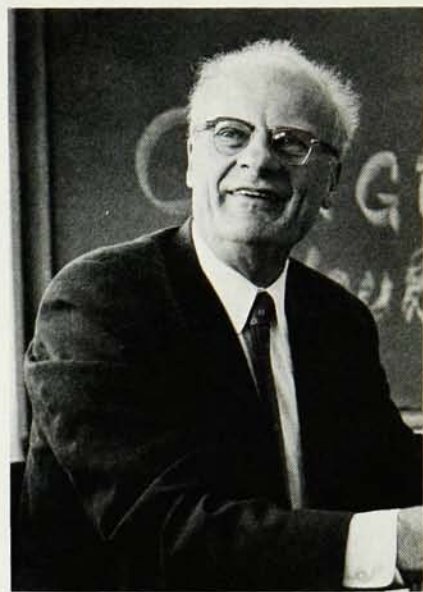
On 30 October the Swedish Academy of Science awarded the 1967 Nobel Prize in physics to Hans A. Bethe, professor of physics at Cornell University. The award cites "his contributions to the theory of nuclear reactions, especially his discoveries concerning energy production of stars."

Bethe was borne in Alsace-Lorraine in 1906. After receiving his doctorate in 1928 from the University of Munich, he was instructor of physics at the Universities of Frankfurt, Stuttgart and Munich. In 1930-32 he worked first under Lord Rutherford at Cambridge University and then under Enrico Fermi in Rome. When Hitler came to power Bethe was dismissed from the University of Tübingen where he was assistant professor in 1933. He came to the United States in 1935 and joined the Cornell faculty as acting assistant professor. During the second world war, Bethe served as head of the theoretical-physics division at Los Alamos Scientific Laboratory where he was instrumental in developing the atomic bomb.

In 1929 Robert Atkinson and Fritz Houtermans determined the probability of nuclear reactions occurring in a gas with a Maxwellian velocity distri-

bution.¹ They found at temperatures and densities existing in the interior of stars that protons penetrate atoms frequently and that such reactions can liberate enough energy to account for observed solar radiation. Almost a decade later, Bethe, in conjunction with Charles Critchfield, proposed that the so-called "proton-proton" process, in which protons form deuterons and eventually alpha particles, is a source of stellar energy.² In the same year, 1938, Bethe developed the theory of the carbon-nitrogen cycle.³ In this reaction four protons and two electrons are converted to an alpha particle with carbon acting as a catalyst. The energies produced by the carbon cycle and the proton-proton reaction are both in excellent agreement with the observed value of energy production in the sun.

Among his other important contributions are the first development of the theory of electron-positron pair creation in the electric field of a nucleus—resulting in the Bethe-Heitler formula and the development of an exact quantum-mechanical calculation of the stopping power of material for fast charged particles. He made further contributions to the theory of light nuclei, in particular the deuteron, and



BETHE

to the understanding of the mechanism of neutron absorption.

References

1. H.A. Bethe, C.L. Critchfield, *Phys. Rev.* 54, 248 (1938).
2. R. Atkinson, F. Houtermans, *Z. Physik* 54, 656 (1929).
3. H.A. Bethe, *Phys. Rev.* 55, 434 (1939).

Albert Whitford has been elected to succeed Bengt Strömberg as president of the American Astronomical Society. Whitford, who is currently director of the Lick Observatory at Mount Hamilton, Calif., will continue as acting president of the society until the summer of 1968 when he will begin a two-year term as president.

Visiting professors in the Institute for Theoretical Physics at Stony Brook are Marcos Moshinsky, professor at the Instituto de Fisica, Universidad Nacional Autonoma de Mexico, Andre Martin of CERN, and Yuval Ne'eman, of the University of Tel Aviv. Visiting associate professors are Gilbert Mahoux, from CEN, Saclay, and Giuseppe Furlan, from the University of

Trieste. Edward N. Adams of IBM and Guido Finocchiaro of CERN are visiting professors in the physics department.

Edwin Rush, Robert M. Brown and Larry L. Smalley have been appointed assistant professors at the University of Alabama, Huntsville.

Martin Greenspan has been named chief of the sound section, mechanics division, in the National Bureau of Standards Institute for Basic Standards.

Battelle Memorial Institute has appointed Sherwood L. F. Fawcett executive vice president.

Abraham Sosin, who was with North American Aviation, has received a

dual appointment as professor of physics and professor of mechanical engineering at the University of Utah.

Roger S. Van Heyningen has been named head of the physics division at Kodak Research Laboratories, Rochester, N. Y. He will succeed Julian H. Webb, a fellow of the American Physical Society, who retires in January.

Henry T. Motz of Los Alamos Scientific Laboratory has been appointed to the European-American Nuclear Data Committee of the Atomic Energy Commission. He has also accepted chairmanship of the AEC's nuclear cross-section advisory group.

York University, Toronto, has appointed the following assistant professors in the physics department: George Dar-

World's only gas lasers with just 1 control: an on-off switch



Model 200
0.6 milliwatt guaranteed
Full year warranty
\$195 complete

Model 240
1.0 milliwatt guaranteed
Full year warranty
\$295 complete

Never need adjustment, alignment, or maintenance

As simple to work as a light switch, these new, rugged He-Ne continuous gas lasers are operated by a single on-off control. Nothing more is necessary, because ULI's Lasertron™ plasma tubes have permanently aligned and sealed internal reflectors. Their proprietary design completely eliminates the need for adjusting mechanisms commonly found in other lasers of this type.

The tubes are long-lived and foolproof —will operate even under water! (They are practically complete instruments in

themselves and are available separately to OEMs.)

Since they have no mechanisms to get out of order or out of adjustment, these lasers are excellent performers in tough environments. The solid-state power supplies are simple and thoroughly reliable, assuring immediate, continuing output to specification.

Use the coupon to order now from University Laboratories, Inc./733 Allston Way, Berkeley, California 94710/Telephone: (415) 848-0491.

MODEL 200 \$195 complete
• Power over 0.6 milliwatt • Wave-length: 6328 Å • Uniphase (TEM₀₀) wavefront • Alignment stability guaranteed • Built-in collimator • Low ripple DC supply • Full year warranty.

MODEL 240 \$295 complete
• Power over 1.0 milliwatt • Wave-length: 6328 Å • Uniphase (TEM₀₀) wavefront • Alignment stability guaranteed • Built-in collimator • Adjustable tripod mount • Rugged design • Low ripple DC supply • Full year warranty.

UNIVERSITY LABORATORIES, INC., 733 ALLSTON WAY
BERKELEY, CALIFORNIA 94710

☐ Please send technical data on ULI lasers.
☐ Please reserve ☐ a Model 200 ☐ a Model 240 from your current production. My official purchase order and shipping instructions will follow.

Name _____

Organization _____

Address _____

City _____ State _____ Zip _____

Terms: 2% discount 10 days, net 30 days. ULI products returned for any reason, prepaid and undamaged, within 30 days will receive full credit.

University Laboratories

ewych from the University of Florida, **Hammond Dugan** of Harvard, **Walter Duley** and **Helen Freedhoff** from Imperial College, **James Laframboise** of the University of Windsor, **F. J. Morgan**, formerly with University of Western Ontario, and **Allan Stauffer** of the University of London.

Raymond H. McFee has been named associate director of Douglas Aircraft Co.'s advanced research laboratories in Santa Monica, Calif.

The physical science building at Kansas State University has been named Cardwell Hall in honor of **Alvin B. Cardwell** who recently retired as professor and chairman of the physics department.



GOLDWASSER

The Universities Research Association (URA) has announced the appointment of **Edwin L. Goldwasser** as deputy director of the National Accelerator Laboratory, at Weston, Ill.

He has been a professor at the University of Illinois.

Promotions in the physics department at Polytechnic Institute of Brooklyn include **Deo C. Choudhury** to professor and **Sandor J. Freedman**, **Guiseppo Oppo**, and **Stephen B. Soffer** to associate professors. **Nikolaos G. Alexandropoulos**, formerly at Syracuse University, and **Reuven Chen**, from the University of Tel-Aviv, have been appointed assistant professors.

The University of West Florida at Pensacola, has named **Palmer L. Edwards** of Texas Christian University professor and chairman of the physics department. **William B. Phillips** was appointed assistant professor.

Physicists selected as astronauts by NASA are **Joseph P. Allen**, former research associate at the University of Washington, **Philip K. Chapman**, staff member of MIT's experimental astronomy laboratory, **Brian T. O'Leary**, of the space sciences laboratory at the University of California, and **Robert A. Parker**, assistant professor of astronomy at the University of Wisconsin.

At the British Institute of Physics and the Physical Society, **Alice C. Stickland** has resigned as editor and deputy director. She has moved to the Royal Society where she will be editor of the proceedings of the Year of the Quiet Sun. Her editorial duties at IPPS have been taken over by **C. I. Pederesen** with the new title of "managing editor."

Lodewijk Woltjer, professor and chairman of the astronomy department at Columbia University, and **Norman H. Baker**, an associate professor in the department, have become editors of *The Astronomical Journal*.

York College, a new four-year college of the City University of New York, has appointed **Martin S. Spergel** and **Frank R. Pomilla** associate professors of physics. **Eugene Levin** has been appointed assistant professor.

Boris Dotsenko, former chief nuclear scientist at the Ukrainian Academy of Sciences in Kiev, has defected to Canada where he has studied at the University of Alberta for the past year.

Chalmers Sherwin, former Deputy Assistant Secretary of Commerce for Science and Technology, has joined the Office of Science and Technology as special consultant to OS&T director **Donald F. Hornig**.

Bruno Pontecorvo has been appointed head of a new school of space physics at Lake Baikal in Siberia. The Italian-born physicist defected to Russia in 1950.

Bernard Rosen, former head of polymer physics at Southern Research Institute, has been named director of the research division at Plas-Tech Equipment Corp.

Bernhard Gross has been appointed director, department of scientific and technical research, Brazilian National Commission on Nuclear Energy. He was formerly with the International Atomic Energy Agency.

Edward L. Robinson has become associate professor and director of the radiation laboratory at the University of Alabama, Birmingham. He was head of the physics department at Samford University.

New assistant professors at Virginia

Polytechnic Institute are **Ronald Adler** of the University of Colorado, **Richard Arndt** of Lawrence Radiation Laboratory, Livermore, **Ming-Chiang Li** of the Institute of Advanced Study, Princeton, **Jerome Long** of the University of Pennsylvania, **T. Daniel Nainan** of Nebraska Wesleyan and **David Roper** of Kentucky Southern College.

Western Michigan University has appointed **Robert Shamu**, formerly at Argonne National Laboratory, and **R. D. Kaul** who was with NASA Lewis Laboratories, associate professors.

Ronald S. Rivlin has been appointed director of the center for the application of mathematics, and Centennial University Professor at Lehigh University. He was formerly with Brown University.

Peter Scadron, formerly at Sprague Electric Company research center, has become assistant professor at Butler University.

Eldon Ferguson has been named director of the Environmental Science Services Administration's aeronomy laboratory in Boulder, Colorado.

Mildred S. Dresselhaus of Lincoln Laboratory has been appointed Abby Rockefeller Mauzé Visiting Professor at Massachusetts Institute of Technology.



WILLARD

Harvey B. Willard, formerly of Oak Ridge National Laboratory, has been appointed chairman of the combined physics department of the recently federated Case Western Reserve University.

Roy M. Thaler has been appointed vice chairman. **Ballur S. Chandrasekhar**, formerly chairman of Western Reserve's physics department, has been named Perkins Professor of physics. Recently promoted to associate professors are **John G. Adler**, **Kenneth L. Kowalski**, **Donald E. Schuele** and **Philip L. Taylor**. **J. A. Rix** has been promoted to assistant professor. New appointments include **William J. Fickinger**, formerly at Vanderbilt University, as associate professor and **Paul B. Kantor**, formerly at

Measures Biaxial Angular position or movement of the object on which it is sighted.

MODEL 440 TWO-AXIS ELECTRONIC HIGH SPEED AUTO-COLLIMATOR

**Simple ... Simultaneous ...
Biaxial!**



Is versatile and economical



Has fast dynamic response



Offers extreme precision



Represents a quantum jump
forward in electro-optical technology

PhysiTech, Inc. 

For Complete Details, Write or Phone (215) 657-2900
PHYSITECH, INC., WILLOW GROVE, PA. 19090

EXPANDING to serve you better

As of January 1st, 1968, Nuclear Enterprises will open a new plant with efficient production facilities in the San Francisco Bay area. All orders and enquiries for Scintillation Detectors and related products should be directed to our new address . . .

NUCLEAR ENTERPRISES

935 Terminal Way
San Carlos, California 94070
Phone (415) 593-1455

or:

Harshaw Chemical Co., Cleveland, Ohio, Ph. (204) 721-8300

ASSOCIATE COMPANIES:

Nuclear Enterprises (G.B.) Ltd., Edinburgh, Scotland;

Nuclear Equipment Corp., 931 Terminal Way, San Carlos, California

PHYSICISTS-SCIENTISTS

KEY PERSONNEL is a National organization devoted exclusively to the selective search for competent careerists among the technical disciplines.

Working closely with clients Coast to Coast, it is our policy to provide a professional service to scientists and engineers, that is ethical, knowledgeable and confidential. Our service is designed to provide YOU with a convenient focal point from which to explore, easily and efficiently, the numerous career opportunities existing anywhere in the U. S.

Our service to you—the individual scientist or engineer—is WITHOUT COST since our search fees are assumed by our organizational clients, who are Industrial, Defense and nonprofit organizations engaged in the advancement of the state-of-the-art.

We are currently searching to fill a broad spectrum of positions from semi-junior to General Manager across the entire continent.

If you would like to explore for yourself, our unique approach, write for our confidential summary form or forward a copy of your current résumé as soon as possible:

John F. Wallace
Executive Vice President



KEY PERSONNEL CORP.

218 Tower Bldg.

Baltimore, Md. 21202

Stony Brook, as assistant professor. **Victor L. Pollak** and **D. Parsons** are visiting assistant professors.



ULAM

Stanislaw Ulam, a research advisor at the Los Alamos Scientific Laboratory, has retired. He will become chairman of the mathematics department at the University of Colorado. He is known for work in thermonuclear weapons and for initiating the Monte Carlo Method of random sampling.

Appointments in the physics and astronomy department at the University of Maryland include **Nicholas A. Krall**, formerly of General Atomic Company, as professor. **Eduard A. K. Hintz** from the Institut für Plasma-physik at Jülich, **Chung-Yun Chang** of Syracuse University, **Douglas G. Currie**, formerly with Northeastern University, **George Gloeckler**, from the University of Chicago, **Michael P. Greene** of Brown University and **Winthrop S. Risk** of Princeton have been named assistant professors. **J. Patrick Harrington** has been appointed assistant professor in the department of astronomy.

The University of Oregon has appointed **Paul S. Csonka**, **George W. Rayfield** formerly of the University of Pennsylvania and **Gerald D. Mahan**, of General Electric Research and Development Center as assistant professors. **Henry E. Hall** of the University of Manchester has been named visiting professor.

The International Atomic Energy Agency named **Jersy Z. Minozewski** of Poland as director of its division of health, safety and waste disposal.

Kuldip P. Chopra has been appointed professor of applied physics at Nova University located in Fort Lauderdale, Fla.

Three Scientists Given Atoms for Peace Prize

Isadore I. Rabi of the United States, **Bertrand L. Goldschmidt** of France

and **W. Bennett Lewis** of Canada were named recipients of the Atoms for Peace Award. All three scientists are members of the scientific advisory committees of the International Atomic Energy Agency and of the United Nations. The prize, which carries an honorarium of \$90 000, was established by the Ford Motor Company as a memorial to the late Henry Ford and his son Edsel. It is given on the basis of the merit of the contribution, wherever found in the world and without regard for nationality or politics. This was the seventh award under a program originally initiated in response to President Eisenhower's 1955 appeal at Geneva for international efforts to develop nuclear energy for peaceful purposes.

Since he began teaching at Columbia forty years ago, Rabi has had considerable influence on the development of nuclear science through technical achievements, organization of new institutions, and the development of students who have become internationally renowned physicists. A key consultant in the formation of Brookhaven, Los Alamos and MIT atomic laboratories, he conceived the idea of European collaboration to create the European center for nuclear research (CERN). Rabi also has been an eloquent spokesman on the cultural values of science.

Bertrand L. Goldsmith participated in the early atomic energy research at the University of Chicago, and in Canada. In France, he has worked for the Commissariat on Atomic Energy, and since 1959, has been its director of foreign relations and programs. He has served for four years as executive vice president of the European Atomic Energy Society.

W. Bennett Lewis, a native of England, is senior vice president of Atomic Energy of Canada, Ltd., the government body supervising atomic research. Since 1946, he has been associated with the development of atomic energy in Canada. First he was director of the division of atomic energy research of the National Research Council, and since 1952, he has been vice president of the government's atomic research organization.

A fourth nominee for the award, **Vasily S. Yemelyanov**, has refused the prize. He is head of the Soviet Ad-

ministration for the Peaceful Uses of Atomic Energy.

Franklin Institute Award Goes to Murray Gell-Mann

Elementary particle theorist **Murray Gell-Mann** has received the Franklin Medal for 1967. The Medal, first awarded to Thomas A. Edison in 1915, is given to the individual who, in the opinion of the institute, has done most to advance a knowledge of physical science or its applications. Gell-Mann, who is Robert Andrews Millikan Professor of theoretical physics at California Institute of Technology, is being cited for contributions to elementary-particle physics.



GELL-MANN

While teaching at the University of Chicago, in 1953, he proposed a scheme for classifying strongly interacting particles into charged multiplets involving a new quantum number called "strangeness." Other problems, however, still remained—classification of separate multiplets of particles governed by weak interactions. Gell-Mann arranged such particles and resonances into groups of multiplets and supermultiplets that expressed the fundamental symmetries of nature: the "Eightfold Way." He made additional contributions to the understanding of dispersion relations, and suggested that physical laws developed by Tullio Regge for low-energy phenomena might be useful in the high-energy regions as well.

Gell-Mann, who has been visiting professor at the Collège de France and the University of Paris, as well as at MIT, is currently on leave for one year at the Institute for Advanced Study in Princeton, N. J. □