

Philadelphia Physicist Heads US Chess Players

A physicist has been elected president of the US Chess Federation. Leroy Dubeck, a solid-state experimentalist who is assistant professor in the Temple University physics department, will serve until 1972. Last month he represented the US at a meeting of the World Chess Federation in Puerto Rico.

Dubeck first began playing chess at 13 and has belonged to chess clubs



DUBECK

since his high-school days. The competitive aspect of the game particularly appeals to him. In a 3-round per day tournament, he told **PHYSICS TODAY**, an entrant may play 15 hours with only minimal breaks, and "you have to have a real competitive instinct to be able to do that."

A computer was Dubeck's most unusual and, it appears, querulous opponent. In the match between man and machine, played about ten years ago, Dubeck says that he made what he believed to be the winning move only to have the computer declare his position illegal. One of Dubeck's moves had been incorrectly transmitted, and the sponsor of the match considered that the result was indecisive.

Northeastern University, Boston has the following additions to its physics department: **Takeo Izuyama**, from the University of Tokyo, as visiting

professor; **David A. Garelick**, of Brookhaven, and **John Reading**, of the Atomic Energy Establishment, Harwell, as associate professors; **Evangelos Anastasakis**, of Pennsylvania State University, **Robert Boughton**, NSF postdoctoral fellow at the Swiss Federal Institute of Technology, **James L. Sigel**, of MIT Lincoln Laboratory and **Jeffrey Sokoloff**, of Brookhaven, as assistant professors; and **David Earles** as research associate. Promotions include **Michael Glaubman** to professor; **Lowell Dworin**, **Hyman Goldberg**, **Pran Nath** and **Fa Yueh Wu** to associate professors; and **Gary Greenhut** and **Gerard J. Dreiss** to assistant professors. Faculty on leave for 1969-70 are **Petros Argyres**, to the University of Paris; **Richard Arnowitz**, to King's College and Imperial College London; **Richard Grojean**, to the National Bureau of Standards; and **Roy Weinstein**, to Stanford University.

Albert Gold, former associate dean of the College of Engineering and Applied Science at the University of Rochester, has been appointed special assistant to the president of Rockefeller University.

Leonard I. Katzin, of Argonne National Laboratory, is spending the 1969-70 year as visiting professor in the department of inorganic chemistry at The Hebrew University, Jerusalem, with a parallel appointment part-time at Tel Aviv University.

Ferdinand Kroger is the new chairman of the department of materials science in the University of Southern California School of Engineering. **William G. Spitzer**, who has been chairman of the department since 1967, is now chairman of the physics department. In his new post, Kroger will be responsible for all research and instruction.

New director of the Third Physics Institute at the University of Göttingen is **Manfred R. Schroeder**, formerly of Bell Laboratories. Schroeder, at Bell since 1954, was most recently director of the Acoustics, Speech and Mechanics Research Laboratory. At the

Göttingen institute, emphasis is on acoustics and microwave research. Schroeder will also be professor of physics at the university.

John A. Pople, Carnegie Professor of chemical physics at Carnegie-Mellon University, has won the Irving Langmuir award in chemical physics. The award is to be presented at the spring meeting of the American Chemical Society.

The department of physics of the University of Louisville has the following new faculty members: **Roger E. Mills**, formerly a staff physicist at Battelle Memorial Institute, is an associate professor; **Shi-Yu Wu**, research associate from Case Western Reserve University, is an assistant professor; and **John F. Kielkopf**, 1969 PhD from Johns Hopkins University, is an assistant professor. **Manuel Schwartz**, who continues as head of the engineering physics department, is now also chairman of the physics department.

M. Donald Blue will be the first scientific attaché for Europe of the Honeywell Corporation. Blue, a solid-state physicist, has been doing research at Honeywell since 1956. His role in this newly created post will be to act as liaison between Honeywell and European university scientists.

John Hovorka, formerly in the MIT department of aeronautics and astronautics, is now chairman of the Division of Science and Mathematics and professor of physics at Curry College, Milton, Mass.

Two physicists were awarded prizes at the Franklin Institute Medal Day ceremonies on 15 Oct. **Emmett N. Leith**, professor of electrical engineering at the University of Michigan, received the Ballantine medal for his work in holography, and **Harold Edgerton** of MIT was awarded the Michelson medal for his development of equipment to photograph shock waves, nuclear phenomena and underwater subjects, and to explore the ocean by sonar. The institute ceremonies recognize international achieve-



Atomic Physics

ADVANCES IN ATOMIC AND MOLECULAR PHYSICS, Volume 5

edited by **D. R. BATES** and **IMMANUEL ESTERMAN**

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1969, about 430 pp., \$18.50



Quantum Liquids

THEORY OF QUANTUM FLUIDS

by **EUGENE FEENBERG**

This monograph presents an essentially elementary treatment, in a context of difficult problems, of the theory of uniform quantum fluids. Emphasis is placed on the microscopic description of liquid He^4 and He^3 in the physical density range using simple but basically realistic forms of the potential function between pairs of neutral atoms.

1969, 262 pp.



Shock Waves .

GAS DYNAMICS

by **ERNST BECKER**

translated by **E. L. CHU**

This book provides an introduction to the dynamics and thermodynamics of gases. Special emphasis is given to the foundations of the subject in the basic laws and theorems of thermodynamics and continuum mechanics. Conceived within the framework of phenomenological continuum theory, the book also takes into account those modern developments which have been stimulated by problems encountered in aero-space work. Concerned mainly with unsteady flow and steady super- and hypersonic flow, the author considers such basic flow phenomena as simple waves, shock waves, and boundary layers.

1968, 295 pp., \$15.00



Biophysics

ENERGY FLOW IN BIOLOGY

by **HAROLD J. MOROWITZ**

Presents a study of the emergence of biological-type order in physical systems. The analysis is carried out in terms of thermodynamics, statistical mechanics and kinetic theory. Systems undergoing energy flow from a source to a sink are shown to undergo molecular rearrangements to a more ordered state. The results of the physical analysis are applied to the "origin of life" problem as well as to present day terrestrial ecology, and the thermodynamic foundations of trophic ecology are analyzed.

1968, 173 pp., \$9.50

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ments in engineering and the physical sciences.

Dale R. Corson is the new president of Cornell University. Corson, who was Cornell provost, has been acting president since the resignation of James A. Perkins.

Eleven physicists from seven countries have received National Science Foundation fellowships to work in the US in a program to improve US science research and education. These winners are: **Florin Abeles** of the University of Paris, who will be at the University of North Dakota; **Emile Daniel** of the University of Strasbourg, France, who will be at American University; **Istvan Dezs**i of the Central Research Institute for Physics in Budapest, who will be at the University of Louisville; **Velpuri Lakshminarayana**, of Andhra University, India, who will be at Brigham Young University; **Shneior Lifson** of the Weizmann Institute, Israel, who will be at the Brooklyn Polytechnic Institute; **Ian Mark Mills** of the University of Read-

ing, England, who will be at Ohio State University; **Jürgen Schneider** of the University of Freiburg, Germany, who will be at Rice University; **Raymond W. B. Stephens** of Imperial College, London, who will be at the University of Houston; **Takao Tohmatsu** of the University of Tokyo, who will be at the Utah State University; **Manfred Winnewisser** of the University of Kiel, Germany, who will be at Mississippi State University and **Karl E. J. Wirtz** of the University of Karlsruhe, Germany, who will be at the University of Washington.

A newly created post at Sperry Rand will be filled by **Sidney M. Rubens**. Rubens will be director of special projects for the Univac federal systems division.

Charles A. Lincoln and **Myron Luntz** have joined the physics department at State University College at Fredonia, N.Y. as assistant professors.

1969-70 Visiting Fellows of the Joint Institute for Laboratory Astrophysics are: **Herbert P. Broida** of the University of California, Santa Barbara;

Mihai Gavrilă of Bucharest University; **Edward Gerjuoy** of the University of Pittsburgh; **Douglas W. O. Heddle** of the University of York, UK; **Mitio Inokuti** of Argonne National Laboratory; **Paul Ledoux** of the University of Liège, Belgium; **Edwin L. Lewis**, Oxford University; **H. Harvey Michels**, United Aircraft Research Laboratories, East Hartford; **Leonid P. Presnyakov**, Lebedev Institute, Moscow; **George B. Rybicki**, Smithsonian Institution Astrophysical Observatory, Cambridge; **Herbert Walther**, Institute for Experimental Physics, Technical College of Hanover, Germany.

Recent promotions at Michigan State University include **S. M. Austin**, **B. H. Dickinson**, **Gerald L. Pollack** and **P. A. Schroeder** to professor; **G. Stranahan** to associate professor; and **H. Ma** to assistant professor. **Truman O. Woodruff** and **Richard Schlegel** have rejoined the department after sabbatical leaves at the University of Pisa and Cambridge University, respectively.

Wilmot N. Hess has resigned his post as science director of the Houston Manned Spacecraft Center to direct the research laboratories of the Environmental Science Services Administration. Recent resignations from the space program also include **Elbert King**, curator of the Lunar Receiving Laboratory, who will head the University of Houston geology department; **Curtis Michel**, an astronaut, who has returned to Rice University as assistant professor of physics and **Donald Wise**, deputy director of Apollo Lunar Exploration, who has become visiting professor of extraterrestrial geology at the University of Massachusetts.

The Carborundum Company, Niagara Falls, announces that **H. Dean Batha** has been appointed associate director of research and development.

James W. Corbett has succeeded **C. Luther Andrews** as chairman of the physics department at State University of New York, Albany; **Benjamin E. Chi** has been promoted to associate professor; and **Keith Ratcliff**, from MIT, has joined the faculty as assistant professor.

Kodak has established a new physical-optics laboratory that will be headed by **James C. Owens**. Owens comes to Kodak from the US Environmental



ALLEN V. ASTIN (right), who retired at the end of August after 17 years as head of the National Bureau of Standards, was honored at a dinner on 22 Aug. The above photograph, taken at the dinner, shows Astin holding the metric-system bathroom scale that was presented to him as a parting gift. **Myron Tribus**, Assistant Secretary of Commerce for science and technology, is shaking hands with Astin while Undersecretary of Commerce **Rocco C. Siciliano** looks on. Astin, now 65, has been with the bureau since 1932 and will continue to serve it as consultant-director emeritus.

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U.S.A. (NEW YORK AND SAN FRANCISCO):

interviews beginning in mid-March 1970. **Last Day** for the receipt of applications: **9th January 1970.**

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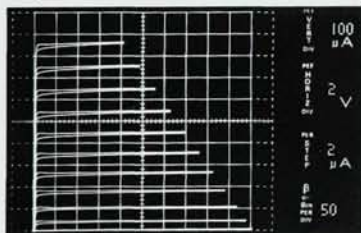
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EXPANDED VIEWING AREA—The large display area (10 cm x 10 cm, 12 cm usable horizontal), internal illuminated graticule, and bright trace bear directly on viewing ease, resolution, and readability.



Scale-factor readout effectively labels the display parameters near the CRT for convenient reference during setup and testing. The simple, but bothersome, correction for magnifiers or multipliers is computed and displayed, as is the often used value of Beta/div or g_m /div. Calibration data recording during photography is a prime convenience factor.

SETUP VERSATILITY FOR DIODES, TRANSISTORS, AND FET's—Multi-function switching makes test set-up faster and more understandable. By combining and pre-programming compatible functions, a single switch movement can select several normally-used conditions. Examples:



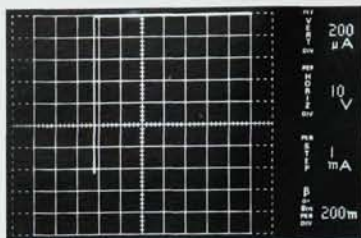
Other than the normal display functions, the NPN transistor waveform (above) required selection of collector range and percent, power limit, polarity and step amplitude. Step generator polarity and positioning is combined with the polarity switch; series resistance is determined by the voltage range and power limit switch.

Measurement Concepts

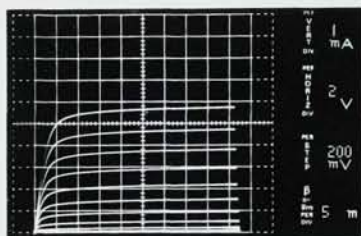


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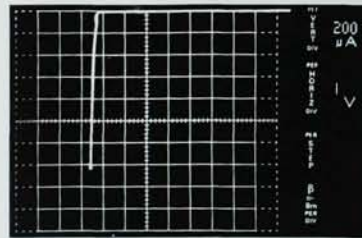


This Zener diode display required settings for collector volts, power limit, and polarity. The negative polarity selection positioned the trace-start to the upper right-hand corner. If desired, the display could be inverted with a single pushbutton. The Zener voltage at 1 mA is 72 V, accurate within 3%.



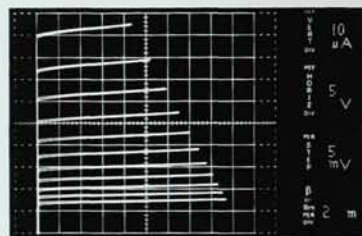
This MOSFET drain family test set-up is the same as for transistors except the step polarity was inverted for operation in the depletion region. The DC step offset could be used to view both enhancement and depletion characteristics by positioning the step-start below the zero bias level.

RESOLUTION AND CONTROL is enhanced in the Type 576 by the concept of calibrated offset. The DISPLAY OFFSET is a precision positioning control and X10 magnifier which calibrates the graticule centerline value and expands the effective measurement axis to 100 cm rather than 10 cm.



The display above is the same 72 V Zener diode test previously discussed except the display offset and magnifier are used to improve resolution and accuracy. The centerline value is now 70 V but the horizontal deflection factor is 1 V/div. The Zener voltage can now be resolved as 72.6 V within 2%, a X10 increase in resolution and improvement from 3% in absolute accuracy.

The calibrated DC STEP OFFSET allows the steps to start on a DC plateau up to X10 the step amplitude setting. It can either AID or OPPOSE the step polarity within the maximum current or voltage limitations of the generator, a control feature which is important to certain tests. One example is the enhancement-depletion FET display previously mentioned.



The display above shows a transistor test with voltage drive to the base. The DC STEP OFFSET permits positioning of the small voltage steps within the active region of the transistor base.

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Services Administration at Boulder, Colorado where he worked on optical propagation as it relates to atmospheric and geophysical problems. **Calvin D. Salzberg** of Kodak will spend this year at Stanford University.

Formerly with CBS Laboratories, **Andrew L. Dalisa** has joined the research group at Philips Laboratories, North American Philips Corp, Briarcliff Manor, N. Y.

Duane N. Sunderman is now assistant director for technical development at Battelle Memorial Institute, Columbus. He was formerly coordinator of basic research at Battelle-Columbus. Sun-

derman, a chemical physicist, has worked on a variety of problems including nuclear-fuel reprocessing and radiotracer techniques.



CHOPRA

Kuldip P. Chopra has been named professor of physics at Old Dominion University, Virginia. He was formerly professor of applied physics at Nova University in Florida.

Additions to the Los Alamos Scientific Laboratory staff include **William S. Bennett III**, **John J. Malanify**, **John E. Foley** and **Chester F. Hwang**.

Harry Hess, Space Board Chairman, Dies Suddenly

Harry H. Hess, chairman of the Space Science Board, died this August in Woods Hole, Massachusetts, where he was heading a board conference. Hess, 63, was professor of geology and curator of mineralogy at Princeton. His research interests were unusually varied, and he made important contributions in several fields: Hess was among the first proponents of the ocean-floor spreading hypothesis, contributed to the planning of the Apollo 11 scientific program and was influential in the design of the Houston Lunar Receiving Laboratory.

Among the honors Hess had received were the Feltrinelli medal of the Italian Accademia dei Lincei and the Penrose Medal of the Geological Society of America. The National Aeronautics and Space Administration recently cited him for his contributions to the space program.

Kenichi Watanabe Dies at 58; Studied Upper Atmosphere

Kenichi Watanabe, a University of Hawaii physicist, died in August at the age of 58. Watanabe, a native of Honolulu, studied at Caltech and received his PhD there in 1940. After teaching at both Cal Tech and Wabash College, he became a physicist at the US Naval Research Laboratory and in 1961 was made head of the Air Force Cambridge Research Center atmospheric-composition section. Wata-

nabe joined the Hawaii physics department as professor in 1954 and in 1961 was promoted to senior professor, the position that he held until his death.

Watanabe, a pioneer in the use of rockets to study the upper atmosphere, measured ozone concentration in that region, and his group was the first to measure in detail vacuum-ultraviolet absorption coefficients of several important upper-atmospheric gases. He established a vacuum-ultraviolet lab at Hawaii and this past spring received the Hawaii University award for excellence in research. Watanabe was a member of the National Aeronautics and Space Administration Planetary Atmospheres Panel and of the editorial advisory board of the Planetary and Space Science Journal and was a fellow of both the American Physical Society and the American Optical Society.

Cecil Powell, Cosmic-Ray Physicist, Dies in Italy

Cecil F. Powell died on 9 August in Bellano, Italy. At the time of his death he was visiting the summer institute at Varenna.

Born in 1903, Powell had worked under Charles T. Wilson and Ernest Rutherford at Cambridge, where he received his PhD in 1927. He then went to the University of Bristol to do work with A. M. Tyndall, and for the rest of his life he remained at Bristol where he became Melville Wills Professor of Physics in 1948 and

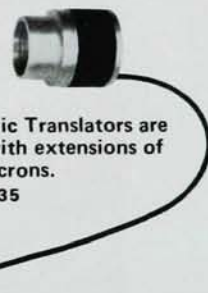
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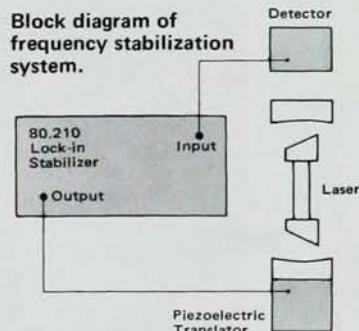


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