

CHARGE SENSITIVE PREAMPLIFIERS

NEW
PRODUCT



FEATURING

- Thin film hybrid technology
- Small size (TO-8, DIP)
- Low power (5-18 milliwatts)
- Low noise
- Single supply voltage
- 168 hours of burn-in time
- MIL-STD-883/B
- One year warranty

APPLICATIONS

- Aerospace
- Portable instrumentation
- Mass spectrometers
- Particle detection
- Imaging
- Research experiments
- Medical and nuclear electronics
- Electro-optical systems

ULTRA LOW NOISE < 280 electrons r.m.s.!

Model A-225 Charge Sensitive Preamplifier and Shaping Amplifier is an FET input preamp designed for high resolution systems employing solid state detectors, proportional counters etc. It represents the state of the art in our industry!



Models A-101 and A-111 are Charge Sensitive Preamplifier-Discriminators developed especially for instrumentation employing photomultiplier tubes, channel electron multipliers (CEM), microchannel plates (MCP), channel electron multiplier arrays (CEMA) and other charge producing detectors in the pulse counting mode.

Models A-203 and A-206 are a Charge Sensitive Preamplifier/Shaping Amplifier and a matching Voltage Amplifier/Low Level Discriminator developed especially for instrumentation employing solid state detectors, proportional counters, photomultipliers or any charge producing detectors in the pulse height analysis or pulse counting mode of operation.



AMPTEK INC.

6 DE ANGELO DRIVE, BEDFORD, MA 01730
U.S.A. TEL: (617) 275-2242
With representatives around the world.

the Pontifical Academy, Weisskopf was recently sent to present the Academy's position on the dangers of nuclear war to President Reagan.

in brief

The **Materials Research Society** has presented the 1982 **von Hippel Award** to **Clarence C. Zener**, Emeritus University Professor of Physics at Carnegie-Mellon University. The award, which recognizes outstanding and interdisciplinary contributions to a broad spectrum of work in materials science, was given to Zener for his "contributions of great originality and impact in the fields of metallurgy, physics and applied mathematics." His research interests include theoretical atomic physics, dielectric breakdown, ferromagnetism, an elasticity internal friction, solid-state diffusion, elastic constants and the thermodynamics and kinetics of metallurgical transformations. Most recently he has been involved in developing solar sea power.

Surendra P. Singh, formerly of the University of Rochester, and **Howard J. Carmichael**, formerly of the City College of the City University of New York, were appointed assistant professors of physics at the University of Arkansas, Fayetteville.

Torgeir Engeland and **John Rekstad** of the University of Oslo were presented jointly with the nuclear-physics prize of Norsk Data for their contribution to the understanding of the structure of deformed atomic nuclei. The prize is sponsored by Norsk Data, the computer manufacturing firm, and is given annually at the Norwegian Physical Society Meeting.

Donald Voss, formerly of Lawrence Livermore Lab, has joined the staff of Mission Research Corporation in Albuquerque.

John Philip, director of the Australian Institute of Physical Sciences, has been awarded the **Robert E. Horton Medal** by the American Geophysical Union for his contributions to geophysics. Philip is most widely known for his work in developing the physical theory and mathematical analysis of water movement in soil. He explained for the first time the physics of infiltration, a process of water movement which plays a central part in the hydrologic cycle.

Gerald A. Smith, formerly of Michigan State University, has been appointed professor of physics and head of the physics department at Pennsylvania State University. Joining him in the newly-formed Laboratory for Elementary Particle Science are his colleagues **James J. Whitmore**, as professor of physics, and **Benedict Y. Oh**, as associate professor of physics, both formerly of Michigan State University.

David Schramm, Chairman of Astronomy and Astrophysics at the University of Chicago, has been named Louis Block Professor in the Physical Sciences.

Margaret L. A. MacVicar, associate professor of physical science and Cecil and Ida Green Professor of Education at MIT, has joined the Carnegie Institution of Washington as vice president. While at Carnegie she will retain her academic affiliation with MIT and work with Carnegie's president, James Ebert, on policy and financial administration.

obituaries

Philip Rudnick

Philip Rudnick, a research physicist and mathematician at the Marine Physical Laboratory of the Scripps Institution of Oceanography from 1949 to 1969, died 10 June 1982.

Rudnick was born on 21 May 1904. He received his BS, MS and PhD degrees in physics from the University of Chicago. After graduation in 1931, Rudnick served as assistant, associate and full professor of physics at Vanderbilt University. From 1942 to 1945, he worked at the Applied Physics Laboratory of Johns Hopkins University with Merle Tuve's group on proximity fuses and later on ram-jets. In 1947, in correspondence with Carl Eckart, he expressed an interest in the Bureau of Standards' high-speed computer that

was to be located at UCLA. This interest in computational physics led him, two years later, to join the Marine

RUDNICK



Physical Laboratory, where he used the Danielson-Lanczos technique for analyzing signal spectra. Prior to World War II he had worked in spectroscopy and also on the optical and magneto-optical activity of crystalline nickel sulfate hexahydrate.

During his long affiliation with MPL, he made substantial contributions to sonar signal processing, underwater acoustics and electromagnetic wave propagation in the sea. His theoretical work with Victor C. Anderson on digital multibeam beamforming (DIMUS) processing provided the basis for DIMUS sonars now in service in the US Navy. He was also a member of the scientific team that developed the tapered hull shape and the wave-response capabilities of FLIP, Scripps's unique floating instrument platform. His other contributions include studies of very-low-frequency radio communication through the sea and advances in theory that made possible digital beamforming and other sonar system advances.

Rudnick's ability and innate modesty are epitomized by a comment he made when the fast Fourier transform algorithm became "discovered" and publicized. He had done quite a bit of work in acoustics and was always using the Fourier transform (based on the 1942 paper of Gordon Danielson and Cornelius Lanczos), which at best was a very tedious computation. When, in 1965, other mathematicians and physicists discovered the fast Fourier transform algorithm, a great to-do was made about it. The discoverers soon learned that Rudnick had been using the method for a long time. When they asked him why he had not advertised it, he replied that it had never occurred to him to do it any other way.

WILLIAM A. NIERENBERG

FRED NOEL SPIESS

VICTOR C. ANDERSON

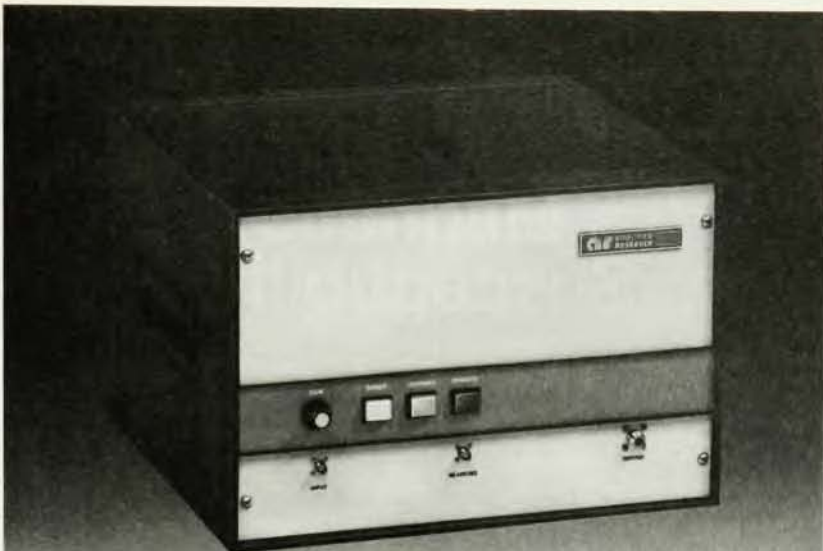
FRED H. FISHER

Scripps Institution of

Oceanography

Otto Halpern

Otto Halpern, a distinguished theoretical physicist, was born in Vienna on 25 April 1899. He was educated at the University of Vienna, completing his doctoral dissertation, in 1922, on photo-phoresis, under Hans Thirring. His attempt to take the next step in an Austrian academic career, to become *Privatdozent*, was unsuccessful, anti-Semitic attitudes being particularly pronounced in university circles in Vienna at that time. Instead he applied for a Rockefeller fellowship and studied for two years with Werner Heisenberg in Leipzig. In 1930 Heisenberg recommended him for a post at New York University, where he re-



Your NMR work deserves our RF amplifiers.

Conservatively-rated power amplifiers, with the noise-blanking capability that pulsed NMR demands, have been a specialty of ours for well over a decade. Whether your needs for clean rf power are at the 200- to 500-watt level (as supplied by our Model 200L shown here) or up in the kilowatt range, we have the pulse power systems to ensure your peace of mind.

During pulse operation (at duty cycles up to 25%), the 200L can deliver up to 500 watts over a bandwidth of 1-200 MHz; yet when blanked with a +5V signal it reduces noise 30 dB in less than 5 microseconds. We know how important that noise-free environment is to the integrity of your results.

If you're upgrading an existing system or moving into high-power spectrometry for solid-material experiments, we suggest you work for a few moments with an AR amplifier. Enjoy the instant frequency response without need for tuning or bandswitching; the total immunity to any degree or phase of load mismatch; the assurance that nowhere within the bandwidth will the output power be less than the rated minimum. (When we say minimum, we mean *minimum*.)

Call us to discuss your present and expected applications. Or write for our NMR Application Note 0013 and the informative booklet "Your guide to broadband power amplifiers."

AR **AMPLIFIER
RESEARCH**

160 School House Road, Souderton, PA 18964-9990 USA
Phone 215-723-8181 • TWX 510-661-6094

7816

Circle number 35 on Reader Service Card

PHYSICS TODAY / JULY 1983

79