

## we hear that

and mathematics and will also serve as the director of the Belfer Research Center, a facility conducting research programs related to energy science and technology, materials science and medical instrumentation.

Formerly the director of advanced research for the American Optical Corporation, **Elias Snitzer** has joined United Technologies' Research Center as manager of technical planning. Snitzer will be involved with programs in the area of fiber-optics telecommunications.

**Stephen G. Brush**, physicist and historian of science at the University of Maryland,

received the 1977 Pfizer Award presented by the History of Science Society for his book, *The Kind of Motion We Call Heat*, on the history of the kinetic theory of gases in the 19th century.

**Edward A. Knapp**, the associate division leader of the medical-physics division of Los Alamos Scientific Laboratory, was appointed the leader of the newly formed division of accelerator technology.

**Richard L. Herbst**, most recently affiliated with the applied-physics department of Stanford University, was named director of research for the Quanta-Ray Corporation, where he will be involved with laser-related instrumentation for nonlinear optics.

## obituaries

### Bernard Gregory

Bernard Gregory, one of France's most influential scientists, died at home in Elancourt, France, on Christmas eve at age 58. His death was a severe loss for French science, for the idea of international collaboration he so heartily espoused and for the community of high-energy physicists worldwide.

In 1938, Gregory gained first in the entrance examinations for both the Ecole Polytechnique and the Ecole Normale Supérieure, two of the most difficult *grande écoles* in France. He chose the Polytechnique, but after one year the war in France terminated his studies. Serving as a lieutenant, he was captured in 1940 and remained a prisoner until the end of the war in 1944. His accounts of his prison years, when he took every opportunity to obtain physics and mathematics books for his own study, were fascinating.

He returned to the Ecole Polytechnique, graduating first in his class of 1945. In 1948, he came to the United States for graduate work with Bruno Rossi at the Massachusetts Institute of Technology, where he received a PhD for his work on the interactions of cosmic rays and nuclei.

In 1951, Gregory became an assistant director at the cosmic-ray laboratory of the Ecole Polytechnique, where he, with many other excellent young physicists, devoted his scientific efforts to problems in cosmic rays. Gregory was invited to Brookhaven National Laboratory, where one of the big new accelerators was in operation, in 1958.

He became the scientific director of CERN in the early 1960's, and contributed much to make it an active center for European physicists and non-European guests. In particular, his persuasive arguments were of great help to the Di-



GREGORY

rectorate in its efforts to expand CERN's facilities by constructing the intersecting proton storage ring (perhaps better known as the ISR), an addition that was to give CERN a unique facility in particle research.

He was appointed the director-general of CERN in 1966, and during his five-year term CERN continued to be in the forefront of particle research and also a truly international center with American, Russian and other foreign physicists working productively with the Europeans.

In 1971 Gregory returned to Paris and became the head of the High-Energy Laboratory at the Ecole Polytechnique, and in 1973 the French Government appointed him the director of the Centre National de la Recherche Scientifique, a post roughly equivalent to the director of the National Science Foundation. Three years later he stepped one rung higher, taking over the Delegation Generale à la Recherche Scientifique et Technique, a position comparable to the US Presidential Scientific Adviser.

# LeCroy

The large variety of logic units offered by LeCroy allows selection to meet a wide range of applications. The design of LeCroy logic units also affords the maximum counting rate capability and minimum coincidence resolving time possible with *no sacrifice of reliability*. Special LeCroy features include:

- **Minimum propagation delay**

Low input-output delay means rapid decision-making, even with complex trigger configurations. This can represent substantial savings in analog delay cable.

- **Compact packaging**

High density single-width NIM modules, with multiple channels per module, minimize requirements for NIM bins.

- **Veto**

Inhibit capability affords greater versatility of trigger selection and in many applications decreases the total decision-making time.

- **Updating**

Updating outputs allow maximum counting rate capability without saturation. Veto efficiency is therefore maximized by updating.

- **High fan-out**

Most LeCroy logic units supply multiple outputs. This allows for complex trigger configurations with ease.

- **Complementary logic**

The complementary outputs on all logic units increase their versatility. Complementary logic may also be used to generate delays without cable.

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Fill a NIM bin without overloading the power supply. Low power means lower operating temperature and thus high reliability.

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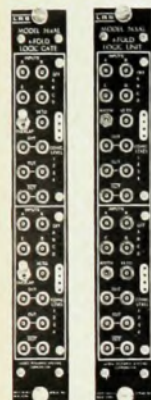
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## COINCIDENCE



### Dual 4-Fold Majority Logic MODELS 364AL, 365AL

The standard for resolving time, counting rate and reliability. Choose between the 364 Series (overlap output) and the 365 Series (adjustable output width). Programming pins virtually eliminate accidental changes in operating mode. These updating units feature separate veto for each channel and guaranteed 150 MHz operation.



### Triple 4-Fold Coincidence MODEL 465

This high-density coincidence unit features both adjustable output width and overlap outputs. Guaranteed 120 MHz operation, 1 nsec coincidence resolving time, separate veto for each channel, and updating operation.



### Quad 2-Fold Logic Unit MODEL 622

Each of the four independent updating channels of the 622 may be used in coincidence and OR mode. The unit features a common veto, high fan-out per channel, updating operation, and the widest range of output width adjustment of any LeCroy logic unit.

## HIGH-MULTIPLICITY LOGIC



### 8-Channel Strobed Coincidence MODEL 370C

Accepts 8 NIM inputs and a latching strobe to record the status of a set of detectors. Coincidence resolution < 1.8 nsec. Useful for multitrigger configurations. 125 MHz operation.



### Multiplicity Logic Unit MODEL 380A

Accepts up to 32 NIM inputs. Supplies a NIM logic pulse when N inputs fire simultaneously ( $1 \leq N \leq 6$ ). N is switch-selectable. A > N output is also supplied. Larger multiplicity and greater than 32 inputs are achievable by using the summing output. Module simplifies straightforward hodoscope logic.



### Quad Mixed Logic Fan-In/Fan-Out MODEL 429A

Each of the 4 independent channels logically ORs 4 NIM inputs. All inputs respond to both NIM and TTL signal levels. Provides three - 32 mA NIM output pairs, two normal and one complementary. Contains provision for channel mixing  $2 \times 8$ ,  $4 \times 4$  or  $1 \times 16$ . Direct-coupling throughout means no duty cycle effects. Unique design keeps power requirements within NIM specs.

## MEANTIMER



### Octal Meantimer MODEL 624

...deadtimeless circuit designed to equalize photon transit time in large scintillation counters. Discriminated signals from both ends of the scintillator are employed. The unit gives less than 300 psec FWHM timing and offers three NIM outputs per each of the 8 channels. This circuit allows large counters to participate in coincidence triggers without computer corrections.

## GATE GENERATORS



### Dual Gate and Delay Generators MODELS 222, 222N, 222NL

Two channels per module each give gates of 100 nsec to 11 sec. Accept NIM or TTL inputs and supply both as outputs. Completely deadtimeless operation.

## LEVEL ADAPTER



### Level Adapter MODEL 688AL

Solves the problem of mixing NIM and TTL logic signals. Converts 8 channels of NIM to TTL and 8 channels of TTL to NIM.

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## obituaries

In spite of his time-consuming work as the key man of French science, he maintained a personal interest in CERN and in activities directed towards international cooperation in science. In 1975 he was chosen to be the chairman of the Division of Particles and Fields of the International Union of Pure and Applied Physics and also served as the chairman of the newly founded International Committee of Future Accelerators. Only weeks before his death, Gregory was elected chairman of the CERN Council, the decision-making body of the Laboratory.

Everyone who had the opportunity to work with Gregory was struck by his simplicity and modesty. He had a rare gift of cool, rational, cartesian thinking in matters where others might react emotionally or impulsively. This trait made him an extraordinary coordinator and administrator. At the same time he had a deep love for simple, elegant physics.

Above all, he was a wonderful human being; without him it will be difficult to continue the drive towards European and world collaboration in science to which he devoted so much of his life.

RONALD R. RAU

Brookhaven National Laboratory

VICTOR F. WEISSKOPF

Massachusetts Institute of Technology

### Reuben S. Title

Reuben S. Title, research physicist at the IBM Thomas J. Watson Research Center, Yorktown Heights, New York, died suddenly at the age of 47 on 28 November 1977. His work in electron spin resonance is well known to solid-state physicists and chemists.

He was born in Toronto, Canada, in 1930 and received BA and MA degrees in physics from the University of Toronto in 1951 and 1952. After studying on an 1851 Exhibition Scholarship, he was awarded the PhD degree from Cambridge University in 1956. After one year at the National Research Council of Canada and another at the Bell Telephone Laboratories, he joined the IBM Research Division in 1958 as a research physicist and later became manager of the Electronic Properties of Materials group. He returned to the Cavendish for a sabbatical year in 1973-74.

Title began his scientific career in atomic beams, but soon made the transition to electron spin resonance, a subject in which he made many important contributions. He saw spin resonance as a powerful tool in obtaining specific and unique structural information about materials and was usually one of the first to obtain samples of new materials in order to see what useful information about them he could uncover.



TITLE

Title was one of the earliest workers to use the technique of photoexcitation to produce or change epr spectra in luminescent materials, especially in rare-earth phosphors and II-VI materials. He also wrote a definitive survey of paramagnetic resonance in II-VI materials.

He and his co-workers were the first to report the characteristic epr signal of amorphous silicon and germanium. Their interpretation in terms of "dangling bonds" has provided the basis for many further developments. His studies on ion-implanted silicon crystals led to useful models for the formation of continuous amorphous layers and for the kinetics and annealing of ion damage.

Title also investigated various III-V semiconductor materials. Some of his last experiments were on superionic conductors, where the paramagnetic ion itself may be in motion.

In his years at IBM he helped to establish a sense of cooperation and of mutual interest and support within the laboratory. His advice and expertise were highly valued by all his colleagues. He will be greatly missed.

A. H. NETHERCOT

IBM Corporation

Yorktown Heights, N.Y.

### Richard Roberts

On 17 January Richard W. Roberts, age 43, died suddenly at his home in Wilton, Connecticut. He had become widely known and admired as an administrator and manager of research organizations in both private industry and the Federal government. All who knew him had high expectations for his future.

He graduated in chemistry from the University of Rochester (BS in 1956) and from Brown University (PhD in 1959), and spent a year as a National Academy of Sciences postdoctoral fellow at the National Bureau of Standards, an organization to which he would later return as director.

After joining the General Electric Research and Development Center in 1960,