

consultations, became a driving force for electron-positron storage rings at DESY, thereby setting the direction for the laboratory's successful future with the DORIS, PETRA, and HERA colliders.

Jentschke fostered close personal and scientific contacts between DESY and CERN. His success with DESY made him a natural candidate for becoming director general of CERN, a position he held from 1971 to 1975. The era of his directorship was marked by the physics performed with the Intersecting Storage Rings, the construction of the Super Proton Synchrotron, and a successful neutrino physics program that culminated in one of CERN's most important results: the discovery of the neutral weak current.

After completing his term at CERN, Jentschke returned to the University of Hamburg as a professor of physics and director of the university's physics institute. In 1977, he took a sabbatical leave to take part in what was probably the most exciting experiment in particle physics at the time: SLAC's polarized electron-deuteron scattering measurements that first established electroweak interference. Named professor emeritus in 1979, Jentschke continued to actively follow the

progress at DESY and elsewhere, participating regularly in seminars, colloquia, and scientific discussions; upholding international connections; and serving on international and national advisory boards.

Jentschke had an immense and contagious enthusiasm for physics. Eager to learn and discuss, he stimulated thoughts and ideas among others. Most important, he had vision and courage. A scientific leader, he granted his colleagues much freedom and responsibility. The atmosphere he created remains preciously present at DESY as his lasting legacy.

**Paul Söding
Albrecht Wagner**

*DESY and University of Hamburg
Hamburg, Germany*



Lyle Benjamin Borst

Lyle Benjamin Borst

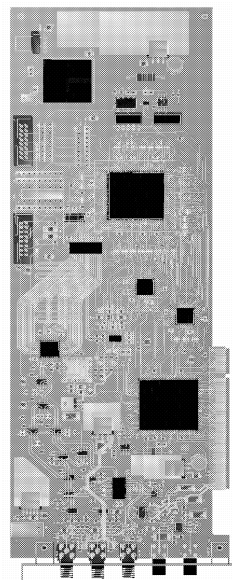
Lyle Benjamin Borst, who led the construction of the graphite reactor at Brookhaven National Laboratory, died on 30 July 2002 at his home in Williamsville, New York.

Lyle was born on 24 November 1912 in Chicago, Illinois. He received both bachelor's and master's degrees in chemistry from the University of Illinois. In 1941, he was awarded a

PhD in chemistry from the University of Chicago. His doctoral dissertation, prepared under William Draper Harkins, was entitled "The Angular Distribution of Recoil Nuclei."

Between 1941 and 1943, Lyle was a research associate at the Metallurgical Laboratory in Chicago. He joined Clinton Laboratories (later Oak Ridge National Laboratory) in Oak Ridge, Tennessee, in 1943; there he worked

Multiple-Hit TDC for TOF Mass-Spectrometry and Photon-Counting – new version offers 250 ps time resolution



MODEL P7887 WITH DATA ACQUISITION RATES OF UP TO 4 GHZ

- PCI-board with on-board FIFO for continuous fast data transfer
- Histogramming in the PC at more than 11,000,000 stop events/s
- Sweep range to 1s (with offset to 68s) and continuous
- **Multi-hit capable; No Deadtime, No Missed Events, No Double Counting**
- WINDOWS 98/NT/2000 based operating software included
- Two on-board ultra-fast discriminators for pos. and neg. inputs
- Options: Tag-inputs, Oven controlled oscillator and Drivers for LabVIEW and LINUX

Other versions with 500 ps, 1 ns and 2 ns time resolution are also available

For more details and applications visit our site:

www.fastcomtec.com
In the USA call 831-429-5227

FAST

For information contact:
ComTec GmbH

FAST ComTec GmbH, Grünwalder Weg 28a
D-82041 Oberhaching/Germany

Web-Page: <http://www.fastcomtec.com>, e-mail: support@fastcomtec.com
Phone: +49-89-665180-50, FAX: +49-89-665180-40, in the USA call (831) 429-5227

Circle number 27 on Reader Service Card

THERMOCUBE

Thermocube Thermoelectric Chiller

Precise Temperature Control of Lasers or Other Equipment
Excellent Reliability, and Energy Conservation

Choose The Thermocube When You Need:

- Cooling to 400 Watts
- Operating range of -5 to 50 +/- 0.2 °C, even near ambient
- 40 psi pumps standard
- Compact 1ft³ case
- Quiet 57 and 62 dBA models



**Solid State
COOLING SYSTEMS**

20 Pleasant View Road
Pleasant Valley, New York 12569
Phone: 845-635-5500
Fax: 845-635-8081
www.sscooling.com

BE SURE TO VISIT US AT PHOTONICS WEST BOOTH #1841

Circle number 28 on Reader Service Card

as a senior physicist on the Manhattan Project. In 1946, he was named chairman of Brookhaven's department of reactor science and engineering, where he developed the design of the lab's graphite reactor and eventually was in charge of its operation.

Lyle had been involved earlier in the X-10 reactor at Oak Ridge, which was also air cooled. That experience led him to a number of changes that greatly enhanced the design of the new reactor in terms of its research capability. Most important, he changed the geometry of cooling by designing a vertical cut across the center of the graphite structure, thus separating the two halves and permitting the coolant air to enter the approximately 10-centimeter-wide gap. The coolant then moved in opposite directions through the two halves into separate plenums and then to a common stack for release at about 350 feet above ground. The separation of the coolant stream into the two halves led to cooling channels only half as long as the graphite structure. The shortened air-flow path reduced the pressure drop of coolant across the reactor markedly for a given rate of flow through each channel and led to substantially increased power for the same pressure drop.

As a result of Lyle's innovations, the design power of the graphite reactor was 28 MW compared to the 2–3 MW of the X-10 reactor. Lyle also settled on control and scram rods that penetrated the core at the corners in a diagonal scheme, which allowed for the reactor's maximum surface area to be used for experimental facilities. More than 50 experiments could be installed simultaneously—more than all other research reactors in the world combined.

Lyle's design also improved the cooling of the reactor's fuel. To permit the relatively high power that the reactor generated, the natural uranium fuel was enclosed in aluminum tubes with six fins each to increase the heat transfer area. The sealed cans with the fuel elements were filled with an atmosphere of helium to protect the uranium from oxidation by the coolant air. The system's integrity was monitored for leaky elements by sensors.

In 1951, Lyle left Brookhaven for the University of Utah, where he became a professor of physics. At that time, atmospheric testing of nuclear weapons was at a peak, which greatly upset Lyle. After collecting fallout in his yard and concluding that the resulting amounts of radioactive material were health-threatening, he gave interviews to newspaper reporters

about his concerns and made his views known to the Atomic Energy Commission.

Lyle left Utah in 1954 for a faculty position at New York University, where he taught physics and nuclear engineering. While at NYU, we sent him a supply of uranium slugs from the graphite reactor's stockpile that we had used in a maximum-criticality experiment. Lyle used the uranium in an experimental lattice arrangement installed in an olive barrel, an experiment that became known as the "Pickle Barrel" experiment. The "pickle barrel" ended up in the Smithsonian Institution as the first teaching subcritical reactor.

In 1961, Lyle joined SUNY Buffalo as a professor of physics. He served in that position until 1983, when he was named a professor emeritus.

Lyle was a proponent of openness in the nuclear program. He cofounded both the Association of Oak Ridge Scientists and the Federation of American Scientists, organizations that had openly backed the McMahon bill and civilian rather than military control of atomic energy. Later, he was a member of the national board of the American Civil Liberties Union.

Lyle was a strong and forceful advocate for what he believed was technically and morally correct. His efforts have left a lasting imprint on the peaceful uses of atomic energy.

Bernard Manowitz
Brightwaters, New York
Herbert J. C. Kouts
Brookhaven, New York

George Briggs Collins

George Briggs Collins, particle experimentalist, educator, and administrator, died on 15 December 2001 after a long battle with Alzheimer's disease.

George was born in Washington, DC, on 3 January 1906. He attended Johns Hopkins University, where, in 1932, he received his only degree, a PhD in physics in the emerging field of UV spectroscopy, under the direction of R. W. Wood.

In 1933, George accepted a position on the faculty at the University of Notre Dame. There, he built one of the highest-energy Van de Graaff accelerators at that time. Eight years later, having attained the rank of professor for his pioneering work on nuclear excitation and disintegration, he left Notre Dame to assist in the war effort at MIT's Radiation Laboratory. He led the magnetron group, which contributed to the development of radar for the US military. George also

helped document the laboratory's technical series on advanced electronics. He served as the deputy editor of the MIT Radiation Laboratory Series and was the author of volume 6 of that series: *Microwave Magnetrons* (McGraw-Hill, 1948).

George joined the physics department at the University of Rochester in 1946 and served as chairman, beginning that year, until 1950. Not only did he strengthen the department through new faculty hires such as Robert Marshak, but he was also in charge of the construction and operation of the 240-MeV synchrocyclotron. He and Marshak initiated the Rochester Conference series—the first conference was in 1950—which continues today as the International Conferences on High-Energy Physics.

George was called to Brookhaven National Laboratory in 1950 to serve as chairman of the Cosmotron department, which was responsible for the construction and operation of the first accelerator to achieve energies in excess of 1000 MeV. As a Fulbright fellow in Belgium during 1957 and 1958, he proposed a plan for increasing the participation of Belgian universities in high-energy physics research.

Transferring in 1962 to Brookhaven's physics department, George worked as a senior physicist and group leader for high-energy experiments at both the Cosmotron and the newly commissioned Alternating Gradient Synchrotron, which then had the world's highest energy, 30 GeV. At the time of his transfer, he and Joe Fischer initiated the development, at Brookhaven, of a new instrument for particle research at high energy: the wire spark chamber. From the mid-1960s to the mid-1970s, George's group at the AGS performed single-arm, double-arm, and multiparticle spectrometer experiments using planar and cylindrical arrays of wire spark chambers. The single-arm spectrometer results were among the first to reveal the role of diffractive processes in elastic and slightly inelastic collisions of hadrons. Those devices and their offspring, multiwire proportional chambers, combined with sophisticated digital computers, have revolutionized how particle research is now performed.

In 1971, at the age 65 and with substantial energy and continuing enthusiasm for new challenges, George was convinced by a young collaborator, W. Peter Trower, to join the physics department of Virginia Tech, located among the hills of southwestern Virginia. The challenge of an emerging physics program and uni-