

independent of British commitments to the joint European program in JET.

Bas's personality and family background contributed greatly to his success as a leader of a large scientific team. His acute intellect and great personal charm shaped his approach to management of human resources. However, his approach could be provocative, even confrontational, designed no doubt to make his colleagues uncomfortable with complacency.

Bas was a founding member of the European Physical Society, chairman of the International Fusion Research Council (1976–83), and chairman of the Plasma Physics Commission of the International Union of Pure and Applied Physics (1969–78). In the UK he chaired the Institute of Physics (1978–80) and won IOP's Glazebrook Medal in 1989. He also served on the Royal Society's Council as vice president in 1986–87. Bas has been a prominent member of the Pugwash Trust, chairman of the British Pugwash group, and a member of the international Pugwash council.

He is sorely missed for his enthusiasm for fusion and drive for international collaboration.

Nicol J. Peacock
Jes P. Christiansen
Culham Science Centre
Abingdon, England

Theodore David Schultz

Theodore David Schultz, a theoretical physicist and science education advocate, died of cancer on 20 September 2004 in Washington, DC.

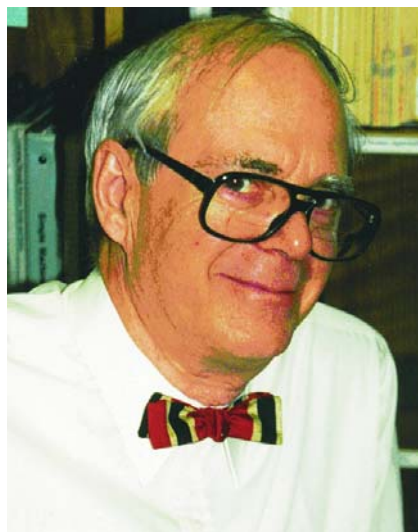
Born in Chicago on 6 January 1929, Ted lived in the city's northern suburbs. As a teenager, he was a contestant on the radio show *Quiz Kids*, and when he was 16, he attended the small Deep Springs College near Death Valley, California. He continued his undergraduate studies at Cornell University and graduated with a bachelor's degree in engineering physics in 1951. He then studied with J. C. Slater at MIT and explored the polaron problem using the path integral methods developed by another Cornell graduate, Richard Feynman. Ted pushed that approach to its limits. In 1956 he received his PhD. His thesis, "Electron-Lattice Interactions in Polar Crystals," was widely read, with more than 2000 copies circulated.

Ted's subsequent two-year postdoctoral work with Rudolf Peierls in Birmingham, England, led to his now well-known paper on polarons, "Slow

Electrons in Polar Crystals: Self-Energy, Mass, and Mobility," published in *Physical Review* in 1959. Ted joined the University of Illinois in 1958. During the two years that followed, he worked with John Bardeen, first as a research associate professor and then as a research assistant professor.

He left Illinois to join IBM's T. J. Watson Research Center in Yorktown Heights, New York, where he spent the next 32 years, except for a sabbatical at the University of Munich. Ted started at the research center as a charter member of the theoretical group headed by Elliot Montroll, with Elliott Lieb and Dan Mattis. Particularly productive during those years, Ted wrote the short but elegant book *Quantum Field Theory and the Many-Body Problem* (Gordon and Breach, 1964), one of the first books on this subject. He worked with Lieb and Mattis on ferromagnetism and anti-ferromagnetism, and they produced probably their best-known paper, "Two-Dimensional Ising Model as a Soluble Problem of Many Fermions," which was published in *Reviews of Modern Physics* in 1964. That article became a citation classic. Mattis has testified to Ted's extraordinary role in research while Ted was at IBM—his close cooperation and ability to be a sounding board for ideas—and noted that all ideas relating to many-body problems, including the original XY model of magnetism, were filtered through Ted. From 1964 to 1965, Ted was a visiting adjunct professor at New York University.

Ted enjoyed another period of great productivity from the mid-1970s to the early 1980s. He worked primarily with experimentalists on the charge-transfer salt TTF-TCNQ;



Theodore David Schultz

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he published some 20 papers and a book chapter on the subject. Again, he was an important sounding board, and his erudition and critical scientific taste played major roles in that effort. Ted continued to act as a wise sounding board for young theorists who joined the lab in the 1980s.

Ted spent the years 1990–92 as the technical assistant to the director of the physical science department at Yorktown and, during that period, served on two NSF panels on teacher enhancement. Improving elementary science education then became his abiding interest. He believed he needed to do something more.

After he retired from IBM in 1992, Ted moved to the nation's capital and became the program officer for networking at the National Science Resource Center, a position he held until 1996. He oversaw the production and writing of two sections for the study *Resource for Teaching Elementary School Science*, published by the National Academy Press in 1996. He then consulted for and subsequently became an employee of the American Physical Society. He worked for the society's Teacher–Scientist Alliance Institute, which implements systemwide reform of science education through intensive five-day institutes. Ted helped produce and lead those institutes. He retired from APS in 2001, at about the time he became ill.

A man of many interests, Ted was very active in the 1960s in Democratic politics in the village of Ossining, New York. He worked with Ossining's mayor, another theorist from IBM, and helped lead the village into an urban renewal program. Ted also became a leader of the local Friends of Music of Ossining. In no small measure, it is because of Ted's knowledge and good sense that the organization is healthy and still producing a six-concert chamber music series in a time when dwindling audiences have ended many such enterprises.

Much of Ted's life centered on his family—his wife of 47 years, Almut, and his two daughters. He was always proud of his daughters' accomplishments: Jennifer's work as a teacher of English as a second language abroad and in the US and Andrea's career as a professional violinist who is devoted to chamber music. Ted was overjoyed by the birth of his second grandchild shortly before he died. For his family, Ted designed and helped build a beautiful contemporary home overlooking the Hudson River. His house was featured in *Better Homes and Gardens* in 1969.

Ted loved classical music and played the cello and the piano. He enjoyed

bridge, tennis, sailing, photography, camping, and cross-country skiing.

Ted's intellectual curiosity was insatiable and his knowledge was vast. He believed in the rational pursuit of truth and lived passionately according to his ideals. He cared deeply about other people, and his love for others was reciprocated. He is missed very much by his family, colleagues, and many friends.

Alan B. Fowler

*IBM T. J. Watson Research Center
Yorktown Heights, New York*

Julia A. Thompson

Julia A. Thompson, who made contributions to many important subfields in experimental particle physics, particularly in the area of weak interactions, died in an automobile accident on 16 August 2004 in Wood River, Illinois. During her career, Julia participated in experiments at several particle accelerator laboratories, including Brookhaven National Laboratory, CERN, and Russia's Budker Institute of Nuclear Physics in Novosibirsk. She had been working on the MINOS experiment at Fermilab at the time of her death.

Born on 13 March 1943, in Little Rock, Arkansas, Julia graduated from Cornell College in Mt. Vernon, Iowa, in 1964 with a BA in physics. She earned her MS from Yale University in 1966. Three years later, she received her PhD from Yale in the field of elementary particle physics under the joint supervision of J. Sandweiss and one of us (Willis), with a thesis entitled "An Isospin Conservation Test from K-p Interactions at 400 MeV/c."

In 1972 Julia joined the faculty of the department of physics and astronomy at the University of Pittsburgh. She was affiliated with the university for the remainder of her career. She was a dedicated teacher of undergraduate students and a strong proponent of involving them in her research activities. During her career, she supervised some 60 undergraduate student researchers, some of whom became coauthors on her publications. In 1992 she founded Research Experiences for Undergraduates in Physics—Focus on Minorities, a program that placed undergraduate students in research groups during the summer months. Funding from NSF and the support of her university and department—which provided her with released time from teaching—along with enthusiastic participation of her university colleagues, made the program a success.

In 1988 Julia decided to join the CMD2 project, a new experiment at the low-energy e^+e^- collider VEPP-2M at Novosibirsk. She recognized at once the potential to study charge conjugation–parity violation (CP) in the kaon system and spent a sabbatical year, 1989–90, developing her ideas. She made plans for a comprehensive study of phi decays to kaon pairs, including a realistic estimate of possible systematic effects.

It was rare at that time for Western physicists to work for extended periods in Novosibirsk, particularly during the winter months, and to do so was logistically and ideologically complicated. As the era of the Soviet Union was drawing to a close, there were shortages of food and essential items; Julia, along with her Russian colleagues, endured those shortages during an unusually cold winter. Such difficulties did not discourage her from becoming a regular visitor to



Julia A. Thompson (center)

Novosibirsk. Her final doctoral student carried out a study of tagged decays of charged kaons in the CMD2 experiment, which permitted Julia to see her original ideas come to fruition. She spoke fluent Russian, which she often used for presentations at seminars in Novosibirsk, and always traveled with a book of Russian poetry.

In 1999 during a visit to South Africa, Julia took the initiative to contact the education ministry in Cape Town and visit several high schools to learn about their physics programs. (The photograph above shows Julia speaking to high-school students at a career fair near Cape Town in 2002.) She spoke to a number of local physicists interested in outreach to high schools; after the end of apartheid,