Gerhard E. Fischer

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steels during hardening.

Zener joined the faculty of the University of Chicago in 1946. Building on several of his earlier studies on internal friction of solids, he described the "standard linear solid" in his book *Elasticity and Anelasticity of Metals* (University of Chicago Press, 1948). His group at the Institute for the Study of Metals at Chicago developed many applications of internal friction to the viscous nature of grain boundaries and to diffusion in alloys.

Accompanying this work was further research in theoretical physics and materials science. Zener published on such diverse topics as mechanisms of diffusion in metals, interactions of magnetic moments that are responsible for ferromagnetism, the stability of alloy phases and the kinetics of the formation of phases precipitated from solid solutions.

In 1951 Zener went to the Westinghouse Research Laboratories, where he eventually became director of research. The labs had long had an excellent program in magnetism, which he further encouraged. He also led a group investigating the physics and materials science aspects of energy conversion devices using the thermoelectric effect.

Zener became dean of science at Texas A&M University in 1965. In 1968 he returned to Pittsburgh to become a professor of physics at Carnegie Mellon University. He published in 1973 a proposal for generating electrical power from temperature differentials in the sea. This paper elicited a huge reader response.

Both Clarence and his wife, Ruby, graciously extended the hospitality of their home to thousands. His professional generosity to his colleagues was legendary; even if the basic idea behind a paper was his, he always insisted that authors be listed alphabetically. Giving away ideas was no penalty to him: He had plenty left over for his own use.

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Gerhard E. Fischer

Gerhard Emil Fischer, senior scientist at the Stanford Linear Accelerator Center, died of a heart attack on 7 February 1993. He was 64 years old. A physicist by training, he was one of the best and most versatile scientists who have ever worked at SLAC.

Born in Germany, Gerry Fischer left the country with his parents in the late 1930s and moved to Canada. Gerry received his BASc degree from the University of Toronto in 1949 and his PhD in physics from the University of California, Berkeley, in 1954. After a brief period on the physics faculty at Columbia University, he took a position as a research fellow at the Cambridge Electron Accelerator. From that point forward much of his career focused on accelerator theory and technology, especially that concerning colliding-beam machines.

Fischer moved to SLAC in 1965, becoming a member of a group working on the design of the electron–positron colliding-beam storage ring now called SPEAR. Gerry foresaw that synchrotron radiation would lead to the establishment of synchrotron radiation research centers; the first of these was the Stanford Synchrotron Radiation Laboratory, based on SPEAR. He was responsible for the SPEAR injection system, for much of the understanding of the beam dynamics, and for the design of the large solenoidal magnet of the MARK I detection system at SPEAR. This work on the storage ring and detector contributed to the discoveries of the J/ψ and charmed particles.

SPEAR was followed by the larger e^+e^- storage ring PEP, a joint project involving SLAC and the Lawrence Berkeley Laboratory and completed in 1980. Here again Gerry Fischer had an indispensable role, leading the work on the injection system and on the main-ring magnet system and contributing to work in other areas.

During the last decade Fischer played a central role in the development of a new type of machine, an e^+e^- linear collider, starting with the first such machine, the Stanford Linear Collider. He was responsible for the initial damping ring design and construction, for the design of the unique alternating-gradient magnets that make up the curving arcs of the SLC and for many other aspects of the SLC. Because the incredibly small dimensions and tolerances that characterize linear colliders (such as beam-spot sizes of microns or less) demand extreme stability, Fischer in recent years had become perhaps the world's leading authority on the ground motions that can disturb such beams.

Gerry Fischer was exceptionally skillful at what he did, helpful to others in more ways than can be recounted, and a friend and mentor to many. He will be sorely missed.

BURTON RICHTER
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Christopher Bottcher

Christopher Bottcher, a senior research scientist at Oak Ridge National Laboratory, died on 27 February, 1993, after a yearlong battle with cancer. He was 48.

Chris was born in Belfast, Northern Ireland, and got both his BSc and his PhD in applied mathematics at Queen's University in Belfast, graduating in 1968. From 1968 to 1971 he was a research fellow at what was then the Harvard College Observatory (now the Harvard–Smithsonian Laboratory Center for Astrophysics) and lectured in astronomy at Harvard. He returned to the UK in 1971 to accept a joint appointment with Manchester University and Daresbury Laboratory. He joined the physics division at Oak Ridge National Laboratory in 1977. He became a part-time professor of physics in the Center of Excellence at the University of Tennessee, Knoxville, in 1988.

Chris devoted much of his time to the study of atomic collision phenomena. In his early years he contributed to the understanding of electron–atom, electron–molecule and atom–atom scattering. Later his interests shifted to complex reactions and resonances.

In recent years he had developed a vigorous multidisciplinary research program spanning chemistry, atomic physics, nuclear physics, particle physics and computational science. Chris pioneered the application of massively parallel supercomputers to problems in atomic physics and devoted much of his energy to the education of young people in this discipline.

Chris had a forceful, immediate brilliance that was not limited to scientific research. He was a voracious reader with an extraordinary range of knowledge. He was incapable of simplicity; he invested straightforward questions with depth, complexity and subtlety. Chris had a unique, riotous sense of humor and a penetrating wit. To those who knew him well, he was an enormously kind, supportive and encouraging companion.

Chris's tragic death at so early a point in his career is a loss not only to his many friends and collaborators but also to the whole field of theoretical physics.

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