Earl Grey Fellow at Stockholm University and the next two years at the University of California, Berkeley, as a Commonwealth Fellow. He moved in 1937 to take an assistant lectureship in physics at Manchester. His early experiences in spectroscopy led him, years later when designing a new laboratory at the University of Durham, to ensure that a high-current arc could be operated in every laboratory!

At Manchester, he came under the spell of the impressive Patrick Blackett (himself an experimenter par excellence) and soon transferred to cosmic-ray physics. Cloud chamber expertise led to a number of interesting results, culminating in the V particle work.

Following a spell as acting director of the physics department at Manchester, and after Blackett had departed for Imperial College, London, Rochester moved to the University of Durham in 1955 and took John Major and me with him. Using nuclear emulsions and, later, bubble chambers, Major spearheaded research at the accelerators and contributed to cosmic-ray work, too. I continued cosmic-ray research using electronic techniques, and eventually discovered, with Indian and Japanese research groups, the cosmic-ray neutrino in the Kolar Gold Fields in India. The cosmic-ray work led to astrophysics and the creation of the now most impressive astronomy group at Durham. Parallel developments in particle physics theory have led to a similarly prestigious particle theory group, currently led by James Stirling.

In all this, Rochester was at the helm in the sense of inspired choices of staff and the provision of facilities. Furthermore, he was a fine sounding board for his staff's discoveries, real and imagined. In his early days at Durham, when he read and commented on every paper before submission, one could rely on the English being corrected, as well as the physics being queried. The English corrections, in fact, came from his wife, Ida! His companion and strength for more than 60 years, Ida was an English graduate.

Rochester spent the rest of his career at Durham, where he became the first pro-vice chancellor (deputy vice-chancellor) in 1969. His contributions to university administration were legion; he was much in demand for his logical, quiet, sensible, nonpartisan approach. He was deeply involved in the design of the department's new main building. Opened in 1997 on the 50th anniversary of his discovery of kaons, it was named the Rochester Building by the university's chancellor, the actor Peter Ustinov.

In the early years of his long retirement beginning in 1973, Rochester took an interest in the history of astronomy at Durham. He was fascinated by events in the 19th century, not least by the university's first professor of mathematics, Temple Chevallier. That man was also a professor of astronomy, reader in Hebrew, deputy principal, part-time registrar, and parish priest of Esh, a village near Durham! Rochester unearthed the story of Chevallier's "observer" in the 1850s, Richard Carrington, whose work led to the discovery of the differential rotation of the Sun and thus to the fact that the Sun is not a rigid body. Carrington threw in the towel when the university declined to upgrade the observatory's telescopes, and he moved south, where he constructed his own observatory! Rochester loved the story.

He is remembered with fond affection by all who knew him and he is further remembered at Durham by the annual Rochester Lecture, in which leading scientists from the UK and abroad present the latest developments in physics. In addition, the universities of Durham and Newcastle jointly award the annual Rochester Prize to the best undergraduate in first-year science.

Rochester's wife, who, with him, was a pillar of the local Methodist Church, from which they gained much inner strength, survived him by only six days.

Arnold Wolfendale
University of Durham
Durham, England

Bo Andersson

Bo Andersson, an unconventional strong-interaction theorist with close relations to the experimental particle physics community, died unexpectedly from a heart attack on 4 March 2002. He was returning home from the winter school in St. Petersburg, Russia, and collapsed while changing trains in Malmö, Sweden.

Bo was born in Kristianstad, Sweden, on 8 June 1937. He attended Lund University, earning his BSc in 1961, and joined the lively circle of young physicists around professor Gunnar Källén. In 1967, he defended his PhD thesis on singularities in Feynman amplitudes, which he researched under the guidance of Källén. Bo remained affiliated with Lund throughout his career. He became a professor in the theoretical physics department in 1984 and had intended on retiring in June 2002 and remaining as active as ever in research.

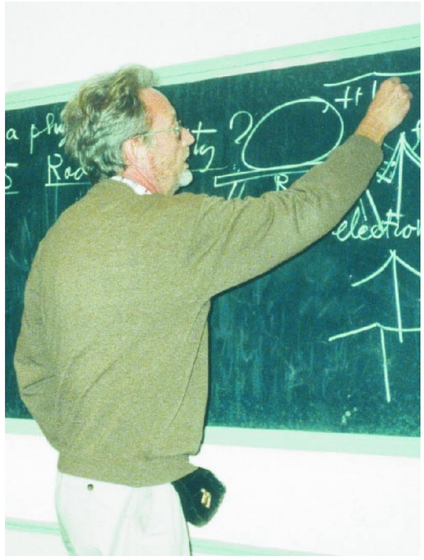
During his postdoctoral years, Bo continued formal studies of singularities in Feynman amplitudes, but in the early 1970s, he drastically changed his field of research. Collaborating with the nuclear emulsion experimental group at Lund, Bo worked on understanding heavy-ion reactions and became involved in the preparations for a charm-search experiment at Fermilab. Continuing along the phenomenological road, he and one of us (Gustafson) started up a close-knit collaboration at Lund for the study of strong interactions, work that continued until Bo's death. The group that was formed fostered some 30 PhD students over the years. The coffee room at Lund was filled with lively discussions among the group's members, blended with the rich smoke from Bo's pipe.

Bo's most famous contribution, in collaboration with Gustafson, was the development of what has become known as the Lund model for high-energy reactions. The model describes these reactions as a two-step process: (1) hard interactions between quarks and gluons in the initial phase of a high-energy collision, in which the effective coupling is small and the emission of gluons can be treated by perturbative calculations, and (2) the subsequent soft hadronization process, in which the coupling becomes large and nonperturbative models are needed. The description of this second step is the hallmark of the Lund model. It assumes that a stringlike confining force field is established between quark–antiquark pairs formed in the first step. Transverse excitations on the string kinks are identified as gluons. Concepts from quantum chromodynamics, such as infrared stability and color coherence, have constituted important guidelines in developing the model.

The way quarks and gluons are ordered along the string influences the color structure of events and provides unique predictions for the energy and particle flow in high-energy collisions. These features were first observed in 1980 by the JADE collaboration in three-jet events produced in electron–positron annihilation at the PETRA machine at the German Electron Synchrotron (DESY) in Hamburg, Germany, and have later been observed in multiparticle production at all kinds of high-energy events.

Color coherence implies that the color of a gluon and its corresponding anticolor in a neighboring gluon radiate softer gluons coherently as a color dipole. In a gluon emission cascade, these color dipoles form chains, which exactly match the strings stretched in the later soft phase of an interaction. This correspondence opens the possibility for a better understanding of the nature of the strong interaction, with a unified description of the two-step process and a smooth transition between the perturbative and nonperturbative regime. Bo was particularly engaged in researching this problem before his death.

The physical and mathematical properties of the string fragmentation model and its connection to the basic quantum chromodynamics field theory were continuous sources of inspiration for Bo. Practical applications such as Bose–Einstein correlations, polarization phenomena, and baryon production went hand in hand with studies of the quantization of the string and other fundamental aspects. He also thought that the understanding of heavy-ion collisions, based on the preceding concepts, was an important topic. Although Bo focused on developing a framework to describe normal collisions, he also proposed and explored the possibility of novel collective effects, giving them imaginative names such as color ropes, firecrackers, and smoke rings.



BO ANDERSSON

Starting in 1978, a large set of computer simulation programs have been developed by the Lund group as an essential complement to the model evolution and an important component in the effort to provide a better contact between theory and experiments. These programs with event generators for different processes in high-energy collisions—the Lund Monte Carlos, which includes Jetset, Lepto, Pythia, Fritiof, and Ariadne—have had a significant effect on the experimental community. Today, nearly all high-energy physics experimenters rely on the use of these generators to help understand data.

Bo was a dedicated researcher brimming with new ideas, which he conveyed to others with passion and intensity. Dreading conformity, he enjoyed open discussions that he felt could lead to a better understanding of the underlying physics. In particular, he sought to engage in dialogue with the experimental community to better understand existing data and to hammer out new tests. Bo enjoyed traveling. He was a frequent and appreciated lecturer and discussion partner at workshops and research schools, and spent several sabbatical periods abroad.

Bo's interest in physics was mixed with far-ranging cultural interests and a genuine concern for fellow beings. In the early 1990s, he provided help to researchers from the decaying Eastern bloc, including a group of young mathematics students from Leningrad (now St. Petersburg) for whom he sought special funding so that they might study in Lund. In recent years, he focused his attention on China and the development of phenomenological research there. (The photo on the preceding page shows him lecturing at Shandong University, Jinan, in 1997.) He enjoyed meeting people and had friends scattered around the world. His death leaves behind a great emptiness.

Gösta Gustafson
Torbjörn Sjöstrand
Lund University
Lund, Sweden

Wade Lanford Fite

Wade Lanford Fite, an emeritus professor of physics at the University of Pittsburgh, died on 22 February 2002 at his home in Fox Chapel, Pennsylvania. He had been suffering from heart and kidney failure.

Fite was born on 4 October 1925 in Apperson, Oklahoma, and was raised in Winfield, Kansas. He served in the US Army in World War II as a staff sergeant and was based in the southwest Pacific. After his wartime service, Fite returned to the University of Kansas, where he earned his AB degree in physics in 1947. He earned his physics graduate degrees at Harvard University, an MA in physics in 1949 and a doctorate, under the supervision of Otto Oldenberg, in 1951. His PhD thesis was entitled "The Adsorption of Light by Negative Ions."

The same year he earned his PhD, Fite briefly worked for Philco Corp in Philadelphia, Pennsylvania, as a research physicist. His work focused on electron optics. In 1952, he became an instructor and in 1955, a lecturer, at the University of Pennsylvania. While at Penn, Fite collaborated with Lewis Branscomb at the National Bureau of Standards (now known as NIST) in Washington, DC, on the first laboratory experiment on the cross section for photodetachment of electrons from negative ions. An NSF postdoctoral fellowship allowed Fite to work on atomic collisions in the laboratory of H. S. W. Massey at University College London in 1954.

Fite returned from England to teach briefly at Penn before accepting a position as a staff scientist with the general atomic division of General Dynamics Corp in San Diego, California, where he established the atomic physics laboratory. Fite's principal field of research was in atomic physics, especially collision phenomena. His work at General Dynamics

Wade Lanford Fite

focused on atomic processes relevant to upper atmosphere physics and space science.

Fite left General Dynamics in 1963 to accept a faculty position with the University of Pittsburgh's physics department, where he spent the remainder of his career until his retirement in 1988. While at Pittsburgh, Fite also served on advisory panels for a number of governmental agencies, including NASA, NSF, the National Bureau of Standards, and a number of defense organizations. From 1973 to 1980, he served as chair of the joint National Academy of Sciences and National Research Council's committee on atomic and molecular science. In 1964, Fite cofounded Extranuclear Labs (now called ABB Extrel) in Pittsburgh, with Ted Brackmann. To identify ions in their own atomic physics research, a high-throughput mass spectrometer and associated radio frequency power supply were needed. The package these researchers developed was a major technical advance that attracted the attention of other researchers. The company then began marketing mass spectrometers and other scientific instruments. Fite was president until 1984 and chairman of the board until his retirement from the company in 1990.

Fite was an accomplished oboist who performed with the Manila Symphony Orchestra, owing to his assignment, while in the military, to an entertainment group. He also played with the San Diego Symphony, among other musical groups. Fite enjoyed sports, including tennis and fishing.

Brackmann, Fite's longtime colleague, noted that Fite was a man who was most honest and multitalented, and was a compulsive achiever. Fite learned to read and speak Russian by studying a book on the seat beside him as he drove to work. He had superb organizational skills, once saying, "Find a neat physics lab and you will find no work being done."

David Jasnow
University of Pittsburgh
Pittsburgh, Pennsylvania

Yuri Ilich Galperin

Yuri Ilich Galperin, a space research pioneer, died in Moscow on 28 December 2001 of a heart attack.

Galperin was born in Moscow on 24 September 1932. His father was a professor of languages, and although Galperin showed an early talent for literature and languages, he chose to study astronomy when he entered Moscow University. His teacher and mentor was Iosif Shklovsky, a creative astronomer still remembered for his work on the Sun and in radio astronomy. Shklovsky's irreverent style—his stories are collected in *Echelon,* translated from Russian as *Five Billion Vodka Bottles to the Moon* (W. W. Norton, 1991)—earned him trouble with authorities but admiration from students, and Galperin throughout life tried to emulate that style. He earned his *kandidat* degree (like a PhD) from Moscow University in 1959. He was awarded his doctorate in 1968 and his professorship in 1983, both from the Shternberg Institute of Astronomy.

Another mentor was Valerian Krassovsky, who helped develop infrared sensors for the Soviet army during World War II and later (on his own) provided astronomers with that technology for surveying the sky in the infrared. After graduation, Galperin failed to find work at any research institute of the Soviet Academy, and Krassovsky therefore arranged for him to be posted to an arctic station to study the aurora borealis, which he did in 1955–58. Before then, scientists had observed only five to six proton auroras, but Galperin added 17 more.

Astronomer friends thought he had been sidelined, studying such an uninteresting thing as the aurora. But attitudes changed after October 1957, when Sputnik was launched. By then Krassovsky was designing a scientific spacecraft, meant to be Sputnik 1 (but slipping to Sputnik 3), and he invited Galperin to join him—provided Galperin gave some other scientist the sophisticated auroral spectrograph he had built. Galperin never