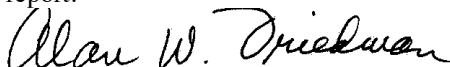


DOCUMENTS OF THE GENERAL FACULTY

**REPORT OF THE MEMORIAL RESOLUTION COMMITTEE FOR
MILO M. BACKUS**

The special committee of the General Faculty to prepare a memorial resolution for Professor Emeritus Milo M. Backus, Department of Geological Sciences, has filed with the secretary of the General Faculty the following report.



Alan W. Friedman, Secretary
General Faculty and Faculty Council
The University of Texas at Austin
Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

**IN MEMORIAM
MILO M. BACKUS**

Milo M. Backus, Shell Chair Emeritus in the Department of Geological Sciences, passed away May 25, 2018, in Dallas, Texas, after a remarkable career in geophysics that included two decades in industry and more than two decades at The University of Texas at Austin. Milo was born in Chicago, Illinois, in 1932 and attended the Massachusetts Institute of Technology (MIT), majoring in geophysics and graduating in 1952. He entered graduate school there, completed his Ph.D. in 1956, and joined Geophysical Services Incorporated (GSI) in Dallas. He came to UT Austin in 1975 as the first Pratt Professor of Geophysics, which had been endowed by legendary exploration geophysicist Wallace Pratt with the goal of attracting a person of Milo's stature. Upon retirement in 1998, he moved to Dallas to be near family, while continuing his affiliation with the University as a senior research scientist at its Bureau of Economic Geology until age eighty.

Although Milo's Ph.D. dissertation was in the field of geochemistry, he was surrounded at MIT by colleagues in the Geophysical Analysis Group, a petroleum industry-sponsored project (1952-57) developing time series analysis tools for geophysical digital data processing, building upon MIT Professor Norbert Wiener's World War II classified research. There was also a direct MIT-GSI pipeline promoted by GSI President Cecil Green to recruit graduate students for summer and permanent positions. Milo worked at GSI, including field work on seismic crews, during his summers, and then joined GSI full time in 1956. Only three years later, he published the landmark paper "Water reverberations—Their Nature and Elimination" using time-series analysis methods to solve a major problem in seismic reflection prospecting. Digital recording and computer processing were at the heart of this paper, which became the focus of GSI's successful efforts to convert seismic recording in the global exploration geophysics industry from analog to entirely digital recording and processing within a period of about three years. Milo, who was the leader in this remarkable achievement, was soon promoted to GSI Vice President and Research Director. Later in the 1960s and into the early 70s, Milo led GSI to the forefront of new technologies in exploration seismology, especially in three-dimensional data acquisition and processing. Technologies developed at GSI under his direction are now the industry standard in the search for petroleum. With its strength in digital data processing, GSI also became a leader in the nascent field of seismic nuclear weapons discrimination, and many of Milo's publications from the 1960s are concerned with associated fundamental problems in array signal processing and detection of seismic signals in noise. Milo was not just a data processing technical genius, but was also deeply engaged in the interpretation of seismic data, traditionally the purview of geologists. His 1975 paper "Flat Spot Exploration" demonstrated that seismic waves reflected from the level surface formed by the water-oil or gas-oil contact in reservoirs provided a direct indicator of hydrocarbons.

Upon joining UT Austin in 1975, Milo taught classes in exploration geophysics and related fields and supervised many Masters and Ph.D. students. Within a few years, he launched an industry-sponsored consortium, Project SEER (Solid Earth Exploration Research), which provided support for students and the industry contact that launched careers for many. The focus of research efforts under SEER were, broadly, to recognize and exploit information from both compressional and shear properties of Earth materials. Up to this point, most exploration

seismic methods simply ignored shear properties and shear waves, so an “acoustic” (that is, fluid) Earth was the customary starting model for designing field acquisition and processing methods and for interpreting data. Milo was again at the forefront of a revolution that changed the exploration geophysics industry. Many research projects from SEER (with students) and later work at the UT Bureau of Economic Geology were concerned with developing methods such as Amplitude Versus Offset (AVO) and others that extract shear properties and associated lithology information from seismic data. He also helped develop field and processing techniques to generate, observe, and interpret shear wave reflections. He served as the Society of Exploration Geophysicists (SEG) Distinguished Lecturer in 1985, presenting “The Fourth Dimension—Offset-Dependent Reflectivity,” in recognition of his leadership in developing this technology.

During his career, Milo was active in the SEG, serving on many committees and as Vice-President (1976-77) and President (1979-80). He became an honorary SEG member in 1988, receiving its highest award, the Maurice Ewing Medal, in 1991. His “Flat Spot Exploration” paper was recognized by the European Association of Geophysical Exploration with its Conrad Schlumberger Award in 1975. The 1959 “Water Reverberations” paper was the best article in the SEG journal *Geophysics* that year. The SEG also granted GSI two Distinguished Achievement Awards recognizing that, under Milo’s direction, GSI had led the industry to adopt digital seismic systems and processing methods (awarded 1986) and had developed three-dimensional seismic methods (awarded 1989). After Milo’s retirement from the UT Austin faculty, the SEG devoted an article to him in its magazine, *The Leading Edge* (September 2000), which featured testimonials from former students, many in academic and industry leadership positions. In 2004, the Milo M. Backus Endowed Fund for Exploration Geophysics was created by the Board of Regents of the UT System, with funding provided by Decker Dawson, also a former SEG president and a long-time colleague and benefactor of the University. Milo was named to the Jackson School of Geosciences Hall of Distinction by the UT Geology Foundation in 2011.

This memorial resolution was prepared by a special committee consisting of Professors Clark R. Wilson (Chair) and Stephen P. Grand.

Distributed to the Dean of the Jackson School of Geosciences on September 4, 2018, and posted under “Memorial Resolutions” at <https://wikis.utexas.edu/display/facultycouncil/Wiki+Home>.