

**In Memoriam**  
**Charles Gregory Speziale**  
**1948–1999**

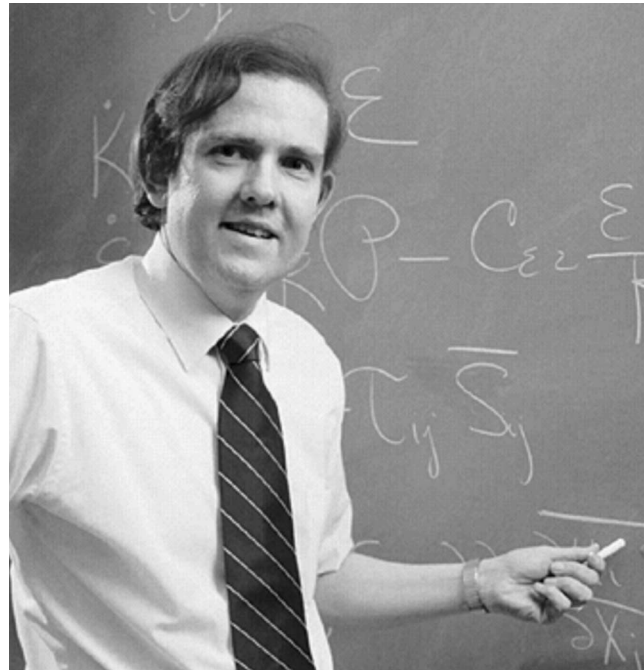
Charles Speziale, a prolific researcher and educator whose contributions to fluid mechanics cover non-Newtonian fluid mechanics, kinetic theory of gases, vortex dynamics, and turbulence, passed away on April 30, 1999 in Newton, Massachusetts, due to complications arising from Anderson-Fabry disease.

Charles was passionate about and dedicated to his work. His extraordinary intellect showed itself in his insights and creativity. He had the courage of his opinions and a strong sense of honesty, and permeated an infectious enthusiasm. The impact of his output and ideas has been particularly strong in turbulence research. He had a total mastery of rational continuum mechanics and at a time when progress in turbulence was often based more on inspired empiricism, Charles provided some of the important mathematical and physical concepts that continue to guide turbulence modelers today. His turbulence closure models played a crucial role in improving the predictive ability for complex flows of engineering relevance and utilized extended Galilean invariance of the Reynolds stress, the Galilean invariance of the subgrid stresses, and the limiting behavior of Reynolds stresses in flows subject to a strong rotational or magnetic field. Charles further advanced turbulence modeling by proposing a pressure-strain model and developing an algebraic model for Reynolds stress. His contributions also include the study of final decay of turbulence based on an elegant nonlinear fixed-point analysis. In a closely related effort he worked to develop a nonlinear eddy viscosity model for Reynolds stress that is capable of predicting flows driven by the anisotropy of normal stresses, such as internal secondary flows and flows with recirculation of nonlinear fluids.

Charles published more than 100 papers in archival journals and contributed numerous papers at professional conferences. He also gave a large number of invited lectures and was a frequent speaker in turbulence symposia. He was the editor of a number of monographs on turbulence. He also served as an associate editor of the AIAA Journal, the ASME Journal of Applied Mechanics, and the International Journal of Engineering Science, among others.

Charles Gregory Speziale was born on June 16, 1948 in Newark, New Jersey, and attended the Newark College of Engineering, where he earned a Bachelor's Degree in Civil Engineering and Applied Mathematics in 1970, and an MS in Engineering Mechanics in 1972 with Professor Robert Kirchner as his advisor. He spent the following year at Rutgers University, where he studied mechanical engineering and worked on double-diffusive convection with Professor C. F. Chen. Continuing his education at Princeton University, he earned an MA and Ph.D. in Aerospace and Mechanical Sciences in 1975 and 1978, respectively, with Professor A. C. Eringen as his advisor.

In January 1978, Charles joined Stevens Institute of Technology, where he was promoted to the rank of Associate Professor with tenure in 1982. He left Stevens in 1985 to become a member of the faculty of the Georgia Institute of Technology. His research



during this period, funded by the National Science Foundation, the Exxon Education Foundation, and the Office of Naval Research, centered on non-Newtonian fluids, kinetic theory of gases, and fundamental issues related to turbulence modeling. In 1987, he was invited to join the Institute for Computer Applications in Science and Engineering (ICASE), located at NASA Langley, where he concentrated on turbulence research. At the time of his death in 1999, Charles was a faculty member at Boston University, where he had moved to in 1992.

His untimely passing at a time when he was at the peak of his powers was a great loss to the community. He will be missed and will be remembered not only for his seminal contributions, but for his keen intellect and for the exceptional human being that he was.

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