DONALD WILLIAM PEACEMAN pioneered techniques for the numerical solution of partial differential equations and their application to modeling single and multiphase flows in porous media, known as petroleum reservoir simulation. He died June 19, 2017, at the age of 91.

Don was born in Miami, Florida, and grew up in Brooklyn, New York. He graduated from the City College of New York in 1947 and earned his doctorate in chemical engineering from Massachusetts Institute of Technology in 1951. After graduation, he and his wife Ruth (née Klein) moved to Houston, where Don joined Humble Oil & Refining Company, at that time a subsidiary of Standard Oil of New Jersey. The latter became Esso and then Exxon, and the Research Division of Humble Oil evolved into Exxon Production Research Company; in 1998 Exxon merged with Mobil to form a new company called Exxon Mobil Corporation (ExxonMobil).

When Don started work, reservoir modeling consisted in the use of physical models to mimic the behavior of oil and gas reservoirs. Such models were very expensive to build and operate, and had very limited capabilities. In the early 1950s there were no real computers available to engineers, and techniques for solving nonlinear partial differential equations on computers did not exist. Don collaborated with George H.
Bruce, Henry H. Rachford Jr., and John D. Rice to obtain the first numerical solution of a one-dimensional, single-phase, gas flow problem using an IBM 604 accounting machine. Their result was published in 1953, followed in 1955 by the publication (with Rachford) of a technique for solving two- and three-dimensional problems, known as the alternating direction method.

Don made important contributions to the advancement of reservoir simulation technology throughout his life. One of his most significant later in life was on the modeling of wells in simulators. In a 1978 paper he showed how the pressure of a vertical well, which is generally only a few inches in diameter, is related to the pressure of the surrounding grid block that is typically orders of magnitude larger than the well. In subsequent papers he generalized this model, and it is now the standard approach in virtually every commercial reservoir simulator.


After his retirement from ExxonMobil in 1986 Don continued to consult for the petroleum industry and participated extensively in professional conferences. His last paper appeared in 1993 on the modeling of horizontal wells in reservoir simulation.

The technologies Don helped launch in the early 1950s are now essential tools for managing the world’s petroleum production systems. His significant contributions were recognized

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through his election to the NAE as well as a number of honors from the Society of Petroleum Engineers: the Robert Earll McConnell Award (1979), Reservoir Description and Dynamics Award (1985), Anthony F. Lucas Gold Medal (1991), and honorary membership (2005).

Don is survived by daughter Caren Cowan and her husband David, son Alan Peaceman and his wife Karen; grandchildren Michael Cowan (wife Jennifer), Steven Cowan, Sarah Peaceman (husband Hal Dworkin), Daniel Peaceman (wife Aviel), and Claire Peaceman; and a great-granddaughter. Ruth died December 20, 2010.