

## James Glimm - a biographical sketch

James Glimm was born in 1934 in Peoria, Illinois. He received his Ph.D. in mathematics from Columbia University in 1959. He has made deep and original contributions in a variety of areas in both pure and applied mathematics. His early work in the theory of operator algebras was fundamental, and today the "Glimm algebras" that bear his name continue to play an important role in this vibrant area of research. In mathematical physics, Glimm worked on problems in quantum field theory, quantum statistical mechanics, shock wave theory, and scientific computation.

His seminal paper "Solutions in the large for nonlinear hyperbolic systems of equations", *Comm. Pure Appl. Math.* **18** (1965), remains to this day the foundation for our understanding of hyperbolic conservation laws. It starts with a strikingly new insight of the interaction among elementary waves, and proceeds by constructing the "Glimm interaction functional", which controls the total variation of weak solutions. Ideas introduced in this paper have provided the basic analytical tools for generations of researchers in the field.

Throughout the 1970's, Glimm made important contributions to quantum field theory, but after 1980 he returned to hyperbolic conservation laws and worked actively, as the leader of a group of young applied mathematicians, on the computation of multi-dimensional solutions and on various applications.

Glimm was elected to the National Academy of Sciences in 1984. Starting in January 2007, he served a 2-year term as president of the American Mathematical Society. He was an Invited Speaker of the ICM in 1970 at Nice, and a Plenary Speaker of the ICM in 1974 at Vancouver. In 1993, Glimm was awarded the Leroy P. Steele Prize for his contribution to solving hyperbolic systems of partial differential equations. In 2002 he won the National Medal of Science "For his original approaches and creative contribution to an array of disciplines in mathematical analysis and mathematical physics". This is the country's highest honor for research in mathematics and science.