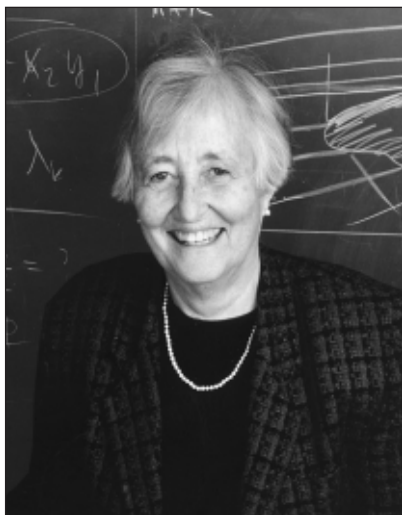


2006 Birkhoff Prize



Cathleen S. Morawetz

The 2006 George David Birkhoff Prize in Applied Mathematics was awarded at the 112th Annual Meeting of the AMS in San Antonio in January 2006.

The Birkhoff Prize recognizes outstanding contributions to applied mathematics in the highest and broadest sense and is awarded every three years (until 2003, it was awarded usually every five years). Established in 1967, the prize was endowed by the family of George David Birkhoff (1884–1944), who served as AMS president during 1925–1926. The prize is given jointly by the AMS

and the Society for Industrial and Applied Mathematics (SIAM). The recipient must be a member of one of these societies and a resident of the United States, Canada, or Mexico. The prize carries a cash award of US\$5,000.

The recipient of the Birkhoff Prize is chosen by a joint AMS-SIAM selection committee. For the 2006 prize, the members of the selection committee were: Barbara L. Keyfitz, Charles S. Peskin, and Gunther Uhlmann (chair).

Previous recipients of the Birkhoff Prize are: Jürgen K. Moser (1968), Fritz John (1973), James B. Serrin (1973), Garrett Birkhoff (1978), Mark Kac (1978), Clifford A. Truesdell (1978), Paul R. Garabedian (1983), Elliott H. Lieb (1988), Ivo Babuška (1994), S. R. S. Varadhan (1994), Paul H. Rabinowitz (1998), John N. Mather (2003), and Charles S. Peskin (2003).

The 2006 Birkhoff Prize was awarded to CATHLEEN S. MORAWETZ. The text that follows presents the selection committee's citation, a brief biographical sketch, and the awardee's response upon receiving the prize.

Citation

To Cathleen S. Morawetz for her deep and influential work in partial differential equations, most notably in the study of shock waves, transonic flow, scattering theory, and conformally invariant estimates for the wave equation.

Biographical Sketch

Cathleen Synge Morawetz was born in Toronto, Canada, in 1923, where her father, Irish-born and

educated John L. Synge, was a professor of mathematics. The family returned to Ireland from 1925 to 1930. From 1930 to 1945 Morawetz received her education in the public schools of Toronto and later her B.A. at the University of Toronto. She started graduate school at the Massachusetts Institute of Technology, receiving an M.S. in 1946. In October 1945 she married Herbert Morawetz, who became a professor of polymer chemistry at Brooklyn Polytechnic. In 1946 Morawetz began working at New York University with Courant and Friedrichs, editing their book on compressible flow. In 1950 she completed a Ph.D. thesis on imploding shocks. From 1950 to 1951 she worked at MIT with C. C. Lin on fluid dynamic stability. In 1951 she returned to NYU on a part-time basis and worked with Friedrichs and Bers, mainly on the problems of transonic flow and mixed equations. In the late 1950s, at Courant's suggestion, she began working with Harold Grad on the mathematical problems of plasma physics, where she showed how a collisionless shock could exist without invoking turbulence. In 1957 she was appointed to the faculty of the Courant Institute. She continued to work in partial differential equations, mainly on problems of mixed type but also on the wave equation. There she solved problems of decay by new conservation laws and later used the same type of estimates with Ludwig to justify geometrical optics in the lit region of a star shaped object. She continued to concentrate on these topics for the rest of her career. She retired in 1993 and became president of the AMS in 1995 (she had also served as an AMS trustee in the 1980s). Morawetz was awarded the National Medal of Science in 1998.

Response

It is a totally unthought of and a wonderful surprise to receive the Birkhoff Prize. I am very, very grateful to the two societies, AMS and SIAM, for choosing me. There are many, many people whom I would have liked to thank for helping me over the years, but I would not have room for their names on this page. But one person stands out for supporting and encouraging me when I was between the crucial professional ages of twenty-three and thirty-five. I worked part-time on my Ph.D., part-time as a postdoc, and I had four children. That person was Richard Courant, the creator of the Courant Institute at New York University, where I have been a professor ever since.