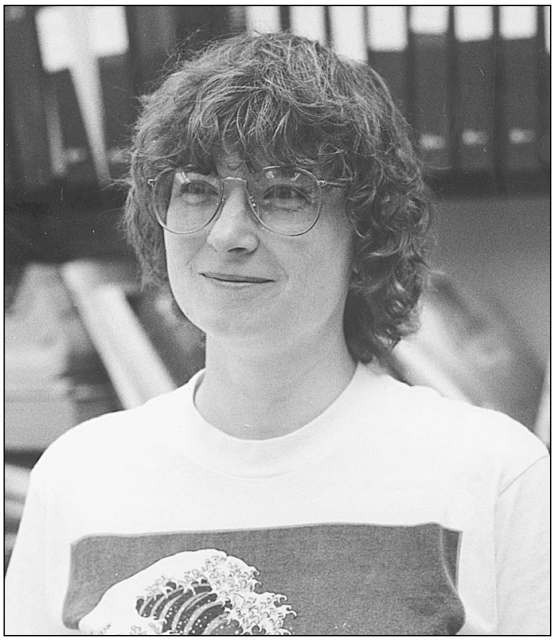
1997 Satter Prize



Ingrid Daubechies

The Ruth Lyttle Satter Prize in Mathematics was established in 1990 using funds donated to the AMS by Joan S. Birman of Columbia University in memory of her sister, Ruth Lyttle Satter. Professor Satter earned a bachelor's degree in mathematics and then joined the research staff at AT&T Bell Laboratories during World War II. After raising a family, she received a Ph.D. in botany at the age of forty-three from the University of Connecticut at Storrs, where she later became a faculty member. Her research on the biological clocks in plants earned her recognition in the U.S. and abroad. Professor Birman requested that the prize be established to honor her sister's commitment to research and to encouraging women in science. The prize is awarded every two years to recognize an outstanding contribution to mathematics research by a woman in the previous five years. The amount of the prize is $1,200.

The 1997 Satter Prize has been awarded to INGRID DAUBECHIES. The prize was presented at the Society's 103rd Annual Meeting in San Diego in January 1997. The prize was awarded by the AMS Council on the recommendation of a selection committee consisting of Peter Sarnak, Carol Wood, and Lai-Sang Young (chair).

The text that follows contains the committee's citation for the award, a brief biographical sketch, and a response from Ingrid Daubechies upon receiving the award.

Citation

The Satter Prize Committee recommends that the 1997 Ruth Lyttle Satter Prize in Mathematics be awarded to Ingrid Daubechies of Princeton University for her deep and beautiful analysis of wavelets and their applications. Her work is a permanent contribution not only to mathematics but to science and engineering. Daubechies' best-known achievement is her construction of compactly supported wavelets in the late 1980s. Over the last five years she has continued their development on the theoretical level and to applications in physics and signal processing. Her continuing research has resulted in the following path-breaking developments. Her discovery with Jaffard and Journe of orthonormal Wilson bases provided the first clues to the existence of cosine packet libraries of orthonormal bases as well as Gaussian bases. These are now standard tools in time frequency analysis as well as in the numerical analysis of partial differential equations. Her work with A. Cohen on biorthogonal wavelet bases provided a more flexible approach to the use of wavelets in image compression algorithms. Biorthogonal basis functions are currently the most common wavelets used in standard compression; they are considered to be superior to orthogonal filters in, for example, fingerprint compression. While continuing to push forward wavelet analysis, Daubechies has also made important contributions in other related areas. Of particular note are her work with Klauder on path integration and her work with her student Anna Gilbert on homogenization, which has contributed to our understanding of multiscale interactions and their computations.

Biographical Sketch

Ingrid Daubechies received both her bachelor's and Ph.D. degrees (in 1975 and 1980) from the Free University in Brussels, Belgium. She held a research position at the Free University until 1987. From 1987 to 1994 she was a member of the technical staff at AT&T Bell Laboratories, during which time she took leaves to spend six months (in 1990) at the University of Michigan, and two years (1991–93) at Rutgers University. She is now at the mathematics department and the Program in Applied and Computational Mathematics at Princeton University.

She was awarded a Leroy P. Steele prize for exposition in 1994 for her book *Ten Lectures on Wavelets*. From 1992 to 1997 she was a fellow of the John D. and Catherine T. MacArthur Foundation. She is a member of the American Academy of Arts and Sciences, the American Mathematical Society, the Mathematical Association of America, the Society for Industrial and Applied Mathematics, and the Institute of Electrical and Electronical Engineers. She is married and has two children.

Response from Ingrid Daubechies

I would like to thank the American Mathematical Society as well as the members of the Ruth Lyttle Satter Prize Committee for awarding this prize to me this year. I am particularly grateful that the citation mentions both my theoretical work and my interest in concrete applications. They are both important to me, and it is gratifying to see them both recognized. I would also like to thank my many collaborators: working with them has enriched both my mathematics and my life.