

**MEMORIAL RESOLUTION OF THE FACULTY  
OF THE UNIVERSITY OF WISCONSIN-MADISON**

**ON THE DEATH OF PROFESSOR EMERITUS WALTER RUDIN**

Walter Rudin, Vilas professor emeritus at the University of Wisconsin-Madison, died on May 20, 2010, at his home in Madison after a long battle with Parkinson's Disease. He was born in Vienna on May 2, 1921.

The Rudins were a well-established Jewish family which began its rise to prominence in the first third of the 19th century. By the 1830s, Walter's great-grandfather Aron Pollak had built a factory to manufacture matches; he also became known for his charitable activities, including the construction of a residence hall where 75 needy students at the Technical University in Vienna could live without paying rent. As a result Aron was knighted by Emperor Franz Joseph in 1869 and took the name Aron Ritter Pollak von Rudin. The Rudin family prospered, and Walter's father Robert was a factory owner and electrical engineer, with a particular interest in sound recording and radio technology. He married Walter's mother Natalie (Natasza) Adlersberg in 1920. Walter's sister Vera was born in 1925.

After the Anschluss in 1938, the situation for Austrian Jews became impossible, and the Rudin family left Vienna. Walter served in the British Army and Navy during the Second World War and rejoined his parents and sister in New York in late 1945. He entered Duke University, obtaining a BA in 1947 and a PhD in mathematics in 1949. He was a C.L.E. Moore Instructor at the Massachusetts Institute of Technology and began teaching at the University of Rochester in 1952.

While on leave visiting Yale in 1958, Rudin received a call from R.H. Bing at the University of Wisconsin-Madison, asking if he would be interested in teaching summer school. Rudin said that since he had a Sloan Fellowship he wasn't interested in summer teaching. Then, as he writes in his autobiography *As I Remember It*, "my brain slipped out of gear but my tongue kept on talking and I heard it say 'but how about a real job?'" As a result, Walter Rudin joined the Department of Mathematics at UW-Madison in 1959, where he remained until his retirement as Vilas professor in 1991. He and his wife, the distinguished mathematician Mary Ellen (Estill) Rudin, were popular teachers at both the undergraduate and graduate level and served as mentors for many graduate students. They lived in Madison in a house designed by Frank Lloyd Wright, and its intriguing architecture and two-story high living room made it a center for social life in the department.

Walter Rudin was one of the preeminent mathematicians of his generation. He worked in a number of different areas of mathematical analysis, and he made major contributions to each. His early work reflected his classical training and focused on the study of trigonometric series and holomorphic functions of one complex variable. He was also very influenced by the then relatively new study of Banach algebras and function algebras. One of his important results in this area, building on the work of Arne Beurling, is the complete characterization of the closed ideals in the disk algebra in 1956.

Another major area of Walter's interest was the general theory of harmonic analysis on locally compact Abelian groups. In the late 1950s and 1960s, this was a very active and popular area of research, and perhaps only partially in jest, Walter suggested that mathematicians introduce a new word, 'lgbalcag', to replace the phrase "Let  $G$  be a locally compact Abelian group" which is how almost every analysis seminar began in those days. One of Walter's major achievements in this area was his 1959 work with Helson, Kahane and Katznelson, which characterized the functions that operate on the Fourier transforms of the  $L^1$ -algebra. Rudin synthesized this aspect of his mathematical career in his 1962 book, *Fourier Analysis on Groups*.

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Walter's interests changed again in the late 1960s, and he began to work on problems in several complex variables. At that time the study of the analytic aspects of complex analysis in several variables was relatively new and unexplored, and it was not even clear what the right several-variable generalization should be of the one-dimensional unit disk. There are at least two candidates: the polydisk and the ball. Walter did important work with both. For example, he showed for the polydisk (1967) and the unit ball (1976) that the zero sets of different  $H^p$  classes of functions are all different. His work on the "Inner Function conjecture" led to a tremendous amount of research, and after the solution by Aleksandrov and Hakim-Sibony-Løw (1981), Walter made additional important contributions to this question. Much of Rudin's work in several complex variables is presented in three of his advanced books. The first, published in 1969, is *Function Theory in Polydiscs*. The second, published in 1980, is *Function Theory in the Unit Ball of  $\mathbb{C}^n$* . His work on inner functions was summarized in a series of NSF-CBMS lectures, which were then published in 1986 as *New Constructions of Functions Holomorphic in the Unit Ball of  $\mathbb{C}^n$* .

Walter Rudin is also known to generations of undergraduate and graduate students for his three outstanding textbooks: *Principles of Mathematical Analysis* (1953), *Real and Complex Analysis* (1966), and *Functional Analysis* (1973). In 1993 he was awarded the American Mathematical Society Leroy P. Steele Prize for Mathematical Exposition. He received an honorary degree from the University of Vienna in 2006.

In addition to his widow Mary Ellen, Walter Rudin is survived by his four children: Catherine Rudin, professor of modern languages and linguistics at Wayne State College, Nebraska; Eleanor Rudin, an engineer working for 3M in Saint Paul, Minnesota; Robert Rudin of Madison; and Charles Rudin, professor of oncology at the Johns Hopkins University in Baltimore. He is also survived by four grandchildren: Adem, Deniz, Sofia, and Natalie.

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