

Frank L. Spitzer

July 24, 1926 — February 1, 1992

Frank Spitzer was one of the most original probabilists of his generation. He was born in Vienna, Austria on July 24, 1926. Fleeing from the Nazis, he spent the second world war in Sweden and finished high school there. He came to the U.S. after the war, did a stint in the U.S. Army and became a student at the University of Michigan. He received a B.A. degree and then a Ph.D. degree in 1953 from this same university.

After receiving his Ph.D. degree, Frank Spitzer was an Instructor at the California Institute of Technology from 1953-55, an Assistant and Associate Professor at the University of Minnesota from 1955-60, and then came to Cornell University as a Full Professor in 1961, where he stayed for the rest of his life, except for sabbatical leaves. He spent a year at Princeton University on an NSF Senior Postdoctoral Fellowship in 1960-61 and a year in Strasbourg, France on a Guggenheim Fellowship in 1965-66. He also participated in a special probability year at the Mittag-Leffler Institute in Djursholm, Sweden in 1972-73. Frank retired from Cornell in 1991 because his struggle with Parkinson's disease for a number of years had made teaching and doing research very difficult for him.

Apart from the Fellowships named above, Frank received a number of honors. He was elected a Fellow of the Institute of Mathematical Statistics in 1971, was invited for a lecture in the probability section at the International Congress of Mathematicians in Vancouver, Canada in 1974 and was the Wald Lecturer to the Institute of Mathematical Statistics in 1979. Frank was elected to the National Academy of Sciences in 1981. For about twenty years Frank was an editor of one of the principal probability journals, the *Zeitschrift für Wahrscheinlichkeitstheorie und verwandte Gebiete* and its successor, *Probability Theory and Related Fields*.

Frank Spitzer's main contributions to probability theory were in the area of Brownian motion, fluctuation and potential theory of random walks and Brownian motion, and interacting particle systems. He discovered remarkable combinatorial identities which give expressions for the characteristic function of the maximum of a random walk, as well as for the ladder heights. By delicate estimates Frank proved the existence of the potential kernel for an arbitrary random walk on the d -dimensional integer lattice. This result has led to much further work, and has been generalized to random walks on groups. Interacting particle systems are perhaps the most exciting and active subfield of probability these days, and Frank Spitzer is widely regarded as the father of this area. It is closely related to statistical physics and Frank contributed greatly to the rigorous study of statistical mechanics models which is a joint activity of probabilists and statistical physicists nowadays. His work was instrumental in

bringing about a strong interaction between these two groups. Several of Frank's most influential articles have been reprinted in a recent Festschrift in honor of him, which was edited by Rick Durrett and Harry Kesten (*Random Walks, Brownian Motion and Interacting Particle Systems*, Birkhauser-Boston, 1991).

Frank Spitzer had a strong sense of elegance and a feeling for which result was beautiful and worthwhile. He would show great enthusiasm for such results, be they his own or due to others. All this comes through very well in this 1964 book, *Principles of Random Walks*, which is still one of the best sources for many properties of random walks. A second edition of the book appeared in 1976 and the book has also been translated into Russian and French. Frank's enthusiasm also showed in his lectures. He was an inspiring lecturer who taught with pleasure at some special summer schools such as the Mathematical Association of America in Williams College in 1971 and in St. Flour, France in 1973.

Frank was always very generous with his time. He was always available for all kinds of help, professional and personal, to his students and friends. He showed considerable concern for the well being of his students and knew how to stimulate and encourage them. This has led to thirteen Ph.D. students, several of whom are now well known probabilists in their own right. Frank was also generous with his ideas and loved to discuss his work with colleagues and to make them coauthors. The high regard in which he was held was apparent from the enthusiasm shown by the contributors to the Festschrift in Frank's honor last year and by the many sincere messages of condolence which were received.

At the time of his retirement, Frank was contemplating volunteer work, both in the local community and in the mathematical community. He tried to follow up a call for help from the Rumanian mathematicians to help them reestablish a functioning library system after the upheavals in their country; unfortunately, no effective help seemed feasible. Frank's principal hobby was a love of the outdoors. He greatly enjoyed hiking and skiing. He jogged regularly together with students and colleagues and kept this up till the end despite the fact that Parkinson's disease forced him to slow down. He was an avid mushroom hunter and one of his great but unfulfilled ambitions was to find morels in Ithaca.

Frank Spitzer is survived by his daughter, Karen of Rhode Island; his son, Tim of New Jersey; two granddaughters; and a sister. Frank Spitzer's death is a heavy loss for his family and friends as well as for probability theory.

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