

Daniel J. Rudolph (1949–2010)

Mike Boyle

Dan Rudolph died in February 2010 of ALS (amyotrophic lateral sclerosis, “Lou Gehrig’s Disease”). A member of the AMS for many years, he was one of the world’s leading ergodic theorists. He combined mathematical brilliance with great generosity and positivity of spirit. He is survived by his wife of eighteen years, Michelle; their three children, Beatrice, Jonah, and Layton; and his brother, Jim.

In ergodic theory Dan was both a problem solver, with a remarkable talent for constructions, and a theory builder. The measurable classification of isometric extensions of Bernoulli shifts, the representation of any measurable flow as a flow under a function assuming just two values, the generalization of this result to \mathbb{R}^n actions, the construction of the minimal self-joinings “counterexample machine”, the proof that Lebesgue measure is the only positive entropy ergodic measure on $[0, 1]$ which is invariant under the maps $\times 2$ and $\times 3$, the use of joinings to prove the BFKO “return times theorem” and a generalization, the work on Bernoullicity of geodesic flows with Patterson-Sullivan measure, the Bernoulli theory for constant-to-one endomorphisms developed with Chris Hoffman (and used by Hoffman and Hecklen to solve a problem of Mañé in complex dynamics), the development of criteria for standardness of a reverse filtration of sigma algebras, . . . the list goes on. His impact was broad and deep.

He developed, eventually in collaboration with Janet Kammeyer and others, a theory of restricted orbit equivalence which placed Ornstein’s Bernoulli theory, Dye’s theorem, Kakutani equivalence, and other relations in a single unified framework. With Benjamin Weiss he developed the “orbit transference method” for generalizing theorems for \mathbb{Z} actions to actions of amenable groups.

Following his 1975 Ph.D. at Stanford under Don Ornstein, Dan held positions at U.C. Berkeley, Hebrew University, and Stanford before settling in 1981 at the University of Maryland. During his time at Maryland, he performed as a modern dancer, was designated a Distinguished Scholar-Teacher, and was an invited speaker at the International Congress of Mathematicians. He was chair of the graduate program and acting chair of the department. He was a leader in developing a Treisman-style calculus program. He founded and directed the SPIRAL program, an intensive six-week preparation for graduate study in the mathematical sciences, developed in close coordination with a group of minority-serving colleges and universities. This program was acknowledged by the AMS with its 2008 Award for Mathematics Programs That Make a Difference.

In 2005 Dan and Michelle moved their family from the suburbs of Washington, D.C., to the open space and mountains of Dan’s old hometown, Fort Collins, where Dan assumed the Albert C. Yates Endowed Chair in Mathematics at Colorado State University. As the ALS emerged and progressed, he continued with department service, Ph.D. students, postdocs, a Math Circle for middle school girls, and his own mathematics. One of his last papers was a joint work with Benjamin Weiss and Matt Foreman, to appear in *Annals of Mathematics*, which proves that the conjugacy equivalence relation on the set of ergodic measure-preserving automorphisms of a standard probability space is complete analytic (in particular, not Borel).

A volume in memory of Dan Rudolph has been published in the journal *Ergodic Theory and Dynamical Systems* (April 2012, Vol. 32, Part 2).

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