2011 Satter Prize

Amie Wilkinson received the 2011 AMS Ruth Lyttle Satter Prize in Mathematics at the 117th Annual Meeting of the AMS in New Orleans in January 2011.

Citation

The Ruth Lyttle Satter Prize in Mathematics is awarded to Amie Wilkinson for her remarkable contributions to the field of ergodic theory of partially hyperbolic dynamical systems.

Wilkinson and Burns provided a clean and applicable solution to a long-standing problem in stability of partially hyperbolic systems in the paper "On the ergodicity of partially hyperbolic systems" (*Annals of Math.* (2) **171** (2010), no. 1, 451–489). The study of hyperbolic systems was begun in the 1960s by Smale, Anosov, and Sinai; this work was built upon earlier achievements of Morse, Hedlund, and Hopf. The recent papers of Wilkinson, jointly with Burns, give what is considered by experts to be the optimal result that unifies much of the deep work done by mathematicians during the intervening decades to weaken the strong hypothesis of hyperbolicity in order to be widely applicable while retaining the fundamentals of the associated dynamical behavior.

Wilkinson has played a central role in the recent major developments in many related areas as well, including making some fundamental advances in understanding generic behavior of C^1 diffeomorphisms. In addition to her outstanding work with Burns, Wilkinson works with many coauthors, such as Avila, Bonatti, Crovisier, Masur, and Viana, with whom she has published many significant results. A problem on the centralizers of diffeomorphisms was stated by Smale more than forty years ago and is included in his list of problems for the twenty-first century; the solution in the C^1 case was provided by Wilkinson in a series of papers with Bonatti and Crovisier.

Biographical Sketch

Amie Wilkinson grew up in Evanston, Illinois, received her A.B. from Harvard in 1989 and Ph.D. from Berkeley in 1995 under the direction of Charles Pugh. After serving one year as a Benjamin Peirce Instructor at Harvard, she moved to Northwestern in 1996 where she was promoted to full professor in 2005. She was the recipient of an NSF Postdoctoral Fellowship and has given AMS Invited Addresses in Salt Lake City (2002), in Rio de Janeiro (2007), and at the 2010 Joint Meetings in San Francisco. She was also an invited speaker in the Dynamical Systems session at the 2010 ICM in Hyderabad. She lives in Chicago with her husband Benson Farb and their two children.

Response

This is an unexpected honor for which I am very grateful. As a woman in math, I have certainly faced some challenges: shaking the sense of being an outsider, coping with occasional sexism, and balancing career and family. These difficulties were ameliorated by the support and encouragement of numerous individuals and institutions, beginning with my parents, who thought it delightful that their older daughter loved math and science (and art and cooking). Early guidance from math teachers, especially John Benson at Evanston High School, was invaluable. The people in the Math Department at Northwestern University demonstrated their faith in me early on and never wavered in their

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support. Northwestern protected my research time early on, was flexible in assigning duties later, and promoted me in a timely fashion. Some of this was a gamble on Northwestern's part, one that other departments might still be hesitant to make.

I have been educated over the years by a string of amazing mentors and collaborators, including those mentioned in the citation. Charles Pugh, Mike Shub, Keith Burns, and Christian Bonatti have played a special role; together, they have taught me how to think, dream, and write mathematics. From early on, Lai-Sang Young (the 1993 Satter

Prize winner) has been a role model; her work in dynamics and clarity of exposition has always set the standard. The joint project with Keith Burns mentioned in the citation was an immensely satisfying collaboration. Whenever I think that the intricacies of partially hyperbolic dynamics have been largely revealed, a new phenomenon arises to delight and inspire.

I also thank my husband Benson, my best friend, mathematical companion, and muse (who occasionally lets me be his muse as well), and my children Beatrice and Felix, who have forced me to take a break from mathematics when I needed it the most.

About the Prize

The Satter Prize is awarded every two years to recognize an outstanding contribution to mathematics research by a woman in the previous five years. Established in 1990 with funds donated by Joan S. Birman, the prize honors the memory of Birman's sister, Ruth Lyttle Satter. 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 United States and abroad. Birman requested that the prize be established to honor her sister's commitment to research and to encouraging women in science. The prize carries a cash award of US$5,000.

The Satter Prize is awarded by the AMS Council acting on the recommendation of a selection committee. For the 2011 prize, the members of the selection committee were Victor W. Guillemin, Jane M. Hawkins, and Sijue Wu.

Previous recipients of the Satter Prize are: Dusa McDuff (1991), Lai-Sang Young (1993), Sun-Yung Alice Chang (1995), Ingrid Daubechies (1997), Bernadette Perrin-Riou (1999), Karen E. Smith (2001), Sijue Wu (2001), Abigail Thompson (2003), Svetlana Jitomirskaya (2005), Claire Voisin (2007), and Laure Saint-Raymond (2009).