

2007 Satter Prize

The 2007 Ruth Lyttle Satter Prize in Mathematics was awarded at the 113th Annual Meeting of the AMS in New Orleans in January 2007.

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 U.S. 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 2007 prize, the members of the selection committee were: Benedict H. Gross, Karen E. Smith, and Chuu-Lian Terng (chair).

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), and Svetlana Jitomirskaya (2005).

The 2007 Satter Prize was awarded to CLAIRE VOISIN. The text that follows presents the selection committee's citation, a brief biographical sketch, and the awardee's response upon receiving the prize.

Citation

The Ruth Lyttle Satter Prize is awarded to Claire Voisin of the Institut de Mathématiques de Jussieu

for her deep contributions to algebraic geometry, and in particular for her recent solutions to two long-standing open problems. Voisin solved the Kodaira problem in her paper "On the homotopy types of compact Kähler and complex projective manifolds", *Invent. Math.* **157** (2004), no. 2, 329-343. There she shows that in every dimension greater than three, there exist compact Kähler manifolds not homotopy equivalent to any smooth projective variety. This problem has been open since the 1950s when Kodaira proved that every compact Kähler surface is diffeomorphic to (and hence homotopy equivalent to) some projective algebraic variety. Her idea is to start with the fact that certain endomorphisms can prevent a complex torus from being realized as a projective variety, and then to construct Kähler manifolds whose Albanese tori must carry such endomorphisms for homological reasons. In a completely different direction, Voisin also solves Green's Conjecture in her papers "Green's canonical syzygy conjecture for generic curves of odd genus", *Compos. Math.* **141** (2005), no. 5, 1163-1190, and "Green's generic syzygy conjecture for curves of even genus lying on a K3 surface", *J. Eur. Math. Soc.* **4** (2002), no. 4, 363-404.

A century ago, Hilbert saw that syzygies (relations among relations) were important invariants of varieties in projective space, and in the early 1980s, Mark Green conjectured that the syzygies of a general curve canonically embedded in projective space should be as simple as possible. This conjecture attracted a huge amount of effort by algebraic geometers over twenty years before finally being settled by Voisin. Her idea is to work with curves on a suitable K3 surface, where she executes



Claire Voisin

deep calculations with vector bundles (at least in even genus) that lead to the required vanishing theorems.

Biographical Sketch

Claire Voisin defended her thesis in 1986 under the supervision of Arnaud Beauville. She began employment in the Centre National de la Recherche Scientifique as *chargée de recherche* in 1986 and since then pursued her career in this institution. She occasionally taught graduate courses but mainly does research and advises students. Her honors include the European Mathematical Society Prize (1992), the Servant Prize (1996) and the Sophie Germain Prize (2003) of the Académie des Sciences de Paris, and the silver medal of the CNRS (2006). She was an invited speaker at the International Congress of Mathematicians in 1994 in Zurich.

Response

I am deeply honored to have been chosen to receive the 2007 Ruth Lyttle Satter Prize. I feel of course very encouraged by this recognition of my work. I would like to thank the members of the prize committee for selecting me. I am also very grateful to my institution, the CNRS, which made it possible for me to do research in the best conditions.