

# 2010 Morgan Prize

SCOTT DUKE KOMINERS received the 2010 AMS-MAA-SIAM Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student at the Joint Mathematics Meetings in San Francisco in January 2010. Receiving an honorable mention was MARIA MONKS.

## Citation: Scott Duke Kominers

Scott Kominers is the winner of the 2010 Morgan Prize for Outstanding Research by an Undergraduate Student. The award is based on his outstanding and prolific record of undergraduate research spanning a broad range of topics, including number theory, computational geometry, and mathematical economics. Kominers already has several published papers in such journals as *Proceedings of the AMS*, *Journal de Théorie des Nombres de Bordeaux*, *International Journal of Number Theory*, and *Integers*. His work on extremal lattices sheds new light on some problems that have been extensively investigated in recent years, and his work (with collaborators) on “hinged dissections” resolves a problem going back to 1864.

In addition to his mathematical work, Kominers has published papers in musicology, as well as puzzles and haikus. He graduated in 2009 from Harvard and is engaged in doctoral studies in mathematical economics.

## Biographical Sketch: Scott Duke Kominers

Scott Duke Kominers grew up in Bethesda, Maryland, attending Walt Whitman High School, where his teacher Susan Schwartz Wildstrom crystallized Scott’s interest in mathematics. Scott’s first research experience occurred at the 2004 Research Science Institute at MIT, at which he wrote a paper in quadratic form representation theory for which he won the AMS’s Karl Menger Prize. Scott graduated from Harvard summa cum laude in mathematics in 2009, with a minor in ethnomusicology. He

received Harvard’s Thomas Temple Hoopes Prize for his senior thesis, “Weighted Generating Functions and Configuration Results for Type II Lattices and Codes”.

In college, Scott had the good fortune and honor to work in a host of fields under many advisers: number theory under Noam D. Elkies; computational geometry under Erik D. Demaine; mathematical economics under Susan Athey, Edward L. Glaeser, Drew Fudenberg, John William Hatfield, William R. Kerr, Alvin E. Roth, Andrei Shleifer, and E. Glen Weyl; and musicology under Kay Kaufman Shelemay. Scott feels blessed with friends and family, especially Zachary Abel and Paul Kominers, with whom he collaborates on both research and the *Harvard College Mathematics Review*.

Currently, Scott is pursuing mathematical economics studies as a graduate student in the Harvard Business Economics Ph.D. program, supported by a National Science Foundation Graduate Research Fellowship.



Scott Duke Kominers

## Response: Scott Duke Kominers

I am deeply honored to have received this award. I want to thank the AMS, MAA, and SIAM for this recognition, and Mrs. Frank Morgan for endowing the prize. I owe uncountably many thanks to my advisers—Susan Athey, Erik D. Demaine, Edward L. Glaeser, Drew Fudenberg, John William Hatfield, William R. Kerr, Alvin E. Roth, Kay Kaufman Shelemay, Andrei Shleifer, David Smith, E. Glen Weyl, and especially Noam D. Elkies—for their teaching, advice, and support. Additionally, I am grateful to my high school mathematics teacher, Susan Schwartz Wildstrom, for fostering and encouraging my love of mathematics. I want to thank both the Research Science Institute and the

Harvard College Program for Research in Science and Engineering for providing me with stimulating research environments. Finally, I thank my collaborators and classmates for energizing and enlightening me, and my family for its unceasing love and inspiration.

### **Citation for Honorable Mention: Maria Monks**

The Morgan Prize Committee is pleased to award Honorable Mention for the 2010 Morgan Prize for Outstanding Research by an Undergraduate Student to Maria Monks.

The award recognizes her excellent work in combinatorics and number theory. She has an impressive portfolio of five papers, three of which have already appeared in *Proceedings of the AMS*, *Journal of Combinatorial Theory, Series A*, and *Electronic Journal of Combinatorics*. Maria is a 2009 Goldwater Scholar and a recipient of the 2009 Alice T. Schafer Prize for Women in Mathematics. She is currently a senior at MIT and, in addition to her achievements in mathematics, is an accomplished cross-country runner.

### **Biographical Sketch: Maria Monks**

Maria Monks was raised in Hazleton, Pennsylvania, where her father fostered her interest in mathematical problem solving. She grew as a mathematician through competitions and programs such as the Lehigh Valley ARML Team and the Mathematics Olympiad Summer Program.

At the 2007 and 2008 Duluth REUs supervised by Joe Gallian, she solved an open problem on partition reconstruction from minors and discovered a new mock theta function which provides a new combinatorial proof of a partition congruence identity. As an undergraduate at MIT, Maria worked with Richard Stanley on a classification problem in matroid theory and also worked in a fluid dynamics laboratory modeling wave dynamics in trenches. In 2008 she was a coach of the USA team for the Girls Math Olympiad in China, and she is heavily involved with the Harvard-MIT Mathematics Tournament, a competition for high school students run by MIT and Harvard undergraduates. She was the primary author of the 2009 competition and enjoys writing problems in her spare time.

When she is not busy attacking a deep open problem in mathematics, Maria can often be found running. She has competed for the MIT varsity cross-country team for the past four years and intends to train for marathons upon completion of her cross-country career.

### **Response: Maria Monks**

I am very honored to have been named an Honorable Mention for the Frank and Brennie Morgan Prize, and I thank the AMS, MAA, and SIAM for selecting me for this award.

There are more people that deserve to be thanked than can possibly fit into a reasonably sized response, but I would like to express my gratitude to the people who had the most impact on my mathematical career. I thank Joe Gallian for nominating me for this prize and for serving as a wonderful advisor at the Duluth REU. I also express my gratitude to Ken Ono and Richard Stanley for their help, advice, and mentorship in various research projects. Most importantly, I thank my father, Ken Monks, and the rest of my family for providing a wonderful environment in which to grow up and for opening my eyes to the beauty of mathematics.

### **About the Prize**

The Morgan Prize is awarded annually for outstanding research in mathematics by an undergraduate student (or students who have submitted joint work). Students in Canada, Mexico, or the United States or its possessions are eligible for consideration for the prize. Established in 1995, the prize was endowed by Mrs. Frank (Brennie) Morgan of Allentown, Pennsylvania, and carries the name of her late husband. The prize is given jointly by the AMS, the Mathematical Association of America (MAA), and the Society for Industrial and Applied Mathematics (SIAM) and carries a cash award of US\$1,200.

Recipients of the Morgan Prize are chosen by a joint AMS-MAA-SIAM selection committee. For the 2010 prize, the members of the selection committee were: Georgia Benkart, Anna L Mazzucato, Maeve L. McCarthy, Michael E. Orrison, Kannan Soundararajan, and Paul Zorn.

Previous recipients of the Morgan Prize are: Kannan Soundararajan (1995), Manjul Bhargava (1996), Jade Vinson (1997), Daniel Biss (1998), Sean McLaughlin (1999), Jacob Lurie (2000), Ciprian Manolescu (2001), Joshua Greene (2002), Melanie Wood (2003), Reid Barton (2005), Jacob Fox (2006), Daniel Kane (2007), Nathan Kaplan (2008), and Aaron Pixton (2009).