2008 Morgan Prize

Nathan Kaplan

The 2008 AMS-MAA-SIAM Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student was awarded at the Joint Mathematics Meetings in San Diego in January 2008.

The Morgan Prize is awarded annually for outstanding research in mathematics by an undergraduate student (or students having 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$1,000.

Recipients of the Morgan Prize are chosen by a joint AMS-MAA-SIAM selection committee. For the 2008 prize, the members of the selection committee were Kelly J. Black, James H. Curry, Karen E. Smith, Kannan Soundararajan, Judy L. Walker, and Paul Zorn (chair).

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), and Daniel Kane (2007).

The 2008 Morgan Prize was awarded to NATHAN KAPLAN. The text that follows presents the selection committee's citation, a brief biographical sketch, and the awardee's response upon receiving the prize.

Citation

Nathan Kaplan has been named the recipient of the 2008 Morgan Prize for Outstanding Research by an Undergraduate. He graduated in 2007 from Princeton University with high honors. He also received the mathematics department's Peter Greenberg Prize, which honors outstanding mathematical accomplishments.

This award is based principally on four impressive papers in algebraic number theory, two of them individual and two with other authors. (Coauthors of the joint papers were careful to highlight Kaplan's substantial contributions.) At least three of these papers have been accepted for publication in such venues as the *Journal of Number Theory*, the *Journal of Algebra and Its Applications*, and *Acta Arithmetica*. Concerning Nathan's paper "Flat cyclotomic polynomials of order three", the *Journal of Number Theory* wrote that the work "contains…rather definitive results substantially advancing our understanding of cyclotomic polynomials of order three." Another recommender observed that this and related work of Kaplan demonstrates "remarkable creativity [and] technical facility…[and] will provide researchers new tools."

Kaplan participated in three summer REU [Research Experiences for Undergraduates] programs (at Trinity University, Williams College, and the University of Minnesota-Duluth) during his undergraduate career and produced publishable, professional-level work at all three. One of his supervisors described him as the most outstanding undergraduate with whom he had worked. Another supervisor described Kaplan as an extraordinary student—brilliant, friendly, outgoing, polite, and fun to work with. All of his recommenders, and this committee, fully expect Kaplan to become a very successful research mathematician.

Biographical Sketch

Nathan Kaplan was raised in Brooklyn, New York, and began taking mathematics classes at Columbia University while in high school. He graduated in June 2007 with a degree in mathematics from Princeton University and is currently at Cambridge

University doing Part III of the Mathematical Tripos.

His first research experience was in the summer of 2004 at the Trinity University REU program studying numerical monoids with Scott Chapman. The following summer he worked in the algebraic number theory group at the Williams College SMALL program under the direction of Allison Pacelli. In 2006 Kaplan attended Joe Gallian's REU at the University of Minnesota-Duluth and studied cyclotomic polynomials. This past summer he returned to the Trinity REU and worked as a graduate assistant. He also participated in independent research at Princeton with Ramin Takloo-Bighash, who has advised him since his first week on campus.

Next fall he will begin the mathematics Ph.D. program at Harvard University on a National Science Foundation Graduate Fellowship. He plans to study algebraic number theory. He is enthusiastic about teaching and has been active in tutoring since high school. Outside of math he is a dedicated New York Mets fan, enjoys theater and film, and once bowled a 162.

Response

I am very honored to be selected for the 2008 Morgan Prize. I would like to thank Mrs. Frank Morgan for endowing the award and the AMS, MAA, and SIAM for sponsoring it. I am very grateful to all of my advisers who have taught me what research is all about: Ramin Takloo-Bighash and Manjul Bhargava at Princeton, Scott Chapman at Trinity University, Allison Pacelli at Williams, and Joe Gallian at the University of Minnesota-Duluth. I owe a lot of thanks to the other students I worked with at summer REU programs and also to the students in my problem set groups at Princeton for helping me get the most out of my academic experiences. I would also like to thank my friends in Princeton, NYC, and elsewhere for giving me something to do when I needed a mathematical break. Most importantly, I must thank my parents for their love and support and for giving me so many opportunities to succeed.