1999 AMS-MAA-SIAM Morgan Prize

Today undergraduate students are working on problems of current research interest, proving theorems, writing up results for publication, and giving talks on their work. There is undergraduate research today at the highest standards of professional excellence. The Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student is intended to recognize and encourage outstanding mathematical research by undergraduate students. The prize was endowed by Mrs. Frank Morgan and also carries the name of her late husband.

At the Joint Mathematics Meetings in San Antonio in January 1999, the 1998 Morgan Prize was awarded to DANIEL BISS. An Honorable Mention was presented to AARON F. ARCHER.

The prize selection committee consisted of George Andrews, Kelly J. Black, Catherine A. Roberts, Robert O. Robson, Martha J. Siegel, and Trevor Wooley.

The text that follows contains the committee's citation, a brief biographical sketch of Daniel Biss, and his response upon receiving the award. The same material is also presented for Aaron Archer.

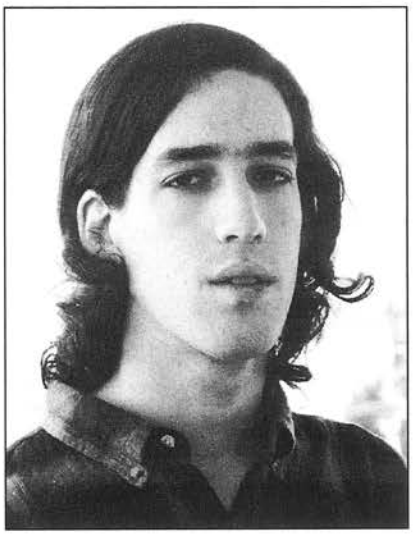
Daniel Biss

Citation

The 1998 winner of the Morgan Prize for outstanding research by an undergraduate is Daniel Biss, whose undergraduate studies were conducted at Harvard University. His submission for the prize included results in combinatorics, topology, group theory, and graph theory.

The committee was most impressed by Biss's remarkable breadth as well as depth. The most exciting aspect of his submission was his extension of a category which more closely binds the associations between combinatorial group theory and combinatorial topology. Overall, Biss's submission included four solid research papers, two of which have been accepted for publication.

The strength of his research, coupled with outstanding letters, insured that he is a truly outstanding candidate, and the committee is proud to give the 1998 Frank and Brennie Morgan Prize to Daniel Biss.



Daniel Biss

Biographical Sketch

Daniel Biss was born in Akron, Ohio, in 1977 and brought up in Bloomington, Indiana. His mathematical education began in 1992 under the guidance of Ciprian Foias, Distinguished Professor of Mathematics at Indiana University, who taught him analysis and measure theory. Around the same time, Biss began taking graduate-level courses at Indiana.

In the summer of 1994 he attended the Research Science Institute at the Massachusetts Institute of Technology, where he won the H. G. Rickover Medal, awarded to the outstanding student at the Institute. There he began working on a problem in algebraic combinatorics. This work was continued under the guidance of Professor Foias, as

well as Kent Orr, also a professor at Indiana. It resulted in a paper for which Biss was named a finalist in the Westinghouse Science Talent Search, a winner of the Naval National Science Award, and a winner of the *USA Today* All-USA Academic Team competition.

In 1995 Biss went to Harvard University to pursue an undergraduate degree in mathematics. The following summer he was a student at the Duluth Summer Mathematics Research Experience for Undergraduates, under the direction of Joseph A. Gallian. Biss returned each of the following two years as a research advisor. During his second year at Harvard he was a course assistant for an honors freshman multivariable calculus course and later for a representation theory course. He has twice received a Certificate of Distinction in Teaching. In 1997 he was awarded the Barry M. Goldwater Scholarship in Mathematics, Science, and Engineering. In the spring of 1998 Biss graduated summa cum laude and received the Thomas Wendell Hoopes prize for his undergraduate thesis "Homotopy theory with a view toward stable computations", written under the direction of Raoul Bott and Michael Hopkins, professors at Harvard and MIT respectively.

Response

I am very honored to have been awarded the Morgan Prize. I would like to thank the AMS, MAA, and SIAM for instituting this award. Also, I would like to give my thanks for the opportunity to attend a summer Research Experience for Undergraduates in Duluth, MN. Without the existence of such a program and without the guidance of the program's founder and director, Joseph A. Gallian, I would never have been able to do most of the work for which the prize was awarded. I'd also like to point out that some of the work was done in collaboration with Samit Dasgupta, and without his ideas and commitment that could never have come about. Lastly, I'd like to thank the many other people who have been tremendous mathematical influences, particularly Kent Orr and Ciprian Foias, who have always been able to point me in the right direction, both inside and outside of mathematics.

Honorable Mention: Aaron F. Archer

Citation

An Honorable Mention is awarded to Aaron F. Archer for his nomination to the 1998 Frank and Brennie Morgan Prize. Archer's undergraduate studies were conducted at Harvey Mudd College. His submission for the prize included two solid papers on graph theory, introducing new chromatic interpretations for a graph.

Archer also has two applied mathematics papers in preparation and is a coauthor on a third paper that was awarded the SIAM Prize from the Mathematical Modeling Contest. All of his references painted a picture of a multitalented mathematician with demonstrated problem-solving ability, proven research ability, excellent communication skills, and an aptitude for working with others. As one of his letters stated, "Everything he does, he does well."

This outstanding young researcher has been recognized by an Honorable Mention in this year's Morgan Prize competition.

Biographical Sketch

Aaron Archer grew up in Tucson, Arizona. Last May he earned his B.S. in mathematics, graduating with high distinction from Harvey Mudd College in Claremont, California. Aaron's experience as a high school student at the 1992 Hampshire College Summer Studies in Mathematics summer camp strongly influenced him to study mathematics in college, and he returned to teach at the program in 1995 and 1998. He is also an alumnus of the Budapest Semesters in Mathematics and the Research Experiences for Undergraduates programs at Indiana University and the University of Minnesota, Duluth. He has done work in chromatic graph theory, computational geometry, discrete dynamical systems, and recreational mathematics. He received a Barry M. Goldwater Scholarship for his undergraduate studies. He initiated and led a fundraising effort last spring to establish a merit scholarship for promising incoming math students at Harvey Mudd, named after his classmate Andrew "Rif" Hutchings.

Archer is currently a Hertz Fellow in the Department of Operations Research and Industrial Engineering at Cornell University, where he is concentrating on discrete optimization.

Response

I am greatly honored to receive this recognition for my undergraduate work. I would like to thank all those who have helped guide my research or given me valuable advice and encouragement, particularly Professors Joseph Gallian of the University of Minnesota, Duluth; Maynard Thompson of Indiana University; and Michael Moody, Arthur Benjamin, and Francis Su of Harvey Mudd College.