Paul R. Halmos - Lester R. Ford Awards

The Paul R. Halmos-Lester R. Ford Awards recognize authors of articles of expository excellence published in *The American Mathematical Monthly*. The awards were established in 1964 as the Ford awards, named for Lester R. Ford, Sr., a distinguished mathematician, editor of *The American Mathematical Monthly*, 1942–1946, and President of the Mathematical Association of America, 1947–1948. In 2012, the Board of Governors designated these awards as the Paul R. Halmos–Lester R. Ford Awards to recognize the support for the awards provided by the Halmos family and to recognize Paul R. Halmos, a distinguished mathematician and editor of the *Monthly*, 1982–1986.

Tristram Bogart and Kevin Woods

"A Plethora of Polynomials: A Toolbox for Counting Problems," *The American Mathematical Monthly,* 129:3, 203–222. doi.org/10.1080/00029890.2022.2010487

This article introduces the reader to parameterized families of counting problems whose solutions are polynomial-like. The authors begin with examples that illustrate Ehrhart's theorem (1962) about the number of integral points that lie in dilations of a polytope. They gradually increase the complexity of the counting problems, introducing multiple parameters, quantifiers, and Boolean operations. The numerous examples range across contexts, from buying Chicken McNuggets to chromatic polynomials for graphs to placing pieces on a chess board. All the examples fit under the umbrella of recent theorems of the authors and John Goodrick, which are provided toward the end of the paper.

Response

We are thrilled to receive this award from the MAA. These polynomial-like functions (called quasi-polynomials) pop up in a surprising number of places, in diverse areas of mathematics such as combinatorics, discrete geometry, commutative algebra, optimization, logic, etc. We have enjoyed creating a framework for understanding many of these appearances of quasi-polynomials, and the *Monthly* provided a great opportunity to share our discoveries with other mathematicians. It was a pleasure to write the article, and we are glad that people have enjoyed reading it! Thank you to our collaborators, the *Monthly* editorial staff, and the reviewers for their help with this paper, and thank you to the award committee for this honor.

Biographical Sketches

Tristram Bogart received his PhD from the University of Washington in 2007. After post docs at Queen's University and MSRI/San Francisco State University, he moved to Los Andes University in Bogotá, Colombia, where he is now an associate professor of mathematics.

Kevin Woods received his PhD from the University of Michigan in 2004. After a post doc at the University of California, Berkeley, he moved to Oberlin College in 2006, and he is now a professor of mathematics there. He is happiest when he is with his dog or is taking long walks, but he is sad that his dog cannot keep up on these long walks.