

## Paul R. Halmos - Lester R. Ford Awards

### Colin Adams, Allison Henrich, Kate Kearney, and Nicholas Scoville

“Knots related by knotoids,” *The American Mathematical Monthly*, 126(6), 483–490.  
10.1080/00029890.2019.1583971.

A knot is an embedding of a circle in a 3-dimensional Euclidean space; a knotoid is the projection of a knot with open ends (so a projection of an embedding of an interval). We can look at the equivalence of knotoids in the same way as we look at equivalence of knot diagrams but performing the equivalence moves away from the open ends. Two knots are said to be knotoid equivalent if there is a knotoid whose closure by an arc over the top of the diagram is one of the knots and whose closure by an arc under the diagram is the other. An interesting open question was to determine which pairs of knots were knotoid equivalent. The authors use a sequence of clever moves to prove the new result that in fact *every* pair of knots are knotoid equivalent. Their method makes use of knotoids with a high number of crossings, which generates some interesting open problems.

### Response

We had so much fun writing this paper! The story of how the paper came about is almost as interesting as the results themselves. It involves one faculty member asking another to treat them like an undergraduate researcher so they could work on a project together, despite the fact that they work in different research areas. Another collaborator joined the duo because working on the team sounded like a fun avenue for thinking about some new problems. Finally, a fourth (surprise!) collaborator went from being an anonymous referee to being an essential member of the team.

We are still in awe that this unlikely sequence of events allowed us to complete this joint project. Most of all, we are grateful to Susan Colley, Editor of the *Monthly*, for being such a wonderful steward of this paper, to our referees who gave us useful feedback and encouragement, and to those who decided to honor us with this award.

### Biographical Sketches

**Colin Adams** received his PhD from the University of Wisconsin in 1983 and is now the Thomas T. Read Professor of Mathematics at Williams College. He is particularly interested in knot theory in all its forms. The author/co-author of nine books, including one math comic book and one math novel, he is also the humor columnist for the expository magazine the *Mathematical Intelligencer*. He turns many of the columns into scripts which are then performed with the help of a great band of mathematicians/actors at the Joint Math Meetings every year.

**Allison Henrich** is a Professor of Mathematics at Seattle University, having earned her PhD in 2008 from Dartmouth College. This is the second time Allison has been honored with the Halmos-Ford Award, first winning the award with Louis Kauffman for their paper “Unknotting Unknots” in 2015. Allison has found an outlet for her love of high-quality, mathematical exposition by serving on the editorial boards of several journals, including *Mathematics Magazine* and the *College Math Journal* and publishing in most of MAA’s journals. She has also co-authored and co-edited several books, including *An Interactive Introduction to Knot Theory* (with Inga Johnson), *A Mathematician’s Practical Guide to Mentoring Undergraduate Research* (with Michael Dorff and Lara Pudwell), and *Living Proof: Stories of Resilience Along the Mathematical Journey* (with Emille Lawrence, Matthew Pons, and Dave Taylor).

**Kate Kearney** earned her PhD from Indiana University in 2011. After a postdoctoral position at Louisiana State University, she joined the faculty of the Gonzaga University Mathematics Department in 2014. Kate has been working with knots since she learned about them in an undergraduate summer research project, and she now enjoys introducing them to her own undergraduate research students.