

Mary P. Dolciani Award

Joseph Gallian

University of Minnesota Duluth

Professor Joseph Gallian exemplifies the combination of excellence in both mathematical research and mathematics education that the Mary P. Dolciani Award honors. Dr. Gallian has published 35 research papers in pure mathematics, 40 papers related to teaching, 30 expository articles, 17 news articles, 7 books, led numerous workshops and conferences, and has given nearly 100 invited addresses at meetings. Dr. Gallian has been widely recognized for his contributions. He is an Inaugural Fellow of the American Mathematical Society; a recipient of the Franklin and Deborah Tepper Haimo Award for teaching excellence from the MAA; a recipient of every teaching award given by the University of Minnesota Duluth and the University of Minnesota System for which he is eligible, and a recipient of the most prestigious award given by the MAA recognizing contributions to our profession, the Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics.

Dr. Gallian has been a tireless contributor to the MAA serving on numerous committees spanning all aspects of MAA work, heading MAA grant funded projects, securing contributions for the MAA Carriage House programs, and notably served as MAA President. The MAA work for which he is best known is his 23-year leadership role in Project NExT.

Dr. Gallian is a great communicator of mathematics, inspiring mathematicians and students alike through his many presentations and expository papers and books. His talk on “Assigning Drivers License Numbers” has been heard and enjoyed by thousands. He led the effort to produce the film *Hard Problems*, about the U.S. team to the International Mathematical Olympiad, and to have the film *Julia Robinson and Hilbert’s Tenth Problem* syndicated on public television.

In 1977, Professor Gallian helped to change undergraduate mathematics education across the country with his groundbreaking summer research program for undergraduate at the University of Minnesota Duluth. At that time, most mathematicians did not believe that undergraduate students could do significant original research in mathematics. Gallian showed that indeed talented undergraduates could and did produce publishable research results. In over 40 years of summer programs, Dr. Gallian taught and mentored over 250 REU students. One of those students states that the uniqueness of this program is that Professor Gallian treats undergraduate students as if they were working on a PhD thesis problem. The UMD program is recognized for the numbers of students who have gone to graduate school, received PhD’s in mathematics, won mathematical prizes, and have gone onto stellar careers. A highlight of Dr. Gallian’s remarkable career was an invitation from his student Manjul Bhargava to be his official guest at the ceremony in Seoul at which he received the Fields Medal. While his REU attracts highly talented students, Dr. Gallian excels in matching each one with a challenging published open problem. He spreads the word about undergraduate research through talks, papers, workshops, and conferences. Gallian and other REU directors in mathematics have made REUs a staple of summer enrichment offerings. Furthermore, because REUs showed it is a reasonable expectation for undergraduates to do original mathematics, research has been incorporated in the undergraduate curriculum across the country and throughout the spectrum of undergraduate institutions. Through his leadership of Project NExT, generations of new faculty have emulated Professor Gallian, combining research and excellent teaching and incorporating undergraduate research in their programs. Through the MAA, Dr. Gallian secured grants for undergraduate research conferences, workshops for faculty on undergraduate research, and for undergraduates’ travel in order to present their work at national mathematics meetings and undergraduate research conferences. These efforts further

solidified the place of research in the undergraduate experience. It is for his profound impact on undergraduate mathematics education combined with an outstanding career as a research mathematician that Professor Joseph Gallian is awarded the 2019 Mary P. Dolciani Award.

Response

It is a great honor to receive the Dolciani award. I thought I was a long shot to win it, but I considered it an honor just to be nominated. I decided early on that rather than run summer research programs with faculty colleagues, the best people to assist me with the programs were alumni of the program. Over the years, I have had fantastic program alumni return to Duluth to live and work with wonderful undergraduates to accomplish significant research. Together, we have established a community of peers where interactions take place long after their initial participation in the program. The Dolciani award citation gives me credit for their efforts and the contributions of others who have helped to create a role for research in the undergraduate mathematics education. The NSF and the NSA provided crucial financial support and the MAA provided the necessary logistical support with minicourses, conferences, and Project NExT. There are too many people who contributed to this revolution to mention by name, but it is not a slight to the others to thank Aparna Higgins and Frank Morgan for their major contributions.

Biographical Sketch

Joe Gallian received a PhD from Notre Dame in 1971. He has been at the University of Minnesota Duluth since 1972. He is the author of the book *Contemporary Abstract Algebra* (9th edition) and coauthor of the book *For All Practical Purposes* (10th edition). His research interests include groups, graphs, and combinatorics. For pleasure, he enjoys spending time with his ten-year-old grandson Joey, reading nonfiction, and listening to National Public Radio.