



# 2021 George David Birkhoff Prize

Gunther Uhlmann was awarded the 2021 George David Birkhoff Prize at the Annual Meeting of the AMS, held virtually January 6–9, 2021.



Gunther Uhlmann

## Citation

The 2021 George David Birkhoff Prize in Applied Mathematics is awarded to Gunther Uhlmann for his fundamental and insightful contributions to inverse problems and partial differential equations, as well as for his incisive work on boundary rigidity, microlocal analysis, and cloaking. Gunther's work is distinguished by its mathematical beauty and relevance to many significant

applications, especially in medical imaging, seismic prospecting, and general inverse problems.

## Biographical Sketch

Gunther Uhlmann was born in Quillota, Chile, in 1952. He studied mathematics as an undergraduate at the Universidad de Chile in Santiago, gaining his Licenciatura degree in 1973. He continued his studies at the Massachusetts Institute of Technology, where he received a PhD in 1976 under the direction of Victor Guillemin. He held postdoctoral positions at MIT, Harvard University, and the Courant Institute of Mathematical Sciences. In 1980 he became assistant professor at MIT and then moved in 1985 to the University of Washington, where he was appointed Walker Family Endowed Professor in 2006. From 2010–2012 he also held the Endowed Excellence in Teaching Chair at the University of California and was appointed the Si-Yuan Professor at the Institute for Advanced Study, Hong Kong University of Science and Technology in 2014.

Uhlmann received a Sloan Research Fellowship in 1984 and a Guggenheim Fellowship in 2001. Also in 2001, he was elected a corresponding member of the Chilean Academy of Sciences and, in 2013, a Foreign Member of the Finnish

Academy of Sciences. He was elected to the American Academy of Arts and Sciences in 2009 and became a Fellow of the Society for Industrial and Applied Mathematics (SIAM) in 2010. He was an invited speaker at the International Congress of Mathematicians in Berlin in 1998 and a plenary speaker at the International Conference on Industrial and Applied Mathematics (ICIAM) in Zurich in 2007. He gave the AMS Einstein Lecture in 2012, a plenary lecture at the International Congress of Mathematical Physics in 2015, and a plenary lecture at the 2016 Latin American Congress of Mathematics. He was Clay Senior Scholar at MSRI in 2010 and 2019 and Chancellor Professor at University of California, Berkeley, in 2010. Uhlmann was awarded the AMS Bôcher Prize in 2011, the SIAM Kleinman Prize in 2011, and the Solomon Lefschetz Medal by the Mathematical Council of the Americas in 2017.

## Response from Gunther Uhlmann

I would like to thank the AMS and SIAM for the great honor of being named the recipient of the 2021 George Birkhoff Prize in Applied Mathematics. Several of the previous recipients of the award are some of my mathematical heroes. I would like to also thank my collaborators and my graduate students and postdocs who have enriched my life both professionally and personally.

Many people were very influential early in my career, and I can mention only a few. Nicolas Yus was my undergraduate mentor in Chile, and I owe him my thanks for his great support and teaching. Warren Ambrose made it possible for me to go to graduate school at MIT, and he was a continuous source of support and encouragement, especially in my early years in the United States. Herbert Clemens also helped me to come to the United States, and he has been an example to emulate in my life. My PhD advisor Victor Guillemin taught me so much—he has a contagious enthusiasm for mathematics. Richard Melrose shared with me many times his great insight, and he has

been a true friend. I met Alberto Calderón during my graduate studies at MIT; he is one of my mathematical heroes, such an original mathematician. Norberto Kerzman was also very supportive and encouraging during my graduate studies, and we became friends. The year I was at Courant, I had the great fortune of meeting Louis Nirenberg. He taught me many things in mathematics and is one of the kindest people I have ever met—a wonderful role model for anybody to follow. I also treasured the friendship I started with Cathleen Morawetz during my stay at Courant. Most of all, I have had the unwavering support of my family, my late wife Carolina, my daughter Anita, and my son Eric. Without them this would not have been possible. Carolina would have been so proud. This prize is dedicated to our five grandchildren, Thomas, Eli, Louis, Charlie, and little Carolina. They are my joy.

### About the Prize

The Birkhoff Prize recognizes outstanding contributions to applied mathematics in the highest and broadest sense and is awarded every three years. Established in 1967, the prize was endowed by the family of George David Birkhoff (1884–1944), who served as AMS President during 1925–1926. The prize is given jointly by the AMS and the Society for Industrial and Applied Mathematics (SIAM). The recipient must be a member of one of these societies and a resident of the United States, Canada, or Mexico. The prize carries a cash award of US\$5,000.

The recipient of the Birkhoff Prize is chosen by a joint AMS-SIAM selection committee. For the 2021 prize, the members of the selection committee were:

- Douglas N. Arnold
- Aaron L. Fogelson
- Irene M. Gamba (Chair)

The complete list of recipients of the Birkhoff Prize can be found at [https://www.ams.org/prizes-awards/pabrowse.cgi?parent\\_id=9](https://www.ams.org/prizes-awards/pabrowse.cgi?parent_id=9).