

Norbert Wiener Prize in Applied Mathematics



The Wiener Prize is awarded for an outstanding contribution to applied mathematics in the highest and broadest sense. The American Mathematical Society and the Society for Industrial and Applied Mathematics award this prize jointly; the recipient must be a member of one of these societies. This prize was established in 1967 in honor of Professor Norbert Wiener and was endowed by a fund from the Department of Mathematics of the Massachusetts Institute of Technology. The endowment was further supplemented by a generous donor.



Eitan Tadmor

Citation

Eitan Tadmor

Eitan Tadmor, a Distinguished University Professor at the University of Maryland, College Park, will receive the 2022 AMS-SIAM Norbert Wiener Prize in Applied Mathematics for his original contributions to applied and numerical analysis with applications in fluid dynamics, image processing, and collective dynamics. The prize also recognizes the significant

impact of his fundamental work in theory and computation of nonlinear partial differential equations.

The signature of Tadmor's work is the interplay between analytical theories and computational algorithms for such equations. His many outstanding contributions include the development of high-resolution central schemes; entropy conservative/stable schemes; and the spectral viscosity method for nonlinear conservation laws. He collaborated in groundbreaking work on the regularization of conservation laws and their relation to kinetic formulation. He introduced novel ideas of multi-scale hierarchical decompositions of images with applications to problems in critical regularity spaces.

Currently, Tadmor is leading a research program in collective dynamics, with a series of novel contributions which include adaptive alignment; topologically based and multi-species dynamics; and development of a general paradigm for emergent behavior away from thermal equilibrium.

Biographical Note

Eitan Tadmor holds a joint appointment in the Department of Mathematics and the Institute for Physical Sciences and Technology at the University of Maryland, College Park. He received his PhD in mathematics from Tel Aviv University in 1978 and began his career as a Bateman Research Instructor at Caltech (1980–1982) before joining the faculties of Tel Aviv University (1983–1995) and UCLA (1995–2002). In 2002 he was recruited by the University of Maryland to lead the Center for Scientific Computation and Mathematical Modeling (CSCAMM) and served as CSCAMM director (2002–2016). In 2016–2017 he was a Senior Fellow at the Institute for Theoretical Studies (ITS) at ETH-Zürich.

Tadmor was a founding co-director of the NSF Institute for Pure and Applied Mathematics (IPAM) at UCLA (1999–2001) and the principal investigator of both an NSF Focus Research Group (2008–2012) and the NSF Kinetic Research Network (Ki-Net) at the University of Maryland (2012–2020). He gave an invited lecture at the ICM (Beijing, 2002); the SIAM invited address at the JMM (Baltimore, 2014); the 2016 Leçons Jacques-Louis Lions (Paris); a Nachdiplom Lecture series at ETH (Zürich, 2017); and a plenary address at the ICIAM (Valencia, 2019). He is the recipient of the 2015 SIAM-ETH Peter Henrici Prize and will be the AMS Gibbs Lecturer in 2022. Tadmor is a Fellow of the AMS and SIAM.

Response from Eitan Tadmor

I am honored and delighted to receive the 2022 Norbert Wiener Prize. I have been mentored by and collaborated with many mathematicians who played an indispensable role in my career. I mention Gideon Zwas, David Gottlieb, and Ami Harten at Tel Aviv University and Björn Engquist

and Stanley Osher at UCLA. I was influenced by Heinz-Otto Kreiss and Peter Lax as role models, and I am indebted to Alexandre Chorin and Ron DeVore for lifelong professional friendships. I thank my students and collaborators at Tel Aviv University, UCLA, and the University of Maryland, who enriched my mathematical world. I feel blessed to be part of a worldwide network of mathematicians, which is like a home away from home for me.

My work in mathematics and applications has given me great joy. As a language spoken in different scientific disciplines, mathematics is constantly engaged with new developments in a variety of fields of science and technology. The synergy between mathematics and applications requires the development of new “dialects” in applied and computational mathematics. I am always fascinated by the creative tension between imagination and rigor needed to develop these dialects and their use in solving concrete problems.

Credits

Photo of Eitan Tadmor is courtesy of Eitan Tadmor.