# Michael I. Weinstein

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## Research areas

Partial Differential Equations and Analysis; Applied Mathematics
Dynamical Systems; Multi-Scale Phenomena in Mathematical Physics

Waves in Nonlinear, Inhomogeneous, Microstructured and Random Media;
Applications to Waves in Photonics, Quantum Physics and Fluids

## Education

B.Sc. (Mathematics), Union College, *summa cum laude*, 1977

M.Sc. (Mathematics), Courant Institute - NYU, 1979

Ph.D. (Mathematics), Courant Institute - NYU, 1982 - (Advisor: George C. Papanicolaou)

## Positions

2004-
Professor of Applied Mathematics
Department of Applied Physics & Applied Mathematics
Columbia University

2014-
Professor of Mathematics
Department of Mathematics
Columbia University

1998 - 2004
MTS - Fundamental Mathematics Research Department
Bell Laboratories, Lucent Technologies

1988 - 2000
Professor of Mathematics (1993 - 2000); Associate Professor of Mathematics (1988 - 1993)
University of Michigan, Ann Arbor

1984-1988
Assistant Professor of Mathematics
Princeton University

1982-1984
NSF Postdoctoral Fellow - (Mentor: Joseph B. Keller)
Stanford University

# Selected Honors and Invitations

Martin D. Kruskal Prize - SIAM, 2018

Bergman Distinguished Visiting Professor and Bergman Memorial Lecture,
Stanford University, Winter, 2018

Simons Foundation Math + X Investigator, 2015

Fellow of the AMS, 2014

SIAM Fellow, 2010

Joe Keller Lecture, Stanford University - April, 2017

Van Winter Lecture in Mathematical Physics, University of Kentucky - March, 2017

Plenary Invitations to LMS-EPRC Symposium on Mathematical and Computational Aspects of
Maxwells Equations (Durham, UK) and Trimester on Nonlinear Dispersive Waves (IHES - France),
Spring-Summer, 2016

Plenary Lecture, WAVES 2015- Karlsruhe Institute of Technology, July, 2015

Plenary Lecture, Math. at Interface of PDE, Calculus of Variations & Material Science , IMA,
May, 2014

Keynote speaker, Conference on Nonlinear waves — Theory and Applications
Chinese Academy of Sciences, Beijing, China - June, 2013

Plenary Lecture - SIAM Conference on Analysis of PDEs
Orlando, Florida  - December, 2013

Ordway Distinguished Visiting Professorship, University of Minnesota (2011-2012)– 4 Lectures

Plenary Lecture, Analytic & Computational Techniques in Spectral Theory,
Gregynog, Wales, 2011

Distinguished Lecture in Applied Mathematics
University of Massachusetts, Amherst, October, 2009

Plenary Lecture, VIII Americas Conference on Differential Equations,
Veracruz, Mexico October, 2009

Invited Short Course on Nonlinear Dispersive Waves and Applications
Colloque Trimester - Institut Henri Poincaré, May-June, 2009

Plenary Lecture (2 lectures) Conference on Modeling and Analysis of Nanostructures,
Universität Karlsruhe, November, 2008

Plenary Lecture, Conference on Multiscale Modeling, Analysis and Simulations,
Michigan State University, 2008

Invited 3 hour tutorial, Int'l Conference on Nonlinear Evolution Equations and Wave Phenomena,
University of Georgia, Athens, GA 2007,

Plenary Lecture, SIAM Conference on Nonlinear Waves and Coherent Structures,
Orlando, Florida 2001

Invited Lecture, National Academy of Sciences: Frontiers in Science Symposium
Beckman Center, Irvine, CA, 2001

# Visiting Professorships

June, 2019
University of Paris IX, Dauphine

Winter, 2018
Bergman Distinguished Visiting Professor
Stanford University

2011-2012
Ordway Distinguished Visiting Professor
University of Minnesota

May-June, 2009, Institut Henri Poincaré, Paris

June, 2010, 1992 & May, 1989; June, 2004
Université de Paris Sud, Orsay; Université de Cergy-Pontoise

1995-1996, Program in Applied and Computational Mathematics
Princeton University

October, 1994, Institut Mittag Leffler, Djursholm, Sweden

June-July, 1993
E. Landau Center for Mathematical Analysis
Hebrew University, Jerusalem, Israel

June, 1992 Visiting Member
Institute for Advanced Study - Princeton

# Editorial Boards

Pure and Applied Analysis, SIAM Journal on Mathematical Analysis (2004-2017). Multiscale Modeling and Simulation (2012-2017), Studies in Applied Mathematics (2014-2018), AMS Mathematical Surveys and Monographs (2010-2018), Journal of Nonlinear Science (Senior Editor, 2012-2016) , Studies in Applied Mathematics

# Professional Leadership, Committees and Service

Chair, Thematic Year on Mathematics and Optics at
NSF - Institute for Mathematics and its Applications (IMA), 2016-17

National Science Foundation Panels in Applied Mathematics, PDE and Mathematical Physics

New York Academy of Sciences Judge, Blavatnik Awards for Young Scientists, 2008-

Simons Foundation, Reviewer of Grant Proposals, 2011-

Mathematics Department Review Panel at Temple University, 2007

Simons Foundation Math + X Workshops at Columbia:
2017-18 - Mathematical and Physical Aspects of Topologically Protected States
2018-19 - Transport and Localization in Random Media: Theory and Application
2019-20 - Mathematics of Topological Insulators (upcoming)

Co-organizer of Conference on Nonlinear Schrödinger Equations and Applications, Crete, 2013

Co-organizer of Banff Conferences on:
*Photonic Topological Insulators* (2017),
*Analysis of Nonlinear Wave Equations and Applications* (2009) and
*Evolution of Microscopic and Macroscopic Fields* (2006)

Co-organizer of Conference on *Mathematical Problems in Nonlinear Optics and Microstructure*, International Centre for Mathematical Sciences (ICMS), Edinburgh, 2004

U.S. National Academy of Sciences First Middle East Symposium on Frontiers in Science and Engineering, Istanbul, Turkey - 2004 Applied Mathematics Session Organizer

U.S. National Academy of Sciences Symposium on Frontiers in Science Organizing Committee - 2002, 2003, and Invited Lecture 2001

# Patents

1. Patent Number US 6,801,685 B2 (with R.E. Slusher & R.H. Goodman)
   Trapping light pulses at controlled perturbations in periodic optical structures

2. Patent Number US 7,023,533 (with S.E. Golowich)
   System and method for determining propagation characteristics of photonic structures