

ARTHUR JAFFE

Landon T. Clay Professor of Mathematics and Theoretical Science, Harvard University

WEB SITE: WWW.ARTHURJAFFE.NET

University Education:

AB in Chemistry, Princeton University 1959
BA in Mathematics, Cambridge University 1961
PhD in Physics, Princeton University 1966

Current Activities:

Chairman of the Board, Dublin Institute for Advanced Study, School of Theoretical Physics
Member of the Science Board, Santa Fe Institute
Member of the Advisory Board, *Communication in Mathematical Physics*
Member of the Editorial Board, *Annals of Functional Analysis* (AFA)
Member of the International Advisory Board, Center for Mathematical Physics, Hamburg
Member of the Board of Directors, Jacobs University Bremen Foundation of America

Memberships/Recognition:

Honorary Member of the Royal Irish Academy 2009
Member of the US National Academy of Sciences 2000
Member of the American Academy of Arts and Sciences 1978
Fellow of the American Mathematical Society
Fellow of the American Association for the Advancement of Science
Fellow of the Society of Industrial and Applied Mathematicians
Fellow of the American Physical Society
Medal from the Collège de France 1990
Dannie Heineman Prize in Mathematical Physics (APS and AIP) 1980
Prize in Mathematics and Physics (New York Academy of Science) 1979
Alfred P. Sloan Foundation Faculty Fellow
John Simon Guggenheim Foundation Fellow (two appointments)
National Research Council Post-doctoral Fellow
National Science Foundation Pre-doctoral Fellow
Marshall Scholar

Some Prior Activities:

Co-Founder, Member, Director, and President of the Clay Mathematics Institute, 1998–2002
Chair of the Council of Scientific Society Presidents, 2000
President of the American Mathematical Society, 1997–1998
Chair of the American Association for the Advancement of Science Mathematics Section, 2001
President of the International Association of Mathematical Physics, 1991–1996
Member of the Board of Advisors, John Templeton Foundation 2008–2012
Member of the Board of Directors, Institute for Schools of the Future 2000–2010
President's Commission for the National Medal of Science: Member 1996–2002, Chair 2001–2002
Member of the Perspective Commission: the International University of Bremen, 2006
Chairman of the Harvard University Department of Mathematics, 1987–1990
Initiating Member: Pinnacle Project for Gifted Children, American Psychological Association, 2001
Member of the Advisory Board, Pennsylvania State University Department of Mathematics
Member of the Board, International Mathematical Olympiad 2001, 1997–2003
Member of the Executive Committee, Mathematical Sciences Education Board (NRC) 2001–2009
Trustee, Mathematical Sciences Research Institute, Berkeley, 1991–1994
Board Member and Advisor, Project Euclid, 2000–2004

Committee on Resources for the Mathematical Sciences (David Committee) NRC 1980–1983
Co-Founder and Organizer of the Cargèse Summer School in Mathematical Physics, 1976, 1979, 1981, 1987, 1991, 1994, 1996.
Founder and Chair Mathematics Advocacy Task Force of the American Mathematical Society, 1996–1997
Reviews: Penn State U. Math. (Chair); E.T.H. Mathematics; Princeton Physics (Chair); Princeton Mathematics; American University in Beirut (Chair); Brandeis University Science Programs; Dublin Institute for Advanced Study, School of Theoretical Physics (Chair).
Communications in Mathematical Physics, Editor 1976–1979; Chief Editor 1979–2000
Letters in Mathematical Physics, Editorial Board
Reviews in Mathematical Physics, Associate Editor
Annals of Physics, Assistant Editor 1981–2000
Progress in Physics, Birkhäuser Boston, Founding Editor 1980–1983
Geometry and Functional Analysis, Editorial Board 1989–2000
Journal of Mathematical Physics, Editorial Board 1973–1976

Selected Visiting Positions and Lectureships:

Boston University, Visiting Professor 2001–2002
Class of 1927 Lecturer, Rensselaer Polytechnic Institute 2000
University of Rome, Visiting Professor 1995
Frank Hahn Lecturer, Yale University 1985
Hedrick Lecturer at the Mathematical Association of America 1985
Porter Lecturer, Rice University 1983
University of California, Distinguished Visiting Professor 1982
Rockefeller University, Visiting Professor 1979; Adjunct Professor 1980–1986
Accademia Nazionale dei Lincei, Lecture Series 1977
Princeton University, Visiting Professor 1971
E.T.H. Zürich (Swiss Federal Institute of Technology), Guest Professor 2005, 1968
Stanford University, Acting Assistant Professor 1966
Institute for Advanced Study, Visiting Member, 1967
IBM Research, Yorktown Heights, summer 1959

Mentoring:

Trained over 50 graduate students and post-doctoral fellows

Publications:

Co-author of 4 books and over 150 articles.
Editor of 7 other books.

Contact Information:

Preferred Mailing address and telephone: 27 Lancaster Street, Cambridge, MA 02140
617-492-7227 home; 857-205-4367 cell phone

Department of Physics, 17 Oxford Street, Harvard University, Cambridge, MA 02138
Department of Mathematics, 1 Oxford Street, Harvard University, Cambridge, MA 02138

E-mail: Arthur_Jaffe@Harvard.edu

Web: <http://www.arthurjaffe.net>

Arthur Jaffe

Arthur Jaffe grew up in Pelham, NY, attending the local schools and enjoying music and science. He studied chemistry at Princeton University (intending to be a physician). While still in high school, his parents brought back souvenirs and stories from a trip to the 1953 Coronation in England and a Lecture Tour with the Royal Society of Medicine. This aroused his interest to study abroad. He won a Marshall Scholarship and decided to switch to study mathematics at Clare College, Cambridge. Returning two years later to Princeton, he worked with Arthur Wightman—to complete a journey from chemistry, through mathematics, to becoming a mathematical physicist.

On the retirement of George Mackey in 1985, Jaffe became the Landon T. Clay Professor of Mathematics and Theoretical Science at Harvard. He chaired the Mathematics Department from 1987 to 1990. He belongs to the U.S. National Academy of Sciences and he recently became an Honorary Member of the Royal Irish Academy.

Working together, Arthur Jaffe and James Glimm founded the subject “Constructive Quantum Field Theory.” Their research showed for the first time that one could reconcile mathematics with quantum theory, relativity, and interaction. (They received several awards on this account.) Whether one can realize this conglomeration of properties in four-dimensional space-time, remains one of the one of the most challenging unresolved questions in physics and in mathematics. Constructive quantum field theory also led to a *mathematical, non-perturbative theory of renormalization*. Jaffe has research interests and results in analysis, quantum field theory, super-symmetry, gauge theory, and non-commutative geometry.

Arthur’s ten-week visit to the ETH in 1968 led shortly afterward to Robert Schrader, Konrad Osterwalder, and Jürg Fröhlich coming from the ETH to Harvard as post-doctoral fellows. This began a long-lasting informal collaboration in mathematical physics between these two institutions, one which still continues today. Over the years, Arthur Jaffe has worked with over fifty graduate students and postdoctoral fellows.

Beginning in 1974 Jaffe worked with Pronob Mitter to organize a summer school in mathematical physics. This came to fruition during seven summers between 1976 and 1996, at a well-known site in Cargèse (Corsica). The focus of these schools was to bring together leaders from mathematics and physics, whose research had potential scientific overlap, in an effort to provide an inspirational experience for researchers and students.

Arthur Jaffe served from 1979 to 2000 as Chief Editor of *Communications in Mathematical Physics*, broadening its scope and cementing its role as the leading journal in mathematical physics. He appointed over thirty editors and advisors during that period.

Jaffe served for six years as President of the International Association of Mathematical Physics (1991-1997). He then was elected president of the American Mathematical Society (1997--1998), the first mathematical physicist in this role. John Ewing, the Executive Director of the Society remarked that Jaffe redefined the role of president. He later served for a year as Chair of the Council of Scientific Society.

Jaffe provided the central ideas that led to the formation of the Clay Mathematics Institute in 1998. He became its first President and designed and implemented most of the initial CMI programs. One of his pet projects was the Millennium Prize Problems in mathematics, which were launched during May 2000 at the Collège de France.

Beginning in 1999 Jaffe assisted Martin Seligman, former president of the American Psychological Association, in initiating the Pinnacle Project for gifted children. In 2001 Jaffe established a mathematics program for talented high school students through the CMI. He served as a board member and a sponsor to bring the 2001 International Mathematics Olympiad to Washington. He organized the closing ceremony for the Olympiad around the theme of bringing the high-school teams from sixty countries into motivational contact with leading American research mathematicians.

In 2005 Arthur Jaffe succeeded Sir Michael Atiyah as Chair of the Board of the Dublin Institute for Advanced Study, School of Theoretical Physics. In 2009 he was elected an Honorary Member of the Royal Irish Academy.