ARTHUR JAFFE
WEB SITE: WWW.ARTHURJAFFE.NET

Current Activities:

Landon T. Clay Professor of Mathematics and Theoretical Science, Harvard University
Chair of the Board, Dublin Institute for Advanced Study, School of Theoretical Physics
Member of the Council, Dublin Institute for Advanced Study
Member U.S. National Committee for Mathematics
Member Science Board, Santa Fe Institute
Member of the International Advisory Board, Center for Mathematical Physics, Hamburg
Member of the Advisory Board, Pennsylvania State University Department of Mathematics
Member Board of Directors, Jacobs University Bremen, Foundation of America
Member Board of Directors, Institute for Schools of the Future
Communication in Mathematical Physics, Advisory Board
Reviews in Mathematical Physics, Associate Editor
Letters in Mathematical Physics, Editorial Board

Education:

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

Memberships, Etc:

Honorary Member of the Royal Irish Academy
Member US National Academy of Sciences
Fellow American Academy of Arts and Sciences
Fellow American Association for the Advancement of Science
Fellow of the Society of Industrial and Applied Mathematicians
Fellow American Physical Society
Medal from the Collège de France
Dannie Heineman Prize in Mathematical Physics (APS and AIP)
Prize in Mathematics and Physics (New York Academy of Science)

Some Prior Activities:

Co-Founder, Member, Director, and President: The Clay Mathematics Institute, 1998–2002
President, American Mathematical Society, 1997–1998
Chair, Council of Scientific Society Presidents, 2000
Chair, American Association for the Advancement of Science Mathematics Section, 2001
President, International Association of Mathematical Physics, 1991-1996
President's Commission for the National Medal of Science, Member 1996–2002, Chair 2001–2002
Member of the Perspective Commission, International University of Bremen, 2006
Chair, Harvard University Department of Mathematics, 1987–1990
Initiating Member, Pinnacle Project for Gifted Children, American Psychological Association, 2001
Board Member, International Mathematical Olympiad 2001, 1997–2003
Member Executive Committee, Mathematical Sciences Education Board (NRC)
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 AMS Mathematics Advocacy Task Force, 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).
Alfred P. Sloan Foundation Faculty Fellow
John Simon Guggenheim Foundation Fellow (twice)
NRC Postdoctoral Fellow, NSF Predoctoral Fellow, Marshall Scholar

Editorial:

Communications in Mathematical Physics, Editor 1976–1979; Chief Editor 1979–2000
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 Physic*s, Editorial Board 1973–1976

Prior Affiliations or Positions:

Boston University, Visiting Professor 2001–2002
University of Rome, Visiting Professor 1995
University of California, Distinguished Visiting Professor 1982
Rockefeller University, Visiting Professor 1979; Adjunct Professor 1980–1986
Princeton University, Visiting Professor 1971
Courant Institute, Visitor 1969
E.T.H. Zürich, Guest Professor 2005, 1968
Stanford University, Acting Assistant Professor 1966
Institute for Advanced Study, 1967
IBM Research, Yorktown Heights, 1959
American Cyanamid Corporation Research, Stanford, CT, 1958

Lecture Series:

Introduction of Constructive Quantum Field Theory, Zürich 2005
Class of 1927 Lectures, Rensselaer Polytechnic Institute, Troy 2000
Symposium on Mathematical Proof, Roskilde, Denmark 1998
Distinguished Lecture Series, Fields Institute 1996
Lecture Course, Collège de France 1990
Frank Hahn Lectures, Yale University 1985
Hedrick Lecturers at the Mathematical Association of America 1985
Lecture Tour, Soviet Academy of Sciences 1985
Lecture Tour, Chinese Academy of Sciences 1983
Alumni Lectures, Pennsylvania State University 1983
Porter Lectures, Rice University 1983
Poiana Brasov Summer School 1981
Bonn Mathematics Institute 1980
Summer School of the Australian Mathematics Society, Melbourne 1982
Accademia Nazionale dei Lincei 1977
Cargèse Summer School lectures 1996, 1991, 1987, 1981, 1979, 1976
Les Houches Summer School lectures 1995, 1970
Erice Summer School lectures 1985, 1983, 1973
Varenna Summer School 1968

Professional Society Invited Lectures:

American Mathematical Society, Washington 2000, New York 1978
Mathematische Gesellshaft in Hamburg, Anniversary 1990
International Congress of Mathematicians, Helsinki 1978
Australian Mathematical Society 1987
Canadian Mathematical Society 1984
International Association of Mathematical Physics 1994, 1991, 1988, 1981, 1979, 1977
International Congress on High Energy Physics 1986, 1984, 1973, 1970
International Congress on Information Theory 1979, 1976
American Physical Society, New York 1970

Selected Symposium Lectures

Jürg Fröhlich Symposium, Zurich 2007
John Lewis Symposium, Dublin 2005

Panel on Mathematical Physics, Royal Irish Academy, Dublin September 2005
John von Neumann Symposium, Budapest 2003
International Symposium on Education, National Academy of Sciences, Washington 2003
Konrad Osterwalder Symposium, Zurich 2002
Elliott Lieb Symposium, Vienna 2002
Richard Kadison Symposium, Durham NH 2001
Sergio Doplicher Symposium, Sienna 2000
Symposium on "Proof," New York 2000
Robert Schrader Symposium, Berlin 2000
Marshall Stone Symposium, New York 1999
Harry Lehmann Symposium in Hamburg 1999
Roland Dobrushin Symposium, Vienna 1998
Kurt Symanzik Symposium, Hamburg 1984
John von Neumann symposium, New York 1988
IBM Mathematics Research Center Anniversary Celebration, Yorktown Heights 1988
Balomenos Lecture, University of New Hampshire 1985
The Mathematical Heritage of Henri Poincaré 1980
Mathematics for the Millennium, American University of Beirut, January 2000
Leipzig Mathematics Institute Opening Symposium 1998
Boston University Symposium on the Conceptual Developments of 20th Century Field Theories 1996
Mathematical Sciences Research Institute, Berkeley, Sponsors Day 1995
Arthur Wightman symposium, Princeton 1992
Distinguished Lecture Bard College 1990

Mentoring:

Trained over 50 graduate students and post-doctoral fellows

Publications:

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

Contact Information:

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

Department of Mathematics, 1 Oxford Street, Harvard University, Cambridge, MA 02138
Office Telephone: +1-617-495-4320, Fax: +1-617-495-2895
E-mail: Arthur_Jaffe@Harvard.edu Web: http://www.arthurjaffe.net

Assistant:

Mrs. Barbara Drauschke E-mail: drauschk@math.harvard.edu or drauschk@physics.harvard.edu

Revised 2009

Arthur Jaffe

Arthur Jaffe grew up in Pelham, NY, where he attended the local schools and enjoyed music and science. As a Princeton undergraduate he majored in chemistry, graduating summa cum laude and with highest honors.

In 1953, while Arthur was still in high school, the Royal Society of Medicine invited his parents to visit and inducted his father as a member. Souvenirs from that trip aroused Arthur's interest to study abroad, and six years later Arthur became a Marshall Scholar and a student at Clare College, Cambridge. He studied mathematics there, and two years later returned to Princeton, to earn his doctorate working with Arthur Wightman—thereby completing degrees in three subjects: chemistry, mathematics, and physics. During his graduate training, Arthur was lucky to spend the 1963-1964 academic year with his advisor as one of the first students at the newly-founded Institut des Hautes Etudes Scientifiques in Bures-sur-Yvette, France.

While in Bures, he began to investigate the question: "Is quantum theory compatible with special relativity and interaction?" Another version of this question is: Does "quantum field theory" make mathematical sense? Over the next years he solved this problem in space-time of less than four dimensions, in a long series of papers, many together with J. Glimm and other collaborators. This work gave the basis to the subject known as *constructive quantum field theory*.

Some related scientific questions were also resolved by this work: In particular, it established a mathematical foundation for the *theory of renormalization*, independent from perturbation theory. Another advance was to prove multiple solutions (phases) exist in quantum field theory. Currently Arthur Jaffe is also interested in super-symmetry, field theory on curved space, and the possible role in physics of non-commutative geometry, a new subject to which he has also contributed mathematically. He is also interested in the philosophical foundations of mathematical proof and fundamental issues in science. Arthur Jaffe has received several professional prizes and awards for his scientific research.

After spending a year at Stanford and the Institute for Advanced Study, he came to Harvard University as assistant professor in 1967, becoming Professor of Physics in 1970. He joined the Department of Mathematics in 1973, and in 1985 he succeeded George Mackey as the "Landon Clay Professor of Mathematics and Theoretical Science." He served as visiting professor at several institutions, including Princeton University, Rockefeller University, Boston University, the Swiss Federal Institute of Technology, and the University of Rome La Sapienza.

In 1976 Jaffe co-founded a series of Cargèse, Corsica summer schools in mathematical physics. In 2001 he established a mathematics program for talented high school students. He played an important role in enabling the 2001 International Mathematics Olympiad to take place in the United States. Beginning in 1999 he assisted Martin Seligman and the American Psychological Foundation in initiating the Pinnacle Project for gifted children.

He has been adept in recognizing and encouraging exceptional research talent at an early stage. In the summer of 1968, Jaffe came as Guest Professor to the E.T.H. Zurich. Shortly afterward Robert Schrader, Konrad Osterwalder, and Jürg Fröhlich came to work at Harvard, beginning a long-lasting collaboration in mathematical physics between these two institutions. Over the years, Arthur has worked with over fifty graduate students and postdoctoral fellows.

Jaffe served for twenty one years as Chief Editor of *Communications in Mathematical Physics,* broadening its scope and cementing its role as the leading journal in mathematical physics. He appointed and collaborated with over thirty editors during that period. He served for three years as Chair of the Harvard Mathematics Department, and for six years as President of the International Association of Mathematical Physics (approximately 1,000 members). As president of the American Mathematical Society (approximately 30,000 members), the Executive Director remarked that he "redefined" the role of president. He later served as Chair of the Council of Scientific Society Presidents (comprising some 60 Societies).

Jaffe conceived the Clay Mathematics Institute, serving as a Founding Member and Director, as well as its Founding President. In this role he designed and implemented most of their initial programs, including the *Millennium Prize Problems* in mathematics.

In 2005 Arthur Jaffe succeeded Sir Michael Atiyah as Chair of the Board of the Dublin Institute for Advanced Study, School of Theoretical Physics. He is a member of the American Academy of Arts and Sciences and of the U.S. National Academy of Sciences. In 2009 he was elected an Honorary Member of the Royal Irish Academy.