



Curriculum Vitae Professor Dr. Martin Quack



Name: Martin Quack

Born: 22 July 1948

Major Scientific Interests: High Resolution Infrared Spectroscopy, Spectroscopy of atmospheric trace gases, Kinetics of Intramolecular Primary Processes, Intramolecular energy flow, Infrared multiphoton excitation and laser chemistry, Fundamental symmetry principles for intramolecular dynamics and spectroscopy, Molecular Chirality and Parity Violation.

Academic and Professional career

- since 1983 Professor ordinarius of Physical Chemistry at ETH Zurich (head of the institute in 1986/87, 1991/92 and 2007/08), Switzerland
- 1982 - 1983 Full professor (C4) at the University of Bonn
- 1978 Habilitation from Göttingen University
- 1976/77 Max Kade Fellow at the University of California, Berkeley, USA
- 1975 Obtained doctorate from the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland
- 1972 - 1975 Student at the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland
- 1970 - 1971 Student at Göttingen University
- 1969 - 1970 Student at the University of Grenoble, France
- 1966 - 1969 Student at TH Darmstadt

Project coordination, Membership in collaborative research projects

- 1997 - 2005 Alliance for Global Sustainability, Project Spectroscopic Approach Towards Local and Global Management of the Earth's Atmosphere
- 1995 - 2012 Co-Editor of the "Green Book of IUPAC", Quantities, Units and Symbols in Physical Chemistry
- 1991/92 - 2012 Founding member and later member of the C⁴ Project (Competence Center for Computational Chemistry)

Functions in Scientific Societies and Committees

- since 2014 Member of the Presidium of the National Academy of Sciences Leopoldina
- 2011 - 2012 President of the German Bunsen Society for Physical Chemistry (DBG)
- 2002 - 2011 Member of the Swiss National Research Council of the Swiss National Science Foundation
- 2002 - 2009 Member of the advisory board for the scientific journal *Angewandte Chemie*
- 1997 - 2013 Member of the executive committee (sometimes as chairman) of the Colloquium on High-Resolution Molecular Spectroscopy (biennial international conference)
- 1996 - 2012 Delegate of the President for faculty appointment procedures (DPW)
- since 1992 Member of the Chemical Research Division of the Swiss Chemical Society (Vice President 1999-2000, President Elect 2001, President 2002-2004)
- 1992 - 2008 Student delegate for the Interdisciplinary Sciences degree programme at ETH Zurich, Switzerland
- 1987 - 2006 Titular Member of Commission 1.1 of the International Union of Pure and Applied Chemistry (IUPAC), sometimes as secretary; national representative since 2006
- 1984 - 1998 Advisory editor for *Chemical Physics Letters*
- 1984 - 1987 Co-editor of *Molecular Physics*

Honours and Awarded Memberships

- 2012 August Wilhelm von Hofmann medal from the Gesellschaft Deutscher Chemiker
- 2012 Paul von Ragué Schleyer Lecturer, University of Georgia, Athens, USA
- 2009 Bomem-Michelson Award of the Coblenz Society, Pittcon, Chicago, USA
- 2009 Honorary Dr. rer. nat. from Göttingen University

- 2008 Chandrasekhara Venkata Raman Memorial Lecturer, Indian Association for the Cultivation of Science, Kolkata, India
- 2006 Erwin Schrödinger Gold Medal, awarded by SASP and the University of Innsbruck, Austria
- 2005 Visiting Miller Research Professor, University of California, Berkeley, USA
- 2004 Wilhelm Jost Memorial Lectureship Award from the Göttingen Academy of Sciences and the German Bunsen Society for Physical Chemistry
- 2002 Paracelsus Prize of the Swiss Chemical Society
- 1999 Elected as full member to the Berlin Brandenburg Academy of Sciences and the Humanities
- 1998 Elected as member to the German National Academy of Sciences Leopoldina
- 1991 Otto Bayer Award
- 1990 Elected as Fellow of the American Physical Society
- 1988 Hinshelwood Lecturer, Oxford University and Christensen Fellow, St. Catherine's College, Oxford, UK
- 1987 Bourke Lecturer and Medal, Royal Society of Chemistry, UK
- 1984 Otto Klung Award of the Freie Universität Berlin
- 1982 Coblenz Society Lecturer, Columbus, Ohio, USA
- 1982 Nernst-Haber-Bodenstein Prize of the German Bunsen Society for Physical Chemistry
- 1980 Lecturer scholarship awarded by the Chemical Industry Fund
- 1966 Dilthey Award of the Ludwig-Georgs-Gymnasium, Darmstadt

Major Scientific Interests

Martin Quack is the head of the group "Molecular Kinetics and Spectroscopy" at ETH Zürich. The main research theme is the understanding of fundamental, physical-chemical molecular primary processes. The basic research question concerns the fully quantum mechanical molecular motion, which is at the origin of all chemical reactions. An essential aspect of the research is the systematic combination of experimental and theoretical studies. The experimental studies concentrate on high resolution infrared spectroscopy, infrared multiphoton excitation and time resolved kinetic spectroscopy. Finally, the group studies fundamental symmetry principles in molecular processes and molecular chirality in relation to parity violation.

Martin Quack has contributed fundamental work on many aspects of molecular kinetics and

spectroscopy. Among his achievements are the formulation of detailed state-to-state symmetry selection rules based on the principles of nuclear spin symmetry and parity conservation in chemical reactions, the formulation of a quantum statistical theory of infrared multiphoton excitation and its experimental verification, the quadiabatic channel approach to simple bond fission reactions and tunnelling rearrangement and stereomutation reactions, the development of the high resolution spectroscopic approaches to study attosecond to femtosecond and picosecond intramolecular energy flow leading to the discovery of the mode specific quantum dynamics of functional groups, as well as the theory of the quantum dynamics of chiral molecules including parity violation. He pioneered the correct theoretical calculation and the formulation of a new experimental approach to obtain the exceedingly small energy difference between enantiomers of chiral molecules, which is connected to some of the most fundamental problems of symmetry violation in physics, chemistry, and possibly biological evolution.

A survey of most of the current interests can be found in "Handbook of High Resolution Spectroscopy", M. Quack, F. Merkt eds., 3 volumes, Wiley 2011 (in particular the articles authored and coauthored by M. Quack).