



Wolfgang E. Ernst – Biography

current position and address:

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Education:

- 1969-1977 Study of physics and mathematics at the Technische Universität Hannover (Germany) and Imperial College London (UK)
- 1975 Diplom Physiker - Technische Universität Hannover (plasma physics, adviser Prof. W. Böttcher, thesis topic: density measurements in SF₆ shock waves)
- 1977 Dr. rer. nat. - Technische Universität Hannover (plasma physics, adviser Prof. W. Böttcher, thesis topic: ionization relaxation in rare gas plasmas)
- 1983 Habilitation - Freie Universität Berlin (Germany)(thesis topic: high resolution molecular spectroscopy)

Academic and Professional Appointments:

- 1978-1979 Postdoctoral Research, Electrical Engineering Department, Rice University, Houston, TX (adviser Prof. F. K. Tittel, research topic: electron-beam pumped excimer lasers)
- 1979-1983 Assistenzprofessor, Fachbereich Physik, Freie Universität Berlin
- 1983-1987 Privatdozent, Freie Universität Berlin
- 1988-1989 Außerplanmäßiger Professor, Freie Universität Berlin
- 1990-2002 Professor of Physics, The Pennsylvania State University, University Park, PA
- 1997-2002 Professor of Chemistry (additional appt.), The Pennsylvania State University
- since 2002 Ordentlicher Universitätsprofessor für Experimentalphysik, Technische Universität Graz, Emeritus Univ.-Prof. since October 1, 2019

Additional Research Appointments and Sabbaticals:

- 1986 Department of Chemistry, Stanford University, Stanford, CA (with R. N. Zare)
- 1991/1992 (summers) Max-Planck-Institut für Strömungsforschung, Göttingen, Germany (with U. Buck)
- 1996 Department of Chemistry, Princeton University, Princeton, NJ (with G. Scoles)

Honors and Awards:

- 1970-1977 Scholarship, Foreign exchange, and Graduate Fellow, all Studienstiftung des deutschen Volkes
- 1978 Postdoctoral fellowship, Deutsche Forschungsgemeinschaft
- 1985-1989 Heisenberg Fellowship (German young faculty award)
- 1987 Physik-Preis 1987, Deutsche Physikalische Gesellschaft
- 1997 Election as Fellow of The American Physical Society
- 1998 Penn State Faculty Scholar Medal for Outstanding Achievement in the Physical Sciences
- 2013 Election as Fellow of the European Physical Society
- 2015 Forschungspreis des Landes Steiermark (the Research Prize of the State of Styria)

Research:

Molecular spectroscopy, molecular beams, clusters, superfluid helium droplets, atomic and molecular interactions on surfaces, nonlinear optics, plasma spectroscopy, gas laser development.

More than 230 refereed publications, 95 plenary or invited lectures at international conferences, about 420 other conference contributions, about 135 invited seminars and colloquia.

Important steps during research career:

1978/9 Rice University Houston (postdoc with German DFG fellowship): Demonstration of a **new blue-green laser transition** in e-beam pumped XeF laser.

1979-89 FU Berlin (university assistant) and **Stanford University** (Heisenberg Fellowship): Development of new high-resolution spectroscopy methods, analysis and modeling of the structure and dynamics in alkaline earth monohalide radicals, **1987 PHYSIKPREIS** of the German Physical Society).

1990-2002 Penn State University (tenured full professor): First high resolution analysis of a pseudorotational potential in a trimer molecule, criteria developed for the unambiguous identification of a pseudo Jahn-Teller effect as opposed to pure Jahn-Teller coupling, identification of Berry's Phase in molecular systems (**Faculty Scholar Medal of Science 1998**).

1994-98, collaboration with Prof. Giacinto Scoles (**Princeton University**, Princeton sabbatical 1996): First optical spectroscopy of doped helium droplets, first identification of high-spin alkali trimers.

since **2002 TU Graz**: Development of a highly successful AMO Physics program (molecules, clusters, surfaces) (**2015 Research Prize of the State of Styria**).

Memberships:

The American Physical Society (APS Lifetime Fellow),

European Physical Society (EPS Fellow),

Austrian Physical Society (ÖPG), Chair Quantum Optics Division (2004-7), **President 2013-2014**,

German Physical Society (DPG),

Deutsche Bunsengesellschaft für Physikalische Chemie,

Erwin Schrödinger Society for Nanoscience (Austria)

Deutscher Hochschulverband

Board duties:

Steering Committee, International Symposium on Molecular Spectroscopy (1995-1999),

Consultant in optics and spectroscopy, Penn State Applied Research Lab (2000/2001),

Member, EGAS Board of the European Physical Society (2004-2010),

Member, Scientific Board, bi-annual Colloquium on High Resolution Molecular Spectroscopy (2011-),

Member, Editorial Board, *Journal of Molecular Spectroscopy* (Elsevier) (2011-2014),

Member, Collegio di Dottorato in Scienza dei Materiali, Università di Milano-Bicocca (2012-),

Member, Steering Committee, International Symposium on the Jahn-Teller Effect (2012-...),

Member, International Advisory Committee, Int. Conf. on Vibrations at Surfaces (2014-),

Member, Advisory Board, Conference on Quantum Fluid Clusters (2015-...),

Member, Program Committee, AnalytiX 2018(Miami, Florida, USA) &2019(Singapore),

Member, Ownership Board, *Phys Chem Chem Phys* (2015-...).

Member, Management Committee EU COST Action CM 1405 "Molecules in Motion (MOLIM)" (2015-2019)

Organization of conferences:

Co-Organizer (with R. Herman), 14th International Conference on Spectral Line Shapes (1998),

Chairman and Organizer of a Special Symposium on "Jahn-Teller and Renner-Teller Interactions in Molecules" at the 55th International Symposium on Molecular Spectroscopy (June 2000),

Chair, 343rd Heraeus Meeting "Helium Clusters – Finite-Size Superfluid and Nano-Size Cryostat" (**2005**),

Chair, **2006** Annual Meeting of the Austrian Physical Society,

Co-Chair (with L. Windholz), **2008** EGAS Conference of the European Physical Society,

Chair, 482nd Heraeus Meeting "Helium Nanodroplets – Confinement for Cold Molecules and Cold Chemistry" (**2011**),

Chair, 22nd International Symposium on the Jahn-Teller Effect, Graz, Austria **2014**,

Chair, **2018** Annual Meeting of the Austrian Physical Society.

Referee activities:

Journals: regular referee for Advanced Materials, Applied Physics B, Chemical Physics, Chemical Physics Letters, ChemPhysChem, European Physical Journal, Journal of Chemical Physics, Journal of Molecular Spectroscopy, Journal of Physical Chemistry Letters, Journal of Physical

Chemistry A, B, and C, Journal of Computational and Theoretical Chemistry, Journal of Quantitative Spectroscopy and Radiative Transfer, Journal of Inorganic and Organometallic Polymers and Materials, Molecular Physics, Nanoscale (UK), Nature Publishing Group (UK), Optics Communications, PCCP (Physical Chemistry – Chemical Physics), Physical Review Letters, Physical Review A and B, American Chemical Society Books.

Funding agencies: referee proposals for US National Science Foundation (AMO Physics, Physical Chemistry, Theoretical Chemistry, Division of Materials Research); US Department of Energy; Petroleum Research Fund of the American Chemical Society; Research Corporation (USA); United States Civilian Research and Development Foundation; National Research Council USA; National Research Council Canada; Engineering and Physical Sciences Research Council, United Kingdom; NWO Exacte Wetenschappen Physical Sciences (Netherlands); Schweizer Nationalfond SNF (Switzerland); Regional Council of Brittany, France; University Research Plan (PAR), University of Siena, Italy; Österreichischer Akademischer Austauschdienst (ÖAD, Austria); Deutsche Forschungsgemeinschaft (DFG, Germany); Studienstiftung des deutschen Volkes (Germany); Max-Planck Society (Germany).

10 important invited presentations at international conferences and international advanced schools (out of 95):

- 1 Alkali Clusters – Model Systems for the Study of Vibronic Interactions, 35th EGAS Conference, Brussels, Belgium (July 2003) (**plenary lecture**).
- 2 Helium droplets as nano-cryostats for molecular spectroscopy: aggregation, state selection and electron spin resonance, 64th International Symposium on Molecular Spectroscopy, Columbus, Ohio, USA, 22-26 June 2009 (**plenary lecture**).
- 3 Electronic shell models for small alkali clusters, **2 lectures at the Summer School** on "Shell Effects in Finite Quantum Systems", **Majorana Centre in Erice**, Sicily, Italy, 25 – 31 July, 2010.
- 4 Spectroscopy of Doped Helium Droplets: Weakly Bound Clusters, Rydberg States, and Electron Spin Resonance, 22nd Colloquium on High Resolution Molecular Spectroscopy, Dijon, France, 28 Aug. – 2 Sep. 2011 (**plenary lecture**).
- 5 Homo- and Heteronuclear Alkali Trimers – Conical Intersections and Spin-Orbit Coupling, 21st International Symposium on the Jahn-Teller Effect, Tsukuba, Japan, 26 – 31 August 2012 (**invited**).
- 6 Cluster Aggregation, Spin Dynamics, and Cold Reactions in Doped Helium Droplets, Wolfgang E. Ernst, 32nd International Symposium on Free Radicals, Potsdam, Germany, 21 – 26 July 2013 (**invited**).
- 7 Cold Chemistry in Helium Droplets, **keynote lecture** at the 44th World Chemistry Congress (IUPAC), Istanbul, Turkey, 11-16 August 2013.
- 8 Aggregation Dynamics of Metal Dopants in Helium Nanodroplets, 7th International Chemical Congress of Pacific Basin Societies (PACIFICHEM), Honolulu, Hawaii, USA, 15 – 20 December 2015 (**invited**).
- 9 Alkali – Alkaline Earth Diatomics: Molecules for Ultracold Physics, AnalytiX 2017, Fukuoka, Japan, 22-24 March 2017 (**invited**).
- 10 Mixed metal clusters - core-shell structures, phase transitions, and nano alloying, *Atoms, Molecules and Clusters in Motion* conference (AMOC 2022), Helsinki, Finland and on a cruise ship between Helsinki and Stockholm, June 6 - 10, 2022 (**invited**)