Prof. Gerhard L. Ertl
Professor, Nobel laureate in Chemistry, 2007

Most important awards, prizes and academies

Honorary Memberships: 2009, Deutscher Hochschulverband; 2008, Dechema (German Society of Chemical Technology); 2008, GDCh (German Chemical Society); 2008, Berliner Wissenschaftliche Gesellschaft; 2008, European Academy of Sciences and Art; 2008, Physikalischer Verein, Frankfurt a.M.; 2007, Royal Society of Chemistry; 2006, Deutsche Bunsengesellschaft für Physikalische Chemie; 1985, Honorary Fellow, Royal Society of Edinburgh. *Memberships*: 1993, Member, Berlin-Brandenburg Academy of Sciences; 1993, Foreign Honorary Member, American Academy of Arts and Sciences; 1992, Member, Academia Europaea; 1986, Member, German Academy of Sciences, "Leopoldina".*Corresponding memberships*: 2001, Austrian Academy of Sciences; 1998, Bavarian Academy of Sciences; 1993, Nordrhein.-Westfal. Academy of Sciences; 1986, Scientific Society of Braunschweig; 2002, Foreign Associate, National Academy of Sciences. Dr. *honoris causa*: 2009, Marie Curie-Sklodowska University, Lublin; 2009, Comenius University, Bratislava; 2009, Humboldt-Universität zu Berlin; 2008, Technische Universität München; 2008, Queen's University Belfast; 2003, University of Aarhus; 2003, Chalmers University of Technology, Goeteborg; 2003, University of Leuven; 2000, University of Münster; 1992, Ruhr-University of Bochum.Awards: 2008, Diesel Gold Medal, Deutsches Institut für Erfindungswesen; 2008, Nicolaus Copernicus Medal, Polish Academy of Sciences; 2008, Großes Bundesverdienstkreuz mit Stern, President of the Federal

Republic of Germany; 2008, Verdienstmedaille, Land Baden-Würtemberg; 2007, Nobel Prize in Chemistry, The Nobel Prize Foundation; 2007, Otto-Hahn-Preis, Gesellschaft Deutscher Chemiker, Deutsche Physikalische Gesellschaft, & the City of Frankfurt/M; 2007, Gold Medal, Slovak Chemical Society; 2007, Baker Lectureship, Cornell University, Ithaca (NY); 2007, Faraday Lectureship, Royal Society of Chemistry; 2006, Guptill Lecture, Dalhousie University, Halifax; 2005, Angström Lecture, University of Uppsala; 2005, Linus Pauling Lecture, California Institute of Technology; 2002, FMC Lectureship Princeton University; 2002, Karl Ziegler Visiting Professor, Max Planck Institute Mulheim; 2002, Spiers Memorial Medal and Lectureship, Royal Society of Chemistry; 2001, G.F. Smith Lecture, University of Illinois, Urbana; 2001, Kelly Lecture, Purdue University; 2001, Schuit Lecture, Technical University of Eindhovern; 2001, Pitzer Lecture, University of California, Berkeley; 1999, Roessler Lectureship, Cornell University; 1999, Le Bel Lecture, Université de Strasbourg; 1999, Debye Lecture, Universiteit Utrecht; 1998, Wolf Prize in Chemistry, Wolf Foundation; 1998, Karl Ziegler Prize, German Chemical Society; 1998, Francois Gault Lectureship, European Catalysis Society; 1998, M. Curie Lectureship, Polish Chemistry Society; 1997, Laird Lecture, University of British Columbia; 1997, A.D. Little Lectureship, Massachusetts Institute of Technology; 1996, Honorary Professor, Humboldt University, Berlin; 1996, Carl Engler Medal, German Scientific Society for Coal and Petroleum Research (DGMK); 1996, Merck Lecture, Rutgers University; 1996, Brdicka Lecture, Czech Academy of Sciences; 1995, Medard W. Welch Award, American Vacuum Society; 1995, Stauffer Lecture, University of Southern California; 1994, Rolf Sammet Visiting Professor, University of Frankfurt; 1992, Hewlett-Packard Europhysics Prize, European Physical Society; 1992, Japan Prize, Science and Technology Foundation of Japan; 1992, Bunsen Medal, German Bunsen Society for Physical Chemistry; 1992, Großes Bundesverdienstkreuz, President of the Federal Republic of Germany; 1992, Kolthoff Lectureship, University of Minnesota; 1992, Kaufman Memorial Lecture, University of Pittsburgh; 1991, Leibniz Prize, German Science Foundation; 1991, Bourke Medal and Lectureship, Royal Society of Chemistry; 1990, Alwin Mittasch Medal, German Federation of Chemical Engineers (DECHEMA); 1990, Dow Lectureship, University of Western Ontario; 1990, Coover Lecture, Iowa State University; 1989, Frontiers in Chemical Research Lectureship, Texas A&M University; 1988, William Draper Harkins Lecture, University of Chicago; 1988, Barre Lecture, University of Montreal; 1987, Liebig Medal, German Chemical Society; 1986, Honorary Professor, Free University of Berlin; 1986, Honorary Professor, Technical University of Berlin; 1986, Langmuir Lecture, American Chemical Society; 1985, C.F. Gauss Medal, Scientific Society of Braunschweig; 1985, Centenary Medal and Lectureship, Royal Society of Chemistry; 1985, C.G.A. Schuit Lecture, University of Delaware; 1984, FECS Lecture, Federation of European Chemical Societies; 1984, Industry Lecture, Norwegian Chemical Society; 1979, Paul H. Emmett Award in Fundamental Catalysis, American Catalysis Society; 1979, E.W. Müller Award, University of Wisconsin-Milwaukee; 1977, Frank Ciapetta National Lectureship, American Catalysis Society; 1976, Sherman Fairchild Distinguished Scholar, California Institute of Technology. Other distinctions: 2009, Gerhardt Ertl Young Investigator Award (German Physical Society); 2008, Gerhard Ertl Building (Faculty of Chemistry & Pharmacy, Ludwig-Maximilians-Universität, Munich; 2008, Gerhard Ertl Lecture Award (jointly instituted by FHI, FUB, HUB, TUB); 2008, Integrierte

Gesamtschule Gerhard Ertl, Sprendlingen/Rheinhessen; 2008, Ehrenmitglied, Berliner Oratorien-Chor; 2008, Ertl Center for Electrochemistry and Catalysis (Gwangju Institute of Science and Technology, S. Korea).

Summary of scientific research

Gerhard Ertl is known for determining the detailed molecular mechanisms of the catalytic synthesis of ammonia over iron (Haber Bosch process) and the catalytic oxidation of carbon monoxide over platinum (catalytic converter). During his research he discovered the important phenomenon of oscillatory reactions on platinum surfaces and, using photoelectron microscopy, was able to image for the first time, the oscillating changes in surface structure and coverage that occur during reaction. He always used new observation techniques like low-energy electron diffraction (LEED) at the beginning of his career, later ultraviolet photoelectron spectroscopy (UPS) and scanning tunneling microscope (STM) yielding ground breaking results. He won the Wolf Prize in Chemistry in 1998 along with Gabor A. Somorjai of the University of California, Berkeley for "their outstanding contributions to the field of the surface science in general and for their elucidation of fundamental mechanisms of heterogeneous catalytic reactions at single crystal surface in particular". Gerhard Ertl was awarded the 2007 Nobel Prize in Chemistry for his studies of chemical processes on solid surfaces.

Main publications

Ertl, G., Reaktionen an Oberflächen: vom Atomaren zum Komplexen (Nobel-Vortrag),*Angew. Chem.* 120, 3578-90 (2008); Reactions at Surfaces: From Atoms to Complexity (Nobel Lecture), *Angew. Chem. Int. Ed.* 47, 3524-35 (2008), Ertl, G., Activation of diatomic molecules at solid surfaces, *Phil. Trans. R. Soc. A* 363, 955-8 (2005); Ertl, G., Ammonia Synthesis – Heterogeneous, in Istvan T. Horváth (Ed.), *Encyclopedia of Catalysis*, 6 vol., John Wiley & Sons, Hoboken, NJ, 2003, Vol. 1, pp. 329-52, online in: I.T. Horváth, E. Iglesia, M.T. Klein, J.A. Lercher, A.J. Russell, E.I. Stiefel (Eds.), *Encyclopedia of Catalysis* www.mrw.interscience.wiley.com/enccat/, John Wiley & Sons, New York, 2002; Ertl, G., Heterogeneous catalysis on atomic scale, *J. Mol. Catal. A* 182-182, 5-16 (2002); Ertl, G., Spiers Memorial Lecture – Dynamics of surface reactions. Spiers Memorial Lecture. *Faraday Discuss.* 121, 1-15 (2002); Ertl, G., Heterogeneous catalysis on the atomic scale, *Chem. Rec. 1*, 33-45 (2001); Ertl, G., Heterogeneous catalysis on the atomic scale, *Chem. Rec. 1*, 33-45 (2001); Ertl, G., Heterogeneous catalysis: from "black art" to atomic understanding, in *Chemistry for the 21st Century* (Eds.), E. Keinan, I. Schechter, Wiley-VCH, Weinheim-New York 2001, 54-69; Ertl, G., Dynamics of reactions at surfaces, *Adv. Catal.* 45, 1-69 (2000); Ertl, G., and T. Gloyna, Katalyse: Vom Stein der Weisen zu Wilhelm Ostwald, *Z. Phys. Chem.* 217, 1207-19 (2003); Ertl, G., H. Knözinger, F. Schüth, and J. Weitkamp (Eds.), *Handbook of Heterogeneous Catalysis*, 2nd Edition, 8 Volumes, Wiley-VCH, Weinheim 2008 (includes: Ertl, G., Dynamics of surface reactions, pp. 1462-79; Ertl, G., Non-linear dynamics: Oscillatory kinetics and spatio-temporal pattern formation, pp. 1492-1516).