Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Klaus von Klitzing

Name: **Klaus von Klitzing**
Date of birth: **28 June 1943**

Research Priorities: solid state research, experimental solid state physics, low-dimensional electron systems, quantum Hall effect

Klaus von Klitzing is a German physicist and specialist in experimental solid-state physics. On 5 February 1980, while working at the Grenoble High Magnetic Field Laboratory, he succeeded in discovering and precisely measuring the stepwise change of the Hall voltage under certain conditions. For the discovery of the quantised Hall effect, Klaus von Klitzing received the undivided Nobel Prize in Physics in 1985. With his work, Klaus von Klitzing initiated a new field of research that continues to be highly relevant today.

Academic and Professional Career

since 1985	Director, Max Planck Institute for Solid State Research (MPI-FKF), Stuttgart and Honorary Professor, University of Stuttgart, Stuttgart, Germany
1980 - 1984	Professor for solid state research, Technical University Munich (TUM), Munich, Germany
1978	Habilitation in Physics, University of Würzburg (JMU), Würzburg, Germany
1972	Ph.D. in Physics, JMU, Würzburg, Germany
1969 - 1980	Assistant, JMU, Würzburg, Germany
1962 - 1969	Diploma in Physics, Technical University Braunschweig, Braunschweig, Germany

Functions in Scientific Societies and Committees (Selection)

2011	Member, Scientific Advisory Board, Graphene Flagship, Chalmers University of Technology, Gothenburg, Sweden
2008	Member, Scientific Committee, Bayer Climate Award, Bayer AG, Leverkusen, Germany
2007	Member, Research Council, European Association of National Metrology Institutes (EURAMET), Germany
2006	Member, Board of Trustees, Institute for Advanced Study (IAS), TUM, Munich, Germany
2005	Member, Jury, START-Wittgenstein Program, Austrian Science Fund (FWF), Austria
2005	Member, Scientific Committee, International Solvay Institutes, Belgium
2000	Member, Advisory Board, NTT Basic Research Laboratory (BRL), Atsugi, Japan
1992	Member, Bord of Trustees, Deutsches Museum München, Munich, Germany
1989	Member, Bord of Trustees, National Metrology Institute of Germany (PTB), Germany

Honours and Awarded Memberships (Selection)

2019	Member, Order Pour le Mérite for Sciences and the Arts, Germany
2012	Distinguished Affiliated Professor, TUM, Munich, Germany
2011	Honorary Degree, National University of Mongolia (NUM), Ulaanbaatar, Mongolia
2011	Honorary Degree, Weizmann Institute of Science (WIS), Rehovot, Isral
2010	Honorary Member, German Association of University Professors and Lecturers (DHV), Germany
2009	Austrian Decoration for Science and Art, Austria
2008	Honorary Degree, Institute of Semiconductors (IOS), Chinese Academy of Sciences (CAS), China
2007	Member, Pontifical Academy of Sciences (PAS), Vatican City
2007	Member, Austrian Academy of Sciences (ÖAW), Austria
2006	Honorary Degree, Grenoble INP Graduate Schools of Engineering and Management, Université Grenoble Alpes (UGA), Grenoble, France
2006	Honorary Degree, Shanghai University (SHU), Shanghai, China
2006	Foreign Member, CAS, China
2003	Foreign Member, Royal Society, UK

2002	Honorary Degree, Bilkent University, Ankara, Turkey
2000	Honorary Member, German Physical Society (DPG), Germany
2000	Honorary Degree, Slovak Academy of Sciences (SAS), Slovakia
1998	Honorary Degree, University of Nottingham, Nottingham, UK
1996	Member, German National Academy of Sciences Leopoldina, Germany
1994	Foreign Member, Russian Academy of Sciences (RAS), Russia
1990	Foreign Associate, National Academy of Sciences (NAS), USA
1990	Honorary Degree, University of Antwerp, Netherlands
1988	Honorary Degree, University of Maryland (UMD), College Park, USA
1988	Bavarian Maximilian Order for Science and Art, Bavarian Minister-President, Germany
1986	Order of Merit of the Federal Republic of Germany, Grand Cross with Star and Sash, Federal Republic of Germay
1985	Member, Bavarian Academy of Sciences (BAdW), Germany
1985	Nobel Prize in Physics, Royal Swedish Academy of Sciences (KVA), Sweden
1982	Hewlett Packard Europhysics Prize, European Physical Society (EPS)
1981	Walter Schottky Prize, DPG, Germany

Research Priorities

Klaus von Klitzing is a German physicist and specialist in experimental solid-state physics. On 5 February 1980, while working at the Grenoble High Magnetic Field Laboratory, he succeeded in discovering and precisely measuring the stepwise change of the Hall voltage under certain conditions. For the discovery of the quantised Hall effect, Klaus von Klitzing received the undivided Nobel Prize in Physics in 1985. With his work, Klaus von Klitzing initiated a new field of research that continues to be highly relevant today.

The quantum Hall effect describes the deflection of electrons in a strong magnetic field at very low temperatures. Under these conditions, a voltage that occurs transversely to an electron current does not grow continuously with the strength of the magnetic field, but in steps. Thus, the resistance also changes in steps. The so-called Hall resistance RH, i.e. the ratio of the Hall voltage to the strength of the current, thereby assumes as plateau values only integer fractions of the von Klitzing constant RK=h/e2 (≈25.8kΩ), where h is the Planck constant and e is the elementary charge. Both are physical constants; the plateau values, therefore, neither depend on the material properties such as the charge carrier density, nor on the sample size, nor on the strength of the magnetic field.

The von Klitzing constant RK is a universal reference for measuring resistance and can be precisely reproduced anywhere in the world. In 1990, it was established by international agreement as the standard for representing the unit measurement ohm. Since the 2019 revision, the International System of Units (SI) has been defined by assigning fixed values to a number of constants, including e and h. As a result, the von Klitzing constant in SI units now has an exact value.

Klaus von Klitzing is a scientist who considers it his obligation to promote interest and enthusiasm for scientific disciplines. He is the eponym and jury member of the Klaus-von-Klitzing-Prize, established in 2005. This award is given to dedicated natural science teachers who help inspire students to work and think scientifically through their outstanding commitment and creativity.