



## Awarded...

The Nobel Prize is the high point of an academic career. Here we present the recipients for 2007 in the natural sciences. In line with tradition, the prizes are awarded on the anniversary of the death of Alfred Nobel on December 10. This year, each prize is worth 10 million Swedish kronor (around 1 million euro).

### Chemistry: G. Ertl

On his birthday, Gerhard Ertl (b. 1936, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin) learned that he will be awarded the Nobel Prize in Chemistry 2007 for his works on chemical processes on solid surfaces. Since



G. Ertl

the 1960s, Ertl has developed methods for the investigation of surface chemistry. He showed how experimental methods can be combined to give a more complete picture of surface reactions and investigated the chemistry behind

central challenges such as the adsorption of hydrogen on metals (e.g. palladium or nickel), the Haber-Bosch process for the synthesis of ammonia, as well as the oxidation of CO on platinum. For this purpose, he employed methods such as low-energy electron diffraction (LEED),<sup>[1a]</sup> X-ray diffraction, FTIR spectroscopy, photoelectron spectroscopy, and secondary-ion mass spectrometry. Ertl published two review articles<sup>[1b]</sup> on this topic in *Angewandte Chemie*.

Ertl studied physics at the University of Stuttgart and received his PhD in physical chemistry in 1965 from the Technical University of Munich under the supervision of Heinz Gerischer in the field of electrochemistry. In 1968 he became professor of physical chemistry at the Technical University of Hanover, in 1973 he moved to the Ludwig Maximilians University of Munich, and in 1986 he became the successor of his PhD advisor as director of the Fritz Haber Institute. At the same time he became honorary professor at the Technical University of Berlin and the Free University of Berlin; in 1992 the Humboldt University of Berlin also awarded him this title. Among his many other awards are the Wolf Prize in Chemistry (1998), the Japan Prize of the Science and Technology Foundation of Japan (1992), and the Karl Ziegler Prize of the German Chemical Society (Gesellschaft Deutscher Chemiker, GDCh, 1998). Ertl was recently recognized with the Otto Hahn Prize for Chemistry and Physics, which is awarded jointly by the GDCh, the German Physical Society (Deutsche Physikalische Gesellschaft), and the city of Frankfurt am Main. Ertl served on the editorial board of *Angewandte Chemie* from 1991 until 2000, is currently a member of the editorial boards of *ChemPhysChem* and *Chemistry—A European Journal*, and is co-editor of the multivolume *Handbook of Heterogeneous Catalysis*, a new edition of which will be released by Wiley-VCH in early 2008.

### Physics: P. Grünberg and A. Fert

The Nobel Prize in Physics 2007 has been awarded to Albert Fert (b. 1938, Université Paris-Sud; Unité Mixte de Physique CNRS/THALES Orsay, France) and Peter Grünberg (b. 1939, Forschungszentrum Jülich, Germany) for their discovery of giant magnetoresistance (GMR). Magnetoresistance, that is, the dependence of electric conductivity on the strength of an applied magnetic field, was discovered by William Thomson (Lord Kelvin) 150 years ago. In the 1980s, Fert and Grünberg independently discovered that nanoscale ferromagnetic/nonmagnetic multilayer systems of  $(\text{FeCr})_n$  ( $n < 60$ ) and Fe/Cr/Fe exhibited this effect to a much

larger extent than any other systems known at that time. Very soon, the GMR effect was used in the read/write heads of hard-disk drives to achieve the data storage densities currently achievable.<sup>[2]</sup>

### Medicine: M. R. Capecchi, M. Evans, and O. Smithies

The Nobel Assembly at Karolinska Institutet has awarded the Nobel Prize in Physiology or Medicine 2007 jointly to Mario R. Capecchi (b. 1937, Howard Hughes Medical Institute and University of Utah, Salt Lake City, USA), Martin J. Evans (b. 1941, Cardiff University, UK), and Oliver Smithies (b. 1925, University of North Carolina at Chapel Hill, USA) for their discoveries of principles for introducing specific gene modifications in mice with embryonic stem cells. These discoveries led to the creation of an immensely powerful technology referred to as gene targeting in mice. Gene targeting is often used to inactivate single genes. Such gene “knockout” experiments have been used to elucidate the roles of numerous genes in embryonic development, adult physiology, aging, and disease. With gene targeting it is now possible to produce almost any type of DNA modification in the mouse genome. Evans is a member of the editorial board of the *Encyclopedia of Molecular Cell Biology and Molecular Medicine*, published by Wiley-VCH.

[1] a) G. Ertl, J. Küppers, *Low Energy Electrons and Surface Chemistry*, VCH, Weinheim, 2nd ed., **1985**; b) G. Ertl, *Angew. Chem.* **1976**, 88, 423; *Angew. Chem. Int. Ed. Engl.* **1976**, 15, 391; G. Ertl, *Angew. Chem.* **1990**, 102, 1258; *Angew. Chem. Int. Ed. Engl.* **1990**, 29, 1219.

[2] P. Grünberg, *Physik-Journal*, **2007**, Issue 8–9, 33.

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