

## Manfred Thumm Is Granted 2012 Heinrich Hertz Prize

EnBW and KIT Honor Physicist for His Research into Microwave Technology

Today, the EnBW Foundation, together with Karlsruhe Institute of Technology (KIT), will hand over the Heinrich Hertz Prize to Professor Manfred Thumm. The former Head of the Institute for Pulsed Power and Microwave Technology (IHM) of KIT receives the prize in the amount of EUR 10,000 for his scientific work related to the generation, transportation, and conversion of high and highest microwave powers for fusion research. Its objective is the development of a permanent, safe, and low-CO<sub>2</sub> energy source capable of supplying base load power.

The prize will be handed over by Dr. Hans-Josef Zimmer, Chief Technical Officer of EnBW Energie Baden-Württemberg AG, and KIT President Professor Eberhard Umbach on the Day of the Department of Electrical Engineering and Information Technology of KIT that will be organized today from 15 hrs at the Tulla-Hörsaal on KIT Campus South (Englerstraße 11, building 11.40). The EnBW Foundation and KIT, formerly Universität Karlsruhe (TH), have been granting the Heinrich Hertz Prize since 1975 for special scientific or technical achievements in the field of generation, distribution, and application of electric energy or for other application-oriented research activities.

Manfred Thumm is an internationally acknowledged expert in the area of energy generation by nuclear fusion. His merits in research and education in particular comprise contributions in plasma physics and high-power microwave technology. "I am extremely proud of this prize, because my lecturing work at KIT was associated with Heinrich Hertz," says Professor Manfred Thumm. "In the 1880s, Hertz for the first time succeeded in detecting electromagnetic waves using his high-frequency measurement technique at the Karlsruhe Polytechnical School. From 1991 to 2011, I lectured on "Microwave Measurement Technology" and published the corresponding handbook together with two colleagues."

High-power microwave technology covers the generation, transport,



*KIT Energy Center: Having future in mind*

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diagnosis, and application of high and highest microwave powers and contributes decisively to fusion research. Research into nuclear fusion is aimed at developing a nearly inexhaustible, safe, and low-CO<sub>2</sub> energy source capable of supplying base load power and having the potential of reaching a major share in the energy mix of the future. Fusion of atomic nuclei produces large amounts of energy. Present nuclear power plants apply nuclear fission for energy production. In special fusion power plants, plasmas, i.e. gases with free charge carriers, are heated up to more than 110 million degrees Celsius. The high heating powers required are reached by electron cyclotron resonance heating. The confined plasma absorbs the energy required from irradiated microwave power at very high frequencies of 140 to 170 gigahertz. With his scientific work over more than 35 years, Manfred Thumm decisively contributed to establishing cyclotron resonance heating as an integral constituent of future fusion power plants. In close cooperation with the Institute of Plasma Research of the University of Stuttgart and the company of Thales Electron Devices (TED), Manfred Thumm was the first to develop gyrotron tubes to maturity. These gyrotron tubes are generators of short-wave microwaves of highest performance. Thumm also contributed decisively to the experimental facilities of Wendelstein 7-X at Greifswald and ITER at Cadarache, France. Both facilities promote the development of future fusion reactors.

A **photo of the price ceremony** may be requested by mail to [presse@kit.edu](mailto:presse@kit.edu) or by phone +49 721 608-47414.

#### **About the Person**

Manfred Thumm, born in 1943, studied physics at the University of Tübingen from 1966 to 1972 and received his doctorate with distinction in experimental nuclear physics in 1976. Then, he was member of the scientific staff and from 1982, head of a working group at the Institute of Plasma Research of the University of Stuttgart. In 1990, he moved to Karlsruhe and was appointed Professor of Microwave Technology at the Institut für Höchstfrequenztechnik und Elektronik (IHE, Institute of Highest-frequency Technology and Electronics) of the then Universität Karlsruhe (TH). At the then Forschungszentrum Karlsruhe, he headed the Division of Gyrotron Development and Microwave Technology of the Institute of Technical Physics (ITEP). From 1999 to 2011, he headed the Institute for Pulsed Power and Microwave Technology (IHM) of Forschungszentrum Karlsruhe and the later KIT. Manfred Thumm is specially committed to national and

international cooperation in fusion research. Among others, he is member of the Technical Commission “Vacuum Electronics and Displays” of the Information Technology Society (ITG) of the Association for Electrical, Electronic and Information Technologies (VDE). He chaired this commission from 1996 to 1999. He is member of the Coordinating Committee for the Development Programme of Electron Cyclotron Wave Systems for ITER of the Commission of the European Communities, EURATOM, in Brussels and of the International Advisory Committee of the worldwide Institute of Electrical and Electronics Engineers (IEEE). Among his numerous distinctions are the Honorary Doctorate of the Technical University of St. Petersburg (2002), the Kenneth John Button Prize and Medal of the London Institute of Physics (2000) as well as the IEEE Fellowship (2002). Last year, Manfred Thumm was awarded the Plasma Physics Innovation Prize of the European Physical Society (EPS). Thumm is presently heading the project “Laboratory of Advanced Research on Millimeter Wave and Terahertz Radiation“ at Novosibirsk State University, which is funded with EUR 3.2 million by the Russian government. Manfred Thumm has published four books, 270 articles in journals, and 1200 contributions to proceedings. In addition, he holds twelve patents relating to active and passive microwave components.

**Karlsruhe Institute of Technology (KIT) is one of Europe’s leading energy research establishments. The KIT Energy Center pools fundamental research with applied research into all relevant energy sources for industry, households, services, and mobility. Holistic assessment of the energy cycle also covers conversion processes and energy efficiency. The KIT Energy Center links excellent competences in engineering and science with know-how in economics, the humanities, and social science as well as law. The activities of the KIT Energy Center are organized in seven topics: Energy conversion, renewable energies, energy storage and distribution, efficient energy use, fusion technology, nuclear power and safety, and energy systems analysis.**

**Research, education, and innovation at KIT foster the energy turnaround and reorganization of the energy system in Germany. Clear priorities lie in the areas of energy efficiency and renewable energies, energy stores and grids, electromobility, and enhanced international cooperation in research.**

**Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. KIT focuses on a knowledge triangle that links the tasks of research, teaching, and innovation.**

This press release is available on the internet at [www.kit.edu](http://www.kit.edu).