

## Research for Tomorrow's Environment

For the Thirtieth Time, the Sparkassenstiftung Rewards Environmental Research Projects of Young Scientists



*The Sparkassenstiftung rewards Ph. D. and diploma theses as well as student projects focusing on sustainability. (Photo: photocase)*

**It is now confirmed by this year's award ceremony of the Sparkasse (savings bank) that Karlsruhe Institute of Technology (KIT) and its young scientists conduct research into a wide spectrum of environmental topics. Six projects in the fields of civil engineering and geosciences, mechanical engineering, economics, physics, and electrical engineering are awarded a total of EUR 10,000. The Chairman of the Board of the Karlsruhe Savings Bank and the President of KIT will hand over the awards on Thursday, April 29, 2010, 17 hrs, at the Allgemeines Verfügungsgebäude (building 50.41, Adenauerring 20).**

The first prize goes to three scientists, whose dissertations are granted 2,000 Euros each by the Savings Bank Foundation.

Within the framework of his dissertation, geocologist Ekkehart

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Bethge developed an instrument to plan water resources management. With his method, the risk of pollutant infiltration from a retention basin designed for flood protection into the groundwater can be estimated. This is important, as the migration of pollutants may endanger the use of groundwater as a drinking water resource.

Mechanical engineer Fatih Sarikoc wrote a Ph. D. thesis on the further development of engines for the reduction of nitrogen oxide emissions. He focused on exhaust gas recirculation. Apart from conventional exhaust gas recirculation, he analyzed the potential of stratified, external exhaust gas recirculation. Using a jet-controlled direct gasoline injection system, nitrogen oxide emissions were reduced by 60 to 65 percent at a nearly constant fuel consumption.

Patrick Jochem is granted the award for his dissertation in economics. He found that a certificate trading scheme that makes the petroleum dealers accountable may increase incentives for an emission reduction of the main emission producer in the transport sector, i.e. road traffic. To estimate the impacts of certificate trading on households and truck companies, Jochem developed a simulation model in a Java environment. Based on these model results, Jochem recommends a sector-overlapping trading system, in which the individual road user who does not adapt his behavior pays for CO<sub>2</sub> reduction in other sectors by an increased fuel price.

1,500 Euros each are granted to the meteorologist Max Bangert and the civil engineer Michael Schlick for their diploma theses.

Bangert's thesis decisively contributes to the understanding of the impact of emissions on the daily weather situation and the estimation of the contribution of aerosols to climate change. Simulations for Southwest Germany reveal the influence of aerosol particles on regional precipitation. An increased number of particles causes precipitation to weaken or even suppresses light precipitation events. Water content of the clouds is changed.

In his diploma thesis, Schlick develops special equations for a detailed economic efficiency analysis of biogas facilities to be built by planners and investors. With these equations, requirements for the plant manufacturers can be defined more precisely and various offers can be compared much better.

Three students of the Department of Electrical Engineering and Information Technology are granted a recognition prize in the total

amount of EUR 1,000. Within the framework of student projects, Michael Allgeier, Hatem Bouferguine, and Philip Schumann successfully developed the “Low Power Wind Turbines Energy Maximiser“. By means of this unit, the energy originating from the generator of a small wind turbine shall be used as efficiently as possible for charging a 12 V battery, with a small volume, low weight, and low costs being the main requirements. This robust device suitable for daily use can be applied for the autonomous electricity supply of mobile homes, small houses, or systems without power connections. It reduces greenhouse gases and helps avoid heavy metals in batteries.

The Environmental Award has been granted by the Savings Bank Foundation since 1989, i.e. since a time when environmental research did not yet capture public awareness as strongly as it does now. The award is granted for excellent scientific work and projects in the general public interest and contributing to the solution of environmental problems. A semester in advance, university departments are invited to propose dissertations, diploma theses, project studies or other student projects for the award. These proposals are then reviewed in a multi-step process. Finally, the foundation council decides on the persons who are granted the award.

**Karlsruhe Institute of Technology (KIT) is a public corporation and state institution 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).