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**Institut für Quantenoptik und Quanteninformation**  
Österreichische Akademie der Wissenschaften

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## Well-endowed Award for Innsbruck Quantum Physicist

**His exceptional research in experimental physics earned professor Johannes Hecker Denschlag the Rudolf Kaiser Award 2007. The prize for young German physicists, founded by the Stifterverband für die Deutsche Wissenschaft, is worth 30,000 euros and was handed over this Friday at the University of Innsbruck.**

Johannes Hecker Denschlag is fascinated by ultracold quantum gases. At the Institute of Experimental Physics of the University of Innsbruck he researches into their physical properties, and very successfully so, as his publications in major scientific magazines such as Nature and journals of physics show. The Rudolf Kaiser foundation now crowns his achievements by awarding him the Rudolf Kaiser Prize 2007. This award encourages young German experimental physicists and is worth 30,000 euros. The board of trustees at the foundation chooses a winner on the recommendation of the scientific advisory board.

### Repulsive and yet inseparable

In 2006 Johannes Hecker Denschlag was the first person in the world to report on “dangerous liaisons” in the quantum world. What we know from human relations you can also find in the world of quantum physics: two atoms form a repulsively bound pair, i.e. they repel each other and yet are inseparable precisely because of that. Working closely with theorists, Hecker Denschlag’s team were the first to prove this state. To do this the researchers slowly laid a three-dimensional optical lattice of laser beams across a Bose-Einstein condensate of rubidium atoms. Wherever two atoms come to lie on a lattice site, they form a repulsively bound pair. Although the atoms repel each other, they cannot leave the lattice site because their repulsive energy prevents them from doing so. This insight was a major impulse for basic research and a contribution to understanding the complex quantum-mechanical systems better. “The prize is a great recognition of my work and a motivation for pursuing this research topic with enthusiasm and energy,” a delighted Johannes Hecker Denschlag promises. “The prize is also an appreciation of the working group, because you cannot do experimental physics on your own.”

### **Renowned teachers and supporters**

Johannes Hecker Denschlag was born in Mainz in 1969 and studied physics at the University of Mainz. For his doctorate he worked in the research team of Anton Zeilinger and Jörg Schmiedmayer at the Institute of Experimental Physics at the University of Innsbruck. From 1998 to 2000, Hecker Denschlag held a post-doc position in the team of physics Nobel laureate William D. Phillips at the National Institute of Standards and Technology (NIST) in Gaithersburg, USA. This is where he started researching Bose-Einstein condensates, a project he continued at the University of Innsbruck in the team of Wittgenstein award winner Rudolf Grimm. Today he has his own working group at the Institute of Experimental Physics. In 2005 he received the *venia legendi* and in 2006 a professorship at the University of Innsbruck.

You can find pictures on: <http://www.iqoqi.at/media/download/>

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