

# WIENER PHYSIKALISCHES KOLLOQUIUM

## TU-WIEN - UNIVERSITÄT WIEN

### WS 2014

Einladung zum Vortrag von

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## High performance quantum computing

More than a century after the development of quantum mechanics we have reached an exciting time where non-trivial devices that make use of quantum effects can be built: quantum random number generators to produce true random numbers, optical lattice emulators to mimic models of condensed matter physics and quantum annealers to solve classical optimization problems. As the roadmap to building universal quantum computers becomes more concrete an important emerging question is the identification of important real-world applications of quantum computers. In order for a quantum computer to be competitive, it needs to not only be asymptotically superior but be able to solve problems within a limited time that no classical supercomputer can solve. I will review how substantial algorithmic improvements of quantum algorithms have brought problem in quantum chemistry from the realm of science fiction to being realistic applications. Similar algorithmic improvements will be needed in other areas in order to identify more “killer apps” for quantum computing.

**December, 15th 2014, 17:30 hrs**  
(ab 17:00 Uhr Kaffee)

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