

## SYQG 1: Symposium Quantengravitation

Zeit: Mittwoch 14:00–16:15

Raum: 30.95: 001

**Plenarvortrag** SYQG 1.1 Mi 14:00 30.95: 001  
**Quantum Gravity: General Introduction and Recent Developments** — •CLAUS KIEFER — Institute for Theoretical Physics, University of Cologne, Germany

One of the biggest open problems in physics is the consistent unification of quantum theory with general relativity. The resulting quantum theory of gravity would have an important bearing upon the physics of the early universe, the understanding of black holes, and the structure of spacetime. In my talk I start by giving a general introduction to the motivation for and the problems of a theory of quantum gravity. I then briefly describe the main approaches - quantum general relativity (including loop quantum gravity) and string theory - and some of their applications. I conclude with presenting some recent results that deal with the microstructure of space, black-hole entropy, and quantum cosmology.

**Plenarvortrag** SYQG 1.2 Mi 14:45 30.95: 001  
**Does Quantum Gravity need Strings?** — •CONSTANTIN BACHAS

— LPTENS, 24 rue Lhomond, 75231 Paris, France

This is a critical review of the arguments that make string theory the leading contender for a theory of quantum gravity. Open problems, including the search for experimental hints of string unification, will be discussed.

**Plenarvortrag** SYQG 1.3 Mi 15:30 30.95: 001  
**Loop Quantum Gravity (LQG)** — •THOMAS THIEMANN — FAU Erlangen Nürnberg, Germany — Perimeter Institute for Theoretical Physics, Canada

Loop Quantum Gravity (LQG) is a candidate theory that intends to combine the principles of General Relativity and Quantum Field Theory. The major challenge is to circumvent the notion of a background metric which on the one hand underlies the axiomatic formulation of QFT but on the other hand is not allowed in GR. In this talk we motivate and outline elements of LQG and discuss applications and open research problems.