

## Paralelas PA02

# UV-Finite and Higher-Derivative Gravitational Theories

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### **Abstract:**

The two main problems of quantum gravitation are its renormalizability and unitarity. In my talk, I will show how to consistently solve both in the framework of non-local gravitational theories. I construct super-renormalizable theories and finally, I find theories that are completely free of ultraviolet divergences. In the framework of quantum field theory, in the last models, the symmetry is enhanced to the full conformal. I will comment that this is essential also on the classical level to solve the problems of spacetime singularities. Among the main research achievements of this programme I will also mention applications via exact solutions, to cosmology and black hole physics. Eventually, if time permits the results for quantum gravitational theories with six derivatives and their relation to the asymptotic safety scenario in the gravitational setup will be discussed as well.

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