

Institut Ruđer Bošković  
ZAVOD ZA TEORIJSKU FIZIKU  
Bijenička c. 54  
ZAGREB, HRVATSKA

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## SEMINAR ZAVODA ZA TEORIJSKU FIZIKU

(Zajednički seminari Zavoda za teorijsku fiziku,  
Zavoda za eksperimentalnu fiziku IRB-a i Fizičkog odsjeka PMF-a)

# Quantum Gravity models - a brief conceptual summary

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### Abstract:

After short historical overview we describe the difficulties with application of standard QFT methods in quantum gravity (QG). The incompatibility of QG with the use of classical continuous space-time required conceptually new approach. We present briefly three proposals: loop quantum gravity (LQG), the field-theoretic framework on noncommutative space-time and QG models formulated on discretized (triangularized) space-time. We evaluate these models as realizing expected important properties of QG: background independence, consistent quantum diffeomorphisms, noncommutative or discrete structure of space-time at very short distances, finite/renormalizable QG corrections. We only briefly outline an important issue of embedding QG into larger geometric and dynamical frameworks (e.g. supergravity, (super)strings, p-branes, M-theory), with the aim to achieve full unification of all fundamental interactions.

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