

Seminar

Dr. Wolfgang Wieland

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Covariant loop quantum gravity

Friday, January 9, 2015

at 15:15 h

ESI, Boltzmann Lecture Hall

Abstract: The talk gives an introduction to covariant loop quantum gravity, and presents recent developments in the field. The kinematical Hilbert space is derived from Ashtekars reformulation of general relativity in terms of $SU(2)$ YangMills variables. Quantum states of geometry live on the boundary of spacetime. Areas, angles and volumes turn into operators with discrete spectra. The dynamics is given in terms of spinfoam amplitudes, which represent the continuation of spin-network boundary states into the bulk. The most crucial open problem concerns the semi-classical limit: How can we recover general relativity plus quantum corrections? Studying this question, I found a proposal for a new action for discretized gravity in terms of spinors [arXiv:1407.0025]. The action is a one-dimensional line integral over the edges of the discretization, and these edges turn into the worldlines of a system of defects scattering at the vertices of the discretization.

N. Carqueville

December 19, 2014