Spectral Theory and Dynamics of Quantum Systems

GRADUIERTENKOLLEG 1838

Guest Lectures

Prof. Oliver Matte

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Differentiability properties of stochastic flows in non-relativistic QED

Oktober 24, 2016 - 15:45 h,
Room 8.526 - University of Stuttgart, Pfaffenwaldring 57

Abstract: Together with Batu Güneysu and Jacob Schach Møller we recently studied stochastic differential equations associated with the standard model of non-relativistic quantum electrodynamics (QED). In this talk we discuss differentiability properties of the corresponding stochastic flow. Furthermore, we present a Bismut-Elworthy-Li type formula for the derivatives of the semi-group generated by the non-relativistic QED Hamiltonian. This formula reveals the smoothing properties of the semi-group. Finally, we explain how to prove the smoothness of an associated Fock space operator-valued semi-group kernel.

Feynman-Kac formulas for the renormalized Nelson Hamiltonian

Oktober 27, 2016 - 10:00 h,
Room 8.526 - University of Stuttgart, Pfaffenwaldring 57

Abstract: We explain the derivation of a Feynman-Kac type formula for the renormalized Nelson Hamiltonian. This derivation involves a novel discussion of Feynman's complex phase, which eventually implies a lower bound on the spectrum of the renormalized Nelson Hamiltonian exhibiting the correct leading behavior for large coupling and matter particle numbers. We also obtain a Feynman-Kac formula for the renormalized Nelson Hamiltonian in a non-Fock representation. Both Feynman-Kac formulas imply positivity improving properties of the corresponding semi-groups. - This talk is based on joint work with Jacob Schach Møller.