

C7 Differential Operators of Mathematical Physics: Spectral Theory and Dynamics

The project C7 deals with the differential operators of mathematical physics under various aspects. Elliptic operators, notably Laplace and Dirac type operators, are examined with respect to their spectral resolution, their index formulas and their scattering behaviour, in singular (stratified) spaces and with singular coefficients. The corresponding parabolic heat operators provide links with the geometry via their small time asymptotics and uniform bounds on their kernel, and with stochastics via the Feynman-Kac type formulas for their kernel. Finally, wave equations are of interest in Lorentzian manifolds in the presence of black holes and other singularities.