Borel summability and rigorous WKB for partial differential equations

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The talk will focus on general results on Borel summability of solutions of linear or nonlinear systems of PDEs and on rigorously proving asymptotic behavior of solutions.

In the case of nonlinear PDEs with analytic coefficients Borel summability, asymptotic behavior and formation of singularities are rigorously shown for relatively wide classes of evolution equations. A linear problem of particular importance is the behavior of the wave function in the Schroedinger equation for large time. Ionization of Hydrogen atoms in fields of arbitrary strength is an application of special interest that will be discussed.