

Christiaan Jozef Farielda van de Ven: Coupling of the continuum and semiclassical limit. Part I: convergence of eigenvalues

Friday, May 8, 2026 4:05 PM (30 minutes)

In this talk we analyze the semiclassical d -dimensional Schrödinger operator in the continuum $-1/2\Delta + \lambda_N^2 V$ discretized on a mesh with spacing proportional to $1/N$. The semi-classical parameter λ_N is chosen as $\lambda_N = N^{1-\gamma}$, with $\gamma \in (-1, 1)$, which ensures that N governs both the semiclassical and continuum limit simultaneously. We prove that all eigenvalues of the discrete operator converge to those of the continuum, as $\lambda_N \rightarrow \infty$. Beyond this semi-classical domain, in the case of the harmonic oscillator, we further discuss the spectral asymptotics for $\gamma \in \mathbb{R} \setminus (-1, 1)$, thereby fully characterizing the eigenvalue behavior across all possible values of $\gamma \in \mathbb{R}$. Joint work with L. Pettinari and M. Keller.