Speaker: Johannes Sjöstrand, IMB, Université de Bourgogne

Title of the talk: On a $\partial, \overline{\partial}$ system with a large parameter.

Abstract: This talk is based on joint works with Christian Klein and Nikola Stoilov. In electrical impedance tomography and in the scattering theory of integrable Davey-Stewartson II equations there appears a system of $\partial, \overline{\partial}$ equations on $\mathbf{C}$, depending on a potential q and a spectral parameter $k \in \mathbf{C}$. We study the asymptotics of the solutions for large values of the spectral parameter k. When $q \in \langle \cdot \rangle^{-2} H^s(\mathbf{C})$ for some $s \in]1, 2]$, we show that the solution converges as a geometric series with ratio $\mathcal{O}(1/|k|^{s-1})$. When q is the characteristic function of a strictly convex open set with smooth boundary, the ratio is $\mathcal{O}(1/|k|)$. Numerical simulations show the applicability of the asymptotic formulae for the example of the characteristic function of the disk.

We will also discuss recent progress concerning the possible two term asymptotics for the reflection coefficient.