Counting bound states: From Weyl to Maximal Fourier Multipliers

Deriving precise estimates for bound states has a long history. It ranges from Rayleigh’s theory of sound and Weyl’s asymptotic to more detailed questions concerning the eigenvalue distribution of Schrödinger operators. We will give a personally biased sketch of some of the history and discuss some new results, including the somewhat surprising fact how tools from harmonic analysis - so-called maximal Fourier multiplier bounds - can help in counting bound states.