MILIVOJE LUKIC, Rice University
Stahl–Totik regularity for Schrodinger operators

This talk describes a theory of regularity for one-dimensional continuum Schrodinger operators. For any half-line Schrodinger operator with a bounded potential V, we obtain universal thickness statements for the essential spectrum, in the language of potential theory and Martin functions (which will be defined in the talk). Namely, we prove that the essential spectrum is not polar, it obeys the Akhiezer–Levin condition, and moreover, the Martin function at infinity obeys the two-term asymptotic expansion $\sqrt{-z} + \frac{a}{2\sqrt{-z}} + o(\frac{1}{\sqrt{-z}})$ as $z \to -\infty$. The constant a in its asymptotic expansion plays the role of a renormalized Robin constant and enters a universal inequality $a \le \liminf_{x\to\infty} \frac{1}{x} \int_0^x V(t)dt$. This leads to a notion of regularity, with connections to the exponential growth rate of Dirichlet solutions and limiting eigenvalue distributions for finite restrictions of the operator, and applications to decaying and ergodic potentials. This is joint work with Benjamin Eichinger.