

Unique Continuation and Uncertainty Principles

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26-30 November 2018 (5 sessions) | 16:00 - 18:00 (a total of 10 hours)

This course is an introduction to the Unique Continuation (UC) Property in the sense of Hardy Uncertainty Principle: consider $u(t,x)$ a solution to an evolution equation at time t and space variable x . Assuming that $u(0,x)$ and $u(1,x)$ decay sufficiently fast for large $|x|$, then we derive that the only possibility is $u=0$.

We will prove the UC property for the Schrödinger equation with potential, both in the continuous and discrete settings.

PROGRAMME:

1. Intro and motivation: Hardy's theorem and the relation between the theorem and UC properties for the free Schrödinger equation.
2. Unique Continuation for the Schrödinger equation with potential. Persistence properties for solutions with fast decay at two different times.
3. Monotonicity formulas (log-convexity) and Carleman estimates using real variable methods.
4. If time permits, some words on the sharp result.
5. Unique Continuation for Discrete Schrödinger Equation.

OBJECTIVE: To get familiar with the techniques of Carleman estimates and monotonicity formulas.

PREREQUISITES: basic functional analysis and PDEs.

***Registration is free, but mandatory, before 21st November:** So as to inscribe go to <https://bit.ly/2pVNI4M> and fill the registration form.