

MIT GRADUATE STUDENT LUNCH SEMINAR
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Title: Not all Critical Points are Minimizers

Abstract: The zero set of a harmonic function can be (locally) written as the graph of a smooth function except around a set of points of co-dimension 2. There are lots of proofs of this fact, but we will focus on one which views harmonic functions not as a solution to a PDE but rather as (local) minimizers of the Dirichlet energy. The key tool will be what is called an “Epiperimetric Inequality.”

These epiperimetric inequalities are useful for studying not just harmonic functions but minimizers to other functionals (e.g. area-minimizers and solutions to free boundary problems). Through lots of examples, we will talk about this tool and explain how part of its power lies in the 18.01 fact that not every critical point is a (local) minimizer.