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The singular free boundary in the Signorini problem

In this talk I will overview the Signorini problem for a divergence form elliptic operator with Lipschitz coefficients, and I will describe a few methods used to tackle two fundamental questions: what is the optimal regularity of the solution, and what can be said about the singular free boundary in the case of zero thin obstacle. The proofs are based on Weiss and Monneau type monotonicity formulas. This is joint work with Nicola Garofalo and Arshak Petrosyan.