Colloquium

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Oct. 22 at 2:00 pm, HH3017

How hard is proving hardness? Logic approach to barriers in complexity.

Abstract:

In spite of much work over the years, the main questions in
complexity theory such as P vs. NP remain unresolved. Is this
question solvable at all? Is P vs. NP independent of some logical theory? Indeed, on a meta-level,
there are several results that state that certain classes of techniques, including Turing's celebrated
diagonalization, cannot be used to resolve these questions. Such results we call the "barriers" of
complexity theory.

In this talk, we will survey some of the main such barriers
(Relativization, Natural Proofs, Algebrization), and talk about how knowledge of such barriers
helps evaluate (and, so far, discard) proposed proofs of P vs. NP. We will talk about the logic
basis for such barriers, an how some barriers can be formalized as an independence of a logic
theory.