Abstract:

The class $P$ attempts to capture the efficiently solvable computational tasks. It is full of practically relevant problems, with varied and fascinating combinatorial structure. In this talk, I will give an overview of a rapidly growing body of work that seeks a better understanding of the structure within $P$. Inspired by NP-hardness, the main tool in this approach are combinatorial reductions. Combining these reductions with a small set of plausible conjectures, we obtain tight lower bounds on the time complexity of many of the most important problems in $P$. 

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Hardness in $P$