**Talk: What is polynomial optimization?**

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**Abstract**: The talk is a general introduction to polynomial optimization, which is the problem of minimizing polynomial functions over semi-algebraic sets. Despite its special structure, polynomial optimization can model a large family of problems in the applications. We will see that this problem is equivalent to that of characterizing positive polynomials over semi-algebraic sets, hence related to more general questions in real algebraic geometry and especially with the theory of SOS-polynomials (sum-of-squares). The talk is meant to be complementary to the courses given by M. Laurent and M. Safey El Din during the workshop, and dedicated to non-experts.