

**Talk: Volume computation, optimization and comparing hierarchies of upper and lower bounds**

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**Abstract:** In this talk we first introduce the notion of pushforward measure and show how it can help reduce some difficult multivariable problems (like e.g. volume computation of semialgebraic sets and polynomial optimization) to a simpler univariate formulation. As usual, the devil hides into details and we show where the difficulty has moved, namely computing efficiently the integral of powers of a given polynomial on simple sets (like unit box, unit sphere, ellipsoid, or their image by an affine transformation). While trivial for small powers, the problem can become challenging for higher powers (even in relatively modest dimension). We end up the talk by comparing moment-SOS hierarchies of upper and lower bounds in polynomial optimization.