### *SOS/SDP methods: from optimization to games*

In the last few years, techniques based on sum of squares (SOS) decompositions of multivariate polynomials, semidefinite programming (SDP), and results from real algebraic geometry have proved extremely useful in the formulation of hierarchies of convex relaxations for difficult polynomial optimization problems. In this talk we show how these can be extended to a game theoretic setting. In particular, we discuss a class of zero-sum two-person games with an infinite number of pure strategies, here the payoff function is a polynomial expression of the actions of the players. We show that the value of the game, and the corresponding optimal strategies, can be computed by solving a single semidefinite program, thus providing a natural generalization of the well-known LP characterization of finite games. In addition, we show how the results can be applied, with suitable modifications, to a general class of semialgebraic games and problems with two quantifiers.