Optimal designs for polynomials, continued fractions and some applications to random matrices

In this talk we consider the problem of determining optimal designs in heteroscedastic multivariate polynomial regression models. Mathematically we are maximizing real valued functions with probability measures as arguments.
We use continued fractions to solve the statistical optimization problem. As a further application we give new proofs for the almost sure approximation of eigenvalues of Wishart matrices by roots of classical orthogonal polynomials and for the asymptotic distribution of the corresponding spectrum.