1070-60-123   **Alex Bloemendal*** (`alexb@math.toronto.edu`), Department of Mathematics, University of Toronto, Room 6290, 40 St. George Street, Toronto, ON M5S 2E4, Canada. *Finite rank perturbations of large random matrices.*

Finite (or fixed) rank perturbations of large random matrices arise in a number of applications. The main phenomenon is a phase transition in the largest eigenvalues as a function of the perturbation. I will describe joint work with Bálint Virág in which we introduce a new way to study these models. The starting point is a reduction to a natural band form; under the soft edge scaling, it converges to a souped-up version of the known continuum random Schrödinger operator on the half-line. We describe the near-critical fluctuations in several ways, solving a known open problem in the real case. One characterization—a simple linear PDE—also yields a new route to the Painlevé structure in the celebrated Tracy-Widom laws. (Received February 05, 2011)