1154-46-237 **Masoud Khalkhali*** (masoud@uwo.ca) and **Shahab Azarfar**. *From random spectral triples to spectral curves and topological recursion.*

Recently suggested matrix models to probe quantum gravity based on Dirac operators on finite spectral triples, pose very challenging analytic problems. In particular their large N limits have only been studied by computer simulations. There are also conjectures about existence of phase transition in the limit laws. In this talk I will show how new techniques developed in modern random matrix theory, namely topological recursion and the theory of Riemann surfaces (more precisely spectral curves), can be effectively applied and yield rigorous results (even for more general models). The Schwinger-Dyson equations satisfied by the connected correlators W_n of the corresponding multi-trace formal 1-Hermitian matrix model are derived. I will show that the coefficients $W_{g,n}$ of the large N expansion of W_n's enumerate discrete surfaces, called stuffed maps, whose building blocks are of particular topologies. The spectral curve $(\Sigma, \omega_{0,1}, \omega_{0,2})$ of the model can be investigated in detail. In particular, I will give an explicit expression for the fundamental symmetric bidifferential $\omega_{0,2}$ in terms of the formal parameters of the model. This is Joint work with S. Azarfar. (arXiv:1906.09362). (Received August 26, 2019)