1108-60-518 **Jinho Baik*** (baik@umich.edu), 530 Church Street, Ann Arbor, MI 48109. *Phase transition of the free energy for random matrix.*

The largest eigenvalue of a random matrix can be regarded as the free energy at zero temperature. Motivated by the recent development in directed polymers, we introduce the free energy at finite temperature and consider the large dimension limit. We prove the existence of the phase transition and evaluate the limiting distribution for both sub and super critical cases for Wigner matrices and invariant ensembles. This is a joint work with Ji Oon Li. (Received January 20, 2015)