



Cours de physique théorique

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Introduction to Random Matrix Theory and its various applications

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Suggested readings/references:

- (1) “Random matrices” book by **M. L. Mehta**
- (2) “Log-gases and Random matrices” book by **P.J. Forrester**
- (3) “Random Matrices” by **Bertrand Eynard, Taro Kimura** and **Sylvain Ribault**, based on lectures by Bertrand Eynard at IPhT, Saclay, available at: <http://ipht.cea.fr/Docspht/articles/t14/193/public/RM.pdf>
- (4) “Random Matrices, the Ulam Problem, Directed Polymers & Growth Models, and Sequence Matching”, **S.N. Majumdar** Les Houches lecture notes (Complex systems, 2006), [arXiv/cond-mat/0701193](http://arxiv.org/abs/cond-mat/0701193)
- (5) “Extreme Value statistics of correlated random variables”, by **S.N. Majumdar** and **Arnab Pal**, based on lectures by S.N. Majumdar at the GGI workshop (Florence, 2014), [arXiv: 1406.6768](http://arxiv.org/abs/1406.6768)
- (6) “Extreme Eigenvalues of Wishart Matrices: Application to Entangled Bipartite System”, **S.N. Majumdar**, a book chapter in “**Handbook of random matrix theory**” ed. by G. Akemann et.al. [arXiv: 1005.4515](http://arxiv.org/abs/1005.4515)
- (7) “Top eigenvalue of a random matrix: large deviations and third order phase transition”, **S.N. Majumdar** and **G. Schehr**, J. Stat. Mech. P01012 (2014), [arXiv: 1311.0580](http://arxiv.org/abs/1311.0580). [[Review article]]
- (8) “Introduction to the Random Matrix Theory: Gaussian Unitary Ensemble and Beyond”, **Y. V. Fyodorov**, [arXiv: 0412017](http://arxiv.org/abs/0412017). [[Review article]]
- (9) “Random matrix theory of quantum transport”, **C.W.J. Beenakker**, Rev. of Mod. Phys. 69, 731 (1997), [arXiv/cond-mat/9612179](http://arxiv.org/abs/cond-mat/9612179). [[Review article]]

See also two recent popular articles:

(1) "*Equivalence Principle*", **M. Buchanan**, Nature Phys. 10, 543 (2014)

http://www.nature.com/nphys/journal/v10/n8/full/nphys3064.html?WT.ec_id=NPHYS-201408

(2) "*At the far ends of a new universal law*" by **N. Wolchover**, Quanta magazine (October, 2014)

<https://www.quantamagazine.org/20141015-at-the-far-ends-of-a-new-universal-law/>