

# INTEGRABLE STRUCTURES IN RANDOM MATRIX THEORY AND BEYOND

MSRI Workshop  
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- [1] G. AKEMANN, J. BAIK, and P. DI FRANCESCO (eds.), *The Oxford handbook of random matrix theory*, Oxford University Press, Oxford, 2011, ISBN 978-0-19-957400-1. MR 2920518. Zbl 1321.15005. doi: 10.1093/oxfordhb/9780198744191.001.0001.
- [2] G. W. ANDERSON, A. GUIONNET, and O. ZEITOUNI, *An introduction to random matrices*, Cambridge Studies in Advanced Mathematics **118**, Cambridge University Press, Cambridge, 2010, ISBN 978-0-521-19452-5. MR 2760897. Zbl 1184.15023. doi: 10.1017/CBO9780511801334.
- [3] Z. BAI and J. W. SILVERSTEIN, *Spectral analysis of large dimensional random matrices*, 2nd ed., Springer Series in Statistics, Springer, New York, 2010, ISBN 978-1-4419-0660-1. MR 2567175. Zbl 1301.60002. doi: 10.1007/978-1-4419-0661-8.
- [4] J. BAIK, P. DEIFT, and T. SUIDAN, *Combinatorics and random matrix theory*, Graduate Studies in Mathematics **172**, American Mathematical Society, Providence, RI, 2016, ISBN 978-0-8218-4841-8. MR 3468920. Zbl 1342.05001. doi: 10.1090/gsm/172.
- [5] P. BLEHER and A. ITS (eds.), *Random matrix models and their applications*, Mathematical Sciences Research Institute Publications **40**, Cambridge University Press, Cambridge, 2001, ISBN 0-521-80209-1. MR 1842779. Zbl 0967.00059. <http://library.msri.org/books/Book40/contents.html>.
- [6] P. DEIFT and P. FORRESTER (eds.), *Random matrix theory, interacting particle systems, and integrable systems*, Mathematical Sciences Research Institute Publications **65**, Cambridge University Press, New York, 2014, ISBN 978-1-107-07992-2. MR 3380529. Zbl 1318.81009. <http://library.msri.org/books/Book65/contents.html>.
- [7] P. DEIFT and D. GIOEV, *Random matrix theory: invariant ensembles and universality*, Courant Lecture Notes in Mathematics **18**, American Mathematical Society, Providence, RI, 2009, ISBN 978-0-8218-4737-4. MR 2514781. Zbl 1171.15023. doi: 10.1090/cln/018.
- [8] P. A. DEIFT, *Orthogonal polynomials and random matrices: a Riemann–Hilbert approach*, Courant Lecture Notes in Mathematics **3**, American Mathematical Society, Providence, RI, 1999, ISBN 0-9658703-2-4; 0-8218-2695-6. MR 1677884. Zbl 0997.47033. doi: 10.1090/cln/003.
- [9] A. S. FOKAS, A. R. ITS, A. A. KAPAEV, and V. Y. NOVOKSHENOV, *Painlevé transcendent: the Riemann–Hilbert approach*, Mathematical Surveys and Monographs **128**, American Mathematical Society, Providence, RI, 2006, ISBN 0-8218-3651-X. MR 2264522. Zbl 1111.34001. doi: 10.1090/surv/128.
- [10] P. J. FORRESTER, *Log-gases and random matrices*, London Mathematical Society Monographs Series **34**, Princeton University Press, Princeton, NJ, 2010, ISBN 978-0-691-12829-0. MR 2641363. Zbl 1217.82003. doi: 10.1515/9781400835416.
- [11] M. L. MEHTA, *Random matrices*, 3rd ed., Pure and Applied Mathematics **142**, Elsevier/Academic Press, Amsterdam, 2004, ISBN 0-12-088409-7. MR 2129906. Zbl 1107.15019. <https://www.sciencedirect.com/bookseries/pure-and-applied-mathematics/vol/142>.

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Bibliography by Jinho Baik.

- [12] L. PASTUR and M. SHCHERBINA, *Eigenvalue distribution of large random matrices*, Mathematical Surveys and Monographs **171**, American Mathematical Society, Providence, RI, 2011, ISBN 978-0-8218-5285-9. MR 2808038. Zbl 1244.15002. doi: 10.1090/surv/171.
- [13] M. POTTERS and J.-P. BOUCHAUD, *A first course in random matrix theory: for physicists, engineers and data scientists*, Cambridge University Press, Cambridge, 2021, ISBN 978-1-108-48808-2; 978-1-108-76890-0. Zbl 1451.60005. doi: 10.1017/9781108768900.
- [14] D. ROMIK, *The surprising mathematics of longest increasing subsequences*, Institute of Mathematical Statistics Textbooks **4**, Cambridge University Press, New York, NY, 2015, ISBN 978-1-107-42882-9; 978-1-107-07583-2. MR 3468738. Zbl 1345.05003. doi: 10.1017/CBO9781139872003.
- [15] T. TAO, *Topics in random matrix theory*, Graduate Studies in Mathematics **132**, American Mathematical Society, Providence, RI, 2012, ISBN 978-0-8218-7430-1. MR 2906465. Zbl 1256.15020. doi: 10.1090/gsm/132.
- [16] R. VERSHYNIN, *High-dimensional probability: an introduction with applications in data science*, Cambridge Series in Statistical and Probabilistic Mathematics **47**, Cambridge University Press, Cambridge, 2018, ISBN 978-1-108-41519-4. MR 3837109. Zbl 1430.60005. doi: 10.1017/9781108231596.
- [17] J. ZINN-JUSTIN, *From random walks to random matrices: selected topics in modern theoretical physics*, Oxford Graduate Texts, Oxford University Press, Oxford, 2019, ISBN 978-0-19-878775-4. Zbl 1417.81014. doi: 10.1093/oso/9780198787754.001.0001.