

WHAT DO FAMILIES OF RANDOM MATRICES CONVERGE TO?

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What does it mean for several random matrices to converge jointly as their size tends to infinity? Since matrices do not generally commute and live in spaces of changing dimension, this question requires new notions of convergence and independence. Remarkably, in the large-matrix limit, familiar concepts such as independence, cumulants, and set partitions acquire natural noncommutative counterparts. Free probability provides a framework for describing these limiting objects and their joint behavior.

I will give an accessible introduction to this picture, with particular emphasis on strong convergence and the intrinsic freeness principle, and explain how these notions are related. No prior knowledge of random matrices or free probability will be assumed.