The origin of order in random matrices with symmetries[1] CALVIN
JOHNSON, San Diego State University — From Noether's theorem we know symmetries lead to conservation laws. What is left to nature is the ordering of conserved quantities; for example, the quantum numbers of the ground state. In physical systems the ground state is generally associated with "low" quantum numbers and symmetric, low-dimensional irreps, but there is no a priori reason to expect this. By constructing random matrices with nontrivial point-group symmetries, I find the ground state is always dominated by extremal low-dimensional irreps. Going further, I suggest this explains the dominance of $J = 0$ g.s. even for random two-body interactions.

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