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Emergent symmetries in disordered quantum spin systems VICTOR QUITO, National High Magnetic Field Laboratory, FSU, PEDRO LOPES, Universit de Sherbrooke, JOSE HOYOS, University of So Paulo, EDUARDO MIRANDA, Campinas State University — A common theme in low- or high-energy physics is the fact that a state may have a symmetry lower than its underlying Lagrangian. Behind this feature is the phenomenon of spontaneous symmetry breaking. A more exotic situation corresponds to a low-energy state whose symmetry is greater than its underlying Lagrangian. Recently, we have proved rigorously that strong disorder can lead to emergent symmetries, with no fine tuning required. We will show a generic route to emergent symmetries induced by strong disorder, as well as several examples of rich phase diagrams. Strongly disordered spin-1 chains with manifest $SU(2)$ symmetry show two phases with emergent $SU(3)$ symmetry. Spin-S chains with S_{j1} also show emergent $SU(N)$ phases but with less richness. Finally, we show that generic $SO(N)$ symmetric-chains accommodate two different phases with emergent $SU(N)$ symmetries.

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