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Conformal field theory and quantum many-body physics
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**Quenched mass disorder in the large N
theory of vector bosons**

I will talk about my study on the critical bosonic $O(N)$ vector model with quenched random mass disorder in the large N limit. At infinite N limit, we can exactly solve the disordered model. The resulting low energy behavior can be described by two scale invariant theories, one of which has an intrinsic scale. At finite N , by using the $1/N$ and epsilon expansion, we study the RG flow of the disordered system. IR fate in different dimensions are discussed.