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A Mott Glass to Superfluid Transition for Random Bosons in Two Dimensions DAVID PEKKER, SHANKAR IYER, GIL REFAEL, Caltech — We study the zero temperature superfluid-insulator transition for a two-dimensional model of interacting, lattice bosons in the presence of quenched disorder and particle-hole symmetry. We follow the approach of a recent series of papers by Altman, Kafri, Polkovnikov, and Refael, in which the strong disorder renormalization group is used to study disordered bosons in one dimension. Adapting this method to two dimensions, we study several different species of disorder and uncover universal features of the superfluid-insulator transition. In particular, we locate an unstable finite disorder fixed point that governs the transition between the superfluid and a gapless, glassy insulator. We present numerical evidence that this glassy phase is the incompressible Mott glass and that the transition from this phase to the superfluid is driven by percolation-type process. Finally, we provide estimates of the critical exponents governing this transition.

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