New Glassy Phases of Electrons in Disordered Potentials ROGER HAYDOCK¹, University of Oregon, NIGEL GOLDENFELD, University of Illinois at Urbana-Champaign — Critical disorders are found analytically for the Anderson model of independent electrons in two and three-dimensional random potentials. At large disorders the states are exponentially localized, then with decreasing disorder the model goes through a sequence of less strongly localized phases ending with power-law localization just above the transition to extended states. These results follow from an analytic transformation of the Anderson model into augmented space where disorder is removed from matrix-elements by constructing a basis of extended states correlated with the potential. For different disorders, the states are dominated asymptotically by different sectors of augmented space, and these sectors are identified by path-counting.

¹work supported by the Richmond F. Snyder Fund