Replica theory for fluctuations of the activation barriers in glassy systems JOERG SCHMALIAN, Iowa State University, MAXIM DZERO, Rutgers University, PETER WOLYNES, University of California at San Diego — Using an effective potential approach to self generated glasses we determine the nucleation of entropic droplets in systems with random first order transition and entropy crisis. We demonstrate that fluctuations of the configurational entropy and of the liquid glass surface tension are crucial for an understanding of the barrier fluctuations in glassy systems and thus are responsible for the broad spectrum of excitations and heterogeneous dynamics in glasses. In particular we derive a relation between the length scale for dynamic heterogeneity and the related barrier fluctuations.

Joerg Schmalian
Iowa State University

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