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**Exploiting disorder for global response: Independence of bond-level response and selected-bond removal networks<sup>1</sup>**  
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The properties of amorphous solids near jamming are qualitatively different from those of simple crystals [1]. In a crystal with only one atom per unit cell, all atoms play the same role in producing the solid's global response to an external perturbation; disordered materials are not similarly constrained. We will demonstrate a new principle that emerges for disordered matter: *independence of bond-level response*. This independence refers not only to the dearth of strong correlations between the response of one bond compared to another, but also, and more importantly, to the variation of response of any specific bond to different external perturbations. Using *selected-bond removal networks*, where individual bonds can be successively removed, we demonstrate that one can drive the overall system to different regimes of behavior. Consequently one can exploit disorder to achieve unique, varied, textured and tunable global response.

[1] "Solids between the mechanical extremes of order and disorder," C.P. Goodrich, A.J. Liu and S.R. Nagel *Nature Physics* **10**, 578 (2014).

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