
Disorder and the mechanical properties of glasses

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Abstract

Structural disorder and elastic heterogeneity underlie the mechanical properties of glasses, leading to non-affine deformation and elusive damage reactions. However, the statistics of spatial disorder can currently be assessed only indirectly. In particular, the individual roles of physical and chemical disorder remain unclear. In this talk, we will start by reviewing vibrational heterogeneity of glassy materials in the THz regime, and will try to understand how such knowledge could be relevant in the design of new glass formulations. Since glassy disorder and liquid dynamics are inherently related, unconventional routes of glass processing are required to tailor disorder in a range wide enough to reach practical relevance. In the second part of this presentation, we will consider some of these techniques.

Keywords: disorder, Boson peak, mechanical properties

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