

Abstract Submitted
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Universality in the delayed failure of colloidal gels JORIS SPRAKEL, DAVID WEITZ, Harvard University — The mechanical failure of heterogeneous solids is not always instantaneous with the application of a load, but can be significantly delayed. We use colloidal gels, a prototypic heterogeneous material, to unravel the microscopic mechanisms behind this delayed failure. A universal behavior is revealed; the delay time depends only on the magnitude of the applied stress not on its origin. Whether the gel succumbs to internal tension, gravitational compression or shear stresses, the behavior can be quantitatively explained using a generalized bond-rupture model that describes the microscopic events triggering macroscopic failure.

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