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Avalanches of dewetting holes in viscoelastic phase separation CHANGQIAN YU, SUNG CHUL BAE, STEVE GRANICK, University of Illinois at Urbana-Champaign — Textbook ideas fails regarding phase separation of polymer solutions, because of viscoelastic effects. Here with fluorescence microscopy we visualize in real time this process. Quasi two dimensional polymer solutions of polystyrene near the critical concentration are confined between non-wetting surfaces. Apart from a double phase separation induced by rapid hydrodynamic coarsening, we observe novel avalanched dewetting of solvent-enriched holes, not only in the polymer-enriched phase but also near the walls. Strikingly, this occurs at the late stage of the spinodal decomposition. These dewetting holes govern pattern evolution of the phase-separated polymer network.

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