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Double Percolation in the Intermediate Phase of Network Glasses
J.C. PHILLIPS, Physics, Rutgers University, GERRY LUCOVSKY, Physics, North Carolina State University — Intermediate Phases (IP) in network glasses, discovered by Boolchand and coworkers, exhibit two striking properties: a nearly reversible glass transition, and nearly zero internal network stress. Double percolation, a well-established phenomenon in polymer blend-carbon black composites and numerical simulations, explains quantitatively the ranges of the intermediate phase observed in ternary chalcogenide alloys. The mechanism underlying IP double percolation in network glasses is spinodal enthalpy-entropy balance. Triple percolation also explains many aspects of the phase diagrams of cuprate high-temperature superconductors.

J. C. Phillips
Physics, Rutgers University

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