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**Thin Film Flows : Beer, Bread and Breaking-Up** JAN VERMANT, ETH, Zurich — Thin liquid films (TLF) are ubiquitous in nature and in technological applications. Typically, TLFs form when two bubbles or droplets come into close proximity, and thus they can be present in various multiphase systems, such as foams, emulsions and bread. At equilibrium, the stability of such systems is directly related to the magnitude of the film's disjoining pressure, which was introduced by Derjaguin and Obuchov in 1936 as defined by the sum of all intermolecular forces that act between two opposing surfaces of the film, or alternatively as the derivative of the Gibbs energy per unit area with respect to separation distance. Other forces acting in thin films are those due to capillary pressures caused by curvature differences, and hydrodynamic stresses because of flow, both of which lead to a pressure jump across the film. When the disjoining pressure is larger than the pressure jump across the TLF, then film rupture and coalescence are arrested. The disjoining pressure and capillary forces are equilibrium properties that only depend on the state and geometry of the system. However, many applications entail non-equilibrium conditions, such as those encountered in draining and sheared multiphase systems. In such occasions, the dynamics of films are characterised by a complex interplay between the hydrodynamic, capillary, intermolecular forces and the interfacial stresses. We will discuss how these play a role in beer foam stability and in bread making.

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