

# Singularities, Instabilities and Patterns in Fluid Flow

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Liquid drops are model systems that have provided intuition everywhere from the fission of atomic nuclei to the dynamics of electric discharge of metal surfaces to the dynamics of star formation. As liquid drops flow they can break apart, coalesce, form patterns and evaporate. Many striking phenomena of drop dynamics have to do with the formation of singularities as some quantity (e.g., pressure or velocity) diverges; in other cases, the astonishing behavior is determined by an underlying flow instability; in still others it determined by interactions with a nearby surface. In this lecture, I will review some of the unexpected behavior associated with these constraints focusing on the role that instabilities and singularities play in drop dynamics.