

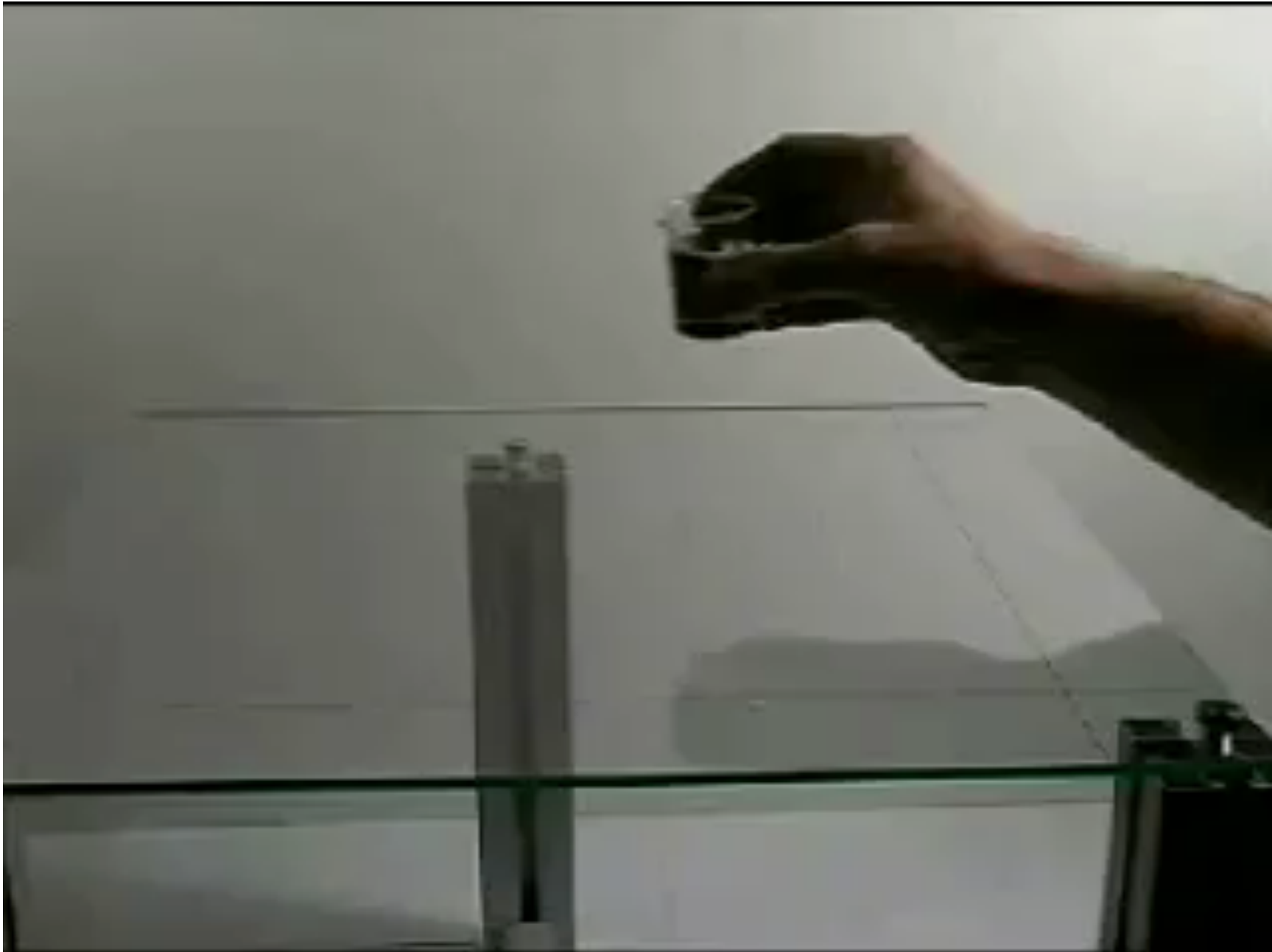
18.357: Lecture 14

Instability of superposed fluids

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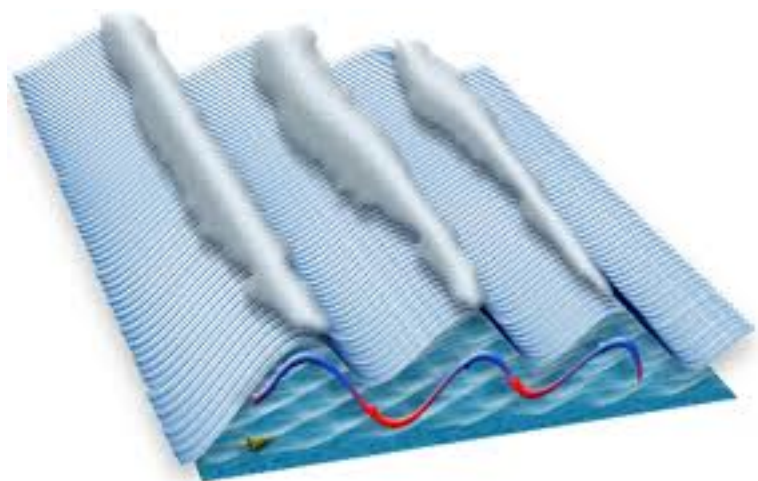


Pset 2, Q3











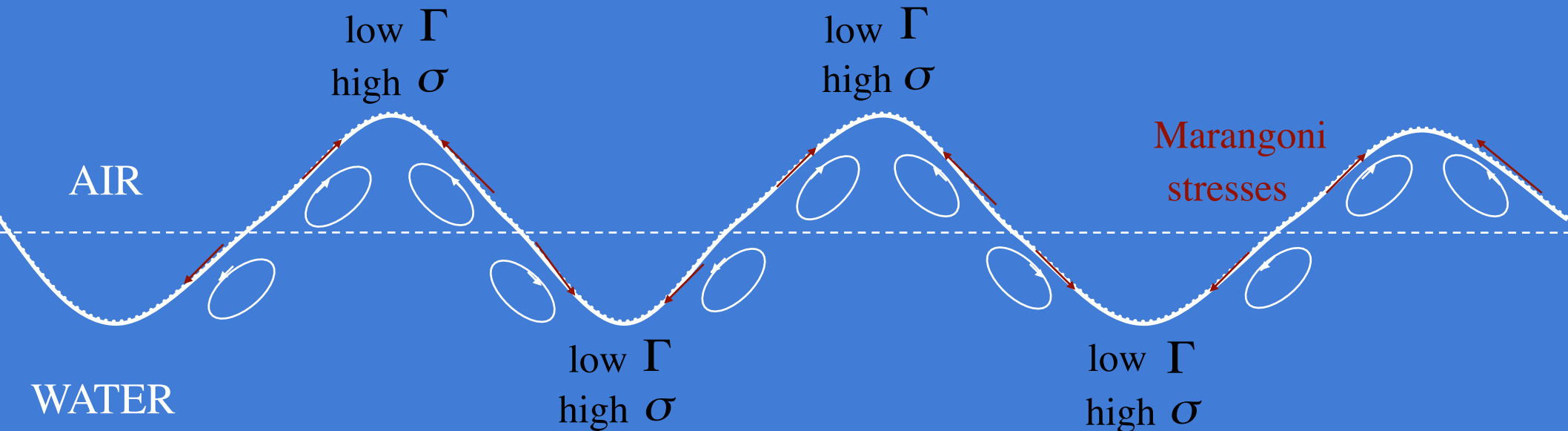


Why the flat stripes?

The suppression of capillary waves by surfactant

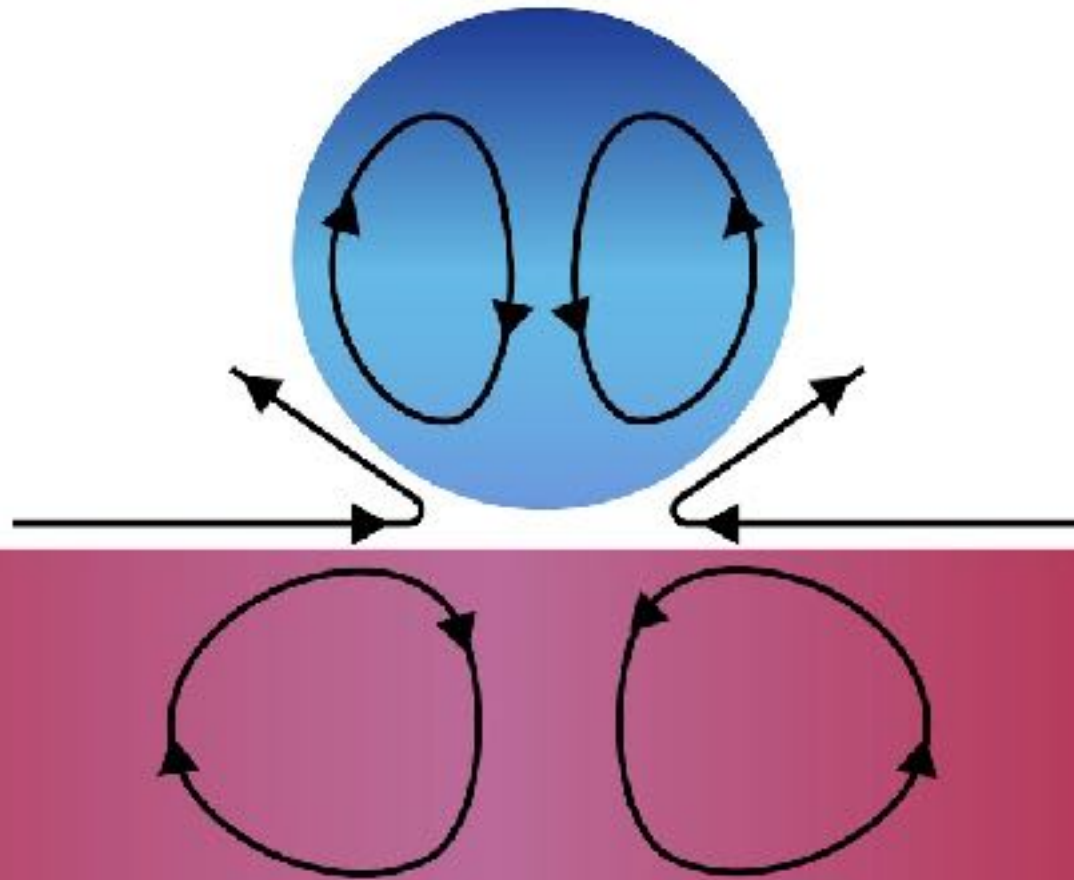
- wave motion generates regions of surface divergence
- concomitant surfactant gradients generate Marangoni stresses
- resulting small scale flows extremely dissipative

$$\frac{d\sigma}{d\Gamma} < 0$$



- flat ship wakes first remarked upon by Pliny the Elder
- examined by Benjamin Franklin, motivated by Bermudan spear fishermen
- now used to track submarines: flat wakes visible on satellite images

The Michela Geri Problem



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Pset 2, Q3