FLUIDS 2

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II. INSTABILITIES

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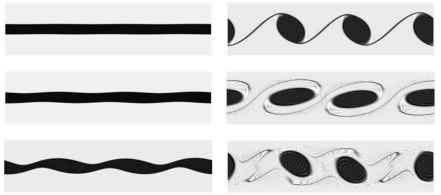
II. INSTABILITY

II.1. Concept of stability

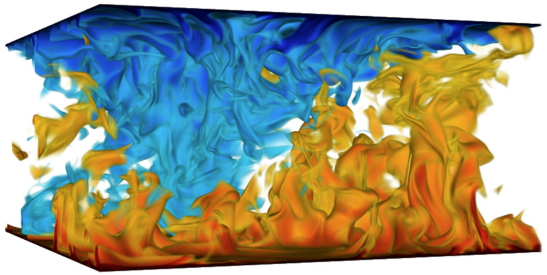
II.2. Kelvin-Helmholtz Instability



II.3. Parallel Shear instability

II.4. Convective instability

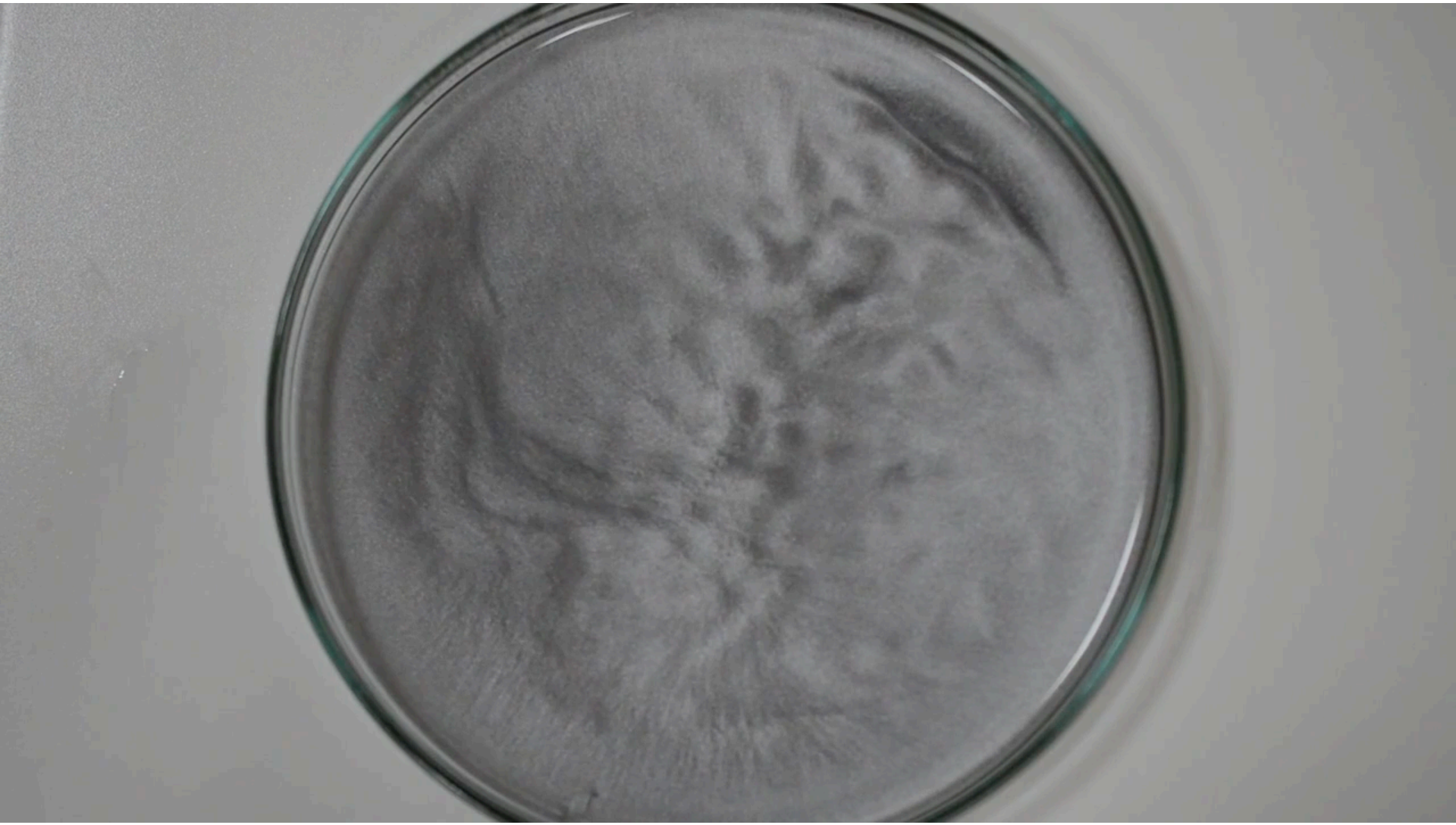
(Rayleigh–Bénard)



II.4. Convective instability

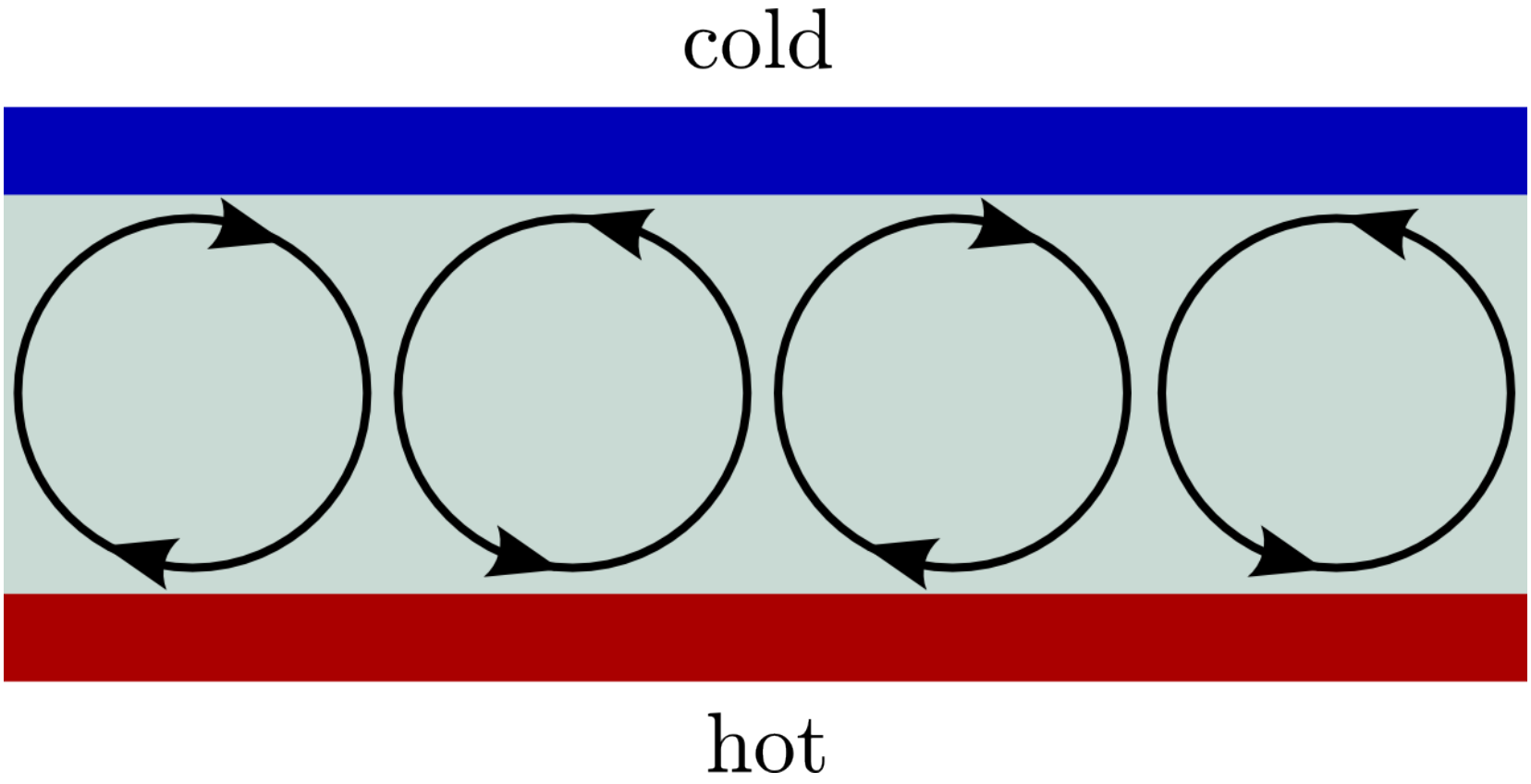
https://www.youtube.com/watch?v=eX9NpXH7UrM

II.4. Convective instability

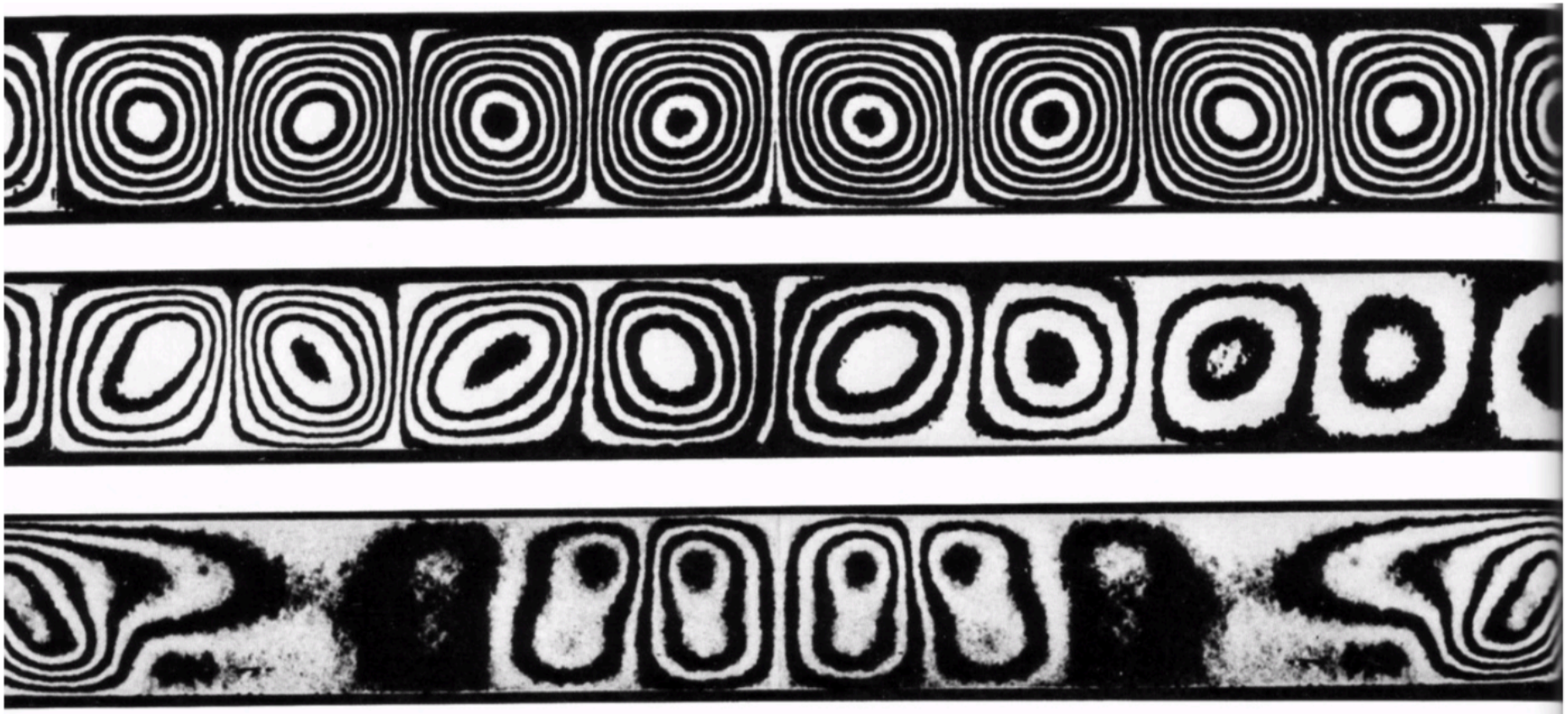


https://www.youtube.com/watch?v=v2vMXmuC818

II.4. Convective instability



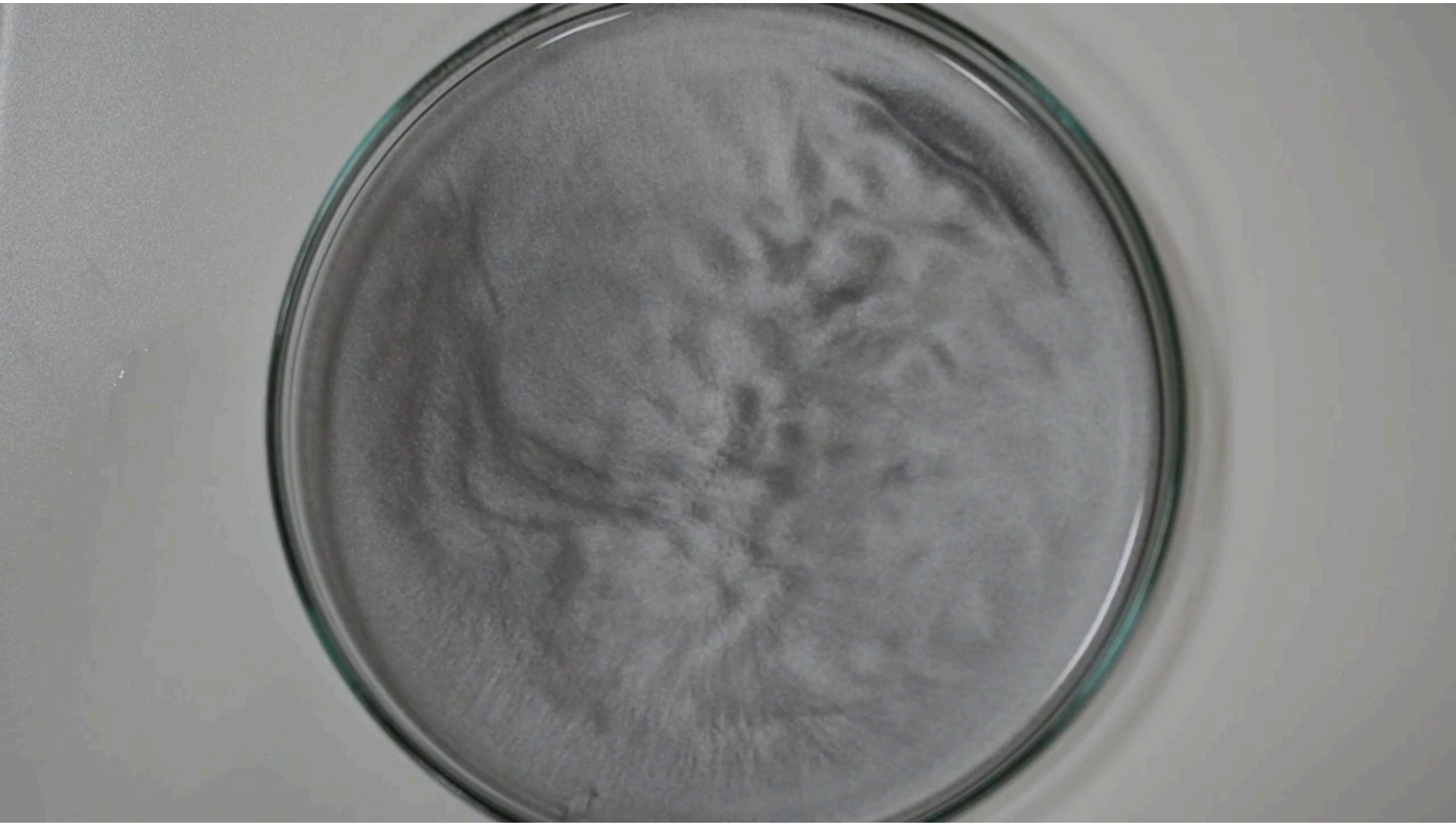
II.4. Convective instability



Buoyancy-driven convection rolls. Differential interferograms show side views of convective instability of silicone oil in a rectangular box of relative dimensions 10:4:1 heated from below. At the top is the classical Rayleigh-Bénard situation: uniform heating produces rolls parallel to the shorter side. In the middle photograph the temperature difference and hence the amplitude of motion increase from right to left. At the bottom, the box is rotating about a vertical axis. *Oertel & Kirchartz 1979, Oertel 1982a*

II.4. Convective instability

Benard-Marangoni instability

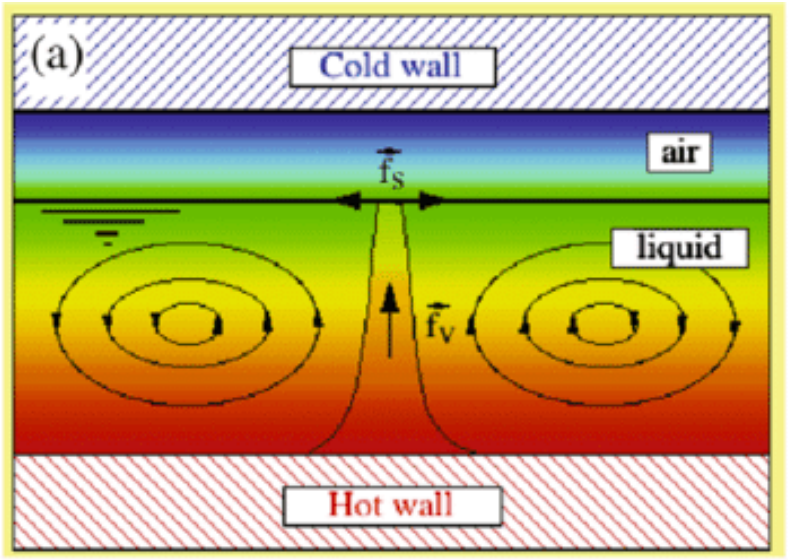


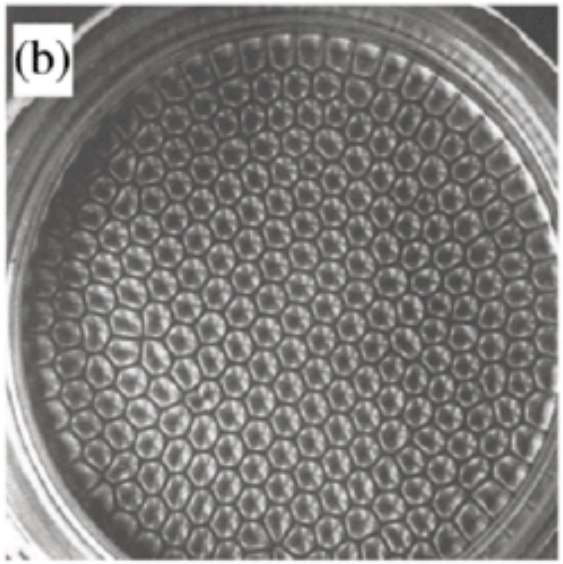
https://www.youtube.com/watch?v=v2vMXmuC818

Benard-Marangoni instability

The Marangoni effect is the mass transfer along an interface between two fluids due to a gradient of the surface tension.

In the case of temperature dependence, this phenomenon may be called thermo-capillary convection (or Bénard–Marangoni convection).





Turbulent convection

Atmospheric convection