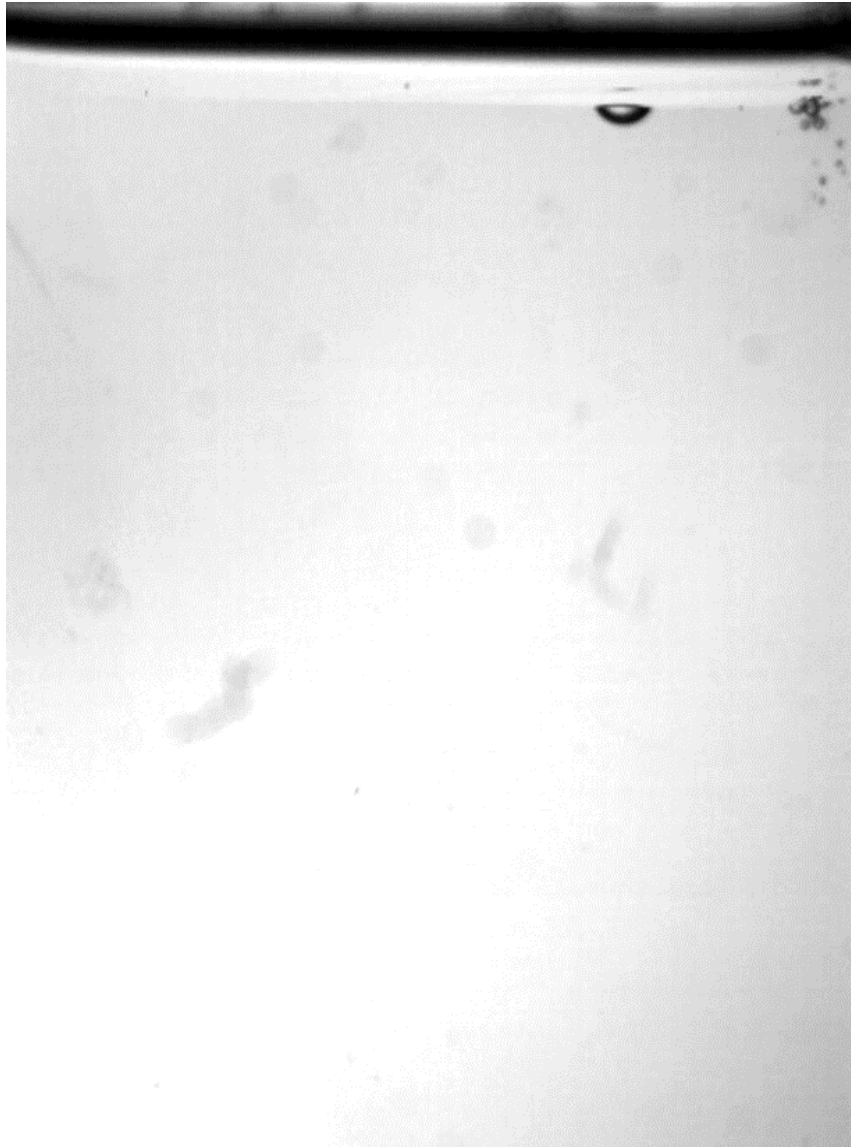


The creation



- Air layer trapped
- Pinch-off

Antibubbles, so what?

October 2023

Cyril André

S. Dorbolo, B. Scheid and J. Miguet

Bubble or antibubble?

Bubble

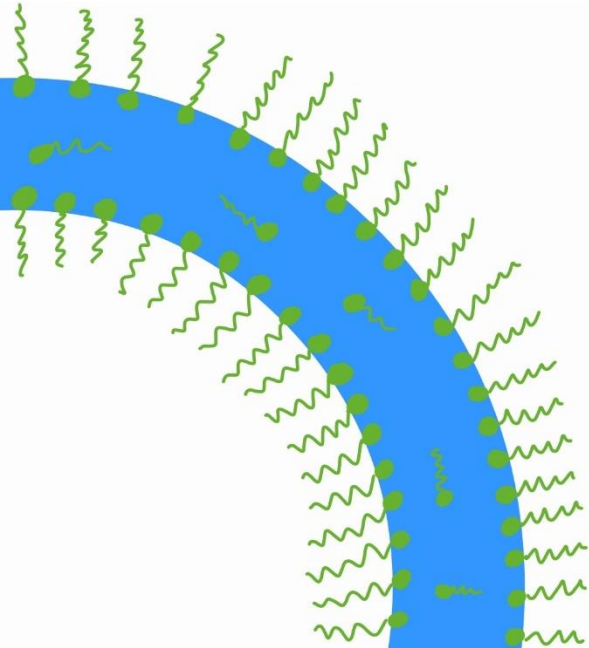


Antibubble



Bubble or antibubble?

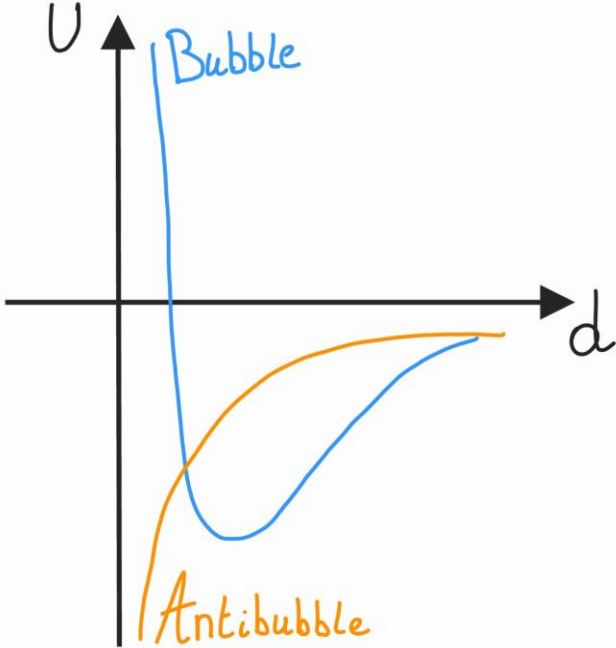
Bubble



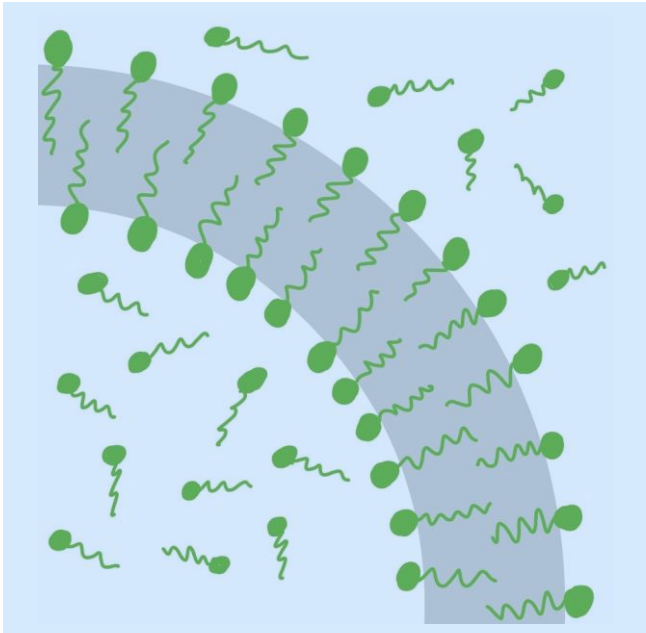
Heads → Equilibrium

$$R \sim \text{mm} - \text{m}$$

$$\varepsilon \sim \mu\text{m}$$



Antibubble



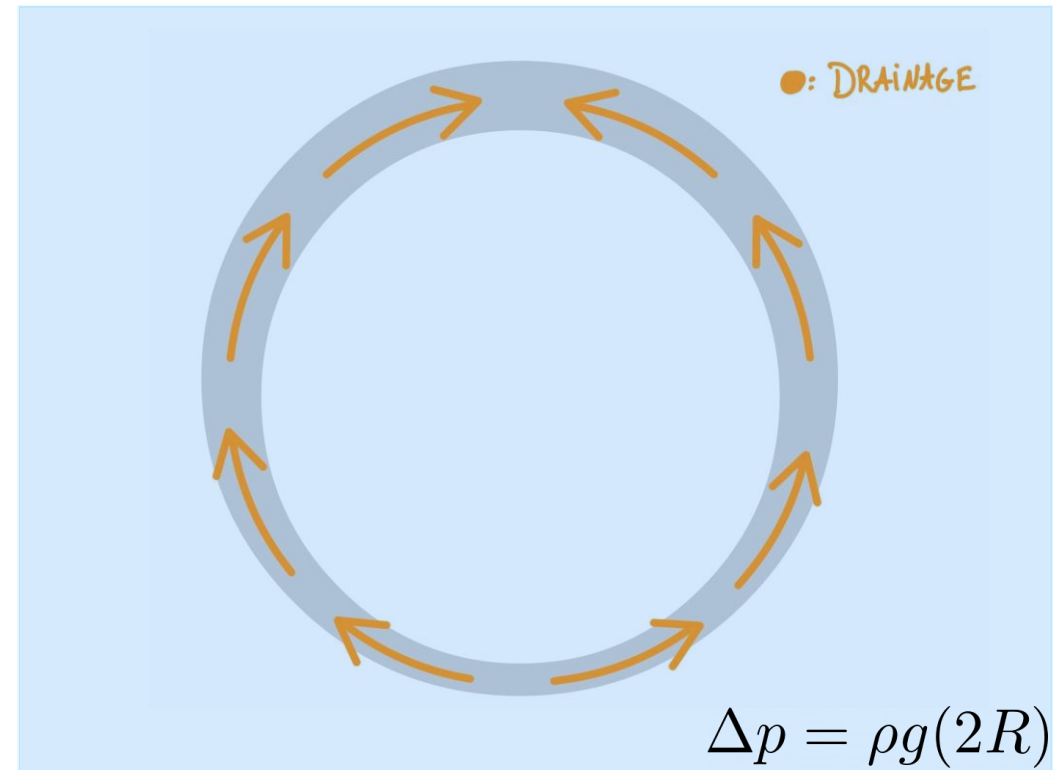
Tails → No equilibrium

$$R \sim \mu\text{m} - \text{cm}$$

$$\varepsilon \sim \mu\text{m}$$

- Drainage
 - Hydrostatic pressure
 - Thickening at the top
 - Thinning at the bottom: Van der Waals

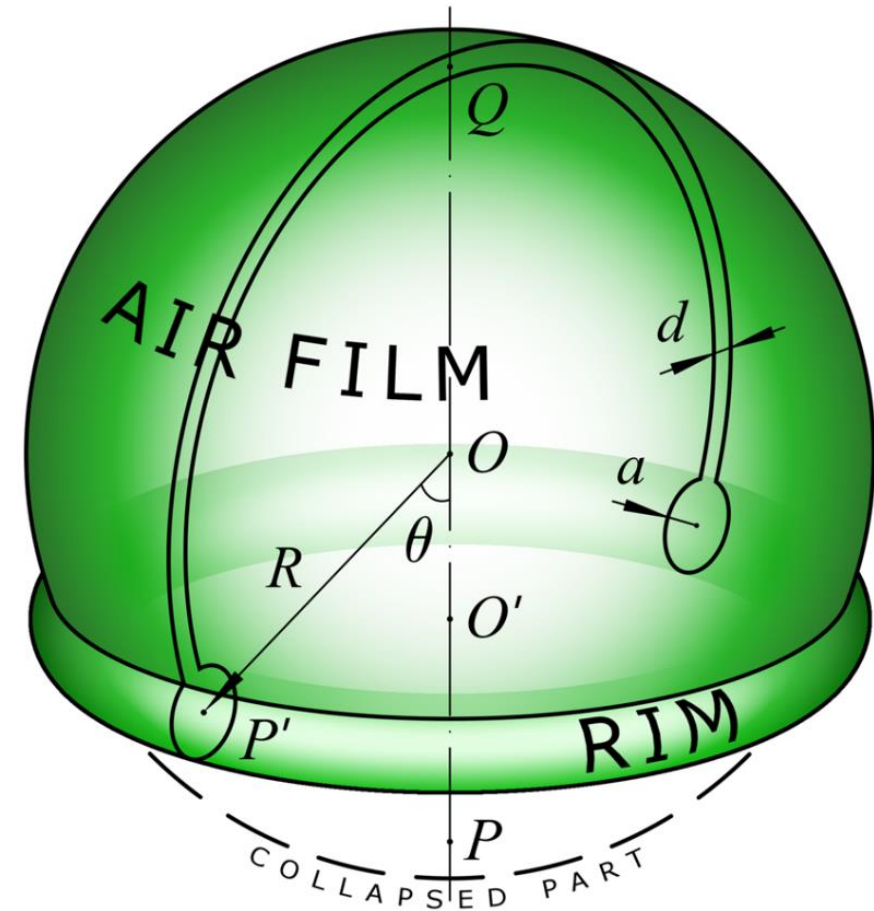
→ Lifetime



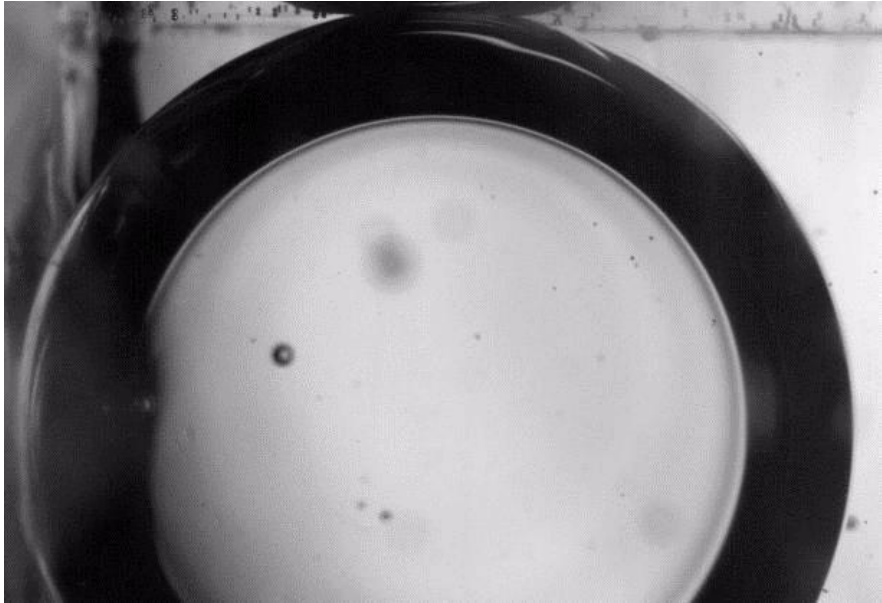
Collapse

- Retraction
- Taylor-Culick (Sob'yanin)
 - Geometry: spherical
 - Speed decreases

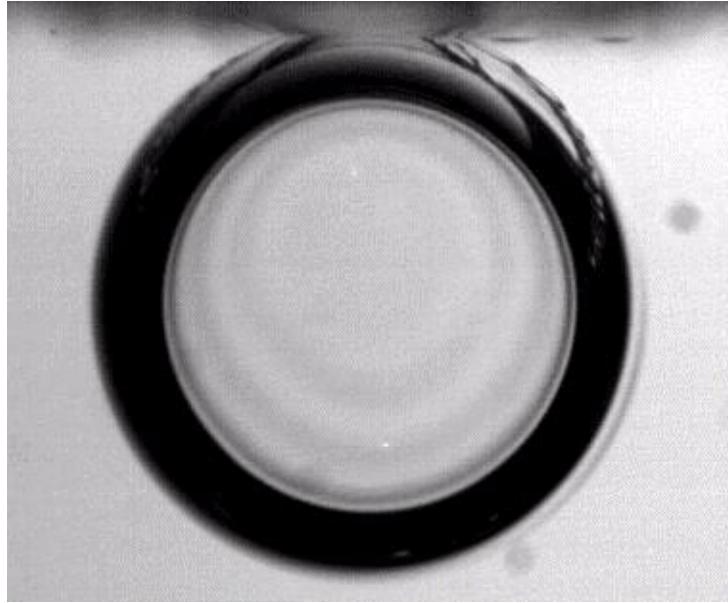
→ Life is not a *long fleuve tranquille*



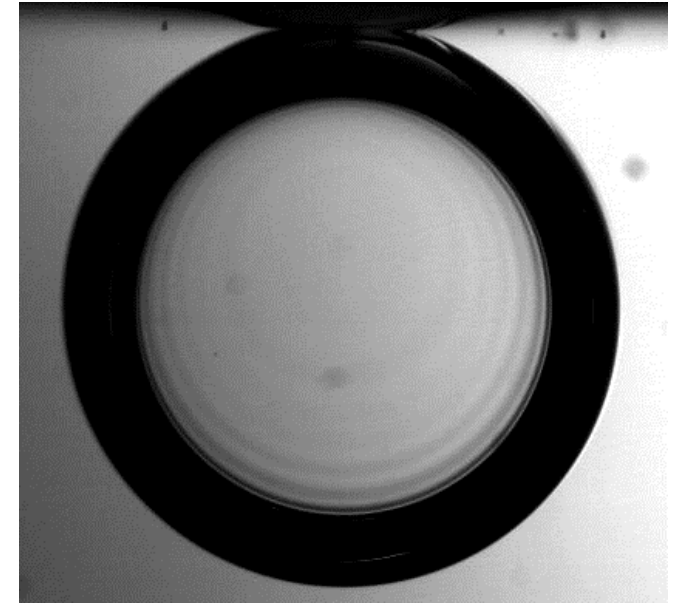
Collapse, you said?



SLES + CAPB
1 CMC
→ Spinodal decomposition



Dreft
5 CMC
→ Viscous fingering



TX100
5 CMC
→ Bubbles

→ More complex than expected

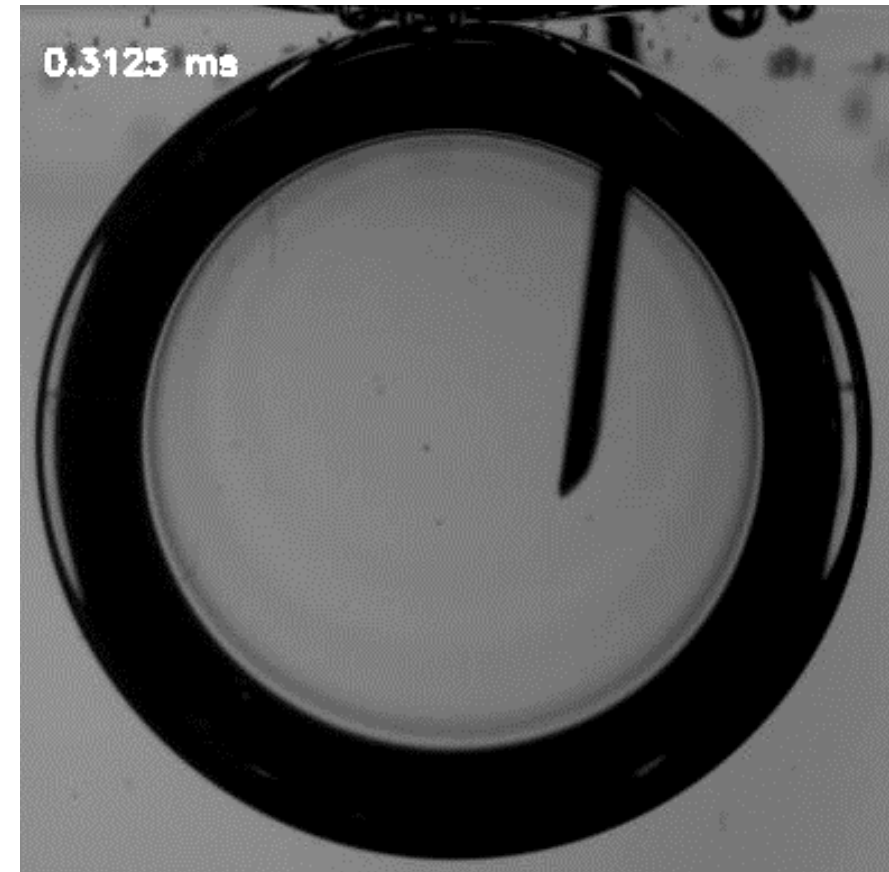
Explosion!

2 steps:

1. Retraction

2. Rupture

- Spinodal decomposition
- Viscous fingering
- Bubbles



SLES + CAPB
1 CMC

Explosion!

2 steps:

1. Retraction

2. Rupture

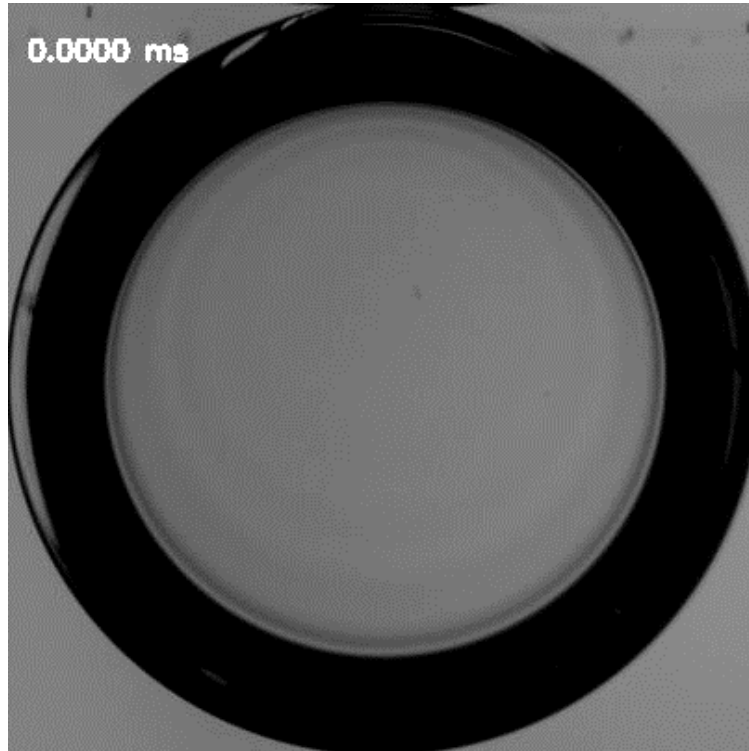
- Spinodal decomposition
- Viscous fingering
- Bubbles



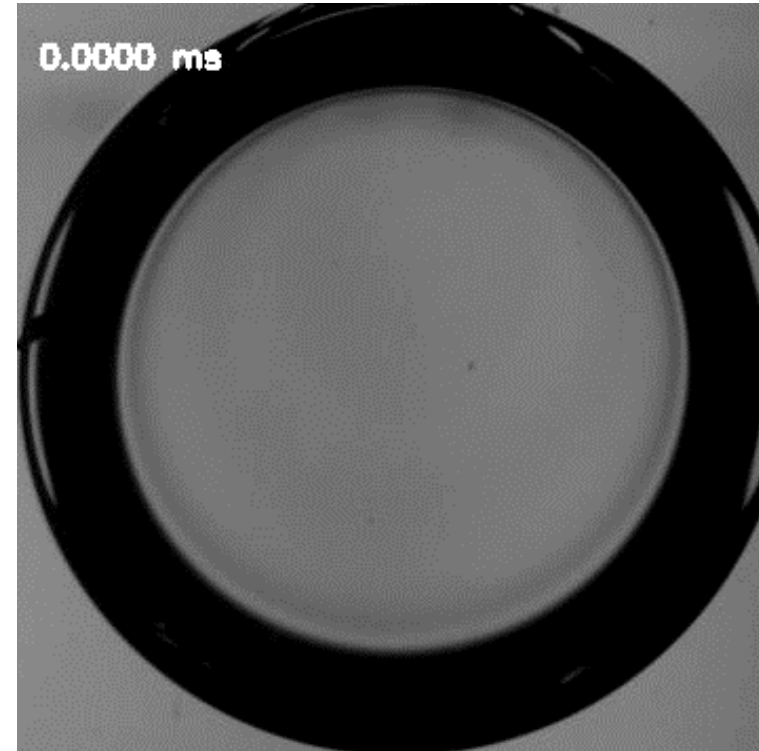
SLES + CAPB
1 CMC

Effects of concentration

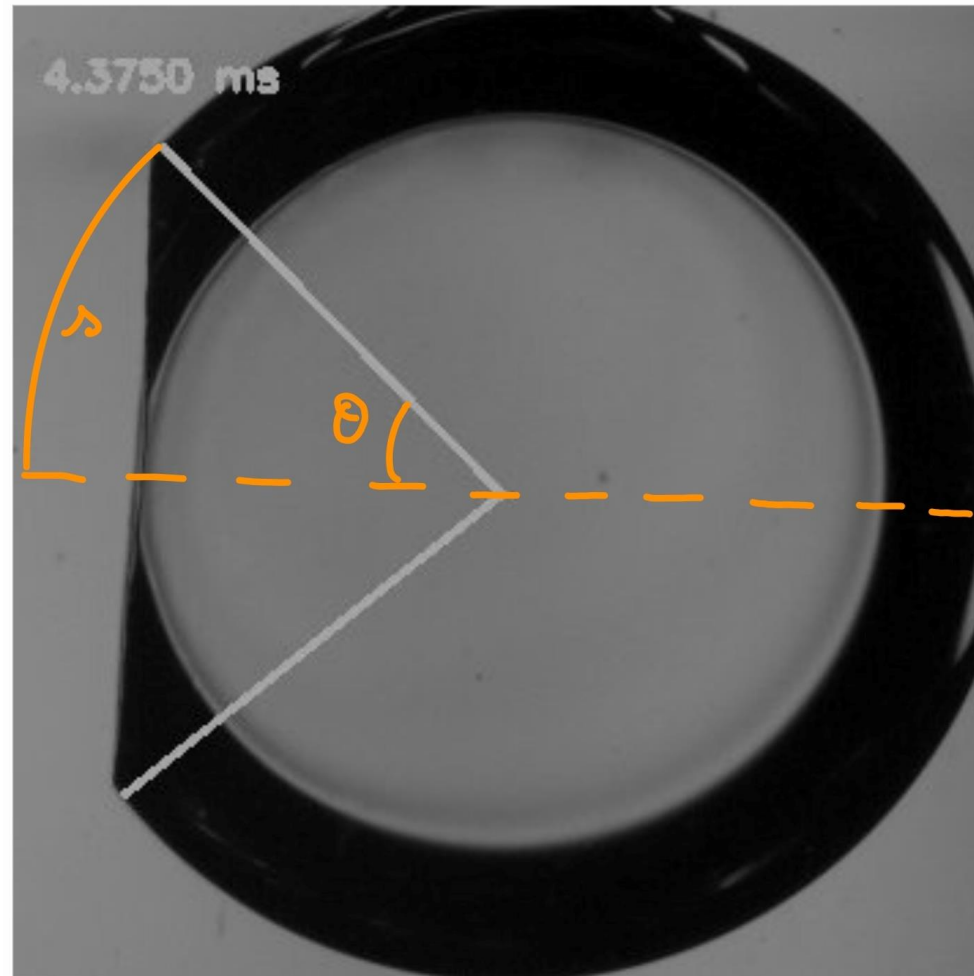
SLES + CAPB
0.1 CMC



SLES + CAPB
1 CMC



Tracking



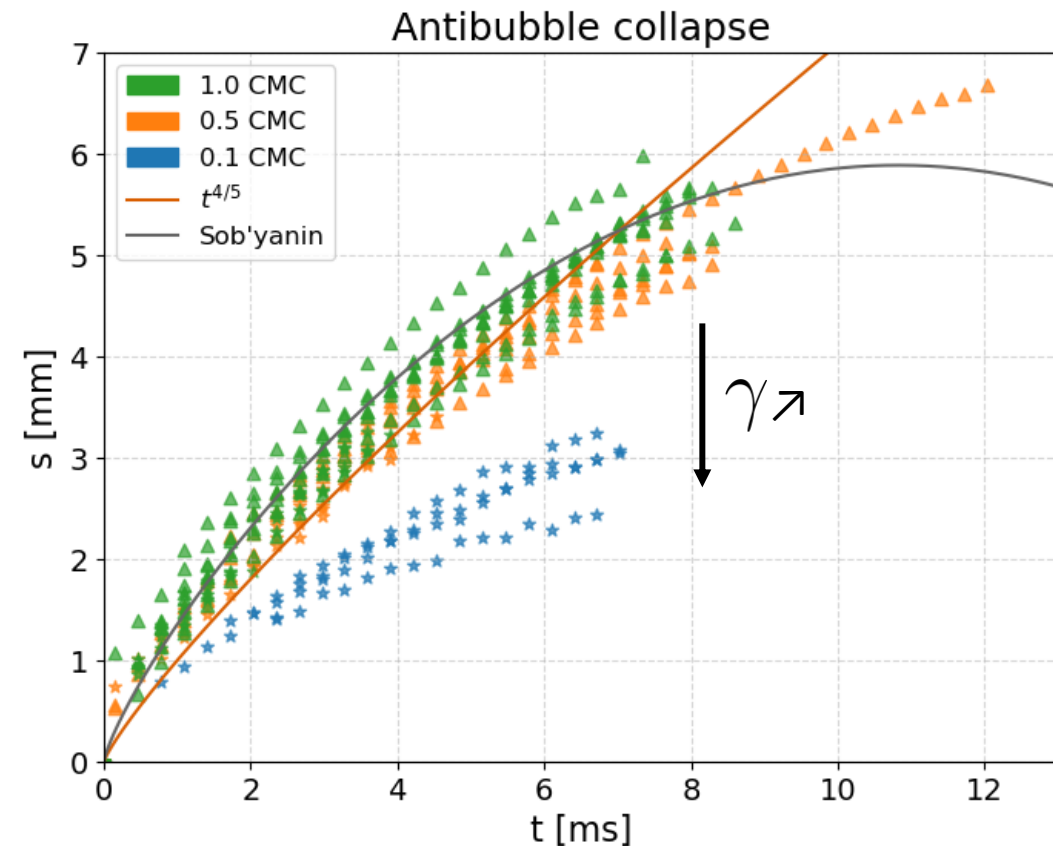
Collapse – Results

1. Mid/high concentration

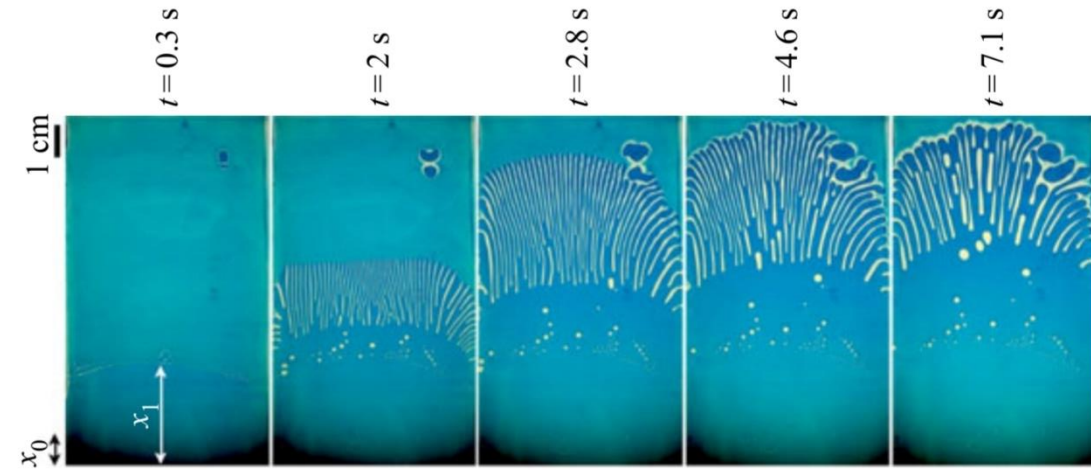
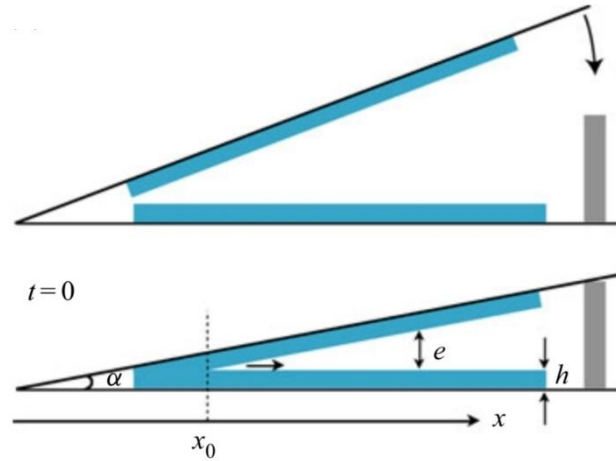
→ Sob'yanin

2. Low concentration

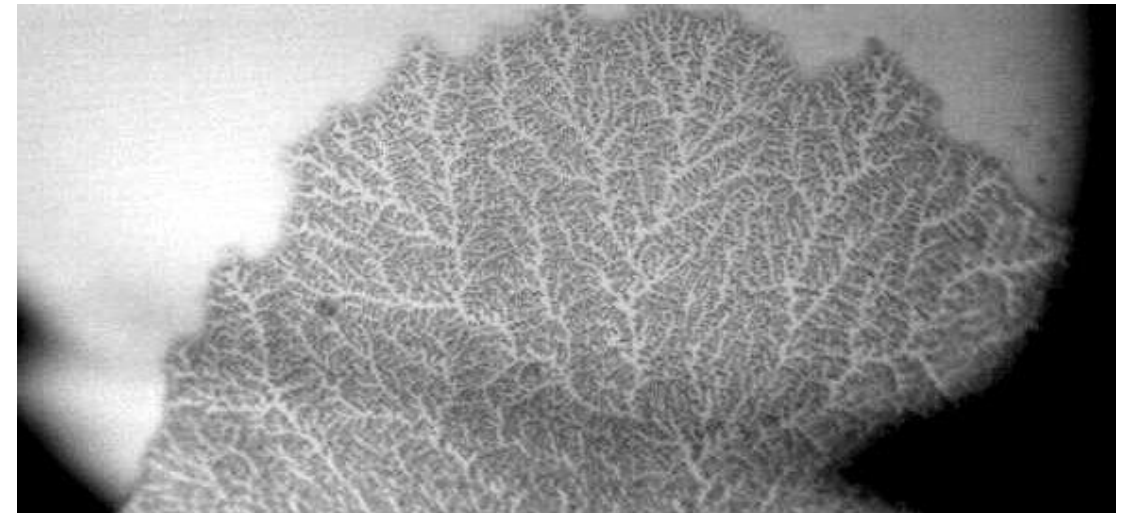
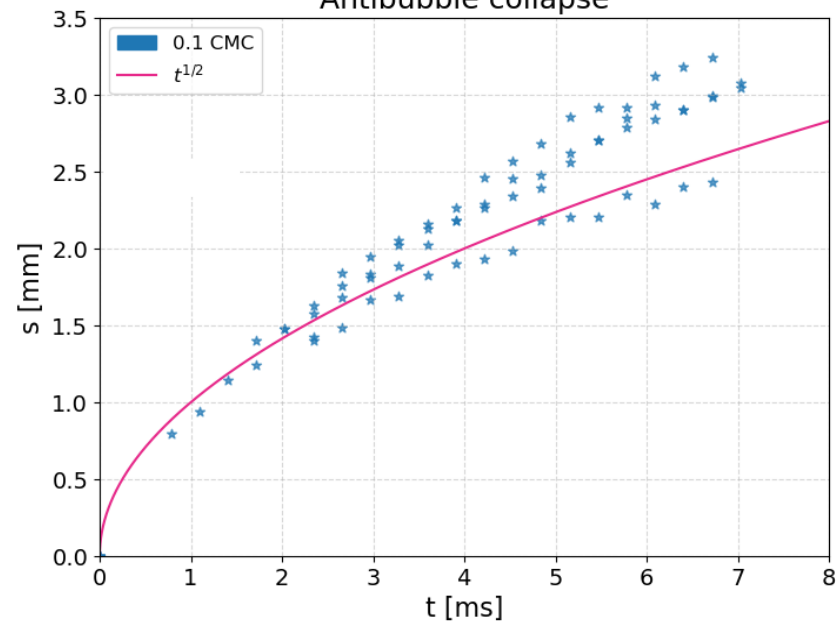
→ Lower speed but **higher** γ

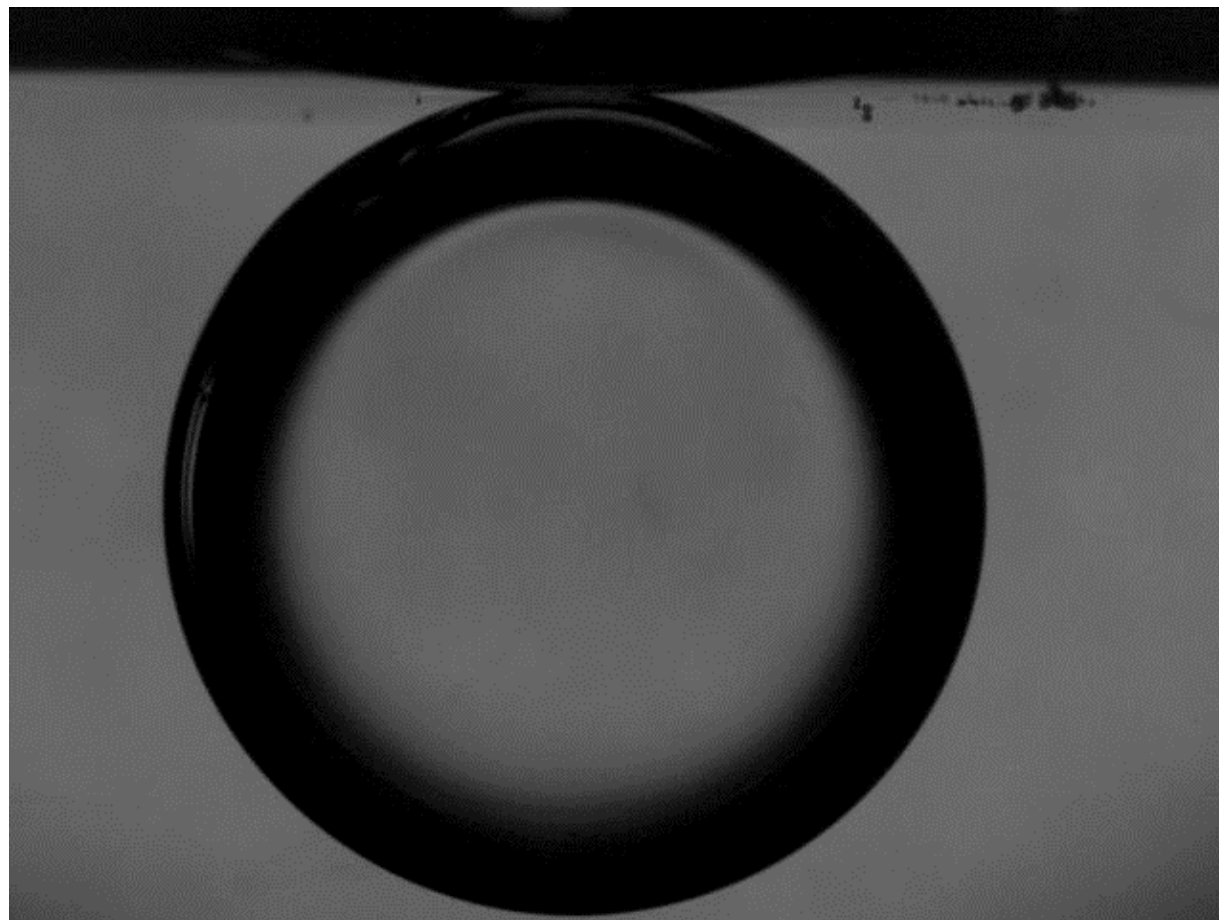


Appealing analogy



Antibubble collapse





Looking for a postdoc?

- **Subject:** STABilization of AntiBubbles (STAB-AB)
- **Duration:** 12 months (+ 24 months optional)
- **Starting date:** January 2024 (flexible)
- **Contact:** Benoit.Scheid@ulb.be

