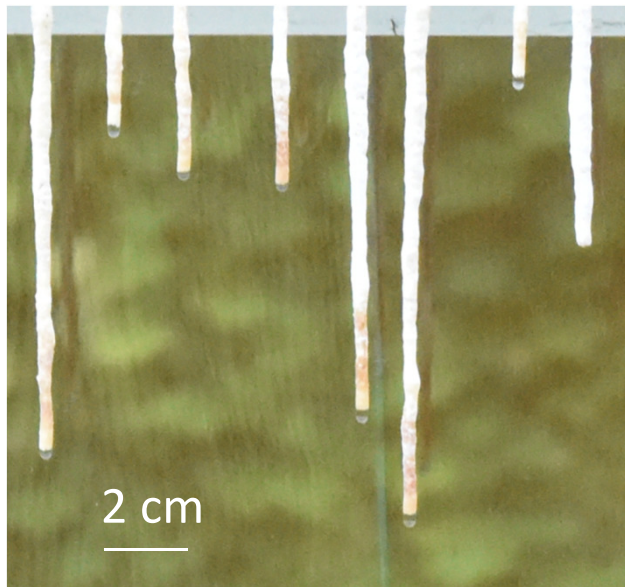


Dripping flow with solidification : an analogue system for the growth of tubular stalactites

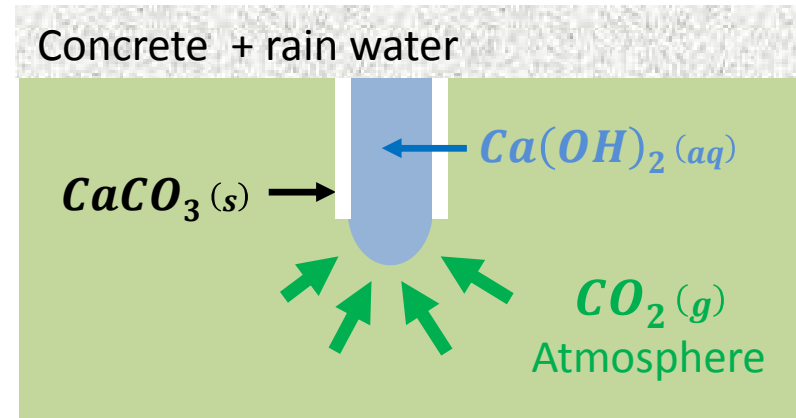
Anne Mongruel, Antonin Eddi, Philippe Claudin - PMMH

Natural tubular stalactites

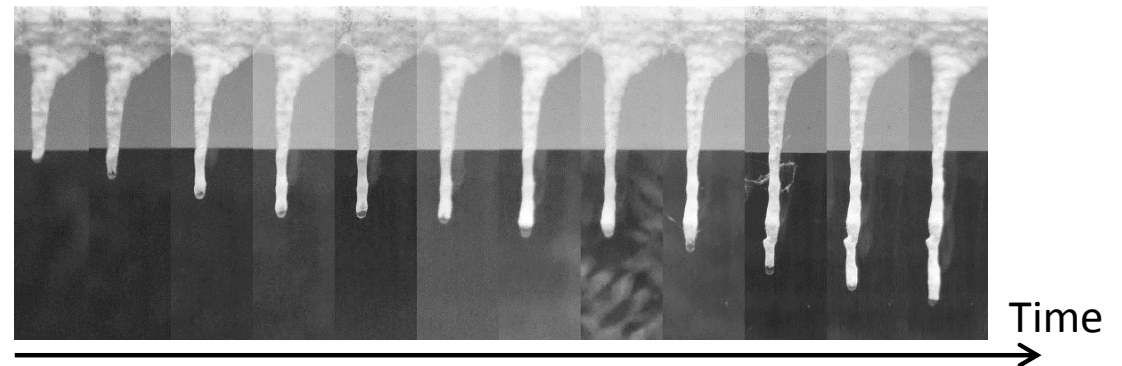


Campus Jussieu, November 2022

Tube inner diameter $\cong 5$ mm



Tube growth rate $\cong 1$ cm/month $\cong 0.2$ μ m/min

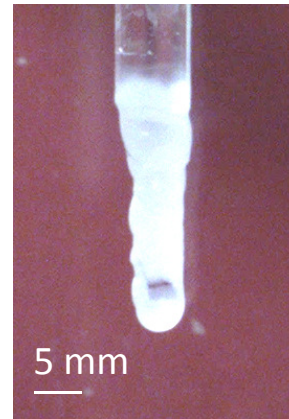


Lab-grown tubular stalactites

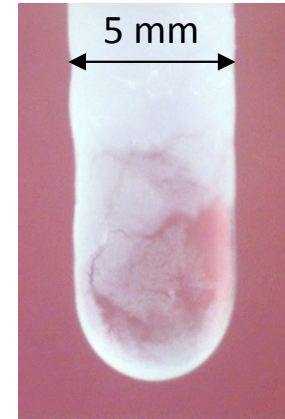


controlled injection rate

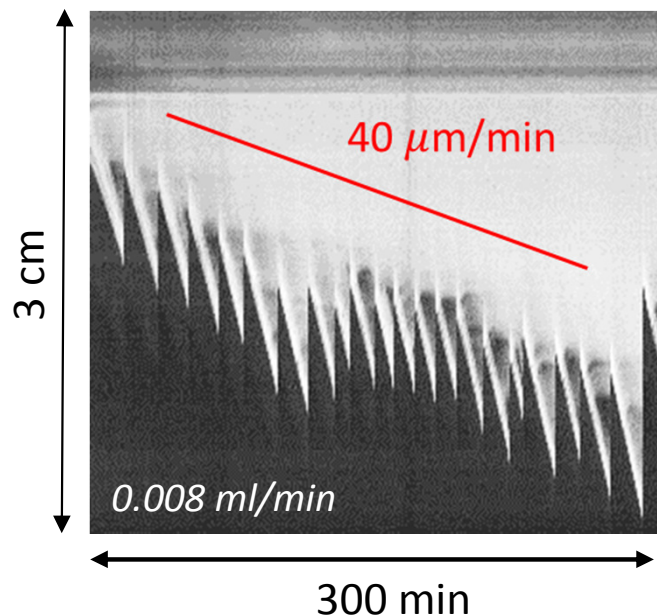
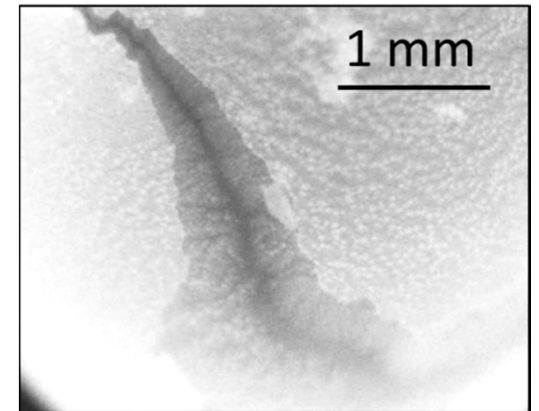
- **Interfacial crystallization** of strontium carbonate by absorption of CO_2
- **Dendrites** : diffusion-limited growth



0.001 ml/min



0.004 ml/min



- **Competition** between :
 - interfacial crystallization
 - flow-induced rupture of surface layer
- **Tube growth** limited by :
 - dendrites growth velocity ($\cong 40 \mu\text{m}/\text{min}$) at high injection rate
 - flow velocity at small injection rate