# Simulation of two interacting squirmers

Robin and Justine

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What is a Squirmer ?

- ▶ Introduced by James Lighthill in 1952 [4]
- ▶ Extended by John Blake in 1971 [4]
- ▶ Model for a spherical microswimmer
- ▶ Cannot model cilia so we impose boundary conditions
  - ▶ Tangential time-independant velocity at the boundary, propelling the squirmers.
 - ▶ In particullar, we fix the type β and the speed $B1$.
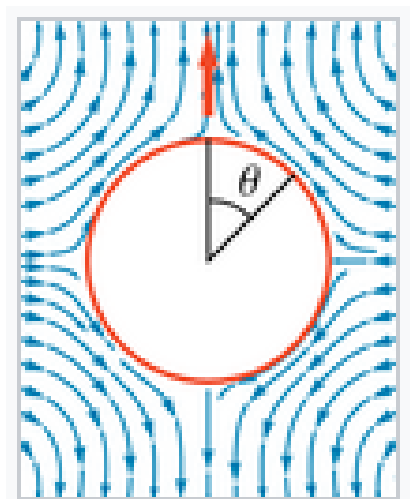
[4]

Objectives

- ▶ Understand the "Squirmers" model
- ▶ Study the dynamics between two squirmers
  - ▶ Study the interactions between two squirmers [1][2]
  - ▶ Reformulate the formulas of all present forces and torques (hydrodynamic and collision) [1][2]
  - ▶ Develop code to calculate the motion of two squirmers
- ▶ Numerical Experiments
  - ▶ Verify if our results align with previous studies[1][2][3]
  - ▶ Verify if changing the value of β and the initial distance affect the behavior

Roadmap

Roadmap
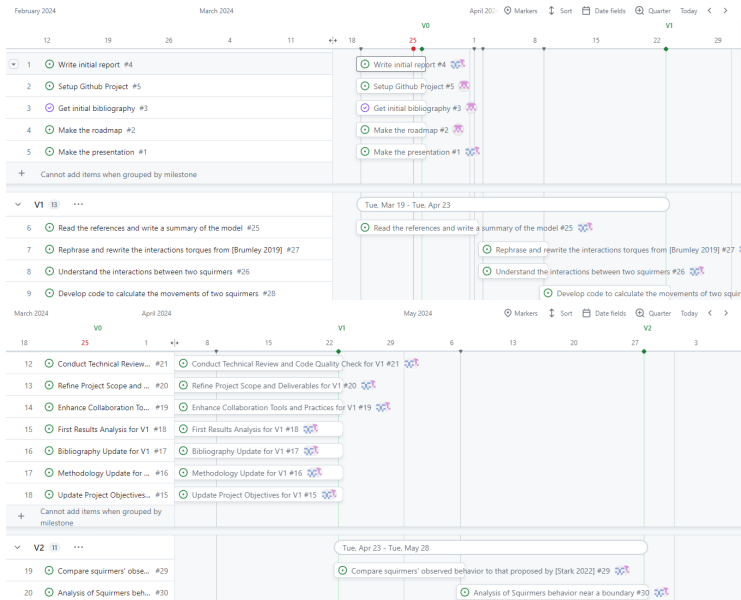
References

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📄 Théry A., Maaß C.C. and Lauga E., *Hydrodynamic interactions between squirmers near walls: far-field dynamics and near-field cluster stability*, Royal Society Open Science, 2023

📄 Miloš Knežević, Till Welker & Holger Stark, *Collective motion of active particles exhibiting non-reciprocal orientational interactions*, Scientific Reports, 2022

📄 Wikipédia, *Squirmer*, Wikipédia, 2022