Constituent components of diffusion
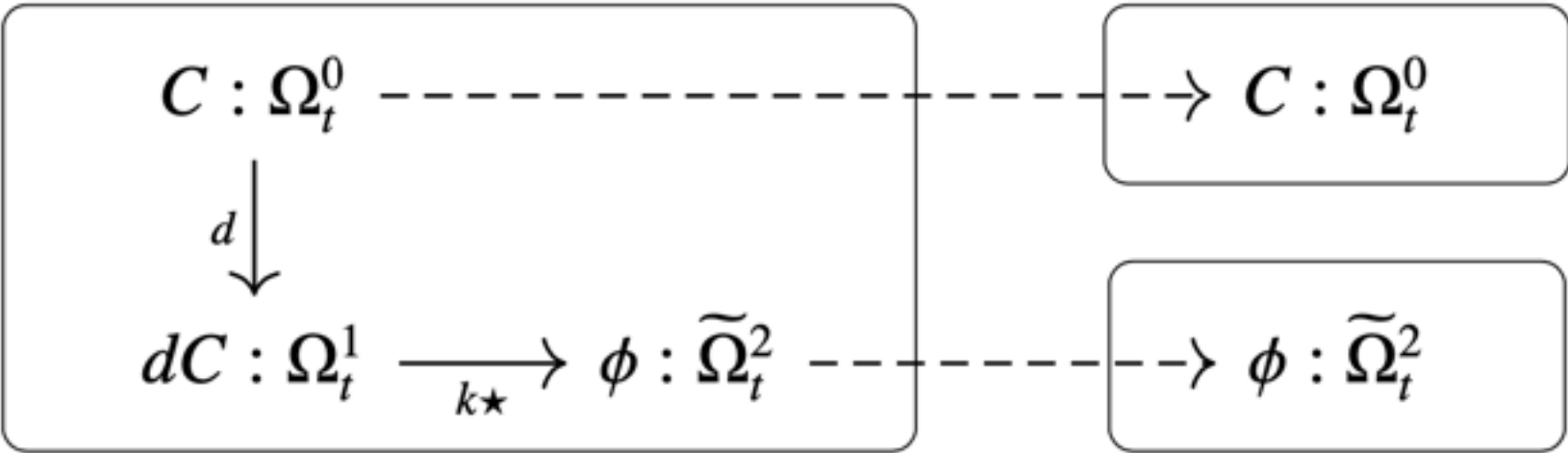Understanding equations as conjunctions of principles

- $\partial_t C = \star \, \mathrm{d}\phi = \star \, \mathrm{d}(k\star)\mathrm{d}C$

- This is really the conjunction of two physical principles:

  - **Fick's first law**: $\phi = k \star \mathrm{d}C$

  - **Conservation of mass**: $\partial_t C = \star \, \mathrm{d}\phi$

- Informally, both of these give us holes in which we can plug the same two variables: C and ϕ

- We can formalise this using **multispans** and **undirected wiring diagrams**
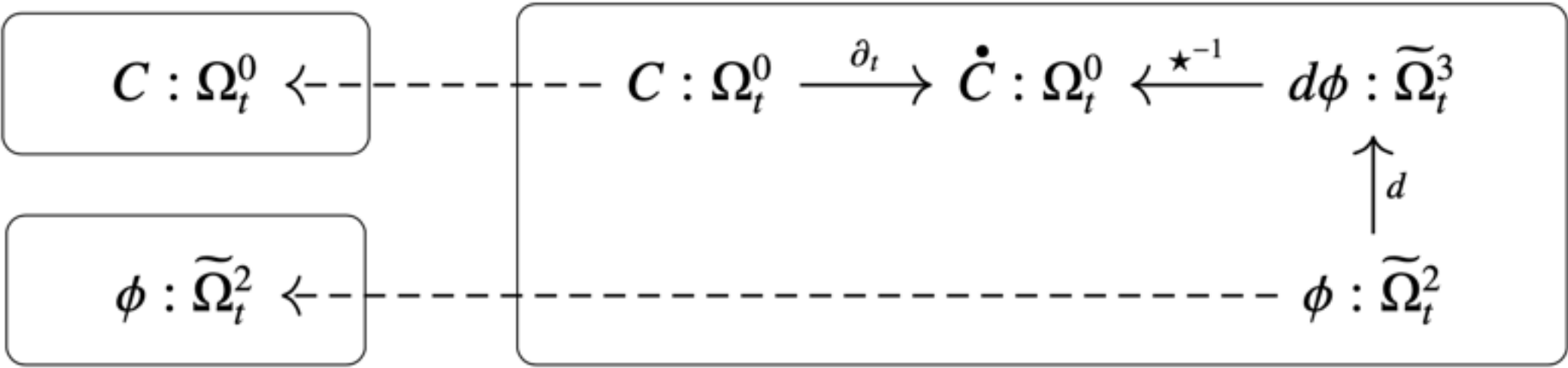
Constituent components of diffusion

Understanding equations as conjunctions of principles
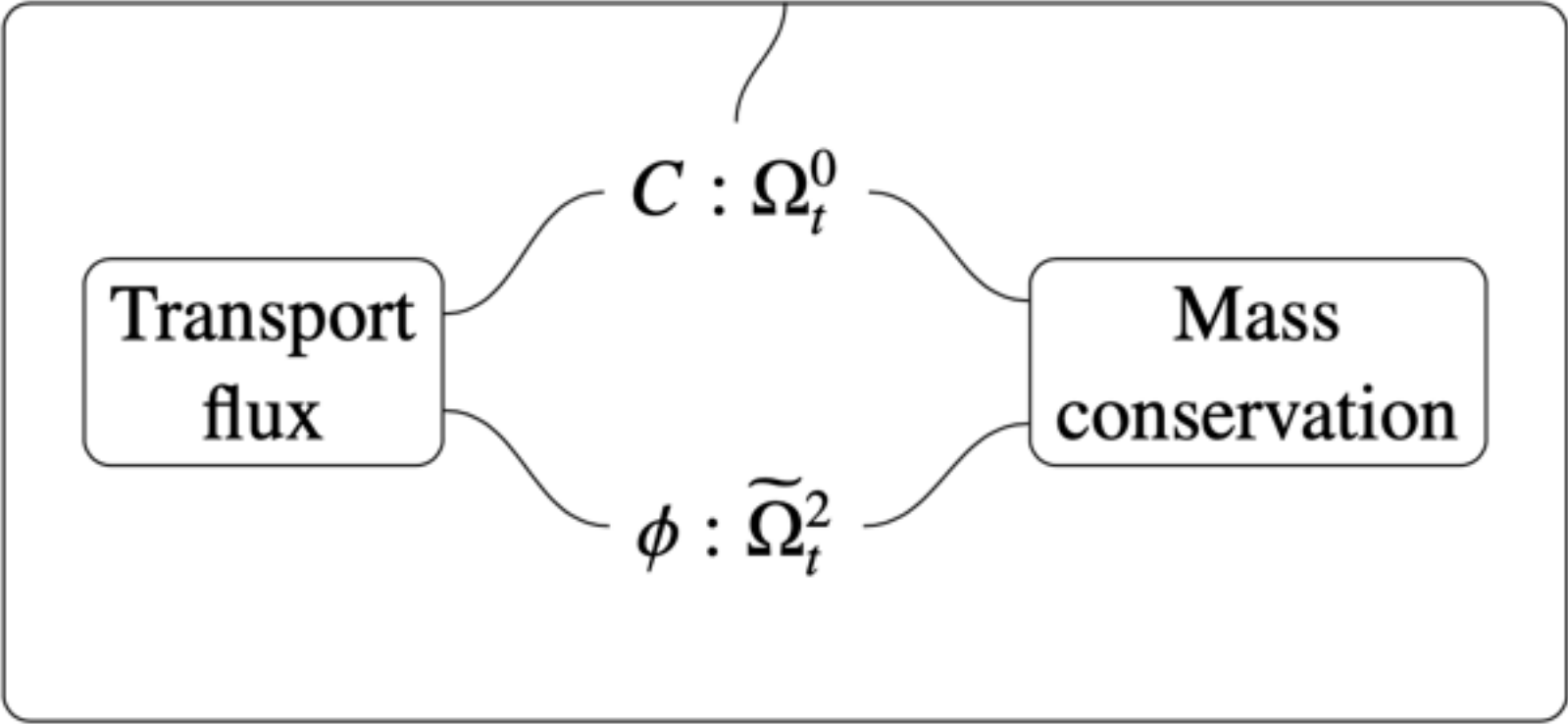
Multispans (components)

Fick's first law

Conservation of mass

UWD (schema)

Composition pattern for diffusion