

# **“Physical biology of the cell” – Final program**

**September 25 – September 29, 2023**

## **Monday, September 25 - A feeling for the organism: adventures in biological numeracy**

- 08.40-09.00: welcome coffee
- 09:00- 12h30 - order of magnitude thinking, simple estimates in biology
- 12h30 - 13h30 – buffet lunch at the CIML – provided by CENTURI
- 13h30 - 16h30 scaling estimates and dimensionless numbers, introduction to diffusion
- 16h45 - 19h - computational explorations - cell growth rates, image analysis, regression

## **Tuesday, September 26 - Probability as the language of biology - from coin flips to diffusion to embryogenesis**

- 08.40-09.00: welcome coffee
- 09:00- 12h30 – Chemical master equation through diffusion
- 12h30 - 13h30 lunch
- 13h30 - 16h30 - Probability distributions and their appearance in biological phenomena
- 16h45 - 19h - computational explorations – simulating diffusion – chemical master equations through production and degradation

## **Wednesday, September 27 - All is flux: Dynamics across scales in biology**

- 08.40-09.00: welcome coffee
- 09:00- 12h30 – Applications of chemical master equations in cytoskeletal length control
- 12h30 - 13h30 lunch
- 13h30 - 16h30 – statistical mechanics and their applications
- 16h45 - 19h - computational explorations – numerical integration of coupled cytoskeletal lengths, stochastic simulations of ligand-receptor binding

## **Thursday, September 28 - The Secret of Life: Defiance**

- 08.40-09.00: welcome coffee
- 09:00- 12h30 - defying the call to equilibrium, examples of biological defiance
- 12h30 - 13h30 lunch
- 13h30 - 16h30 - thinking about ATP consumption and its biological consequences; human impacts
- 16h45 - 19h - computational explorations – stochastic simulations of kinetic proofreading

## **Friday, September 29 - Beyond the atoms: Coarse-Grained views of living matter**

- 08.40-09.00: welcome coffee
- 09:00- 12h30 - field theories of active matter
- 12h30 - 13h30: buffet lunch at the CIML – provided by CENTURI
- 13h30 - 16h - Overview of physical biology, what has been achieved, what next?