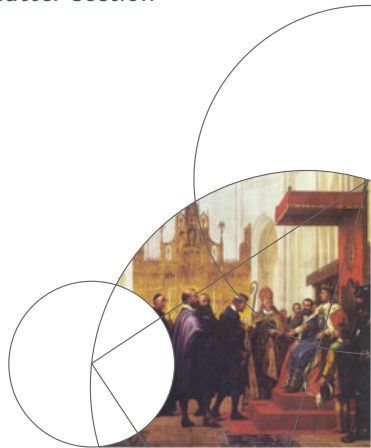




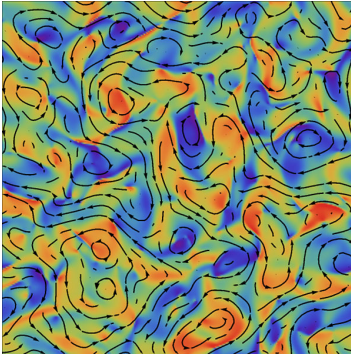
Research in the Biophysics and Active Matter section

NBIA M.Sc. Day, October 11th, 2023

Martin Cramer Pedersen
mcpe@nbi.ku.dk

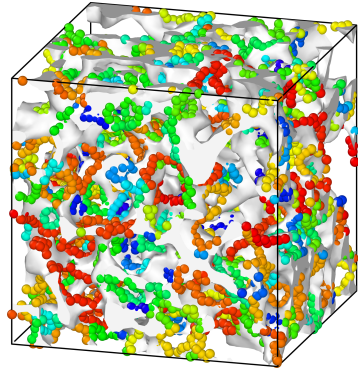


Versatile research topics and methods



Theory from:

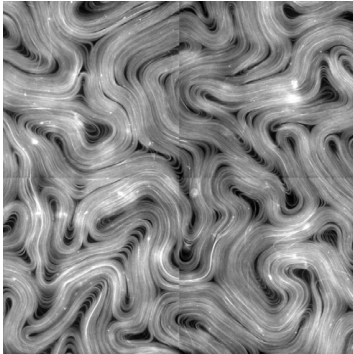
- soft and condensed matter physics
- hydrodynamics
- biophysics and statistical physics



Tools from:

- image analysis
- ODEs and PDEs
- differential geometry
- computational topology

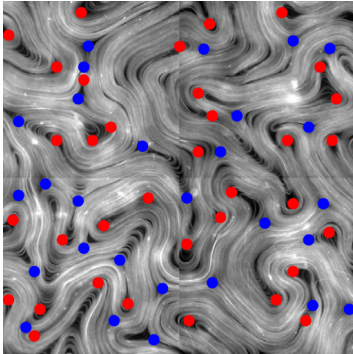
Topological data analysis of active matter pattern formation



Keywords: applied topology, persistent homology, data science



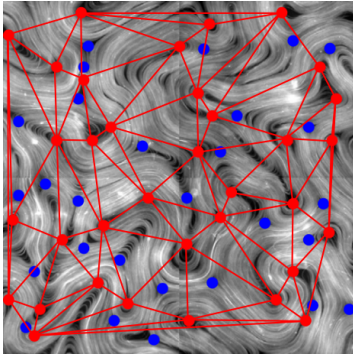
Topological data analysis of active matter pattern formation



Keywords: applied topology, persistent homology, data science



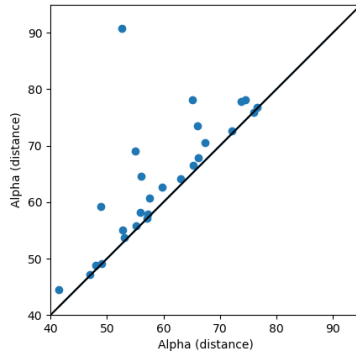
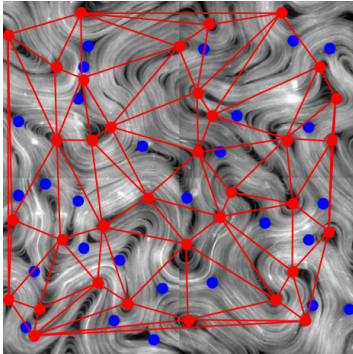
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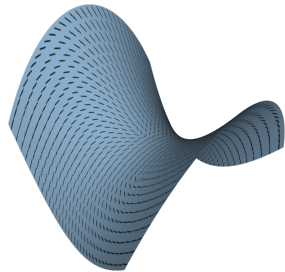
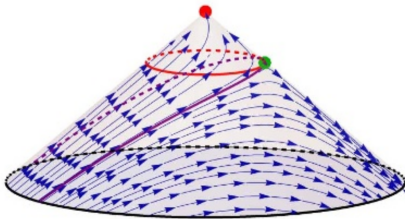


Topological data analysis of active matter pattern formation



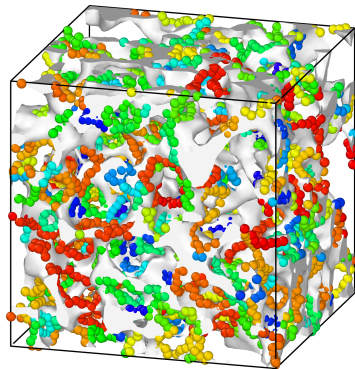
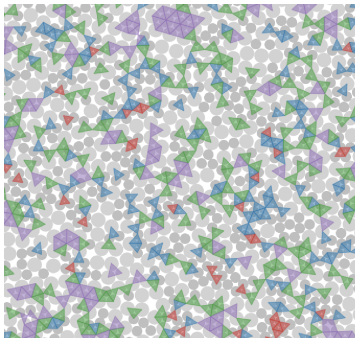
Keywords: applied topology, persistent homology, data science

Impact of curvature on pattern formation (and dynamics)



Keywords: differential geometry, high-performance computing, chaos

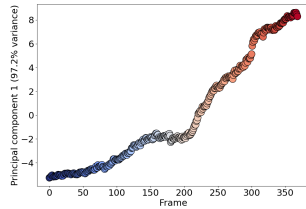
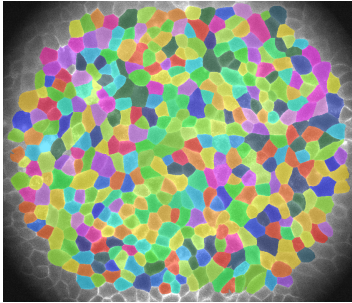
Topological descriptions of soft matter and granular systems



Keywords: molecular simulations, applied topology, materials science



Cell confluence, jamming, and migration



Keywords: image processing and analysis, machine learning, applied geometry

