

# Biophysics of Selforganization

## I. Foundations

1. What is life? What is biophysics?
2. Structure of the cell
3. Biologically relevant (macro) molecules
4. Reaction kinetics
5. Enzymes as biocatalysts
6. Membranes and transport

## II. Selforganization

1. Cornerstones of nonequilibrium thermodynamics
2. Qualitative theory of dynamical systems
3. Time-dependent systems
4. Stationary structures (activator-inhibitor systems)
5. Dynamical structures
  - a) Front propagation in bistable systems
  - b) Waves in excitable media
6. Migration, convection, and all that ....

## III. Applications

1. Information processing (inter- and intracellular communication)
2. Molecular motors
3. Evolution
4. Dynamics of biological networks

Appendix Selected methods in biophysics (technical aspects)

Exercises

Recipes

Literature