

Soft Matter

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Foreword

- Warnings:
 - usual room: 204A.
 - Two teachers: Giuseppe Foffi and myself. The two lectures are complementary and independent.
- Today's lesson:
 - overview of soft matter.
 - Introduce the objects of soft matter, their classification, their interactions, energy and length scales.
 - qualitative lesson.
 - To be specified in future lessons.
- Knowledges/tools that you will need:
 - Statistical Physics (as $k_B T \sim$ cohesive energy)
 - notion of hydrodynamics at low Reynolds number (systems in solution)
 - notion of elasticity
 - electrostatic interactions (systems with permanent or induced charges)
 - Statistical Physics ;-)
- Main difficulty of a Soft Matter Course:
 - many different systems, topics, techniques,...
 - not a unique theoretical framework developed from A to Z
 - thus formulae cannot be all derived from Principia, some are given without demonstration; **be prepared to it** ;-)
 - this lecture is just a partial, non-exhaustive view of Soft Matter Physics

Outline

- Chap I: What is Soft Matter
- Chap II: Surface energy: macroscopic description
- Chap III: Surface energy: microscopic description
- Chap IV: Thermal fluctuations of surfaces and membranes
- (• Chap V: Foams)