

## Computational Problems

The list of computational SDE problems for presentations

1. Quasi-Monte Carlo methods
2. Stochastic volatility in options
3. Monte Carlo methods for finance and Malliavin calculus
4. Stochastic dynamics
5. Molecular dynamics
6. A stochastic harmonic oscillator
7. Filtering
8. Parameter estimation
9. Turbulence and wave in random media
10. Monte Carlo multigrid
11. Your own problem

Every problem, except 11, has a description and references, which can be obtained from the teacher. Read the literature and study the formulation and motivation of the problem. The problems are not precisely formulated. Use your knowledge and fantasy to formulate

- the mathematical model,
- the problem you want to solve,
- the SDE simulation.

Try to use the literature to formulate interesting problems. You are welcome to discuss with the teachers before the presentation.

**Concerning presentations:** Problems are presented by lab groups according to a certain schedule. Prepare a 20 minutes presentation with overhead material including the formulation of the problem, theoretical analysis, results from computer simulations, conclusions, open questions et cet. Take the presentation serious and use it as an opportunity of getting some practical training in the difficult art of oral presentation. Remember that presenting a material in a clear and convincing way requires quite a bit of preparation and training to be successful. We all need practice and positive criticism in this respect, both teachers and students.