

6. **Hamiltonian Markov chain Monte Carlo methods for posterior sampling**

Proposer: Arnaud Doucet

Brief description: Hamiltonian MCMC is a class of MCMC methods introduced in physics for simulating complex systems. This powerful class of methods has been partially overlooked in the statistics literature. The objective of this project is to develop and implement Hamiltonian MCMC algorithms for some non-linear non-Gaussian time series models.

M. Girolami, B. Calderhead, 'Riemann manifold Langevin and Hamiltonian Monte Carlo methods'. *J. R. Statist. Soc. B.* (with discussion). 73, Part 2. pp 1-37, 2011.

R.M. Neal, 'MCMC using Hamiltonian Dynamics', *Handbook of Markov Chain Monte Carlo*, S. Brooks, A. Gelman, G. Jones, and X.-L. Meng (editors), Chapman & Hall / CRC Press, 2011