

# Bayesian inference in population genetics

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## **Lecture 1.** Basic principles of Bayesian inference and MCMC programs

- Likelihood, prior and posterior distributions
- The Beta-Binomial model
- Markov chains, Gibbs samplers and the Metropolis Hastings algorithm
- Homework with R

## **Séance 2.** Genetic structure of populations

- Basic concepts of population genetics
- The Hardy-Weinberg equilibrium
- Bayesian clustering

**Practical work:** software STRUCTURE, simulations and application to data

## **Séance 3.** Approximate Bayesian Computation

- Coalescent theory, Time since the most common recent ancestor (TMRCA)
- Rejection algorithms and corrections

**Practical work:** software MS: estimating the TMRCA

## **Séance 4.** Extensions

- Model choice and DIC
- Spatial priors and number of populations in STRUCTURE
- Comments on practice