

# Stochastic Processes In Evolution and Ecology

Bath - Berlin - Frankfurt - Mainz - Warwick

“Estimating recombination by observing the diffusion of haplotype frequencies”

**Abstract:** Recombination is a fundamental evolutionary force, but it is difficult to quantify because the effect of a recombination event on patterns of variation in a sample of genetic data can be hard to discern. Estimators for the recombination rate, which are usually based on the idea of integrating over the unobserved possible evolutionary histories of a sample, can therefore be noisy. Here we consider a related question: how would an estimator behave if the evolutionary history actually was observed? This would offer an upper bound on the performance of estimators used in practice. I will derive an expression for the maximum likelihood estimator for the recombination rate based on a continuously observed, multi-locus, Wright-Fisher diffusion of haplotype frequencies, complementing existing work for an estimator of selection. The estimator has unusual properties because the observed information matrix can explode in finite time whereupon the recombination parameter is learned without error. We also show that the recombination estimator is robust to the presence of selection in the sense that incorporating selection into the model leaves the estimator unchanged. This is joint work with Bob Griffiths (Monash).

Speaker:

Paul Jenkins (University of Warwick)

Time:

Monday, 23.01.2023, 4 P.M. CET

The lecture will be held online. Interested? You can get the link from Jochen Blath

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