Bangalore School On Statistical Physics - VII

Lectures on Population Genetics by Kavita Jain

Lec. 1: One locus deterministic models

- historical introduction, evolutionary forces
- Hardy-Weinberg equilibrium
- effect of selection, mutation, migration

Lec. 2: Multiloci deterministic models

- 2 locus model, linkage disequilibrium
- L-loci models: mutation selection balance, error threshold

Lec. 3: One locus stochastic models

- Wright-Fisher process, Moran process
- Fixation probability, fixation time
- Stationary distribution

Lec. 4: Multiloci stochastic models

- Evolution of genetic systems, fixation probability
- Adaptive walks and extreme value theory

Lec. 5: Neutral coalescent theory

- Kingman's coalescent
- Properties of coalescent times

Textbook references

- *Elements of Evolutionary Genetics*, B. Charlesworth and D. Charlesworth
- *Mathematical Population Genetics: I*, W. J. Ewens
- *Coalescent Theory: An Introduction*, J. Wakeley