Frankfurt **S**tochastic **C**olloquium

in conjunction with

Stochastic Processes In EvoLution and Ecology

Bath - Berlin - Frankfurt - Mainz - Warwick

Charline Smadi (INRAE and Institut Fourier, Université Grenoble)

„Quasi-equilibria and click times for a variant of Muller's ratchet“

We will introduce and study a variant of a well-known model in population genetics, named Muller’s ratchet, which is seen as one explanation of the ubiquity of sexual selection in Nature. Consider a population of N individuals, each of them carrying a type in \N_0. The population evolves according to a Moran dynamics with selection and mutation, where an individual of type k has the same selective advantage over all individuals with type k′>k, and type k mutates to type k+1 at a constant rate (in the classical Muller's ratchet, the selective advantage is proportional to k′−k). For a regime of selection strength and mutation rates which is between the regimes of weak and strong selection/mutation, we obtain the asymptotic rate of the click times of the ratchet (i.e. the times at which the hitherto minimal (`best') type in the population is lost), and reveal the quasi-stationary type frequency profile between clicks. The large population limit of this profile is characterized as the normalized attractor of a ``dual'' hierarchical multitype logistic system. An important role in the proofs is played by a graphical representation of the model, both forward and backward in time, and a central tool is the ancestral selection graph decorated by mutations. This is a joint work with A. González Casanova and Anton Wakolbinger

Time/Venue: Wednesday, 15.02.2023, 13.45 - 14.15 CET - Get together with Coffee and Cookies

14.15 CET - Start lecture

Robert-Mayer-Straße 10, Room 711 (gr.)

The lecture will be held in attendence **and** hybrid format.

For online broadcast, you can get the link from Jochen Blath, blath@math.uni-frankfurt.de