Two PhD positions in theoretical and computational genetics

We are looking for two PhD students for a collaborative project between the groups of Prof. Joachim Krug (Institute for Biological Physics) and Dr. Markus Stetter (Institute for Plant Sciences) on the **roles of polygenic adaptation and pleiotropy in the evolution of plant populations under changing environments**. The project combines analytic theory, simulations, and the analysis of large-scale empirical data from different plant species, and is part of the new **Collaborative Research Center TRR341 "Plant Ecological Genetics"** funded by Deutsche Forschungs-gemeinschaft (DFG). The focus of the project is the joint adjustment of multiple phenotypic traits, so-called adaptive trait syndromes, which play an important role in ecological specialization.

PhD1 (Krug lab): The student will develop and study analytical models for the adaptation of single and multiple traits under different environmental scenarios. The mathematical framework is based on Fisher's geometric model (Hwang et al. 2018), which combines an additive genotype-phenotype map with a nonlinear phenotype-fitness map displaying a unique optimal trait combination. The project is suitable for applicants with a background in theoretical population genetics, theoretical physics or mathematics.

PhD2 (Stetter lab): The student will employ forward-in-time simulations to study the adaptation of single and multiple traits under different environmental scenarios. Building up on previous research (Stetter et al 2018) you will apply these models to explicit plant populations and compare them to empirical data. The project is suitable for applicants with a background in (theoretical) population genetics, quantitative genetics or mathematics.

What we expect and what we offer: We are looking for highly motivated individuals with a basic knowledge in population and quantitative genetics, good computational skills, and a degree in biology, physics, mathematics or computer science. Previous experience with population genetic simulations is an asset but not a requirement. Successful candidates will be integrated into the newly established Graduate School in Ecological Genetics (GEcoGen). Salary will be based on 65% of the level E13 of the German public service salary scale (TV-L). The project can start as soon as we have found a suitable candidate.

How to apply: Applications including a CV, degree certificates, a letter of motivation, and names and contact information of two references should be submitted before July 10, 2022 at https://jobportal.uni-koeln.de. The reference number is Wiss2206-01. For further information about the project and the consortium please contact the PI's or consult the advertisement.

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