

> “Units of Selection and Individuality - A Workshop on Multilevel Selection“ 4 – 5 June 2014

Topics of the workshop

Under the main theme “Units of Selection and Individuality – A Workshop on Multilevel Selection“, two main topics will be discussed:

1) The Unit of Selection - Individual vs. Metaorganism

According to the hologenome theory of evolution, the target of natural selection might not always be the individual organism, but the holobiont, superorganism, or metaorganism, i.e. the organism together with its associated microbial community. The debate around the individual – metaorganism dichotomy includes questions like: Is the symbiosis between host and microorganisms optional or obligatory? Can the partners exist independently? How is the metaorganism concept changed if a mutualistic symbiosis collapses, e.g., when the microbes become pathogenic? And can the rapid change of microbial genetic information confer a greater adaptive potential to the combined holobiont evolution? Within this context, we will discuss also more general philosophical aspects like: What is an individual? What is the unit of selection and what defines a unit of selection?

2) Inclusive Fitness Theory meets Multilevel Selection

The hierarchy of biological organization includes several levels (e.g., genes, cells, individuals, groups). This hierarchical structure evolves through “major transitions“, i.e. when previously independent units form groups that eventually become individuals and targets of selection. This process of recurring individualization can be explained by inclusive fitness theory, one of the basic theories underpinning social evolution. There has been intense debate about the extent to which evolution has been shaped by selective pressures acting at the hierarchical levels. We will discuss questions like: How exactly does selection act on the different levels? Is the unit of selection within the species the individual or the group? How can the association of previously independent units become individualistic and what is the unit of individuality?

Goals of the workshop

The goals of this workshop are, firstly, to train the doctoral students in evolutionary thinking and educate them about the different levels of selection. Secondly, the workshop is meant to foster collegial exchange on the topic of multilevel selection, integrating both biological and philosophical sciences. Thirdly, the workshop is the start of a topic group, which comprises



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weekly meetings of students and PIs of the Münster Graduate School of Evolution. These meetings will aim at a conceptual unification of theories of individuality addressing the two main topics above and may result in an opinion or review paper.

Confirmed speakers

- **Seth Bordenstein** (Nashville, USA), Research topics: Hologenome, metaorganism, host-microbe interactions, <http://bordensteinlab.vanderbilt.edu/index.html>
- **Tim Linksvayer** (Pennsylvania, USA), Research topics: Evolutionary genetics, social evolution, evolutionary ecology, <http://linksvayer.bio.upenn.edu/>
- **Jürgen Gadau** (Arizona State University, USA), Research topics: speciation, species differences, and adaptations in solitary and social Hymenoptera, <http://gadau.lab.asu.edu/>

Organizers:

- Joachim Kurtz, Westfälische Wilhelms-Universität Münster, Germany
Speaker of the Münster Graduate School of Evolution (MGSE)
- Jürgen Gadau, Arizona State University, USA
ETT-Fellow of the Münster Graduate School of Evolution (MGSE)
- Rebecca Schreiber (nee Heiming), Westfälische Wilhelms-Universität Münster, Germany
Coordinator of the Münster Graduate School of Evolution (MGSE)

Venue:

“Kavaliershäuschen”, Schlossplatz 6, 48149 Münster, Germany

