



Exploration of Ecological Interactions with Molecular and Chemical Techniques

5 PhD positions in Molecular and Chemical Ecology and Evolution

International Max Planck Research School: "The Exploration of Ecological Interactions with Molecular and Chemical Techniques"

The International Max Planck Research School (IMPRS) "The Exploration of Ecological Interactions with Molecular and Chemical Techniques" in Jena, Germany, invites applications for **5 PhD positions** beginning in January 2018. The overarching research topic is the use of molecular, chemical and neuroethological techniques to experimentally explore ecological interactions under natural conditions. The main focus is on the relationship between plants, microbes and herbivores, and their environment, as well as the evolutionary and behavioral consequences of these interactions. We offer **15 exciting projects** focusing on different organisms and approaches. The complete list of projects offered including project descriptions is available on our website (http://imprs.ice.mpg.de/ext/index.php?id=420#header_logo).

We are looking for enthusiastic PhD students with strong interests in the above-described central topic. Applicants should have or be about to obtain a Masters or equivalent degree in one of the following fields: ecology, evolutionary biology, bioinformatics, analytical chemistry, entomology, neurobiology, molecular biology, biochemistry, plant physiology and genetics. Exceptional candidates with a Bachelor's degree may also be considered. All our projects are highly integrative and require willingness to closely collaborate with researchers of different backgrounds.

The Research School is a joint initiative of the Max Planck Institute for Chemical Ecology, Friedrich Schiller University, and the Leibniz Institute for Natural Product Research and Infection Biology Jena. We offer state-of-the art equipment, an excellent research environment, supervision by a thesis committee and a structured training program including scientific courses, training in transferable skills and internal conferences. Successful candidates will receive a Max Planck support contract. There are no tuition fees and the working language is English.

Application deadline is August 18, 2017.

For detailed information on the IMPRS, projects offered and application requirements, please visit our website: <http://imprs.ice.mpg.de/>.

Please apply online from July 10, 2017, at: <https://imprs-reg.ice.mpg.de/>.

Projects offered in 2017

Please find below a list of projects we offer for this year's recruitment. All projects are highly integrative and require the collaboration between different research groups. Applicants can identify up to three projects of interest. It is possible to change project preferences during the recruitment in Jena.

[Project 1](#): Surfing the surface: Hydrophobins on fungal hyphae

Supervisors: [Prof. Dr. Erika Kothe](#), Institute for Microbiology, Friedrich Schiller University Jena; [Prof. Dr. Jonathan Gershenzon](#), Department of Biochemistry, Max Planck Institute for Chemical Ecology; [Dr. Aleš Svatoš](#), Research Group Mass Spectrometry, Max Planck Institute for Chemical Ecology

[Project 2](#): Mycorrhizal roots and flowers – does a common signaling system lead to phenotype associations among AMF and pollination preferences in a native tobacco?

Supervisors: [Prof. Dr. Ian Baldwin](#), Department of Molecular Ecology, Max Planck Institute for Chemical Ecology; [Prof. Dr. Erika Kothe](#), Institute for Microbiology, Friedrich Schiller University Jena

[Project 3](#): Towards GC-MS: Adapting SIRIUS and CSI:FingerID for Electron Ionization fragmentation

Supervisors: [Prof. Dr. Sebastian Böcker](#), Chair of Bioinformatics, Friedrich Schiller University Jena; [Prof. Dr. Georg Pohnert](#), Chair of Instrumental Analytics, Friedrich Schiller University Jena; [Dr. Aleš Svatoš](#), Research Group Mass Spectrometry, Max Planck Institute for Chemical Ecology

*[Project 4](#): Multiple chemical compounds from *Mortierella hyalina*, a root-colonizing fungus, promote plant performance*

Supervisors: [Prof. Dr. Ralf Oelmüller](#), Department of Plant Physiology, Friedrich Schiller University Jena; [Dr. Axel Mithöfer](#), Department of Bioorganic Chemistry, Max Planck Institute for Chemical Ecology

[Project 5](#): Opposing the mustard-oil bomb with a glutathione bomb

Supervisors: [Dr. Franziska Beran](#), Research Group Detoxification and Sequestration in Insects, Max Planck Institute for Chemical Ecology; [Prof. Dr. David Heckel](#), Department of Entomology, Max Planck Institute for Chemical Ecology

[Project 6](#): The role of plant defense mechanisms for maintaining the diversity of host races in the pea aphid

Supervisors: [Dr. Grit Kunert](#), Research Group Plant-Aphid Interactions, Max Planck Institute for Chemical Ecology; [Prof. Dr. Jonathan Gershenzon](#), Department of Biochemistry, Max Planck Institute for Chemical Ecology; [Dr. Axel Mithöfer](#), Department of Bioorganic Chemistry, Max Planck Institute for Chemical Ecology; [Prof. Dr. Ralf Oelmüller](#), Department of Plant Physiology, Friedrich Schiller University Jena; [Dr. Alexandra Furch](#), Research Group Plant Vascular Biology, Friedrich Schiller University Jena

[Project 7](#): Evolution in an invasive species: How does sexual communication evolve in a recently invaded moth species?

Supervisors: [Prof. Dr. David Heckel](#), Department of Entomology, Max Planck Institute for Chemical Ecology; [Dr. Astrid Groot](#), Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam

Project 8: Thriving in waste: The role of microbiota in black soldier fly adaptation to a highly variable environment

Supervisors: [Dr. Heiko Vogel](#), Project Group Host Plant Adaptation, Max Planck Institute for Chemical Ecology; [Dr. Shantanu Shukla](#), Project Group Host Plant Adaptation, Max Planck Institute for Chemical Ecology; [Prof. Dr. David Heckel](#), Department of Entomology, Max Planck Institute for Chemical Ecology

Project 9: Molecular profiling Drosophila olfactory sensory neurons

Supervisors: [Prof. Dr. Bill Hansson](#), Department of Evolutionary Neuroethology, Max Planck Institute for Chemical Ecology; [Dr. Sofia Lavista-Llanos](#), Project Group Drosophila Neurogenetics, Max Planck Institute for Chemical Ecology

Project 10: Specificity, phylogeny and fitness contributions of phytoplasma effector proteins

Supervisors: [Prof. Dr. Günter Theißen](#), Department of Genetics, Friedrich Schiller University Jena; [Prof. Dr. Jonathan Gershenzon](#), Department of Biochemistry, Max Planck Institute for Chemical Ecology; [Dr. Axel Mithöfer](#), Department of Bioorganic Chemistry, Max Planck Institute for Chemical Ecology

Project 11: Desert ant navigation based on olfactory cues

Supervisors: [Dr. Markus Knaden](#), Project Group Insect Behavior, Max Planck Institute for Chemical Ecology; [Dr. Silke Sachse](#), Research Group Olfactory Coding, Max Planck Institute for Chemical Ecology

Project 12: How bright and how nasty: the economics of variable aposematic traits

Supervisors: [Dr. Hannah Rowland](#), Max Planck Institute for Chemical Ecology; [Jon Blount](#), University of Exeter, UK

Project 13: Communication: Fungal metabolites as response to organismic interaction

Supervisors: [Prof. Dr. Erika Kothe](#), Institute for Microbiology, Friedrich Schiller University Jena; [Prof. Dr. Wilhelm Boland](#), Department of Bioorganic Chemistry, Max Planck Institute for Chemical Ecology; [Dr. Katrin Krause](#), Institute for Microbiology, Friedrich Schiller University Jena

Project 14: Mustard oils and fruit flies: Explaining the toxic effects of isothiocyanates on a model insect

Supervisors: [Prof. Dr. Jonathan Gershenzon](#), Department of Biochemistry, Max Planck Institute for Chemical Ecology; [Dr. Daniel Giddings Vassão](#), Project Group Detoxification and Mode of Action, Max Planck Institute for Chemical Ecology; [Dr. Markus Knaden](#), Project Group Insect Behavior, Max Planck Institute for Chemical Ecology; [Dr. Sofia Lavista-Llanos](#), Project Group Drosophila Neurogenetics, Max Planck Institute for Chemical Ecology

[Project 15](#): *Identification and functional role of male pheromones in Manduca*

Supervisors: [Dr. Sonja Bisch-Knaden](#), Department of Evolutionary Neuroethology, Max Planck Institute for Chemical Ecology; [Dr. Aleš Svatoš](#), Research Group Mass Spectrometry, Max Planck Institute for Chemical Ecology