IMPRS 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 October 2019 – January 2020. The overarching research topic is the use of molecular, chemical and neurobiological 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 1**2 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: entomology, neurobiology, molecular biology, biochemistry, analytical chemistry, plant physiology, genetics, ecology, evolutionary biology, bioinformatics, and mathematics and computer science. 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 and the Friedrich Schiller University. 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 and outreach skills and participation in research symposia. Successful candidates will receive a Max Planck support contract. There are no tuition fees and the working language is English.

Application deadline is May 24th, 2019.

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

Please apply online from April 8, 2019, at: https://imprs-reg.ice.mpg.de/ .

Projects offered in 2019

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: 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 3: Molecular basis of balanced color polymorphisms in grasshoppers
Supervisors: Prof. Dr. Holger Schielzeth, Institute of Ecology and Evolution, Friedrich Schiller University Jena

Project 4: Communication in plant communities via a hyphal network connecting the roots of neighboring plants
Supervisors: Prof. Dr. Ralf Oelmüller, Plant Physiology, Matthias Schleiden Institute, Friedrich Schiller University Jena; Priv. Doz. Dr. Axel Mithöfer, Department of Bioorganic Chemistry, Max Planck Institute for Chemical Ecology

Project 5: Tapping into signaling interactions between nematodes and aphids
Supervisors: Prof. Dr. Nicole M. van Dam, Molecular Interaction Ecology, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig & Friedrich Schiller University Jena; Dr Grit Kunert, Chemical Communication in Plant-Aphid Interactions, Max Planck Institute for Chemical Ecology

Project 6: Convergent evolution of metabolic pathways: The biosynthesis of benzoxazinoids in dicotyledonous plants
Supervisors: Prof. Dr. Sarah O'Connor, Department of Natural Product Biochemistry, Max Planck Institute for Chemical Ecology; Dr. Tobias Köllner, Department of Biochemistry, Max Planck Institute for Chemical Ecology

Project 7: The role of the transcription factor FLC in growth habit, fruit dimorphism and plant defense of Aethionema arabicum
Supervisors: Prof. Dr. Günter Theißen**,** Genetics, Matthias Schleiden Institute, Friedrich Schiller University Jena; Prof. Dr. Jonathan Gershenzon, Department of Biochemistry, Max Planck Institute for Chemical Ecology; Prof. Dr. Ralf Oelmüller, Plant Physiology, Matthias Schleiden Institute, Friedrich Schiller University Jena

Project 8: Chemical defense strategies of plants and evasion strategies of feeding insects – A systems biology approach

Supervisors: Prof. Dr. Stefan Schuster, Bioinformatics, Matthias Schleiden Institute, Friedrich Schiller University Jena; Prof. Dr. Jonathan Gershenzon, Department of Biochemistry, Max Planck Institute for Chemical Ecology

Project 9: Detoxification of diterpene resin acids by the pine weevil (Hylobius abietis)
Supervisors: Prof. Dr. Jonathan Gershenzon, Department of Biochemistry, Max Planck Institute for Chemical Ecology; Prof. Dr. Erika Kothe, Institute for Microbiology, Friedrich Schiller University Jena
Dr. Axel Schmidt, Department of Biochemistry, Max Planck Institute for Chemical Ecology

Project 10: Bimodal navigation in desert ants: The role of vision and olfaction
Supervisors: Dr. Markus Knaden, Department of Evolutionary Neuroethology, Max Planck Institute for Chemical Ecology; Dr. Hannah Rowland, Research Group Predators and Prey, Max Planck Institute for Chemical Ecology

Project 11: Tiny beetle with a chemical weapon: Do flea beetles use mustard oils against predators and pathogens?
Supervisors: Dr. Franziska Beran, Research Group Sequestration and Detoxification in Insects, Max Planck Institute for Chemical Ecology; Prof. Jonathan Gershenzon, Department of Biochemistry, Max Planck Institute for Chemical Ecology

Project 12: A bird's eye view of warning signals
Supervisors: Dr. Hannah Rowland, Research Group Predators and Prey, Max Planck Institute for Chemical Ecology; Prof. Uwe Mayer, Center for Mind/Brain Sciences, University of Trento