

## ***Master Thesis***

### **Spider silk composition, structure and mechanical properties of different spider species from between distinct climatic regions of Colombia**

Spider silk is a fascinating natural fibre, its toughness surpassing most man-made materials, like Kevlar. Being also biocompatible and sustainable it is of great significance for materials researchers in this age of global environmental concern. To date, a myriad of possible uses for spider silk have been proposed, from medical applications to the incorporation in textiles, each dependent on a specific set of properties. A great variety of potentially interesting spider silks can be found in nature, however, comparably few systematic studies exist that investigate the differences in structure and resulting mechanical properties of fibres from different environments.

The objective of this master thesis is to compare **natural silks of spiders** occurring in a wide range of temperature and precipitation regimes in Colombia concerning their **mechanical behaviour (tensile testing), micro-scale structure (scanning electron microscopy) and composition (infrared spectroscopy, in continuation NMR, WAX, 2D gel electrophoresis, etc.)**. Four species will be analysed: *Parawixia rimosa*, *Araneus bogotensis*, *Acacesia cornigera* and *Argiope argentata* build their orb-webs from the hot lowland mangrove forests, to the semi-desert scrub lands, up to the cold mountain tops at 4000 m in Colombia. The main question is whether these species tailor their silks to the different challenges imposed by distinct habitats.

#### **Requirements:**

- Interest in learning new methods
- Preferentially students of Polymer science, Biochemistry, Molecular biology or similar Master studies

#### **How to apply:**

To apply at the Department of Biomaterials for this Master position, please send an E-mail including your CV and transcripts to [info\(.at.\)bm.uni-bayreuth.de](mailto:info(.at.)bm.uni-bayreuth.de) or directly to [charlotte.hopfe\(.at.\)bm.uni-bayreuth.de](mailto:charlotte.hopfe(.at.)bm.uni-bayreuth.de).