Thesis-Topics 2024 - Animal architectures II

(Bachelor, Master BEE, LENC or Physics)

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Bachelor or Master thesis: 3. Correlation between architecture and mechanical robustness in spider shelters or egg cases

Background: Many spiders construct intricate silk cases to protect their eggs or themselves from predators and parasitoids. Different case architectures in different species emerge from differences in construction behaviour and silk gland arrangements - with profound effects on their efficiency to resist the biting and piercing by predatory insects.

Question: Do some species spin silk scaffold structures that provide a higher tear- and puncture resistance than others? How efficient are they relative to the amount of silk material used?
So far this is not known to science - and you could change that!

Start: any time 2024

Tasks:

- collection and dissection of different silk retreats OR egg cases
- light and scanning electron microscopy of the silk sheets
- tear- OR puncture tests (force measurement to pull apart sample or to pierce through it with a fine needle)

Why should I take this topic?

- work with diverse species and materials - get fascinated by biodiversity
- learn to use a combination of experimental techniques: mechanical testing and microscopy
- learn about biological materials: how their properties correlate with ecological functions and how humans can draw inspiration from them to design new super-materials
- work in a young, interdisciplinary team

Caught your interest? Please contact
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