SEA-EU Master Internship at Kiel University

Title of the Internship

Sentinals of the Sea - The Harbour seal

Scientific field/research area

Natural Sciences

HOST INSTITUTION & PEOPLE

Name of host institution:
Zoology and Functional Morphology of Vertebrates (Böhmer research group), Zoological Institute, Kiel University
Supervisor name and contact (email, phone):
Prof. Dr. Christine Böhmer Am Botanischen Garten 3-9 24118 Kiel, Germany cboehmer@zoologie.uni-kiel.de Phone: +494318804507
Research focus of the institution:
Vertebrates live in virtually all of Earth's habitats displaying a remarkable diversity in phenotypes. Yet, there are areas in the morphological landscape that are not occupied by recent taxa. On the one hand, about 99.9% of all organisms are extinct. But even if we take the fossil record into account, there are still empty areas in the morphospace. Why have some forms evolved and others not? The interplay between phylogeny, function, development, and environment determines phenotypic evolution. Using a synthesis of cutting-edge methods, we quantify variation in living and extinct vertebrates, reveal morphodynamic processes and identify constraints.

Website:	https://www.vertebrates.uni-kiel.de/en

TOPIC OF THE INTERNSHIP

Scientific context of the internship:
The Harbour seal (Phoca vitulina) is considered the most successful pinniped species in terms of the breadth of niches it can occupy. They are widely distributed, encompassing coastal areas of the Pacific and Atlantic oceans in the Northern hemisphere. In the North Sea, Harbour seals are regarded as sentinel species because the health of their population is seen to reflect the health of the marine ecosystem generally. Taking advantage of a unique sample of P. vitulina from the German Northern Sea, the Böhmer research group comprehensively investigates aspects of the seal's anatomy, morphology, ontogeny and evolution in several ongoing projects. A better understanding of the biology of this key species will also help to improve conservation management plans.
Tasks entrusted to the student:
The student will participate in a subproject that addresses a specific research question. For instance, this may involve quantification of fluctuating asymmetry (i.e., minor differences between left and right body sides that are not functionally harmful) in the skeleton of Harbour seals. Within a healthy population, the left-right differences are normally distributed about a mean of zero. Environmental stress, such as malnutrition, can negatively affect development resulting in increased asymmetry. Consequently, fluctuating asymmetry is an index of developmental stability in a population. The methodology would include digitizing bones to obtain three-dimensional models, to quantitatively analyze the morphology using landmark-based geometric morphometrics and subsequent statistical methods. Other subprojects may address questions of ontogenetic changes in the anatomy, the relation between musculature and bone as well as biomechanical implications of morphological differences.
Skills to be acquired or developed:
The student will gain knowledge in comparative anatomy and imaging, acquire expertise in state-of-the-art quantitative morphological analyses (i.e., geometric morphometrics) and statistics (R), develop skills in functional morphology and biomechanics as well as evolutionary biology. Additionally, the student will extend presentation and organisational skills and scientific writing ability.

PROFILE OF THE STUDENT

Minimum level of study required:
Completed Bachelor's degree in Biology or a related field and enrollment in a Master's Degree in Biology or related field.
Field(s) of study:
Comparative anatomy, functional morphology, evolutionary biology
Scientific (or other) skills required:
General knowledge of vertebrate anatomy, statistics, literature research and data management. Basic skills in R are appreciated.
Language skills required:
English

GENERAL CONDITIONS OF THE INTERNSHIP

Desired duration of internship (in months):	2-6 months
Desired start of internship:	Flexible between October to March
Indicated weekly schedule:	35h/week
Payment:	None. It is possible to apply for an Erasmus+ Grant at your own university.
Internship agreement:	An internship agreement will be signed.

To SEA-EU students:
If you're interested please send your CV and letter of motivation to the supervisor.