

Bremen

Profile



Prof. Dr.
Antonia Kesel

The Department of Bionik (Biomimetics) at the University of Applied Sciences Bremen is characterized by its unique undergraduate programme “International bachelor’s degree in Bionik (Biomimetics) (B.Sc.)”. This programme joins both biological and engineering sciences in an innovative and attractive manner and is supervised by Prof. Dr. Antonia Kesel as head of the Bionik (Biomimetics) department. Students get familiar with biomimetic questions by incorporating them into ongoing projects in research areas such as biofouling, fluid dynamics and smart materials. State-of-the-art instruments and methods are an integral part of these research projects on campus as well as at the facilities of our cooperating national and international partners.

In order to pursue this ambitious educational project, which is offered by the University of Applied Sciences since 2003, cooperations between the Department of Bionik (Biomimetics) and qualified national and international partners are essential. In this concern first milestones have been reached: Since July 2004, the University of Applied Sciences is not only a fully supported member of the Bionik-Kompetenz-Netz (BioKoN) but also one of its leading members with Prof. Kesel being appointed a position on the BioKoN executive board. Furthermore, the Society for Technical Biology and Bionik (Biomimetics) (Gesellschaft für technische Biologie und Bionik; GTBB) (chairwoman: Prof. Kesel) is operated from Bremen.

In regard to a sustainable cooperation between scientific and industrial facilities, the department of Bionik (Biomimetics) initiated the communication and exchange platform “*Marine Bionik*” in February 2005. The overwhelming participation in this forum and the coinciding first meeting proved that the Bremen Biomimetic Department has already established itself in best time.

Bremen as Germany’s elected ‘City of Science 2005’ and the University of Applied Sciences are on their best way towards becoming one of *the* locations for Bionik (Biomimetics) in Germany.

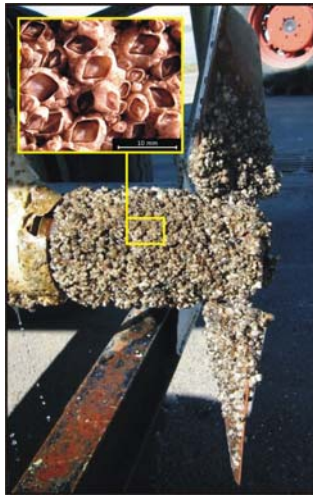
International Bachelor’s degree in Biomimetics (Bionik) (B.Sc.)



Students at work: Microscopy, Wind tunnel experiments and CAD Lab are integral parts of the course

The international degree in Bionik (Biomimetics) (B.Sc.) is an interdisciplinary, practical and application-oriented course with a standard study period of study of 7 semesters, including one semester abroad. The module structure of the course and the implementation of the ECT-System guarantees recognition within the international education system. The lectures’ scheme is divided into different scientific areas: During the first semesters fundamentals in science like physics, chemistry, mathematics, biology and some engineering topics form the basis of the course. Semesters 4-7 not only consolidate this knowledge but also provide an in-depth insight into chosen main topics in the area of materials, construction, and transport systems (locomotion). Alongside scientific-oriented teaching a great emphasis also lies on cognitive and soft skills. Lectures and seminars further incorporate from areas such as management, communication, journalism as well as foreign languages as an integral part of the programme.

Research



Barnacles entirely cover a marine screw propeller (biofouling)

Biofouling:

The persistent colonization of objects exposed to seawater by marine organisms is one of the most prominent problems in marine industries. The main objective of this research project is aimed towards providing an alternative treatment of exposed surfaces to prevent or reduce the attachment and growth of biofouling organisms on these surfaces.

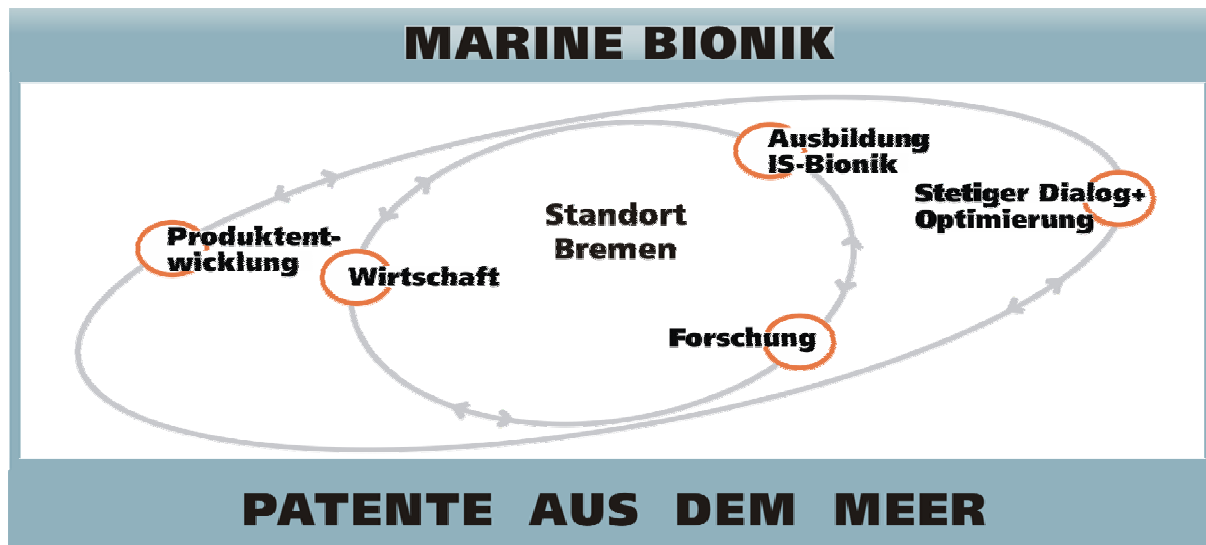
Bioadhesives:

The analysis of barnacle cement using Atomic Force Microscopy is intended to bring insights in to the underlying mechanisms of persistent as well as reversible under-water adhesion. Mussels and starfish are further model organisms of interest.

Fluid dynamics:

Biomechanical analyses of animal movements reveal different strategies toward energetically efficient locomotion. In Bremen, the optimization of propulsive mechanisms is studied in trout and sturgeon. PIV is used to analyse the fluid dynamics of these fish.

“Marine Bionik”



Marine Bionik (Marine Biomimetics) is a communication platform dedicated to accelerating the technological transfer of scientific results from biological studies into innovative technical products from and for all areas of marine interest. This concept aims at sustaining Germany as an important location for science and business.

Contact

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