



## Press Release

### We can make it better, stronger, faster

#### €9.3m project adapts bionic structures for use in architecture – Tübingen researchers collaborate with Stuttgart and Freiburg

Tübingen, 3 June 2014

Over the next four years, researchers from the universities of Tübingen, Stuttgart and Freiburg will be investigating how materials, structures and processes adopted from nature could revolutionize architecture in the coming decades. The German Research Foundation (DFG) has approved the transregional collaborative research center “Biological Design and Integrative Structures,” providing total funding of €9.3m. It is coordinated by the University of Stuttgart.

“We aim to secure bionic knowledge and processes within architecture, while also investigating the biological models which underlie them and the implications for materials science,” says Professor Klaus Nickel, spokesman for the Tübingen part of the collaborative research center. Overall coordinator Professor Jan Knippers of the Institute of Building Structures and Structural Design at the University of Stuttgart, says the goal is “multifunctional, adaptable and at the same time ecologically efficient structures which surpass the boundaries of traditional construction.”

Klaus Nickel, head of Applied Mineralogy in Tübingen, examines areas including how energy dissipates in nature – information which could be used to reduce earthquake damage to buildings – and how small models in nature can often be transposed to the dimensions of architecture without losing their desirable attributes. The researchers aim to improve multifunctional simulation – developing several attributes at once. Nature offers examples of this as well.

Other Tübingen project groups are headed by palaeontologist Professor James Nebelsick and evolutionary biologist Professor Oliver Betz. Nebelsick’s findings on the construction of a sea urchin skeleton will be integrated into collaboration with Stuttgart engineers developing shell segments to be incorporated into buildings. He is also collaborating with architects at Stuttgart and physicists in Freiburg on new production techniques based for instance on the growth of mollusk shells. Oliver Betz is investigating the active movement of jointless structures, and the concept of the organism in biology and architecture as the basis of constructive biomimetics.

Dr Karl Guido Rijkhoek  
Director

Antje Karbe  
Press Officer  
Phone +49 7071 29-76788  
+49 7071 29-76789  
Fax +49 7071 29-5566  
karl.rijkhoek[at]uni-tuebingen.de  
antje.karbe[at]uni-tuebingen.de  
www.uni-tuebingen.de/aktuell

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**Contact:**

Prof. Dr. Klaus G. Nickel  
University of Tübingen  
Geoscience  
Applied Mineralogy  
Phone: +49 7071 29-76802  
klaus.nickel[at]uni-tuebingen.de



Research pavilion of robot-made segments, modeled on the sea urchin skeleton. Photo: ICD/ITKE (Institute for Computational Design / Institute of Building Structures and Structural Design, Stuttgart)