

techtexstil\_innovationprize.2011\_Architektur

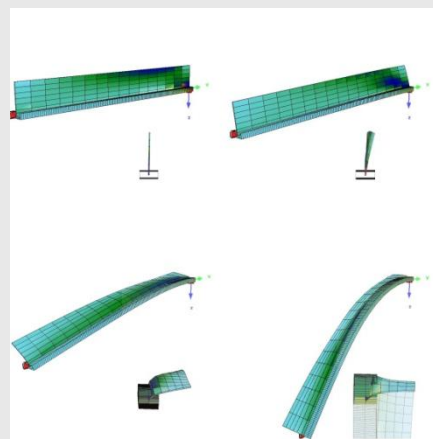
## + BIOMIMETIC, DEPLOYABLE TECHNICAL STRUCTURES

**With the investigation of plant movements as applicable biological models and the use of new construction materials we aim to develop elastic architectural systems. First approaches led to the invention of a hinge-free, stageless flap mechanism (Flectofin®).**

Hinges allow for deployability in technical constructions but are liable to attrition. In contrast, plants show a broad spectrum of hinge-free, reversible movements. Many of them are still to be analysed in order to develop biomimetic pliable structures.

We investigated the flower of the Bird-Of-Paradise (*Strelitzia reginae*) and transferred its kinetic pollination mechanism into a technical system. The *Strelitzia* features joined petals that form a perch for pollinating birds. When bent down by the bird's weight, simultaneous sideward bending of the petal lamina exposes the previously hidden sexual flower organs. Herein, application of a vertical force entails a horizontal movement.

This kinetic system was analysed morphologically, abstracted in three steps and finally transferred into a technical product (Flectofin®). The resulting biomimetic lamella is, alike its role model, capable of a hinge-free, stageless flap movement which can be used for architectural purposes, e.g. as an adaptive façade covering.



### R & D Partner

Prof. Dr. Thomas Speck, Dr. Tom Masselter, Dipl. Biol. Simon Poppinga  
 Plant Biomechanics Group Freiburg  
 University of Freiburg

Dr.-Ing. Markus Milwich, Dr.-Ing. Thomas Stegmaier, Dipl.-Ing. Anja Walter, B.Sc. Julian Sartori

Institute for Textile Technology and Process Engineering  
 University of Stuttgart

Dipl.-Ing. Eberhard Brumm, Dipl.-Ing. Marc Jansen

clauss markisen Projekt GmbH

### Project coordination & Contact

Prof. Dr.-Ing. Jan Knippers,  
 Dipl.-Ing. Julian Lienhard,  
 M. Arch. Simon Schleicher

Institute of Building Structures and Structural Design, University of Stuttgart  
 Keplerstraße 11  
 D-70174 Stuttgart

P: +49 (0)711-685-83279  
 F: +49 (0)711-685-82756  
 E: j.lienhard@itke.uni-stuttgart.de

### More information on the internet

[www.kompetenznetz-biomimetik.de](http://www.kompetenznetz-biomimetik.de)  
[www.itke.uni-stuttgart.de](http://www.itke.uni-stuttgart.de)  
[www.botanischer-garten.uni-freiburg.de](http://www.botanischer-garten.uni-freiburg.de)

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