UNIVERSITÄT SALZBURG

SALZBURG MATHEMATICS COLLOQUIUM
Winter 2018/2019

Soeren Bartels (Freiburg)

„Simulation of nonlinear bending phenomena: convergence, self-avoidance and applications“

December 13, 2018

Abstract:
Nonlinear bending phenomena of thin elastic structures arise in various modern and classical applications like the simulation of microtools or the bending of a piece of paper. A rigorous mathematical framework has only recently been established and provides a basis for developing and analysing numerical approximation schemes. The fourth order character of bending problems and a pointwise isometry constraint for large deformations require appropriate discretization techniques. We adapt methods developed for the approximation of harmonic maps to discretize the isometry constraint and gradient flows to decrease the bending energy. The devised and rigorously analysed numerical methods are illustrated by experiments related to the relaxation of elastic knots, the formation of singularities in a Moebius strip, and the simulation of thermally actuated bilayer plates.

Thursday, **15:00-15:45**
Hörsaal 414, 1. Stock

Fachbereich Mathematik
Universität Salzburg
Hellbrunner Straße 34
5020 Salzburg
AUSTRIA
www.uni-salzburg.at/mathematik