

Laudation for
Stefan Neukamm
ISIMM Junior Award 2014

Stefan Neukamm has finished his Ph.D. under the supervision of Martin Brokate at the Technische Universität München in September 2010, already one year after completion of his diploma. Presently, he is a Visiting Professor at the University of Heidelberg, on leave from the Weierstrass Institute for Applied Analysis and Stochastics.

Already as a student he has shown excellence in the elite graduate and doctoral program TopMath, when doing in parallel a full diploma in music with subsequent master courses in violin.

In his Ph.D. thesis and a series of subsequent papers, Stefan developed a profound theory for homogenization of nonlinearly elastic materials in the context of other small parameters. This includes applications to the important field of dimension reduction for deriving rods and plates models as well as the fundamental question of rigorous linearization in the small-strain limit. His work on the commutability of two Γ -limits has opened up a new research field and provides a flexible tool for applications in mechanical modeling.

Recently, in a series of joint work with Antoine Glorie and Felix Otto, he developed a quantitative theory for stochastic homogenization. The crucial point for the applicability of stochastic homogenization is the control of the sampling error as well as the approximation error arising from the finite size of the representative volume element. Developing a theory of stochastic correctors, they show that the optimal number of samplings is proportional to the volume of the representative volume element. Thus, for the first time it is possible to estimate the total homogenization error for stochastic materials.

Being only four years past his Ph.D., Stefan Neukamm already shows an outstanding international recognition. Moreover, his contributions to mathematics provide interesting links into mechanics and physics. Hence, he is an ideal awardee for the ISIMM Junior Prize.