

Stefan Schwede



Academic career

1996	Dr. math., University of Bielefeld
1996	Postdoc, University of Chicago, IL, USA
1997 - 1998	Postdoc, Massachusetts Institute of Technology, Cambridge, MA, USA
1998 - 2001	Assistant Professor (C1), University of Bielefeld
2001	Habilitation, University of Bielefeld
2002 - 2003	Head of Junior Research Group, DFG Collaborative Research Center SFB 478 "Geometric structures in mathematics", University of Münster
Since 2003	Professor (C4), University of Bonn

Honours

2019	Fellow of the American Mathematical Society
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Invited Lectures

2007	Plenary talk, Joint International Meeting UMI - DMV, Perugia, Italy
2008	Plenary talk, European Mathematical Society – Joint Mathematical Weekend, Copenhagen, Denmark

Research Projects and Activities

DFG Research Training Group GRK 1150 "Homotopy and Cohomology"
Scientific Member
DFG Priority Program SPP 1786 "Homotopy Theory and Algebraic Geometry"
Initiator
Series of Oberwolfach Workshops on "Homotopy theory" (2007, 2011, 2015)
Organizer
Abel Symposium, 2007
Organizer
HIM-Trimester, 2015
Organizer
Semester program "Homotopy Harnessing Higher Structures" at Isaac Newton Institute, 2018
Organizer
"Bonn International Graduate School of Mathematics"
Director, 2013 - 2017
DFG Cluster of Excellence "Hausdorff Center for Mathematics"
Vice-Coordinator (2017 - 2019) and Principal Investigator

Research profile

My main area of expertise is algebraic topology, specifically stable homotopy theory. I contributed to the foundations of stable homotopy theory (comparison of models for the stable homotopy category, rigidity theorem for the stable homotopy category, foundations of the theory of symmetric spectra). Further research concerned basic questions about triangulated categories, in particular the existence and uniqueness of models for triangulated categories, the distinction of algebraic and topological triangulated categories and examples of exotic triangulated categories.

Much of my current and future research is in equivariant stable homotopy theory, in particular "global" phenomena, i.e., spaces or spectra with simultaneous and compatible actions of all compact Lie groups, up to deformations that preserve all symmetries. I introduced a framework

for global equivariant homotopy theory based on orthogonal spectra which opens the door for a rigorous study of global stable homotopy types. The global perspective reveals systematic patterns and facilitates equivariant calculations, for example in the rank filtrations of equivariant infinite symmetric products or global equivariant K-theory.

Future goals include a better understanding of the universal properties of global K-theory (both algebraic and topological) and global equivariant bordism. Alongside, we want to further exploit naturally occurring global structures for new computations.

Editorships

- Documenta Mathematica (2003 - 2016)
- Mathematische Zeitschrift (2006 - 2012)
- Geometry & Topology (since 2016)

Supervised theses

Master theses: 19, currently 1

Diplom theses: 15

PhD theses: 14, currently 2

Selected PhD students

Steffen Sagave (2006): “Universal Toda Brackets of Ring Spectra”,
now Assistant Professor, Radboud University Nijmegen, Netherlands

Constanze Roitzheim (2007): “Rigidity and Exotic Models for the K-local Stable Homotopy Category”,

now Senior Lecturer, University of Kent, England, UK

Morith Rahn (née Groth) (2011): “On the theory of derivators”,

Akademischer Rat, University of Mainz

Lennart Meier (2012): “United elliptic homology”,

now Assistant Professor, Utrecht University, Netherlands

Irakli Patchkoria (2013): “Rigidity in equivariant stable homotopy theory”,

now Lecturer, University of Aberdeen

Karol Szumilo (2014): “Two models for the homotopy theory of cocomplete homotopy theories”,

now postdoc, University of Leeds

Markus Hausmann (2016): “Symmetric products, subgroup lattices and filtrations of global K-theory”, now Postdoc, University of Bonn

Habilitations

Christian Ausoni (2008), now Professor, University of Paris 13, France

Gerald Gaudens (2010)

Steffen Sagave (2013), now Assistant Professor, Radboud University Nijmegen, Netherlands

Selected publications

- [1] Stefan Schwede. *Global Homotopy Theory*. New Mathematical Monographs. Cambridge University Press, Cambridge, 2018. xvi+828 pp, 2018.
- [2] Stefan Schwede. Equivariant properties of symmetric products. *J. Amer. Math. Soc.*, 30(3):673–711, 2017.
- [3] Stefan Schwede. The n-order of algebraic triangulated categories. *J. Topol.*, 6(4):857–867, 2013.
- [4] Stefan Schwede. The p-order of topological triangulated categories. *J. Topol.*, 6(4):868–914, 2013.
- [5] Stefan Schwede. Algebraic versus topological triangulated categories. In *Triangulated categories*, volume 375 of *London Math. Soc. Lecture Note Ser.*, pages 389–407. Cambridge Univ. Press, Cambridge, 2010.
- [6] Stefan Schwede. On the homotopy groups of symmetric spectra. *Geom. Topol.*, 12(3):1313–1344, 2008.

- [7] Fernando Muro, Stefan Schwede, and Neil Strickland. Triangulated categories without models. *Invent. Math.*, 170(2):231–241, 2007.
- [8] Stefan Schwede. The stable homotopy category is rigid. *Ann. of Math. (2)*, 166(3):837–863, 2007.
- [9] Stefan Schwede and Brooke Shipley. Stable model categories are categories of modules. *Topology*, 42(1):103–153, 2003.
- [10] M. A. Mandell, J. P. May, S. Schwede, and B. Shipley. Model categories of diagram spectra. *Proc. London Math. Soc. (3)*, 82(2):441–512, 2001.
- [11] Stefan Schwede and Brooke E. Shipley. Algebras and modules in monoidal model categories. *Proc. London Math. Soc. (3)*, 80(2):491–511, 2000.
- [12] Stefan Schwede. An exact sequence interpretation of the lie bracket in hochschild cohomology. *J. Reine Angew. Math.*, 498:153–172, 1998.