

## Christian Schmeiser – CV

### Personal data

Date of Birth: 16.4.1958  
Place of Birth: Wien, Austria  
Nationality: Austrian  
Website: <http://homepage.univie.ac.at/christian.schmeiser/>

### Research interests

Partial differential equations,  
Kinetic transport theory,  
Mathematical cell biology.

### Education

1984 PhD in Mathematics, Vienna University of Technology  
1981 Diploma in Mathematics, Vienna University of Technology

### Professional career

2005– Full Professor, University of Vienna  
2003–2016 Group leader at the Johann Radon Institute for Computational and Applied Mathematics of the Austrian Academy of Sciences  
2001–2010 Speaker of the FWF funded Wissenschaftskolleg *Differential Equations*  
1990–2005 Associate Professor, Vienna University of Technology  
1989 Habilitation, Vienna University of Technology  
1987–1990 Assistant Professor, Vienna University of Technology  
1983–1987 Associate researcher, Vienna University of Technology

### Visiting affiliations

2015 Visiting scientist at the Newton Institute, Cambridge (1 month)  
2009 Visiting scientist at INRIA, Rocquencourt (2 months)  
2006/07 Visiting professor at Univ. Paris Dauphine (2 months)  
2005 Visiting professor at MIP (CNRS), Toulouse (4 months)  
2004 Visiting professor at Univ. Lille 1 (1 month)

## Recent invited talks

- 2015 *Cell Mechanics, Morphogenetics and Pattern Formation: perspectives from the experimental and theoretical points of view*, Cambridge
- 2015 *Geometric Partial Differential Equations: Surface and Bulk Processes*, Oberwolfach
- 2014 *Kinetic equations*, CIRM, Luminy
- 2014 *Entropy Methods, PDEs, Functional Inequalities, and Applications*, BIRS, Banff
- 2013 *Numerical approximations of hyperbolic systems with source terms and applications*, Aachen

## Editorial and advisory boards

- since 2012 *ESAIM Proceedings*, co-editor
- since 2012 Excellence cluster *Cells in Motion*, Münster, external advisory board member
- since 2010 *ZAMP*, co-editor
- since 2007 *DCDS-B*, co-editor
- 2007–2013 *Radon Series on Computational and Applied Mathematics*, editor

## Recent grant projects

- 2017–2021 SFB *Taming Complexity in Partial Differential Systems* (FWF, participant, 339 kEUR)
- 2014–2018 *Modeling of Polarization and Motility of Leukocytes in Three-Dimensional Environments* (WWTF, PI, 682 kEUR)
- 2013–2021 *DK Dissipation and Dispersion in Nonlinear PDEs* (FWF, participant)
- 2010–2013 *Mathematical modeling of actin driven cell migration* (WWTF, PI, 500 kEUR)
- 2005–2009 *How do cells move? mathematical modeling of cytoskeletal dynamics and cell migration* (WWTF, PI, 500 kEUR)
- 2001–2010 *WK Differential Equations* (FWF, coordinator, 2790 kEUR)

## Recent cooperation partners

Dr. V. Calvez                    ENS Lyon, [vincent.calvez@ens-lyon.fr](mailto:vincent.calvez@ens-lyon.fr)  
Prof. Dr. J. Dolbeault        Univ. Paris Dauphine, [dolbeaul@ceremade.dauphine.fr](mailto:dolbeaul@ceremade.dauphine.fr)  
Prof. Dr. H. Freistühler      Univ. Konstanz, [Heinrich.Freistuehler@uni-konstanz.de](mailto:Heinrich.Freistuehler@uni-konstanz.de)  
Dr. J. Haskovec                KAUST, Saudi Arabia, [haskovec.jan@gmail.com](mailto:haskovec.jan@gmail.com)  
Prof. Dr. N. Masmoudi        Courant Inst., NYU, [masmoudi@cims.nyu.edu](mailto:masmoudi@cims.nyu.edu)  
Prof. Dr. C. Mouhot          Univ. Cambridge, [C.Mouhot@dpms.cam.ac.uk](mailto:C.Mouhot@dpms.cam.ac.uk)  
Dr. L. Neumann                Univ. Innsbruck, [Lukas.Neumann@uibk.ac.at](mailto:Lukas.Neumann@uibk.ac.at)  
Prof. Dr. A. Nouri              Univ. Aix-Marseille, [anne.nouri@univ-amu.fr](mailto:anne.nouri@univ-amu.fr)  
Prof. Dr. B. Perthame        Univ. Paris 6, [Benoit.Perthame@upmc.fr](mailto:Benoit.Perthame@upmc.fr)  
Dr. G. Raoul                    Ecole Polytechnique, Palaiseau, [gael.raoul@cmap.polytechnique.fr](mailto:gael.raoul@cmap.polytechnique.fr)  
Dr. J.V. Small                 Inst. for Molecular Biotechnology Austria, [vic.small@imba.oeaw.ac.at](mailto:vic.small@imba.oeaw.ac.at)

## Christian Schmeiser: Publications since 2011

1. S. Hirsch, A. Manhart, C. Schmeiser, Mathematical modeling of myosin induced bistability of lamellipodial fragments, *J. Math. Biol.* (2017), online first.
2. P. Aceves-Sanchez, C. Schmeiser, Fractional-diffusion-advection limit of a kinetic model, to appear in *Kinetic and Related Models*.
3. A. Manhart, C. Schmeiser, Decay to equilibrium of the filament end density along the leading edge of the lamellipodium, *J. Math. Biol.* (2017), online first.
4. A. Nouri, C. Schmeiser, Aggregated steady states of a kinetic model for chemotaxis, *Kinetic and Related Models* **10** (2017), pp. 313–327.
5. A. Manhart, D. Oelz, C. Schmeiser, N. Sfakianakis, Numerical treatment of the Filament Based Lamellipodium Model, *Modeling Cellular Systems*, Springer, 2017.
6. L. Neumann, C. Schmeiser, A kinetic reaction model: decay to equilibrium and macroscopic limit, *Kinetic and Related Models* **9** (2016), pp. 571–585.
7. S. Hirsch, D. Oelz, C. Schmeiser, Existence and uniqueness of solutions for a model of non-sarcomeric actomyosin bundles, *DCDS-A* **36** (2016), pp. 4945–4962.
8. A. Manhart, D. Oelz, C. Schmeiser, N. Sfakianakis, An extended Filament Based Lamellipodium Model produces various moving cell shapes in the presence of chemotactic signals, *J. Theor. Biol.* **382** (2015), pp. 244–258.
9. V. Calvez, G. Raoul, C. Schmeiser, Confinement by biased velocity jumps: aggregation of *Escheria coli*, *Kinetic and Related Models* **8** (2015), pp. 651–666.
10. C. Schmeiser, C. Winkler, The flatness of lamellipodia explained by the interaction between actin dynamics and membrane deformation, *J. Theor. Biol.* **380** (2015), pp. 144–155.
11. J. Dolbeault, C. Mouhot, C. Schmeiser, Hypocoercivity for linear kinetic equations conserving mass, *Trans. AMS* **367** (2015), pp. 3807–3828.
12. F. Achleitner, S. Hittmeir, C. Schmeiser, On nonlinear conservation laws regularized by a Riesz-Feller operator, *Hyperbolic Problems: Theory, Numerics, Applications*, Proc. of Hyp2012, eds. F. Ancona, A. Bressan, P. Marcati, and A. Marson, AIMS Series on Appl. Math., Vol. 8, 2014, pp. 241–248.
13. J. Müller, J. Pfanzelter, C. Winkler, A. Narita, C. LeClainche, M. Nemethova, M.-F. Carrier, Y. Maeda, M.D. Welch, T. Ohkawa, C. Schmeiser, G.P. Resch, J.V. Small, Electron tomography and simulation of baculovirus actin comet tails support a tethered filament model of pathogen propulsion, *PLoS Biol* **12** (2014), e1001765.

14. S.A. Koestler, A. Steffen, M. Nemethova, M. Winterhoff, N. Luo, J.M. Holleboom, J. Krupp, S. Jacob, M. Vinzent, F. Schur, K. Schlüter, P.W. Gunning, C. Winkler, C. Schmeiser, J. Faix, T.E.B. Stradal, J.V. Small, K. Rottner, Arp2/3 complex is essential for actin network treadmilling as well as for targeting of capping protein and cofilin, *Molecular Biol. of the Cell* **24** (2013), pp. 2861–2875.
15. J. Dolbeault, A. Klar, C. Mouhot, C. Schmeiser, Exponential rate of convergence to equilibrium for a model describing fiber lay-down processes, *Appl. Math. Res. Express* **2013** (2013), pp. 165–175.
16. C. Cuesta, S. Hittmeir, C. Schmeiser, Traveling waves of a kinetic transport model for the KPP-Fisher equation, *SIAM J. Math. Anal.* **44** (2012), pp. 4128–4146.
17. H. Freistühler, C. Schmeiser, N. Sfakianakis, Stable length distributions in co-localized polymerizing and depolymerizing protein filaments, *SIAM J. Appl. Math.* **72** (2012), pp. 1428–1448.
18. M. Vinzenz, M. Nemethova, F. Schur, J. Mueller, A. Narita, E. Urban, C. Winkler, C. Schmeiser, S. Koestler, K. Rottner, G.P. Resch, Y. Maeda, J.V. Small, Actin branching in the initiation and maintenance of lamellipodia, *J. Cell Sci.* **125** (2012), pp. 2775–2785.
19. D. Ölz, C. Schmeiser, Simulation of lamellipodial fragments, *J. Math. Biol.* **64** (2012), pp. 513–528.
20. C. Winkler, C. Schmeiser, M. Vinzenz, J.V. Small, Actin filament tracking by the localized Radon transform in three-dimensional electron microscope tomograms of lamellipodia, *J. Structural Biol.* **178** (2012), pp. 19–28.
21. F. Cerreti, B. Perthame, C. Schmeiser, M. Tang, N. Vauchelet, Waves for an hyperbolic Keller-Segel model and branching instabilities, *Math. Models and Meth. in Appl. Sci.* **21** (2011), pp. 825–842.
22. J. Haskovec, N. Masmoudi, C. Schmeiser, M.L. Tayeb, The spherical harmonics expansion model coupled to the Poisson equation, *Kinetic and Related Models* **4** (2011), pp. 1063–1079.
23. J.V. Small, C. Winkler, M. Vinzenz, C. Schmeiser, Reply: Visualizing branched actin filaments in lamellipodia by electron tomography, *Nature Cell Biology* **13** (2011), pp. 1013–1014.
24. B. Perthame, C. Schmeiser, M. Tang, N. Vauchelet, Traveling plateaus for a hyperbolic Keller-Segel system with attraction and repulsion: existence and branching instabilities, *Nonlinearity* **24** (2011), pp. 1253–1270 (featured article).

25. J. Haskovec, C. Schmeiser, Convergence analysis of a stochastic particle approximation for measure valued solutions of the 2D Keller-Segel system, *Comm. PDE* **36** (2011), pp. 940–960.
26. F. Achleitner, S. Hittmeir, C. Schmeiser, On nonlinear conservation laws with a nonlocal diffusion term, *J. Diff. Equ.* **250** (2011), pp. 2177–2196.

**Dissertations supervised since May 2011**

Project leader	Name of the student	Title of the thesis	Year of graduation
C. Schmeiser	C. Winkler	A close look at actin driven movement: from image analysis to simulation	2015
C. Schmeiser	A. Manhart	Cell movement – zooming in and out	2015
C. Schmeiser	P. Aceves Sanchez	Fractional diffusion as macroscopic limit of kinetic transport	2016
C. Schmeiser	S. Hirsch	Models for actin-myosin interaction	ongoing