Jan-Frederik Pietschmann

Personal Data

Date of Birth	17. 12. 1982
Place of Birth	Kreuztal
Nationality	German
marital status	married, two daughters
Web	http://www.jfpietschmann.eu
Email	jan.pietschmann@googlemail.com

Work Experience

10/2017-3/2018	**Vertretungsprofessur (interim professorship)**, *University of Osnabrück*.
since 7/2015	**Post-Doc (DFG, "Eigene Stelle")**, *Westfälische Wilhelms-Universität*.
10/2012-6/2015	**Post-Doc (DFG, "Eigene Stelle")**, *Technische Universität Darmstadt*.
	Interrupted for six month parental leave ("Elternzeit")
02/2012-08/2012	**Post-Doc**, *KTH Royal Institute of Technology & AstraZeneca*, Stockholm.
10/2011-02/2012	**Post-Doc**, *Westfälische Wilhelms-Universität*, Münster.

Education

10/2008-10/2011	**Dissertation**, *University of Cambridge (Trinity College)*.
Title	*On Some Partial Differential Equation Models in Socio-Economic Contexts - Analysis and Numerical Simulations*
Supervisor	Prof. Dr. P. A. Markowich (University of Cambridge)
2003–2008	**Diploma in Mathematics**, *Westfälische Wilhelms-Universität*, Münster.
Title	*Long-time Behaviour of nonlinear Fokker-Planck equations*
Supervisor	Prof. Dr. M. Burger (University of Münster)
2003–2008	**Diploma in Physics**, *Westfälische Wilhelms-Universität*, Münster.
Title	*Development of a Novel Readout System for Small Animal Positron Emmision Tomography*
Supervisor	Prof. Dr. J. Wessels (University of Münster)
2006	**Summer student**, *Deutsches Elektronen-Synchrotron (DESY)*, Hamburg.
1994–2003	**Abitur (A-Levels)**, *Städtisches Gymnasium*, Kreuztal.

External Funding

11/2017-12/2018 **Cluster of Excellence "Cells in Motion": flexible funds project**, *One PhD position. Total amount 60.000 € .*

7/2015-7/2017 **DFG Sachmittelbeihilfe (Eigene Stelle)**, *Post-Doc position for J.-F. Pietschmann, funds for travel. Total amount 163.600 € .*

10/2012-4/2015 **DFG Sachmittelbeihilfe (Eigene Stelle)**, *Post-Doc position for J.-F. Pietschmann, funds for travel and student assistants. Total amount 162.000 € .*

1/2013-12/2014 **DAAD Project-related Exchange**, *Travel funds for the cooperation with Prof. Siwy, UC Irvine for J.-F. Pietschmann and students. Total amount 11.000 € .*

2/2013-2/2016 **Post-Doc stipend Daimler & Benz Foundation**, *Free use within the project "Forward and Inverse Problems Non-Linear Drift-Diffusion". Total amount 40.000 € .*

Teaching Experience

WS 2017/18 **Lecture**, *Analysis III*, University of Osnabrück.

WS 2017/18 **Seminar**, *Elements of mathematics for teachers*, University of Osnabrück.

WS 2016/17 **Seminar**, *Homogenization of elliptic equations*, WWU Münster.
with Prof. Dr. C. Zeppieri

SS 2014 **Lecture**, *Computational Inverse Problems*, TU Darmstadt.
with Dr. M. Schlottbom

07/2012 **Mini-Course**, *Inverse Problems in Partial Differential Equations*, University of Vienna.

WS 2012 **Lecture**, *Inverse Problems in Partial Differential Equations*, University of Münster.
with Dr. F. Wübbeling

2008, 2009 **Supervision and Preparation of Example Sheets**, *Lecture Partial Differential Equations*, Univ. Cambridge.

Supervision

2017– **PhD Student**, *Ina Humpert, Thesis: Modelling and analysis of vesicle transport during neuronal polarization*, WWU Münster, CiM.

2016– **PhD Student**, *Judith Berendsen, Thesis: Cross diffusion and non-local interaction*, WWU Münster.

2015– **PhD Student**, *Bartlomiej Matejczyk, Thesis: Modelling of ionic transport in channels*, University of Warwick.
Co-Supervision, Main supervisor: Dr. Marie-Therese Wolfram

2016– **Other**, *2 Master students, 2 student assistants, 1 exchange student*, WWU Münster.

Prizes, Awards and Memberships

2017- **CeNoS**, *Membership in the Center for Nonlinear Science (CeNoS) at WWU Münster*.

2011 **Rayleigh-Knight Price**, *Awarded by the Department of Applied Mathematics and Theoretical Physics at the University of Cambridge*.

Seminars and Conferences Organized

3/2018 **Invited talk**, Section S19 at GAMM 89th Annual Meeting 2018 , Munich.

7/2018 **Organizer**, *Minisymposium "Inverse Problems and Optimal Control Approaches in Socio-Economic Applications"*, IFIP 2018.

8/2017 **Invited talk**, *Workshop*, ICERM Pedestrian Dynamics: Modeling, Validation and Calibration, USA.

1/2017 **Invited talk**, *Applied Mathematics Seminar, Host: Marie-Therese Wolfram*, Warwick University, UK.

11/2016 **Invited participant**, *"Workshop: Novel Developments in Evolutionary Partial Differential Equations"*, King Abdullah University of Science & Technology, Saudi Arabia.

11/2015 **Invited participant**, *"Workshop: Modeling and Computation of Transmembrane transport"*, Mathematical Biosciences Institute, Ohio, USA.

9/2015 **Organizer**, *Workshop "Variational Methods for Dynamic Inverse Problems and Imaging"*, WWU Münster.

9/2015 **Organizer**, *"Summer school on Inverse Problems" (with M. Burger)*, WWU Münster.

9/2015 **Organizer**, *"Multiscale transport of particles" (with M. Bruna and M.-T. Wolfram)*, Wolfgang Pauli Institute, Vienna.

5/2015 Applied Inverse Problems Conference, *Helsinki*.

Organizer of minisymposium "Inverse problems with applications in biology" (with M. Schlottbom

3/2015 **Organizer**, *Workshop on Mathematical Modelling of synthetic Nanopores*, TU Darmstadt.

9/2014 Chemnitz Symposium on Inverse Problems, *TU Chemnitz*.

3-4/2014 **Invited participant**, *Isaac Newton Institute, Free Boundary Problems*, Cambridge.

6/2013 Applied Inverse Problems Conference, *Dejon, Südkorea*.

Organizer of minisymposium "Inverse Problems in Nonlinear Drift-Diffusion Equations".

4/2012 Seminar in Applied Mathematics, KTH, *Stockholm*.

4/2012 **Invited talk**, *Seminar in Angewandter Mathematik, University of Vienna*, Vienna.

03-06/2008 **Invited participant**, *'Optimal Transport' longterm programm*, IPAM, Los Angeles.

Referee work

Philosophical Transactions A, Mathematical Methods in the Applied Sciences, Discrete and Continuous Dynamical Systems - Series B, Proceedings of the Royal Society A, Dynamic Games and Applications, Communications in Partial Differential Equations.

Languages

german **mother tongue**.

english **fluent**.

french **basic knowledge**.

Publications

Publications in peer-reviewed journals:

1. H. Egger, J.-F. Pietschmann, M. Schlottbom *On the uniqueness of nonlinear diffusion coefficients in the presence of lower order terms*. to appear in Inverse Problems, 2017.

2. J. Berendsen, M. Burger, J.-F. Pietschmann *On a cross-diffusion model for multiple species with nonlocal interaction and size exclusion*. Nonlinear Analysis, Volume 159, 10–39, 2017.

3. B. Matejczyk, M. Valisko, M.-T. Wolfram, J.-F. Pietschmann, D. Boda *Multiscale modeling of a rectifying bipolar nanopore: Comparing Poisson-Nernst-Planck to Monte Carlo*. to appear in JCP, 2017.

4. M. Burger, J.-F. Pietschmann, *Flow Characteristics in a Crowded Transport Model*. Nonlinearity, 29 3528, 2016.

5. H. Egger, J.-F. Pietschmann, M. Schlottbom, Identification of Chemotaxis Models with Volume Filling. SIAM J. Appl. Math., Vol. 75, Issue 2, pp. 275 - 288, 2015.

6. H. Egger, J.-F. Pietschmann, M. Schlottbom, *Identification of nonlinear heat conduction laws*. Journal of Inverse and Ill-posed Problems, Vol. 23, Issue 5, pp. 429 - 437, 2015.

7. T. Gamble, K. Decker, T. Plett, M. Pevarnik, J.-F. Pietschmann, I. Vlassiouk, A. Aksimentiev, Aleksei, and Z. Siwy. *Rectification of Ion Current in Nanopores Depends on the Type of Monovalent Cations–Experiments and Modeling*. Journal of Physical Chemistry Part C, 118(18):9809–9819, 2014.

8. H. Egger, J.-F. Pietschmann, and M. Schlottbom. *Simultaneous identification of diffusion and absorption coefficients in a quasilinear elliptic problem*. Inverse Problems, 30(3):035009, 2014.

9. H. Egger, J.-F. Pietschmann, and M. Schlottbom. *Numerical identification of a nonlinear diffusion law via regularization in Hilbert scales*. Inverse Problems, 30(2):025004, 2014.

10. J.-F. Pietschmann, M.-T. Wolfram, M. Burger, C. Trautmann, Z. Siwy, V. Bayer, G. Nguyen, and M. Pevarnik. *Rectification properties of conically shaped nanopores: consequences of miniaturization*. Phys. Chem. Chem. Phys., 15(39):16917–16926, 2013.

11. M. Burger, J.-F. Pietschmann, and M.-T. Wolfram. *Identification of non-linearities in transport-diffusion models of crowded motion*. Inverse Problems and Imaging, 7(4):1157–1182, 2013.

12. M. Burger, P. Markowich, and J.-F. Pietschmann. *Continuous limit of a crowd motion and herding model: Analysis and numerical simulations*. Kinetic and related Models, 4(4):1025–1047, 2011.

13. L. A. Caffarelli, P. A. Markowich, and J.-F. Pietschmann. *On a price formation free boundary model by Lasry and Lions*. Comptes Rendus Mathematique, 349(11-12):621 – 624, 2011.

14. M. Di Francesco, P. Markowich, J.-F. Pietschmann, and M.-T. Wolfram. *On the Hughes' model of pedestrian flow: The one-dimensional case*. Journal of Differential Equations, 250(3):1334–1362, 2011.

15. M. Burger, M. D. Francesco, J.-F. Pietschmann, and B. Schlake. *Nonlinear cross-diffusion with size exclusion*. SIAM Journal on Mathematical Analysis, 42(6):2842–2871, 2010.

16. B. Düring, P.A. Markowich, J.-F. Pietschmann, and M.-T. Wolfram. *Boltzmann and Fokker-Planck equations modelling opinion formation in the presence of strong leaders*. Proc. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci., 465(2112):3687–3708, 2009.

17. P. Markowich, N. Matevosyan, J.-F. Pietschmann, and M.-T. Wolfram. *On a parabolic free boundary equation modeling price formation*. M3AS, 19(10):1929–1957, 2009.

Conference proceedings and book chapters:

18. J.-F. Pietschmann and B. Schlake. *Lane formation in a microscopic model and the corresponding partial differential equation*. In *Proceedings of the 1st IEEE Workshop on Modeling, Simulation and Visual Analysis of Large Crowds*. 2011.

19. J.-F. Pietschmann. *The connection between microscopic and macroscopic models for pedestrian movement with applications to lane formation*. In *Modeling, Simulation, and Visual Analysis of Large Crowds*, Springer-Verlag, 2013.

Preprints:

20. H. Egger, K. Fellner, J.-F. Pietschmann, B. Q. Tang, *A finite element method for volume-surface reaction-diffusion systems*. submitted, 2015.

21. M. Burger, P. Friele, J.-F. Pietschmann, *On a Reaction–Cross–Diffusion System Modelling the Growth of Glioblastoma*. submitted, 2017.

References

Prof. Dr. Martin Burger, *University of Münster*.

Institute for Computational and Applied Mathematics, Einsteinstrasse 62, 48149 Münster, E-mail: martin.burger@wwu.de

Prof. Dr. Herbert Egger, *TU Darmstadt*.

Fachbereich Mathematik, AG Numerik und Wissenschaftliches Rechnen, Dolivostraße 15, 64293 Darmstadt, E-mail: egger@mathematik.tu-darmstadt.de

Prof. Dr. José Antonio Carrillo de la Plata, *Imperial College London*.

Chair in Applied and Numerical Analysis, Department of Mathematics, E-mail: carrillo@imperial.ac.uk

Prof. Dr. Zuzanna Siwy, *University of California, Irvine*.

Department of Physics and Astronomy, California 92697, United States, E-mail: zsiwy@uci.edu

Münster, October 12, 2017

Jan-Frederik Pietschmann