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Institut für Mathematik
Goethe-Universität Frankfurt

Education

Ph.D. in Mathematics, University of Giessen, Germany, *magna cum laude*; title of dissertation: *Localization of Low Energy Solutions of a Singularly Perturbed Elliptic Neumann Problem via the Geometry of the Domain Boundary*; dissertation directed by Professor Thomas Bartsch — July 1999

***Diplom* in Mathematics**, University of Karlsruhe, Germany, *summa cum laude*; title of thesis: *The Number of Positive Solutions of Semilinear Elliptic Neumann Problems*; thesis directed by Professor Thomas Bartsch — February 1996

***Vordiplom* in Physics**, University of Karlsruhe — August 1990

Professional Positions

Postgraduate position at the University of Giessen, Germany	1996–2001
Research Fellow, University of Giessen	2001–2004
Research Fellow, University of Sydney, Australia	2005–2006
Assistant Professor (tenure track), Mathematics Institute, UNAM, Mexico City	2006–2011
Associate Professor (tenure track), Mathematics Institute, UNAM, Mexico City	2011–2013
Associate Professor (tenured), Mathematics Institute, UNAM, Mexico City	since 2013
Visiting Professor, Mathematics Institute, Goethe-University, Frankfurt, Germany	10/2016–03/2017

Research Interests

- Nonlinear Partial Differential Equations of Elliptic and Parabolic Type
- Nonlinear Functional Analysis
- Infinite Dimensional Dynamical Systems

Honors

Diplom thesis placed in top six contributions among 55 at the German national *Mathematics Student's Conference*, Ulm	1995
Research Fellowship in Giessen, advisor: Thomas Bartsch, sponsor: DFG (German national research agency)	2001–2004
Research Fellowship in Sydney, advisor: Norman Dancer, sponsor: ARC (Australian Research Council)	2005–2006
UNAM PRIDE B	2007
CONACYT SNI 1	2008
UNAM PRIDE C	2010
CONACYT SNI 2	2011
Mexican Academy of Ciences, member	2013

Plenary Talks

X Americas Conference on Differential Equations and Nonlinear Analysis, Buenos Aires	February 2015

Editorial Activities

Associate Editor, *International Journal of Mathematics and Mathematical Sciences*	2006–2010
Member of the editorial board, *Papirhos*, Mathematical Institute of the UNAM	since 2012
Member of the editorial board, *Boletín de la SMM* (Bulletin of the Mexican Mathematical Society)	since 2012

Doctoral Students

- Julián Chagoya Saldaña, graduated on June 24, 2016

Teaching Experience

Teaching assistant, University of Karlsruhe, Germany	1990–1994
Teaching assistant, University of Heidelberg, Germany	1995–1996
Senior teaching assistant, University of Giessen, Germany	1996–2001
Visiting Scholar, University of Wisconsin, Milwaukee, USA	Summer 2003
Lecturer, Faculty of Science, UNAM, Mexico	since 2006
Visiting Professor, University of Frankfurt, Germany	10/2016–03/2017

Courses Given

Minimax methods in the calculus of variations	July 2003
Functional Analysis with applications to Partial Differential Equations	Fall 2006
The Mapping Degree and its Applications in Nonlinear Analysis	Spring 2007
Functional Analysis with applications to Partial Differential Equations	Fall 2007
The Mapping Degree and its Applications in Nonlinear Analysis	Spring 2008
Functional Analysis with applications to Partial Differential Equations	Fall 2008
The Mapping Degree and its Applications in Nonlinear Analysis	Spring 2009
Spectral Theory	Fall 2009
Abstract Evolution Equations and Semilinear Parabolic Problems	Spring 2010
The Mapping Degree in Nonlinear Analysis	Spring 2011
The Luxury of the Flow and Minimax Theorems in the Calculus of Variations	June 2011
Analysis I	Fall 2011
Analysis II	Spring 2012
Complex Analysis I	Fall 2012

Abstract Evolution Equations and Semilinear Parabolic Problems	Spring 2013
Analysis I	Fall 2013
Analysis II	Spring 2014
Complex Analysis I	Fall 2014
Spectral Theory	Spring 2015
Analysis I	Fall 2015
Analysis II	Spring 2016
Linear Partial Differential Equations	Fall 2016
Potential Theory	Spring 2017

Conference and Workshop Organization

TCNPDE07, `http://www.matem.unam.mx/tcnpde07/`, Mexico City	January 2007
VMNDE10, `http://www.matem.unam.mx/oaxaca10/`, Oaxaca, Mexico	October 2010
Summer School on Differential Equations, `http://www.matem.unam.mx/festin2011/`, Mexico City	June 2011
Special Session at MCA2013: Nonlinear elliptic and parabolic initial-boundary value problems, `http://mca2013.org/`, Guanajuato, Mexico	August 2013
Minisymposium at the French-Mexican Meeting on Industrial and Applied Mathematics: Partial Differential Equations, `http://paginas.matem.unam.mx/fmmiam/`, Villahermosa, Mexico	November 2013
Special Session at PRIMA2017: Nonlinear Elliptic PDEs and Systems, `https://prima2017.math.unam.mx/`, Oaxaca, Mexico	August 2017

Administrative Work

Search Committee for an Assistant Professor position in Analysis	1999
Member of the Elections Committee of the Mathematics Institute, UNAM	2009–2013
Section Coordinator for Analysis in the mathematics master program of the UNAM	08/2009–05/2012

Member of the Datacenter Committee of the Mathematics Institute, UNAM   since 2010

Member of the Web Site Committee of the Mathematics Institute, UNAM   since 2010

Member of the Steering Committee of the Mathematics Institute, UNAM   10/2013–04/2014

Head of the Computer Services Unit of the Mathematics Institute, UNAM   05/2014–07/2016

Refereeing of articles

- Acta Applicandae Mathematicae (1)

- Acta Mathematica Universitatis Comenianae (1)

- Applicable Analysis (1)

- Annali di Matematica Pura ed Applicata (1)

- Boundary Value Problems (1)

- Bulletin of the London Mathematical Society (1)

- Calculus of Variations and Partial Differential Equations (2)

- Communications in Partial Differential Equations (1)

- Communications on Pure and Applied Analysis (2)

- Complex Variables and Elliptic Equations (2)

- Computers & Mathematics with Applications (1)

- Comptes Rendus Mathematique (1)

- Discrete and Continuous Dynamical Systems. Series A (1)

- Electronic Journal of Differential Equations (1)

- Electronic Journal of Qualitative Theory of Differential Equations (1)

- ESAIM Control, Optimisation and Calculus of Variations (1)

- European Journal of Mathematics (1)

- International Journal of Mathematics and Mathematical Sciences (1)

- Journal of Differential Equations (3)

- Journal of Functional Analysis (1)

- Journal of Mathematical Analysis and Applications (5)

- Journal of Mathematical Physics (4)

- Manuscripta Mathematica (1)

- Memorias de la SMM (1)

- Nonlinear Analysis Series A: Theory, Methods & Applications (1)

- NoDEA Nonlinear Differential Equations and Applications (2)

- Proceedings of the Edinburgh Mathematical Society (1)

- Proceedings of the Royal Society of Edinburgh. Section A (3)

- SIAM Journal on Mathematical Analysis (1)

- Topological Methods in Nonlinear Analysis (3)

- Transactions of the American Mathematical Society (1)

- Zeitschrift für angewandte Mathematik und Physik (2)

Reviews

- Mathematical Reviews (35)

- Zentralblatt Math (52)

Invited Seminar Presentations

FU Berlin, Germany	June 2002
Comenius University, Bratislava, Slovak Republic	February 2003
University of Mainz, Germany	May 2003
University of Essen, Germany	May 2004
UAM, Mexico City	October 2004
UNAM (Escuela de Otoño), Mexico City	October 2004
University of Sydney, Australia	April 2006

UNSW, Sydney, Australia	April 2006
ITAM, Mexico City	November 2006
UAM, Mexico City	November 2006
University of Giessen, Germany	June 2007
IPN, Mexico City	May 2009
UAEM, Toluca, Mexico	November 2009
University of Rome I (La Sapienza), Italy	February 2010
UMICH, Morelia, Mexico	February 2011
IIMAS, UNAM, Mexico City	April 2011
University of Frankfurt, Germany	July 2011
University of Giessen, Germany	July 2011
IINGEN, UNAM, Mexico City	October 2012
UAM-A, Mexico City	February 2014
University of Frankfurt, Germany	July 2014
University of Karlsruhe, Germany	November 2016
University of Giessen, Germany	December 2016
University of Frankfurt, Germany	December 2016

Invited Talks at Conferences

TVMNLA, Cuernavaca, Mexico	February 1999
EQUADIFF 10, Prague, Czech Republic	August 2001
Nonlinear Functional Analysis, Taiyuan, PR of China	August 2002
Variational Methods and the Nonlinear Schrödinger Equation, Lausanne, Switzerland	February 2004
World Congress of Nonlinear Analysts, Orlando, USA	July 2004
TVMPDE, Guanajuato, Mexico	December 2005
TCNPDE, Mexico City	January 2007
VII Joint Meeting AMS&SMM, Zacatecas, Mexico	May 2007

8th International Conference on Operations Research, Havana, Cuba	February 2008
II Joint Meeting CMS&SMM, Vancouver, Canada	August 2009
VIII Joint Meeting AMS&SMM, Berkeley, USA	June 2010
Workshop on Variational Methods in Nonlinear Differential Equations, Oaxaca, Mexico	October 2010
Third Harmonic Analysis and Partial Differential Equations Work Shop, Mexico City	October 2011
Workshop on Nonlinear Differential Equations , Pienza, Italia	November 2011
Concentration phenomena and compactness issues in nonlinear PDE, Stockholm, Sweden	May 2013
International Workshop on Variational Problems and PDE's, São Paulo, Brazil	September 2013
French-Mexican Meeting on Industrial and Applied Mathematics, Villahermosa, Mexico	November 2013
Spring Central Sectional Meeting of the AMS, Lubbock, Texas, USA	April 2014
VII Symposium on Nonlinear Analysis, Torun, Poland	September 2015
Meeting in Analysis, Cuernavaca, Mexico	November 2015
V Latin-American Congress of Mathematicians, Barranquilla, Colombia (invited to special session)	declined

Workshops and Seminars Visited

DMV seminar on *Symplectic Geometry and Hamiltonian Dynamics*, Blaubeuren, Germany	June 1993
Workshop on *Nonlinear Eigenvalue Problems*, Oberwolfach, Germany	December 1996
Summer school on *Numerical Dynamical Systems*, TU Hamburg-Harburg, Germany	September 1999
DMV seminar on *Reaction-Diffusion Patterns: Theory and Applications*, Oberwolfach, Germany	November 1999
Workshop on *Topological and Variational Methods for Differential Equations*, Oberwolfach, Germany	June 2005

CMO-BIRS workshop on *Asymptotic Patterns in Variational Problems:*   September 2016
PDE and Geometric Aspects, Oaxaca, Mexico

Participation in Teaching Training

Success in Teaching   December 2000

Introduction to Methodical Design of Scientific Classes   February 2001

Technical Experience

Technical assistance in preparation of TeX manuscripts for publication   Summer 1996
in scientific journals of Springer, Heidelberg

Unix system and network administration for the Analysis Research   since 1996
Group at the University of Giessen

Memberships

- *DMV*, German Mathematician's Association

- *SMM*, Mexican Mathematical Society

- *AMS*, American Mathematical Society

Language Skills

- German (native speaker)

- fluent English

- fluent Spanish

Published or Accepted Articles

[1] N. Ackermann, *Multiple single-peaked solutions of a class of semilinear Neumann problems via the category of the domain boundary*, Calc. var. partial differential equations, **7** (1998), no. 3, 263–292, ISSN: 0944-2669, DOI: 10.1007/s005260050109.

[2] N. Ackermann, *On the multiplicity of sign changing solutions to nonlinear periodic Schrödinger equations*, in H. Brezis, K. C. Chang, S. J. Li, and P. Rabinowitz, editors, Topological methods, variational methods and their applications (taiyuan, 2002),

pp. 1–9. World Sci. Publishing, River Edge, NJ, 2003, ISBN: 978-981-238-262-7, URL: http://www.worldscibooks.com/mathematics/5187.html.

[3] N. Ackermann, *On a periodic Schrödinger equation with nonlocal superlinear part*, Math. z. **248** (2004), no. 2, 423–443, ISSN: 0025-5874, DOI: `10.1007/s00209-004-0663-y`.

[4] N. Ackermann, *A Cauchy-Schwarz type inequality for bilinear integrals on positive measures*, Proc. amer. math. soc. **133** (2005), no. 9, 2647–2656 (electronic), ISSN: 0002-9939, DOI: `10.1090/S0002-9939-05-08082-2`.

[5] N. Ackermann and T. Weth, *Multibump solutions of nonlinear periodic Schrödinger equations in a degenerate setting*, Commun. contemp. math. **7** (2005), no. 3, 269–298, ISSN: 0219-1997, DOI: `10.1142/S0219199705001763`.

[6] N. Ackermann and T. Bartsch, *Superstable manifolds of semilinear parabolic problems*, J. dynam. differential equations, **17** (2005), no. 1, 115–173, ISSN: 1040-7294, DOI: `10.1007/s10884-005-3144-z`.

[7] N. Ackermann, *An abstract approach to multibump solutions of periodic Schrödinger equations and applications*, Nonlin. anal. **63** (2005), e1031–e1037, ISSN: 0362-546X, DOI: `10.1016/j.na.2005.02.070`.

[8] N. Ackermann, *A nonlinear superposition principle and multibump solutions of periodic Schrödinger equations*, J. funct. anal. **234** (2006), no. 2, 277–320, ISSN: 0022-1236, DOI: `10.1016/j.jfa.2005.11.010`.

[9] N. Ackermann, T. Bartsch, and P. Kaplický, *An invariant set generated by the domain topology for parabolic semiflows with small diffusion*, Discrete contin. dyn. syst. **18** (2007), no. 4, 613–626, ISSN: 1078-0947, DOI: `10.3934/dcds.2007.18.613`.

[10] N. Ackermann, T. Bartsch, P. Kaplický, and P. Quittner, *A priori bounds, nodal equilibria and connecting orbits in indefinite superlinear parabolic problems*, Trans. amer. math. soc. **360** (2008), no. 7, 3493–3539, ISSN: 0002-9947, DOI: `10.1090/S0002-9947-08-04404-8`.

[11] N. Ackermann, *Solution set splitting at low energy levels in Schrödinger equations with periodic and symmetric potential*, J. differential equations, **246** (2009), no. 4, 1470–1499, ISSN: 0022-0396, DOI: `10.1016/j.jde.2008.10.016`.

[12] N. Ackermann, *Long-time dynamics in semilinear parabolic problems with autocatalysis*, in Y. Du, H. Ishii, and W.-Y. Lin, editors, Recent progress on reaction-diffusion systems and viscosity solutions, pp. 1–30. World Sci. Publ., Hackensack, NJ, 2009, ISBN: 978-981-283-473-7, URL: `http://www.worldscibooks.com/mathematics/7016.html`.

[13] N. Ackermann, M. Clapp, and F. Pacella, *Self-focusing multibump standing waves in expanding waveguides*, Milan j. math. **79** (2011), no. 1, 221–232, ISSN: 1424-9286, DOI: `10.1007/s00032-011-0147-6`.

[14] N. Ackermann, M. Clapp, and F. Pacella, *Alternating sign multibump solutions of nonlinear elliptic equations in expanding tubular domains*, Comm. partial differential equations, **38** (2013), no. 5, 751–779, ISSN: 0360-5302, DOI: `10.1080/03605302.2013.771657`, arXiv: `1210.4229 [math.AP]`.

[15] N. Ackermann and A. Szulkin, *A concentration phenomenon for semilinear elliptic equations*, Arch. ration. mech. anal. **207** (2013), no. 3, 1075–1089, ISSN: 0003-9527, DOI: `10.1007/s00205-012-0589-1`, arXiv: `1206.3196 [math.AP]`.

[16] N. Ackermann, M. Clapp, and A. Pistoia, *Boundary clustered layers near the higher critical exponents*, J. differential equations, **254** (2013), no. 10, 4168–4193, ISSN: 0022-0396, DOI: `10.1016/j.jde.2013.02.015`, arXiv: `1211.2364 [math.AP]`.

[17] N. Ackermann and N. Dancer, *Precise exponential decay for solutions of semilinear elliptic equations and its effect on the structure of the solution set for a real analytic nonlinearity*, Differential integral equations, **29** (2016), no. 7-8, 757–774, ISSN: 0893-4983, arXiv: `1503.03552 [math.AP]`, URL: `http://projecteuclid.org/euclid.die/1462298684`.

[18] N. Ackermann and J. Chagoya, *Ground states for irregular and indefinite superlinear Schrödinger equations*, J. differential equations, **261** (2016), no. 9, 5180–5201, ISSN: 0022-0396, DOI: `10.1016/j.jde.2016.07.025`.

[19] N. Ackermann, *Uniform continuity and Brézis-Lieb type splitting for superposition operators in Sobolev space*, Adv. nonlinear anal. (2016), DOI: `10.1515/anona-2016-0123`, arXiv: `1111.4199 [math.FA]`.

[20] N. Ackermann, A. Cano, and E. Hernández-Martínez, *Spectral density estimates with partial symmetries and an application to Bahri-Lions type results*, Calc. var. partial differential equations, **56** (2017), no. 6, DOI: `10.1007/s00526-016-1107-3`.

Submitted Preprints

[1] N. Ackermann and T. Weth, *High morse index orbitally unstable standing waves for space periodic nonlinear Schrödinger equations*, Preprint, 2017.