

## CURRICULUM VITAE

**Konstantin M. Mischaikow**

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### EDUCATIONAL BACKGROUND:

|       |      |                                 |             |
|-------|------|---------------------------------|-------------|
| B.A.  | 1979 | Reed College                    | Mathematics |
| M.A.  | 1983 | University of Wisconsin-Madison | Mathematics |
| Ph.D. | 1985 | University of Wisconsin-Madison | Mathematics |

### EMPLOYMENT HISTORY:

|                                 |                                |              |
|---------------------------------|--------------------------------|--------------|
| Professor                       | Rutgers University             | 2006-present |
| Director                        | CDSNS, Georgia Tech.           | 1998-2006    |
| Acting Director                 | CDSNS, Georgia Tech.           | Fall 1997    |
| Professor                       | Georgia Tech.                  | 1996-2008    |
| Associate Professor             | Georgia Tech.                  | 1991-1996    |
| Associate Professor             | Michigan State University      | 1990-1991    |
| Assistant Professor             | Georgia Tech.                  | 1989-1991    |
| Assistant Professor             | Michigan State University      | 1987-1990    |
| Visiting Asst. Prof. (Research) | Brown University               | 1985-1987    |
| Lecturer                        | Univ. of Minnesota-Minneapolis | 1984-1985    |

### VISITING APPOINTMENTS:

|  |                      |
|--|----------------------|
| INRIA, Paris                                 | June 2011            |
| Jagellonian University, Poland               | Nov. 2010            |
| University of Paderborn, Germany             | May 2004             |
| Universite Cergy, Pontoise, France           | July 2001            |
| CNRS, Universite de Orsay, France            | January -June 2001   |
| I.H.E.S., France                             | January - March 2001 |
| University of Bremen, Germany                | June 1999            |
| University of Bremen, Germany                | July 1998            |
| Erwin Schrödinger Institute, Vienna, Austria | Sept. 1995           |
| Montana State University                     | Spring 1995          |
| University of Sao Paulo, Brazil              | June 1994            |
| IMA, University of Minnesota                 | Fall 1989            |
| CDSNS, Georgia Tech                          | May 1989             |
| University of Heidelberg, Germany            | June 1988            |
| University of Heidelberg, Germany            | May 1987             |

**HONORS AND AWARDS:**

AMS Invited Address, AMS Sectional Meeting, Newark, NJ, May 2010  
Best Paper Award: *Trans. Japanese SIAM* with Y. Hiraoka and T. Ogawa. 2003  
AMS Invited Address, AMS Regional Meeting, Charlotte N.C., Oct. 1999  
C.I.M.E. Lecturer, Montecatini Terme, June 1994  
Frame Teaching Award, Dept. of Math., Michigan State University, 1989

**GRADUATE STUDENTS SUPERVISED:****Masters:** Tatiana Grudskaya (1997)

Todd Levine (1992)

Marc Niethammer (2003)

**Ph.D:** Justin Bush (Mathematics)

Vidit Nanda (Mathematics)

Eliane Trialdi (2011) *Modeling regulation of transcription initiation*Jean-Phillipe Lessard (2007) *Validated continuation for infinite-dimensional systems*Todd Moeller (2005) *Conley-Morse chain maps*Marcio Gamiero (2005) *Topological analysis of patterns*Sarah Day (2003) *A Rigorous Numerical Method in Infinite Dimensions*Eric Boczko (2002) *Polygonal approximation for flows*Anthony Baker (2000) *Entropy Bounds and the Conley Index*Andrzej Szymczak (1999) *Index Pairs: from Dynamics to Combinatorics and Back*, Sigma Xi: best thesis awardGreg Watson (1998) *Computation of Homology and an Application to the Conley Index*Maria Carbinatto (1997), *The Conley Index and Chaos*Michael Eidenschink (1995) *Exploring Global Dynamics: A Numerical Algorithm Based on the Conley Index Theory*Tomas Gedeon (1994) *Cyclic Feedback Systems***Postdocs:** Amit Patel (2011-present)

Miroslav Kramar (2009 - present)

Jason James (2010 - 2011) Rutgers University

Jean-Phillipe Lessard (2007 - 2010) Institute for Advanced Studies

Debbie Yuster (2007 - 2009) SUNY Maritime

Marcio Gameiro (2005 - 2007) Hokkaido University

Martijn van Noort (2002 - 2004) Imperial University

Wendy Hines (2002 - 2003) University of Nebraska

Pawel Pilarczyk (2001 - 2003) Jagellonian University  
 Vadim Meleshuk (2001 - 2002) Microsoft  
 Shangbing Ai (2000 - 2002) University of Alabama  
 Salome Martinez (2000 - 2002) University of Chile  
 Madjid Allili (2001 - 2002) Bishops University  
 Oliver Junge (2000) University of Paderborn  
 Piotr Zgliczynski (1999 - 2001) Jagellonian University  
 William Kalies (1994-1996) Florida Atlantic University

**Research Scientists:** Shaun Harker (2009 - present)

**EDITORIAL ACTIVITIES:**

|                  |  |                             |
|------------------|--|-----------------------------|
| Editor-in-Chief  | Journal of Differential Equations              | 2000 - 2011                 |
| Editorial Board  | SIAM Journal on Numerical Analysis             | 2010 - present              |
| Advisory Board   | Foundations of Computational Mathematics       | 2005 - present              |
| Editorial Board  | Journal of Dynamics and Differential Equations | 2002 - present              |
| Editorial Board  | SIAM Journal on Applied Dynamical Systems      | 2001 - 2010                 |
| Editorial Board  | Nonlinear Theory and its Applications          | 2010 - present              |
| Associate Editor | Revista Matemática Complutense                 | 2004 - present              |
| Editorial Board  | NOLTA  | 2010 - present              |
| Editorial Board  | Annales Polonici Mathematici                   | 2008 - present              |
| Editorial Board  | Discrete and Continuous Dynamical Systems      | 2000 - 2006                 |
| Editorial Board  | Topological Methods in Nonlinear Analysis      | 2000 - present              |
| Editorial Board  | Journal of Nonlinear Studies                   | 2001 - present              |
| Editorial Board  | Journal of Differential Equations              | 1998 - 2000, 2012 - present |

**SERVICE:**

**Rutgers:** Monthly IAS-Rutgers Topology Workshop: Identifying Order in Complex Systems, 2009 - present

DIMACS Executive Committee 2009-present

Mathematical Biology Seminar, Fall 2008

Mathematics Colloquium Committee, 2007-2009

BioMaPS Executive Committee, 2010 - present

BioMaPS Curriculum Committee, 2007-2009

BioMaPS Steering Committee, 2006-present

Mathematics Graduate Committee (alternate) 2008-2010

Mathematics Committee on Research Grants

**Georgia Tech:** College of Science Promotion and Tenure, 2004-2006

Executive Board, Georgia Institute of Technology, 1995-1997

**National:** SIAG/Dynamical Systems J. D. Crawford Prize, Selection Committee, 2010

AMS Committee on Science Policy, 2008-2011

Advisory Board, Dynamical Systems Activity Group, SIAM, 2007-2009, 2012 - 2013

SIAM Major Awards Committee, 2004-2008

Vice Chair, Dynamical Systems Activity Group, SIAM, 1997-1999

**International:** Portuguese FCT - Evaluation Panel Mathematics 2009

Portuguese FCT - Research Unit Evaluation 2007-2008

**CONFERENCE ORGANIZATION:**

|           |  |                          |              |
|-----------|--|--------------------------|--------------|
| Org.      | IV Developers Workshop on the Conley-Morse Database Project                    | Kauai                    | March 2012   |
| Sci. Com. | III Developers Workshop on the Conley-Morse Database Project                   | Florianopolis, Brazil    | Feb. 2012    |
| Sci. Com. | IX Americas Conference on Differential Equations and Nonlinear Analysis        | Trujillo, Peru           | Jan. 2012    |
| Org. Com. | Foundations Comp. Math.  | Budapest                 | June 2011    |
| Org.      | Computational Topology and Dynamics  | Christchurch New Zealand | Aug. 2010    |
| Org. Com. | ATMCS4   | Münster                  | June 2010    |
| Co-Org.   |  | Newark                   | May 2010     |
| Co-Org.   | AMS Regional Meeting Workshop on Topology Identifying Order in Complex Systems | Rutgers/IAS              | Monthly 2009 |
| Sci. Com. | VIII Americas Conference on Differential Equations and Nonlinear Analysis      | Veracruz, Mexico         | Oct. 2009    |
| Co-Org.   | Dynamics, Topology and Computations  | Bedlewo                  | June 2009    |
| Co-Org.   | Computational Homology and Dynamics  | Bozeman                  | August 2008  |
| Org. Com. | Foundations Comp. Math.  | Hong Kong                | June 2008    |
| Org. Com. | ICMC Summer Meeting on Differential Equations                                  | Sao Carlos               | Jan. 2008    |
| Co-Org.   | Minisymposium: ICIAM Dynamics of Gene Regulation                               | Zurich                   | July 2007    |
| Co-Org.   | Computational Homology and Fluid dynamics                                      | Atlanta                  | March 2007   |
| Co-Org.   | Dynamics, Topology and Computations  | Bedlewo                  | June 2006    |
| Co-Org.   | DARPA Workshop on State-Dependent Delays in Regulatory Networks                | DIMACS                   | March 2006   |
| Co-Org.   | Computational Homology and Materials Science                                   | Atlanta                  | Feb 2006     |
| Co-Org.   | Minisymposium, SIAM Dynamical Systems  | Snowbird                 | May 2005     |
| Co-Org.   | Sixth Americas Conference on Differential Equations and Nonlinear Analysis     | Santiago, Chile          | Jan 2005     |

### CONFERENCE ORGANIZATION (continued):

|           |  |                      |            |
|-----------|--|----------------------|------------|
| Org. Com. | Geometric Methods in Dynamical Systems                                     | U. Delaware          | June 2004  |
| Co-Org.   | Workshop in Quantitative Mathematical Modeling of Gene Regulatory Networks | MBI<br>Ohio State U. | Dec 2004   |
| Co-Org.   | US-Japan Workshop on Dynamics and Computation                              | Japan                | March 2004 |
| Co-Org.   | Minisymposium, SIAM Dynamical Systems                                      | Snowbird             | May 2003   |
| Org. Com. | Fifth Americas Conference on Differential Equations and Nonlinear Analysis | Alberta              | July 2002  |
| Org. Com. | Conley Index Theory  | Sherbrooke           | Aug. 2001  |
| Org. Com. | SIAM Dynamical Systems   | Snowbird             | May 2001   |
| Org. Com. | IV Americas Conf. on Diff. Eqn. & Nonlinear Analysis                       | Venezuela            | Oct. 2000  |
| Co-Org.   | Biology & Differential Eqs.  | Atlanta              | Sept. 2000 |
| Co-Org.   | SIAM Pacific Rim 2000  | Hawaii               | Aug. 2000  |
| Org. Com. | SIAM National Meeting  | Atlanta              | July 1999  |
| Org. Com. | SIAM Dynamical Systems   | Snowbird             | May 1999   |
| Org. Com. | Equadiff   | Berlin               | Aug. 1999  |
| Co-Org.   | Dynamics Days  | Atlanta              | Jan. 1999  |
| Co-Org.   | III Americas Conf. on Diff. Eqns. & Nonlinear Analysis                     | Atlanta              | Sept. 1998 |
| Co-Org.   | Conley Index Theory  | Banach Center        | June 1997  |
| Co-Org.   | US-Japan Conf. on Singular Perturbations & Dynamics                        | Calloway<br>Gardens  | March 1996 |

### PUBLICATIONS (Books):

#### Published:

1. T. Kaczynski, K. Mischaikow, and M. Mrozek, *Computational Homology* Applied Mathematical Sciences **157** Springer-Verlag, 2004.
2. K. Mischaikow and M. Mrozek, Conley Index, *Handbook of Dynamical Systems II: Towards Applications*, (B. Fiedler, ed.) North-Holland, 2002.
3. K. Mischaikow, M. Mrozek, and P. Zgliczynski (eds.), *Conley Index Theory*, Polish Acad. Sci. Banach Center Publications 47, 1999.
4. L. Arnold, C. Jones, K. Mischaikow, and G. Raugel, *Dynamical Systems*, Lecture Notes in Mathematics 1609 (R. Johnson ed.), Springer, 1995.

#### In Preparation:

1. W. Kalies, K. Mischaikow, and R. Vandervorst, *Conley Theory* (Graduate Text).

## PUBLICATIONS:

1. L. Kondic, A. Goulet, C. S. O'Hern, M. Kramar, K. Mischaikow, and R. P. Behringer, Topology of force networks in compressed granular media, *EPL*, **97** (5) 54001 (2012).
2. Zin Arai, Marcio Gameiro, Tomas Gedeon, Hiroshi Kokubu, Konstantin Mischaikow, Hiroe Oka, Graph-based topological approximation of saddle-node bifurcation in maps, *RIMS Kokyuroku Beassatsu*, to appear.
3. Huseyin Kurtuldu, Konstantin Mischaikow, and Michael F. Schatz, Measuring the departures from the Boussinesq approximation in Rayleigh-Bénard convection experiments, *J. Fluid Mechanics*, (2011) 682: 543-557.
4. Huseyin Kurtuldu, Konstantin Mischaikow, and Michael F. Schatz, Extensive scaling from computational homology and Karhunen-Loève decomposition analysis of Rayleigh-Bénard convection experiments, *Physical Review Letters*, **107** 034503 (2011).
5. Jan Bouwe van den Berg, Jason D. Mireles-James, Jean-Philippe Lessard, and Konstantin Mischaikow, Rigorous Numerics for Symmetric Connecting Orbits: Even Homoclinics of the GrayScott Equation, *SIAM J. Math. Anal.* **43**, (2011) 1557-1594.
6. J.-B. van den Berg, J.P. Lessard, and K. Mischaikow, Global smooth solution curves using rigorous branch following, *Mathematics of Computation*, **79** (2010) 1565-1584.
7. K. Mischaikow and T. Wanner, Topology-Guided Sampling of Nonhomogeneous Random Processes, *Annals of Applied Probability*, **20** 1068-1097 (2010).
8. Z. Arai, W. Kalies, H. Kokubu, K. Mischaikow, H. Oka, and P. Pilarczyk, A Database Schema for the Analysis of Global Dynamics of Multiparameter Systems, *SIAM J. Applied Dyn. Syst.*, **8** 757 (2009).
9. James R. Wilson, Marcio Gameiro, Konstantin Mischaikow, William Kalies, Peter W. Voorhees, and Scott A. Barnett, Three-Dimensional Analysis of Solid Oxide Fuel Cell Ni-YSZ Anode Interconnectivity, *Microscopy and Microanalysis* **15** (2009) 71-77.
10. G. Chen, K. Mischaikow, R. Laramée, and E. Zhang, Efficient Morse Decompositions of Vector Fields, *IEEE Transactions on Visualization and Computer Graphics* **14** (IEEE Visualization 2008) 848-862.
11. S. Maier-Paape, U. Miller, K. Mischaikow, and T. Wanner, Rigorous numerics for the Cahn-Hilliard equation on the unit square, *Revista Matemática Complutense*, **21** (2008) 351-426.

12. M. Gamero, J.-P. Lessard and K. Mischaikow, Validated Continuation over Large Parameter Ranges for Equilibria of PDEs, *Mathematics and Computers in Simulation* (2008) doi:10.1016/j.matcom.2008.03.014.
13. S. Day, H. Kokubu, S. Luzzatto, K. Mischaikow, H. Oka, P. Pilarczyk, Quantitative hyperbolicity estimates in one-dimensional dynamics, *Nonlinearity* **21** (2008) 1967 - 1987.
14. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, When activators repress and repressors activate: a qualitative analysis of the Shea and Ackers model, *Bulletin of Mathematical Biology*, **70** (2008) 1660-1683.
15. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, Binding cooperativity in phage  $\lambda$  is not sufficient to produce an effective switch, *Biophys. J.*, **94** (2007) 3384-3392.
16. T. Gedeon, K. Mischaikow, K. Patterson and E. Traldi, When activators repress and repressors activate: a qualitative analysis of the Shea-Ackers model, *The Eighth International Conference on Systems Biology (ICSB-2007) Proceedings*, 2007.
17. K. Krishan, H. Kurtuldu, M. F. Schatz, M. Gameiro, K. Mischaikow, and S. Madruga, Homological and symmetry breaking in Rayleigh-Benard convection: Experiments and simulations, *Physics of Fluids*, **19** 117105 (2007).
18. S. Day, W. Kalies, K. Mischaikow, and T. Wanner, Probabilistic and Numerical Validation of Homology Computations for Nodal Domains, *Electronic Research Announcements*, **13** (2007) 60–73.
19. K. Mischaikow and T. Wanner, Probabilistic validation of homology computations for nodal domains, *Annals of Applied Probability* **17** (2007) 980–1018.
20. E. Boczko, T. Gedeon, and K. Mischaikow, Dynamics of simple regulatory switch, *J. Mathematical Biology* **55** (2007) 679-719.
21. G. Chen, K. Mischaikow, R. Laramee, P. Pilarczyk and E. Zhang, Vector Field Editing and Periodic Orbit Design Using Morse Decompositions, *IEEE Transactions on Visualization and Computer Graphics*, **13** (2007) 769–785.
22. S. Day, J.-P. Lessard, and K. Mischaikow, Validated Continuation for Equilibria of PDEs, *SIAM Numerical Analysis*, **45** (2007), 1398–1424.
23. M. Gameiro, T. Gedeon, W. Kalies, H. Kokubu, K. Mischaikow, and H. Oka, Topological horseshoes of traveling waves for a fast-slow predator-prey system *Journal of Dynamics and Differential Equations* **19** (2007) 623–654.



24. S. Maier-Paape, K. Mischaikow, and T. Wanner, Structure of the Cahn-Hilliard equation on the square, *Int. J. Chaos Bif.* **17** (2007) 121–1263.
25. Erik Boczko, W. Kalies and K. Mischaikow, Polygonal approximation of flows, *Topology and its Applications*, **154** (2007) 2501–2520.
26. A. Szymczak, A. Stillman, A. Tannenbaum and K. Mischaikow, Coronary vessel cores from 3D imagery: a topological approach, *Medical Image Analysis*, **10** (2006) 548-559.
27. E. Zhang, K. Mischaikow and G. Turk, Vector Field Design on Surfaces, *ACM Transactions on Graphics* **25** (2006), pp. 1294-1326
28. T. Gedeon and K. Mischaikow, Singular boundary value problems via the Conley index, *Topological Methods in Nonlinear Analysis*, **28** (2006), pp. 263-284
29. Z. Arai and K. Mischaikow, Rigorous Computations of Homoclinic Tangencies, *SIAM Dynamical Systems*, **5** (2006) 280-292
30. M. Niethammer, W. Kalies, K. Mischaikow and A. Tannenbaum, On the detection of simple points in higher dimensions using cubical homology, *IEEE Transactions on Image Processing*, **15** (2006) 2462-2469.
31. T. Gedeon, H. Kokubu, K. Mischaikow and H. Oka, The Conley index for fast-slow systems, II. Higher-dimensional slow variables, *J. Diff. Eqns.*, **225** (2006) 242-307.
32. W.D. Kalies, K. Mischaikow and R.C.A.M. VanderVorst, An Algorithmic Approach to Chain Recurrence, *Foundations of Computational Mathematics* **5** (2005) 409-449.
33. K. Mischaikow, Computational Homology and the Analysis of Nonlinear Dynamics, *Bull. Japan-SIAM* **15** (2005) (translated into Japanese).
34. K. Mischaikow, M. Mrozek and Paweł Pilarczyk, Graph Approach to the Computation of the Homology of Continuous Maps, *Foundations of Computational Mathematics* **5** (2005) 199-229.
35. E. Boczko, T. Cooper, T. Gedeon, K. Mischaikow, D. Murdock, S Pratap, and K. Wells, Structure Theorems and the Dynamics of Nitrogen Catabolite Repression in Yeast, *Proc. Nat. Acad. Sci.* **102** (2005) 5647-5652.
36. S. Day, Y. Hiraoka, K. Mischaikow and T. Ogawa, Rigorous Numerics for Global Dynamics of the Swift-Hohenberg Equation, *SIAM Dynamical Systems* **4** (2005) 1-31.
37. V. Hutson, Y. Lou and K. Mischaikow, Convergence in competition models with small diffusion coefficients, *J. Diff. Eqns.* **211** (2005) 135-161.

38. E. Zhang, K. Mischaikow and G. Turk, Feature Based Surface Parameterization and Texture Mapping, *ACM Trans. on Graphics*, **24** (2005) 1-27.
39. M. Grinfeld, G. Hines, V. Hutson, K. Mischaikow and G. Vickers, Nonlocal Dispersal, *Differential and Integral Equations* **18** (2005) 1299-1320.
40. S. Day, K. Mischaikow, and O. Junge, Towards automated chaos verification, *Proc. Equadiff03*, World Scientific, Singapore, 157–162. 2005.
41. M. Gameiro, K. Mischaikow, and T. Wanner, Evolution of Pattern Complexity in the Cahn-Hilliard Theory of Phase Separation, *Acta Materialia* **53** (2004) 693-704.
42. M. Gameiro, W. Kalies, and K. Mischaikow, Topological characterization of spatial-temporal chaos, *Phys. Rev. E*, **70**, 035203 (2004).
43. S. Day, O. Junge and K. Mischaikow, A rigorous numerical method for the global analysis of infinite dimensional discrete dynamical systems *SIAM Dynamical Systems*, **3** (2004), 117–160.
44. G. Flores and K. Mischaikow, Selection of slow diffusion in a reaction diffusion model: limiting cases, *Rocky Mountain J. of Math.* **34** (2004) 1299-1325.
45. V. Hutson, S. Martinez, K. Mischaikow and G. Vickers, The evolution of dispersal, *J. Math. Biology* **47** (2003) 483-517.
46. Y. Hiraoka, K. Mischaikow, and T. Ogawa, Conley index based numerical verification methods for global bifurcations of the stationary solutions to the Swift-Hohenberg Equation, *Trans. Japanese Soc. Ind. Appl. Math.* **13** (2003) 191-211. (in Japanese)
47. V. Hutson, Y. Lou, K. Mischaikow, and P. Polacik, Competing species near a degenerate limit, *SIAM J. Math Analysis* 35:453-491, 2003.
48. T. Kaczynski, K. Mischaikow and M. Mrozek, Computing homology. Algebraic topological methods in computer science (Stanford, CA, 2001). *Homology Homotopy Appl.* **5** (2003) 233–256.
49. M. Niethammer, A.N. Stein, W.D. Kalies, P. Pilarczyk, K. Mischaikow and A. Tannenbaum, Analysis of blood vessel topology by cubical homology, *Proc. ICIP, 2002*.
50. K. Mischaikow, Topological techniques for efficient rigorous computations in dynamics, In *Acta Numerica 2002*, pages 435-478. Cambridge University Press, 2002.
51. V. Hutson, Y. Lou and K. Mischaikow, Spatial heterogeneity of resources versus Lotka-Volterra Dynamics, *J. Diff. Eqns.*, **185**(1) (2002), 97-136.

52. V. Hutson, K. Mischaikow and P. Polacik, The evolution of dispersal rates in a heterogeneous time-periodic environment, *J. of Mathematical Biology* **43** (2001), 501-533.
53. M. Allili, K. Mischaikow and A. Tannenbaum, Cubical homology and the topological classification of 2D and 3D imagery *Proc. ICIP'01, 2001*.
54. T. Gedeon, H. Kokubu, K. Mischaikow, and H. Oka, Chaotic solutions in slowly varying perturbations of Hamiltonian systems with applications to shallow water sloshing, *J. Dyn. & Diff. Eqns.* **14** (2002) 63–84.
55. P. Zgliczynski and K. Mischaikow, Rigorous numerics for partial differential equations: the Kuramoto-Sivashinsky equation, *Foundations of Computational Mathematics* **1** (2001) 255-288.
56. K. Mischaikow, M. Mrozek and A. Szymczak, Chaos in the Lorenz equations: A computer assisted proof. Part III: Classical parameter values, *J. Diff. Eqns.*, **169**(1) (2001), Part 3, 17-56.
57. V. Hutson, K. Mischaikow, and G. T. Vickers, Multiple travelling waves in evolutionary game dynamics, *Japan J. Ind. Appl. Math.* **17**(3) (2000) 341-356.
58. M. Carbinatto, J. Kwapisz and K. Mischaikow, Horseshoes and the Conley index spectrum, *Ergodic Thy. & Dyn. Sys.* **20** (2000) 365-377.
59. T. Gedeon, H. Kokubu, K. Mischaikow, H. Oka and J. Reineck, The Conley index for fast-slow systems, I. One-dimensional slow variable, *J. Dyn. Diff. Eqns.* **11**(3)(1999), 427-470.
60. K. Mischaikow, M. Mrozek and J. Reineck, Singular index pairs, *J. Dyn. Diff. Eqns.* **11**(3)(1999), 399-425.
61. M. Carbinatto and K. Mischaikow, Horseshoes and the Conley index spectrum-II: The Theorem Is Sharp, *Discrete & Continuous Dyn. Sys.* **5**(3) (1999), 599-616.
62. H. Kokubu, K. Mischaikow and H. Oka, Directional transition matrix, *Conley Index Theory*, Banach Center Publication **47** (1999), 133-144.
63. V. Hutson and K. Mischaikow, Periodic travelling waves, *Conley Index Theory*, Banach Center Publications **47**(1999), 109-114.
64. K. Mischaikow, The Conley index theory: a brief introduction, *Conley Index Theory*, Banach Center Publication **47**(1999), 9-19.
65. W. Kalies, K. Mischaikow and G. Watson, Cubical approximation and computation of homology, *Conley Index Theory*, Banach Center Publication **47**(1999), 115-131.

66. K. Mischaikow, M. Mrozek, J. Reiss, and A. Szymczak, Construction of symbolic dynamics from experimental time series, *Phys. Rev. Lett.* **82**(6)(1999), 1144-1147.
67. V. Hutson and K. Mischaikow, An approach to practical persistence, *J. Math. Biology* **37**(1998), 447-466.
68. J. Dockery, V. Hutson, K. Mischaikow, and M. Pernarowski, The evolution of slow dispersal rates: a reaction-diffusion model, *J. Math. Biology* **37**(1998), 61-83.
69. K. Mischaikow, M. Mrozek and J. Reineck, Singular Index Pairs, *Universitatis Iagellonicae Acta Mathematica*, Fasciculus XXXVI (1998), 223-226.
70. G. Flores, A. Minzoni, K. Mischaikow, and V. Moll, Post-fertilization traveling waves on eggs, *Nonlinear Anal: TMA* **36** (1999), 45-62.
71. R. Franzosa and K. Mischaikow, Algebraic transition matrices in the Conley Index theory, *Trans. AMS*, **350** (3) (1998), 889-912.
72. K. Mischaikow and M. Mrozek, Chaos in the Lorenz equations: A computer-assisted proof. Part II: Details, *Math. of Computing* **67**(223)(1998), 1023-1046.
73. H. Kokubu, K. Mischaikow, Y. Nishiura, H. Oka and T. Takaishi, Connecting orbit structure of monotone solutions in the shadow system, *J. Diff. Eqns.* **140**(2)(1997), 309-364.
74. H. Kokubu, K. Mischaikow, and H. Oka Existence of infinitely many connecting orbits in a singularly perturbed ordinary differential equation, *Nonlinearity* **9** (1996), 1263-1280.
75. C. McCord and K. Mischaikow, On the global dynamics of attractors for scalar delay equations, *J. AMS* **9** (4) (1996), 1095-1133.
76. V. Hutson and K. Mischaikow, Singular limits for travelling waves for a pair of equations, *Proc. Royal Society Edinburgh*, **126** (1996), 399-411.
77. C. McCord, K. Mischaikow and M. Mrozek, Zeta functions, periodic trajectories, and the Conley index, *J. Diff. Eqns.* **121** (2) (1995), 258-292.
78. C. McCord and K. Mischaikow, Equivalence of topological and singular transition matrices in the Conley Index theory, *Michigan Math. J.* **42** (1995), 387-414.
79. T. Gedeon and K. Mischaikow, Structure of the global attractor of cyclic feedback systems, *J. Dyn. & Diff. Eq.*, **7** (1) (1995), 141-190.
80. K. Mischaikow, H. Smith and H.R. Thieme, Asymptotically autonomous semiflows: Chain recurrence and Lyapunov functions, *Trans. AMS*, **347**(5)(1995), 1669-1685.

81. K. Mischaikow, Global asymptotic dynamics of gradient-like bistable equations, *SIAM J. Math. Anal.*, **26** (5) (1995), 1199-1224.
82. K. Mischaikow and M. Mrozek, Isolating neighborhoods and chaos, *Japan J. Industrial & Applied Math.*, **12**(2)(1995) 205-236.
83. K. Mischaikow, A C-graph approach for studying the dynamics of a system of parabolic equations, *Finite and Infinite Dimensional Dynamics*, Lec. Notes in Num. Appl. Anal., Proc. of Kyoto Conf. on Dynamical Systems, (1989) (ed. K. Masuda and S.-N. Chow), World Scientific (1996), 135-158.
84. H. Hattori and K. Mischaikow, An application of connection matrix to magnetohydrodynamic shock profiles, *Multidimensional Hyperbolic Problems and Computation* (eds. J. Glimm and A. Majda), IMA **29**, Springer-Verlag (1991) 169-172.
85. V. Hutson, J. Lopez-Gomez, K. Mischaikow and G. Vickers, Limit behavior for a competing species problem with diffusion, *Dynam. Systems & Appl.*, R. P. Agarwal, ed., World Scientific Publ. Co., Singapore (1995), 343-358.
86. K. Mischaikow and M. Mrozek, Chaos in the Lorenz equations: A computer-assisted proof, *Bulletin, AMS*, **32**(1)(1995), 66-72.
87. K. Mischaikow and J. Reineck, A product theorem for connection matrices and the structure of connecting orbits, *J. Non-linear Analysis, Theory, Methods & Appls.*, **23** (1994), 1293-1314.
88. T. Gedeon and K. Mischaikow, Dynamics of cyclic feedback systems, *Resenhas IME-USP*, **1** (1994), 495-515.
89. K. Mischaikow and Y. Morita, Dynamics on the global attractor of a gradient flow arising from the Ginzburg-Landau equation, *Japan J. of Indust. & Appl. Math.*, **11**(1994), 185-202.
90. K. Mischaikow and J. Reineck, Travelling waves in predator-prey systems, *SIAM J. Math. Anal.*, **24** (1993), 1179-1214.
91. V. Hutson and K. Mischaikow, Travelling waves for mutualist species, *SIAM J. Math. Anal.*, **24** (1993), 987-1008.
92. K. Mischaikow, The structure of isolated invariant sets and the Conley Index, *Contemporary Mathematics* (ed. C. McCord), **152**(1993), 269-290.
93. H. Hattori and K. Mischaikow, On the slow motions of phase boundaries in the Korteweg theory of capillarity, *Dyn. Systems & Appls.*, **1**(1992), 441-452.
94. B. Fiedler and K. Mischaikow, Dynamics of bifurcations for variational problems with  $O(3)$  equivariance: A Conley index approach, *Arch. Rat. Mech. Anal.* **119**(1992), 145-196.

95. C. McCord and K. Mischaikow, Connected simple systems, transition matrices, and heteroclinic bifurcations, *Trans. AMS* **333**(1)(1992), 397-422.
96. K. Mischaikow, Travelling waves for a cooperative and a competitive-cooperative system, *Viscous Profiles and Numerical Methods for Shock Waves* (ed.M. Shearer), SIAM (1991), 125-141.
97. H. Hattori and K. Mischaikow, A phase transition problem – A dynamical systems approach, *Viscous Profiles and Numerical Methods for Shock Waves* (ed.M. Shearer), SIAM (1991), 73-78.
98. H. Hattori and K. Mischaikow, A dynamical system approach to a phase transition problem, *J. Diff. Eqns.*, **94**(2)(1991), 340-378.
99. K. Mischaikow, Dynamic phase transitions: A connection matrix approach, *Nonlinear Evolution Equations that Change Type* (ed. B. Keyfitz and M. Shearer), Springer-Verlag (1990), 164-180.
100. K. Mischaikow and G. Wolkowicz, A predator-prey system involving group defense: A connection matrix approach, *Non-Linear Analysis, Theory, Methods & Appl.*, **14**(11)(1990), 955-969.
101. H. Hattori and K. Mischaikow, On the existence of intermediate magnetohydrodynamic shock waves, *J. of Dyn. & Diff. Eqns.*, **2**(2)(1990), 163-175.
102. K. Mischaikow, Transition systems, *Proc. Royal Society of Edinburgh*, **112A**(1989), 155-175.
103. K. Mischaikow, Homoclinic orbits in Hamiltonian systems and heteroclinic orbits in gradient and gradient-like systems, *J. Diff. Eqns.*, **81**(1)(1989), 167-213.
104. K. Mischaikow and G. S. K. Wolkowicz, A connection matrix approach illustrated by means of a predator-prey model involving group defense, *Mathematical Ecology: Proc. of the Research Conf., Trieste, 1986* (ed. T. G. Hallam, L. J. Gross, and S. A. Levin), World Scientific Publishing (1988), 682-716.
105. K. Mischaikow, Existence of generalized homoclinic orbits for one parameter families of flows, *Proc. Amer. Math. Soc.*, **103**(1)(1988), 59-68.
106. K. Mischaikow, Bifurcation into pathology for Hamiltonian systems, *J. Diff. Eqns.*, **72** (1988), 56-94.
107. R. Franzosa and K. Mischaikow, The connection matrix theory for semiflows on (not necessarily locally compact) metric spaces, *J. Diff. Eqns.*, **71**(2)(1988), 270-287.

108. K. Mischaikow, Conley's connection matrix, *Dynamics of Infinite Dimensional Systems* (ed. S.-N. Chow, J. Hale), NATO ASI Series, Series F: Computer and Systems Sciences, **37**, Springer-Verlag (1987), 179-186.
109. K. Mischaikow, Classification of travelling wave solutions of reaction diffusion systems, LCDS Report 86-5 (1985).