

Curriculum Vitæ – HW Broer

January 25, 2019

1 Personal

Private data

Hendrik Wolter Broer
Date of birth 18 February 1950
Married to Dr Trijntje Roggen
(parents of four children)

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Education at the University of Groningen

Ph.D. 1979 Mathematics and Natural Sciences
M.Sc. 1974 Mathematics
B.Sc. 1971 Mathematics, Physics and Astronomy

Academic position

Professor emeritus of *Dynamical Systems*, University of Groningen
Member *Royal Netherlands Academy of Arts and Sciences* (KNAW)

Membership professional Societies

Koninklijk Wiskundig Genootschap (KWG)
American Mathematical Society (AMS)

2 Professional service and management

Groningen University

Chairman *Johann Bernoulli Foundation for Mathematics*
(organizes annual JB Lectures for a general audience)

Editorial boards

Editor *Discrete and Continuous Dynamical Systems – Series S*

Past services

- Scientific director *Johann Bernoulli Institute (JBI) for Mathematics and Computer Science* 2009-14
Director *School of Mathematics and Computing Science*
(opleidingsdirecteur *Wiskunde & Informatica*) 1997-2002
Managing director NWO-cluster *Nonlinear Dynamics of Natural Systems (NDNS+)* 2005-11
- Editor in Chief *Indagationes Mathematicæ* 2008-18
Editor *Epsilon-Uitgaven*, Utrecht / Amsterdam 1990-2012
Division editor *Journal of Mathematical Analysis and Applications*
(division *Ordinary Differential Equations & Dynamical Systems*) 2005-09
- Chairman Section Mathematics KNAW 2015-2017
Chairman (and vice chairman) *Koninklijk Wiskundig Genootschap (KWG)* 2006-11 (co-initiator of the *Platform Wiskunde Nederland (PWN)*)
Chairman Board National *Mathematics Research Institute (MRI)* (2005-10)
Chairman Chamber of Mathematics *VSNU* 2001-06
(one major achievement was foundation (in company) of the nationwide master education in mathematics, named *Mastermath*)
- Scientific Secretary FOM Programme *Mathematical Physics* 2003-07
- Head of Group *Dynamical Systems & Mathematical Physics* 1996-2014

- Member Mathematics Board *Lorentz Center* Leiden University 2005-09
- Member OCW-committee (stuurgroep) *Natuur, Leven & Technologie* (NLT) 2005-08
- Member OCW-Vernieuwingscommissie Wiskunde *Commissie Toekomst Wiskundeonderwijs* (cTWO) (2005-13)
- Member Program Committee *Nationale Wiskundedagen* (NWD) (2000-16) (annual grand scale national meeting secondary school teachers)

Meetings organized

- Workshop *Dynamical Systems & Bifurcations* (with B.L.J. Braaksma and F. Takens) Groningen 1984
- Workshop *Geometry and Analysis in Nonlinear Dynamics* (with F. Takens) Groningen 1989
- Bernoulli Workshop *Dynamical Systems* (with I. Hoveijn, S.A. van Gils and F. Takens) Groningen 1995
- Workshop *Finite Dimensional Dynamical Systems* (with G. Vegter) Lorentz Center Leiden 1997
- Workshop *Global Analysis of Dynamical Systems* (with B. Krauskopf and G. Vegter) Lorentz Center Leiden 2001
- Large scale conference *Equadiff 2003* (with F. Dumortier, J. Mawhin, A. Vanderbauwhede and S.M. Verduyn Lunel) Hasselt 2003
- Workshop *Nonlinear Dynamics, Ergodic Theory and Renormalization* (with A.C.D. van Enter, M. Martens and F. Takens) Lorentz Center Leiden 2004
- Large scale conference *European Nonlinear Oscillator Conference 2005* (with D.H. van Campen, H. Nijmeijer and F. Verhulst) Eindhoven 2005
- Workshop *Mathematics of Life Sciences* (with A. Doelman, S.M. Verduyn Lunel and A. van der Vaart) Groningen 2005 (in NWO-cluster NDNS+)
- Workshop *Dynamics of Nonlinear Waves* (with A. Doelman, M. Haragus and Th. Gallay) Groningen 2006 (in NWO-cluster NDNS+)
- Workshop *Mathematics of Earth Sciences* (with H.A. Dijkstra, A. Doelman and H.E. de Swart) Groningen 2006 (in NWO-cluster NDNS+)

- Slotsymposium FOM/NWO programma *Mathematische Fysica* (with R.H. Dijkgraaf, N.P. Landsman and A.C.D. van Enter), Amsterdam 2007
- Workshop *The chaotic and ergodic Properties of 'real' Hamiltonian systems* (with Paul Tupper) workshop Centre de Recherche Mathématiques de Montréal CRM/ISM 2007
- Workshop *KAM Theory and its applications* (with H. Hanßmann and M.B. Sevryuk), Lorentz Center 2008 (in NWO-cluster NDNS+)
- Workshop *New Directions in Dynamical Systems* (with S.J. van Strien, H. Hanßmann, A.J. Homburg, G.B. Huitema and F. Takens), Lorentz Center 2009
- Workshop *Nonlinear Dynamics of Natural Systems* (with A. Doelman, A. van der Vaart, S.M. Verduyn Lunel; local organizers A. Muntean, M.A. Peletier), EURANDOM TU/e 2010 (in NWO-cluster NDNS+)
- Special Session *Complexity of Geometry and Analysis of Larger Scale Dynamical Systems* (with Carles Simó, Renato Vitolo and Gert Vegter): The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden University of Technology 2010
- Workshop *Coherent Structures in Dynamical Systems* (with Francisco J. Beron-Vera, Mara J. Olascoaga and Thomas Peacock), Lorentz Center, May 2011
- Workshop *Extreme Events in chaotic systems with applications to the weather* (with Mark Holland, Alef Sterk and Pau Rabassa), Groningen University, May 2012
- Workshop *Resonance and Synchronization* (with Domien Beersma and Henk Nijmeijer), Lorentz Center, August 2012
- Workshop *Taking the Measure of One-Dimensional Dynamics* (with Henk Bruin, Robert Fokkink, Frank de Hollander, Ale Jan Homburg and Marco Martens), Lorentz Center, April 2016
- Workshop *Transformations in Statistical Mechanics: Pathologies and Remedies* (with Frank de Hollander, Frank Redig and Wiloetta Ruszel), Lorentz Center, October 2016
- *Symposium on advances in semi-classical methods in mathematics and physics* (Erik Bergshoeff and Daniel Roest - Van Swinderen Institute; Henk Broer and Holger Waalkens - Johann Bernoulli Institute), Van Swinderen Huys, October 2016

3 Research

PhD supervision and examination

PhD supervision

1. George B. Huitema, *Unfoldings of quasi-periodic tori*. University of Groningen, February 1988. Promotor: B.L.J. Braaksma, referent: H.W. Broer. (Funded by the Netherlands Organisation for Scientific Research NWO.)
2. Bernd Krauskopf, *On the 1:4 resonance problem*. University of Groningen, June 1995. Promotores: F. Takens and H.W. Broer.
3. Heinz Hanßmann, *Quasi-periodic motions of a rigid body, a case-study on perturbations of superintegrable systems*, University of Groningen, October 1995. Promotor: H.W. Broer, referent: R.H. Cushman.
4. Hinke M. Osinga, *Computing invariant manifolds, variations on the graph transform*. University of Groningen, June 1996. Promotor: H.W. Broer, co-promotor: G. Vegter. (Funded by the Netherlands Organisation for Scientific Research NWO.)
5. Florian O.O. Wagener, *On the skew Hopf–bifurcation*. University of Groningen, January 1998. Promotores: F. Takens and H.W. Broer. (Funded by the Netherlands Organisation for Scientific Research NWO.)
6. Gerton A. Lunter, *Bifurcations in Hamiltonian systems: Computing singularities by Gröbner bases*. University of Groningen, December 1999. Promotor: H.W. Broer, co-promotor: G. Vegter.
7. Hans H. de Jong, *Quasiperiodic breathers in systems of weakly coupled pendulums: Applications of KAM theory to classical and statistical mechanics*. University of Groningen, December 1999. First promotor: H.W. Broer, second promotor: M. Winnink, referent: A.C.D. van Enter. (Funded by the Netherlands Organisation for Scientific Research NWO (FOM).)
8. Evgeny Verbitskiy, *Generalized entropies in dynamical systems*. University of Groningen, October 2000. Promotores: F. Takens and H.W. Broer. (Funded by the Netherlands Organization for Scientific Research NWO.)
9. Martijn van Noort, *Global coherent dynamics of the parametrically forced pendulum: a case study in one-and-a-half degrees of freedom*. University of Groningen, May 2001. Promotor: H.W. Broer, co-promotor: G. Vegter. (Funded by the Netherlands Organisation for Scientific Research (NWO): Foundations FOM and SMC.)

10. Renato Vitolo, *Bifurcations of attractors in 3D diffeomorphisms: a study in experimental mathematics*. University of Groningen, October 2003. Promotor: H.W. Broer, co-promotores: C. Simó (University of Barcelona) and F. Takens.
11. Maria Cristina Ciocci, *Bifurcation of periodic solutions and persistence of quasi-periodic solutions in reversible systems*. University of Ghent, November 2003. Promotor: A. Vanderbauwhede (University of Gent), co-promotor: H.W. Broer.
12. Taede A. Smedes, *Avoiding Balaam's mistake: exploring Divine action in an age of scientism*. University of Groningen, March 2004. Promotor: L.J. van den Brom, second promotor: H.W. Broer, co-promotor: A.F. Sanders.
13. Jun Hoo, *Quasi-periodic bifurcations in a strong resonance: combination tones in gyroscopic stabilisation*. University of Groningen, January 2005. Promotor: H.W. Broer. (Funded by the Netherlands Organisation for Scientific Research NWO (FOM).)
14. Khairul Saleh, *Organising centres in semi-global analysis of dynamical systems*. University of Groningen, December 2005. Promotor: H.W. Broer, with J.M. Tuwankotta and E. Soewono (ITB-Bandung, Indonesia) as counterparts. (Funded by the Royal Dutch Academy of Sciences KNAW and the Dutch Ministry of Economic Affairs.)
15. Iris Gulikers, *Reinvention of geometry*. University of Groningen, December 2005. Promotor: H.W. Broer, with J.A. van Maanen and A. van Streun as co-advisors. (Partly funded by the Netherlands Organisation for Scientific Research NWO).
16. Harry Sitters, *Sybrandt Hansz Cardinael 1578-1647, Rekenmeester en wiskundige, zijn leven en zijn werk*. University of Groningen, November 2007. Promotores: H.W. Broer and J.A. van Maanen. (Funded by the Netherlands Organisation for Scientific Research NWO (Program LION).)
17. Easwar Naga Subramanian, *Attractor switching in neuron networks and Spatiotemporal filters for motion processing*. Promotores: H.W. Broer and N. Petkov, University of Groningen, February 29th, 2008.
18. Olga Lukina, *Geometry of torus bundles in Hamiltonian dynamics*. Promotor: H.W. Broer, University of Groningen, September 2008.

19. Sarma Chandramouli, *Renormalization and non-rigidity*. Promotores: H.W. Broer, University of Groningen and M. Martens (Stony Brook), December 2008.
20. Peter Hazard, *Hénon-like maps and renormalization*. Promotores: H.W. Broer, University of Groningen and M. Martens (Stony Brook), December 2008.
21. Alex Opoku, *On Gibbs properties of transforms of lattice and mean-field systems*. Promotores: Ch. Külske, A.C.D. van Enter and H.W. Broer, University of Groningen, 4 September 2009.
22. Sijbo-Jan Holtman, *Dynamics and geometry of resonant bifurcations*. Promotores: H.W. Broer and G. Vegter, University of Groningen, 18 September 2009. (Funded by the Netherlands Organisation for the Advancement of Scientific Research NWO.)
23. Alef Sterk, *Atmospheric variability and the Atlantic Multidecadal Oscillation. Part B: Mathematical analysis of reduced models*. Promotores: H.W. Broer, H.A. Dijkstra (IMAU) and C. Simó (University of Barcelona), University of Groningen, 1 October 2010. (Funded by the Netherlands Organisation for Scientific Research NWO, area Earth- and Life Sciences.)
24. Jos Tolboom, *The potential of a classroom network to support teacher feedback, a study in statistics education*. Promotores: H.W. Broer and W.A.J.M. Kuiper (SLO), University of Groningen, 15 June 2012.
25. Xia Liu, *The discontinuous Hopf-transversal system and its geometric regularization*. Promotor: H.W. Broer. (Funded by the Netherlands Organisation for Scientific Research NWO, area Exact Sciences - Applied Mathematics.) University of Groningen, 22 February 2013.
26. Hildeberto Jardón Kojakhmetov, *Geometric Desingularization of Constrained Differential Equations in Terms of Slow-Fast Systems*. Promotores: Henk Broer and Gert Vegter. Funded by Mexican National Council for Science and Technology. University of Groningen, 12 June 2015.
27. Nikolay Martynchuk, *On Monodromy in Integrable Hamiltonian Systems*. Promotores: H.W. Broer and K. Efsthathiou. University of Groningen, 21 September 2018.
28. Dirk van Kekem, *Dynamics of the Lorenz-96 Model*. Promotores: H.W. Broer and A.E. Sterk. University of Groningen, 12 October 2018.

29. Swier Garst, *Dynamics amidst Folding and Twisting in 2-dimensional Maps*. Promotores: H.W. Broer, A.E. Sterk and J.M. Aarts (Technische Universiteit Delft). University of Groningen, 19 October 2018.

PhD examination

1. Igor Hoveijn, *Aspects of resonance in dynamical systems*, promotor F. Verhulst, Utrecht 1992.
2. Gert H.M. van der Heijden, *Nonlinear drillstring dynamics*, promotor F. Verhulst, Utrecht 1994.
3. Jeroen S.W. Lamb, *Reversing symmetries in dynamical systems*, promotor H.W. Capel, University of Amsterdam 1994.
4. Joost Hermans, *Rolling rigid bodies with and without symmetries*, promotor J.J. Duistermaat, Utrecht 1995.
5. Roland J.P. Boon, *Bifurcation in fluid flow near a boundary surface*, promotores P.G. Bakker and J.W. Reyn, Delft 1997.
6. Willem Cazemier, *Proper orthogonal decomposition and low dimensional models for turbulent flows*, promotor A.E.P. Veldman, Groningen 1997.
7. Jordi Villanueva, *Normal forms around lower dimensional tori of Hamiltonian systems*, promotor À. Jorba, Universitat Politècnica de Catalunya (Barcelona) 1997.
8. Stefano Stramigioli, *From differentiable manifolds to interactive robot control*, promotores G. Honderd and G.J. Olsder, Delft 1998.
9. Claudia Valls, *The classical Arnold example of diffusion with two equal parameters*, promotor C. Simó, Universitat de Barcelona 1999.
10. Sebastian Wiczorek, *The dynamical complexity of optically injected semiconductor lasers*, promotores D. Lenstra and B. Krauskopf, Vrije Universiteit Amsterdam 2002.
11. Lennaert van Veen, *Time scale interaction in low-order climate models*, promotores F. Verhulst and J.D. Opsteegh, Utrecht 2002.
12. Johan M. Tuwankotta, *Higher order resonances in dynamical systems*, promotor F. Verhulst, Utrecht 2002.

13. Bob Rink, *Geometric dynamics of Hamiltonian lattices*, promotores F. Verhulst and J.J. Duistermaat, Utrecht 2003.
14. Kevin Webster, *Bifurcations of reversible systems with application to the Michelson system*, promotor J.S.W. Lamb, Imperial College London 2003.
15. Joaquim Puig, *Reducibility of quasi-periodic skew-products and the spectrum of Schrödinger operators*, promotor C. Simó, Universitat de Barcelona 2004.
16. Nguyen Huu Khanh, *Heteroclinic cycles in thermal convection models*, promotores A. Doelman and A.J. Homburg, University of Amsterdam 2005.
17. Olivier Sapin, *Flot croisé aus-dessus d'un solénoïde et théorème de gap labelling pour l'opérateur de Schrödinger matriciel*, promotor H. Jauslin, Université de Bourgogne (Dijon) 2005.
18. Hendrikjan G. Schaap, *Ising models and neural networks*, promotores A.C.D. van Enter and M. Winnink, Groningen 2005.
19. Nenad Mehajlovic, *Torsional and lateral vibrations in rotor/drillstring systems*, promotor H. Nijmeijer, Eindhoven 2005.
20. Hill Meijer, *Co-dimension 2 bifurcations of iterated maps*, promotores F. Verhulst and Yu. Kuznetsov, Universiteit Utrecht 2006.
21. Hartmut Erzgräber, *Dynamics of delay-coupled semiconductor laser systems*, promotores D. Lenstra and B. Krauskopf, Vrije Universiteit Amsterdam 2006.
22. Mathilde Kammerer - Colin de Verdière, *Bifurcations de variétés invariantes*, promotor R. Moussu, Université de Bourgogne (Dijon) 2006.
23. Taoufik Bakri, *Averaged behaviour of nonconservative coupled oscillators*, promotores F. Verhulst and Yu. Kuznetsov, Universiteit Utrecht 2007.
24. Hicham Zmarrou, *Bifurcations of random maps*, promotor A. Doelman, copromotor A.J. Homburg, Universiteit van Amsterdam 2008.
25. Arturo Vieiro, *Study of the effect of conservative and weakly dissipative perturbations on symplectic maps and Hamiltonian systems*, promotor C. Simó, Universitat de Barcelona 2009.
26. Pau Rabassa, *Contribution to the study of perturbations of low dimensional maps*, promotor Àngel Jorba, Universitat de Barcelona 2010.

27. Erik Steur, *Synchronous behavior in networks of coupled systems, with applications to neuronal dynamics*, promotor Henk Nijmeijer, Eindhoven 2011.
28. Jaap Eldering, *Persistence of noncompact Normally Hyperbolic Invariant Manifolds in bounded geometry*, promotores Erik van den Ban and Heinz Hanßmann, Utrecht 2012.
29. Quang Sang PHAN, *Monodromie spectrale d'opérateurs non-autoadjoints*, promotores Christophe CHEVERRY, Francis NIER, San VU NGOC, Université de Rennes 1, 2012.
30. Blaz Mramor, *Some destructive results in the Aubry–Mather theory*, promotor Rob van der Vorst, VU Amsterdam 2012.
31. Thomas de Jong, *Topological shooting, invariant manifold theory and rigorous numerics applied to an ODE for hypha tip growth*, promotores Mark Peletier and Georg Prokert, EU Eindhoven 2019

Postdoctoral fellows and guest researchers

1. Dr I. Hoveijn, in NWO-program *Mathematical Aspects of Nonlinear Dynamical Systems*, 1992–1996.
2. Dr A.L. Hagen, NWO-postdoc, with G. Vegter (PI), 1997–1999.
3. Dr H.P. Bruin, KNAW-fellow, 2000–2003.
4. Dr V. Naudot, FWN-postdoc (compensating for Directorship *School of Mathematics and Computer Science*), 2001–2005.
5. Dr K. Efstathiou, FWN-postdoc (compensating for Managing Directorship NWO-cluster *NDNS+* and for the scientific directorship *JB1*), 2005–2012.
6. Dr Pau Rabassa Sans, NWO-postdoc (under the auspices of Complexity-NET European network), 2011–2013.
7. Dr Zhao Lei, FWN-postdoc (compensating for scientific directorship *JB1*), 2013–2015.

Grant support

1. All workshops under 2 were funded by the Royal Netherlands Academy of Arts & Sciences (KNAW) and the Netherlands Organisation for the Advancement of Scientific Research (NWO). *Equadiff*2003 moreover was sponsored by the European Science Foundation *Prodyn*, the Mathematics Research Institute (MRI) and the FOM Program *Mathematical Physics*.
2. NWO Priority Program *Mathematical Aspects of Nonlinear Dynamical Systems* with S.A. van Gils (UTwente) and F. Takens (RUG), 1993-1997. Amounted to 1.3 Mf.
3. NWO *Open / Free Competition Mathematics*, totally 5 PhD students. The NWO area *Earth- and Life Sciences* is funding 1 PhD student. See 3 for details.
4. FOM program *Mathematical Physics*, totally 2 PhD students. See 3 for details.
5. KNAW program *Extended Program in Applied Mathematics (EPAM)*, 1 PhD student, see 3.
6. From KNAW postdoc program, 1 postdoc jointly with J.M. Tuwankotta (PI ITB-Bandung).
7. One postdoctoral three-year KNAW-fellow, see above.
8. NWO cluster *Nonlinear Dynamics of Natural Systems (NDNS+)* and Ministry of Economic Affairs with A. Doelman (CWI, Amsterdam), S.M. Verduyn Lunel (Leiden) and A. van der Vaart (VU Amsterdam) 2005–2009. Amounts to 4.0 MEuro, of which 1.7 MEuro for Groningen University Mathematics research infrastructure.
9. NWO Complexity-NET *Predictability of Extreme Weather Events*, in cooperation with R. Vitolo (Exeter), M. Holland (Exeter), 21 Months of postdoctoral research.
10. NWO cluster *Nonlinear Dynamics of Natural Systems (NDNS+)* and Ministry of OCW 2013–2016: three year prefinancing of a tenure track assistant professor 240 KEuro.

Scientific publications

In international refereed journals

1. HWB, Quasi-periodicity in local bifurcation theory, *Nieuw Arch. Wisk.* **4**(1), (1983), 1–32.
2. HWB and G. Vegter, Subordinate Sil’nikov bifurcations near some singularities of vector fields having low codimension, *Ergod. Th. & Dynam. Sys.*, **4**, (1984), 509–525.
3. HWB and F.M. Tangerman, From a differentiable to a real analytic perturbation theory, applications to the Kupka Smale theorems, *Ergod. Th. & Dynam. Sys.*, **6**, (1986), 345–362.
4. B.L.J. Braaksma and HWB, On a quasi-periodic Hopf bifurcation, *Ann. Institut Henri Poincaré, Analyse non linéaire*, **4**, no.2, (1987), 115–168.
5. HWB and F. Takens, Formally symmetric normal forms and genericity, *Dynamics Reported*, **2**, (1989), 36–60.
6. HWB, G.B. Huitema and F. Takens, Unfoldings of quasi-periodic tori, *Mem. AMS*, **83**(421), (1990), 1–82.
7. B.L.J. Braaksma, HWB and G.B. Huitema, Toward a quasi-periodic bifurcation theory, *Mem. AMS*, **83**(421), (1990), 83–175.
8. HWB and G.B. Huitema, A proof of the iso-energetic KAM-theorem from the ‘ordinary’ one, *Journ. Diff. Eqns.*, **90**(1), (1991), 52–60.
9. HWB and G. Vegter, Bifurcational aspects of parametric resonance, *Dynamics Reported, New Series* **1**, (1992), 1–51.
10. HWB, S.-N. Chow, Y. Kim and G. Vegter, A normally elliptic Hamiltonian bifurcation, *ZAMP* **44**, (1993), 389–432.
11. HWB and F. Takens, Mixed spectrum and rotational symmetry, *Arch. Rational Mech. An.* **124**, (1993), 13–42.
12. HWB, Huygens’ isochrone slinger, *Euclides*, **70**(4) (1995), 110–117.
13. HWB and G.B. Huitema, Unfoldings of quasi-periodic tori in reversible systems, *Journ. Dynamics and Differential Equations*, **7**(1), (1995) 191–212.

14. HWB and M. Levi, Geometrical aspects of stability theory for Hill's equations, *Archive Rat. Mech. An.* **131**, (1995), 225–240.
15. HWB, KAM-Theory: Multi-Periodicity in conservative and dissipative systems, *Nieuw Arch. Wisk.* **14**(1), (1996), 1–15.
16. HWB, R. Roussarie and C. Simó, Invariant circles in the Bogdanov-Takens bifurcation for diffeomorphisms, *Ergod. Th. & Dynam. Sys.* **16**, (1996), 1147–1172.
17. HWB, G.B. Huitema and M.B. Sevryuk, Quasi-periodic tori in families of dynamical systems: order amidst chaos, *Springer LNM* **1645**, (1996), Springer-Verlag (195 p).
18. HWB, H.M. Osinga and G. Vegter, Algorithms for computing normally hyperbolic invariant manifolds, *ZAMP*, **48**, (1997), 480–524.
19. HWB, De chaotische schommel, *Pythagoras* **35**(5), (1997), 11–15.
20. HWB, I. Hoveijn and M. van Noort, A reversible bifurcation analysis of the inverted pendulum, *Physica D*, **112**, (1998), 50–63.
21. HWB, G.A. Lunter and G. Vegter, Equivariant singularity theory with distinguished parameters, two case studies of resonant Hamiltonian systems, *Physica D*, **112**, (1998), 64–80.
22. HWB, C. Simó and J.C. Tatjer, Towards global models near homoclinic tangencies of dissipative diffeomorphisms, *Nonlinearity*, **11**(3), (1998), 667–770.
23. HWB, I. Hoveijn, G.A. Lunter and G. Vegter, Resonances in a Spring-Pendulum: algorithms for equivariant singularity theory, *Nonlinearity*, **11**(5), (1998), 1–37.
24. HWB and C. Simó, Hill's equation with quasi-periodic forcing: resonance tongues, instability pockets and global phenomena, *Bol. Soc. Bras. Mat.* **29**, (1998) 253–293.
25. HWB, F. Takens and F.O.O. Wagener, Integrable and non-integrable deformations of the skew Hopf bifurcation, *Regular and Chaotic Dynamics* **4**(2), (1999), 17–43.
26. HWB, I. Hoveijn, M. van Noort and G. Vegter, The inverted pendulum: a singularity theory approach, *Journ. Diff. Eqns.* **157**, (1999), 120–149.

27. HWB, The how and what of chaos, *Nieuw Arch. Wisk. 5th series* **1**(1), (2000), 34–43.
28. HWB and F.O.O. Wagener, Quasi-periodic stability of subfamilies of an unfolded skew Hopf bifurcation, *Archive Rat. Mech. An.* **152**, (2000), 283–326.
29. HWB and C. Simó, Resonance tongues in Hill's equations: a geometric approach, *Journ. Diff. Eqns.* **166**, (2000), 290–327.
30. HWB and C. Simó, Reducible linear quasi-periodic systems with positive Lyapunov exponent and varying rotation number, *Journ. Diff. Eqns.* **168**, (2000), 60–66.
31. HWB, Quasi-periodicity in dissipative systems, *MIHMI (Journ. Indonesian Math. Soc.)*, **7**(3), (2001), 7–33.
32. HWB, C. Simó and R. Vitolo, Bifurcations and strange attractors in the Lorenz-84 climate model with seasonal forcing. *Nonlinearity* **15**(4), (2002), 1205–1267.
33. HWB, A. Hagen and G. Vegter: Multiple purpose algorithms for invariant manifolds, *Dynamics of Continuous, Discrete and Impulsive Systems*, Series B: Applications and Algorithms, **10**(3), (2003), 331-34
34. HWB, I. Hoveijn, G.A. Lunter and G. Vegter, Bifurcations in Hamiltonian systems: Computing singularities by Gröbner bases. Springer *LNM* **1806**, 2003.
35. HWB and M. Golubitsky and G. Vegter, The geometry of resonance tongues: A Singularity Theory approach. *Nonlinearity* **16** (2003) 1511-1538.
36. HWB, H. Hanßmann, À. Jorba, J. Villanueva and F.O.O. Wagener, Normal-internal resonances in quasi-periodically forces oscillators: a conservative approach, *Nonlinearity* **16** (2003) 1751-1791.
37. HWB, C. Simó and J. Puig, Resonance tongues and instability pockets in the quasi-periodic Hill-Schrödinger equation, *Commun. Math. Phys.*, **241**, (2003) 467-503.
38. HWB, Coupled Hopf-bifurcations: Persistent examples of n -quasiperiodicity given by families of 3-jets, *Astérisque*, **286** (2003), 223-229.
39. HWB, Ken uw klassieken: Kolmogorov in het Concertgebouw. *Nederl. Tijdschr. voor Natuurkunde*, jaargang 70 nummer 1 (2004), 20-21.

40. HWB, KAM theory: the legacy of Kolmogorov's 1954 paper. *Bull. AMS (New Series)*, **41**(4) (2004), 507-521.
41. HWB, I. Hoveijn, M. van Noort, C. Simó and G. Vegter, The parametrically forced pendulum: a case study in $1\frac{1}{2}$ degree of freedom, *Journ. Dynamics and Differential Equations*, **16**(4) (2004), 897-947.
42. HWB, Kolmogorov, la 'K' de KAM, *Butlletí de la Societat Catalana de Matemàtiques*, **18**(2) (2004), 39-57.
43. HWB, H. Hanßmann and J. You, Bifurcations of normally parabolic tori in Hamiltonian systems, *Nonlinearity* **18** (2005) 1735-1769.
44. HWB, V. Naudot, R. Roussarie and K. Saleh, Bifurcations of a predator-prey model with non-monotonic response function, *C.R. Acad. Sci. Paris Ser. I* **341** (2005), 601-604.
45. HWB, Wiskunde als kritische succesfactor? *Euclides* **81**(6) (2006), 282-285.
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