

# Publication List Helmut Hofer<sup>1</sup>

## Journal Articles:

- (1) *A multiplicity result for a class of nonlinear problems with applications to a nonlinear wave equation.* Jour. of Nonlinear Analysis, Theory, Methods and Applications, 5, No. 1 (1981), 1-11
- (2) *Existence and multiplicity result for a class of second order elliptic equations.* Proc. of the Royal Society of Edinburgh, **88A** (1981), 83-92
- (3) *A new proof for a result of Ekeland and Lasry concerning the number of periodic Hamiltonian trajectories on a prescribed energy surface.* Bollettino UMI **6**, 1-B (1982), 931-942
- (4) *A variational approach to a wave equation problem at resonance.* Metodi asintotici e topologici in problemi differenziali non lineari; ed. L. Boccardo, A.M. Micheletti, Collano Atti di Congressi, Pitagora Editrice, Bologna (1981), 187-200
- (5) *On the range of a wave operator with nonmonotone nonlinearity.* Math. Nachrichten **106** (1982), 327-340
- (6) *Variational and topological methods in partially ordered Hilbert spaces.* Math. Annalen **261** (1982), 493-514
- (7) *On strongly indefinite functionals with applications.* Transactions of the AMS **275**, No. 1 (1983), 185-213
- (8) *A note on the topological degree at a critical point of mountainpass-type.* Proc. of the AMS **90**, No. 2 (1984), 309-315
- (9) *Homoclinic, heteroclinic and periodic orbits for indefinite Hamiltonian systems* (with J. Toland). Math. Annalen **268** (1984), 387-403
- (10) *The topological degree at a critical point of mountainpasstype.* AMS Proceedings of Symposia in Pure Math. **45**, Part 1 (1986) 501-509
- (11) *A geometric description of the neighborhood of a critical point given by the mountainpass-theorem.* Proc. of the London Math. Society **31** (1985), 566-570
- (12) *Periodic solutions of prescribed minimal period for convex Hamiltonian systems* (with I. Ekeland). Inv. Math. **81** (1985), 155-188

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- (13) *Free oscillations of prescribed energy at a saddle point of the potential in Hamiltonian dynamics* (with J. Toland). Delft Progress Report **10** (1985), 238-249
- (14) *Lagrangian embeddings and critical point theory*. Ann. IHP, Analyse Nonlineaire **6** (1985), 407-463
- (15) *Subharmonic solutions for convex non autonomous Hamiltonian systems* (with I. Ekeland). Comm. Pure and Appl. Math., Vol. XI, No. 1 (1987), 1-36
- (16) *Relations between global invariants of convex contact manifolds and local invariants of their periodic Hamiltonian trajectories*. Proc. of a Conference on Recent Advances in Hamiltonian Systems 1987, World Scientific (1987), 177-205
- (17) *Periodic solutions on hypersurfaces and a result by C. Viterbo* (with E. Zehnder). Inv. Math. **90** Fasc 1 (1987), 1-9
- (18) *Global and local invariants for convex hypersurfaces and their periodic trajectories; a survey*. (with I. Ekeland). Nato ASI Series C: **209**, Periodic solutions of Hamiltonian systems and related topics, (1987), 139-146
- (19) *A remark on a priori bounds for periodic solutions of Hamiltonian systems* (with V. Benci and P. Rabinowitz). Nato ASI Series C: **209**, Periodic solutions of Hamiltonian systems and related topics (1987), 85-88
- (20) *A strong form of the mountain pass theorem and application*. Nonlinear Diffusion Equations and their Equilibrium States I, Springer, MSRI Publications, 341-351
- (21) *Convex Hamiltonian energy surfaces and their periodic trajectories* (with I. Ekeland). Comm. in Math. Physics **113** (1987), 419-469
- (22) *Sur les hypersurfaces convexes et leurs caractéristiques fermées*. (with I. Ekeland), CRAS, Paris **304**, Serie I (1987), 237-240
- (23) *The Weinstein conjecture in cotangent bundles and related results* (with C. Viterbo). Annali di Scuola Normale Superiore di Pisa, Serie IV, Vol. XV, Fasc III (1988), 411-445
- (24) *Two symplectic fixed point theorems with applications to Hamiltonian dynamics* (with I. Ekeland). Journ. Math. Pure et Appl. **68** (1989), 467-489
- (25) *Liusternik–Schnirelman–theory for Lagrangian intersections*. Ann. IHP, Analyse Nonlinéaire **5**, no. 5 (1988), 465-499
- (26) *The Weinstein conjecture in  $P \times \mathbb{C}^e$*  (with A. Floer and C. Viterbo). Math. Zeit. **203** (1990), 469-482
- (27) *Symplectic topology and Hamiltonian dynamics* (with I. Ekeland). Math. Zeit. **200** (1989), 355-378

- (28) *Recent progress in symplectic geometry*. Lectures in Pure and Appl. Math **121**, 49-94 (Marcel Decker)
- (29) *Capacités symplectiques* (with I. Ekeland). CRAS, Paris, t. 307, Serie I (1988) 37-40
- (30) *Symplectic topology and Hamiltonian dynamics* (with I. Ekeland). Séminaire sur les Equations aux Dérivées Partielles 1987–1988, Exp. No XXIII 4pp Ecole Polytechnique, Palaiseau, 1988
- (31) *Symplectic topology and Hamiltonian dynamics II* (with I. Ekeland). Math. Zeit. **203** (1990), 553-567
- (32) *A new capacity for symplectic manifolds* (with E. Zehnder). Analysis et cetera (P. Rabinowitz, E. Zehnder eds.) Academic Press 1990, 405-428
- (33) *First order elliptic systems and the existence of homoclinic orbits in Hamiltonian systems* (with K. Wysocki). Math. Annalen **288** (1990), 483-503
- (34) *On the topological properties of symplectic maps*. Proceedings of the Royal Society of Edinburgh **115 A** (1990), 25-38
- (35) *The Weinstein conjecture in the presence of holomorphic spheres* (with C. Viterbo). Comm. Pure Appl. Vol. XLV (1992), 583-622
- (36) *Towards the definition of symplectic boundary* (with Y. Eliashberg). Geometric and Functional Analysis **2**, No. 2 (1992) 211-220
- (37) *Coherent orientation for periodic orbit problems in symplectic geometry* (with A. Floer). Math. Zeit. **212** (1993), 13-38
- (38) *Symplectic homology I: Open sets in  $C^n$*  (with A. Floer), Math. Zeit. **215** (1994), 37-88
- (39) *Symplectic homology II: A General Construction* (with K. Cieliebak, A. Floer and K. Wysocki ). Math. Zeit. **218** (1995), 103-122
- (40) *Applications of symplectic homology I* (with A. Floer and K. Wysocki). Math. Zeit. **217** (1994), 577-606
- (41) *Symplectic capacities*. Proceedings of the Durham Conference on Low-Dimensional Topology, (edited by S. Donaldson and C. Thomas), Cambridge University Press, London Mathematical Society Lecture Notes 151 (1990)
- (42) *Topological properties of symplectic maps*. Pitman Research Notes on Mathematics **243** (1992), 113-119
- (43) *Symplectic invariants*. Proceedings of the ICM Kyoto 1990, Springer 1991, 521-528
- (44) *An energy-capacity inequality for the symplectic holonomy of hypersurfaces flat at infinity* (with Y. Eliashberg). Symplectic

- Geometry, edited by D. Salamon, London Mathematical Society Lecture Note Series **192** (1993), 95-114
- (45) *Floer homology and Novikov rings* (with D. Salamon). The Floer Memorial Volume, Progress in Math. Vol. 133, Birkhäuser
  - (46) *Estimates for the energy of a symplectic map*. Comm. Math. Helv. **68**(1993), 48-72
  - (47) *Unseen symplectic boundaries* (with Y. Eliashberg). Volume in honour of E. Calabi
  - (48) *Pseudoholomorphic curves in symplectisation with applications to the Weinstein conjecture in dimension three*. Inv. Math. 114(1993), 515-563
  - (49) *A Hamiltonian characterization of the three-ball* (with Y. Eliashberg). Journal of Differential and Integral Equations, Vol.7 No.5 (1994), 1303-1324
  - (50) *Transversality results in the elliptic Morse theory of the action functional* (with A. Floer and D. Salamon). Duke Mathematical Journal, Vol. 80 No. 1 (1995), 251-292
  - (51) *Properties of pseudoholomorphic curves in symplectisations II: Embedding controls and algebraic invariants* (with K. Wysocki and E. Zehnder). Geometric and Functional Analysis, Vol. 5 No.2 (1995), 270-328
  - (52) *A Characterisation of the Tight Three-Sphere* (with K. Wysocki and E. Zehnder). Duke Mathematical Journal, Vol. 81, No. 1 (1995), 159-226
  - (53) *Lagrangian intersections in contact geometry* (with Y. Eliashberg and D. Salamon). Geometric and Functional Analysis, Vol.5 No. 2 ( 1995), 244-269
  - (54) *Symplectic invariants and Hamiltonian dynamics* (with E. Zehnder). The Floer Memorial Volume, Progress in Mathematics 133, Birkhäuser 1995
  - (55) *Properties of pseudoholomorphic curves in symplectisations I: Asymptotics* (with K. Wysocki and E. Zehnder). Ann. Inst. Henri Poincaré, Analyse Nonlineaire, Vol. 13, No.3 (1996), 337-379
  - (56) *Applications of symplectic homology II* (with K. Cieliebak, A. Floer and K. Wysocki). Math. Zeit. **223** (1996), 27-45
  - (57) *Properties of pseudoholomorphic curves in symplectisations IV: Asymptotics with degeneracies* (with K. Wysocki and E. Zehnder), Contact and Symplectic Geometry, edited by C. Thomas, Cambridge University Press 1996

- (58) *On genericity for holomorphic curves in 4-dimensional almost-complex manifolds* (with V. Lizan and J.-C. Sikorav). Journal of Geometric Analysis, Vol. 7, No. 1, 1998
- (59) *The Dynamics on Three-Dimensional Strongly Convex Energy Surfaces* (with K. Wysocki and E. Zehnder). Annals of Mathematics, Vol. 148 (1998), 197-289
- (60) *Unknotted periodic orbits for Reeb flows on the three-sphere* (with K. Wysocki and E. Zehnder). Topol. Meth. in Nonli. Analysis **7** (1996), 219–244
- (61) *Holomorphic curves in contact dynamics* (with M. Kriener). Proceedings of Symposia in Pure Mathematics Vol. 66 (1999), 77-131
- (62) *A Characterisation of the Tight Three-Sphere II* (with K. Wysocki and E. Zehnder). Comm. Pure Appl. Math. Vol LII (1999), 1139-1177
- (63) *Properties of pseudoholomorphic curves in symplectisations III: Fredholm theory* (with K. Wysocki and E. Zehnder). In Progress in Nonlinear Differential Equations and Their Applications Vol. 35 (Ed. J. Escher and G. Simonett), 381-477
- (64) *Holomorphic curves and dynamics in dimension three*. IAS/Park City Math. Ser. Vol. 7, AMS 1999, 35-101
- (65) *Pseudoholomorphic curves and dynamics* (with E. Zehnder). "The Arnold-Fest", Fields Inst. Commun. AMS, 1999, 225-239
- (66) *Dynamics, Topology and Holomorphic Curves*. Proceedings of the ICM Berlin, vol. I
- (67) *Introduction to Symplectic Field Theory* (with Y. Eliashberg and A. Givental), GAFA 2000, Special Volume, Part II, pp560-673
- (68) *Holomorphic curves and real three-dimensional dynamics*, GAFA 2000, Special Volume, part II, pp674-704
- (69) *Pseudoholomorphic curves and dynamics in three dimensions* (with K. Wysocki and E. Zehnder). Handbook on Dynamical Systems Vol. 1A, Elsevier (2002), 1129-1188
- (70) *Finite Energy Cylinders of Small Area* (with K. Wysocki and E. Zehnder). Journal of Ergodic Theory and Dynamical Systems Vol. 22 No. 5 (2002), 1451–1486
- (71) *Finite Energy Foliations Of Tight Three-Spheres and Hamiltonian Dynamics* (with K. Wysocki and E. Zehnder). Annals Vol. 157 No. 1 (2003), 125-255

- (72) *Compactness Results in Symplectic Field Theory* (with F. Bourgeois, Y. Eliashberg, K. Wysocki and E. Zehnder). *Geometry and Topology* Vol. 7 (2004), 799-888
- (73) *The Weinstein Conjecture for Planar Contact Structures in Dimension Three* (with C. Abbas and K. Cieliebak), *Comment. Math. Helv.* 80 (2005), no. 4, 771–793
- (74) *A General Fredholm Theory and Applications*, Current Developments in Mathematics, 2004, Year Published: 2006, Ed. Barry Mazur, Harvard University; Wilfried Schmid, Harvard University; Shing-Tung Yau, Harvard University; David Jerison, M.I.T.; Tomasz Mrowka, M.I.T.; Richard Stanley, M.I.T., International Press
- (75) Quantitative symplectic geometry (with K. Cieliebak, J. Latschev and F. Schlenk), *Dynamics, ergodic theory, and geometry*, 1–44, *Math. Sci. Res. Inst. Publ.*, 54, Cambridge Univ. Press, Cambridge, 2007
- (76) *A General Fredholm theory I: A splicing-based differential geometry*, *JEMS*, Vol. 9, No. 4, (2007), 841-876
- (77) *A General Fredholm Theory II: Implicit Function Theorems* (with K. Wysocki and E. Zehnder), *GAFA* Volume 19, Number 1, (2009), 206-293
- (78) *On the Weinstein conjecture in higher dimensions* (with P. Albers), *Comment. Math. Helv.* Volume 84, Issue 2, (2009), 429-436
- (79) *A General Fredholm Theory III: Fredholm Functors and Polyfolds* (with K. Wysocki and E. Zehnder), *Geometry and Topology* 13:4, (2009), 2279-2387
- (80) *Integration theory on the zero sets of polyfold Fredholm sections* (with K. Wysocki and E. Zehnder), *Math. Ann.* 346, (2010), 139-198
- (81) *Sc-Smoothness, Retractions and New Models for Smooth Spaces* (with H. Hofer, K. Wysocki and E. Zehnder), *Discrete and Continuous Dynamical Systems*, Vol 28 (2), (2010), 665-788
- (82) *Global Surfaces of Section in the Planar Restricted Three-Body Problem* (with P. Albers, J. Fish, U. Frauenfelder and O. van Koert), *Arch. Ration. Mech. Anal.* 204 (2012), no. 1, 273-284
- (83) *First Steps Towards a Symplectic Dynamics* (with B. Bramham), *Surv. Differ. Geom.*, 17, Int. Press, Boston, MA, 2012, 127-177
- (84) *Feral Pseudoholomorphic Curves and Minimal Sets* (with J. Fish), *Oberwolfach Report* 12 (2015), no. 3

- (85) *Polyfolds and Fredholm Theory*, Lectures on Geometry, Clay Lecture Notes Series, edited by N. Woodhouse, Oxford University Press 2017, 87-156
- (86) *Applications of Polyfold Theory I: Gromov-Witten Theory* (with K. Wysocki and E. Zehnder), Memoirs of the AMS, Vol 248, number 1179 (2017) , 224 pages
- (87) *Exhaustive Gromov Compactness for Pseudoholomorphic Curves* (with J. Fish), Asterisque Vol 415 (2020), 87-112.
- (88) *Almost Existence from the Feral Curve Perspective and Some Questions* (with J. Fish), Ergodic Theory and Dynamical Systems, 1-43. doi:10.1017/etds.2021.20

#### **Books: Mathematical**

- (1) *Symplectic Invariants and Hamiltonian Dynamics* (with E. Zehnder). Advanced Texts in Mathematics, Birkhäuser
- (2) *The Floer Memorial Volume* (edited jointly with C. Taubes, A. Weinstein and E. Zehnder), Progress in Mathematics Vol. 133, Birkhäuser
- (3) *Holomorphic Curves and Global Questions in Contact Geometry* (with C. Abbas), Birkhäuser Advanced Texts / Basler Lehrbücher A Series of Advanced Textbooks in Mathematics, XII, 322 pages, 2019
- (4) *Polyfold and Fredholm Theory* (with K. Wysocki and E. Zehnder) Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, A Series of Modern Surveys in Mathematics 72, Springer, 1023 pages, 2021

#### **Books: Non-mathematical**

- (1) *Innovation, Venture Capital, Arbeitsplaetze* (Edited jointly with A. Scheidegger and G. Scheuenstuhl, in German ) Haupt Verlag

#### **Preprints:**

- (1) *Feral pseudoholomorphic curves and minimal sets*, (with J. Fish), 154 pages (2018), submitted.
- (2) *Polyfold and SFT Notes I: A Primer on Polyfolds and Construction Tools*, 68 pages (2018), arxiv:1806.07025.
- (3) *Polyfold and SFT Notes II: Local-Local M-Polyfold Constructions*, 123 pages (2018), arxiv:1808.04939
- (4) *Lectures on Polyfolds and Symplectic Field Theory* (with J. Fish), 134 pages, arxiv:1808.07147.

#### **In Preparation:**

- (1) *Polyfold Constructions: Tools, Techniques, and Functors* (with J. Fish), book in preparation.