

1 Themen Masterseminar Wintersemester 2016-17

betreut durch Uwe Thiele (UT)¹ und Raphael Wittkowski (RW)²

1.1 UT: Räumliche Lokalisierung in dissipativen Systemen

Spatial Localization in Dissipative Systems

Literatur: [1, 2] and references therein

1.2 UT: Muster und kollektives Verhalten in granularen Medien

Patterns and collective behavior in granular media

Literatur: [3, 4, 5] and references therein

1.3 UT: Knitter-, Falt- und Runzelinstabilitäten

Buckling and wrinkling instabilities

Literatur: [6, 7, 8] and references therein

1.4 UT: Hydrodynamik schwimmender Mikroorganismen

The hydrodynamics of swimming microorganisms

Literatur: [9, 10, 11] and references therein

1.5 UT: Parity-breaking bifurcation in a one-dimensional pattern

Paritätsbrechende Bifurkation in eindimensionalen Mustern

Literatur: [12, 13, 14] and references therein

1.6 RW: Dissipative Solitonen

Dissipative solitons

Literatur: [15, 16, 17] and references therein

1.7 RW: Motilitätsinduzierte Phasenseparation

Motility-induced phase separation

Literatur: [18, 19] and references therein

1.8 RW: Tschirikow-Taylor-Standardabbildung

Chirikov-Taylor standard map

Literatur: [20] and [21, p. 11 und 178-179, section 8.5 *The Standard Map* in] and references therein

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References

- [1] E. Knobloch. Spatially localized structures in dissipative systems: open problems. *Nonlinearity*, 21:T45–T60, 2008. doi:10.1088/0951-7715/21/4/T02.
- [2] E Knobloch. Spatial localization in dissipative systems. *Annu. Rev. Condens. Matter Phys.*, 6:325–359, 2015. doi:10.1146/annurev-conmatphys-031214-014514.
- [3] IS Aranson and LS Tsimring. Patterns and collective behavior in granular media: Theoretical concepts. *Rev. Mod. Phys.*, 78:641–692, 2006. doi:10.1103/RevModPhys.78.641.
- [4] JL Vinningland, O Johnsen, EG Flekkoy, R Toussaint, and KJ Maloy. Granular rayleigh-taylor instability: Experiments and simulations. *Phys. Rev. Lett.*, 99:048001, 2007. doi:10.1103/PhysRevLett.99.048001.
- [5] DM Winterbottom, SM Cox, and PC Matthews. Pattern formation in a model of a vibrated granular layer. *SIAM J. Appl. Dyn. Syst.*, 7:63–78, 2008. doi:10.1137/06067540X.
- [6] J Genzer and J Groenewold. Soft matter with hard skin: From skin wrinkles to templating and material characterization. *Soft Matter*, 2:310–323, 2006. doi:10.1039/b516741h.
- [7] H Diamant and TA Witten. Shape and symmetry of a fluid-supported elastic sheet. *Phys. Rev. E*, 88:012401, 2013. doi:10.1103/PhysRevE.88.012401.
- [8] S Knoche and J Kierfeld. Buckling of spherical capsules. *Phys. Rev. E*, 84:046608, 2011. doi:10.1103/PhysRevE.84.046608.
- [9] E Lauga and TR Powers. The hydrodynamics of swimming microorganisms. *Rep. Prog. Phys.*, 72:096601, 2009. doi:10.1088/0034-4885/72/9/096601.
- [10] E Lauga. Life around the scallop theorem. *Soft Matter*, 7:3060–3065, 2011. doi:10.1039/c0sm00953a.
- [11] N Cohen and JH Boyle. Swimming at low reynolds number: a beginners guide to undulatory locomotion. *Contemp. Phys.*, 51:103–123, 2010. doi:10.1080/00107510903268381.
- [12] P Brunet, JM Flesselles, and L Limat. Parity breaking in a one-dimensional pattern: A quantitative study with controlled wavelength. *Europhys. Lett.*, 56:221–227, 2001. doi:10.1209/epl/i2001-00509-0.
- [13] P Brunet, JM Flesselles, and L Limat. Dynamics of a circular array of liquid columns. *Eur. Phys. J. B*, 55:297–322, 2007. doi:10.1140/epjb/e2007-00057-y.
- [14] RE Goldstein, GH Gunaratne, L Gil, and P Coulet. Hydrodynamic and interfacial patterns with broken space-time symmetry. *Phys. Rev. A*, 43:6700–6721, 1991. doi:10.1103/PhysRevA.43.6700.
- [15] N. Akhmediev and A. Ankiewicz. *Dissipative Solitons*. Lecture Notes in Physics. Springer Berlin Heidelberg, 2005. ISBN: 978-3-540-23373-2. URL: <https://books.google.de/books?id=IiTn0iZCOYC>.
- [16] N. Akhmediev and A. Ankiewicz. *Dissipative Solitons: From Optics to Biology and Medicine*. Lecture Notes in Physics. Springer Berlin Heidelberg, 2008. ISBN: 978-3-540-78216-2. URL: <https://books.google.de/books?id=64VrCQAAQBAJ>.
- [17] HG Purwins, HU Bodeker, and S Amiranashvili. Dissipative solitons. *Adv. Phys.*, 59:485–701, 2010. doi:10.1080/00018732.2010.498228.
- [18] ME Cates and J Tailleur. Motility-induced phase separation. *Annu. Rev. Condens. Matter Phys.*, 6:219–244, 2015. doi:10.1146/annurev-conmatphys-031214-014710.
- [19] J Bialke, H Löwen, and T Speck. Microscopic theory for the phase separation of self-propelled repulsive disks. *Europhys. Lett.*, 103:30008, 2013. doi:10.1209/0295-5075/103/30008.
- [20] B V Chirikov. A universal instability of many-dimensional oscillator systems. *Phys. Rep.*, 52(5):264–379, may 1979. URL: [http://dx.doi.org/10.1016/0370-1573\(79\)90023-1](http://dx.doi.org/10.1016/0370-1573(79)90023-1), doi:10.1016/0370-1573(79)90023-1.
- [21] S.N. Rasband. *Chaotic Dynamics of Nonlinear Systems*. Dover Books on Physics. Dover Publications, 2015. URL: <https://books.google.de/books?id=61x2CQAAQBAJ>.