

Basic notions and general theory

- Arnold, V. I., Goryunov, V. V., Lyashko, O. V. & Vasiliev, V.A. (1992). *Singularities I*. Encyclopedia of Math. Sciences, Vol. 6. Springer. (Russian edition 1988).
- Arnold, V. I., Goryunov, V. V., Lyashko, O. V. & Vasiliev, V.A. (1992). *Singularity Theory II: Classification and Applications*. Encyclopedia of Math. Sciences, Vol. 39. Springer. (Russian edition 1988).
- Arnold, V. I., Gusein-Zade, S. M. & Varchenko, A. N. (1988). *Singularities of Differentiable Maps, Vol.1*. Birkhäuser Boston.
- Bruce, J. W., Du Plessis, A. A. & Wall, C. T. C. (1987). Determinacy and unipotency. *Invent. Math.* **88**, 521–554.
- Damon, J. (1983). The unfolding and determinacy theorems for subgroups of  $\mathcal{A}$  and  $\mathcal{K}$ . In *Singularities: Proc. Symp. Pure Math.* **40**, Part 1, pp.233–254. AMS.
- Damon, J. (1984). The unfolding and determinacy theorems for subgroups of  $\mathcal{A}$  and  $\mathcal{K}$ . *Memoirs AMS* no.306.
- Damon, J. (1995). Applications of singularity theory to the solutions of nonlinear equations. In *Topological Nonlinear Analysis* (pp. 178-302). Birkhäuser Boston.
- Golubitsky, M. & Guillemin, V. (1973). *Stable Mappings and Their Singularities*. Springer.
- Gromoll, D. & Meyer, W. (1969). On differentiable functions with isolated critical points. *Topology* **8**, 361–369.
- Hörmander, L. (2007). *The Analysis of Linear Partial Differential Operators III: Pseudo-differential Operators*. [Appendix C]. Springer.
- Martinet, J. (1982). *Singularities of Smooth Functions and Maps* (LMS Lecture Notes Vol. 58). Cambridge University Press.
- Martinet, J. (1976). Déploiements versels des applications différentiables et classification des applications stables. In *Singularités d'Applications Différentiables*, Lecture Notes in Math. **535**, pp.1–44. Springer.
- Mather, J. (1968–1971). Stability of  $C^\infty$  mappings:
- I. The division theorem, *Ann. Math.* **89** (1969), 89–104.
  - II. Infinitesimal stability implies stability, *Ann. Math.* **89** (1969), 254–291.
  - III. Finitely determined map germs, *IHES Publ. Math.* **36** (1968), 127–156.
  - IV. Classification of stable germs by  $\mathbf{R}$ -algebras, *IHES Publ. Math.* **37** (1969), 223–248.
  - V. Transversality, *Adv. Math.* **4** (1970), 301–336.
  - VI. The nice dimensions. In *Proc. Liverpool Singularities Symposium I*, Lecture Notes in Math. **192** (1971), pp. 207–253. Springer.
- Thom, R. & Levine, H. (1971). Singularities of differentiable mappings. In *Proc. Liverpool Singularities Symposium I*, Lecture Notes in Math. **192**, pp.1–89. Springer.
- Whitney, H. (1955). On singularities of mappings of Euclidean spaces I. Mappings of the plane into the plane. *Ann. of Math.* **62**, 374–410.

## Real-valued functions and catastrophe theory

- Arnold, V. I. (1975). Critical points of smooth functions and their normal forms, *Russ. Math. Surv.* **30**, 1–75.
- Arnold, V. I. (1992). *Catastrophe Theory*. Springer.
- Bröcker, T. & Lander, L. C. (1975). *Differentiable Germs and Catastrophes*. (LMS Lecture Notes Vol. 17). Cambridge University Press.
- Castrigiano, D. P. L. & Hayes, S. A. (2004). *Catastrophe Theory*. (2nd edition). Westview.
- Gilmore, R. (1981). *Catastrophe Theory for Scientists and Engineers*. Wiley.
- Golubitsky, M. (1978). An introduction to catastrophe theory and its applications. *Siam Review*, **20**, 352–387.
- Poston, T., & Stewart, I. (1978). *Catastrophe Theory and its Applications*. Pitman.
- Thom, R. (1975). *Structural Stability and Morphogenesis*. Benjamin.
- Wassermann, G. (1974). *Stability of Unfoldings*. Lecture Notes in Math. **393**. Springer.
- Zeeman, E. C. (1977). *Catastrophe Theory: Selected Papers, 1972–1977*. Addison-Wesley.

## Evolutes, outlines and caustics

- Bruce, J. W. (1984). Seeing — the mathematical viewpoint. *Math. Intelligencer*, **6**, 18–25.
- Bruce, J. W. (1984). Motion pictures: an application of singularity theory. *J. London Math. Soc.* **2**, 160–170.
- Bruce, J. J. W., & Giblin, P. J. (1992). *Curves and Singularities: a geometrical introduction to singularity theory*. Cambridge University Press.
- Damon, J., Giblin, P., & Haslinger, G. (2009). Local image features resulting from 3-dimensional geometric features, illumination, and movement: I. *Int. J. Computer Vision* **82**, 25–47.
- Damon, J., Giblin, P., & Haslinger, G. (2011). Local image features resulting from 3-dimensional geometric features, illumination, and movement: II. *SIAM J. Imaging Sciences*, **4**, 386–412.

## Gravitational lensing

- Aazami, A. B., Petters, A. O., & Rabin, J. M. (2011). Orbifolds, the A, D, E family of caustic singularities, and gravitational lensing. *J. Math. Phys.*, **52**, 022501.
- Kakigi, Y., Okamura, T., & Fukuyama, T. (1995). Gravitational lensing and catastrophe theory. *Int. J. Mod. Phys. D* **4**, 685–710.
- Mollerach, S. & Roulet, E. (2000). Gravitational lensing as folds in the sky. *Int. J. Mod. Phys. A* **15**, 4083–4097.
- Petters, A. O. (1993). Arnold’s singularity theory and gravitational lensing. *J. Math. Phys.* **34**, 3555–3581.
- Petters, A. O., Levine, H. & Wambsganss, J. (2001). *Singularity Theory and Gravitational Lensing*. Birkhäuser Boston.

## **Bifurcation theory**

Golubitsky, M. & Schaeffer, D. (1979). A theory for imperfect bifurcation via singularity theory. *Comm. Pure Appl. Math.* **32**, 21–98.

Wassermann, G. (1975). Stability of unfoldings in space and time. *Acta Mathematica* **135**, 57–128.

## **Nonlinear operators**

Ambrosetti, A. & Prodi, G. (1995). *A Primer of Nonlinear Analysis*. Cambridge University Press.

Berger, M. S., Church, P. T., & Timourian, J. G. (1985). Folds and cusps in Banach spaces, with applications to nonlinear partial differential equations. I. *Indiana Univ. Math. J.* **34**, 1–19.

Berger, M. S., Church, P. T., & Timourian, J. G. (1988). Folds and cusps in Banach spaces with applications to nonlinear partial differential equations. II. *Trans. AMS* **307**, 225–244.

Damon, J. (1986). A theorem of Mather and the local structure of nonlinear Fredholm maps. In *Proc. Symp. Pure Math.* **45**, Part I, pp. 339–352. AMS.

Hale, J. K. & Rodrigues, H. M. (1977). Bifurcation in the Duffing equation with independent parameters, I. *Proc. Roy. Soc. Edinburgh A*, **77**, 57–65.

Hale, J. K. & Rodrigues, H. M. (1978). Bifurcation in the Duffing equation with independent parameters, II. *Proc. Roy. Soc. Edinburgh A*, **79**, 317–326.

DRJC: BCAM January 2014