

Dr. Hans Engler

Curriculum Vitae

Permanent Affiliation

Professor of Mathematics
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Personal Information

Born 1953 in Lengerich, Germany
Married, two children
U.S. and German citizen

Education

1971 - 1975 Universität Münster, Germany
1975 - 1981 Universität Heidelberg, Germany
1976: Diplom-Mathematiker (M.S. in Mathematics)
1981: Dr. rer. nat (Ph.D.) in Mathematics

Professional History

1973 - 1979: Teaching assistant in Münster and Heidelberg
1979 - 1981: Research associate, Institut für Angewandte Mathematik, Heidelberg
1981 - 1982: Postdoctoral visitor, Mathematical Research Center, University of Wisconsin - Madison
1983 - 1983: Instructor, Dept. of Mathematics, Northwestern University, Evanston, IL
1983 - 1984: Instructor, Dept. of Mathematics, The University of Texas at Austin
1984 - present: Department of Mathematics, Georgetown University, Washington, DC
1988 - present: Guest researcher, Electronics and Electrical Engineering Laboratory, NIST, Gaithersburg, MD
1990 - 1991: Visiting Scientist, Institut für Angewandte Mathematik, Universität Bonn, Germany
1997 - 2000, 2003, 2006, 2008: Program director for Applied Mathematics, Division of Mathematical Sciences, National Science Foundation, Arlington, VA

Scientific Interests

Applied Mathematics: Continuum Mechanics, Material Science, Signal Processing
Analysis: Ordinary and Partial Differential Equations, Integral Equations, Calculus of Variations
Numerical Analysis
Statistics

Consulting Experience

Testing and quality assurance of electronic devices
Evaluation of picosecond measurements
Analysis of high-dimensional data sets
Analysis of customer satisfaction data
Evaluation of cryptographical schemes
Statistical expert witness

Teaching Experience (Courses and Tutorials)

Precalculus, Business Calculus, Calculus I & II, Multivariable Calculus, Linear Algebra
Introductory Statistics, Mathematics in Society*
Applied Linear Algebra*, Complex Variables, Differential Geometry, Advanced
Calculus, Ordinary Differential Equations, Numerical Analysis, Mathematical
Optimization*, Mathematical Statistics, Cryptography*, Stochastic Processes*, Game
Theory*, History of Mathematics*
Data Mining and Data Exploration*, Computational Methods in Statistics*, Statistical
Consulting Practicum
Supervision of undergraduate honors theses in graph theory, cryptography, and stochastic
simulation
*Courses or tutorials with asterisks * were introduced or designed*

Administrative Experience and Service

1992 - 1997: Department Chair. Supervision of department of about 15 members, course
scheduling, curriculum supervision, budget preparation, merit and promotion evaluations.
1997 - 2000 (full time), 2003, 2006, 2008 (part time): Program director, National Science
Foundation. Solely or jointly responsible for review management, funding decisions, and
award administration for about 500 research and training proposals in Mathematics,
Science and Engineering.
2003: Chaired working group for Master of Science proposal in mathematics and
statistics
Since 2005: Graduate director for Master of Science program in mathematics and
statistics
Departmental hiring committees, undergraduate advising, colloquium organizer
College admission committees, College Executive Council
Main Campus Planning Committee, Faculty Grievance Code Committee, Main Campus

Honor Council, Main Campus Executive Faculty, University Senate
Reviewer for Mathematical Reviews and Zentralblatt für Mathematik
Referee for archival journals and book proposals
Reviewer and panelist for NSF and NDSEG

Membership in Professional Societies

American Mathematical Society
Society for Industrial and Applied Mathematics
American Statistical Association

Languages

Bilingual in English and German, French, some Italian

Technology

Matlab, Mathematica, Mathcad, Minitab, R
Microsoft Office, HTML

Publications

1. Functional-differential equations in Banach spaces: growth and decay of solutions, *J. Reine Angew. Math* **322** (1981), 53-73
2. Invariant sets for functional-differential equations in Banach spaces and applications, *Nonlinear Anal.* **5** (1981), 1225-1243
3. A version of the chain rule and integro-differential equations in Hilbert spaces, *SIAM J. Math. Anal.* **13** (1982), 801-810
4. On some parabolic integro-differential equations: existence and asymptotics of solutions, *Equadiff 82* (Wuerzburg, 1982), *Lecture Notes in Math.* 1017, 161-167, Springer, Berlin, 1983
5. Stabilization of solutions for a class of parabolic integro-differential equations, *Nonlinear Anal.* **8** (1984), 1337-1371
6. Bounds and asymptotics for a scalar Volterra integral equation, *J. Integral Equations* **7** (1984), 209-227
7. Relations between travelling wave solutions of quasilinear parabolic equations, *Proc. Amer. Math. Soc.* **93** (1985), 297-302
8. On nonlinear scalar Volterra integral equations. I, *Trans. Amer. Math. Soc.* **291** (1985), 319-336
9. (with Olof Staffans), On a Volterra integro-differential equation with several nonlinearities, *Houston J. Math.* **11** {1985}, 299-306
10. Contractive properties for the heat equation in Sobolev spaces, *J. Funct. Anal.* **64** (1985), 412-435
11. A note on scalar Volterra integral equations. II, *J. Math. Anal. Appl.* **115** (1986), 363-395
12. On Hamilton-Jacobi equations in bounded domains, *Proc. Roy. Soc. Edinburgh Sect.*

A **102** (1986), 221-242

13. Existence of regular solutions for semilinear parabolic integro-differential equations, *Ann. Mat. Pura Appl.* (4) **144** {1986}, 23-47

14. Strong solutions for strongly damped quasilinear wave equations, in: *The legacy of Sonya Kovalevskaya* (Cambridge, Mass., and Amherst, Mass., 1985)}, *Contemp. Math.* **64**, 219-237, Amer. Math. Soc., Providence, RI, 1987

15. On the dynamic shear flow problem for viscoelastic liquids, *SIAM J. Math. Anal.* **18** (1987), 972-990

16. Existence of radially symmetric solutions of strongly damped wave equations, in: *Nonlinear semigroups, partial differential equations and attractors* (Washington, D.C., 1985), *Lecture Notes in Math.* **1248**, 40-51, Springer, Berlin, 1987

17. (with F. Neubrander and J. Sandefur) Strongly damped semilinear second order equations, in: *Nonlinear semigroups, partial differential equations and attractors* (Washington, D.C., 1985), *Lecture Notes in Math.* **1248**, 52-62, Springer, Berlin, 1987

18. Asymptotic properties of solutions of nonlinear Volterra integro-differential equations, *Results Math.* **13** (1988), 65-80

19. An alternative proof of the Brezis-Wainger inequality, *Comm. Partial Differential Equations* **14** (1989), 541-544

20. Global regular solutions for the dynamic antiplane shear problem in nonlinear viscoelasticity, *Math. Z.* **202** (1989), 251-259

21. Boundary value problems for weak solutions of a class of quasilinear hyperbolic integrodifferential equations, in: *Volterra integrodifferential equations in Banach spaces and applications* (Trento, 1987), *Pitman Res. Notes Math. Ser.* **190**, 111-140, Longman Sci. Tech., Harlow, 1989

22. On quasilinear hyperbolic integrodifferential equations in unbounded domains, in: *Nonlinear semigroups, partial differential equations and attractors* (Washington, DC, 1987), *Lecture Notes in Math.* **1394**, 44-55, Springer, Berlin, 1989

23. {with Bernhard Kawohl and Stephan Luckhaus), Gradient estimates for solutions of parabolic equations and systems, *J. Math. Anal. Appl.* **147** (1990), 309-329

24. Weak solutions of a class of quasilinear hyperbolic integrodifferential equations describing viscoelastic materials. *Arch. Rational Mech. Anal.* **113** (1991), 1 - 38. *Corrigendum*, *Arch. Rat. Mech. Anal.* **130** (1995), 401.

25. (with Suzanne Lenhart) Viscosity solutions for weakly coupled systems of Hamilton-Jacobi equations. *Proc. London Math. Soc.* **63** no. 3 (1991), 212 - 240.

26. A matrix Volterra integrodifferential equation occurring in polymer rheology. *Pacific J. Math.* **149** (1991), 25 - 60.

27. (with Georg Hetzer) Convergence to equilibria for a class of reaction-diffusion systems. *Osaka J. Math.* **29** (1992), 471 - 481.

28. On semilinear evolution equations with many Lyapunov functionals. *Differential and Integral Equations* **5** (1992), 1069 - 1088.

29. Strong solutions of quasilinear integrodifferential equations with singular kernels in several space dimensions. *Electronic J. Differential Eq.* vol. 1995, No. 02, pp. 1 - 16.

30. Global smooth solutions for a class of parabolic integrodifferential equations. *Transaction of the American Math. Soc.* **348** (1996), 267 - 290.

31. Similarity solutions for a class of hyperbolic integrodifferential equations. *Differential and Integral Equations* vol. **10** (1997), 815 - 840.

32. The behavior of the QR-factorization algorithm with column pivoting. *Applied Math. Letters* vol **10** (1997), 7 - 11.
33. An example of Lp-regularity for a class of hyperbolic integrodifferential equations. *Proc. Volterra Centennial Symposium* (Arlington, TX 1996, C. Corduneanu and I. W. Sandberg, ed.), Gordon and Breach, Amsterdam 2000, pp. 67 - 82.
34. (with M. Souders and G. N. Stenbakken) Efficient testing of electronic devices. *Proceedings Interface '97* (Houston, TX 1997), *Computing Science and Statistics*, Vol **29**, pp. 592 - 596.
35. (with A. D. Koffman, T. M. Souders, and G. N. Stenbakken) High-Dimensional Empirical Linear Prediction (HELP) Toolbox User's Guide, Version 2.2, NIST Technical Note **1428**, *Natl. Inst. Stand. Technol. (U.S.)*, 28 pages (May 1999).
36. (with X. Han, G. N. Stenbakken, F. J. Von Zuben) Application of Neural Networks in the Development of Nonlinear Error Modeling and Test Point Prediction, *Proc. of 17th Instrumentation and Measurement Technology Conference (IMTC/2000)*, Baltimore, MD, pp. 641-646.
37. (with D. Bergman) Improved IDDQ Testing with Empirical Linear Prediction. *Proc. IEEE International Test Conference 2002*, Baltimore, MD, pp. 954-963. IEEE Computer Society 2002.
38. Asymptotic Stability of Traveling Wave Solutions for Perturbations with Algebraic Decay. *Journal of Differential Equations* **185** (2002), 348-369
39. (with J. Pruess and Glenn F. Webb) Analysis of a model for the dynamics of prions II. (2005). *J. Math. Anal. Appl.* **324** (2006), 98–117.
40. Asymptotic Self-Similarity for Solutions of Partial Integro-Differential Equations. *Z. f. Analysis u. Anwendungen* **26** (2007), 417 - 438.
41. (with A. Cabot and S. Gadat) On the long time behavior of second order differential equations with asymptotically small dissipation. 2007, 35 pp. *Transaction of the American Math. Soc.*, to appear. Preprint at <http://arxiv.org/abs/0710.1107>.
42. (with A. Cabot and S. Gadat) On second order differential equations with asymptotically small dissipation. 2008, 13 pp. Submitted to *electronic J. of Differential Equations*.
43. Random search algorithms for the sparse null vector problem. 2008, 15 pp. Submitted to *Linear Algebra and its Applications*. Preprint at <http://arxiv.org/abs/0804.3411>.