

# curriculum vitae

Martin H. Gutknecht

December 21, 2010

## Persönliche Daten, akademische Grade

1. Okt. 1944 geboren in Bern  
Mai 1969 dipl. Math. ETH  
Feb. 1973/Mar. 1974 Dr. sc. math. (ETH Zürich)  
Apr. 1977 Heirat mit Ursula Zimmerli  
(3 Kinder: Stefan 1979, Andreas 1981, Simon 1987)  
Okt. 1980 Habilitation, Privatdozent an der ETH Zürich  
Sep. 1997 Titularprofessor an der ETH Zürich

## Ausbildung, Anstellungen, Gastaufenthalte

- 1951 – 1955 Primarschule in Köniz (Kt. Bern)  
1955 – 1959 Städtisches Progymnasium Bern  
1959 – 1963 Städtisches Gymnasium Bern; Maturität Typ C (Sept. 1963)  
1963 – 1964 Universität Bern (Mathematik, Astronomie, Physik)  
1964 – 1969 Abteilung für Mathematik und Physik der ETH Zürich, Diplom in Mathematik (Okt. 1968 – Mai 1969)  
1968 – 1973 Assistent bei Prof. A. Huber (1968–1970) und Prof. P. Henrici (1968–1973); Dissertation in Approximationstheorie mit Anwendung auf digitale Filter, Doktorexamen (Feb. 1973)  
1973 – 1975 Wissenschaftlicher Mitarbeiter und Lehrbeauftragter an der ETH und für ein Semester an der Universität Basel; Herausgabe der Vorlesungen über Numerische Mathematik des verstorbenen Prof. Heinz Rutishauser  
1976 Post-doctoral Fellow des kanadischen Nationalfonds am Computer Science Department der *University of British Columbia, Vancouver*  
1977 – 1983 Oberassistent und Lehrbeauftragter an der ETH Zürich; Habilitation  
9/79 – 9/80 Forschungsaufenthalt am Computer Science Department der *Stanford University* (mit Stipendium des Schweiz. Nationalfonds)  
1983 – 1988 Wissenschaftlicher Adjunkt und Lehrbeauftragter an der ETH Zürich

- 8/85 – 3/86 Visiting Scientist am Mathematical Sciences Department des *IBM Thomas J. Watson Research Center, Yorktown Heights, New York* (mit IBM World Trade Visiting Scientist Fellowship)
- 1988 – 1995 *Leiter des Interdisziplinären Projektzentrums für Supercomputing* an der ETH Zürich
- 1996 – 1998 *Wissenschaftlicher Direktor* des zur ETH Zürich gehörenden *Swiss Center for Scientific Computing / Centro Svizzero di Calcolo Scientifico*
- 1999 – 2009 *Leitender Wissenschaftler* am Departement für Mathematik der ETH Zürich
- 3/01 – 4/01 Visiting Scientist an der *School of Mathematical Sciences, Australian National University, Canberra, ACT, AUS*
- 6/08 Teilpensionierung (50%)
- 11/08 – 12/08 *Gastwissenschaftler* am *DFG Forschungszentrum MATHEON*, Berlin
- 12/08 – 2/09 *DFG Mercator Gastprofessor* an der *TU Berlin*
- 10/09 Pensionierung
- 4/10 – 5/10 *DFG Mercator Gastprofessor* an der *TU Berlin*

## **Forschungstipendien und -kredite**

- 1979/80 Nationalfondsstipendium für fortgeschrittene Forscher (1 Jahr)
- 1985/86 IBM World Trade Visiting Scientist Fellowship (8 Monate)
- 1987/90 Nationalfondsprojekt “Software für numerische konforme Abbildung” (24 Monate, Fr. 140'662.-)
- 1989/91 (mit E. Anderheggen, H. Melchior, W. Gander, H.U. Schwarzenbach) KWF-Projekt “Herstellung eines Programmsystems für die dreidimensionale Simulation von Halbleitersensoren” (24 Monate, Fr. 311'150.-)
- 1990/92 (mit Ph. de Forcrand, H.P. Lüthi, D. Würtz) Nationalfondsprojekt “Supercomputer Research in Physics and Chemical Physics” (24 Monate, Fr. 330'614.-)
- 1991/93 (mit J.P. Berrut) Nationalfondsprojekt “Software für numerische konforme Abbildung” (18 Monate, Fr. 118'034.-)
- 1991/92 (mit W. Fichtner) Nationalfondsprojekt “Numerische Algorithmen zur Lösung nichtsymmetrischer Gleichungssysteme auf Vektor- und Parallelrechnern” (12 Monate, Fr. 117'306.-)
- 1992/94 (mit Ph. de Forcrand, H.P. Lüthi, D. Würtz) Nationalfondsprojekt “Supercomputer Research in Physics and Chemical Physics” (24 Monate, Fr. 412'628.-)
- 1993/94 (mit W. Fichtner) Nationalfondsprojekt “Numerische Algorithmen zur Lösung nichtsymmetrischer Gleichungssysteme auf Vektor- und Parallelrechnern” (12 Monate, Fr. 127'601.-)

- 1993/95 (mit Ph. de Forcrand) Nationalfondsprojekt “Fast quark propagator calculations” (24 Monate, Fr. 69’398.-)
- 1994/96 (mit Ph. de Forcrand, H.P. Lüthi) Nationalfondsprojekt “Supercomputer Research in Physics and Chemical Physics” (24 Monate, Fr. 385’488.-)
- 1995/97 Nationalfondsprojekt “Numerical Algorithms for Solving Very Large Systems of Equations” (24 Monate, Fr. 262’960.-).
- 1995/98 (mit M. Gross, H. Keck, R. Peikert) KWF/KTI-Projekt “Visualisierung von Strukturen in dreidimensionalen Vektorfeldern am Beispiel von CFD-Simulation für Strömungsmaschinen” (36 Monate, Fr. 113’000.-)
- 1998/2000 (mit M. Gross, H. Keck, R. Peikert) KTI-Projekt “Visualisierung von Strukturen in dreidimensionalen Vektorfeldern am Beispiel von CFD-Simulation für Strömungsmaschinen” (24 Monate, Fr. 79’750.-)
- 1998/2000 (mit W. Fichtner) KTI-Projekt “Effiziente numerische Methoden zur parallelen direkten Lösung von linearen Gleichungssystemen aus der Prozess- und Halbleiterbauelemente-Simulation” (24 Monate, Fr. 260’100.-)
- 2005/2007 (mit W. Fichtner) Nationalfondsprojekt “Robust iterative solvers for linear systems in nanoelectronic computational science (ROBUST)” (24 Monate, Fr. 156’744.-)
- 2008-2010 (mit J. Liesen, V. Mehrmann, R. Nabben) 3-monatige DFG Mercator Gastprofessur

## Berufliche Aktivitäten

### Zeitschriften-Redaktionsarbeit

- 1984 – heute Associate Editor (1984–1991) bzw. Editor (1991–) von *Numerische Mathematik* (Springer)
- 1987 – heute Associate Editor von *Journal of Computational and Applied Mathematics* (North-Holland)
- 1987 – 1995, 2008 – 2010 Associate Editor von *SIAM Journal on Matrix Analysis and Applications* (SIAM)
- 1990 – heute Editor von *Numerical Algorithms* (J.C. Baltzer [–2000], Kluwer [2001–2004], Springer [2005–])
- 1993 – heute Editor von *Electronic Transactions on Numerical Analysis* (Kent State University)
- 1994 – 2002 Associate Editor von *SIAM Journal on Numerical Analysis* (SIAM)
- 1998 – 2000 Managing Editor von *Speedup* (Speedup Society)

Gutachter für rund 35 wissenschaftliche Zeitschriften sowie für verschiedene Hochschulen und forschungsfördernde Organisationen.

## Kommissions-Arbeit

1978 – 1989	Mitglied der Computer-Kommission der ETH Zürich
1981 – 1987	Mitglied der Kommission für das Nachdiplomstudium in Mathematik an der ETH Zürich
1987	Mitglied der Projektoberleitung und des Benchmarkteams für die Beschaffung eines schweizerischen Hochleistungsrechners
1988 – 1991	Mitglied des HLR-Rates der beiden ETH
1989 – 1991	Mitglied der (zweiten) Projektoberleitung für die Beschaffung eines schweizerischen Hochleistungsrechners
1992 – 1996	Ständiger Gast der Informatik-Kommission der ETH Zürich
1992 – 1999	Mitglied der Evaluationsgruppe für Cray-Projekte
1992 – 1998	Mitglied der Evaluationsgruppe für NEC-Projekte
1995 – 1997	Mitglied des ‘Executive Steering Committee’ der ‘Cray–ETHZ J90 SuperCluster Cooperation’
1996	Mitglied der Arbeitsgruppe für den Studiengang in Rechnergestützten Wissenschaften an der ETH Zürich
1996 – 1998	Mitglied des ‘Steering Committee’ des ‘SCSC–NEC Joint Program in Software Application Port and Development’
2000 – 2008	Mitglied der Bibliothekskommission des D-Math der ETH Zürich
2000 – 2009	Mitglied der Raumkommission des D-Math der ETH Zürich
2001 – 2004	Mitglied der Kommission für das Doktoratsstudium am D-Math der ETH Zürich
2002 – 2009	Mitglied der Computerkommission des D-Math der ETH Zürich
2006, 2010	Mitglied des Preiskomitees für den “Applied Numerical Algebra Prize” (China)

## Doktoranden

1. André Kaiser, “ $L^\infty$ -Konvergenz verschiedener Verfahren der sukzessiven Konjugation zur Berechnung konformer Abbildungen”, Diss. ETH No. 8160, ETH Zürich, 1986.
2. Alejandro Amrein, “A simplified CF approximation”, Diss. ETH No. 8183, ETH Zürich, 1986.
3. Heinz Däppen, “Die Schwarz-Christoffel-Abbildung für zweifach zusammenhängende Gebiete, mit Anwendungen”, Diss. ETH No. 8495, ETH Zürich, 1988.
4. Artan Boriçi, “Krylov subspace methods in lattice QCD”, Diss. ETH No. 11689, ETH Zürich, 1996.
5. Helga Labermeier, “Simulation and optimisation of the storage and delivery of goods with stochastic/seasonal depending demand”, Diss. ETH No. 12849, ETH Zürich, 1998.
6. Damian Loher, “Reliable nonsymmetric block Lanczos algorithms”, Diss. ETH No. 16337, ETH Zürich, 2006.

## Korreferate und externe Gutachten (Diss./Habil.)

1. Trygve Markus Hegland, “Numerische Lösung von Fredholmschen Integralgleichungen erster Art bei ungenauen Daten”, Diss. ETH No. 8553, ETH Zürich, 1988. (Referent: Prof. J. Marti)
2. Roland Peter Haas, “Anwendung schneller Algorithmen auf gemischte Diss. ETH No. 9214, ETH Zürich, 1990. (Referent: Prof. H. Brauchli)
3. Thomas Huckle, “Krylovraummethoden für normale Matrizen und für Toeplitzmatrizen”, Habil. Universität Würzburg, 1991.
4. Hassane Allouche, “Multivariate Newton-Padé approximants: the singular case”, Diss. Universiteit Antwerpen, 1991. (Advisor: Prof. A. Cuyt)
5. Claude Pommerell, “Solution of Large Unsymmetric Systems of Linear Equations”,
6. Marie-Paule Istace, “On rational Chebyshev approximation in the complex plane”, Diss. Université Namur, 1994. (Advisor: Prof. J.-P. Thiran)
7. Bernhard Beckermann, “On the numerical condition of polynomial bases: Estimates for the condition number of Vandermonde, Krylov and Hankel matrices”, Habil. Universität Hannover, 1996.
8. Diederik R. Fokkema, “Subspace methods for linear, non-linear, and eigen problems”, Diss. Universiteit Utrecht, 1996. (Advisor: Prof. H. van der Vorst)
9. Marlis Hochbruck, “The Padé table and its relation to certain numerical algorithms”, Habil. Universität Tübingen, 1996.
10. Michèle Reifenberg, “Numerical solution of a boundary integral equation for conformal mapping by means of attenuation factors”, Diss. Université Fribourg, 1997. (Referent: Prof. J.-P. Berrut)
11. Marc Jonin, “La décomposition polaire — Etude d’un algorithme” Diss. Université Fribourg, 1999. (Referent: Prof. H. Rummler)
12. Olaf Schenk, “Scalable parallel sparse LU factorization methods on shared memory multiprocessors”, Diss. ETH No. 13515, ETH Zürich, 2000. (Referent: Prof. W. Fichtner)
13. Markus Ziegler, “A stable cubically convergent GR algorithm and Krylov subspace methods for non-Hermitian eigenvalue problems”, Universität Tübingen, 2001. (Referent: Prof. Dr. K.P. Hadeler)
14. Gregor Schmidlin, “Fast solution algorithms for integral equations in  $\mathbb{R}^3$ ”, Diss. ETH No. 15016, ETH Zürich, 2003. (Advisor: Prof. Chr. Schwab)
15. Leonhard Jaschke, “Preconditioned Arnoldi methods for systems of nonlinear equations”, Diss. ETH No. 15223, ETH Zürich, 2003. (Advisor: Prof. W. Gander)
16. Stefan Karl Röllin, “Parallel iterative solvers in computational electronics”, Diss. ETH No. 15859, ETH Zürich, 2004. (Advisor: Prof. W. Fichtner)

## Organisation von Konferenzen

1. “Symposium on Numerical Analysis and Computational Complex Analysis”, Zürich, August 15–17, 1983 (mit J. Marti, H.R. Schwarz, W. Gander, und J. Waldvogel)
2. “ETH-NEC Joint Workshop on Supercomputing”, Zürich, April 25, 1991 (mit R. Hütter)
3. Minisymposium on “Nonsymmetric Lanczos algorithms”, Fourth SIAM Conference on “Applied Linear Algebra”, Minneapolis, MN, USA, September 11–14, 1991
4. “Second ETH-NEC Joint Workshop on Supercomputing”, Zürich, April 24, 1992 (mit R. Hütter)
5. Workshop on “Supercomputing in Science and Industry”, Monte Verità, Ascona, Mai 31 – Juni 6, 1992 (mit R. Jeltsch)
6. “Third ETH-NEC Joint Workshop on Parallel Computing”, Zürich, April 29, 1993 (mit R. Hütter)
7. Workshop on “Massively Parallel Scientific Computing”, Monte Verità, Ascona, März 07–11, 1994 (mit R. Jeltsch and W. Gander)
8. “Householder Symposium XIII on Numerical Algebra”, Pontresina, Juni 17–21, 1996 (mit W. Gander)
9. “Sixth ETH-NEC Joint Workshop on Supercomputing”, Zürich, September 12-14, 1996 (with R. Hütter)
10. Minisymposium on “Lanczos-type methods”, Sixth SIAM Conference on “Applied Linear Algebra”, Snowbird, UT, USA, October 29–November 1, 1997
11. 25th SPEEDUP Workshop: “Trends in High-Performance Computing: Systems, Services, and User Requirements”, Cadro-Lugano, März 25–26, 1999
12. Workshop on “Computational Science and Engineering”, Monte Verità, Ascona, Switzerland, Mai 02–07, 1999 (mit R. Jeltsch und W. van Gunsteren)
13. Session on “Developments and Trends in Iterative Methods for Large Systems of Equations”, 16th IMACS World Congress 2000, Lausanne, Switzerland, August 21–25, 2000 (mit W. Schönauer)
14. GAMM-Jahrestagung 2001, Zürich, Schweiz, 12.–15. Februar 2001 (mit R. Jeltsch und L. Kleiser)
15. Latsis-Symposium 2002 on “Iterative Solvers for Large Linear Systems”, Zurich, Switzerland, February 18–21, 2002 (mit W. Gander)
16. Minisymposium on “New Approaches to Preconditioning”, ICIAM03, Sydney, Australia, July 7, 2003 (mit Michele Benzi)
17. Minisymposium on “Accuracy and Effectiveness of Krylov Space Methods”, ICIAM03, Sydney, Australia, July 9, 2003
18. “6th International Congress on Industrial and Applied Mathematics (ICIAM07)”, Zurich, Switzerland, July 16–20, 2007 (mit R. Jeltsch and others)
19. GAMM Workshop on “Applied and Numerical Linear Algebra with special emphasis on Preconditioning”, Zurich, Switzerland, September 10-11, 2009 (mit D. Kressner)
20. Minisymposium on “Induced dimension reduction (IDR): a family of efficient Krylov solvers”, SIAM Conference on Applied Linear Algebra, Seaside, California, October 26–29, 2009 (mit Martin van Gijzen)
21. The Third International Conference on Numerical Algebra and Scientific Computing (NASC10), Beijing (Chairs: M.H. Gutknecht and Zhong-Ci Shi; Org.: Zhong-Zhi Bai et al.)

# Publikationsliste

## Wissenschaftliche Artikel

1. A priori Fehlerschranken für sukzessiv abgepaltene Polynomnullstellen. *ZAMP* **22**, 630–634 (1971).
2. A posteriori error bounds for the zeros of a polynomial. *Numer. Math.* **20**, 139–148 (1972).
3. Ein Abstiegsverfahren für gleichmässige Approximation, mit Anwendungen. Dissertation Nr. 5006, ETH Zürich, 1973.
4. Existence of a solution to the discrete Theodorsen equation for conformal mappings. *Math. Comp.* **31**, 478–480 (1977).
5. Non-strong uniqueness in real and complex Chebyshev approximation. *J. Approx. Theory* **23**, 204–213 (1978).
6. Ein Abstiegsverfahren für nicht-diskrete Tschebyscheff-Approximationsprobleme. In: *Numerische Methoden der Approximationstheorie, Band 4* (Hrsg. L. Collatz, G. Meinardus, H. Werner), 154–171. ISNM Vol. 42, Birkhäuser, Basel, 1978.
7. Fast algorithms for the conjugate periodic function. *Computing* **22**, 79–91 (1979).
8. Solving Theodorsen's integral equation for conformal maps with the fast Fourier transform. Habilitationsschrift, ETH Zürich, 1979.
9. Solving Theodorsen's integral equation for conformal maps with the fast Fourier transform and various nonlinear iterative methods. *Numer. Math.* **36**, 405–429 (1981).
10. Numerical experiments on solving Theodorsen's integral equation for conformal maps with the fast Fourier transform and various nonlinear iterative methods. *SIAM J. Scient. Stat. Comp.* **4**, 1–30 (1983).
11. Two applications of periodic splines. In: *Approximation Theory III* (E.W. Cheney, ed.), 467–472. Academic Press, New York, 1980.
12. (mit Lloyd N. Trefethen) Recursive digital filter design by the Carathéodory-Fejér method. *Numer. Anal. Proj. Ms. NA-80-01*, Computer Science Dept., Stanford University, 1980.
13. (mit Lloyd N. Trefethen) Real polynomial Chebyshev approximation by the Carathéodory-Fejér method. *SIAM J. Numer. Anal.* **19**, 358–371 (1982).
14. (mit Lloyd N. Trefethen) The Carathéodory-Fejér method for real rational approximation. *SIAM J. Numer. Anal.* **20**, 420–436 (1983).
15. Listen der Publikationen und Doktoranden von Heinz Rutishauser. Research Report 82-01, Seminar f. Angew. Math., ETH Zürich, 1982.
16. (mit Stephen W. Ellacott) The polynomial Carathéodory-Fejér approximation method for Jordan regions. *IMA J. Numer. Anal.* **3**, 207–220 (1983).
17. (mit Stephen W. Ellacott) The Carathéodory-Fejér extension of a finite geometric series. *IMA J. Numer. Anal.* **3**, 221–227 (1983).

18. Rational Carathéodory-Fejér approximation on a disk, a circle, and an interval. *J. Approx. Theory* **41**, 257–278 (1984).
19. On the computation of the conjugate trigonometric rational function and on a related splitting problem. *SIAM J. Numer. Anal.* **20**, 1198–1205 (1983).
20. (mit Julius O. Smith and Lloyd N. Trefethen) The Carathéodory-Fejér method for recursive digital filter design. *IEEE Trans. Acoust., Speech, Signal Processing* **ASSP-31**, 1417–1426 (1983).
21. On complex rational approximation. In: *Computational Aspects of Complex Analysis* (H. Werner, L. Wuytack, E. Ng, H.J. Bünger, eds.), 79–101 (Part I), 103–132 (Part II). D. Reidel Publ. Co., Dordrecht, Netherlands, 1983.
22. (mit Lloyd N. Trefethen) Nonuniqueness of best rational Chebyshev approximations on the unit disk. *J. Approx. Theory* **39**, 275–288 (1983).
23. (mit Lloyd N. Trefethen) Real vs. complex rational Chebyshev approximation on an interval. *Trans. Amer. Math. Soc.* **280**, 555–561 (1983).
24. (mit Lloyd N. Trefethen) Real and complex Chebyshev approximation on the unit disk and interval. *Bull. Amer. Math. Soc.* **8**, 455–458 (1983).
25. Algebraically solvable Chebyshev approximation problems. In: *Approximation Theory IV* (C.K. Chui, L.L. Schumaker, J.D. Ward, eds.), 491–498. Academic Press, New York, 1983.
26. (mit Lloyd N. Trefethen) On convergence and degeneracy in rational Padé and Chebyshev approximation. *SIAM J. Math. Anal.* **16**, 198–210 (1985).
27. (mit Lloyd N. Trefethen) Real vs. complex rational Chebyshev approximation on complex domains. In: *Numerische Methoden der Approximationstheorie, Band 7* (Hrsg. L. Collatz, G. Meinardus, H. Werner), 87–97. ISNM Vol. 67, Birkhäuser, Basel, 1984.
28. Numerical conformal mapping methods based on function conjugation. *J. Comput. Appl. Math.* **14**, 31–77 (1986).
29. Hankel norm approximation of power spectra. In: *Computational and Combinatorial Methods in Systems Theory* (C.I. Byrnes and A. Lindquist, eds.), 315–326. North-Holland/Elsevier Science Publ., Amsterdam/New York, 1986.
30. (mit André Kaiser) Iterative k-step methods for computing possibly repulsive fixed points in Banach spaces. *J. Math. Anal. Applics.* **125**, 104–122 (1987).
31. (mit Wilhelm Niethammer and Richard S. Varga) k-step iterative methods for solving nonlinear systems of equations. *Numer. Math.* **48**, 699–712 (1986).
32. The evaluation of the conjugate function of a periodic spline on a uniform mesh. *J. Comput. Appl. Math.* **16**, 181–201 (1986).
33. (mit Edward B. Saff) A de Montessus type theorem for CF approximation. *J. Comput. Appl. Math.* **16**, 251–254 (1986).
34. (mit Lloyd N. Trefethen) Padé, stable Padé, and Chebyshev-Padé approximation. In: *Algorithms for Approximation* (J.C. Mason and M.G. Cox, eds.), 227–264. IMA Conf. Series, new series, Vol. 10, Clarendon Press, Oxford, 1987.

35. An iterative method for solving linear equations based on minimum norm Pick-Nevanlinna interpolation. In: Approximation Theory V (C.K. Chui, L.L. Schumaker, J.D. Ward, eds.), 371–374. Academic Press, New York, 1986.
36. Attenuation factors in multivariate Fourier analysis. *Numer. Math.* **51**, 615–629 (1987).
37. The pioneer days of scientific computing in Switzerland. In: A History of Scientific Computing (S.G. Nash, ed.), 301–313. ACM Press, New York, and Addison-Wesley, Reading, Mass., 1990.
38. (mit Eric Hayashi, Lloyd N. Trefethen) The CF table. *Constr. Approx.* **6**, 195–223 (1990).
39. The rational interpolation problem revisited. *Rocky Mountain J. Math.* **21**, 263–280 (1991).
40. Stationary and almost stationary iterative  $(k, l)$ -step methods for linear and nonlinear systems of equations. *Numer. Math.* **56**, 179–213 (1989).
41. Continued fractions associated with the Newton-Padé table. *Numer. Math.* **56**, 547–589 (1989).
42. Iterative methods for linear systems of equations designed via complex rational approximation. In: Approximation Theory VI, Vol. I, (C.K. Chui, L.L. Schumaker, J.D. Ward, eds.), 315–318. Academic Press, New York, 1989.
43. In what sense is the rational interpolation problem well posed? *Constr. Approx.* **6**, 437–450 (1990).
44. (mit Gene H. Golub) Modified moments for indefinite weight functions. *Numer. Math.* **57**, 607–624 (1990).
45. A completed theory of the unsymmetric Lanczos process and related algorithms, Part I. *SIAM J. Matrix Anal. Appl.* **13**, 594–639 (1992).
46. A completed theory of the unsymmetric Lanczos process and related algorithms, Part II. *SIAM J. Matrix Anal. Appl.* **15**, 15–58 (1994).
47. The unsymmetric Lanczos algorithms and their relations to Padé approximation, continued fractions, and the qd algorithm. Preliminary Proc. Copper Mountain Conference on Iterative Methods, 1990.
48. (mit Daniel L. Boley, Sylvan Elhay, Gene H. Golub) Nonsymmetric Lanczos and finding orthogonal polynomials associated with indefinite weights. *Numerical Algorithms* **1**, 21–43 (1991).
49. On certain types of  $(k, l)$ -step methods for solving linear systems of equations. In: Iterative Methods in Linear Algebra (R. Beauwens and P. de Groen, eds.), 373–380, Elsevier (North-Holland), Amsterdam, 1992.
50. (mit Roland W. Freund and Noël M. Nachtigal) An implementation of the look-ahead Lanczos algorithm for non-Hermitian matrices. *SIAM J. Sci. Comput.* **14**, 137–158 (1993). [Extended version: RIACS Tech. Rep. 90.45, Nov. 1990.]
51. Variants of BiCGStab for matrices with complex spectrum. *SIAM J. Scient. Comput.* **14**, 1020–1033 (1993).

52. Changing the norm in conjugate gradient type algorithms. *SIAM J. Numer. Anal.* **30**, 40–56 (1993).
53. Block structure and recursiveness in rational interpolation. In: *Approximation Theory VII* (E.W. Cheney, C.K. Chui, L.L. Schumaker, eds.), 93–130, Academic Press, Boston, 1993.
54. Stable row recurrences for the Padé table and a generically superfast lookahead solver for non-Hermitian Toeplitz systems. *Linear Algebra Appl.* **188/189**, 351–421 (1993).
55. (mit Steven F. Ashby) A matrix analysis of conjugate gradient algorithms. In: *Advances in Numerical Methods for Large Sparse Sets of Linear Systems, Parallel Processing for Scientific Computing* (M. Natori and T. Nodera, eds.), No. 9, 32–47, Keio University, 1993.
56. (mit Marlis Hochbruck) Look-ahead Levinson and Schur algorithms for non-Hermitian Toeplitz systems. *Numer. Math.* **70**, 181–227 (1995).
57. (mit Stan Cabay, Ron Meleshko) Stable rational interpolation? In: *Systems and Networks: Mathematical Theory and Applications* (U. Helmke, R. Menniken, J. Saurer, eds.), *Proceedings of the International Symposium MTNS '93, Regensburg, Germany, Vol. 2*, pp. 631–634, Akademie-Verlag, Berlin, 1994.
58. (mit Marlis Hochbruck) The stability of inversion formulas for Toeplitz matrices. *Linear Algebra Appl.* **223/224**, 307–324 (1995).
59. The multipoint Padé table and general recurrences for rational interpolation. *Acta Appl. Math.* **33**, 165–194 (1993). Reprinted in: *Nonlinear Numerical Methods and Rational Approximation II* (A. Cuyt, ed.), 109–136, Kluwer, Dordrecht, The Netherlands, 1994.
60. (mit William B. Gragg) Weakly stable look-ahead versions of the Euclidean and Chebyshev algorithms. In: *Approximation and Computation* (R.V.M. Zahar, ed.), 231–260, ISNM 119, Birkhäuser Verlag, Basel-Boston-Berlin, 1994.
61. The Lanczos process and Padé approximation. In: *Proceedings Cornelius Lanczos International Centenary Conference*, (J.D. Brown et al., eds.), 61–75, SIAM, Philadelphia, 1994.
62. (mit Marlis Hochbruck) Look-ahead Levinson- and Schur-type recurrences in the Padé table. *Electronic Trans. Numer. Anal.* **2**, 104–129 (1994).
63. (mit Marlis Hochbruck) Optimized look-ahead recurrences for adjacent rows in the Padé table. *BIT* **36**, 264–286, 1996.
64. (mit Klaus J. Ressel) Look-ahead procedures for Lanczos-type product methods based on three-term Lanczos recurrences. *SIAM J. Matrix Anal. Appl.* **21**, 1051–1078 (2000).
65. (mit Klaus J. Ressel) QMR-smoothing for Lanczos-type product methods based on three-term recurrences. *SIAM J. Sci. Comp.* **19**, 55–73 (1998).
66. Lanczos-type solvers for nonsymmetric linear systems of equations. *Acta Numerica* **6**, 271–397 (1997).

67. (mit Zdenek Strakoš) Accuracy of two three-term and three two-term recurrences for Krylov space solvers. *SIAM J. Matrix Anal. Appl.* **22**, 213–229 (2000).
68. Theodorsen’s integral equation. In: *Encyclopaedia of Mathematics, Supplement III* (M. Hazewinkel, ed.) 401-402, Kluwer Academic Publishers, 2002, Dordrecht, The Netherlands.
69. (mit Miroslav Rozložník) Residual smoothing techniques: do they improve the limiting accuracy of iterative solvers? *BIT* **41**, 86–114 (2001).
70. On Lanczos-type methods for Wilson fermions. In: *Numerical Challenges in Lattice Quantum Chromodynamics. Proceedings of the Interdisciplinary Workshop on Numerical Challenges in Lattice QCD*, Wuppertal, August 22-24, 1999 (A. Frommer, Th. Lippert, B. Medeke, K. Schilling, eds.) 48–65; *Lecture Notes in Computational Science and Engineering (LNCSE)*, Vol. 15, Springer, Berlin, 2000.
71. A matrix interpretation of the extended Euclidean algorithm. In: *Structured Matrices in Mathematics, Computer Science, and Engineering*, Vol. 1 (V. Olshevsky, ed.) 53–70, *Contemporary Mathematics*, Vol. 280, American Mathematical Society, 2001.
72. (mit Miroslav Rozložník) By how much can residual minimization accelerate the convergence of orthogonal residual methods? *Numerical Algorithms* **27**, 189–213 (2001).
73. (mit Stefan Röllin) The Chebyshev iteration revisited. *Parallel Comput.* **28**, 263–283 (2002).
74. (mit Stefan Röllin) Variations of Zhang’s Lanczos-Type Product Method. *Appl. Numer. Math.* **41**, 119–133 (2002).
75. (mit Miroslav Rozložník) A framework for generalized conjugate gradient methods — with special emphasis on contributions by Rüdiger Weiss. *Appl. Numer. Math.* **41**, 7–22 (2002).
76. (mit Thomas Schmelzer) A QR-decomposition of block tridiagonal matrices generated by the block Lanczos process. In: *Proceedings of the 17th IMACS World Congress, Paris, 2005* (P. Borne, M. Benrejeb, N. Dangoumau, and L. Lorimier, eds.) 1–8 Ecole Centrale de Lille, Villeneuve d’Ascq, France (ISBN 2-915913-02-1; CD only), July 2005.
77. Block Krylov space methods for linear systems with multiple right-hand sides: an introduction. In: *Modern Mathematical Models, Methods and Algorithms for Real World Systems* (A.H. Siddiqi, I.S. Duff, and O. Christensen, eds.), 420–447, Anamaya Publishers, New Delhi, India, 2007.
78. (mit Thomas Schmelzer) Updating the QR decomposition of block tridiagonal and block Hessenberg matrices. *Appl. Numer. Math.* **58**, 871–883 (2008), avail. online 29 Apr. 2007.
79. A brief introduction to Krylov space methods for solving linear systems. In: *Frontiers of Computational Science — Proceedings of the International Symposium on Frontiers of Computational Science 2005* (Y. Kaneda, H. Kawamura, and M. Sasai, eds.), 53–62, Springer-Verlag, Berlin Heidelberg, Mar. 2007.

80. (mit Thomas Schmelzer) The block grade of a block Krylov space. *Linear Algebra Appl.* **430**, 174–185 (2009), avail. online 30 Aug. 2008.
81. (mit Pavel Jiránek, Miroslav Rozložník) How to make Simpler GMRES and GCR more stable. *SIAM J. Matrix Anal. Appl.* **30**, 1483–1499 (2008).
82. IDR explained. *Electronic Trans. Numer. Anal.* **36**, 126–148 (2010).
83. (mit Beresford N. Parlett) From qd to LR, or, how were the qd and LR algorithms discovered? *IMA J. Numer. Anal.* **??**. ???–??? (2010); published online May 27, 2010.
84. (mit Jens-Peter M. Zemke) Eigenvalue computations based on IDR. Research Report No. 2010-13, SAM, ETH Zurich & Bericht Nr. 145, INS, TU Hamburg-Harburg; published online May 4, 2010.  
Shortened ms. submitted to SIMAX July 29, 2010.

## Zusammenfassungen

1. A completed theory of the unsymmetric Lanczos process and related algorithms. Extended abstract, Householder Symposium XI on Numerical Algebra, Tylösand, Sweden, 1990.
2. A weakly stable, generically superfast algorithm for non-Hermitian Toeplitz systems. Householder Symposium XII on Numerical Algebra, Lake Arrowhead, CA, USA, 1993.
3. (mit Klaus J. Ressel) Look-ahead procedures for Lanczos-type product methods based on three-term recurrences. Extended abstract, Copper Mountain Conference on Iterative Methods, Copper Mtn., CO, USA, 1996.
4. (mit Klaus J. Ressel) Look-ahead procedures for Lanczos-type product methods based on three-term recurrences. Extended abstract, Householder Symposium XII on Numerical Algebra, Pontresina, Switzerland, 1996.
5. (mit Klaus J. Ressel) Attempts to improve the accuracy of the Lanczos and Lanczos-type methods for solving linear systems. Extended abstract, Householder Symposium XII on Numerical Algebra, Pontresina, Switzerland, 1996.
6. Improving accuracy and efficiency of Lanczos-type solvers for nonsymmetric linear systems of equations. Project description, CSCS Annual Report 1998, pp. 24–27, Centro Svizzero di Calcolo Scientifico, Manno, 1999.
7. Conquering roundoff effects in the biconjugate gradient and related methods. Extended abstract, International RIKEN Symposium on Linear Algebra and its Applications, Tokyo, Japan, 1999.
8. (mit Damian Loher) Preconditioning by similarity transformations: another valid option? Extended abstract, International RIKEN Symposium on Linear Algebra and its Applications, Tokyo, Japan, 1999.
9. Trends in Iterative Methods and Preconditioning—a Brief Overview. Proceedings of the 16th IMACS World Congress, 2000.
10. (mit Stefan Röllin) Variations of Zhang’s Lanczos-Type Product Method. Proceedings of the 16th IMACS World Congress, 2000.

11. Revisiting  $(k, \ell)$ -step methods. Proceedings of the 2nd Kyoto Forum on Krylov Subspace Methods, 2010.

### Populärwissenschaftliche Artikel, historische Notizen

- (1) Als wären's 10'000 Personalcomputer. Finanz und Wirtschaft, Magazin "Informatik 88", 28. Sept. 1988.
- (2) The pioneer days of scientific computing in Switzerland. IPS Windows, No. 2, 23–27 (1991), and Crosscuts, **2**, No. 3, 14–17 (1993).
- (3) Henrici, Peter (1923–1987). Historisches Lexikon der Schweiz, Band 6, Verlag Schwabe, Basel, 2007. <http://www.hls-dhs-dss.ch/textes/d/D43121.php>
- (4) Preface (with a short biography and a bibliography of Rüdiger Weiss), Appl. Numer. Math. **41**, 1–6 (2002).
- (5) Numerical Analysis in Zurich — 50 years ago. Zurich Intelligencer, 10–15, Springer-Verlag, July 2007.
- (6) Numerical Analysis in Zurich — 50 years ago. In: math.ch/100 — Schweizerische Mathematische Gesellschaft, Société Mathématique Suisse, Swiss Mathematical Society 1910–2010 (eds. Bruno Colbois, Christine Riedtmann, Viktor Schroeder), European Mathematical Society, Zurich, 2010, pp. 279–290. (*Slightly revised version of the 2007 article with the same title.*)

### Vorlesungsskripten

- (1) Lineare Algebra — Studiengang Informatik, personal web site, 2001–2007.
- (2) Iterative Methods, personal web site, 2004–2006.
- (3) (mit P. Arbenz, O. Chinellato, M. Sala) Software for Numerical Linear Algebra, ETH Lecture Notes, Jul. 2006

### Herausgabe von Büchern

- (1) H. Rutishauser: Vorlesungen über numerische Mathematik (2 Vols.), herausgegeben von M. Gutknecht, unter Mitwirkung von P. Henrici, P. Läuchli und H.R. Schwarz. Birkhäuser, Basel, 1976. (Englische Übersetzung durch W. Gautschi: Birkhäuser, Basel, 1990.)
- (2) Developments and Trends in Iterative Methods for Large Systems of Equations — in memoriam Rüdiger Weiss (W. Schönauer and M.H. Gutknecht, eds.), Special Issue, Appl. Numer. Math. **41**, No. 1 (April 2002), 245 pages.
- (3) Numerical Algorithms, Parallelism and Applications (M.H. Gutknecht, E.J. Kontoghiorghes, and V. Simoncini, eds.), Special Issue, Appl. Numer. Math. **49**, No. 1 (April 2004), 133 pages.

## Vorträge an Universitäten und Forschungszentren

- U Kentucky at Lexington (22.3.76)
- FU Berlin (8.12.77)
- U Fribourg (13.2.79)
- Stanford U (12.5.80)
- EPF Lausanne (17.12.82)
- U Bonn (17.5.83)
- TH Aachen (18.5.83)
- U Bielefeld (8.6.83)
- U Mannheim (29.11.83)
- U Eichstätt (30.11.83)
- Kent State U (17.10.85)
- IBM Yorktown (29.10.85)
- U North Carolina at Chapel Hill (22.11.85)
- Courant Institute, New York U (14.2.86)
- U South Florida at Tampa (5.3.86)
- U Zürich (18.12.86)
- U Göttingen (7.7.87)
- U Hamburg (9.7.87)
- Kent State U (29.6.88)
- U Zürich (8.11.88)
- U Basel (7.12.88)
- U Pretoria (20.7.89)
- U Cape Town (28.7.89)
- U Fribourg (16.1.90)
- CSRD, U Illinois Urbana-Champaign (27.3.90)
- U Antwerp (4.7.91)
- Lawrence Livermore National Laboratory (9.9.91)
- Northern Illinois U (16.9.91)
- IMA, U Minnesota (12.3.92)
- TU Dresden (12.5.92)
- U Rostock (13.5.92)
- AT&T Bell Laboratories (20.10.92)
- Courant Institute, New York U (10.12.93)
- U Namur (22.4.94)
- U Colorado at Boulder (15.4.96)
- Academy of Sciences, Prague (24.6.97)
- Keio U, Yokohama (12.12.97)
- U Pavia (4.3.98)
- Chinese Acad. of Sciences Beijing (31.7.98)
- Emory U, Atlanta (23.10.98)
- Chalmers U of Technology, Göteborg (27./28.10.98)
- Linköping U (29.10.98)
- Keio U, Yokohama (25.11.99)
- Australian National U, Canberra (29.11.99)
- Australian National U, Canberra (26.3.01)
- U Queensland, Brisbane (12.4.01)
- U Adelaide (23.4.2001)
- Massey U, Auckland (26./27.4.01)
- Oxford U (23.8.05)
- Keio U, Yokohama (7.12.05)
- Nagoya U (8.12.05)
- LSEC, ICMSEC, Chinese Academy of Sciences, Beijing (21.9.06)
- Tsinghua U, Beijing (22.9.06)
- Jiao Tong U, Shanghai (17.10.06)
- Fudan U, Shanghai (19.10.06)
- Purdue U, West Lafayette, IN (14.10.08)
- TU Berlin (16.12.08)
- Weierstrass Institute, Berlin (12.01.09)
- TU Bergakademie Freiberg (16.01.09)
- TU Chemnitz (20.01.09)
- TU Hamburg-Harburg (28.01.09)
- Hong Kong Baptist U (15.01.10)
- Gifu Shotoku U, Gifu (16.03.10)
- TU Berlin (04.05.10)
- TU Berlin (06.05.10)
- U Mainz (20.05.10)
- Shanghai Jiao Tong U (14.10.10)

## Eingeladene Vorträge an Konferenzen

- Conferences on Numerical Methods in Approximation Theory, Oberwolfach, Germany (June 1973, Nov. 1977, Jan. 1981, Mar. 1983, Oct. 1986)
- Conferences on Constructive Methods in Complex Analysis, Oberwolfach, Germany (Aug. 1978, July 1980, Aug. 1983, Aug. 1987, Feb. 1991, Mar. 1995)
- NATO Advanced Study Institute on Computational Aspects of Complex Analysis, Braunlage, Germany (July/Aug. 1982)
- Conference on Rational Approximation and Interpolation, Tampa, Florida (Dec. 1983)
- International Conference on Numerical Analysis, Munich, Germany (Mar. 1984)
- International Conference on Computational and Applied Mathematics, Leuven, Belgium (July 1984)
- Symposium on Delay Equations, Approximation and Application, Mannheim, Germany (Oct. 1984)
- 7th International Symposium on the Mathematical Theory of Networks and Systems, Stockholm, Sweden (June 1985)
- SIAM Eastern Ohio/Western Pennsylvania Section Meeting, Pittsburgh, Pennsylvania (Oct. 1985)
- Felix-Klein-Kolloquium, Düsseldorf, Germany (May 1986)
- Conference on Nonlinear Numerical Methods and Rational Approximation, Antwerpen, Belgium (Apr. 1987)
- ACM Conference on the History of Scientific and Numeric Computation, Princeton, New Jersey (May 1987)
- Conference on Numerical Linear Algebra and Parallel Computation, Oberwolfach, Germany (Feb./March 1988)
- US/Norway Joint Seminar on Padé Approximants and Related Topics, Boulder, Colorado (June 1988)
- Parallel Computing in Optimization, Murten, Switzerland (Sep. 1988)
- Symposium on Computational Aspects of Complex Analysis, Phoenix Joint Mathematics Meeting, Phoenix, Arizona (Jan. 1989)
- Conference on Approximation Theory and Linear Algebra, Kent, Ohio (Mar.-Apr. 1989)
- Fifteenth South African Symposium on Numerical Mathematics, Umhlanga Rocks (July 1989)
- Copper Mountain Conference on Iterative Methods, Copper Mountain, CO (April 1990)
- Householder Symposium XI, Tylösand, Sweden (June 1990)
- Conference on Numerical Linear Algebra, Oberwolfach, Germany (April 1991, April 1994, April 1997)
- Seventh International Symposium on Approximation Theory, Austin, TX (Jan. 1992)
- Workshop on Iterative Methods for Nonsymmetric Problems, Austin, TX (Jan. 1992)

- International Congress on Extrapolation and Rational Approximation, Tenerife, Canary Islands (Jan. 1992)
- Workshop on Iterative Methods for Sparse and Structured Problems, Minneapolis (Feb. 1992)
- Conference on Numerical Analysis and Scientific Computing, Kent, Ohio (Mar. 1992)
- Householder Symposium XII, Lake Arrowhead, CA (June 1993)
- Conference on Nonlinear Numerical Methods and Rational Approximation, Antwerp, Belgium (Sep. 1993)
- International Symposium on Special Functions, Approximation, Numerical Quadrature and Orthogonal Polynomials, West Lafayette, IN (Dec. 1993)
- Lanczos Centenary Conference, Raleigh, NC (Dec. 1993)
- Conference on Numerical Linear Algebra with Applications, Oberwolfach, Germany (April 1994)
- Conference on Orthogonal Polynomials and Numerical Analysis, Luminy, France (Sep. 1994)
- Conference on Iterative Methods for Solving Systems of Linear Equations, Namur, Belgium (May 1995)
- Swiss Numerical Analysis Day '97, Geneva (Mar. 1997)
- Czech-U.S. Workshop on Iterative Methods and Parallel Computing (IMPC '97), Milovy, Czech Republic (June 1997)
- Conference on Applications and Computation of Orthogonal Polynomials, Oberwolfach, Germany (Mar. 1998)
- International Symposium on Theory and Algorithms for Large Scale Matrix Problems, Dalian, China (Aug. 1998)
- Interdisciplinary Workshop on Numerical Challenges in Lattice QCD, Wuppertal, Germany (Aug. 1999)
- EMS/WiR Summer School Numerical Simulation of Flows, Heidelberg (1999)
- International RIKEN Symposium on Linear Algebra and its Applications, RIKEN, Tokyo, Japan (Nov. 1999)
- Session on “Developments and Trends in Iterative Methods for Large Systems of Equations” at 16th IMACS World Congress 2000, Lausanne, Switzerland (Aug. 2000)
- Minisymposium on “Recent Advances in Krylov Subspace Methods” at First SIAM-EMS Conference, Berlin, Germany (Sep. 2001)
- GAMM Workshop on “Numerical Linear Algebra with Special Emphasis on Numerical Methods for Structured and Random Matrices”, Berlin, Germany (Sep. 2001)
- Conference on Computational Linear Algebra with Applications, Milovy, Czech Republic (Aug. 2002)
- Workshop on Contemporary Computational Mathematics, Canberra, Australia (Jul. 2003)
- International Summer School on Numerical Linear Algebra and Its Applications, Monopoli, Italy (Sep. 2003)
- International Workshop on Numerical Linear Algebra and Its Applications, Monopoli, Italy (Sep. 2003)

- Dagstuhl Seminar on Theoretical and Computational Aspects of Matrix Algorithms, Dagstuhl, Germany (Oct. 2003)
- International Conference on Industrial and Applied Mathematics (Biannual Indian SIAM Meeting), New Delhi, India (Dec. 2004)
- Joint Workshop on Computational Chemistry and Numerical Analysis (CCNA2005), Akihabara, Tokyo, Japan (Dec. 2005)
- International Symposium on Frontiers of Computational Science (FCS 2005), Nagoya, Japan (Dec. 2005)
- First International Conference on Numerical Algebra and Scientific Computing (NASC06), Beijing (Oct. 2006)
- Gene Golub Around the World Commemoration, Leuven, Belgium (Feb. 2008)
- RSV80: Conference on the Occasion of Richard Varga's 80th Birthday, Kent, OH, USA (Oct. 2008)
- Workshop "IDR and block Lanczos solvers for large nonsymmetric systems", TU Delft, The Netherlands (June 2009)
- Minisymposium "The QR Algorithm: 50 Years later, its Genesis by John Francis, and Subsequent Developments", 23rd Biennial Conference on Numerical Analysis, Glasgow, Scotland (June 2009)
- Autumn School "Future Developments in Model Order Reduction", Terschelling, The Netherlands (Sep. 2009)
- 3rd International Conference on Structured Matrices and Tensors, Hong Kong, China (Jan. 2010)
- 2nd Kyoto Forum 2010 on Krylov Subspace Methods, Kyoto University, Kyoto, Japan (Mar. 2010)
- Workshop on "Sparse Matrix Solvers and Preconditioning", Keio University, Hiyoshi, Yokohama, Japan (Mar. 2010)
- The Third International Conference on Numerical Algebra and Scientific Computing (NASC10), Beijing (Oct. 2010)

## Gehaltene Vorlesungen

- Numerische Mathematik I (ETHZ; SS 1973–75)
- Numerisches Praktikum (ETHZ; WS 1974/75)
- Numerische Mathematik (U Basel; WS 1974/75)
- ALGOL-Kurs (U Basel; WS 1974/75)
- Numerische Praktikum (U Basel; WS 1974/75)
- Numerik und Programmieren I+II (ETHZ; 1977/78, 1978/79, 1980/81 – 1984/85)
- Numerik-Software an der ETHZ (ETHZ; SS 1981)
- Theorie und Numerik der Approximation (ETHZ; WS 1981/82)
- Symmetrische Eigenwertprobleme (ETHZ; WS 1982/83)
- Padé-Approximation (ETHZ; WS 1983/84)
- Lineare Algebra (ETHZ; WS 1984/85)
- Numerische Mathematik für Ingenieure (ETHZ; SS 1985, 1987)
- Numerische Methoden (für Math./Phys.) (ETHZ; SS 1986, 1988)
- Rationale Interpolation (ETHZ; SS 1986)
- Numerik (für Naturwissenschaftler) (ETHZ; WS 1986/87, 1987/88)
- Vektorrechner-Algorithmen für lineare Gleichungssysteme (ETHZ; WS 86/87)
- Vektorrechner-Algorithmen (ETHZ; WS 1987/88)
- Analysis III+IV (für Elektroing. und Informatiker) (ETHZ; 1988/89)
- Analysis I+II (für Elektroing.) (ETHZ; 1989/90)
- Lanczos-Algorithmen für nicht-symmetrische Matrizen (ETHZ; SS 1991)
- Schnelle Hankel- und Toeplitz-Löser (ETHZ; SS 1992)
- Padé-Approximation und rationale Interpolation (ETHZ; WS 1992/93)
- Lanczos-Algorithmen für nicht-symmetrische Matrizen (ETHZ; SS 1993)
- Theorie und Numerik partieller Differentialgleichungen (Rand- und Eigenwertprobleme) (ETHZ; WS 1993/94)
- Theorie und Numerik partieller Differentialgleichungen Anfangswertaufgaben) (ETHZ; SS 1994)
- Iterative Methoden (ETHZ; WS 1995/96)
- Ausgewählte Kapitel der Numerischen Mathematik (U Fribourg; WS+SS 1995/6)
- Numerische Methoden der linearen Algebra (U Fribourg; WS+SS 1996/7)
- Iterative Methoden (ETHZ; SS 1998)

- Vorkonditionierung (ETHZ; WS 1998/99)
- Lanczos-Algorithmen für nicht-symmetrische Matrizen (ETHZ; SS 1999)
- Introduction à l'analyse numérique (U Fribourg; SS 1999)
- Algebra I (für Informatiker) (ETHZ; WS 1999/2000)
- Algebraisches Multigrid (ETHZ; SS 2000)
- Algebra I (für Informatiker) (ETHZ; WS 2000/2001)
- Iterative Methoden (ETHZ; SS 2001)
- Algebra I (für Informatiker) (ETHZ; WS 2001/2002)
- Preconditioning (ETHZ; SS 2002)
- Algebra I (für Informatiker) (ETHZ; WS 2002/2003)
- Software for Numerical Linear Algebra [with W. Gander, B.N. Parlett] (ETHZ; SS 2003)
- Lineare Algebra (für Informatiker) [mit W. Gander] (ETHZ; WS 2003/2004)
- Numerische Mathematik II (für Mathematiker) (ETHZ; WS 2003/2004)
- Software for Numerical Linear Algebra [with W. Gander, B.N. Parlett] (ETHZ; SS 2004)
- Lineare Algebra (für Informatiker) [mit W. Gander] (ETHZ; WS 2004/2005)
- Numerische Mathematik (für Mathematiker) (ETHZ; SS 2005)
- Software for Numerical Linear Algebra [with W. Gander] (ETHZ; SS 2005)
- Lineare Algebra (für Informatiker) [mit W. Gander] (ETHZ; WS 2005/2006)
- Numerische Mathematik (für Mathematiker) (ETHZ; SS 2006)
- Software for Numerical Linear Algebra [with P. Arbenz, O. Chinellato] (ETHZ; SS 2006)
- Lineare Algebra (für Informatiker) [mit W. Gander] (ETHZ; WS 2006/2007)
- Numerische Methoden (für Elektroingenieure und Materialwissenschaftler) (ETHZ; SS07)
- Lineare Algebra (für Informatiker) [mit W. Gander] (ETHZ; HS 2007)
- Software for Numerical Linear Algebra [with W. Gander] (ETHZ; FS 2008)
- Theory and Numerics of Model Reduction [with D. Kressner] (ETHZ; FS 2009)

## Adresse

Büro-Adresse    ETH Zürich  
Seminar für Angewandte Mathematik  
HG G52.2  
CH-8092 Zürich, Schweiz  
Tel. (044) 632 34 64  
Fax (044) 632 11 04

Privat-Adresse    Zelgligasse 1  
CH-4900 Langenthal, Schweiz  
Tel. (062) 923 30 19

Email            [mhg@math.ethz.ch](mailto:mhg@math.ethz.ch)

URL              <http://www.sam.math.ethz.ch/~mhg>