Curriculum Vitae

1. Name: Walter Gander
   Date of birth: 5–24–44
   Married to Heidi Gander, Dr. phil. cultural anthropologist and theologian
   two daughters:
   Marie-Louise and Beatrice

2. Address:

   office:

   Computer Science
   ETH, CAB G 66.2
   Universitätsstrasse 6
   CH-8092 Zürich
   Switzerland

   Tel: +41 44 632-7430
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   email: `gander@inf.ethz.ch`

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   Turnerstrasse 38
   CH-8006 Zürich
   Switzerland
   Tel: +41 43 810 0938

3. WEB page: `http://www.inf.ethz.ch/personal/gander/`

4. Present Academic Position: Professor in Scientific Computing in the Computer Science Department of ETH.

Degrees	Field	Institution	Year
Full Professor	Computer Science	ETH Zürich	1991
Associate Professor	Computer Science	ETH Zürich	1987
Privatdozent	Numerical Analysis	ETH Zürich	1979
Dr. sc. math.	Mathematics	ETH Zürich	1973
ETH Diploma	Mathematics	ETH Zürich	1968

5. Education

   Grown up in Biel, Switzerland, Matura 1963 type B (Latin and English). Student of mathematics and physics at ETH from 1963 – 1968.

6. Professional Employment

   1968 – 1973: Assistant and graduate student of Heinz Rutishauser and Peter Henrici at ETH Zürich.

   1973 – 1987: Professor of Numerical Analysis and Computer Science at the University of Applied Sciences Neu-Technikum Buchs `http://www.ntb.ch/`.

1977/78, 1984, 1993 and 2006: Sabbatical leaves visiting Gene Golub in the Computer Science Department of Stanford University.

2000 on sabbatical leave visiting Nick Trefethen at Oxford University (Comlab `http://web.comlab.ox.ac.uk/`).

1979 – 1987: Privatdozent at ETH Zürich.

1987 – 1991: Associate Professor in Computer Science at ETH.

since 1991 Full Professor in Computer Science at ETH Zürich.

May 1989 – May 1991: Head of the evaluation committee for the Swiss national supercomputer ("Projekt HLR-91"). Purchased the first NEC SX-3 supercomputer for the Swiss National Supercomputing Center in Manno `http://www.cscs.ch/`

October 1989 – 1992: President of the Swiss Supercomputer Counsel (Hochleistungsrechnerrat).

October 1990 – October 1992: Head of Education (Abteilungsvorsteher) of the Department of Computer Science at ETH Zürich (ca. 900 students).

January 1989. Founding of the Institute for Scientific Computing at ETH. Head of this institute till September 1997.

October 1997 – October 2001: Chairman of the Department of Computer Science at ETH and also Head of Education of Computer Science.

Languages

Fluent in German, French and English.

Membership in associations

- Member of Swiss Informaticians Society (SI), ACM, SIAM, GAMM, Swiss Mathematical Society, Schweizerische Euler-Gesellschaft.
- Treasurer of SARIT (Swiss Association for Research in Information Technology `http://www.sarit.ch/`). SARIT is the Swiss member of the European Research Consortium for Informatics and Mathematics (ERCIM) `http://www.ercim.org/` which groups the major research IT laboratories of Europe.
- Member of the international advisory board of the "Bavarian Graduate School of Computational Engineering", TU München `http://www.bgce.de/`.
- Member of the Advisory Board for Computer Science of the University of Applied Sciences of Rapperswil, Switzerland `http://www.hsr.ch/`.

PhD Students

Supervised as Referent

Stefan Bondeli: *Divide and Conquer: Parallele Algorithmen zur Lösung tridiagonaler Gleichungssysteme*, 1991.

Urs von Matt: *Large Constrained Quadratic Problems*, 1992.

Michael Oettli: *The Homotopy Method Applied to the Symmetric Eigenproblem*, 1995.

Volker Strumpen: *The Network Machine*, 1995.

David Sourlier: *Three Dimensional Feature Independent Best Fit in Coordinate Metrology*, 1995.

Tobias Fabio Christen: *Computer Simulation of Nerve Signal Transmission*, 1999.

Stefan Andreas Schmälzle: *New Methods for Nurbs Surface Approximation to Scattered Data*, 2001.

Erwin Achermann MUSAC*: a Tool for Evaluating Measurement Uncertainty*, Verlag Dr. Kovač, 2002.

Roman Geus *The Jacobi-Davidson algorithm for solving large sparse symmetric eigenvalue problems with application to the design of accelerator cavities*, 2002.

Oliver Broeker *Parallel Multigrid Methods using Sparse Approximate Inverses*, 2003

Leonhard Jaschke *Preconditioned Arnoldi Methods for Systems of Nonlinear Equations*, 2003.

Supervised as Korreferent

Perry Bartelt: Finite Element Procedures on Vector/Tightly Coupled Parallel Computers, 1989.

Bert Pohl: Ein Algorithmus zur Lösung von Anfangswertproblemen auf Parallelrechnern, 1992.

Arno Liegmann: Efficient Solution of Large Sparse Linear Systems, 1995.

Albert Hugo Widmann: Parallelization in Monte Carlo Simulations of Atomistically Detailed Polymers, 1995.

Masud Ghazvini: Modellgestützte, mehrdimensionale, inverse Interpolation zur effizienten Verbesserung der Positionier- und Orientierungsgenauigkeit von Industrierobotern, 1996.

Tilo Levante: Optimierung von Pulssequenzen, 1997.

Beat Hörmann: Error Assessment with Approximate Inverses in Linear System Solving with Application to Stopping Criteria for Iterative Methods, 1997 (University of Basel).

Claude G. Diderich: Automatic Data Distribution for Massively Parallel Distributed Memory Computers, 1998 (EPFL, Lausanne).

Lars Lippert: Wavelet-based Volume Rendering, 1998.

Remo Schnidrig: Adrenalin: a distributed realtime environment for the intraday analysis of financial markets, 1998.

Rolf Strebel: Pieces of Software for the Columbic m Body Problem, 2000.

Martin Roth: Bernstein-Bézier Representations for Facial Surgery Simulation, 2002.

Oscar Chinellato: The Complex-Symmetric Jacobi-Davidson Algorithm and its Application to the Computation of some Resonance Frequencies of Anisotropic Lossy Axisymmetric Cavities, 2005.

Honors

- Since February 2002 corresponding member of the Bavarian Academy of Sciences (`http://www.badw.de/`).
- Member (and board member) of the Swiss Academy of Engineering Sciences (SATW `http://www.satw.ch/index_EN`) since 2007.

Publications

A: Books

[1] W. Gander, L. Molinari and H. Švecová
Numerische Prozeduren aus Nachlass und Lehre von Prof. H. Rutishauser, ISNM 33, Birkhäuser Basel, 1977.

[2] W. Gander
Chapter 6, *Numerik* in: *Informatik für Ingenieure*, F. L. Nicolet ed., Springer Verlag, 1979.

[3] W. Gander
Computermathematik, Birkhäuser Basel, 1985. Second edition 1992.

[4] W. Gander
Computermathematik, Lösungen der Aufgaben mit PASCAL Programmen, Birkhäuser Basel, 1986.

[5] W. Gander and J. Hřebíček, ed.,
Solving Problems in Scientific Computing using Maple and Matlab ,
Springer Berlin Heidelberg New York, 1993, second edition 1995, third edition 1997, second printing of third edition 2001, fourth edition 2004.
`http://www.solvingproblems.ethz.ch/`

Chinese edition of the third edition 1999, China Higher Education Press and Springer Verlag.

Portuguese edition of the third edition, Editora Edgard Blücher LTDA, Sao Paoulo, 2001.

Russian edition of fourth edition: December 2005, Publisher Vassamedia, Minsk, Bjelarus.

B: Articles

1. W. Gander
Numerische Prozeduren, Bericht Nr. 4 der Fachgruppe für Computerwissenschaften der ETH Zürich, 1972.

2. W. Gander
Numerische Implementationen des Romberg'schen Extrapolationsverfahrens mit Anwendungen auf die Summation unendlicher Reihen, Dissertation ETH Nr. 5172, 1973.

3. W. Gander
Transfer of Numerical Programs, ACM SIGNUM Newsletters Vol. 11, No. 1, 1976.

4. W. Gander
A Machine Independent Algorithm to Compute Percentage Points of the χ^2–Distribution, Zeitschrift für Angewandte Mathematik (ZAMP), 1978.

5. W. Gander
On the Linear Least Squares Problem with a Quadratic Constraint, Stanford Report STAN-CS-78-697, 1978 (Habilitationsschrift).

6. W. Gander
Algorithms for the QR–Decomposition, Research Report Nr. 80-2 des Seminars für Angewandte Mathematik der ETHZ, 1980.

7. W. Gander
Least Squares with a Quadratic Constraint , Numerische Mathematik 36, 291-307, 1981.

8. W. Gander
Wie genau kann man mit dem Computer lineare Gleichungssysteme lösen ? ,
Didaktik der Mathematik 4, 247-268, 1982.

9. W. Gander
A Simple Adaptive Quadrature Algorithm, Research Report No. 83-03 des Seminars für Angew. Mathematik der ETHZ, 1983.

10. W. Gander
Das Verfahren von Givens zur Auflösung linearer Gleichungssysteme, Didaktik der Mathematik 4, 263-277, 1984.

11. W. Gander
On Halley's Iteration Method, The American Mathematical Monthly, Vol. 92, No. 2, February 1985.

12. P. Arbenz and W. Gander
Solving nonlinear Eigenvalue Problems by Algorithmic Differentiation, Computing 36, 205-215, 1986.

13. P. Arbenz, W. Gander and G. H. Golub
Restricted Rank Modification of the Symmetric Eigenvalue Problem: Theoretical Considerations, Linear Algebra and its Appl. Vol. 104, 75-95, 1988

14. W. Gander, G.H. Golub and Urs von Matt
A Constrained Eigenvalue Problem, Linear Algebra and its Appl. Vol. 114/115, 815-839, 1989

15. W. Gander and G.H. Golub
Discussion of: Linear Smoother and additive Models by A. Buja et al.,, The Annals of Statistics, Vol. 17, No. 2, 529-532

16. W. Gander
Rechnergestützte Herstellung wissenschaftlicher Texte von der Rohfassung bis zum Druck – ein Beispiel, in: Typographie für Informatiker, Herausgegeben von A. Gerold, Technische Universität München, Juni 1989.

17. W. Gander
Algorithms for the Polar Decomposition, SIAM J. on Sci.and Stat. Comp., Vol. 11, No. 6, 1990

    TR-Report 101 Departement für Informatik Nr. 101, Januar 1989

18. Walter Gander, Gene H. Golub and Dominik Gruntz
Solving Linear Equations by Extrapolation in: *Supercomputing*, NATO ASI Series F: Computer and Systems Sciences, No 62, Janusz S. Kowalik (Ed.), p. 279-295, Springer-Verlag Berlin, 1989.

19. W. Gander, G.H. Golub and Urs von Matt
A Constrained Eigenvalue Problem, in Numerical Linear Algebra, Digital Signal Processing and Parallel Algorithms, NATO ASI Series, Series F: Computer and Systems Sciences, Vol. 70, ed. G. H. Golub and P. Van Dooren, Springer-Verlag, 1991, pp. 677–686.

20. W. Gander and D. Gruntz
The Billiard Problem, The Maple Technical Newsletter, Spring 1992, Birkhäuser Verlag.

21. W. Gander and D. Gruntz
The Billiard Problem, Int. J. Math. Educ. Sci. Technol., 1992, Vol. 23, No. 6, 825-830.

22. S. Bondeli and W. Gander
Cyclic reduction for special tridiagonal matrices, SIAM J. for Matrix Analysis Vol. 15, January 1994.

23. W. Gander, G.H. Golub and Urs von Matt
Large Constrained Quadratic Problems, Proceedings of the Cornelius Lanczos International Centenary Conference 1993, edited by David Brown et al., SIAM, 1994, pp. 308-310.

24. P. Arbenz and W. Gander
A Survey of Direct Parallel Algorithms for Banded Linear Systems,
TR-Report 221 Departement Informatik ETHZ, November 1994.
`http://tinyurl.com/6pc295`

25. Walter Gander, Gene H. Golub and Rolf Strebel
Least-Squares Fitting of Circles and Ellipses, BIT 34 (1994), pp. 558-578.

    TR-Report 217 Departement Informatik ETHZ, June 1994.
    `http://tinyurl.com/6pc295`

    TR-Report SCCM-94-08, Stanford University, 1994.

26. Christen T.F., Gander W., Vranesic I., Knoepfel T.
Modeling Diffusion in the Synaptic Cleft.
In: BIOMATH-95. Datecs Publishing. Sofia. p. 35, 1995.

27. P. Arbenz and W. Gander
Direct Methods for Banded Linear Systems on Massively Parallel Processor Computers.
In: Parallel Processing for Scientific Computing, (Ed.: Bailey, D. H. et al.) SIAM, Philadelphia, PA, 1995, pp. 506–507.

28. P. Kolm, P. Arbenz and W. Gander
Generalized Subspace Correction Methods for the Solution of Linear Systems.
TR-Report 241 Departement Informatik ETHZ, Okt. 1995
`http://tinyurl.com/6pc295`

    TR-Report TRITA-NA-9509, C2M2, Nada, KTH, Stockholm, November 1995.

29. D. Sourlier, W. Gander
A New Method and SW-Tool for the Exact Solution of Complex Measuring Problems,
In: Advanced Mathematical Tools in Metrology II, World Scientific Publishing Co., 1996.

30. D. Sourlier, W. Gander
Mathematisch exakte Auswertung komplexer Geometrien,
Proceedings 9. internationales Oberflächenkolloquium, 29.–31.1.96, Chemnitz-Zwickau, pp. 103-114.

31. P. Arbenz, W. Gander and M. Oettli
The Remote Computation System,
In: High Performance Computing and Networking, H. Liddell and A. Colbrook and B. Hertzberger and P. Sloot eds., Lecture Notes in Computer Science, 1067, Springer-Verlag, 1996, pp. 662-667.

    TR-Report 245 Departement Informatik ETHZ.
    `http://tinyurl.com/6pc295`

32. P. Arbenz and W. Gander and M. Oettli
The Remote Computation System,
Parallel Computing, Vol. 23, 1997, pp. 1421-1428.

33. P. Arbenz, W. Gander, H. P. Lüthi and U. von Matt
Sciddle 4.0, or, Remote Procedure Calls in PVM, in High-Performance Computing and Networking, Proceedings of the International Conference and Exhibition, ed. H. Liddell, A. Colbrook, B. Hertzberger and P. Sloot, Lecture Notes in Computer Science, Vol. 1067, Springer, Berlin, 1996, pp. 820–825.

34. P. Arbenz, W. Gander, H. P. Lüthi and U. von Matt
Sciddle 4.0: Remote Procedure Calls in PVM, in Workstations und ihre Anwendungen, Proceedings der Fachtagung SIWORK'96, Universität Zürich, ed. C. Cap, vdf, Zürich, 1996, pp. 323–326.

35. P. Arbenz and W. Gander
Direct Parallel Algorithms for Banded Linear Systems,
special volume on "Numerical Analysis, Scientific Computing, Computer Science" of Zeitschrift fuer Angewandte Mathematik und Mechanik (ZAMM) Akademie Verlag, Berlin, Proceedings ICIAM 95, 1996.

36. W. Gander, G. H. Golub and R. Strebel
Least Squares Fitting of Circles and Ellipses.
In: Numerical Analysis, Supplement to the Bulletin of the Belgian Mathematical Society, Dez. 1996, pp. 63–84.

37. R. Strebel, D. Sourlier and W. Gander
A Comparison of Orthogonal Least Squares Fitting in Coordinate Metrology.
In: Recent Advances in Total Least Squares Techniques and Errors-In-Variables Modeling. S. Van Huffel (Ed.), SIAM Proceedings series, 1997, pp. 249-258.

38. W. Gander and G.H. Golub
Cyclic Reduction - History and Applications,
Proceedings of the Workshop on Scientific Computing : 10-12 March, 1997, Hong Kong, editor-in-chief, Gene Howard Golub ; managing editor, Shiu Hong

Liu ; editors, Franklin T. Luk, Robert James Plemmons. Springer Verlag, New York, 1997.

TR-Report SCCM-97-02, Stanford University, 1997.

39. W. Gander and D. Sourlier
Best-Fit of Sculptured Surfaces,
pp. 59 – 73 in: G. J. Olling, B. K. Choi and R. B. Jerard, *Machining Impossible Shapes*, IFIP TC5 WG5.3 International Conference on Sculptured Surface Machining (SSM98), Conference Proceedings, Kluwer Academic Publishers, 1999.

    TR-Report 307, Departement Informatik, 1998.
    `http://tinyurl.com/5rk5fj`

40. W. Gander and W. Gautschi
Adaptive Quadrature - Revisited,
BIT Vol. 40, No. 1, March 2000, pp. 84–101.

    TR-Report 306, Departement Informatik, 1998.
    `http://tinyurl.com/5rk5fj`

    Our quadrature programs are are used for the new quadrature routines since Matlab 6, Dec. 2000.

41. W. Gander and D. Gruntz
Derivation of Numerical Methods using Computer Algebra,
SIAM Review, Vol 41, Number 3, 1999.

    TR-Report 305, Departement Informatik, 1998.
    `http://tinyurl.com/5rk5fj`

42. Peter Arbenz, Oliver Bröker, Oscar Chinellato, Walter Gander, Roman Geus, and Rolf Strebel
A Comparison of Numerical Implementations of the Eigenstate Expansion Method for Quantum Molecular Dynamics Simulations,
TR-Report 333 Departement Informatik ETHZ, January 2000.
`http://tinyurl.com/5rk5fj`

43. Linda Petzold et al. (SIAM Working Group on CSE Education)
Graduate Education in Computational Science and Engineering
SIAM Review, Volume 43, Number 1, March 2001, pp. 163–177.

44. W. Gander
Bookreview: From Elementary Probability to Stochastic Differential Equations with MAPLE
Journal of the American Statistical Association, March 2003.

45. Christian Soltmann, Conradin Beeli, Reinhard Lück, Walter Gander
In-situ high-temperature powder diffraction study of reversible phase transitions in decagonal $AI_{71.2}Co_{12.8}Ni_{16}$
J. Appl. Cryst. (2003). 36, 1030-1039.

46. W. Gander
Change of basis in polynomial interpolation
Numer. Linear Algebra Appl. 2005; **12**; 769–778

47. W. Gander
Generating Numerical Algorithms with Computer Algebra
BIT Numerical Mathematics (2006) 46: 491-504 (Special edition dedicated to Germund Dahlquist).

48. W. Gander
Zeros of Determinants of λ-Matrices in: MATRIX METHODS: THEORY, ALGORITHMS AND APPLICATIONS, Dedicated to the Memory of Gene Golub. Vadim Olshevsky & Eugene Tyrtyshnikov eds. World Scientific Publishers, 2008

49. Steven J. Leon, Åke Björck, Walter Gander, Julien Langou
Gram-Schmidt Orthogonalization: 100 Years and More, submitted to SIAM Review.

Scopes Projects

The SCOPES co-operation programme (Scientific Co-operation between Eastern Europe and Switzerland) enables researchers from Eastern Europe and Switzerland to collaborate on their scientific work in mutual partnerships. The designated group of partner countries is a reflection of the Eastern European aid policy of the Swiss Federal Government.

The aim of the programme is to enhance the qualifications as well as performance and competitiveness of research groups and institutions in Eastern Europe. SCOPES is a joint initiative by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC).

I managed three Scopes projects:

1. *Solving Problems in Scientific Computing* 1991–1993

   Project partners: Prof. Jaroslav Buchar and Prof. Jiří Hřebíček Institut of Physics, Mendel University of Agriculture and Forestry, Brno

2. *Establishing Computational Science and Engineering in Bulgaria and Macedonia*, 2002–2004.

   Project partners:

   - Institute of Mathematics and Informatics (IMI) of the Bulgarian Academy of Sciences (Prof. S. Dodunekov, Prof. S. Markov), Sofia, Bulgaria.
   - Department Informatics at the Faculty of Mathematics and Natural Sciences of the South-West University Blagoevgrad, Bulgaria (Prof. I. Mirchev)

- Department of Mathematics of the Faculty for Mechanical Engineering and Instrument Design of the Technical University Gabrovo, Bulgaria (Prof. S. Kapralov)
- Institute of Informatics of the Faculty of Natural Sciences and Mathematics at the University Saints Cyril and Methodius (UKIM), Skopje, Macedonia (Prof. S. Markovski)
- Faculty of Mechanical Engineering at UKIM, Skopije (Prof. T. Zlatanovski)

3. *New Methods for Quadrature*, 2005–2008

   Project partners:

   - Prof. Gradimir V. Milovanovic, University of Nis, Serbia
   - Prof. Borislav Bojanov, Department of Mathematics University of Sofia, Bulgaria

Recent Program Committees

- Householder 1996 Pontresina (Main Organizer)
- GAMM 2001, 12-15 Februar 2001, ETH Zurich.
- 3rd INTERNATIONAL FORTWIHR - CONFERENCE 2001, March 12th to 14th, 2001, University of Erlangen-Nuremberg, Germany
- HERCMA 2001 Athens, 20-22 September 2001
- Latsis Symposium 2002, 18-21 February 2002, ETH Zurich (Main Organizer). *Iterative Solvers for Large Linear Systems, celebrating 50 years of the conjugate gradient method.*
- Member (treasurer) of the Organizing Committee of ICIAM 2007 `http://www.ICIAM07.ch/`
- Organizer of "40 years of Computer Science at ETH" October 3, 2008 `http://www.ethz.ch/news/ethupdate/2008/080929_1/index`