

axiomTM



The 30 Year Horizon

<i>Manuel Bronstein</i>	<i>William Burge</i>	<i>Timothy Daly</i>
<i>James Davenport</i>	<i>Michael Dewar</i>	<i>Martin Dunstan</i>
<i>Albrecht Fortenbacher</i>	<i>Patrizia Gianni</i>	<i>Johannes Grabmeier</i>
<i>Jocelyn Guidry</i>	<i>Richard Jenks</i>	<i>Larry Lambe</i>
<i>Michael Monagan</i>	<i>Scott Morrison</i>	<i>William Sit</i>
<i>Jonathan Steinbach</i>	<i>Robert Sutor</i>	<i>Barry Trager</i>
<i>Stephen Watt</i>	<i>Jim Wen</i>	<i>Clifton Williamson</i>

Volume Bibliography: Axiom Literature Citations

Portions Copyright (c) 2005 Timothy Daly

The Blue Bayou image Copyright (c) 2004 Jocelyn Guidry

Portions Copyright (c) 2004 Martin Dunstan

Portions Copyright (c) 1991-2002,
The Numerical Algorithms Group Ltd.
All rights reserved.

This book and the Axiom software is licensed as follows:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of The Numerical Algorithms Group Ltd. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Inclusion of names in the list of credits is based on historical information and is as accurate as possible. Inclusion of names does not in any way imply an endorsement but represents historical influence on Axiom development.

Cyril Alberga	Roy Adler	Richard Anderson
George Andrews	Henry Baker	Stephen Balzac
Yurij Baransky	David R. Barton	Gerald Baumgartner
Gilbert Baumsлаг	Fred Blair	Vladimir Bondarenko
Mark Botch	Alexandre Bouyer	Peter A. Broadbery
Martin Brock	Manuel Bronstein	Florian Bundschuh
William Burge	Quentin Carpent	Bob Caviness
Bruce Char	Cheekai Chin	David V. Chudnovsky
Gregory V. Chudnovsky	Josh Cohen	Christophe Conil
Don Coppersmith	George Corliss	Robert Corless
Gary Cornell	Meino Cramer	Claire Di Crescenzo
Timothy Daly Sr.	Timothy Daly Jr.	James H. Davenport
Jean Della Dora	Gabriel Dos Reis	Michael Dewar
Claire DiCrescendo	Sam Dooley	Lionel Ducos
Martin Dunstan	Brian Dupee	Dominique Duval
Robert Edwards	Heow Eide-Goodman	Lars Erickson
Richard Fateman	Bertfried Fauser	Stuart Feldman
Brian Ford	Albrecht Fortenbacher	George Frances
Constantine Frangos	Timothy Freeman	Korrinn Fu
Marc Gaetano	Rudiger Gebauer	Kathy Gerber
Patricia Gianni	Holger Gollan	Teresa Gomez-Diaz
Laureano Gonzalez-Vega	Stephen Gortler	Johannes Grabmeier
Matt Grayson	James Griesmer	Vladimir Grinberg
Oswald Gschnitzer	Jocelyn Guidry	Steve Hague
Vilya Harvey	Satoshi Hamaguchi	Martin Hassner
Ralf Hemmecke	Henderson	Antoine Hersen
Pietro Iglio	Richard Jenks	Kai Kaminski
Grant Keady	Tony Kennedy	Paul Kosinski
Klaus Kusche	Bernhard Kutzler	Larry Lambe
Frederic Lehouby	Michel Levaud	Howard Levy
Rudiger Loos	Michael Lucks	Richard Luczak
Camm Maguire	Bob McElrath	Michael McGettrick
Ian Meikle	David Mentre	Victor S. Miller
Gerard Milmeister	Mohammed Mobarak	H. Michael Moeller
Michael Monagan	Marc Moreno-Maza	Scott Morrison
Mark Murray	William Naylor	C. Andrew Neff
John Nelder	Godfrey Nolan	Arthur Norman
Jinzhong Niu	Michael O'Connor	Kostas Oikonomou
Julian A. Padget	Bill Page	Jaap Weel
Susan Pelzel	Michel Petitot	Didier Pinchon
Claude Quitte	Norman Ramsey	Michael Richardson
Renaud Rioboo	Jean Rivlin	Nicolas Robidoux
Simon Robinson	Michael Rothstein	Martin Rubey
Philip Santas	Alfred Scheerhorn	William Schelter
Gerhard Schneider	Martin Schoenert	Marshall Schor
Fritz Schwarz	Nick Simicich	William Sit
Elena Smirnova	Jonathan Steinbach	Christine Sundaresan
Robert Sutor	Moss E. Sweedler	Eugene Surowitz
James Thatcher	Baldir Thomas	Mike Thomas
Dylan Thurston	Barry Trager	Themos T. Tsikas
Gregory Vanuxem	Bernhard Wall	Stephen Watt
Juergen Weiss	M. Weller	Mark Wegman
James Wen	Thorsten Werther	Michael Wester
John M. Wiley	Berhard Will	Clifton J. Williamson
Stephen Wilson	Shmuel Winograd	Robert Wisbauer
Sandra Wityak	Waldemar Wiwianka	Knut Wolf
Clifford Yapp	David Yun	Richard Zippel
Evelyn Zoernack	Bruno Zuercher	Dan Zwillinger

Contents

0.1	Axiom Citations in the Literature	v
0.2	Axiom Citations of External Sources	xx

New Foreword

On October 1, 2001 Axiom was withdrawn from the market and ended life as a commercial product. On September 3, 2002 Axiom was released under the Modified BSD license, including this document. On August 27, 2003 Axiom was released as free and open source software available for download from the Free Software Foundation's website, Savannah.

Work on Axiom has had the generous support of the Center for Algorithms and Interactive Scientific Computation (CAISS) at City College of New York. Special thanks go to Dr. Gilbert Baumslag for his support of the long term goal.

The online version of this documentation is roughly 1000 pages. In order to make printed versions we've broken it up into three volumes. The first volume is tutorial in nature. The second volume is for programmers. The third volume is reference material. We've also added a fourth volume for developers. All of these changes represent an experiment in print-on-demand delivery of documentation. Time will tell whether the experiment succeeded.

Axiom has been in existence for over thirty years. It is estimated to contain about three hundred man-years of research and has, as of September 3, 2003, 143 people listed in the credits. All of these people have contributed directly or indirectly to making Axiom available. Axiom is being passed to the next generation. I'm looking forward to future milestones.

With that in mind I've introduced the theme of the "30 year horizon". We must invent the tools that support the Computational Mathematician working 30 years from now. How will research be done when every bit of mathematical knowledge is online and instantly available? What happens when we scale Axiom by a factor of 100, giving us 1.1 million domains? How can we integrate theory with code? How will we integrate theorems and proofs of the mathematics with space-time complexity proofs and running code? What visualization tools are needed? How do we support the conceptual structures and semantics of mathematics in effective ways? How do we support results from the sciences? How do we teach the next generation to be effective Computational Mathematicians?

The "30 year horizon" is much nearer than it appears.

Tim Daly
CAISS, City College of New York
November 10, 2003 ((iHy))

A bibliography of Axiom references which are used throughout Axiom. The first section contains literature that mentions Axiom, initially derived with permission from Nelson Beebe's collection. The second section contains references from Axiom to the literature.

0.1 Axiom Citations in the Literature

Bibliography

- [ACM89] ACM, editor. Proceedings of the ACM-SIGSAM 1989 International Symposium on Symbolic and Algebraic Computation, ISSAC '89 ACM Press, New York, NY 10036, USA, 1989, ISBN 0-89791-325-6, LCCN QA76.95.I59 1989
- [ACM94] ACM, editor, ISSAC '94. Proceedings of the International Symposium on Symbolic and Algebraic Computation. ACM Press, New York, NY, 10036, USA, 1994, ISBN 0-89791-638-7. LCCN QA76.95.I59 1994
- [ACS91] D. Augot, P. Charpin, and N. Sendrier. "The minimum distance of some binary codes via the Newton's identities", In Cohen and Charpin [CC91], pages 65-73 ISBN 0-387-54303-1 (New York), 3-540-54303-1 (Berlin). LCCN QA268.E95 1990
- [AL94] Adams, William W. and Loustaunau, Philippe "An Introduction to Gröbner Bases" American Mathematical Society (1994) ISBN 0-8218-3804-0
- [And84] George E. Andrews. "Ramanujan and SCRATCHPAD". in Golden and Hussain [GH84], pages 383-??
- [And88] G. E. Andrews. "Application of Scratchpad to problems in special functions and combinatorics" In Janssen [Jan88], pages 158-?? ISBN 3-540-18928-9, 0-387-18928-9 LCCN QA155.7.E4T74 1988
- [Ano91] Anonymous editor, Proceedings 1991 Annual Conference, American Society for Engineering Education. Challenges of a Changing World. ASEE, Washington, DC USA 1991 2 vol.
- [Ano92] Anonymous. Programming environments for high-level scientific problem solving. IFIP TC2/WG 2.5 working conference. IFIP Transactions. A Computer Science and Technology, A-2:??, 1992. CODEN ITATEC. ISSN 0926-5473
- [Ano95] Anonymous. GAMM 94 annual meeting. Zeitschrift für Angewandte Mathematik und Physik, 75 (suppl. 2), 1995, CODEN ZAMMAX, ISSN 0044-2267
- [BC85] Bruno Buchberger and Bob F. Caviness, editors EUROCAL '85: European Conference on Computer Algebra, Linz, Austria, April 1-3, 1985; proceedings, volume 204 of Lecture Notes in Computer Science. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1985, ISBN 0-387-15983-5 (vol. 1), 0-387-15984-3 (vol. 2) LCCN QA155.7.E4 E86 1985 Two volumes

- [BGDW95] P. A. Broadbery, T. Gómez-Díaz, and S. M. Watt “On the implementation of dynamic evaluation” In Levelt [Lev95] pages 77-84 ISBN 0-89791-699-9 LCCN QA76.95 I59 1995 <http://www.acm.org/pubs/citations/proceedings/issac/220346/p77-broadbery> ACM order number 505950
- [Boe89] Hans-J. Boehm. “Type inference in the presence of type abstraction” ACM SIGPLAN Notices, 24(7) pp192-206 July 1989 CODEN SINODQ ISSN 0362-1340 <http://www.acm.org/pubs/citations/proceedings/pldi/73141/p192-boehm>
- [Bou95] J. L. Boulanger “Object oriented method for Axiom” ACM SIGPLAN Notices, 30(2) pp33-41 February 1995 CODEN SINODQ ISSN 0362-1340
- [Bro89] M. Bronstein. “Simplificatoin of real elementary functions” ACM [ACM89] pages 207-211 ISBN 0-89791-325-6 LCCN QA76.95.I59 1989
- [Bro91] M. Bronstein, “The Risch differential equation on an algebraic curve” in Watt [Wat91], pp241-246 ISBN 0-89791-437-6 LCCN QA76.95.I59 1991
- [Bro93] Manuel Bronstein, editor ISSAC’93: proceedings of the 1993 International Symposium on Symbolic and Algebraic Computation, July 6-8, 1993, Kiev, Ukraine, ACM Press New York, NY 10036, USA, 1993 ISBN 0-89791-604-2 LCCN QA76.95 I59 1993 ACM order number 505930
- [Bru09] Brunelli, J.C. “Streams and Lazy Evaluation Applied to Integrable Models” http://arxiv.org/PS_cache/nlin/pdf/0408/0408058v1.pdf
- [BS93] Manuel Bronstein and Bruno Salvy “Full partial fraction decomposition of rational functions” In Bronstein [Bro93] pp157-160 ISBN 0-89791-604-2 LCCN QA76.95 I59 1993 <http://www.acm.org/pubs/citations/proceedings/issac/164081/p157-bronstein>
- [BS94] T. Beneke and W. Schwippert. Double-track into the future: MathCAD will gain new users with Standard and Plus versions. Elektronik, 43(15) pp107-110, July 1994, CODEN EKRKAR ISSN 0013-5658
- [BT94] R. Brown and A. Tonks “Calculations with simplicial and cubical groups in AXIOM” Journal of Symbolic Computation 17(2) pp159-179 February 1994 CODEN JSYCEH ISSN 0747-7171
- [Buh05] Buhl, Soren L., “Some Reflections on Integrating a Computer Algebra System in R” www.math.auc.dk/~slb/kurser/software/RCompAlg.pdf
- [Bur91] W. H. Burge, “Scratchpad and the Rogers-Ramanujan identities” In Watt [Wat91], pp189-190 ISBN 0-89791-437-6 LCCN QA76.95.I59 1991
- [BW87] W. Burge and S. Watt, “Infinite structures in SCRATCHPAD II” Technical Report RC 12794 (#57573) IBM Thomas J. Watson Research Center, Box 218, Yorktown Heights, NY 10598, USA 1987
- [BW89] W. H. Burge and S. M. Watt “Infinite structures in Scratchpad II” in Davenport [Dav89], pp138-148 ISBN 3-540-51517-8 LCCN QA155.7.E4E86 1987

- [Cal94] J. Calmet, editor Rhine Workshop on Computer Algebra, Proceedings. Universität Karsruhe, Karlsruhe, Germany 1994
- [CC91] G. Cohen and P. Charpin, editors EUROCODE '90 International Symposium on Coding Theory and Applications Proceedings. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1991 ISBN 0-387-54303-1 (New York), 3-540-54303-1 (Berlin), LCCN QA268.E95 1990
- [CCM92] Paul Camion, Bernard Courteau, and Andre Montpetit. "Un problème combinatoire dans les graphes de Hamming et sa solution en Scratchpad" (English: A combinatorial problem in Hamming Graphs and its solution in Scratchpad) Rapports de recherche 1586, Institut National de Recherche en Informatique et en Automatique, Le Chesnay, France, January 1992, 12pp
- [Chu89] Chudnovsky, D.V. and Chudnovsky, G.V. "The computation of classical constants" Proc. Natl. Acad. Sci. USA Vol 86 pp8178-8182, Nov 1989
- [CJ86] Chudnovsky, David and Jenks, Richard "Computers in Mathematics" International Conference on Computers and Mathematics July29-Aug1 1986 Marcel Dekker, Inc (1990) ISBN 0-8247-8341-7
- [Dal92] S. Dalmas "A polymorphic functional language applied to symbolic computation" In Wang [Wan92] pp369-375 ISBN 0-89791-489-9 (soft cover) 0-89791-490-2 (hard cover) LCCN QA76.95.I59 1992
- [Dal88] Daly, Timothy "Axiom in an Educational Setting" Axiom course slide deck January 1988
- [Dal02] T. Daly "Axiom as open source" SIGSAM Bulletin (ACM Special Interest Group on Symbolic and Algebraic Manipulation) 36(1) pp28-?? March 2002 CODEN SIGSBZ ISSN 0163-5824
- [Dal03] Daly, Timothy, "The Axiom Wiki Website" <http://axiom.axiom-developer.org>
- [Dal09] Daly, Timothy, "The Axiom Literate Documentation" <http://axiom.axiom-developer.org/axiom-website/documentation.html>
- [Dal06] Timothy Daly "Axiom Volume 1: Tutorial" Lulu, Inc. 860 Aviation Parkway, Suite 300, Morrisville, NC 27560 USA, 2006 ISBN 141166597X 287pp <http://www.lulu.com/content/190827>
- [Dav79] Davenport, J.H. SPAD.SCRIPT VM/370 SPAD.SCRIPTS August 24, 1979
- [Dav82] Davenport, J.H. "On the Parallel Risch Algorithm (III): Use of Tangents" SIGSAM V16 no. 3 pp3-6 August 1982
- [Dav89] J. H. Davenport, editor EUROCAL '87 European Conference on Computer Algebra Proceedings Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1989 ISBN 3-540-51517-8 LCCN QA155.7.E4E86 1987

- [Dav92a] J. H. Davenport “The AXIOM system” AXIOM Technical Report TR5/92 (ATR/3) (NP2492) Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, December 1992 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Dav92b] J. H. Davenport “How does one program in the AXIOM system?” AXIOM Technical Report TR6/92 (ATR/4)(NP2493) Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK December 1992 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Dav93] J. H. Davenport “Primality testing revisited” Technical Report TR2/93 (ATR/6)(NP2556) Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, August 1993 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Dav10] Davenport, J. H. “Computer Algebra”
staff.bath.ac.uk/masjhd/JHD-CA.pdf
- [DSTxx] Davenport, J. H., Siret, and Tournier “Computer Algebra”
staff.bath.ac.uk/masjhd/masternew.pdf
- [DD89] C. Dicrescenzo and D. Duval “Algebraic extensions and algebraic closure in Scratchpad II” In Gianni [Gia89], pp440-446 ISBN 3-540-51084-2 LCCN QA76.95.I57 1998 Conference held jointly with AAEECC-6
- [Dev93] Pinch, R.G.E. “Some Primality Testing Algorithms” Devlin, Keith (ed.) Computers and Mathematics November 1993, Vol 40, Number 9 pp1203-1210
- [Dew94] Dewar, M. C. “Manipulating Fortran Code in AXIOM and the AXIOM-NAG Link” Proceedings of the Workshop on Symbolic and Numeric Computing, ed by Apiola, H. and Laine, M. and Valkeila, E. pp1-12 University of Helsinki, Finland (1994)
- [DGJ84] J. Davenport, P. Gianni, R. Jenks, V. Miller, S. Morrison, M. Rothstein, C. Sundaresan, R. Sutor and B. Trager “Scratchpad” Mathematical Sciences Department, IBM Thomas Watson Research Center 1984
- [DGT91] J. H. Davenport, P. Gianni, and B. M. Trager “Scratchpad’s view of algebra II: A categorical view of factorization” In Watt [Wat91], pp32-38 ISBN 0-89791-437-6 LCCN QA76.95.I59 also in: AXIOM Technical Report, ATR/2, NAG Ltd., Oxford, 1992
- [DGT92] J. H. Davenport, P. Gianni, and B. M. Trager “Scratchpad’s view of algebra II: A categorical view of factorization” Technical Report TR4/92 (ATR/2) (NP2491), Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, December 1992 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [DJ92] D. Duval and F. Jung “Examples of problem solving using computer algebra” IFIP Transactions. A. Computer Science and Technology, A-2 pp133-141, 143 1992 CODEN ITATEC. ISSN 0926-5473
- [DLMF] <http://dlmf.nist.gov/software/#T1>

- [Doo99] Sam Dooley, editor. ISSAC 99: July 29-31, 1999, Simon Fraser University, Vancouver, BC, Canada: proceedings of the 1999 International Symposium on Symbolic and Algebraic Computation. ACM Press, New York, NY 10036, USA, 1999. ISBN 1-58113-073-2 LCCN QA76.95.I57 1999
- [Doy99] Nicolas J. Doye. “Automated coercion for Axiom” in Dooley [Doo99], pp229-235 ISBN 1-58113-073-2 LCCN QA76.95.I57 1999
<http://www.acm.org/pubs/contents/proceedings/issac/309831>
- [DST88] J. H. Davenport, Y. Siret, and E. Tournier. Computer Algebra: Systems and Algorithms for Algebraic Computation. Academic Press, New York, NY, USA, 1988, ISBN 0-12-204232-9
- [DT90] J. H. Davenport and B. M. Trager “Scratchpad’s view of algebra I: Basic commutative algebra” In Miola [Mio90], pp40-54. ISBN 0-387-52531-9 (New York), 3-540-52531-9 (Berlin). LCCN QA76.9.S88I576 1990 also in AXIOM Technical Report, ATR/1, NAG Ltd., Oxford, 1992
- [DT92] J. H. Davenport and B. M. Trager “Scratchpad’s view of algebra I: Basic commutative algebra” Technical Report TR3/92 (ATR/1)(NP2490), Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, December 1992.
<http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Du95] Duval, D. “Evaluation dynamique et clôture algébrique en Axiom”. Journal of Pure and Applied Algebra, no99, 1995, pp. 267–295.
- [ES10] Burcin Eröcal and William Stein “The Sage Project”
wstein.org/papers/icms/icms_2010.pdf
- [Fat90] R. J. Fateman “Advances and trends in the design and construction of algebraic manipulation systems” In Watanabe and Nagata [WN90], pp60-67 ISBN 0-89791-401-5 LCCN QA76.95.I57 1990
- [Fat05] Fateman, R. J. “An incremental approach to building a mathematical expert out of software” 4/19/2005
www.cs.berkeley.edu/~fateman/papers/axiom.pdf
- [FD] Faure, Christèle, Davenport, James “Parameters in Computer Algebra”
- [FDN00] Faure, Christèle, Davenport, James, Naciri, Hanane “Multi-values Computer Algebra” ISSN 0249-6399 Institut National De Recherche en Informatique et en Automatique Sept. 2000 No. 4001
- [Fit84] J. P. Fitch, editor, EUROSAM ’84: International Symposium on Symbolic and Algebraic Computation, Cambridge, England, July 9-11, 1984, volume 174 of Lecture Notes in Computer Science. Springer-Verlag, Berlin, Germany / Heildelberg, Germany / London, UK / etc., 1984 ISBN 0-387-13350-X LCCN QA155.7.E4 I57 1984

- [Fit93] J. Fitch, editor. Design and Implementation of Symbolic Computation Systems International Symposium DISCO '92 Proceedings. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1993. ISBN 0-387-57272-4 (New York), 3-540-57272-4 (Berlin). LCCN QA76.9.S88I576 1992
- [For90] A. Fortenbacher. "Efficient type inference and coercion in computer algebra" In Miola [Mio90], pp56-60. ISBN 0-387-52531-9 (New York), 3-540-52531-9 (Berlin). LCCN QA76.9.S88I576 1990
- [Fou90] Francois Fouche. "Une implantation de l'algorithme de Kovacic en Scratchpad" Technical report, Institut de Recherche Mathématique Avancée" Strasbourg, France, 1990 31pp
- [GCL92] Geddes, Keith O., Czapor, Stephen R., and Labahn, George "Algorithms For Computer Algebra" Kluwer Academic Publishers ISBN 0-7923-9259-0 (Sept 1992)
- [GBL91] B. M. Goodwin, R. A. Buonopane, and A. Lee. "Using MathCAD in teaching material and energy balance concepts". In Anonymous [Ano91], pp345-349 (vol. 1) 2 vols.
- [GH84] V. Ellen Golden and M. A. Hussain, editors. Proceedings of the 1984 MACSYMA Users' Conference: Schenectady, New York, July 23-25, 1984, General Electric, Schenectady, NY, USA, 1984
- [GHK91] J. Grabmeier, K. Huber, and U. Krieger. "Das ComputeralgebraSystem AXIOM bei kryptologischen und verkehrstheoretischen Untersuchungen des Forschungsinstituts der Deutschen Bundespost TELEKOM" Technischer Report TR 75.91.20, IBM Wissenschaftliches Zentrum, Heidelberg, Germany, 1991
- [Gia89] P. (Patrizia) Gianni, editor. Symbolic and Algebraic Computation. International Symposium ISSAC '88, Rome, Italy, July 4-8, 1988. Proceedings, volume 358 of Lecture Notes in Computer Science. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1989. ISBN 3-540-51084-2 LCCN QA76.95.I57 1988 Conference held jointly with AAEC-6
- [Gil92] I. Gil. "Computation of the Jordan canonical form of a square matrix (using the Axiom programming language). In Wang [Wan92], pp138-145. ISBN 0-89791-489-9 (soft cover), 0-89791-490-2 (hard cover) LCCN QA76.95.I59 1992
- [GJ71] J. H. Griesmer and R. D. Jenks "SCRATCHPAD/1 - an interactive facility for symbolic mathematics" In Petrick [Pet71], pp42-58. LCCN QA76.5.S94 1971 <http://delivery.acm.org/10.1145/810000/806266/p42-griesmer.pdf>
- [GJ72a] J. Griesmer and R. Jenks. "Experience with an online symbolic math system SCRATCHPAD". in Online'72 [Onl72] ISBN 0-903796-02-3 LCCN QA76.55.O54 1972 Two volumes
- [GJ72b] James H. Griesmer and Richard D. Jenks. "SCRATCHPAD: A capsule view" ACM SIGPLAN Notices, 7(10) pp93-102, 1972. Proceedings of the symposium on Two-dimensional man-machine communications. Mark B. Wells and James B. Morris (eds.).

- [GJY75] Griesmer, J.H., Jenks, R.D., Yun, D.Y.Y “SCRATCHPAD User’s Manual” IBM Research Publication RA70 June 1975
- [GKW03] Johannes Grabmeier, Erich Kaltofen, and Volker Weispfenning, editors. Computer algebra handbook: foundations, applications, systems. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 2003. ISBN 3-540-65466-6 637pp Includes CDROM <http://www.springer.com/sgw/cda/frontpage/0,11855,1-102-22-1477871-0,00.html>
- [GL93] A. Goodloe and P. Loustau. “An abstract data type development of graded rings” In Fitch [Fit93], pp193-202. ISBN 0-387-57272-4 (New York), 3-540-57272-4 (Berlin). LCCN QA76.9.S88I576 1992
- [GM86] Rüdiger Gebauer and H. Michael Möller “Buchberger’s algorithm and staggered linear bases” In Bruce W. Char, editor. Proceedings of the 1986 Symposium on Symbolic and Algebraic Computation: SYMSAC ’86, July 21-23, 1986 Waterloo, Ontario, pp218-221 ACM Press, New York, NY 10036, USA, 1986. ISBN 0-89791-199-7 LCCN QA155.7.E4 A281 1986 ACM order number 505860
- [GM88] R. Gebauer and H. M. Möller “On an installation of Buchberger’s algorithm” Journal of Symbolic Computation, 6(2-3) pp275-286 1988 CODEN JSYCEH ISSN 0747-7171
- [GM89] P. Gianni and T. Mora “Algebraic solution of systems of polynomial equations using Gröbner bases. In Huguet and Poli [HP89], pp247-257 ISBN 3-540-51082-6 LCCN QA268.A35 1987
- [GM94] D. Gruntz and M. Monagan “Introduction to Gauss” SIGSAM Bulletin (ACM Special Interest Group on Symbolic and Algebraic Manipulation), 28(3) pp3-19 August 1994 CODEN SIGSBZ ISSN 0163-5824
- [GS92] J. Grabmeier and A. Scheerhorn “Finite fields in Axiom” AXIOM Technical Report TR7/92 (ATR/5)(NP2522), Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, 1992 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Hec01] Heck, A. “Variables in computer algebra, mathematics and science” The International Journal of Computer Algebra in Mathematics Education Vol. 8 No. 3 pp195-210 (2001)
- [HP89] L. Huguet and A. Poli, editors. Applied Algebra, Algebraic Algorithms and Error-Correcting Codes. 5th International Conference AAEECC-5 Proceedings. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1989. ISBN 3-540-51082-6. LCCN QA268.A35 1987
- [Jan88] R. Janßen, editor. Trends in Computer Algebra, International Symposium Bad Neuenahr, May 19-21, 1987, Proceedings, volume 296 of Lecture Notes in Computer Science. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1988 ISBN 3-540-18928-9, 0-387-18928-9 LCCN QA155.7.E4T74 1988

- [Jen69] R. D. Jenks "META/LISP", Research Report International Business Machines, Inc., Thomas J. Watson Research Center, Yorktown Heights, NY, USA, 1969
- [Jen71] R. D. Jenks "META/PLUS: The syntax extension facility for SCRATCHPAD", Research Report RC 3259, International Business Machines, Inc., Thomas J. Watson Research Center, Yorktown Heights, NY, USA, 1971
- [Jen74] R. D. Jenks "The SCRATCHPAD language" ACM SIGPLAN Notices, 9(4) pp101-111 1974 CODEN SINODQ. ISSN 0362-1340
- [Jen76] Richard D. Jenks. "A pattern compiler" In Richard D. Jenks, editor, SYMSAC '76: proceedings of the 1976 ACM Symposium on Symbolic and Algebraic Computation, August 10-12, 1976, Yorktown Heights, New York, pp60-65, ACM Press, New York, NY 10036, USA, 1976. LCCN QA155.7.EA .A15 1976 QA9.58.A11 1976
- [Jen84a] Richard D. Jenks. "The new SCRATCHPAD language and system for computer algebra" In Golden and Hussain [GH84], pp409-??
- [Jen84b] Richard D. Jenks "A primer: 11 keys to New Scratchpad" In Fitch [Fit84], pp123-147. ISBN 0-387-13350-X LCCN QA155.7.E4 I57 1984
- [Jen88] Jenks, Richard "The Scratchpad II Computer Algebra System Interactive Environment Users Guide" Spring 1988
- [JT81] Jenks, R.D. and Trager, B.M. "A Language for Computational Algebra" Proceedings of SYMSAC81, Symposium on Symbolic and Algebraic Manipulation, Snowbird, Utah August, 1981
- [JT81a] Jenks, R.D. and Trager, B.M. "A Language for Computational Algebra" SIGPLAN Notices, New York: Association for Computing Machinery, Nov 1981
- [JT81b] Jenks, R.D. and Trager, B.M. "A Language for Computational Algebra" IBM Research Report RC8930 IBM Yorktown Heights, NY
- [JOS93] G. Jacob, N. E. Oussous, and S. Steinberg, editors. Proceedings SC 93 International IMACS Symposium on Symbolic Computation. New Trends and Developments. LIFL Univ. Lille, Lille France, 1993
- [Jo06] Joyner, David "OSCAS - Maxima" SIGSAM Communications in Computer Algebra, 157 2006 sage.math.washington.edu/home/wdj/sigsam/oscas-cca1.pdf
- [JS92] Richard D. Jenks and Robert S. Sutor "AXIOM: The Scientific Computation System" Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1992 ISBN 0-387-97855-0 (New York), 3-540-97855-0 (Berlin) 742pp LCCN QA76.95.J46 1992
- [JWS86] Richard D. Jenks, Robert S. Sutor, and Stephen M. Watt "Scratchpad II: an abstract datatype system for mathematical computation" Research Report RC 12327 (#55257), International Business Machines, Inc., Thomas J. Watson Research Center, Yorktown Heights, NY, USA, 1986 23pp

- [JWS87] Richard D. Jenks, Robert S. Sutor, and Stephen M. Watt “Scratchpad II: an Abstract Datatype System for Mathematical Computation” Proceedings Trends in Computer Algebra, Bad Neuenahr, LNCS 296, Springer Verlag, (1987)
- [JWS88] R. D. Jenks, R. S. Sutor, and S. M. Watt “Scratchpad II: an abstract datatype system for mathematical computation” In Janßen [Jan88], pp12-37. ISBN 3-540-18928-9, 0-387-18928-9 LCCN QA155.7.E4T74 1988
- [JT94] R. D. Jenks and B. M. Trager. “How to make AXIOM into a Scratchpad” In ACM [ACM94], pp32-40 ISBN 0-89791-638-7 LCCN QA76.95.I59 1994
- [KKM89] K. Kusche, B. Kutzler, and H. Mayr “Implementation of a geometry theorem proving package in SCRATCHPAD II” In Davenport [Dav89] pp246-257 ISBN 3-540-51517-8 LCCN QA155.7.E4E86 1987
- [KN94] G. Keady and G. Nolan “Production of Argument SubPrograms in the AXIOM – NAG link: examples involving nonleanr systems” Technical Report TR1/94 ATR/7 (NP2680), Numerical Algorithms Group, Inc., Downer’s Grove, IL, USA and Oxford, UK, 1994 <http://www.nag.co.uk/doc/TechRep/axiomtr.html>
- [Kos91] P.-V. Koseleff “Word games in free Lie algebras: several bases and formulas” Theoretical Computer Science 79(1) pp241-256 Feb. 1991 CODEN TCSCDI ISSN 0304-3975
- [Lah08] Lahey, Tim ”Sage Integration Testing” http://github.com/tjl/sage_int_testing Dec. 2008
- [Lam91] L. A. Lambe “Resolutions via homological perturbation” Journal of Symbolic Computation 12(1) pp71-87 July 1991 CODEN JSYCEH ISSN 0747-7171
- [LeB91] S.E.LeBlanc. “The use of MathCAD and Theorist in the ChE classroom” In Anonymous [Ano91], pp287-299 (vol. 1) 2 vols.
- [Le96] Lecerf, Grégoire “Dynamic Evaluation and Real Closure Implementation in Axiom” June 29, 1996 www.math.uvsq.fr/~lecerf/software/drc/drc.ps
- [LD97] Richard Liska, Ladislav Drska, Jiri Limpouch, Milan Sinor, Michael Wester, Franz Winkler ”Computer Algebra - algorithms, systems and applications” June 2, 1997 kfe.fjfi.cvut.cz/~liska/ca/all.html
- [Lev95] A. H. M. Levelt, editor ISSAC ’95: Proceedings of the 1995 International Symposium on Symbolic and Algebraic Computation: July 10-12, 1995, Montreal, Canada ISSAC-PROCEEDINGS-1995. ACM Press, New York, NY 10036, USA, 1995 ISBN 0-89791-699-9 LCCN QA76.95 I59 1995 ACM order number 505950
- [LM91] R. Lynch and H. A. Mavromatis “New quantum mechanical perturbation technique using an ’electronic scratchpad’ on an inexpensive computer” American Journal of Pyhsics, 59(3) pp270-273, March 1991. CODEN AJPIAS ISSN 0002-9505

- [LM06] Li, Xin, and Maza, Moreno “Efficient Implementation of Polynomial Arithmetic in a Multiple-Level Programming Environment” Lecture Notes in Computer Science Springer Vol 4151/2006 ISBN 978-3-540-38084-9 pp12-23 Proceedings of International Congress of Mathematical Software ICMS 2006 www.csd.uwo.ca/~moreno//Publications/Li-MorenoMaza-ICMS-06.pdf
- [Luc86] Michael Lucks “A fast implementation of polynomial factorization” In Bruce W. Char, editor, Proceedings of the 1986 Symposium on Symbolic and Algebraic Computation: SYMSAC '86, July 21-23, 1986, Waterloo, Ontario, pp228-232 ACM Press, New York, NY 10036, USA, 1986. ISBN 0-89791-199-7 LCCN QA155.7.E4 A281 1986 ACM order number 505860
- [Lue77] E. Lueken “Ueberlegungen zur Implementierung eines Formelmanipulationssystems Master’s thesis, Technischen Universität Carolo-Wilhelmina zu Braunschweig. Braunschweig, Germany, 1977
- [Mah05] Mahboubi, Assia, “Programming and certifying the CAD algorithm inside the coq system” Mathematics, Algorithms, Proofs, volume 05021 of Dagstuhl Seminar Proceedings, Schloss Dagstuhl (2005)
- [Mat89] J. Mathews “Symbolic computational algebra applied to Picard iteration” Mathematics and computer education, 23(2) pp117-122 Spring 1989 CODEN MCEDDA, ISSN 0730-8639
- [Mio90] A. Miola, editor. Design and Implementation of Symbolic Computation Systems, International Symposium DISCO '90, Capri, Italy, April 10-12, 1990, Proceedings volume 429 of Lecture Notes in Computer Science, Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1990 ISBN 0-387-52531-9 (New York), 3-540-52531-9 (Berlin) LCCN QA76.9.S88I576 1990
- [Mio93] A. Miola, editor. Design and Implementation of Symbolic Computation Systems, International Symposium DISCO '93 Gmunden, Austria, September 15-17, 1993: Proceedings. Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1993 ISBN 3-540-57235-X LCCN QA76.9.S88I576 1993
- [Mon93] M. B. Monagan “Gauss: a parameterized domain of computation system with support for signature functions”. In Miola [Mio93], pp81-94 ISBN 3-540-57235-X LCCN QA76.9.S88I576 1993
- [Mor89] T. Mora, editor Applied Algebra, Algebraic Algorithms and Error-Correcting Codes, 6th International Conference, AAEECC-6, Rome, Italy, July 4-8, 1988, Proceedings, volume 357 of Lecture Notes in Computer Science Springer-Verlag, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1989 ISBN 3-540-51083-4, LCCN QA268.A35 1988 Conference held jointly with ISSAC '88
- [Mos71] Moses, Joel “Algebraic Simplification: A Guide for the Perplexed” CACM August 1971 Vol 14 No. 8 pp527-537

- [MR90] E. Melachrinoudis and D. L. Rumpf “Teaching advantages of transparent computer software – MathCAD” CoED, 10(1) pp71-76, January-March 1990 CODEN CWLJDP ISSN 0736-8607
- [Nor75] A. C. Norman “Computing with formal power series” ACM Transactions on Mathematical Software, 1(4) pp346-356 Dec. 1975 CODEN ACMSCU ISSN 0098-3500
- [Nor75a] Norman, A.C. “The SCRATCHPAD Power Series Package” IBM T.J. Watson Research RC4998
- [Oll89] F. Ollivier “Inversibility of rational mappings and structural identifiability in automatics” In ACM [ACM89], pp43-54 ISBN 0-89791-325-6 LCCN QA76.95.I59 1989
- [Onl72] Online 72: conference proceedings ... international conference on online interactive computing, Brunel University, Uxbridge, England, 4-7 September 1972 ISBN 0-903796-02-3 LCCN QA76.55.O54 1972 Two volumes.
- [Pa07] Page, William S. “Axiom - Open Source Computer Algebra System” Poster ISSAC 2007 Proceedings Vol 41 No 3 Sept 2007 p114
- [Pet71] S. R. Petric, editor. Proceedings of the second symposium on Symbolic and Algebraic Manipulation, March 23-25, 1971, Los Angeles, California, ACM Press, New York, NY 10036, USA, 1971. LCCN QA76.5.S94 1971
- [Pet93] M. Petitot “Experience with Axiom” In Jacob et al. [JOS93], page 240
- [Pur86] J. Purtilo “Applications of a software interconnection system in mathematical problem solving environments” In Bruce W. Char, editor. Proceedings of the 1986 Symposium on Symbolic and Algebraic Computation: SYMSAC '86, July 21-23, ACM Press, New York, NY 10036, USA, 1986. ISBN 0-89791-199-7 LCCN QA155.7.E4 A281 1986 ACM order number 505860
- [Rio92] R. Rioboo “Real algebraic closure of an ordered field, implementation in Axiom” In Wang [Wan92], pp206-215 ISBN 0-89791-489-9 (soft cover) 0-89791-490-2 (hard cover) LCCN QA76.95.I59 1992
- [Roe95] K. G. Roesner “Verified solutions for parameters of an exact solution for non-Newtonian liquids using computer algebra” Zeitschrift für Angewandte Mathematik und Physik, 75 (suppl. 2):S435-S438, 1995 ISSN 0044-2267
- [Sal89] B. Salvy “Examples of automatic asymptotic expansions” Technical Report 114, Inst. Nat. Recherche Inf. Autom., Le Chesnay, France, Dec. 1989 18pp
- [Sal91] B. Salvy “Examples of automatic asymptotic expansions” SIGSAM Bulletin (ACM Special Interest Group on Symbolic and Algebraic Manipulation), 25(2) pp4-17 April 1991 CODEN SIGSBZ ISSN 0163-5824
- [Sch88] F. Schwarz “Programming with abstract data types: the symmetry package SPDE in Scratchpad” In Janßen [Jan88], pp167-176, ISBN 3-540-18928-9, 0-387-18928-9 LCCN QA155.7.E4T74 1988

- [Sch89] F. Schwarz “A factorization algorithm for linear ordinary differential equations” In ACM [ACM89], pp17-25 ISBN 0-89791-325-6 LCCN QA76.95.I59 1989
- [Sch91] F. Schwarz “Monomial orderings and Gröbner bases” SIGSAM Bulletin (ACM Special Interest Group on Symbolic and Algebraic Manipulation) 25(1) pp10-23 Jan. 1991 CODEN SIGSBZ ISSN 0163-5824
- [SDJ07] Smith, Jacob; Dos Reis, Gabriel; and Jarvi, Jaakko “Algorithmic differentiation in Axiom” ACM SIGSAM ISSAC Proceedings 2007 Waterloo, Canada 2007 pp347-354 ISBN 978-1-59593-743-8
- [Sei94a] W. M. Seiler “Completion to involution in AXIOM” in Calmet [Cal94] pp103-104
- [Sie94b] W. M. Seiler “Pseudo differential operators and integrable systems in AXIOM” Computer Physics Communications, 79(2) pp329-340 April 1994 CODEN CPHCBZ ISSN 0010-4655
- [Sei95] W.M.Seiler “Applying AXIOM to partial differential equations” Internal Report 95-17, Universität Karlsruhe, Fakultät für Informatik 1995
- [Seixx] Seiler, Werner M. “DETools: A Library for Differential Equations” iaks-www.ira.uka.de/iaks-calmet/werner/werner.html
- [Sch92] J. Schü “Implementing des Cartan-Kuranishi-Theorems in AXIOM” Master’s diploma thesis (in german), Institut für Algorithmen und Kognitive Systeme, Universität Karlsruhe 1992
- [Sit89] W. Y. Sit “On Goldman’s algorithm for solving first-order multinomial autonomous systems” In Mora [Mor89], pp386-395 ISBN 3-540-51083-4 LCCN QA268.A35 1998 Conference held jointly with ISSAC ’88
- [Sit92] W. Y. Sit “An algorithm for solving parametric linear systems” Journal of Symbolic Computations, 13(4) pp353-394, April 1992 CODEN JSYCEH ISSN 0747-7171
- [SJ87a] R. S. Sutor and R. D. Jenks “The type inference and coercion facilities in the Scratchpad II interpreter” In Wexelblat [Wex87], pp56-63 ISBN 0-89791-235-7 LCCN QA76.7.S54 v22:7 SIGPLAN Notices, v22 n7 (July 1987)
- [SJ87c] Robert S. Sutor and Richard Jenks “The type inference and coercion facilities in the Scratchpad II interpreter” Research report RC 12595 (#56575), IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA, 1987, 11pp
- [Su87] Sutor, Robert S. “The Scratchpad II Computer Algebra System. Using and Programming the Interpreter” IBM Course presentation slide deck Spring 1987
- [Sme92] Trevor J. Smedley “Using pictorial and object oriented programming for computer algebra” In Hal Berghel et al., editors. Applied computing – technological challenges of the 1990s: proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing, Kansas City Convention Center, March 1-3, 1992 pp1243-1247. ACM Press, New York, NY 10036, USA, 1992. ISBN 0-89791-502-X LCCN QA76.76.A65 S95 1992

- [SS88] D. Shannon and M. Sweedler. “Using Gröbner bases to determine algebra membership, split surjective algebra homomorphisms determine birational equivalence” *Journal of Symbolic Computation* 6(2-3) pp267-273 Oct.-Dec. 1988 CODEN JSYCEH ISSN 0747-7171
- [SSC92] “Algorithmic Methods For Lie Pseudogroups” In N. Ibragimov, M. Torrisi and A. Valenti, editors, *Proc. Modern Group Analysis: Advanced Analytical and Computational Methods in Mathematical Physics*, pp337-344, Acireale (Italy), 1992 Kluwer, Dordrecht 1993 iaks-www.ira.uka.de/iaks-calmet/werner/Papers/Acireale92.ps.gz
- [SSV87] P. Senechaud, F. Siebert, and G. Villard “Scratchpad II: Présentation d’un nouveau langage de calcul formel” Technical Report 640-M, TIM 3 (IMAG), Grenoble, France, Feb 1987
- [Sut85] R. S. Sutor “The Scratchpad II computer algebra language and system” In Buchberger and Caviness [BC85], pp32-33 ISBN 0-387-15983-5 (vol. 1), 0-387-15984-3 (vol. 2) LCCN QA155.7.E4 E86 1985 Two volumes.
- [SW88] R. D. Jenks, R. S. Sutor, and S. M. Watt “Scratchpad II: An abstract datatype system for mathematical computation” In Janßen [Jan88], pp12-?? ISBN 3-540-18928-9, 0-387-18928-9 LCCN QA155.7.E4T74 1988
- [vH94] M. van Hoeij “An algorithm for computing an integral basis in an algebraic function field” *Journal of Symbolic Computation*, 18(4) pp353-363 Oct. 1994 CODEN JSYCEH ISSN 0747-7171
- [Wan89] D. Wang “A program for computing the Liapunov functions and Liapunov constants in Scratchpad II” *SIGSAM Bulletin* (ACM Special Interest Group on Symbolic and Algebraic Manipulation), 23(4) pp25-31, Oct. 1989, CODEN SIGSBZ ISSN 0163-5824
- [Wan91] Dongming Wang, “Mechanical manipulation for a class of differential systems” *Journal of Symbolic Computation*, 12(2) pp233-254 Aug. 1991 CODEN JSYCEH ISSN 0747-7171
- [Wan92] Paul S. Wang, editor. *International System Symposium on Symbolic and Algebraic Computation 92* ACM Press, New York, NY 10036, USA, 1992 ISBN 0-89791-489-9 (soft cover), 0-89791-490-2 (hard cover), LCCN QA76.95.I59 1992
- [Wat89] S. M. Watt “A fixed point method for power series computation” In Gianni [Gia89], pp206-217 ISBN 3-540-51084-2 LCCN QA76.95.I57 1988 Conference held jointly with AAECC-6
- [Wat91] Stephen M. Watt, editor *Proceedings of the 1991 International Symposium on Symbolic and Algebraic Computation, ISSAC’91, July 15-17, 1991, Bonn, Germany*, ACM Press, New York, NY 10036, USA, 1991 ISBN 0-89791-437-6 LCCN QA76.95.I59 1991
- [Wat94] Watt, Stephen M., Broadbery, Peter A., Dooley, Samuel S., and Iglio, Pietro “A First Report on the A# Compiler (including benchmarks)” IBM Research Report RC19529 (85075) May 12, 1994

- [Wat94a] Watt, Stephen M., et. al. “A# User’s Guide” Version 1.0.0 O(ϵ^1) June 8, 1994
- [WJST90] S.M. Watt, R.D. Jenks, R.S. Sutor, and B.M. Trager. “The Scratchpad II type system: Domains and subdomains” in A.M. Miola, editor Computing Tools for Scientific Problem Solving, Academic Press, New York, 1990
- [Web93] A. Weber. “On coherence in computer algebra” In Miola [Mio93], pp95-106 ISBN 3-540-57235-X LCCN QA76.9.S88I576 1993
- [Wes99] Wester, Michael J. “Computer Algebra Systems” John Wiley and Sons 1999 ISBN 0-471-98353-5
- [Wex87] Richard L. Wexelblat, editor. Proceedings of the SIGPLAN ’87 Symposium on Interpreter and Interpretive Techniques, St. Paul, Minnesota, June 24-26, 1987 ACM Press, New York, NY 10036, USA, 1987 ISBN 0-89791-235-7 LCCN QA76.7.S54 v22:7 SIGPLAN Notices, vol 22, no 7 (July 1987)
- [WN90] Shunro Watanabe and Morio Nagata, editors. ISSAC ’90 Proceedings of the International Symposium on Symbolic and Algebraic Computation ACM Press, New York, NY, 10036, USA. 1990 ISBN 0-89791-401-5 LCCN QA76.95.I57 1990
- [Yap00] Yap, Chee Keng “Fundamental Problems of Algorithmic Algebra” Oxford University Press (2000) ISBN0-19-512516-9
- [Yun83] Yun, David Y.Y. “Computer Algebra and Complex Analysis” Computational Aspects of Complex Analysis pp379-393 D. Reidel Publishing Company H. Werner et. al. (eds.)
- [Zen92] Ch. Zenger. “Gröbnerbasen für Differentialformen und ihre Implementierung in AX-IOM, Diplomarbeit, Universität Karlsruhe, Karlsruhe, Germany, 1992

0.2 Axiom Citations of External Sources

Bibliography

- [Ab98] Ablamowicz Rafal, “Spinor Representations of Clifford Algebras: A Symbolic Approach”, Computer Physics Communications Vol. 115, No. 2-3, December 11, 1998, pages 510-535.
- [AS64] Abramowitz, Milton and Stegun, Irene A. “Handbook of Mathematical Functions” (1964) Dover Publications, NY ISBN 0-486-61272-4
- [Alt05] Altmann, Simon L. Rotations, Quaternions, and Double Groups Dover Publications, Inc. 2005 ISBN 0-486-44518-6
- [Ba10] Baker, Martin “3D World Simulation” www.euclideanspace.com
- [Ber95] Laurent Bertrand. Computing a hyperelliptic integral using arithmetic in the jacobian of the curve. *Applicable Algebra in Engineering, Communication and Computing*, 6:275-298, 1995
- [Bro88] Bronstein, Manuel “The Transcendental Risch Differential Equation” J. Symbolic Computation (1990) 9, pp49-60 Feb 1988
- [Bro88a] Bronstein, Manuel “The Transcendental Risch Differential Equation” IBM Research Report RC13460 IBM Corp. Yorktown Heights, NY
- [Bro90] Bronstein, Manuel “Integration of Elementary Functions” J. Symbolic Computation (199) 9, pp117-173 September 1988
- [Bro98] Bronstein, Manuel ”Symbolic Integration Tutorial” INRIA Sophia Antipolis ISSAC 1998 Rostock
- [Bro90] M. Bronstein. “On the integration of elementary functions” *Journal of Symbolic Computation* 9(2):117-173, February 1990
- [Bro91] M. Bronstein. “The Risch differential equation on an algebraic curve” In S.Watt, editor, *Proceedings of ISSAC’91*, pages 241-246, ACM Press, 1991.
- [Bro97] M. Bronstein. *Symbolic Integration I—Transcendental Functions*. Springer, Heidelberg, 1997 ISBN 3-540-21493-3
- [Bro98] M. Bronstein. “The lazy hermite reduction” Rapport de Recherche RR-3562, INRIA, 1998

- [CS03] Conway, John H. and Smith, Derek, A., “On Quaternions and Octonions” A.K Peters, Natick, MA. (2003) ISBN 1-56881-134-9
- [Fl01] Fletcher, John P. “Symbolic processing of Clifford Numbers in C++”, Paper 25, AGACSE 2001.
- [Fl09] Fletcher, John P. “Clifford Numbers and their inverses calculated using the matrix representation.” Chemical Engineering and Applied Chemistry, School of Engineering and Applied Science, Aston University, Aston Triangle, Birmingham B4 7 ET, U. K. www.ceac.aston.ac.uk/research/staff/jpf/papers/paper24/index.php
- [Flo63] Floyd, R. W. “Semantic Analysis and Operator Precedence” JACM 10, 3, 316-333 (1963)
- [Ga95] Garcia, A. and Stichtenoth, H. “A tower of Artin-Schreier extensions of function fields attaining the Drinfeld-Vladut bound” Invent. Math., vol. 121, 1995, pp. 211–222.
- [GL89] Golub, Gene H. and Van Loan, Charles F. “Matrix Computations” Johns Hopkins University Press ISBN 0-8018-3772-3 (1989)
- [Ha1896] Hathway, Arthur S., ”A Primer Of Quaternions” (1896)
- [Ha95] Haché, G. “Computation in algebraic function fields for effective construction of algebraic-geometric codes” Lecture Notes in Computer Science, vol. 948, 1995, pp. 262–278.
- [Ha96] Haché, G. “Construction effective des codes géométriques” Thèse de doctorat de l’Université Pierre et Marie Curie (Paris 6), Septembre 1996.
- [Ham04] Hamdy, S. “LiDIA A library for computational number theory” Reference manual Edition 2.1.1 May 2004 www.cdc.informatik.tu-darmstadt.de/TI/LiDIA
- [Her1872] E. Hermite. Sur l’intégration des fractions rationnelles. *Nouvelles Annales de Mathématiques* (2^{ème} série), 11:145-148, 1872
- [Hig02] Higham, Nicholas J. “Accuracy and stability of numerical algorithms” SIAM Philadelphia, PA ISBN 0-89871-521-0 (2002)
- [HI96] Huang, M.D. and Ierardi, D. “Efficient algorithms for Riemann-Roch problem and for addition in the jacobian of a curve” Proceedings 32nd Annual Symposium on Foundations of Computer Sciences. IEEE Comput. Soc. Press, pp. 678–687.
- [HL95] Haché, G. and Le Brigand, D. “Effective construction of algebraic geometry codes” IEEE Transaction on Information Theory, vol. 41, n27 6, November 1995, pp. 1615–1628.
- [Hou81] Householder, Alston S. “Principles of Numerical Analysis” Dover Publications, Mineola, NY ISBN 0-486-45312-X (1981)
- [Je04] Jeffrey, Alan “Handbook of Mathematical Formulas and Integrals” Third Edition, Elsevier Academic Press ISBN 0-12-382256-4

- [KMJ00] Kaufmann, Matt; Manolios, Panagiotis, and Moore J Strother “Computer-Aided Reasoning: An Approach” Springer, July 31. 2000 ISBN 0792377443
- [Knu84] Knuth, Donald, *The T_EXbook*
Reading, Massachusetts, Addison-Wesley Publishing Company, Inc., 1984. ISBN 0-201-13448-9
- [Kn92] Knuth, Donald E., “Literate Programming” Center for the Study of Language and Information ISBN 0-937073-81-4 Stanford CA (1992)
- [La86] Lamport, Leslie, *LaTeX: A Document Preparation System*,
Reading, Massachusetts, Addison-Wesley Publishing Company, Inc., 1986. ISBN 0-201-15790-X
- [LR88] Le Brigand, D. and Risler, J.J. “Algorithme de Brill-Noether et codes de Goppa”
Bull. Soc. Math. France, vol. 116, 1988, pp. 231–253.
- [LR90] Daniel Lazard and Renaud Rioboo. “Integration of rational functions: Rational computation of the logarithmic part” *Journal of Symbolic Computation*, 9:113-116:1990
- [LMW79] Linger, Richard C.; Mills, Harlan D.; and Witt, Bernard I. “Structured Programming: Theory and Practice” Addison-Wesley (March 1979) ISBN 0201144611
- [Lio1833a] Joseph Liouville. Premier mémoire sur la détermination des intégrales dont la valeur est algébrique. *Journal de l'Ecole Polytechnique*, 14:124-148, 1833
- [Lio1833b] Joseph Liouville. Second mémoire sur la détermination des intégrales dont la valeur est algébrique. *Journal de l'Ecole Polytechnique*, 14:149-193, 1833
- [Loe09] Loetzsch, M. “GTFL - A graphical terminal for Lisp” martin-loetzsch.de/gtfl/
- [Los60] Lösch, Friedrich “Tables of Higher Functions” McGraw-Hill Book Company 1960
- [LTW10] Daly, Timothy “Lambda the Ultimate” lambda-the-ultimate.org/node/3663#comment-62440
- [Luk169] Luke, Yudell L. “The Special Functions and their Approximations” Volume I Academic Press (1969) Mathematics in Science and Engineering Volume 53-I
- [Luk269] Luke, Yudell L. “The Special Functions and their Approximations” Volume II Academic Press (1969) Mathematics in Science and Engineering Volume 53-II
- [Mar07] Marshak, U. “HT-AJAX - AJAX framework for Hunchentoot”
common-lisp.net/project/ht-ajax/ht-ajax.html
- [Mie97] Mielenz, Klaus D. “Computation of Fresnel Integrals” J. Res. Natl. Inst. Stand. Technol. (NIST) V102 No3 May-June 1997 pp363-365
- [Mie00] Mielenz, Klaus D. “Computation of Fresnel Integrals II” J. Res. Natl. Inst. Stand. Technol. (NIST) V105 No4 July-Aug 2000 pp589-590

- [Mul97] Thom Mulders. “A note on subresultants and a correction to the lazard/rioboo/trager formula in rational function integration” *Journal of Symbolic Computation*, 24(1):45-50, 1997
- [NIST10] Olver, Frank W., Lozier, Daniel W., Boisvert, Ronald F., Clark, Charles W. (ed) “NIST Handbook of Mathematical Functions” (2010) Cambridge University Press ISBN 978-0-521-19225-5
- [Ost1845] M.W. Ostrogradsky. De l’intégration des fractions rationnelles. *Bulletin de la Classe Physico-Mathématiques de l’Académie Impériale des Sciences de St. Pétersbourg*, IV:145-167,286-300, 1845
- [Pea56] Pearcey, T. “Table of the Fresnel Integral” Cambridge University Press 1956
- [PJ10] Parnas, David Lorge and Jin, Ying “Defining the meaning of tabular mathematical expressions” *Science of Computer Programming* V75 No.11 Nov 2010 pp980-1000 Elsevier
- [PM95] Parnas, David Lorge and Madey, Jan “Functional Documents for Computer Systems” *Science of Computer Programming* V25 No.1 Oct 1995 pp41-61 Elsevier
- [Pra73] Pratt, Vaughan R. “Top down operator precedence” POPL ’73 Proceedings of the 1st annual ACM SIGACT-SIGPLAN symposium on Principles of programming languages hall.org.ua/halls/wizzard/pdf/Vaughan.Pratt.TDOP.pdf
- [PTVF95] Press, William H., Teukolsky, Saul A., Vetterling, William T., Flannery, Brian P. “Numerical Recipes in C” Cambridge University Press (1995) ISBN 0-521-43108-5
- [Pu09] Puffinware LLC “Singular Value Decomposition (SVD) Tutorial” www.puffinwarellc.com/p3a.htm
- [Ra03] Ramsey, Norman “Noweb – A Simple, Extensible Tool for Literate Programming” www.eecs.harvard.edu/~nr/noweb
- [Ri10] Rich, Albert D. “Rule-based Mathematics” www.apmaths.uwo.ca/~arich
- [RF94] Richardson, Dan and Fitch, John “The identity problem for elementary functions and constants” *ACM Proc. of ISSAC 94* pp285-290 ISBN 0-89791-638-7
- [Ris68] Robert Risch. “On the integration of elementary functions which are built up using algebraic operations” Research Report SP-2801/002/00, System Development Corporation, Santa Monica, CA, USA, 1968
- [Ris69a] Robert Risch. “Further results on elementary functions” Research Report RC-2042, IBM Research, Yorktown Heights, NY, USA, 1969
- [Ris69b] Robert Risch, “The problem of integration in finite terms” *Transactions of the American Mathematical Society* 139:167-189, 1969
- [Ris70] Robert Risch. “The solution of problem of integration in finite terms” *Transactions of the American Mathematical Society* 76:605-608, 1970

- [Ris79] Robert Risch. “Algebraic properties of the elementary functions of analysis” *American Journal of Mathematics*, 101:743-759, 1979
- [Ro72] Maxwell Rosenlicht. Integration in finite terms. *American Mathematical Monthly*, 79:963-972, 1972
- [Ro77] Michael Rothstein. “A new algorithm for the integration of exponential and logarithmic functions” In *Proceedings of the 1977 MACSYMA Users Conference*, pages 263-274. NASA Pub CP-2012, 1977
- [Ste90] Steele, Guy L. “Common Lisp The Language” Second Edition ISBN 1-55558-041-6 Digital Press (1990)
- [St93] Stichtenoth, H. “Algebraic function fields and codes” Springer-Verlag, 1993, University Text.
- [Ta1890] Tait, P.G., *An Elementary Treatise on Quaternions* C.J. Clay and Sons, Cambridge University Press Warehouse, Ave Maria Lane 1890
- [Tai96] Taivalsaari, Antero “On the Notion of Inheritance” *ACM Computing Surveys*, Vol 28 No 3 Sept 1996 pp438-479
- [Tr76] Trager, Barry “Algebraic factoring and rational function integration” In *Proceedings of SYMSAC’76* pages 219-226, 1976
- [Tr84] Trager Barry *On the integration of algebraic functions*, PhD thesis, MIT, Computer Science, 1984
- [vH94] M. van Hoeij. “An algorithm for computing an integral basis in an algebraic function field” *J. Symbolic Computation* 18(4):353-364, October 1994
- [Wa03] Watt, Stephen, “Aldor”, www.aldor.org
- [We71] André Weil, *Courbes algébriques et variétés Abeliennes* Hermann, Paris, 1971
- [Wein] Weisstein, Eric W. “Hypergeometric Function” MathWorld - A Wolfram Web Resource mathworld.wolfram.com/HypergeometricFunction.html
- [Wei03] Weitz, E. “CL-WHO -Yet another Lisp markup language” www.weitz.de/cl-who/
- [Wei06] Weitz, E. “HUNCHENTOOT - The Common Lisp web server formerly known as TBNL” www.weitz.de/hunchentoot/
- [Wo09] Wolfram Research, mathworld.wolfram.com/Quaternion.html
- [Yu76] D.Y.Y. Yun. “On square-free decomposition algorithms” *Proceedings of SYMSAC’76* pages 26-35, 1976