



## Dipl.-Ing. Dr. Axel Riese

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### PERSONAL DETAILS

Born	February 4, 1971 in Linz, Austria
Citizenship	Austria
Marital Status	Single; 3 children

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### EDUCATION

1998	Ph.D. “mit ausgezeichnetem Erfolg”
1995–1998	Ph.D. studies at Research Institute for Symbolic Computation (RISC), J. Kepler University Linz
1995	Diploma degree
1989–1995	Studies in “Technische Mathematik, Studienzweig Informations- und Datenverarbeitung” at J. Kepler University Linz
1989	High School Diploma (“Matura”), BG Ramsauerstraße Linz

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### EMPLOYMENT

2005–...	Application Engineer at Siemens VAI (AIS Advanced Information Systems)
1999–2005	Research Assistant at RISC
1998–1999	Civil Service (“Zivildienst”)
1998	One-month CEEPUS scholarship at University of Ljubljana, Slovenia, with Prof. Marko Petkovšek
1998	Research Assistant at RISC

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### PROJECT EXPERIENCE

2005–...	Continuous Casting Level 2 Automation (VAI)
1998–2005	SFB <i>Numerical and Symbolic Scientific Computing</i> (Austrian FWF)

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## TEACHING

2000–2005	Lecturer at Hagenberg University of Applied Sciences (Mathematics for <i>Media Technology and Design, Software Engineering, Bioinformatics, Computer and Media Security, Mobile Computing, Engineering for Computer-Based Learning</i> )
2000–2005	Lecturer at J. Kepler University Linz ( <i>Linear Algebra, Mathematics for Computer Scientists, Algorithmic Methods</i> )

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## SPECIAL SKILLS

Operating Systems	UNIX (Linux, IRIX), Windows, DOS
Progr. Languages	Java, C/C++, Modula-2, Fortran, Basic, PL/I, Prolog, Lisp, Perl, XML, HTML, CSS
Applications	Eclipse, Mathematica, Maple, Word, Excel, L <sup>A</sup> T <sub>E</sub> X
Foreign Languages	English, Latin
Driving License	B

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## MEMBERSHIPS AND SCIENTIFIC ACTIVITIES

1999–...	Member of <i>American Mathematical Society</i>
1998–...	Referee for various scientific journals
1998–2005	Reviewer for <i>Mathematical Reviews</i>
2004–2005	Reviewer for <i>Zentralblatt für Mathematik</i>

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## COMMISSIONINGS

2005	Carinox, 1-strand stainless steel slab caster, Châtelet, Belgium
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## AWARDS

2004	<i>Best Teacher Award</i> , third place, Hagenberg University of Applied Sciences
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## SOFTWARE

MoldExpert	a tool for monitoring the mold of continuous casting machines and for breakout prevention (co-developer, VAI)
fastZeil	a Mathematica implementation of Gosper's and Zeilberger's algorithm (together with P. Paule and M. Schorn, RISC)
MultiSum	a Mathematica package for proving hypergeometric multi-sum identities (together with K. Wegschaider, RISC)
qZeil	a Mathematica implementation of $q$ -analogues of Gosper's and Zeilberger's algorithm
Bibasic Telescope	a Mathematica implementation of a bibasic analogue of Gosper's algorithm

qMultiSum	a Mathematica package for proving $q$ -hypergeometric multi-sum identities
Omega	a Mathematica implementation of Partition Analysis
RatDiff	a Mathematica implementation of van Hoeij's algorithm for finding rational solutions of linear difference equations
CNullSpace	a C++/SACLIB program for computing the nullspace of a matrix of rational functions (together with E. Aichinger, JKU)

## PUBLICATIONS

A. Riese, *A Mathematica  $q$ -Analogue of Zeilberger's Algorithm for Proving  $q$ -Hypergeometric Identities*, Diploma thesis, RISC, J. Kepler University Linz, 1995.

A. Riese, *A Generalization of Gosper's Algorithm to Bibasic Hypergeometric Summation*, *Electron. J. Combin.*, **3** (1996), #R19.

P. Paule and A. Riese, *A Mathematica  $q$ -Analogue of Zeilberger's Algorithm Based on an Algebraically Motivated Approach to  $q$ -Hypergeometric Telescoping*, in "Special Functions,  $q$ -Series and Related Topics" (M.E.H. Ismail, D.R. Masson and M. Rahman, eds.), *Fields Inst. Commun.*, Vol. 14, pp. 179–210, Amer. Math. Soc., 1997.

A. Riese, *Contributions to Symbolic  $q$ -Hypergeometric Summation*, Ph.D. thesis, RISC, J. Kepler University Linz, 1997.

A. Riese, *Fine-Tuning Zeilberger's Algorithm: The Methods of Automatic Filtering and Creative Substituting*, in "Symbolic Computation, Number Theory, Special Functions, Physics and Combinatorics" (F.G. Garvan and M.E.H. Ismail, eds.), *Developments in Mathematics*, Vol. 4, pp. 243–254, Kluwer, 2001.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis III: The Omega Package*, *European J. Combin.*, **22** (2001), 887–904.

G.E. Andrews, P. Paule, A. Riese, and V. Strehl, *MacMahon's Partition Analysis V: Bijections, Recursions, and Magic Squares*, in "Algebraic Combinatorics and Applications" (A. Betten et al., eds.), pp. 1–39, Springer, 2001.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis VI: A New Reduction Algorithm*, *Ann. Comb.*, **5** (2001), 251–270.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis VII: Constrained Compositions*, in " $q$ -Series with Applications to Combinatorics, Number Theory, and Physics" (B.C. Berndt and K. Ono, eds.), *Contemp. Math.*, Vol. 291, pp. 11–27, Amer. Math. Soc., 2001.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis VIII: Plane Partition Diamonds*, *Adv. in Appl. Math.*, **27** (2001), 231–242.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis IX:  $k$ -Gon Partitions*, *Bull. Austral. Math. Soc.*, **64** (2001), 321–329.

A. Berkovich and A. Riese, *A Computer Proof of a Polynomial Identity Implying a Partition Theorem of Göllnitz*, *Adv. in Appl. Math.*, **28** (2002), 1–16.

R. Lyons, P. Paule, and A. Riese, *A Computer Proof of a Series Evaluation in Terms of Harmonic Numbers*, Appl. Algebra Engrg. Comm. Comput., **13** (2002), 327–333.

A. Riese, *qMultiSum — A Package for Proving q-Hypergeometric Multiple Summation Identities*, J. Symbolic Comput., **35** (2003), 349–376.

P.J. Larcombe, A. Riese, and B. Zimmermann, *Computer Proofs of Matrix Product Identities*, J. Algebra Appl., **3** (2004), 105–109.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis X: Plane Partitions with Diagonals*, South East Asian J. Math. Math. Sci., **3** (2004), 3–14.

G.E. Andrews, P. Paule, and A. Riese, *MacMahon's Partition Analysis XI: Hexagonal Plane Partitions*, SFB Report **2004-4**, J. Kepler University, Linz, 2004.

A. Bećirović, P. Paule, V. Pillwein, A. Riese, C. Schneider, and J. Schöberl, *Hypergeometric Summation Algorithms for High Order Finite Elements*, SFB Report **2006-8**, J. Kepler University, Linz, 2006.

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#### INVITED/CONTRIBUTED CONFERENCE TALKS AND LECTURES

*Treating q-Identities with the Computer*, Conference on Symbolic Computation, Number Theory, Special Functions, Physics and Combinatorics, Gainesville, Florida, November 11–13, 1999.

*Symbolic q-Hypergeometric Summation and Partition Analysis*, Special Functions 2000: Current Perspective and Future Directions, Tempe, Arizona, May 29–June 9, 2000.

*Curing Syndromes with Computer Algebra*, q-Series with Applications to Combinatorics, Number Theory and Physics, Urbana-Champaign, Illinois, October 26–28, 2000.

*qMultiSum — A Package for Proving q-Hypergeometric Multi-Sums*, 46<sup>th</sup> Séminaire Lotharingien de Combinatoire, Lyon, France, March 18–21, 2001.

*Randomization Speeds Up Hypergeometric Summation*, SFB Workshop, Strobl, Austria, April 25–27, 2002.

*Computer Proofs of Hypergeometric Summation Identities and Partition Analysis*, Special Functions in the Digital Age, Minneapolis, Minnesota, July 22–August 2, 2002.

*Hypergeometric Series for High Order Finite Elements*, SFB Workshop, Strobl, Austria, April 24–26, 2003.

*Computer Algebra Algorithms for Symbolic Summation*, Poster presentation at International Workshop on Numerical and Symbolic Scientific Computing, Strobl, Austria, June 16–21, 2003.

*An Introduction to Symbolic (q-) Hypergeometric Summation*, Colloquium Talk at Geometry-Topology Seminar, School of Mathematics, Georgia Institute of Technology, Atlanta, Georgia, September 3, 2003.

*Special Functions and High Order Finite Elements*, SFB Workshop, Strobl, Austria, April 5–7, 2004.