Curriculum Vitae

Personal Data

Full name	Priv.-Doz. Dipl.-Inf. Dr. Christoph Bernhard Koutschan
Date of birth	12.12.1978
Place of birth	Dillingen an der Donau, Germany
Nationality	German
Marital status	Married, two children

Contact

Address	Johann Radon Institute for Computational and Applied Mathematics (RICAM) Austrian Academy of Sciences Altenberger Straße 69, A-4040 Linz
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Education and Work Experience

05/2017	Habilitation in Mathematics, Johannes Kepler University Linz, Austria. Thesis: *Quod Erat Demonstrandum: Proofs by Computer* (evaluation committee: James H. Davenport, Christian Krattenthaler, Marko Petkovšek, Bruno Salvy, Carsten Schneider, Nobuki Takayama)
09/2012 –	Research scientist at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria.
09/2011 – 08/2012	Postdoctoral researcher at Institut National de Recherche en Informatique et en Automatique (INRIA), MSR-INRIA Joint Centre, Orsay, France.
09/2010 – 08/2011	Postdoctoral researcher at the Research Institute for Symbolic Computation (RISC), Linz, Austria.
10/2009 – 06/2010	Postdoctoral researcher at Tulane University, New Orleans, USA.
10/2005 – 09/2009	Ph.D. studies in symbolic computation at RISC, Johannes Kepler University Linz, Austria. Ph.D. thesis: *Advanced Applications of the Holonomic Systems Approach* (advisor: Univ.-Prof. Dr. Peter Paule)

10/1999 – 07/2005	Undergraduate studies in computer science (minor subject: mathematics), Friedrich-Alexander University of Erlangen-Nürnberg, Germany. Diploma thesis: *Regular Languages and Their Generating Function: The Inverse Problem* (advisor: Prof. Dr. Volker Strehl)
07/1998 – 07/1999	Civil Service
06/1998	High school graduation (Abitur) in Coburg, Germany.

Career-Related Activities

- program committee member at DART8 (2017)
- guest editor for Mathematics in Computer Science
- program committee member at ISSAC 2017
- session organizer at ACA 2017
- employee representative at RICAM
- session organizer at the Workshop on Symbolic Computation and Algebraic Statistics (Kyoto, 2016)
- session organizer at the International Congress on Mathematical Software (Berlin, 2016)
- poster committee member at ISSAC 2016
- co-organizer (with I. Georgieva, C. Hofreither, V. Pillwein, R. Uluchev) of the Workshop on Approximation Theory, CAGD, Numerical Analysis, and Symbolic Computation (Linz, 2015)
- co-organizer (with H. Hauser, G. Rond) of the Workshop on Approximation and Combinatorics (CIRM, Luminy, France, 2015)
- help with conference organization (ISSAC 2008, ACA 2008, FPSAC 2009)
- conduct one-week workshops for high school students (2007, 2008, 2009)
- member of DMV and ÖMG
- reviewer for Zentralblatt MATH and Mathematical Reviews
- contribute to the Online Encyclopedia of Integer Sequences (OEIS)

Awards

- 2016 David P. Robbins Prize of the American Mathematical Society (together with M. Kauers and D. Zeilberger)
- 2016 Distinguished Software Presentation Award at ISSAC

Third-Party Funding

- Certificate-free Summation and Integration (SFB project part F 5011-N15, 2017 – 2021, 345,539 EUR)
- Algebraic Statistics and Symbolic Computation (FWF stand-alone project P 29467-N32, 2016 – 2018, 155,904 EUR)

Patents

- Joachim Schöberl, Christoph Koutschan, Peter Paule. *Verfahren, Vorrichtung und Computerprogrammprodukt zur Bestimmung eines elektromagnetischen Nahfeldes einer Feldanregungsquelle eines elektrischen Systems (Method, device and computer program product for determining an electromagnetic near field of a field excitation source for an electrical system).* European Patent EP2378444, US patent US8868382, 2015.

Publications

[55] Shaoshi Chen, Mark van Hoeij, Manuel Kauers, Christoph Koutschan. *Reduction-based creative telescoping for fuchsian D-finite functions.* Journal of Symbolic Computation **85**, pp. 108–127, 2018. DOI: 10.1016/j.jsc.2017.07.005, arXiv: 1611.07421.

[54] Christoph Koutschan, Peter Paule. *Holonomic tools for basic hypergeometric functions.* In *Frontiers in Orthogonal Polynomials and q-Series*, 2018. World Scientific, ISBN 978-981-3228-87-0. To appear. DOI: 10.1142/10677, arXiv: 1602.00454.

[53] Georg Grasegger, Christoph Koutschan, Elias Tsigaridas. *Lower bounds on the number of realizations of rigid graphs.* Technical report no. 2017-35 in the RICAM Reports Series, 2017. Submitted for publication. arXiv: 1710.08237.

[52] Christoph Koutschan, Thotsaporn Thanatipanonda. *A curious family of binomial determinants that count rhombus tilings of a holey hexagon.* Technical report no. 2017-30 in the RICAM Reports Series, 2017. Submitted for publication. arXiv: 1709.02616.

[51] Jose Capco, Matteo Gallet, Georg Grasegger, Christoph Koutschan, Niels Lubbes, Josef Schicho. *Computing the number of realizations of a Laman graph.* Electronic Notes in Discrete Mathematics (Proceedings of Eurocomb 2017) **61**, pp. 207–213, 2017. DOI: 10.1016/j.endm.2017.06.040, arXiv: 1707.03633.

[50] Mariemi E. Alonso, Francisco J. Castro-Jiménez, Herwig Hauser, Christoph Koutschan. *Echelons of power series and Gabrielov's counterexample to nested linear Artin approximation.* Submitted for publication, 2017.

[49] Johannes Middeke, David J. Jeffrey, Christoph Koutschan. *Common factors in fraction-free matrix decompositions.* Submitted for publication, 2017.

[48] Jose Capco, Matteo Gallet, Georg Grasegger, Christoph Koutschan, Niels Lubbes, Josef Schicho. *The number of realizations of a Laman graph.* SIAM Journal on Applied Algebra and Geometry, 2017. To appear. arXiv: 1701.05500.

[47] Matteo Gallet, Christoph Koutschan, Zijia Li, Georg Regensburger, Josef Schicho, Nelly Villamizar. *Planar linkages following a prescribed motion.* Mathematics of Computation **86**, pp. 473–506, 2017. DOI: 10.1090/mcom/3120, arXiv: 1502.05623.

[46] Thomas Cluzeau, Christoph Koutschan, Alban Quadrat, Maris Tõnso. *Effective algebraic analysis approach to linear systems over Ore algebras.* Technical report no. 2017-12 in the RICAM Reports Series, 2017. Submitted for publication.

[45] Christoph Koutschan. *Motion polynomials and planar linkages.* ACM Communications in Computer Algebra **50**(3), pp. 109–112, 2016. DOI: 10.1145/3015306.3015315.

[44] Christoph Koutschan, Martin Neumüller, Cristian-Silviu Radu. *Inverse inequality estimates with symbolic computation.* Advances in Applied Mathematics **80**, pp. 1–23, 2016. DOI: 10.1016/j.aam.2016.04.005, arXiv: 1602.01304.

[43] Shaoshi Chen, Manuel Kauers, Christoph Koutschan. *Reduction-based creative telescoping for algebraic functions.* In *Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC)*, pp. 175–182, 2016. ACM, New York, USA, ISBN 978-1-4503-4380-0. DOI: 10.1145/2930889.2930901, arXiv: 1602.00424.

[42] Saoud Hassani, Christoph Koutschan, Jean-Marie Maillard, Nadjah Zenine. *Lattice Green functions: the d-dimensional face-centred cubic lattice, $d = 8, 9, 10, 11, 12$.* Journal of Physics A: Mathematical and Theoretical **49**(16), 164003, 2016. DOI: 10.1088/1751-8113/49/16/164003, arXiv: 1601.05657.

[41] Constantin Siriteanu, Akimichi Takemura, Christoph Koutschan, Satoshi Kuriki, Donald St. P. Richards, Hyundong Shin. *Exact ZF analysis and computer-algebra-aided evaluation in rank-1 LoS Rician fading.* IEEE Transactions on Wireless Communications **15**(8), pp. 5245–5259, 2016. DOI: 10.1109/TWC.2016.2555796, arXiv: 1507.07056.

[40] Christoph Koutschan, Erwin Suazo, Sergei K. Suslov. *Fundamental laser modes in paraxial optics: from computer algebra and simulations to experimental observation.* Applied Physics B: Lasers and Optics **121**(3), pp. 315–336, 2015. DOI: 10.1007/s00340-015-6231-9, arXiv: 1407.0730.

[39] Shaoshi Chen, Christoph Koutschan. *Proof of the Wilf–Zeilberger conjecture for mixed hypergeometric terms.* Technical report no. 2015-15 in the RICAM Reports Series, 2015. Submitted for publication. arXiv: 1507.04840.

[38] Christoph Koutschan, Helene Ranetbauer, Georg Regensburger, Marie-Therese Wolfram. *Symbolic derivation of mean-field PDEs from lattice-based models.* In *Proceedings of the 17th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)*, pp. 27–33, 2015. IEEE Computer Society Conference Publishing Services (CPS), ISBN 978-1-5090-0461-4. DOI: 10.1109/SYNASC.2015.14, arXiv: 1506.08527.

[37] Manuel Kauers, Christoph Koutschan. *Integral D-finite functions.* In *Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC)*, pp. 251–258, 2015. ACM, New York, USA, ISBN 978-1-4503-3435-8. DOI: 10.1145/2755996.2756658, arXiv: 1501.03691.

[36] Constantin Siriteanu, Akimichi Takemura, Satoshi Kuriki, Hyundong Shin, Christoph Koutschan. *MIMO zero-forcing performance evaluation using the holonomic gradient method.* IEEE Transactions on Wireless Communications **14**(4), pp. 2322–2335, 2015. DOI: 10.1109/TWC.2014.2385075, arXiv: 1403.3788.

[35] Shaoshi Chen, Manuel Kauers, Christoph Koutschan. *A generalized Apagodu-Zeilberger algorithm.* In *Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC)*, pp. 107–114, 2014. ACM, New York, USA, ISBN 978-1-4503-2501-1. DOI: 10.1145/2608628.2608641, arXiv: 1402.2409.

[34] Christoph Koutschan, Peter Paule, Sergei K. Suslov. *Relativistic Coulomb integrals and Zeilberger's holonomic systems approach II.* In *Algebraic and Algorithmic Aspects of Differential and Integral Operators*, Lecture Notes in Computer Science **8372**, pp. 135–145, 2014. Springer-Verlag, Berlin Heidelberg, ISBN 978-3-642-54478-1. DOI: 10.1007/978-3-642-54479-8_6, arXiv: 1306.1362.

[33] Christoph Koutschan. *Holonomic functions in Mathematica.* ACM Communications in Computer Algebra **47**(4), pp. 179–182, 2013. DOI: 10.1145/2576802.2576831.

[32] Christoph Koutschan. *Creative telescoping for holonomic functions.* In Carsten Schneider, Johannes Blümlein (editors): *Computer Algebra in Quantum Field Theory: Integration, Summation and Special Functions*, Texts & Monographs in Symbolic Computation, pp. 171–194, 2013. Springer, Wien, ISBN 978-3-7091-1615-9. DOI: 10.1007/978-3-7091-1616-6_7, arXiv: 1307.4554.

[31] Stefan Gerhold, Manuel Kauers, Christoph Koutschan, Peter Paule, Carsten Schneider, Burkhard Zimmermann. *Computer-assisted proofs of some identities for Bessel functions of fractional order.* In Carsten Schneider, Johannes Blümlein (editors): *Computer Algebra in Quantum Field Theory: Integration, Summation and Special Functions*, Texts & Monographs in Symbolic Computation, pp. 75–96, 2013. Springer, Wien, ISBN 978-3-7091-1615-9. DOI: 10.1007/978-3-7091-1616-6_3, arXiv: 1305.4818.

[30] Stavros Garoufalidis, Christoph Koutschan. *Irreducibility of q-difference operators and the knot* 7_4. Algebraic & Geometric Topology **13**(6), pp. 3261–3286, 2013. DOI: 10.2140/agt.2013.13.3261, arXiv: 1211.6020.

[29] Christoph Koutschan. *Lattice Green's functions of the higher-dimensional face-centered cubic lattices.* Journal of Physics A: Mathematical and Theoretical **46**(12), 125005, 2013. DOI: 10.1088/1751-8113/46/12/125005, arXiv: 1108.2164.

[28] Christoph Koutschan, Thotsaporn Thanatipanonda. *Advanced computer algebra for determinants.* Annals of Combinatorics **17**(3), pp. 509–523, 2013. DOI: 10.1007/s00026-013-0183-8, arXiv: 1112.0647.

[27] Irina Georgieva, Clemens Hofreither, Christoph Koutschan, Veronika Pillwein, Thotsaporn Thanatipanonda. *Harmonic interpolation based on Radon projections along the sides of regular polygons.* Central European Journal of Mathematics **11**(4), pp. 609–620, 2013. DOI: 10.2478/s11533-012-0160-1.

[26] Stavros Garoufalidis, Christoph Koutschan. *The non-commutative A-polynomial of* $(-2, 3, n)$ *pretzel knots.* Experimental Mathematics **21**(3), pp. 241–251, 2012. DOI: 10.1080/10586458.2012.651409, arXiv: 1101.2844.

[25] Larry Glasser, Karen T. Kohl, Christoph Koutschan, Victor H. Moll, Armin Straub. *The integrals in Gradshteyn and Ryzhik. Part 22: Bessel-K functions.* SCIENTIA Series A: Mathematical Sciences **22**, pp. 129–151, 2012.

[24] Herwig Hauser, Christoph Koutschan. *Multivariate linear recurrences and power series division.* Discrete Mathematics **312**(24), pp. 3553–3560, 2012. DOI: 10.1016/j.disc.2012.08.009.

[23] Thierry Combot, Christoph Koutschan. *Third order integrability conditions for homogeneous potentials of degree* -1. Journal of Mathematical Physics **53**(8), 082704, 2012. DOI: 10.1063/1.4746691, arXiv: 1111.5971.

[22] Masao Ishikawa, Christoph Koutschan. *Zeilberger's holonomic ansatz for Pfaffians.* In *Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC)*, pp. 227–233, 2012. ACM, New York, USA, ISBN 978-1-4503-1269. DOI: 10.1145/2442829.2442863, arXiv: 1201.5253.

[21] Stavros Garoufalidis, Christoph Koutschan. *Twisting q-holonomic sequences by complex roots of unity.* In *Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC)*, pp. 179–186, 2012. ACM, New York, USA, ISBN 978-1-4503-1269. DOI: 10.1145/2442829.2442857, arXiv: 1201.3353.

[20] Tewodros Amdeberhan, Christoph Koutschan, Victor H. Moll, Eric S. Rowland. *The iterated integrals of* $\ln(1 + x^n)$. International Journal of Number Theory **8**(1), pp. 71–94, 2012. DOI: 10.1142/S1793042112500042, arXiv: 1012.3429.

[19] Christoph Koutschan, Christoph Lehrenfeld, Joachim Schöberl. *Computer algebra meets finite elements: an efficient implementation for Maxwell's equations.* In Ulrich Langer, Peter Paule (editors): *Numerical and Symbolic Scientific Computing: Progress and Prospects*, Texts & Monographs in Symbolic Computation, pp. 105–121, 2012. Springer, Wien, ISBN 978-3-7091-0793-5. DOI: 10.1007/978-3-7091-0794-2_6, arXiv: 1104.4208.

[18] Frédéric Chyzak, James H. Davenport, Christoph Koutschan, Bruno Salvy. *On Kahan's rules for determining branch cuts.* In *Proceedings of the 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)*, pp. 47–51, 2011. IEEE Computer Society Conference Publishing Services (CPS), ISBN 978-0-7695-4630-8. DOI: 10.1109/SYNASC.2011.51, arXiv: 1109.2809.

[17] Viktor Levandovskyy, Christoph Koutschan, Oleksandr Motsak. *On two-generated non-commutative algebras subject to the affine relation.* In *Proceedings of the 13th International Workshop on Computer Algebra in Scientific Computing (CASC)*, Lecture Notes in Computer Science **6885**, pp. 309–320, 2011. Springer, Berlin Heidelberg, ISBN 978-3-642-23567-2. DOI: 10.1007/978-3-642-23568-9_24, arXiv: 1108.1108.

[16] Stavros Garoufalidis, Christoph Koutschan. *The $\mathfrak{sl}_3$ Jones polynomial of the trefoil: a case study of q-holonomic sequences.* Advances in Applied Mathematics **47**(4), pp. 829–839, 2011. DOI: 10.1016/j.aam.2011.04.001, arXiv: 1011.6329.

[15] Christoph Koutschan, Manuel Kauers, Doron Zeilberger. *Proof of George Andrews's and David Robbins's q-TSPP conjecture.* Proceedings of the National Academy of Sciences **108**(6), pp. 2196–2199, 2011. DOI: 10.1073/pnas.1019186108, arXiv: 1002.4384.

[14] Christoph Koutschan, Victor H. Moll. *The integrals in Gradshteyn and Ryzhik. Part 18: some automatic proofs.* SCIENTIA Series A: Mathematical Sciences **20**, pp. 93–111, 2011.

[13] Christoph Koutschan, Doron Zeilberger. *The 1958 Pekeris-Accad-WEIZAC groundbreaking collaboration that computed ground states of two-electron atoms (and its 2010 redux).* The Mathematical Intelligencer **33**(2), pp. 52–57, 2011. DOI: 10.1007/s00283-010-9192-1, arXiv: 1006.0200.

[12] Tewodros Amdeberhan, Mark W. Coffey, Olivier Espinosa, Christoph Koutschan, Dante V. Manna, Victor H. Moll. *Integrals of powers of loggamma.* Proceedings of the AMS **139**(2), pp. 535–545, 2011. DOI: 10.1090/S0002-9939-2010-10589-0.

[11] Christoph Koutschan. *Eliminating human insight: an algorithmic proof of Stembridge's TSPP Theorem.* In Tewodros Amdeberhan, Luis A. Medina, Victor H. Moll (editors): *Gems in Experimental Mathematics*, Contemporary Mathematics **517**, pp. 219–230, 2010. American Mathematical Society, ISBN 978-0-8218-4869-2. DOI: 10.1090/conm/517, arXiv: 0906.1018.

[10] Christoph Koutschan. *A fast approach to creative telescoping.* Mathematics in Computer Science **4**(2-3), pp. 259–266, 2010. DOI: 10.1007/s11786-010-0055-0, arXiv: 1004.3314.

[9] Christoph Koutschan. *HolonomicFunctions (user's guide).* Technical report no. 10-01 in the RISC Report Series, Johannes Kepler University, Linz, Austria, 2010.

[8] Christoph Koutschan. *Advanced applications of the holonomic systems approach.* ACM Communications in Computer Algebra **43**(3/4), pp. 119–119, 2009. DOI: 10.1145/1823931.1823954.

[7] Christoph Koutschan. *Advanced applications of the holonomic systems approach.* PhD thesis, Research Institute for Symbolic Computation (RISC), Johannes Kepler University, Linz, Austria, 2009.

[6] Manuel Kauers, Christoph Koutschan, Doron Zeilberger. *A Proof of George Andrews' and Dave Robbins' q-TSPP conjecture (modulo a finite amount of routine calculations).* The personal journal of Shalosh B. Ekhad and Doron Zeilberger, 2009.

[5] Manuel Kauers, Christoph Koutschan, Doron Zeilberger. *Proof of Ira Gessel's lattice path conjecture.* Proceedings of the National Academy of Sciences **106**(28), pp. 11502–11505, 2009. DOI: 10.1073/pnas.0901678106, arXiv: 0806.4300.

[4] Manuel Kauers, Christoph Koutschan. *A Mathematica package for q-holonomic sequences and power series.* The Ramanujan Journal **19**(2), pp. 137–150, 2009. DOI: 10.1007/s11139-008-9132-2.

[3] Christoph Koutschan, Viktor Levandovskyy. *Computing one of Victor Moll's irresistible integrals with computer algebra.* Computer Science Journal of Moldova **16**(1(46)), pp. 35–49, 2008.

[2] Christoph Koutschan. *Regular languages and their generating functions: the inverse problem.* Theoretical Computer Science **391**(1-2), pp. 65–74, 2008. DOI: 10.1016/j.tcs.2007.10.031.

[1] Christoph Koutschan. *Regular languages and their generating functions: the inverse problem.* Master thesis (Diplomarbeit), Friedrich-Alexander-Universität, Erlangen-Nürnberg, Germany, 2005.

Talks at Conferences

49. *Symbolic evaluation of determinants and rhombus tilings of holey hexagons.* Invited talk at the ALEA in Europe Workshop, Technical University of Vienna, Austria, October 12, 2017.
48. *Reduction-based creative telescoping for D-finite functions.* Invited talk at Lattice walks at the Interface of Algebra, Analysis and Combinatorics, Banff International Research Station, Canada, September 19, 2017.
47. *Computing the number of realizations of Laman graphs.* Invited talk at the Workshop on Computational Mathematics and Approximation Theory (CMAPT), RICAM, Linz, Austria, September 8, 2017.
46. *Constructing linkages for drawing plane curves.* Invited talk at ACA (23rd Conference on Applications of Computer Algebra), Jerusalem College of Technology, Jerusalem, Israel, July 21, 2017.
45. *Two facets of computational mathematics: numerics and symbolics.* Invited talk at the ERCOM Meeting, RICAM, Austria, April 28, 2017.
44. *Reduction-based creative telescoping for algebraic functions.* Invited talk at the Workshop on Algebraic Statistics and Symbolic Computation, Research Institute for Mathematical Sciences (RIMS), Kyoto University, Japan, July 28, 2016.
43. *Inverse inequality estimates with symbolic computation.* Invited talk at the Waterloo Workshop on Computer Algebra, Wilfrid Laurier University, Waterloo, Canada, July 23, 2016.
42. *Motion polynomials and planar linkages.* Software presentation at ISSAC (41st International Symposium on Symbolic and Algebraic Computation), Wilfrid Laurier University, Waterloo, Canada, July 20, 2016.
41. *Minimally rigid graphs.* Invited talk at MICA (Milestones in Computer Algebra — Celebrating the Research of Erich Kaltofen), University of Waterloo, Canada, July 16, 2016.
40. *Effective algebraic analysis approach to linear systems over Ore algebras.* Invited talk at ICMS (5th International Congress on Mathematical Software), Zuse Institute Berlin, Germany, July 12, 2016.
39. *Inverse inequality estimates with symbolic computation.* Invited talk at the Workshop on Analysis and Advanced Numerical Methods for Partial Differential Equations, Strobl, Austria, July 8, 2016.
38. *Symbolic determinant evaluation.* Invited talk at the Workshop on Algebra, Geometry and Proofs in Symbolic Computation, Fields Institute, Toronto, Canada, December 15, 2015.
37. *Planar linkages following a prescribed motion.* Invited talk at the Workshop on Approximation Theory, CAGD, Numerical Analysis, and Symbolic Computation, Linz, Austria, August 25, 2015.
36. *Pushing forward the dimension of fcc lattices.* Invited talk at the Sixth International Workshop on Differential Algebra and Related Topics (DART-VI, embedded conference of ICIAM), China National Convention Center, Beijing, China, August 10, 2015.
35. *Computer-algebra-based MIMO performance analysis.* Invited talk at the SIAM Conference on Applied Algebraic Geometry, National Institute for Mathematical Sciences (NIMS), Daejeon, South Korea, August 7, 2015.
34. *Pushing forward the dimension of fcc lattices.* Invited talk at SIAM-OPSFA (13th International Symposium on Orthogonal Polynomials, Special Functions & Applications), National Institute of Standards and Technology (NIST), Gaithersburg, USA, June 2, 2015.
33. *Multivariate D-finite and holonomic functions.* Invited talk at the Workshop on Approximation and Combinatorics, Centre international de rencontres mathématiques (CIRM), Luminy, France, April 23, 2015.
32. *Planar linkages following a prescribed motion.* Invited talk at the Computer Algebra Seminar, Kobe University, Japan, March 8, 2015.

31. *Software demo: the HolonomicFunctions package.* Invited talk at the Workshop on computational and algebraic methods in statistics, University of Tokyo, Japan, March 3, 2015.
30. *q-shift operators in knot theory.* Invited talk at the Symbolic Analysis Workshop at FoCM (Foundations of Computational Mathematics), Universidad de la República, Montevideo, Uruguay, December 16, 2014.
29. *Creative telescoping.* Invited talk at the Workshop on geometric control and related fields, RICAM, Linz, Austria, November 17, 2014.
28. *Symbolic computation in knot theory.* Invited talk at the Workshop on Approximation Theory, CAGD, Numerical Analysis, and Symbolic Computation, Sozopol, Bulgaria, August 27, 2014.
27. *A generalized Apagodu-Zeilberger algorithm.* Contributed talk at ISSAC (39th International Symposium on Symbolic and Algebraic Computation), Kobe University, Japan, July 23, 2014.
26. *On the AJ conjecture of connected sums of knots.* Invited talk at the Programme on Combinatorics, Geometry, and Physics, Erwin Schrödinger Institut (ESI), Vienna, Austria, July 17, 2014.
25. *A rational perspective on holonomic functions.* Invited talk at CASTA (Computational Algebraic Statistics, Theories and Applications), Kyoto, Japan, January 22, 2014.
24. *A glimpse of noncommutative Gröbner bases.* Invited talk at the conference Gröbner Bases, Resultants and Linear Algebra, RISC, Johannes Kepler University Linz, Austria, September 6, 2013.
23. *Holonomic functions in Mathematica.* Software presentation at ISSAC (38th International Symposium on Symbolic and Algebraic Computation), Northeastern University, Boston, Massachusetts, USA, June 27, 2013.
22. *Holonomicity and properness are equivalent.* Contributed talk at LARD (Linz Algebra Research Day), Johannes Kepler University Linz, Austria, June 19, 2013.
21. *Zeilberger's holonomic ansatz for Pfaffians.* Contributed talk at ISSAC (37th International Symposium on Symbolic and Algebraic Computation), University of Grenoble, France, July 24, 2012.
20. *Twisting q-holonomic sequences by complex roots of unity.* Contributed talk at ISSAC (37th International Symposium on Symbolic and Algebraic Computation), University of Grenoble, France, July 23, 2012.
19. *Twisting q-holonomic sequences by complex roots of unity.* Invited talk at ACA (18th International Conference on Applications of Computer Algebra), Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, Sofia, Bulgaria, June 28, 2012.
18. *The face-centered cubic lattice.* Invited talk at FELIM (Functional Equations in LIMoges), Faculty of Sciences and Techniques of the University of Limoges, France, March 5, 2012.
17. *Advanced computer algebra for evaluating determinants.* Contributed talk at JNCF (Journées Nationales de Calcul Formel), CIRM Luminy (Marseille), France, November 16, 2011.
16. *Lattice Green's functions of the higher-dimensional face-centered cubic lattices.* Invited talk at the Conference on Applied Algebraic Geometry (Minisymposium "Symbolic Combinatorics"), North Carolina State University, Raleigh, North Carolina, USA, October 6, 2011.
15. *Lattice Green's functions of the higher-dimensional face-centered cubic lattices.* Invited talk at CSASC (Joint Mathematical Conference of the Austrian Mathematical Society together with the Catalan, Czech, Slovak, and Slovenian Mathematical Societies, Minisymposium "Combinatorics and Graph Theory"), Donau-Universität Krems, Austria, September 27, 2011.
14. *Lattice Green's functions.* Invited talk at ACA (17th International Conference on Applications of Computer Algebra), Lamar University, Houston, Texas, USA, June 28, 2011.
13. *Software for special functions.* Invited talk at ICASF (International Conference on Asymptotics and Special Functions), City University of Hong Kong, China, June 1, 2011.

12. *Computer algebra tools for summation and integration.* Invited talk at CMIC (Chiang Mai International Conference), Chiang Mai University, Thailand, January 6, 2011.
11. *Algorithmic combinatorics: symbolic summation and integration.* Tutorial at CMIC (Chiang Mai International Conference), Chiang Mai University, Thailand, January 4–5, 2011.
10. *Proof of the q-TSPP Conjecture.* Contributed talk at SLC 65 (Séminaire Lotharingien de Combinatoire), Strobl, Austria, September 13, 2010.
9. *Proof of George Andrews' and David Robbins' q-TSPP Conjecture.* Contributed talk at the Conference in Honor of Doron Zeilberger's 60th Birthday, Rutgers University, New Jersey, USA, May 27, 2010.
8. *HolonomicFunctions.* Software presentation at FPSAC (21st International Conference on Formal Power Series and Algebraic Combinatorics), RISC, Johannes Kepler University Linz, Austria, July 22, 2009.
7. *Think Big (or how to tackle hard problems with the holonomic systems approach).* Invited talk at the Summation Workshop, RISC, Johannes Kepler University Linz, Austria, July 19, 2009.
6. *Algorithmic proving of special function identities in Mathematica.* Invited talk at ACA (15th International Conference on Applications of Computer Algebra), École de technologie supérieure, Montréal, Canada, June 26, 2009.
5. *A difference operators attack on hard combinatorial problems.* Invited talk at ACA (15th International Conference on Applications of Computer Algebra), École de technologie supérieure, Montréal, Canada, June 25, 2009.
4. *How to prove the q-TSPP Conjecture?* Invited talk at the AMS Joint Mathematics Meeting, Washington DC, USA, January 5, 2009.
3. *Proof of Ira Gessel's lattice path conjecture.* Contributed talk at SLC 61 (Séminaire Lotharingien de Combinatoire), Curia, Portugal, September 24, 2008.
2. *Holonomic function identities.* Invited talk at ACA (14th International Conference on Applications of Computer Algebra), RISC, Johannes Kepler University Linz, Austria, July 27, 2008.
1. *Proof of Ira Gessel's lattice path conjecture.* Invited talk at SNSC (4th International Conference on Symbolic and Numerical Scientific Computing), RISC, Johannes Kepler University Linz, Austria, July 25, 2008.

Peer-Reviewing Activities

For each journal and conference the number of completed reviews is given in parentheses.

- ISSAC (14)
- Journal of Physics A: Mathematical and Theoretical (6)
- Journal of Symbolic Computation (5)
- Journal of Mathematical Analysis and Applications (4)
- Advances in Applied Mathematics (2)
- CASC (2)
- Acta Physica Polonica A (1)
- Ain Shams Engineering Journal (1)
- Ars Mathematica Contemporanea (1)
- Applicable Algebra in Engineering, Communication and Computing (1)
- Electronic Journal of Combinatorics (1)
- European Journal of Combinatorics (1)
- Fluctuation and Noise Letters (1)

- ▷ Foundations of Computational Mathematics (1)
- ▷ FPSAC (1)
- ▷ International Journal of Computer Mathematics (1)
- ▷ International Journal of Theoretical Physics (1)
- ▷ Inventiones Mathematicae (1)
- ▷ Journal of Combinatorial Theory, Series A (1)
- ▷ Journal of Computer and System Sciences (1)
- ▷ Journal of Integer Sequences (1)
- ▷ Journal of Number Theory (1)
- ▷ Journal of the London Mathematical Society (1)
- ▷ Lecture Notes in Computer Science (1)
- ▷ L'Enseignement Mathematique (1)
- ▷ Mathematical Methods in the Applied Sciences (1)
- ▷ Reports on Mathematical Physics (1)
- ▷ SIGMA (1)
- ▷ Theoretical Computer Science (1)
- ▷ Transactions of the AMS (1)

Teaching

Semester	School	Type	Title
W 2017	JKU	Lecture	Mathematik 1 für Mechatronik, Kunststofftechnik, Elektronik und Informationstechnik
	FHH	Lecture	Logische und formale Grundlagen der Informatik
S 2017	JKU	Exercises	Algebra für InformatikerInnen
	FHH	Lecture	Mathematik 1 – Algebra
W 2016	FHH	Lecture	Logische und formale Grundlagen der Informatik
S 2016	JKU	Exercises	Lineare Algebra und Analytische Geometrie 2
	FHH	Lecture	Mathematik 1 – Algebra
W 2015	JKU	Exercises	Lineare Algebra und Analytische Geometrie 1
	JKU	Exercises	Mathematik und Logik für Wirtschaftsinformatiker
	FHH	Lecture	Logische und formale Grundlagen der Informatik
S 2015	FHH	Lecture	Mathematik 1 – Algebra
W 2014	FHH	Lecture	Logische und formale Grundlagen der Informatik
W 2013	JKU	Lecture	Knot Theory and Computer Algebra
	JKU	Exercises	Analysis (Mathematik 2 für Informatiker)
	FHH	Lecture	Logische und formale Grundlagen der Informatik
W 2012	JKU	Exercises	Analysis (Mathematik 2 für Informatiker)
	FHH	Lecture	Logische und formale Grundlagen der Informatik
W 2011	FHH	Lecture	Logische und formale Grundlagen der Informatik
W 2010	JKU	Lecture	Computer Algebra Systems
	JKU	Exercises	Analysis (Mathematik 2 für Informatiker)

	FHH	Exercises	Logische und formale Grundlagen der Informatik
W 2008	JKU	Lecture	Computer Algebra Systems
	JKU	Exercises	Analysis für Informatiker
W 2007	JKU	Exercises	Berechenbarkeit und Komplexität
S 2007	JKU	Exercises	Analysis für Informatiker
W 2006	JKU	Exercises	Formale Grundlagen 2
S 2005	FAU	Exercises	Einführung in die Theoretische Informatik II
S 2004	FAU	Exercises	Einführung in die Theoretische Informatik III
W 2003	FAU	Exercises	Einführung in die Theoretische Informatik II
	FAU	Exercises	Mathematik für Ingenieure I
S 2003	FAU	Exercises	Einführung in die Theoretische Informatik III
W 2002	FAU	Exercises	Mathematik für Ingenieure III
	FAU	Exercises	Organisation und Technologie von Rechensystemen I
S 2002	FAU	Exercises	Mathematik für Ingenieure II
W 2001	FAU	Exercises	Mathematik für Ingenieure I

FAU = Friedrich-Alexander-Universität Erlangen-Nürnberg
FHH = Fachhochschule Hagenberg
JKU = Johannes Kepler Universität Linz

Software

- `LamanGraphs`, a Mathematica package and C++ implementation for constructing Laman graphs and for computing their embedding numbers.
- `PlanarLinkages`, a Mathematica package for constructing and visualizing planar linkages that follow a prescribed curve (or motion), including arithmetic and factorization of motion polynomials.
- Member of the development team of DDMF (Dynamic Dictionary of Mathematical Functions), see http://ddmf.msr-inria.inria.fr.
- `GradshteynRyzhik`, a package for extracting all formulas from the book by Gradshteyn and Ryzhik, and for translating them into the Mathematica language.
- `HolonomicFunctions`, a Mathematica package for dealing with multivariate holonomic functions and sequences, in particular for executing closure properties, evaluating sums and integrals involving special functions, finding relations for a given function, etc.
- `qGeneratingFunctions`, a Mathematica package for manipulations of univariate q-holonomic functions and sequences.
- `RLangGFun`, a Maple implementation of the inverse Schützenberger methodology (a constructive version of Soittola's Theorem).

Personal Interests

- Music: piano lessons (1986 – 1992), lessons in church organ (1992 – 2005), degrees D-diploma (1998) and C-diploma (2003) in church music, regular playing in church services.
- Singing: member of the *Academic Choir* of the FA University of Erlangen-Nürnberg (2002 – 2005), member of the choir *pro musica* (since 2005).
- Photography: using a professional SLR camera

- ▷ Travel: various journeys to many different countries, mainly in Asia, Latin America, and Europe.
- ▷ Languages: Latin (7 years), English (7 years), French (3 years) in high school. Basic courses in Chinese and Russian at university, and studies of the Arabic language (2004 – 2005), including a one-month language course in Lebanon.