

Curriculum Vitae

Ilse Fischer

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born on June 29, 1975, in Klagenfurt, Austria

Education:

Primary and secondary school in Klagenfurt

1993 – 2000	University of Vienna, student of mathematics
January 1998	Mag. rer. nat. (Mathematics); passed with distinctions Thesis: “Der Satz von Skolem, Mahler, Lech – ein Ergebnis über die Nullstellen linearer Rekursionsfolgen” Advisor: Professor Johann Cigler
May 2000	Dr. rer. nat. (Mathematics); passed with distinctions Thesis: “Enumeration of perfect matchings: Rhombus tilings and Pfaffian graphs” Advisors: Professor Christian Krattenthaler and Professor Franz Rendl
January 2006	Habilitation (Mathematics) at the University of Vienna Thesis: “A polynomial method for the enumeration of plane partitions and alternating sign matrices”

Academic Career:

03/1995 – 01/1999	University of Vienna, tutor (teaching assistant)
12/1998 – 03/1999	University of Vienna, research fellow
03/1999 – 02/2004	University of Klagenfurt, researcher and lecturer (“Univer- sitätsassistentin”) in the operations research group
since 03/2004	University of Vienna, researcher and lecturer in the combi- natorics group; permanent position since 11/2008

Visiting Positions:

Winter Term 2001/2002	Georgia Institute of Technology, M.I.T., Michigan State Uni- versity, visiting scholar
Winter Term 2002/2003	University of Vienna, researcher and lecturer
Summer Term 2007	University of Klagenfurt, visiting professor
Summer Term 2009	University of Klagenfurt, visiting professor

Awards:

- 2006 Dr. Maria Schaumayer Preis
- 2009 START AWARD 2009 of the Austrian Science Foundation FWF.

Selected Activities:

- 2002 Member of the organizing committee of the International Conference on Operations Research 2002, University of Klagenfurt
- 2003 – 2009 Deputy secretary of the Austrian Mathematical Society (ÖMG)
- 2005 Member of the organizing committee of the ACE Summer School on Geometric Combinatorics, University of Vienna
- since 2006 Several activities for the advancement of women in mathematics

Funding:

- 2002 – 2005 Member of the research training network “Algebraic Combinatorics in Europe” (ACE) of the European Community Contract: HPRN-CT-2001-00272
- 2006 – 2011 Co-Investigator of the National Research Network “Analytic Combinatorics and Probabilistic Number Theory” of the Austrian Science Foundation FWF
Grant Number: S9607–N13
- 2010 – 2012 Principal Investigator of the START GRANT “Compact enumeration formulas of generalized partitions” of the Austrian Science Foundation FWF

LIST OF PUBLICATIONS

- [1] I. Fischer, Enumeration of perfect matchings: Rhombus tilings and Pfaffian graphs, Dissertation, Vienna 2000.
- [2] I. Fischer, Enumeration of rhombus tilings which contain a fixed rhombus in the centre, *J. Combin. Theory Ser. A* **96** (2001), no.1, 31–88.
- [3] C.H.C. Little, F. Rendl and I. Fischer, Towards a characterisation of Pfaffian near bipartite graphs, *Discrete Math.* **244** (2002), 279–297.
- [4] I. Fischer and C.H.C. Little, A characterisation of Pfaffian near bipartite graphs, *J. Combin. Theory Ser. B* **82** (2001), no.2, 175–222.
- [5] I. Fischer, Moments of inertia associated with the lozenge tilings of a hexagon, *Sém. Lothar. Combin.* **45** (2000/01), Art. B45f, 14 pp.
- [6] I. Fischer, A symmetry theorem on a modified jeu de taquin, *European J. Combin.* **23** (2002), 929–936.
- [7] I. Fischer and C.H.C. Little, Even circuits of prescribed clockwise parity, *Electron. J. Combin.* **10** (2003), Article # R 45, 20 pages.
- [8] I. Fischer, A method for proving polynomial enumeration formulas, *J. Combin. Theory Ser. A* **111** (2005), 37 – 58.
- [8a] I. Fischer, A method for proving polynomial enumerations formulas, extended abstract in the proceedings of the FPSAC’03.
- [9] I. Fischer, A polynomial method for the enumeration of plane partitions and alternating sign matrices, Habilitation thesis, Vienna 2005.
- [10] I. Fischer, G. Gruber, F. Rendl and R. Sotirov, Computational experience with a bundle approach for semidefinite cutting plane relaxations of Max-Cut and Equipartition, *Math. Program. Ser. B.* **105** (2006), 451 – 469.
- [11] I. Fischer, Another refinement of the Bender-Knuth (ex-)Conjecture, *European J. Combin.* **27** (2006), 290 – 321.
- [12] I. Fischer, The number of monotone triangles with prescribed bottom row, *Adv. Appl. Math.* **37** (2006), no. 2, 249 – 267.
- [12a] I. Fischer, The number of monotone triangles with prescribed bottom row, extended abstract in the proceedings of the FPSAC’05.
- [13] I. Fischer, A new proof of the refined alternating sign matrix theorem, *J. Combin. Theory Ser. A.* **114** (2007), no. 2, 253 – 264.
- [14] I. Fischer, An operator formula for the number of halved monotone triangles with prescribed bottom row, *J. Combin. Theory Ser. A.* **116** (2009), no. 3, 515 – 538.
- [15] I. Fischer and D. Romik, More refined enumerations of alternating sign matrices, 37 pages, to appear in *Adv. Math.*, [arXiv:0903.5073](https://arxiv.org/abs/0903.5073).

PREPRINTS

- [16] I. Fischer, A bijective proof of the hook-length formula for shifted standard tableaux, 47 pages, [math.CO/0112261](https://arxiv.org/abs/math/00112261).

[17] I. Fischer, The operator formula for monotone triangle – simplified proof and three generalizations, 16 pages, [arXiv:0903.4628](#).

[18] I. Fischer, Refined enumerations of alternating sign matrices: monotone (d, m) -trapezoids with prescribed top and bottom row, 16 pages, [arXiv:0907.0401](#).

TEACHING EXPERIENCE

I am active in teaching for more than 10 years now and have mainly been teaching courses on Combinatorics, Graph Theory, Operations Research, Linear Algebra (and a few others) for mathematicians as well as for computer scientists, physicists and future teachers. A complete list of courses is given below.

Winter Term 2009/10 (University of Vienna):

- Übungen zu Lineare Algebra für PhysikerInnen, 2 groups

Summer Term 2009 (University of Klagenfurt):

- Vorlesung Operations Research 1
- Übungen zu Operations Research 1
- Seminar zu Operations Research

Winter Term 2008/09 (University of Vienna):

- Übungen zu Einführung in Lineare Algebra und Geometrie, 2 groups

Summer Term 2008 (University of Vienna):

- Seminar (Diskrete Mathematik)
- Übungen zu Analysis für PhysikerInnen I

Winter Term 2007/08 (University of Vienna):

- Seminar (Diskrete Mathematik)
- Übungen zu Analysis für PhysikerInnen I

Summer Term 2007 (University of Klagenfurt):

- Kombinatorik und Graphentheorie
- Übungen zu Kombinatorik und Graphentheorie
- Mathematisches Seminar (Operations Research)

Winter Term 2006/07 (University of Vienna):

- Diskrete Mathematik
- Proseminar zu Diskrete Mathematik, 2 groups.

Summer Term 2006 (University of Vienna):

- Proseminar zu Lineare Algebra und Geometrie 2, 2 groups.

Winter Term 2005/06 (University of Vienna):

- Proseminar zu Lineare Algebra und Geometrie 1, 2 groups.

Summer Term 2005 (University of Vienna):

- Ausgewählte Kapitel aus Graphentheorie
- Proseminar zu Lineare Algebra und Geometrie 2

Winter Term 2004/05 (University of Vienna):

- Proseminar zu Lineare Algebra und Geometrie 1, 2 groups

Summer Term 2004 (University of Vienna):

- Proseminar zu Algebra für LehramtskandidatInnen
- Proseminar zu Lineare Algebra für Physik und verwandte Fächer

Winter Term 2003/04 (University of Klagenfurt):

- Übungen zu Diskrete Mathematik für Informatiker, 2 groups.

Summer Term 2003 (University of Klagenfurt):

- Kombinatorik und Graphentheorie
- Übungen zu Kombinatorik und Graphentheorie

Winter Term 2002/03 (University of Vienna):

- Seminar (Graphentheorie)
- Proseminar zu Lineare Algebra für Physik

Summer Term 2002 (University of Klagenfurt):

- Vorlesung Graphentheorie und Kombinatorik
- Konversatorium zu Graphentheorie und Kombinatorik
- Übungen zu Analysis für Informatiker, 2 groups

Summer Term 2001 (University of Klagenfurt):

- Finanzmathematik
- Konversatorium zu Finanzmathematik

Winter Term 2000/01 (University of Klagenfurt):

- Graphentheorie und Kombinatorik
- Konversatorium zu Graphentheorie und Kombinatorik
- Konversatorium zu Höhere Lineare Algebra

Summer Term 2000 (University of Klagenfurt):

- Konversatorium zu Spieltheorie
- Konversatorium zu Analysis III

Winter Term 1999/2000 (University of Klagenfurt):

- Konversatorium zu Mathematische Modelle in den Wirtschaftswissenschaften
- Konversatorium zu Angewandter Mathematik I/Diskrete Mathematik

Summer Term 1999 (University of Klagenfurt):

- Konversatorium zu Kombinatorische Optimierung

Winter Term 1998/99 (University of Vienna):

- Übungen zu Analysis III

Winter Term 1996/97 (University of Vienna):

- Übungen zu Wahrscheinlichkeitstheorie

SELECTED PRESENTATIONS

- June 2000 10th SIAM Conference on Discrete Mathematics, Minneapolis, Minnesota, “*A characterisation of Pfaffian near bipartite graphs*”.
- April 2001 Workshop: Novel approaches to hard discrete optimization, University of Waterloo, “*Solving hard optimization problems with linear inequality constraints using bundle methods*”.
- September 2001 15th ÖMG-Kongress at the University of Vienna, “*Die Hookenlängenformel für shifted Tableaux*”.
- October 2001 Combinatorics Seminar, Georgia Tech, “*A bijective proof of the hook-length formula for shifted standard tableaux*”.
- December 2001 Combinatorics Seminar, Michigan State University, “*A bijective proof of the hook-length formula for shifted standard tableaux*”.
- October 2002 49th Séminaire Lotharingien de Combinatoire, Ellwangen, “*A bijective proof of the hook-length formula for shifted standard tableaux*”.
- June 2003 15th Conference on Formal Power Series and Algebraic Combinatorics, Linköping University, “*A method for proving polynomial enumeration formulas*”.
- September 2003 European Conference on Combinatorics, Graph Theory and Applications, Prag, “*A method for proving polynomial enumeration formulas*”.
- September 2003 Future Research in combinatorial optimization (Workshop), University of Klagenfurt, “*Polynomiale Abzählformeln*”.
- September 2003 ÖMG Nachbarschaftstreffen, Bozen, “*Eine Methode für den Beweis von polynomialen Abzählformeln*”.
- December 2003 Cologne Combinatorics and Latest Optimization Research Exchange Seminar (Workshop), University of Köln “*Die Geschichte der Alternierenden-Vorzeichen-Matrix-Vermutung*”.
- May 2004 Mathematisches Kolloquium, University of Vienna, “*Polynomiale Abzählformeln*”.
- June 2004 Lecture series “Wissenswertes aus der Mathematik”, Vienna University of Technology, “*Die Geschichte der Alternierenden-Vorzeichen-Matrix-Vermutung*”.
- June 2005 Second Joint Meeting of AMS, DMV and ÖMG, Mainz, “*The number of monotone triangles with prescribed bottom row – or – Halfway to a new proof of the refined alternating sign matrix theorem*”.
- June 2005 17th Conference on Formal Power Series and Algebraic Combinatorics, Taormina, Sicily, poster presentation, “*The number of monotone triangles with prescribed bottom row*”.
- September 2005 Mathematik 2005 (DMV/ ÖMG Jahrestagung), University of Klagenfurt, “*A new proof of the alternating sign matrix theorem*”.
- September 2005 Mathematik 2005 (DMV/ ÖMG Jahrestagung), University of Klagenfurt, SchülerInnentag, “*Die Mathematik des Käse-Kästchen-Spiels*”.
- November 2005 University of Köln, “*Eine polynomiale Methode für die Abzählung von Plane Partitions und alternierenden Vorzeichenmatrizen*”.

- December 2005 University of Klagenfurt, “*Eine polynomiale Methode für die Abzählung von Plane Partitions und alternierenden Vorzeichenmatrizen*”.
- December 2005 Colloquium on discrete mathematics, Graz University of Technology, “*Eine polynomiale Methode für die Abzählung von Plane Partitions und alternierenden Vorzeichenmatrizen*”.
- December 2005 University of Vienna, Habilitation, “*Eine polynomiale Methode für die Abzählung von Plane Partitions und alternierenden Vorzeichenmatrizen*”.
- March 2006 Technische Universität Berlin, Symposium Diskrete Mathematik 2006, “*A new proof of the refined alternating sign matrix theorem*”.
- August 2007 Saalbach-Hinterglemm, Summerschool on mathematics for high-school students 2007, “*Graphen müssen nicht immer Funktionen darstellen*”.
- September 2007 Slovak-Austrian Mathematical Congress, Podbanske, Slovakia, “*Vertically symmetric alternating sign matrices, halved monotone triangles and operator formulas*”.
- April 2008 Freie Universität Berlin, Berlin, “*Die Faszination von Plane Partitions und Alternierenden Vorzeichenmatrizen*”.
- Mai 2008 University of Natural Resources and Applied Life Sciences, Vienna, “*Plane Partitions, alternierende Vorzeichenmatrizen und die mehrdimensionale Partitionsfunktion*”.
- June 2008 University of Leoben, “*Plane Partitions, alternierende Vorzeichenmatrizen und die mehrdimensionale Partitionsfunktion*”.
- May 2009 Tilburg University, “*More refined enumerations of alternating sign matrices*”.
- June 2009 University of Klagenfurt, “*Verfeinerte Abzählungen von alternierenden Vorzeichenmatrizen*”.
- September 2009 ÖMG/DMV Kongress, TU Graz, “*More refined enumerations of alternating sign matrices*”.