Curriculum vitae
Marc A. A. van Leeuwen

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Born   May 1, 1960, Castricum (NL).

Nationality   Dutch

Education

1978: Graduated from highschool (VWO) at Erasmus College Zoetermeer.

1982: Kandidaats examen (B.Sc.; *cum laude*) in physics at Rijksuniversiteit Utrecht (RUU).

1984: Doctoraal examen (M.Sc.; *cum laude*) in mathematics at RUU. Title of Master's thesis: *An Application of Hopf Algebra techniques to Representations of Finite Classical Groups.*

1989: Ph. D. in mathematics at RUU. Title of Doctoral thesis: *A Robinson-Schensted algorithm in the geometry of flags for Classical Groups.*

Employment

1983–84: Student assisitent at RUU.

1984–89: Wetenschappelijk medewerker (scientific staff member) at RUU.

1989–91: Postdoc at RUU (40%) and at CWI Amsterdam (60%).

1992: Guest researcher at RISC Linz (1 month).

1992: Guest researcher at the Mathematisches Institut of the Universität Basel (2 months).

1992–97: Researcher at CWI Amsterdam, department Algebra, Analysis and Geometry, computer algebra group.

1993: Visit to INRIA, Sophia Antipolis, under the ERCIM exchange programme.

1995: Visit to the combinatorics group at Paris/Marne la Vallée within the European Algebraic Combinatorics Network (ACN).

1995: Visit to the combinatorics group at Stockholm within the ACN.

1997: Visit to UQAM, Montréal.

1997–: Professeur at the Université de Poitiers

Current research activities and interests

Algebraic combinatorics: tableaux of various types, pictures, algorithmic constructions such as the Robinson-Schensted correspondence, groups of Lie type, symmetric functions, quantum enveloping algebras, crystal bases.

Algebraic and combinatorial computation; special interest in non-commutative structures (Lie algebras) and combinatorial algorithms (such as the Littlewood-Richardson rule).

Development of the computer algebra package 'LiE' (reductive Lie groups and their representations).

Describing (mathematical) algorithms understandably: literate programming.

Teaching experience

1984–91: Courses in various mathematical subjects at RUU.

Several lectures in the context of the interuniversitary research school EIDMA.

1997–: Various mathematics courses at the Université de Poitiers.

Other activities

1976–78: Participant at the Dutch Mathematical Olympiads (7th respectively 2nd place) and at the International Mathmatical Olympiads (Belgrade and Bucarest; 2nd prize both times, and in Bucarest 2 extra prizes).

1984–86: Cooperator of the Dutch "parallel reduction machine" project.

1989–90: Several small contributions to the computer typesetting program 'TEX' of D. E. Knuth (amongst others the detection and removal of 5 bugs in the code; see D. E. Knuth, *Literate Programming*, CSLI Lecture Notes Number 27, 1992, p. 293 and pp. 338, 339).

1993–95: Member of the *ondernemingsraad* (works council) at CWI.

1994–96: Head of the Dutch node of the Algebraic Combinatorics Network.

1994–96: Board member of the choir "Multiple Voice" in Utrecht.

1994–: Editor of "Séminaire Lotharingien de Combinatoire".

1995–97: Member of the general CWI colloquium commission.

2000–03: Head of the mathematics library, université de Poitiers

Further interests   The design and implementation of programming languages, in particular type systems. Studying computer languages and software systems (ALGOL 68, TEX).

Hobbies   Choral singing; I am currently member of the amateur choirs "Chœur de Chambre de la Vienne" and of the "Ensemble Vocal du Bois d'Amour" at Poitiers. Cycling. Piano playing.

List of publications

[1] with H. P. Barendregt, "Functional programming and the language 'TALE'", pp. 122–207 in *Current trends in concurrency*, LNCS 224, 1985.

[2] *A Robinson-Schensted algorithm in the geometry of flags for Classical Groups*, Thesis (Rijksuniversiteit Utrecht, the Netherlands), (1989).

[3] "An even more symmetric form of Zelevinsky's pictures", in *Proc. of 10. Kolloquium über Kombinatorik, Bielefeld*, 1990.

[4] "The Robinson-Schensted and Schützenberger algorithms and interpretations", pp. 65–88 in *Computational Aspects of Lie Group Representations and Related Topics, Proc. of the 1990 seminar, CWI, Amsterdam* (A. M. Cohen, ed.), CWI Tract 84, 1991.

[5] "An Application of Hopf Algebra techniques to Representations of Finite Classical Groups", *Journal of algebra* **140**, (1991), 210–246.

[6] with A. M. Cohen and B. Lisser, LᴵE, *A Package for Lie Group Computations*, Computer Algebra Nederland, Amsterdam, 1992, ISBN 90-74116-02-7. Manual, included in the LᴵE software distribution.

[7] *The Robinson-Schensted and Schützenberger algorithms; part I: new combinatorial proofs*, CWI Report AM-R9208, 44 pp, (December 1992).

[8] *The Robinson-Schensted and Schützenberger algorithms; part II: geometric interpretations*, CWI Report AM-R9209, 20 pp, (December 1992).

[9] "LᴵE, a software package for Lie group computations", pp. 218–221 in *Computeralgebra in Deutschland*, Fachgruppe Computeralgebra der GI, DMV, GAMM, 1993.

[10] "LᴵE, a software package for Lie group computations", *Euromath Bulletin* **1 (#2)**, (1994), 83–94.

[11] *Literate programming in C (`CWEBx` manual)*, CWI Report AM-R9510, 32 pp, (June 1995). Included in the `CWEBx` software distribution.

[12] "Tableau algorithms defined naturally for pictures", *Discrete Mathematics* **157**, (1996), 321–362.

[13] "The Robinson-Schensted and Schützenberger algorithms, an elementary approach", *Electronic J. of Combinatorics* **3 (no. 2)**, R15, (1996), 32 pp. Reprinted in "The Foata Festschrift", pp. 397–442.

[14] with Marcel Roelofs, "Termination for a class of algorithms for constructing algebras given by generators and relations", *J. of Pure and Applied Algebra* **117&118**, (1997), 431–445.

[15] "An analogue of jeu de taquin for Littelmann's crystal paths", *Séminaire Lotharingien de Combinatoire* **B41b**, (1998), 23 pp.

[16] "Edge sequences, ribbon tableaux and an action of affine permutations", *European J. of Combinatorics* **20**, (1999), 179–195.

[17] "Flag varieties, and interpretations of Young tableau algorithms", *J. of Algebra* **224**, (2000), 397–426.

[18] "Some bijective correspondences involving domino tableaux", *Electronic J. of Combinatorics* **7**, R35, (2000), 25 pp.

[19] "The Littlewood-Richardson rule, and related combinatorics", pp. 93–145 in *Interaction of Combinatorics and Representation Theory*, Math. Soc. of Japan Memoirs 11, 2001.

[20] "Spin-preserving Knuth correspondences for ribbon tableaux", *Electronic J. of Combinatorics* **12(1)**, R10, (2005), 65 pp.

[21] "Schur functions and alternating sums", *Electronic J. of Combinatorics* **11(2)**, A5, (2006), 42 pp.

[22] "Double crystals of binary and integral matrices", *Electronic J. of Combinatorics* **13(1)**, R86, (2006), 94 pp.

[23] "Computing Kazhdan-Lusztig polynomials for split E_8", *Nieuw Archief voor Wiskunde* **5e serie, deel 9, nummer 2**, (June 2008), 113–116.

[24] *Some simple bijections involving lattice walks and ballot sequences*, arXiv:1010.4847, 16 pp, (2010).

[25] with Frédéric Bosio, *A bijection proving the Aztec diamond theorem by combing lattice paths*, arXiv:1209.5373, 26 pp, (2012).

[26] with Jeffrey Adams, Peter Trapa, David A. Vogan Jr, *Unitary representations of real reductive groups*, arXiv:1212.2192v2, 200 pp, (2012).

List of published software

[27] with A. M. Cohen, B. Lisser, et al., LᴵE, *a software package for Lie group computations*, Available electronically at `http://www-math.univ-poitiers.fr/~maavl/LiE/`.

[28] LᴵE *online service*, `http://www-math.univ-poitiers.fr/~maavl/LiE/form.html`.

[29] `CWEBx`, *a system for literate programming in 'C'*, Adaptation of `CWEB` by Sylvio Levy et Donald E. Knuth. Available electronically at `http://www-math.univ-poitiers.fr/~maavl/CWEBx/`.

[30] With F. du Cloux, D. Vogan, A. Noël, `atlas`, *software for computing with real Lie groups and their representations*, `http://www.liegroups.org/`.