

Biographical Sketch

Cristian Paul Lenart

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Education

- 09/1993–06/1996 *University of Manchester (UK).*
06/1996 Ph.D. in Mathematics.
Thesis title: *Combinatorial Models for Certain Structures in Formal Group Theory and Algebraic Topology.*
Advisor: Professor Nigel Ray.
- 10/1992–06/1993 *University of Cambridge (UK).*
06/1993 Certificate of Advanced Study in Mathematics (with distinction).
Director of studies: Dr. Stuart Martin.
- 10/1989–09/1992 *University of Cluj-Napoca (Romania).*
09/1992 Ph.D. in Computer Science.
Thesis title: *Classification and Learning in Pattern Recognition.*
Advisor: Professor Emil Muntean.
- 09/1984–06/1988 *University of Cluj-Napoca (Romania).*
06/1988 B.S. (grade point average 10, on the 1–10 scale).
Subjects studied: Mathematics, Computer Science.

Research Interests (including the 2000 Mathematics Subject Classification)

Algebraic combinatorics (05E05, 05E10, 05E99), algebraic geometry (14C17, 14M15), K -theory (19E08, 19L47, 19L64), Lie groups (22E46), algebraic topology (55N, 55S), cluster analysis and applications to logical analysis of data and DNA sequencing (62H30, 92D20).

Positions Held and Activities

- 09/2005-present *State University of New York at Albany, USA*
Associate Professor.
Advising one PhD student.
- 09/1999-08/2005 *State University of New York at Albany, USA*
Assistant Professor.
Taught the courses: “Calculus I-II” (including “Honors Calculus”), “Introductory Statistics”, “Discrete Mathematics”, “Foundations of Geometry”, “Combinatorics” (graduate), “Representation Theory” (graduate), “Topics in Algebra” (graduate), “Transformation Geometry” (graduate), “Independent Study”. Research in algebraic combinatorics.
- 09/1998–08/1999 *Max-Planck-Institut für Mathematik, Bonn.*
Visiting position.
Research in algebraic combinatorics.
- 05/1999 *Institute for Mathematical Research, ETH Zürich, Switzerland.*
Visitor.
- 08/1998 *Rutgers Center for Operations Research (RUTCOR), NJ.*
Visitor (supported by RUTCOR and DIMACS).
Research on clustering and logical analysis of data.
- 07/1996–06/1998 *Massachusetts Institute of Technology.*
Applied Mathematics Instructor; affiliated with the Laboratory for Computer Science.
Taught the course on “Combinatorial Analysis”. Recitations in “Differential Equations” and “Multivariable Calculus with Vectors”. Research in algebraic combinatorics, cluster analysis and applications to DNA sequencing. Advised three undergraduate students on projects related to my interests.
- 04/1997 *Mathematical Sciences Research Institute, Berkeley, CA.*
General Membership.
- 10/1993–06/1996 *University of Manchester.*
Teaching Assistant.
Recitations in “Calculus”, “Linear Algebra”, “Discrete Mathematics”, “Trees and Networks”, and “Sequences and Series”.
- 06–08/1993 *University of Manchester.*
Visitor (supported by the TEMPUS scheme of the European Community).
Acquaintance with modern teaching methods.
- 05–08/1992 *Rutgers Center for Operations Research (RUTCOR), NJ.*
Visitor (supported by RUTCOR and the University of Cluj-Napoca).
Implemented a clustering algorithm based on Boolean optimization. Compiled a bibliography on Boolean functions and related subjects.

- 09/1988–05/1992 *Geological Prospecting and Exploring, Cluj Section.*
 Programmer (between 02/1990 and 05/1992, I worked part time).
 Implemented geological software.
- 02/1990–09/1992 *University of Cluj-Napoca (Romania).*
 Assistant Professor.
 Recitations and computer laboratory classes as part of the undergraduate courses: “Combinatorics and Graph Theory”, “Foundations of Computer Science”, and “Artificial Intelligence”.

Membership

American Mathematical Society.

Service for the profession

- Referee for the National Science Foundation and the following mathematical journals: *Duke Mathematical Journal*, *Advances in Mathematics*, *International Mathematics Research Notices*, *American Journal of Mathematics*, *Compositio Mathematica*, *Transactions of the American Mathematical Society*, *Proceedings of the American Mathematical Society*, *Journal of Algebra*, *Algebra and Number Theory*, *Mathematical Research Letters*, *Matematische Zeitschrift*, *Journal of Algebraic Combinatorics*, *Journal of Combinatorial Theory Series A*, *Electronic Journal of Combinatorics*, *Journal of Symbolic Computation*, *International Journal for Mathematics and Mathematical Sciences*, *Discrete Mathematics*, *Séminaire Lotharingien de Combinatoire*, *Journal of Mathematics of Kyoto University*.
- Co-organizer of the special session “Combinatorial Representation Theory, Topological Combinatorics and Interactions Between Them” at the Central Section Meeting of the American Mathematical Society, April 5-6, 2008, Indiana University, Bloomington.
- National Science Foundation panel member, 2008.
- Member of the Committee evaluating the HDR thesis (Habilitation à Diriger les Recherches en Mathématiques) of Cédric Lecouvey, University of Calais, France (2007).
- Member of the Program Committee of the 19th International Conference on Formal Power Series and Algebraic Combinatorics (2007).
- External evaluator for the PhD defense of Mihai Beligan, York University, Toronto, 2007.
- Co-organizer of a *Discrete Mathematics and Computer Science Day* at SUNY Albany, September 28, 2002 and March 18, 2006.

- Member of the Steering Committee for the series of conferences *Discrete Mathematics Days in the Northeast* (since 10/2003).
- Co-organizer of the special session “Algebraic and Geometric Combinatorics” at the Eastern Section Meeting of the American Mathematical Society, October 8-9, 2005, Bard College.

Service for the University at Albany

- Member of the departmental Executive Committee, 2005-present.
- PhD thesis advisor: William Adamczak (2006-present), Arthur Lubovsky (2008-present).
- Member in several departmental examination committees: PhD defense (Joseph McCollum, Amanda Beecher), MSc reader (James Lamatina), oral examinations (Amanda Beecher, Timothy Clark, Joseph McCollum, Raymond Reese, Rajan Alexander, Marcus Catlin, Kevin Farmer).
- Departmental research liaison, 2006-present.
- Member of the departmental Undergraduate Committee, 2002-2005 (I have been involved mostly in the development of syllabi for several courses).
- Departmental Colloquium Chair, 2001-2005 (in addition to people invited by other colleagues in the department, I have invited personally 7 colleagues from other institutions in the Northeast, including 4 from MIT).
- Student advisement.
- Presented 4 talks in the departmental graduate student seminar.
- Affiliate member in the Institute for Informatics, Logics and Security Studies (I have been involved in a project related to the development of the computational and applied sciences at the University).
- Involved in the University’s general recruiting open houses, as well as in meetings with high school students and teachers.

Grants, Scholarships, and Prizes

- 2007-2009 National Science Foundation grant DMS-0701044 (Algebra, Number Theory, and Combinatorics), award amount: \$112,538.00. Expected to continue at the same annual level between 2009-2010.
- 2004-2007 National Science Foundation grant DMS-0403029 (Algebra, Number Theory, and Combinatorics), award amount: \$107,408.00.

04/2003-04/2005	Faculty Research Award, SUNY Albany.
2001, 2002, 2005	Individual Development Awards Program Grant, SUNY Albany.
2000-2005	Travel awards, SUNY Albany.
06/2001	Award for attending a NATO Advanced Study Institute, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.
05/1999	General Membership at the Institute for Mathematical Research, ETH Zürich, Switzerland.
04/1997	General Membership at the Mathematical Sciences Research Institute, Berkeley, CA.
10/1993–07/1996	University of Manchester Research Studentship.
10/1993–07/1996	Overseas Research Student Award (a scheme of the British Government).
06–08/1993	TEMPUS grant of the European Community.
06/1993	Magdalene College Prize in Mathematics (Magdalene College, Cambridge).
10/1992–06/1993	Cambridge-Soros Scholarship (awarded by Cambridge Overseas Trust and the Soros Foundation).
1987, 1988	2nd and 1st prizes for two research papers presented at the national conference of research students.
1986	3rd prize at the national competition of students in computer science.
1985, 1986	2nd prizes at the "Traian Lalescu" national competition of students in mathematics.
1979, 1980, 1983	1st prizes in the National Mathematical Olympiad.

Computer Science Skills: Pascal, C, Mathematica, Maple, Splus, LaTeX2e, Emacs for UNIX.

Languages: I read, write, and speak fluently English, French, Hungarian, and Romanian. I can speak some German and Italian.

Publications

- Refereed publications

1. C. Lenart, On combinatorial formulas for Macdonald polynomials, [arXiv:math.CO/0804.4716](#), to appear in *Adv. Math.*
2. C. Lecouvey and C. Lenart, On q -analogs of weight multiplicities for the Lie superalgebras $\mathfrak{gl}(n, m)$ and $\mathfrak{spo}(2n, M)$, [arXiv:math.RT/0711.3433](#), to appear in *J. Algebraic Combin.*
3. C. Lenart and A. Postnikov, A combinatorial model for crystals of Kac-Moody algebras, *Trans. Amer. Math. Soc.*, 360 (2008), 4349–4381. Extended ab-

- stract in *Proceedings of the 17th International Conference on Formal Power Series and Algebraic Combinatorics*, Taormina, Italy, 2005.
4. C. Lenart, On the combinatorics of crystal graphs, II. The crystal commutor, *Proc. Amer. Math. Soc.*, 136 (2008), 825-837.
 5. C. Lenart and A. Postnikov, Affine Weyl groups and representation theory, *Int. Math. Res. Not.*, Art. ID rnm038, 2007, 1-65 (MR 2344548). Extended abstract in *Proceedings of the 16th International Conference on Formal Power Series and Algebraic Combinatorics*, J. West, editor, University of British Columbia, Vancouver, 2004, 187-198.
 6. C. Lenart, On the combinatorics of crystal graphs, I. Lusztig's involution, *Adv. Math.* 211 (2007), 204-243 (MR 2313533). Extended abstract in *Proceedings of the 18th International Conference on Formal Power Series and Algebraic Combinatorics*, San Diego, 2006.
 7. C. Lenart and F. Sottile, A Pieri-type formula for the K -theory of a flag manifold, *Trans. Amer. Math. Soc.*, 359 (2007), 2317-2342 (MR 2276622).
 8. C. Lenart and T. Maeno, Alcove path and Nichols-Woronowicz model of the equivariant K -theory of generalized flag varieties, *Int. Math. Res. Not.*, Article ID 78356, 2006, 1-14 (MR 2264711).
 9. C. Lenart, S. Robinson, and F. Sottile, Grothendieck polynomials via permutation patterns and chains in the Bruhat order, *Amer. J. Math.*, 128 (2006), 805-848 (MR 2251587).
 10. C. Lenart, The K -theory of the flag variety and the Fomin-Kirillov quadratic algebra, *J. Algebra* 285 (2005), 120-135 (MR 2119107).
 11. C. Lenart, A unified approach to combinatorial formulas for Schubert polynomials, *J. Algebraic Combin.* 20 (2004), 263-299 (MR 2106961). Extended abstract in *Proceedings of the 13th International Conference on Formal Power Series and Algebraic Combinatorics*, H. Barceló, editor, Arizona State University, Tempe, 2001, 313-322.
 12. C. Lenart and F. Sottile, Skew Schubert polynomials, *Proc. Amer. Math. Soc.* 131 (2003), 3319-3328 (MR 1990619).
 13. C. Lenart, A K -theory version of Monk's formula and related multiplication formulas, *J. Pure Appl. Algebra* 179 (2003), 137-158 (MR 2003m:14077).
 14. C. Lenart, Combinatorial aspects of the K -theory of Grassmannians, *Ann. Combin.* 4 (2000), 67-82 (MR 2001j:05124).
 15. C. Lenart, Lagrange inversion and Schur functions, *J. Algebraic Combin.* 11 (2000), 69-78 (MR 2001a:05149).
 16. C. Lenart, A Robinson-Schensted-Knuth type correspondence in Schubert calculus and its applications. Extended abstract, in *Proceedings of the 11th International Conference on Formal Power Series and Algebraic Combinatorics*, Marc Noy and Oriol Serra, editors, Universitat Politècnica de Catalunya, Barcelona, 1999, 287-298.

17. C. Lenart, Noncommutative Schubert calculus and Grothendieck polynomials, *Adv. Math.* 143 (1999), 159–183 (MR 2000m:05232).
 18. C. Lenart, The combinatorics of Steenrod operations on the cohomology of Grassmannians, *Adv. Math.* 136 (1998), 251–283 (MR 1999e:55032); MSRI Preprint No. 1997-079.
 19. C. Lenart, Symmetric functions, formal group laws, and Lazard’s theorem, *Adv. Math.* 134 (1998), 219–239 (MR 1999i:05203). Extended abstract in *Proceedings of the 9th International Conference on Formal Power Series and Algebraic Combinatorics*, C. Krattenthaler, editor, Universität Wien, Vienna, 1997, 361–372.
 20. C. Lenart, Formal group-theoretic generalizations of the necklace algebra, including a q -deformation, *J. Algebra* 199 (1998), 703–732 (MR 1999b:05013). Extended abstract in *Proceedings of the 8th International Conference on Formal Power Series and Algebraic Combinatorics*, D. Stanton, editor, University of Minnesota, Minneapolis, 1996, 317–329.
 21. C. Lenart and N. Ray, Hopf algebras of set systems, *Discrete Math.* 180 (1998), 255–280 (MR 1999m:16062). Extended abstract in *Proceedings of the 7th International Conference on Formal Power Series and Algebraic Combinatorics*, B. Leclerc and J.-Y. Thibon, editors, Université de Marne-la-Vallée, Paris, 1995, 387–398.
 22. C. Lenart and N. Ray, Chromatic polynomials of partition systems, *Discrete Math.* 167/168 (1997), 419–444 (MR 1998c:05063); *Proceedings of the 15th British Combinatorial Conference*, Stirling, England, 1995.
 23. C. Lenart, A generalized distance in graphs and centered partitions, *SIAM J. Discrete Math.* 11 (1998), 293–304 (MR 1999g:05067).
 24. C. Lenart, Combinatorial Models for Certain Structures in Formal Group Theory and Algebraic Topology, PhD thesis, University of Manchester, 1996, 185 pp.
 25. C. Lenart, Defining separability of two fuzzy clusters by a fuzzy decision hyperplane, *Pattern Recognition* 26 no. 9 (1993), 1351–1356.
 26. I. Haidu, I. Lazăr, C. Lenart, and A. Imbroane, Modelling of natural hydroenergy organization of the small basins, in *Energy and the Environment into the 1990s: Proceedings of the 1st World Renewable Energy Congress*, Reading, UK, Pergamon Press, 1990, 3159–3167.
- Preprints and work in progress
 1. C. Lenart, Hall-Littlewood polynomials, alcove walks, and fillings of Young diagrams, I, [arXiv:math.CO/0804.4715](https://arxiv.org/abs/math/0804.4715), submitted.
 2. C. Lenart, Hall-Littlewood polynomials, alcove walks, and fillings of Young diagrams, II, work in progress.
 3. P. Hersh and C. Lenart, Combinatorial constructions of weight bases. The Gelfand-Tsetlin basis, [arXiv:math.CO/0804.4719](https://arxiv.org/abs/math/0804.4719), submitted.

4. C. Lenart and T. Maeno, Quantum Grothendieck polynomials, [arXiv:math.CO/0608232](https://arxiv.org/abs/math/0608232), submitted.
 5. W. Adamczak and C. Lenart, The alcove path and the tableaux models, work in progress.
 6. C. Lenart, A new combinatorial model in representation theory, Preprint, math.albany.edu/math/pers/lenart, 2005, 21 pp.
 7. C. Lenart, The many faces of modern combinatorics, Preprint, SUNY Albany, math.albany.edu/math/pers/lenart, 2003, 15 pp.
 8. C. Lenart and N. Ray, Some applications of incidence Hopf algebras to formal group theory and algebraic topology, Preprint, Univ. of Manchester, math.albany.edu/math/pers/lenart, 1995, 18 pp.
- Papers in Romanian journals (in English)
 1. C. Ionescu and C. Lenart, The chemical classification of the brucitic rocks from Budureasa-Valea Mare, Budureasa-Valea Sârca and Pietroasa deposits, based on the ISODATA algorithm. A comparative study, *Studia Univ. "Babeş-Bolyai"*, Geologia 45 (1995), 159–166.
 2. L. Ghergari, C. Lenart, I. Mârza, and D. Pop, Anorthitic composition of plagioclases, criterion for parallelizing tuff horizons in the Transylvanian basin, *Studia Univ. "Babeş-Bolyai"*, Geologia 37 (1992), 31–40.
 3. C. Lenart, Software for classification, *Studia Univ. "Babeş-Bolyai"*, Mathematica 36 (1991), 41–49.
 4. C. Lenart, Topographical data management system, *Studia Univ. "Babeş-Bolyai"*, Mathematica 36 (1991), 51–59.
 5. C. Lenart, Method for improving the results of certain clustering procedures, *Studia Univ. "Babeş-Bolyai"*, Mathematica 35 (1990), 55–63 (MR 94a:68115).
 6. C. Lenart, A classification algorithm for ellipsoid form clusters, *Univ. of Cluj-Napoca Research Seminars*, Preprint no. 9 (1989), 93–102.
 7. C. Lenart, Classification with fuzzy relations II, *Studia Univ. "Babeş-Bolyai"*, Mathematica 34 (1989), 63–67 (MR 91i:04009).
 8. C. Lenart, Classification with fuzzy relations I, *Studia Univ. "Babeş-Bolyai"*, Mathematica 33 (1988), 52–55 (MR 90j:03103).
 9. D. Dumitrescu and C. Lenart, Divisive hierarchical classification for linear clusters, *Studia Univ. "Babeş-Bolyai"*, Mathematica 33 (1988), 48–51.
 10. C. Lenart and D. Dumitrescu, Convex decomposition of fuzzy partitions, *Univ. of Cluj-Napoca Research Seminars*, Preprint no. 5 (1987), 46–54 (MR 90i:05006).
 - Software

1. C. Lecouvey and C. Lenart, Maple package for Lusztig's q -analog of weight multiplicities and its generalization to Lie superalgebras, math.albany.edu/math/pers/lenart, 2007.
2. C. Lenart, Alcove_path, Maple package for the alcove path model, math.albany.edu/math/pers/lenart, 2006.
3. C. Lenart, Package for clustering with fuzzy sets, 1989–1992, 1997.
4. C. Lenart, Package for geological data processing, Geological Prospecting and Exploring Software, 1989–1992.

- Bibliography

1. C. Lenart, A classified bibliography in algebraic combinatorics (1970–1994), BibTeX format, Univ. of Manchester, 1994.
2. C. Lenart, A classified bibliography on Boolean functions and related subjects, RUTCOR Research Report, August 1992.

- Some citations of my work

1. Marquis Who's Who in America, 2004–present; Marquis Who's Who in the World, 2006; Marquis Who's Who in American Education, 7th Edition, 2006; International Who's Who, 2005–present.
2. N. Loehr and G. Warrington, Nested quantum Dyck paths and $\nabla(s_\lambda)$, [arXiv:math.CO/0705.4608](https://arxiv.org/abs/math/0705.4608).
3. Y.-T. Oh, q -analog of the Möbius function and the cyclotomic identity associated to a profinite group, Preprint, 2007.
4. V. Kreiman, Schubert classes in the equivariant K -theory and equivariant cohomology of the Grassmannian, [arXiv:math.AG/0512204](https://arxiv.org/abs/math/0512204).
5. T. Lam and P. Pylyavskyy, Combinatorial Hopf algebras and K -homology of Grassmannians, *Int. Math. Res. Not.*, article ID rnm125, 2007, 1–48.
6. Y.-T. Oh, Classification of the ring of Witt vectors and the necklace ring associated with the formal group law $X + Y - qXY$, *J. Algebra* 310 (2007), 325–350.
7. Y.-T. Oh, Nested Witt vectors and their q -deformation. *J. Algebra* 309 (2007), 683–710.
8. Y.-T. Oh, q -deformation of Witt-Burnside rings, *Math. Z.* 257 (2007), 151–191.
9. H. Duan and X. Zhao, A unified formula for Steenrod operations in flag manifolds, *Compos. Math.* 143 (2007), 257–270.
10. M. Willems, A Chevalley formula in equivariant K -theory, *J. Algebra* 308 (2007), 764–779.
11. H. Duan, Multiplicative rule in the Grothendieck cohomology of a flag variety, *J. Reine Angew. Math.* 600 (2006) 157–176.

12. A. Ram, Alcove walks, Hecke algebras, spherical functions, crystals and column strict tableaux, *Pure Appl. Math. Q.* 2 (2006), 963–1013.
13. P. J. McNamara, Factorial Grothendieck polynomials, *Electron. J. Combin.* 13 (2006), Research Paper 71, 40 pp.
14. Y.-T. Oh, Necklace rings and logarithmic functions, *Adv. Math.* 205 (2006), 434–486.
15. A. N. Kirillov and T. Maeno, On some noncommutative algebras related to K -theory of flag varieties. I, *Int. Math. Res. Not.* 60 (2005), 3753–3789.
16. A. Buch, Alternating signs of quiver coefficients, *J. Amer. Math. Soc.* 18 (2005), 217–237.
17. A. Postnikov, Quantum Bruhat graph and Schubert polynomials, *Proc. Amer. Math. Soc.* 133 (2005), 699–709.
18. Y-T. Oh, Generalized Burnside-Grothendieck ring functor and aperiodic ring functor associated with profinite groups, *J. Algebra* 291 (2005), 607–648.
19. A. Buch, F. Sottile, and A. Yong, Quiver coefficients are Schubert structure constants, *Math. Res. Lett.* 12 (2005), 567–574.
20. A. Knutson and E. Miller, Subword complexes in Coxeter groups, *Adv. Math.* 184 (2004), 161–176.
21. A. Knutson and A. Yong, A formula for K -theory truncation Schubert calculus, *Int. Math. Res. Not.* no. 70 (2004), 3741–3756.
22. H. Tamvakis, The connection between representation theory and Schubert calculus, *Enseign. Math.* (2) 50 (2004), 267–286.
23. Haibao Duan, On the inverse Kostka matrix, *J. Combin. Theory Ser. A* 103 (2003), 363–376.
24. E. Miller, Mitosis recursion for coefficients of Schubert polynomials, *J. Combin. Theory Ser. A* 103 (2003), 223–235.
25. A. Lascoux, Schubert and Grothendieck, *Sém. Lothar. Combin.*, 20pp. (electronic), 2003.
26. A. Buch, A Littlewood-Richardson rule for the K -theory of Grassmannians, *Acta Math.* 189 (2002), 37–78.
27. A. Buch, Grothendieck classes of quiver varieties, *Duke Math. J.* 115 (2002), 75–103.
28. A. Lascoux, Chern and Yang through Ice, Preprint, 2002.
29. A. Lascoux, Transition on Grothendieck polynomials, Physics and combinatorics, 2000 (Nagoya), 164–179, World Sci. Publishing, River Edge, NJ, 2001.
30. V. Prosper, Sfa, a package on symmetric functions considered as operators over the ring of polynomials for the computer algebra system Maple, *J. Symbolic Comput.* 29 (2000), 83–94.
31. P. Chebotarev and E. Shamis, The forest metrics of a graph and their properties, *Automation and Remote Control* 61 (2000), 1364–1373.

32. R. Stanley, *Enumerative Combinatorics*, vol. 2, Cambridge Univ. Press, Cambridge, UK, 1999, p. 515.
33. F. Bergeron, A. Garsia, M. Haiman, G. Tesler, Identities and positivity conjectures for some remarkable operators in the theory of symmetric functions, *Methods Appl. Anal.* 6 (1999), 363–420.
34. R. Wood, Problems in the Steenrod algebra, *Bull. London Math. Soc.* 30 (1998), 449–517.
35. N. Ray and W. Schmitt, Combinatorial models for coalgebraic structures, *Adv. Math.* 138 (1998), 211–262.
36. D. Dumitrescu and H. Pop, Degenerate and nondegenerate convex decompositions of finite fuzzy partitions (II), *Fuzzy Sets and Syst.* 96 (1998), 111–118.
37. D. Dumitrescu and H. Pop, Degenerate and nondegenerate convex decompositions of finite fuzzy partitions (I), *Fuzzy Sets and Syst.* 73 (1995), 365–376.

Talks Presented

1. n combinatorial formulas for Macdonald polynomials, Combinatorics Seminar, *University of Michigan*, Ann Arbor, October 2008; Algebra Seminar, *Binghamton University*, October 2008; Combinatorics Seminar, *Université du Québec à Montréal*, June 2008.
2. Crystals and Macdonald polynomials via alcove walks, invited talk at the workshop “Crystals and Tropical Combinatorics”, Kyoto, August 2008.
3. Hall-Littlewood polynomials, alcove walks, and the Macdonald polynomial inversion statistic, Invited talk at the workshop *Topics in Combinatorial Representation Theory*, Mathematical Sciences Research Institute, Berkeley, CA, March 2008.
4. Alcove paths, Hall-Littlewood polynomials, and a Hopf algebra, invited talk at the workshop *Combinatorial Hopf Algebras and Macdonald Polynomials*, Centre de Recherches Mathématiques, Montréal, May 2007.
5. K -theory and quantum K -theory of flag varieties, invited talk at the workshop *Schubert Calculus and Schubert Geometry*, Banff International Research Station, Canada, March 2007; Capital Region Algebra and Number Theory Seminar at *SUNY Albany*, April 2007.
6. Models for crystals, Workshop *Buildings and Combinatorial Representation Theory*, American Institute of Mathematics, Palo Alto, CA, March 2007.
7. A combinatorial model in Lie theory, Combinatorics seminar at the *University of Minnesota*, Minneapolis, April 2007; Colloquium at *Queen’s University*, Kingston, Canada, March 2007; Séminaire du LMPA “Joseph Liouville”, *University of Calais*, France, January 2007; Algebra and Geometry Seminar, *University of Rome I “La Sapienza”*, November 2006.

8. On the combinatorics of crystal graphs, invited talk at the *Regional AMS Meeting*, Fayetteville (special session on “Combinatorial representation theory”), November 2006; *18th International Conference on Formal Power Series and Algebraic Combinatorics*, San Diego, June 2006.
9. Towards Schubert calculus in quantum K -theory, invited talk at the *Regional AMS Meeting*, San Francisco State University, San Francisco (special session on “Homological and K -theoretical trends in algebraic combinatorics”), April 2006.
10. Generalizing the combinatorics of Young tableaux to arbitrary Lie type, Combinatorics Seminar at *MIT*, April 2006; Combinatorics Seminar at *University of Michigan*, Ann Arbor, March 2006; Combinatorics Seminar at *Ohio State University*, November 2005; invited talk at the *Joint Meeting of the American, German, and Austrian Mathematical Societies*, Mainz (special session on “Algebraic Combinatorics”), June 2005; Algebraic Combinatorics Seminar at *Fields Institute*, Toronto, April 2005; Capital Region Algebra and Number Theory Seminar at *SUNY Albany*, April 2005.
11. A combinatorial model for crystals of Kac-Moody algebras, *17th International Conference on Formal Power Series and Algebraic Combinatorics*, Taormina, Italy, June 2005; Capital Region Algebra and Number Theory Seminar at *SUNY Albany*, November 2004.
12. A new combinatorial model for the equivariant K -theory of G/P , invited talk at the *Regional AMS Meeting*, Northwestern University, Evanston, IL (special session on “Modern Schubert Calculus”), October 2004;
13. A new combinatorial model in Lie theory, Combinatorics and Geometry Seminar at *University of Washington*, April 2004.
14. Affine Weyl groups in K -theory and representation theory, *16th International Conference on Formal Power Series and Algebraic Combinatorics*, University of British Columbia, Vancouver, June 2004; Colloquium at *Dartmouth College*, March 2004; Lie groups seminar at *Rutgers University*, October 2003; Capital Region Algebra and Number Theory Seminar at *SUNY Albany*, November 2003.
15. The K -theory of the flag variety and the Fomin-Kirillov quadratic algebra, invited talk at the *Regional AMS Meeting*, San Francisco State University, San Francisco (special session on “Combinatorial commutative algebra and algebraic geometry”), May 2003; Combinatorics Seminar at *University of Michigan*, Ann Arbor, April 2003.
16. Combinatorial aspects of the cohomology and K -theory of a flag variety, Colloquium, *University of California San Diego*, June 2002.
17. Multiplication formulas in the K -theory of flag varieties, Capital Region Algebra and Number Theory Seminar at *Union College*, Schenectady, November 2001; Colloquium at *Syracuse University*, January 2002; Geometry Seminar at *University*

- of Massachusetts*, Amherst, February 2002; Combinatorics Seminar at *MIT*, May 2002; conference on “Current Trends in Commutative Algebra”, Levico, Italy, June 2002; invited talk at the *Regional AMS Meeting*, Northeastern University, Boston (special session on “Modern Schubert Calculus”), October 2002.
18. Multiplication formulas for Grothendieck polynomials and Pieri operators, invited talk at the *Regional AMS Meeting*, Montréal (special session on “Combinatorial Hopf Algebras”), May 2002.
 19. Combinatorial constructions of Schubert polynomials: a unified approach, Combinatorics Seminar at *MIT*, April 2001; *13th International Conference on Formal Power Series and Algebraic Combinatorics*, Arizona State University, Tempe, May 2001.
 20. Schubert polynomials and the Bruhat order, Capital Region Algebra and Number Theory Seminar at *SUNY Albany*, November 1999.
 21. A Robinson-Schensted-Knuth type correspondence in Schubert calculus and its applications, *11th International Conference on Formal Power Series and Algebraic Combinatorics*, Universitat Politècnica de Catalunya, Barcelona, June 1999.
 22. Flag varieties, Schubert calculus, and related combinatorics, seminars at *Max Planck Institute, Bonn*, and *ETH Zürich*, May 1999.
 23. Combinatorial aspects of the cohomology and K -theory of flag varieties, interview talks at *National University of Singapore*, *Dartmouth College*, *Northeastern University*, and *SUNY Albany*, January-February 1999.
 24. Towards a Littlewood-Richardson rule in Schubert calculus, algebra/combinatorics seminars at *Mathematical Sciences Research Institute* (Berkeley, CA), *University of Minnesota*, *University of Wisconsin-Madison*, *University of Michigan*, *Michigan State University*, and *MIT*, November-December 1998.
 25. Noncommutative Schubert calculus and Grothendieck polynomials, Combinatorics Seminar at *MIT* and Algebra Seminar at *Northeastern University*, May 1998.
 26. Model-based clustering and applications to DNA sequencing, *Rutgers Center for Operations Research*, Rutgers University, January 1998.
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