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# Curriculum Vitae<sup>1</sup>

Benoit Larose

## Personal Information

Academic address: Department of Mathematics  
Champlain Regional College  
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Laboratoire de Combinatoire et  
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Université du Québec à Montréal  
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Date of birth: February 12, 1965

Spoken and written languages: French, English

Citizenship: Canadian

<http://lacim.uqam.ca/~blarose/>

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<sup>1</sup>Last version September 12, 2017

## Studies

*September 1990 - July 1993*

Degree: Ph. D. in Mathematics  
University: Université de Montréal  
Département de Mathématiques et Statistique  
Field: Universal Algebra, Logic, Combinatorics  
Supervisor: Dr. Ivo Rosenberg  
Thesis: “Opérations isotones: critère de complétude,  
propriétés du point fixe et de projection”, 128 pages.

*September 1988 - May 1990:*

Degree: Masters in Mathematics (M. Sc.)  
University: Université de Montréal  
Département de Mathématiques et Statistique  
Field: Universal Algebra, Logic, Combinatorics  
Supervisor: Dr. Ivo Rosenberg  
Thesis: “De certaines propriétés des clones couverts  
par un clone monotone maximal sur un ensemble fini”, 60 pages.

*September 1984 - May 1988:*

Degree: B. Sc. in Mathematics  
University: Université de Montréal  
Département de Mathématiques et Statistique

## Working Experience

*Since May 1998:*

Position: Full-time Instructor  
Champlain Regional College  
Department of mathematics

Courses: Linear Algebra, Calculus, Statistics,  
Applied Mathematics for Computer Science, for Business,  
Discrete Mathematics

*Since October 2015:*

Position: Affiliate Professor  
Université du Québec à Montréal  
Laboratoire de Combinatoire et d'Informatique Mathématique (LACIM)

*March 2017 - May 2019:*

Position: Affiliate Professor  
Université de Montréal  
Département de Mathématiques et Statistiques

*May 2000- May 2017:*

Position: Affiliate Professor (cross appointment)  
Concordia University  
Department of Mathematics and Statistics and  
Department of Computer Science and Software Engineering

Courses: various graduate reading courses in algebra and complexity

*September 1997 - May 1998:*

Position: Assistant Professor (*term appointment*)  
Concordia University  
Department of mathematics and statistics

Courses: Combinatorics, Linear Algebra, Analysis,  
Engineering Calculus, Mathematics for Commerce

*September 1994 - August 1997*

Position: Postdoctoral Fellow  
LACIM (Laboratoire de Combinatoire et d'Informatique Mathématique) and  
CICMA (Centre Interuniversitaire en Calcul Mathématique Algébrique)  
Université du Québec à Montréal, Concordia University

Course: Linear Algebra (UQAM)

*September 1993 - August 1994:*

Position: Visiting Scholar  
Massachusetts Institute of Technology  
Department of Mathematics

## Publications

*Research Interests:* Algorithmic complexity of constraint satisfaction problems, graph homomorphisms, applications of algebra and algebraic topology to these fields; Universal algebra, extremal combinatorics.

### Journal Publications

1. B. Larose, M. Siggers, NU polymorphisms on reflexive digraphs, 24 pages, *SIAM J. Discrete Math.*, to appear.
2. H. Chen, B. Larose, Asking the meta-questions in constraint tractability, *ACM Transactions on Computation Theory*, 30 pages, to appear.
3. T. Feder, P. Hell, B. Larose, M. Siggers, C. Tardif, Graphs admitting k-NU operations. Part II: Irreflexive Graphs, *SIAM J. Discrete Math.*, **28**, no. 2, 817–834, 2014.
4. T. Feder, P. Hell, B. Larose, C. Loten, M. Siggers, C. Tardif, Graphs admitting k-NU operations. Part I: Reflexive Graphs, *SIAM J. Discrete Math.*, **27**, no. 4, 1940–1963, 2013.
5. B. Larose, A. Lemaître, List-Homomorphism Problems on Graphs and Arc-Consistency, *Disc. Math.*, **313**, no. 22, 2525–2537, 2013.
6. L. Egri, A. Krokhin, B. Larose, P. Tesson, The complexity of list homomorphism problems for graphs, *Theory of Computing Systems (selected papers from STACS 2010)*, vol. 51, **2**, 143–178, 2012.  
- Selected as a Notable Paper (Best of 2012) by the ACM’s Computing Reviews.
7. M. Desgroseilliers, B. Larose, C. Malvenuto, C. Vincent, Some results on two conjectures of Schützenberger, *Canad. Math. Bull.*, Vol. 53, no. 3, 453–465, 2010.
8. B. Larose, M. Valeriote, L. Zádori, Omitting Types, Bounded Width and the Ability to Count, *Internat. J. Algebra Comput.* **19** (5), 647–668, 2009.
9. B. Larose, P. Tesson, Universal Algebra and Hardness Results for Constraint Satisfaction Problems, *Th. Comp. Sci. (Special issue for selected papers from ICALP’07)*, **410** 1629–1647, 2009.
10. G. Kun, B. Larose, Stable sets of maximal size in orbits of powers of  $K_n$ , *Europ. J. Combinatorics*, **30**, 17–29, 2009.

11. A. Krokhin, B. Larose, A note on supermodular sublattices in finite relatively complemented lattices, *Algebra Universalis*, **59** no. 1-2, 237–241, 2008.
12. A. Krokhin, B. Larose, Maximizing supermodular functions on product lattices, with application to maximum constraint satisfaction, *SIAM Journal on Disc. Math.*, **22** no. 1, 312-328, 2008.
13. V. Dalmau, A. Krokhin, B. Larose, Retractions onto series-parallel posets, *Discrete Math.*, **308**, 2104–2114, 2008.
14. B. Larose, C. Loten, C. Tardif, A characterisation of first-order Constraint Satisfaction Problems, *Logical Methods in Computer Science* (Special issue: selected contributions of LICS '06), 3 (4), 2007.
15. B. Larose, L. Zádori, Bounded width problems and algebras, *Algebra Universalis*, **56** no. 3-4, 439–466, 2007.
16. V. Dalmau, A. Krokhin, B. Larose, First-order definable retraction problems for posets and reflexive graphs, *J. Logic Comput.*, **17**, no. 1, 31-51, 2007.
17. B. Larose, L. Zádori, Taylor terms, constraint satisfaction and the complexity of polynomial equations over finite algebras, *Internat. J. Algebra Comput.*, **16**, no. 3, 563-581, 2006.
18. B. Larose, Taylor operations on finite reflexive structures, *International Journal of Mathematics and Computer Science*, **1**, no. 1, 1-26, 2006.
19. B. Larose, C. Loten, L. Zádori, A polynomial-time algorithm to recognise near-unanimity graphs, *J. Algorithms*, **55** no. 2, 177–191, 2005.
20. B. Larose, Isotone analogs of results by Malt'sev and Rosenberg, *Beiträge Algebra Geom.*, **46**, no. 1, 61–70, 2005.
21. B. Larose, L. Zádori, Finite posets and topological spaces in locally finite varieties, *Algebra Universalis*, **52**, no. 2-3, 119-136, 2004.
22. B. Larose, C. Tardif, A discrete homotopy theory for binary reflexive structures, *Adv. Math.*, **189** (2), 268-300, 2004.
23. B. Larose, C. Malvenuto, Stable sets of maximal size in Kneser-type graphs, *Europ. J. Combinatorics*, **25** (1), 657-673, 2004.

24. B. Larose, L. Zádori, The complexity of the extendibility problem for finite posets, *SIAM J. Discrete Math.*, **17** (1), 114-121, 2003.
25. B. Larose, A note on minimal varieties generated by order-primal algebras, *Algebra Universalis*, **49**, 107-109, 2003.
26. B. Larose, Families of strongly projective graphs, *Discuss. Math. Graph Theory*, **22**, 271-292, 2002.
27. B. Larose, Strongly projective graphs, *Canad. J. Math.*, **54** (4), 757-768, 2002.
28. A. Krokhin, B. Larose, A monoïdal interval of isotone clones on a finite chain, *Acta Sci. Math. (Szeged)*, **68**, 37-62, 2002.
29. B. Larose, C. Tardif, Projectivity and independent sets in powers of graphs, *J. Graph Theory*, **40** (3), 162-171, 2002.
30. B. Larose, C. Tardif, Strongly rigid graphs and projectivity, *Mult.-Valued Log.*, **7**, no. 5-6, 339-362, 2001.
31. B. Larose, C. Tardif, Hedetniemi's conjecture and the retracts of a product of graphs, *Combinatorica*, **20**, (4), 531-544, 2000.
32. B. Larose, Clone coverings and invertible operations, *Mult.-Valued Log.*, **5**, no. 5, 373-390, 2000.
33. G. Czédli, B. Larose, G. Pollák, Four notes on coalition lattices, *Order*, Vol. 16, no. 1, 19-29, 1999.
34. B. Larose, F. Laviolette, C. Tardif, Normal Cayley graphs and homomorphisms of cartesian powers of graphs, *Europ. J. Combinatorics*, **19**, 867-881, 1998.
35. B. Larose, L. Zádori, Algebraic properties and dismantlability of finite posets, *Discrete Math.*, **163**, 89-99, 1997.
36. B. Larose, On the centralizer of the join operation of a finite lattice, *Algebra Universalis*, **34**, 304-313, 1995.
37. B. Larose, Minimal automorphic posets and the projection property, *Internat. J. Algebra Comput.*, Vol. 5, no. 1, 65-80, 1995.
38. B. Larose, A completeness criterion for isotone operations on a finite chain, *Acta Sci. Math. (Szeged)*, **59**, 319-356, 1994.

39. B. Larose, A property of projective ordered sets, *Europ. J. Combinatorics*, **13**, 371-378, 1992.
40. B. Larose, Sous-clones maximaux du clone des opérations monotones sur un ordre borné fini, *C. R. Acad. Sci. Paris*, t. **314**, Série I, 245-247, 1992.
41. B. Larose, Finite projective ordered sets, *Order*, **8**, 33-40, 1991.

### Refereed Conference Proceedings

1. V. Dalmau, L. Egri, P. Hell, B. Larose, A. Rafiey, Descriptive complexity of list H-coloring problems in logspace: a refined dichotomy. LICS 2015.
2. L. Egri, P. Hell, B. Larose, A. Rafiey, Space complexity of list H-coloring: a dichotomy. SODA 2014.
3. B. Larose, A. Lemaître, List-Homomorphism Problems on Graphs and Arc-Consistency, *ISMVL 2012*, 343–348, 2012.
4. L. Egri, A. Krokhin, B. Larose, P. Tesson, The complexity of list homomorphism problems for graphs, STACS 2010.
5. B. Larose, L. Haddad, Colourings of hypergraphs, permutation groups and CSP's, *Logic Colloquium '04*, 93-108, Lect. Notes Log., **27**, Assoc. Symbol. Logic, La Jolla, CA, 2008.
6. L. Egri, B. Larose, P. Tesson, Directed st-Connectivity is not definable in symmetric Datalog, ICALP 2008, 172-183.
7. V. Dalmau, B. Larose, Maltsev + Datalog  $\Rightarrow$  Symmetric Datalog, LICS 2008, 297-306.
8. B. Larose, P. Tesson, Universal Algebra and Hardness Results for Constraint Satisfaction Problems, ICALP 2007, 267–278.
9. L. Egri, B. Larose, P. Tesson, Symmetric Datalog and Constraint Satisfaction Problems in Logspace, LICS 2007, 193–202.
10. B. Larose, C. Loten, C. Tardif, A characterisation of first-order Constraint Satisfaction Problems, in Proceedings of the 21st IEEE Symposium on Logic in Computer Science (LICS 2006), IEEE, 201-210, 2006.
11. O. Klíma, B. Larose, P. Tesson, Systems of Equations over Finite Semigroups and the #CSP Dichotomy Conjecture, in *Mathematical Foundations of Computer Science 2006 (MFCS 2006)*, Lecture Notes in Computer Science 4162, 584–595, 2006.



12. A. Krokhin, B. Larose, Maximum constraint satisfaction on diamonds, in *Eleventh International Conference on Principles and Practice of Constraint Programming (CP'05)*, Lecture Notes in Computer Science 3709, 388-402, 2005.
13. V. Dalmau, A. Krokhin, B. Larose, First-order definable retraction problems for posets and reflexive graphs, in Proceedings of the 19th IEEE Symposium on Logic in Computer Science (LICS 2004), IEEE, 232-241, 2004.
14. A. Krokhin, B. Larose, Solving order constraints in logarithmic space, in Proceedings of 20th International Symposium on Theoretical Aspects of Computer Science (STACS'03), Berlin, Germany, Lecture Notes in Computer Science 2607, 379-390, 2003.

### Book Chapters

1. B. Larose, Algebra and the complexity of digraph CSPs: a survey, in: *The Constraint Satisfaction Problem: Complexity and Approximability*, Andrei A. Krokhin, Stanislav Zivny, eds. *Dagstuhl Follow-Ups 7, Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik 2017*, 267–285.
2. A. Bulatov, A. Krokhin, B. Larose, Dualities for Constraint Satisfaction Problems, In: *Complexity of Constraints*, LNCS 5250, 93-124, 2008.

## Research Funds (current)

- *N SERC Individual Research Grant (2017-2022)* (20 000 \$/year)
- *CRM Funds for College Researchers (2015-2021)* (46 200 \$/year)

## Research Funds (past)

- *N SERC Individual Research Grant (2011-2017)* (20 000 \$/year)
- *FQRNT Research Grant for College Researchers 2013-2016* (36 000 \$/year)
- *CRM Funds for College Researchers (2011-2015)* (23 000 \$/year)
- *FQRNT Research Grant for College Researchers 2010-2013* (36 000 \$/year)
- *N SERC Individual Research Grant (2006-2011)* (11 000 \$/year)
- *CRM Funds for College Researchers (2008-2011)* (23 000 \$/year)
- *FQRNT Team 2006-2009* of D. Thérien (McGill), with M. Beaudry (Sherbrooke), F. Lemieux (UQAC), P. McKenzie (Montréal), P. Tesson (Laval) ( 42 000 \$/year).
- *N SERC Individual Research Grant (2000-2005)* (7 000 \$/year)
- *Aide ponctuelle aux Chercheurs de College CRM (2005-2006)* (15 000 \$/ year)

## Invited Professor

- INRIA (ENS Cachan) (November 2013)
- Ecole Normale Supérieure de Cachan, Paris (May-June 2013)
- Departament de Tecnologia, Universitat Pompeu Fabra, Barcelona (May-July 2011)

## Visiting Professor (short visits; selected)

- Departament de Tecnologia, Universitat Pompeu Fabra, Barcelona (May 2007)
- Dipartimento di Informatica, Università La Sapienza, Roma I (May 2003 and 2005)
- Computer Science Department, University of Warwick, UK (June-July 2004)
- János Bolyai Institute, Szeged, Hungary (June 2003)

## Supervision of graduate students and postdocs:

- Qinghe Sun, Ph.D. candidate, March 2017 -
- Patrick Moore, M.Sc. candidate September 2013 -
- László Egri, postdoctoral fellow (FQRNT), January 2014 - January 2015
- Adrien Lemaître, Ph.D (June 2012)  
*Complexité des homomorphismes de graphes avec listes*
- Mahya Ghandehari, M. Sc. (July 2005)  
*Independent sets in graph products via harmonic analysis*

## Supervision of undergraduate summer research projects:

- L. Cotarla, O. Marquis-Harvey, M. Hébert, S. Larochelle, S. Jessup, E. Jetzer, P. Boily-Martineau, W. Laarich, FQRNT summer research scholarship (summer 2012)
- L. Hamel, D. Leblanc, FQRNT summer research scholarship (summer 2011)
- M. Desgroseilliers, NSERC summer research scholarship (summer 2006)
- C. Vincent, ISM summer research scholarship  
in co-direction with A. Lauve (UQAM) (summer 2006)
- D. Castonguay, NSERC summer research scholarship (summer 2003)
- C. Vincent, ISM summer research scholarship (summer 2003)

## Supervision of International Baccalaureate extended essays:

- 2015: X. Wu, *The Rubik's cube as a group.*
- 2008: F. Séguin, *Factorisation unique dans les entiers de Gauss.*
- 2007: H. Gervais, *On the preliminaries to Bhargava's proof of the fifteen theorem.*
- 2006: A. Lang, *The Entscheidungsproblem.*  
J. V.-Krajden, *The travelling salesman's problem.*
- 2005: J. Perras, *Patterns of First Significant Digits From Large Data Sets.*
- 2004: F. Cheung, *The irrationality of  $\pi$ .*  
C. Li, *Zermelo's Axiom of Choice.*  
C. W. Tse, *The 5-colour theorem.*  
L. Wang, *Securing the internet with the RSA cryptosystem.*
- 2003: C. Vincent, *Caractérisation des ensembles stables maximaux dans le graphe  $G(2, 1, 1)$ .*
- 2002: C. Robinson, *Liouville's Proof of the Existence of Transcendental Numbers.*
- 2001: P. Chaput, *Computation of the Value of  $\zeta(2)$ , where  $\zeta$  is the Riemann Zeta Function.*  
J. McKeown, *On Generalised Incompressible Navier-Stokes Equations.*

## Selected Awards

- *Fondation UQAM Postdoctoral Fellowship 1995-1996*  
September 1995 - August 1996 (\$ 20 000)
- *Finalist, NSERC 1994-1995 Doctoral Prize* (January 1995)  
Thesis selected to represent the Université de Montréal for the NSERC Doctoral Prize
- *NSERC Postdoctoral Fellowship*  
September 1993 - August 1995 (\$ 29 000/year)
- *FCAR Postdoctoral Fellowship*  
September 1993 (\$ 22 000/year)  
(declined in favor of NSERC fellowship under FCAR rules)
- *NSERC Graduate Studies Award (Ph.D.)*  
September 1990 - August 1992 (\$ 15 000/year)
- *FCAR Graduate Studies Award (M.Sc.)*  
September 1989 - August 1990 (\$ 10 000/year)

## Conference Committees

- WoLLIC 2013 (Program committee)
- LICS Organising committee (2013-2016)
- LICS 2011 co-chair
- LICS 2009 (Program committee)

## Editorial Board

- Order (Springer)

## Recent Conferences

### 1. Plenary Speaker

- Workshop on Finite and Algorithmic Model Theory, Les Houches France (May 2012)
- Summer School on General Algebra and Ordered Sets 2009  
Slovakia (September 2009)
- Mathematics of Constraint Satisfaction: Logic, Algebra and Graph Theory,  
Oxford University  
(A Satellite Meeting of the Logic and Algorithms program of the Isaac Newton Institute,  
Cambridge, U.K.) (March 2006)

### 2. Invited Speaker

- ASL special session on UA and CSP, Boulder, CO (May 2014)
- AMS Sectional Meeting, Louisville, KY (October 2013)
- Séminaire LSV, ENS Cachan, France (June 2013)
- AMS Sectional Meeting, Boulder, CO (April 2013)
- SIAM Conference on Discrete Mathematics, Halifax, Canada (June 2012)
- AMS Sectional Meeting, Honolulu, USA (March 2012)
- KPPY Combinatorics Seminar, Daegu, Korea (December 2011)
- Workshop on Algebras and CSP's, Fields Institute (August 2011)
- Workshop on Graph Homomorphisms, Fields Institute (July 2011)
- Workshop on Universal Algebra and the Constraint Satisfaction Problem  
Nashville, Tennessee (June 2007)
- SIAM Conference on Discrete Mathematics, Victoria, BC, Canada  
(June 2006)
- Combinatorics 2006 (Pavol Hell's 60th Birthday), Victoria, BC, Canada  
(May 2006)
- Seminario di Combinatoria, Università di Roma I, Rome, Italy  
(May 2005)
- Association for Symbolic Logic (ASL), Torino, Italy (July 2004)
- Computing Laboratory Seminar, Oxford University, UK (June 2004)

## 3. Undergraduate Summer School (Invited speaker)

- Research Experiences for Undergraduates  
Computational Number Theory and Combinatorics, Clemson University  
(June 2009)

## 4. Invitational Workshops

- Complexity of Constraints, Dagstuhl  
(October 2006, 2009, November 2012, July 2015, June 2018)
- Algebraic and Model Theoretical Methods in Constraint Satisfaction,  
BIRS, Banff (November 2014)
- Barbados Workshop on Graph Theory  
(March 2012)
- Barbados Workshop on Computational Complexity  
(February 2004-2007)

## 5. General Audience Talks

- ISM Liaison Cégeps Conferences, 2004 - ...
- Camp Mathématique AMQ, June 2002
- Mathématiques et Société Colloquium, ACFAS, June 2002
- Conférences-midi, UQAM, October 1996

## Peer Review and Refereeing (Organisations; Conferences; Journals)

NSERC (Canada), NRF (RSA), CSF (Czech Republic), ASF (Austria) ; ISMVL, MFCS, FOCS, LICS, CSL, STACS; BSL, JACM, SIDMA, JLC, IPL, Discrete Optim., Int'l J. of Alg. and Comp., Information Sciences, Order, Acta Scientiarum Mathematicarum, Multiple-Valued Logic, Algebra Universalis, Discrete Mathematics, European Journal of Combinatorics, Canadian Journal of Mathematics, Theory of Computing Systems, Canadian Mathematical Bulletin.

## Organisation of Conferences

- Organiser (with A. Krokhin (Durham) and C. Tardif (RMC)) Constraint Satisfaction Problems Minisymposium, Canadam 2009, May 2009
- Local organiser (with S. Brlek (UQAM), G. Hahn (Montréal), O. Marcotte (Montréal) A. Vetta (McGill)), *Canadam 2009 (Canadian Discrete and Algorithmic Mathematics Conference)*, CRM, Montréal, May 25-29, 2009
- Organiser (with A. Dawar (Cambridge), P. Kolaitis (IBM Almaden), M. Valeriote (McMaster)), *Workshop on Applications of Universal Algebra and Logic to the Constraint Satisfaction Problem*, American Institute of Mathematics, Palo Alto, April 2008
- Organiser (with J. Hyndman (UBC) and D. Thérien (McGill) ), session on Complexity and Universal Algebra, CMS Winter Meeting, Montréal, December 2004
- Organiser (with C. Crépeau (McGill) and H. Darmon (McGill)), Mathématiques et Société colloquium, May 2000
- Organiser (with L. Haddad (RMC) and I.G. Rosenberg (Montréal)), session on Lattices and Algebras, CMS Winter Meeting, Montréal, December 1999

## Miscellaneous

- Member, hiring committee, Mathematics Department, Champlain Regional College, 2006 to the present.
- Member, comité consultatif Collégial-Universitaire AMQ, November 2013 –
- President, evaluation committee (maths)- college research program FQRNT, February 2017
- Member of evaluation committee - college research program FQRNT, February 2011, 2014, 2015 & 2016
- Member (“membre régulier”), Centre de Recherches Mathématiques (CRM)
- Member, Laboratoire de Combinatoire et d’Informatique Mathématique (LACIM)
- Member, external committee on college research, FQRNT, October 2008-March 2009
- External Member, Ph.D. Thesis Committee, Liana Yepremyan, McGill University, August 2016



- Local coordinator of mathematics contests (CMS, AMA, etc.), Champlain Regional College, 2000-2009