

# CURRICULUM VITAE

**Ján Mináč**

Professor of Mathematics and Computer Science Department (cross-appointed)  
Fellow of the Canadian Mathematical Society, 2019 Second Inaugural Class of Fellows  
Faculty of Science Distinguished Research Professor 2020-2021  
Western University, Department of Mathematics, Middlesex College  
London, Ontario, Canada N6A 5B7

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**Academic Training:**      **Queen's University**, Kingston, Ontario, Canada -- Ph.D. in Mathematics, 1986  
**Comenius University**, Bratislava, Czechoslovakia – RNDr. in Mathematics  
(equivalent to M.Sc. in Mathematics), 1977; B.Sc. in Mathematics, 1976

**Past Employment – Western University:**    Associate Professor, Department of Mathematics (1991 – 2003)  
Assistant Professor, Department of Mathematics (1989 – 1991)

**The University of California at Berkeley:** NSF Postdoctoral Fellow, Department of Mathematics  
(1987 - 1989)

**Mathematical Sciences Research Institute**, Berkeley: Researcher (1986 - 1987) --- Member (Fall 1999)

**Queen's University**, Kingston, Ontario, Canada:    Teaching Assistant, Department of Mathematics  
(1983 – 1986)

**Mathematical Institute of the Academy of Sciences**, Bratislava, Czechoslovakia: Researcher (1976 - 1982)

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## **Awards and Honours**

*Fellow of the Canadian Mathematical Society, 2019 Second Inaugural Class of Fellows.*  
(One of eleven CMS Fellows elected nationwide.)

*Distinguished Research Professor 2020-21 and 2004-05, Faculty of Science, Western University.*

*NSF Postdoctoral Fellowship 1987-1989, Department of Mathematics, University of California at Berkeley.*

**Teaching Awards of Excellence:** *2013 Canadian Mathematical Society Excellence in Teaching Award.*  
*University Students' Council and Alumni Western Teaching Awards of Excellence 1996 - 1997 and*  
*2009 - 2010, Western University.*

## **Teaching Honour Roll Awards of Excellence:**

- *University Students' Council Teaching Honour Roll Awards of Excellence 2018-19, 2017-18, 2016-17, 2015-16, 2014-15, 2013-14, 2012-13, 2011-12, 2010-11, 2008-09, and 2007-08, Western University.*

## **Selected Scholarly and Professional Activities and Invited Lectures 2010 - 2020**

- Member of Editorial Boards: *Encyclopedia of Mathematics.*
- Member, *American Mathematical Society Committee on Human Rights of Mathematicians* (2012-15).
- Invited speaker, *Algebraic and Geometric Theory of Homogeneous Spaces* session, Canadian Mathematical Society 75th+1 Anniversary Summer Meeting, June 4-7, 2021, Ottawa, Ontario.  
Org.: Nikita Karpenko (Alberta), Nicole Lemire (Western Ontario), and Kirill Zaynullin (Ottawa).

- **Invited plenary lecture**, Centro Internazionale per la Ricerca Matematica conference: “New Trends around Profinite Groups,” September 14-18, 2020, Levico Terme, Trentino, Italy.
- **Co-organizer**, American Mathematical Society Fall Sectional Meeting, *Groups and their cohomological invariants in Arithmetic and Geometry* session, University of Texas at El Paso, Sept. 12-13, 2020. Org.: S. Gille (Alberta), N. Karpenko (Alberta), and J. Mináč (Western Ontario).
- Invited lecture: “*TBA*,” Number Theory Seminar, Department of Mathematics, Cornell University, Ithaca, New York, May 1, 2020. (*Postponed due to the COVID-19 pandemic.*)
- **Invited colloquium lecture**: “*The 13<sup>th</sup> mysterious room of a palace of absolute Galois groups*,” Pure Mathematics Colloquia, Department of Mathematics, University of Waterloo, April 1, 2019.
- **Co-organizer of Banff International Research Station workshop**: *Nilpotent Fundamental Groups*, June 18 – 23, 2017. Organizers: J. Mináč (Western University), F. Pop (University of Pennsylvania), A. Topaz (Oxford University) and K. Wickelgren (Georgia Institute of Technology).
- Invited lecture, “*A magical spell of Massey products on Galois  $p$ -extensions*,” Canadian Mathematical Society Winter Meeting, *Cohomological Methods in Quadratic Forms and Algebraic Groups Session*, Montreal, Quebec, December 6, 2015. (Session organizers: S. Gille and N. Karpenko, both U. Alberta.)
- Invited lecture, “*Why I am excited about the use of Massey products in Galois theory*” (joint work with N. D. Tân), American Mathematical Society 2015 Fall Eastern Sectional Meeting, *Advances in Valuation Theory IV Session* (Special Session organized by S. El Hitti, F.-V. Kuhlmann and H. Schoutens), Rutgers University, New Brunswick, NJ, November 15, 2015.
- Invited professor/lecturer, advanced mathematical summer school with Ch. Maire and G. Malle: “*Advanced International School on Galois Groups*,” University of the Basque Country, Bilbao, Spain, July 16 - 27, 2012.
- Invited lecture, *Department of Mathematics, Georgia Institute of Technology*, October 3, 2014. (Invited by Professor K. G. Wickelgren.)
- **Prize lecture**, *Canadian Mathematical Society Excellence in Teaching Award 2013*, CMS Summer Meeting, Halifax, Nova Scotia, June 5, 2013.
- **Invited plenary speaker**, *Workshop on Number Theory with a view Towards Transcendence and Diophantine Approximation*, University of Ottawa, June 8 – 10, 2013. (Invited by the organizers: Professors D. Roy and C. L. Stewart. Honouring Michel Waldschmidt with a doctorate from the University of Ottawa.)
- Invited participant and lecturer, Canadian Mathematical Society Winter Meeting, *Arithmetic Geometry Special Session*, Montreal, December 7 – 10, 2012. (Invited by H. Darmon, E. Goren and A. Lovita.)
- **Invited plenary speaker**, *70<sup>th</sup> Algebra Days*, Carleton University, Ottawa, October 20 – 21, 2012. (Invited by Professors L. Ribes and I. Bumagin.)
- Invited participant, American Institute of Mathematics, “*Deformation Theory, Patching, Quadratic Forms, and the Brauer Group*” workshop, Palo Alto, Jan. 17- 21, 2011 (org.: D. Krashen/M. Lieblich).

- **Invited participant and plenary speaker**, Tel Aviv University workshop on *Field Arithmetic* in honour of the retirement of Professor Moshe Jarden, June 13 – 17, 2010.

### Selected Scholarly Activities 2008 – 2009 and Special Scholarly Events 2004 – 2007

- **Invited two-hour lecture**, “*Group Theory, Number Theory and Representation Theory Seminar*,” Dept. of Mathematics, University of Michigan, Ann Arbor, Nov. 16, 2009. (Invited by Professor G. Prasad.)
- **Invited lecture**, *Second Canada-France Congress*, University of Quebec, Montreal, June 1-5, 2008.
- **Co-organizer** (with J. Swallow), American Mathematical Society 2007 Spring Southeastern Section Meeting, “*Representation Theory and Galois Cohomology in Number Theory*,” Davidson College, Davidson, North Carolina, March 2 - 4, 2007.
- **Short-term visitor and invited lecture**, Research Institute for Mathematical Sciences (RIMS), Kyoto University, Kyoto, Japan, October 23 – 27, 2006.
- **Plenary speaker**, *ABC Algebra Workshop*, University of British Columbia, April 8 - 9, 2006. (Organized by A. Pianzola (U. Alberta) and Z. Reichstein (University of British Columbia).)
- **Visiting scholar and invited lecture**, Department of Mathematics, University of British Columbia, Vancouver, April 2006. (Invited by Professor Z. Reichstein.)
- **Organizer**, workshop on “*Galois Modules, Galois Cohomology, Pro-p-groups and Related Topics*,” The University of Western Ontario, December 10 – 12, 2004.

### Further Banff International Research Station (BIRS) Workshop Co-organization Activity

- “*Nilpotent Fundamental Groups*” (with A. Topaz, F. Pop and K. Wickelgren), June 18 – 23, 2017.
- “*Linear Algebraic Groups and Related Structures*” (with V. Chernousov, A. Merkurjev and Z. Reichstein), September 13 – 18, 2009.
- “*Algebraic Groups, Quadratic Forms and Related Topics*” (with V. Chernousov, R. Elman, A. Merkurjev and Z. Reichstein), September 2 – 7, 2006.
- “*Quadratic Forms, Algebraic Groups, and Galois Cohomology*” (with R. Elman, A. Merkurjev, and C. Riehm), October 4 – 9, 2003.

### Membership on Scientific Program Committees

- **Member of the Scientific Program Committee**, *MoraviaCrypt Conference*, Brno, Czech Republic, June 15 – 22, 2005.
- **Member of the Scientific Program Committee**, *Conference on Public-Key Cryptography and Computational Number Theory*, Banach International Mathematical Center, Warsaw, Poland, September 11 - 15, 2000.

**Membership in Learned Societies:** American Mathematical Society, Canadian Mathematical Society, Mathematical Association of America.

**Oberwolfach Mathematical Institute workshops, AMS meetings, and various conferences and invited talks:** Since 1986 have carried out numerous visits to research workshops, conferences, and invited talks.

**Undergraduate Student Research Supervision:** Since 2002 I have carried out regular research supervision of undergraduate students during the academic year and during the summer. I have had the privilege to mentor, encourage, and support a number of remarkable students during their subsequent development and pursuit of various careers.

**Graduate Students and Postdoctoral Fellows – Activity:** 21 graduate students have completed their advanced degrees under my supervision: 13 PhD students and 8 master students, with some joint supervision with other professors. Currently I am supervising and/or co-supervising 5 PhD students and 1 master student. I have also been working with several postdoctoral fellows: N. D. Tân (currently based in Vietnam), and F. W. Pasini, who is my current joint postdoctoral fellow. (In 2019 N. D. Tân received a prestigious award from the Vietnam Academy of Science and Technology for being the “... best mathematician working in Vietnam under the age of 40.”) We have been working together intensively and very successfully. I have also been mentoring a surprising number of wonderful undergraduate students. This summer we are planning to jointly co-supervise 3 outstanding undergraduate students in their research, under the NSERC USRA program.

**NSERC Grant Funding Support:** Continuous NSERC research grant funding support since 1989. Current research grant funding support (2018 - 2023) \$150,000.

#### A Selection of Publications (from among approximately 100 published or accepted papers)

1. J. Mináč and M. Spira. Formally real fields, C-fields and W-groups. *Math. Zeit.* **205** (1990), 519-530.
2. J. Mináč and R. Ware. Pro-2-Demushkin groups of rank  $\aleph_0$  as Galois groups of maximal 2-extensions of fields. *Math. Ann.* **292** (1992), 337-353.
3. J. Mináč. Poincaré polynomials; stability indices and number of orderings I. *Advances in Number Theory, Canadian Number Theory Association Proceedings*, Clarendon Press Oxford (1993), 515-528.
4. J. Mináč and M. Spira. Witt rings and Galois groups. *Ann. Math.* **144** (1996), 35-60.
5. A. Adem, D. Karagueuzian and J. Mináč. On the cohomology of Galois groups determined by Witt rings. *Adv. Math.* **148** (1999), no. 1, 105-160.
6. J. Mináč and J. Swallow. Galois module structure of  $p$ th-power classes of extensions of degree  $p$ . *Israel J. Math.* **138** (2003), 29-42.
7. W. Gao, D. Leep, J. Mináč and T. L. Smith. Galois groups over nonrigid fields. Proceedings of the International Conference on Valuation Theory and its Applications, Vol. II (Saskatoon, 1999), *Fields Institute Communications*, American Mathematical Society **33** (2003), 61-77.
8. J. Mináč and Z. Reichstein. Trace forms of Galois extensions in the presence of a fourth root of unity. *Int. Math. Res. Not.* (2004), no. 8, 389-410.
9. L. Mahé, J. Mináč and T. L. Smith. Additive structure of multiplicative subgroups of fields and Galois theory. *Doc. Math.* **9** (2004), 301-355.
10. J. Mináč, A. Schultz and J. Swallow. Galois module structure of  $p^{\text{th}}$ -power classes of cyclic extensions of degree  $p^n$ . *Proc. London Math. Soc. (3)* **92** (2006), no. 2, 307-341.
11. N. Lemire, J. Mináč and J. Swallow. Galois module structure of Galois cohomology and partial Euler-Poincaré characteristics. *J. Reine Angew. Math.* **613** (2007), 147-173.
12. D. Benson, N. Lemire, J. Mináč and J. Swallow. Detecting pro- $p$  groups that are not absolute Galois groups. *J. Reine Angew. Math.* **613** (2007), 175-191.
13. D. Benson, S. K. Chebolu, D. Christensen and J. Mináč. The generating hypothesis for the stable module category of a  $p$ -group. *J. Algebra.* **310** (2007), no. 1, 428-433.
14. S. K. Chebolu, D. Christensen and J. Mináč. Ghosts in modular representation theory. *Adv. Math.* **217** (2008), no. 6, 2782-2799.
15. J. F. Carlson, S. K. Chebolu and J. Mináč. Freyd’s generating hypothesis with almost split sequences. *Proc. Amer. Math. Soc.* **137** (2009), no. 8, 2575-2580.
16. N. Lemire, J. Mináč, A. Schultz and J. Swallow. Galois module structure of Galois cohomology for embeddable cyclic extensions of degree  $p^n$ . *J. London Math. Soc. (2)* **81** (2010), no. 3, 525-543.

17. J. F. Carlson, S. K. Chebolu and J. Mináč. Finite generation of Tate cohomology. *AMS J. Representation Theory* **15** (2011), 244-257.
18. J. Labute and J. Mináč. Mild pro-2 groups and 2-extensions of  $\mathbb{Q}$  with restricted ramification. *J. Algebra* **332** (2011), 136-158.
19. I. Efrat and J. Mináč. On the descending central sequence of absolute Galois groups. *Amer. J. Math.* **133** (2011), no. 6, 1503-1532.
20. S. K. Chebolu, I. Efrat and J. Mináč. Quotients of absolute Galois groups which determine the entire Galois cohomology. *Math. Ann.* **352** (2012), no. 1, 205-221.
21. I. Efrat and J. Mináč. Small Galois groups that encode valuations. *Acta Arith.* **156** (2012), no. 1, 7-17.
22. J. Mináč, J. Swallow and A. Topaz. Galois module structure of  $(\ell^n)$ th classes of fields. *Bull. London Math. Soc.* **46** (2014), 143-154.
23. P. Guillot and J. Mináč. Milnor  $K$ -theory and the graded representation ring. *J. K-Theory* **13** (2014), 447-480.
24. J. Mináč and N. D. Tân (with an appendix written by I. Efrat, J. Mináč and N. D. Tân). The kernel unipotent conjecture and the vanishing of Massey products for odd rigid fields. *Adv. Math.* **273** (2015), 242-270.
25. J. Mináč and N. D. Tân. Triple Massey products over global fields. *Doc. Math.* **20** (2015), 1467-1480.
26. S. K. Chebolu, J. Mináč and C. Quadrelli. Detecting fast solvability of equations via small powerful Galois groups. *Trans. Amer. Math. Soc.* **367** (2015), no. 12, 8439-8464.
27. J. F. Carlson, S. K. Chebolu and J. Mináč. Ghosts and strong ghosts in the stable category. *Canad. Math. Bull.* **59** (2016), no. 4, 682-692.
28. J. Mináč, M. Rogelstad and N. D. Tân. Dimensions of Zassenhaus filtration subquotients of some pro- $p$ -groups. *Israel J. Math.* **212** (2016), no. 2, 825-855.
29. J. Mináč and N. D. Tân. Triple Massey products vanish over all fields. *J. London Math. Soc. (2)* **94** (2016), no. 3, 909-932.
30. M. Ataei, J. Mináč and N. D. Tân. Description of Galois unipotent extensions. *J. Algebra* **471** (2017), 193-219.
31. J. Mináč and N. D. Tân. Construction of unipotent Galois extensions and Massey products. *Adv. Math.* **304** (2017), 1021-1054.
32. I. Efrat and J. Mináč. Galois groups and cohomological functors. *Trans. Amer. Math. Soc.* **369** (2017), no. 4, 2697-2720.
33. J. Mináč and N. D. Tân. Triple Massey products and Galois theory. *J. Eur. Math. Soc. (JEMS)* **19** (2017), no. 1, 255-284.
34. J. Mináč and N. D. Tân. Counting Galois  $U_4(\mathbb{F}_p)$ -extensions using Massey products. *J. Number Theory* **176** (2017), 76-112.
35. S. K. Chebolu, D. McQuillan and J. Mináč. Witt's cancellation theorem seen as a cancellation. *Expo. Math.* **35** (2017), no. 3, 300-314.
36. P. Guillot, J. Mináč and A. Topaz (with an Appendix by O. Wittenberg). Four-fold Massey products in Galois cohomology. *Compositio Math.* **154** (2018), no. 9, 1921-1959.
37. P. Guillot and J. Mináč. Extensions of unipotent groups, Massey products and Galois theory. *Adv. Math.* **354** (2019), 106748, 40 pp.
38. J. Mináč, M. Rogelstad and N. D. Tân. Relations in the maximal pro- $p$  quotients of absolute Galois groups. *Trans. Amer. Math. Soc.* **373** (2020), no. 4, 2499-2524.
39. J. Mináč, M. Palaisti, F. W. Pasini and N. D. Tân. Enhanced Koszul properties in Galois cohomology. *Research in the Mathematical Sciences* (to appear 2020). DOI: 10.1007/s40687-020-00208-5. 35 pages.

**A Comprehensive Picture:** Different but strongly interrelated projects, some developed over many years and relying on my previously published work; are leading to a surprisingly coherent picture of the structure of maximal pro- $p$  quotients of absolute Galois groups. These have been completed or are works-in-progress with a number of colleagues. The most recent work carried out during the last seven years, but strongly relying both on my previous work as well as on new developments – on the development of the theory of Massey products in Galois cohomology and Koszul properties of Galois cohomology – is leading us to new theorems, strong conjectures, crucial new insights, and advances in classical problems related to absolute Galois groups. I have also become involved in some very exciting interdisciplinary research in neurology and neural networks, and the application of mathematics to biology and medicine. Because of my background and past experience, I am very dedicated and committed to the promotion of equality, inclusion and diversity.