SHORT CURRICULUM VITAE

Ján Mináč
Western Fellow 2022-23, Inaugural Class of Fellows, Western Academy for Advanced Research
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

Academic Training: **Queen's University**, Kingston, Ontario, Canada -- Ph.D. in Mathematics, 1986
Commenius 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)

Awards and Honours

Western Fellow 2022-23, Western Academy for Advanced Research (WAFAR), Western University (2022 inaugural Fellow of this first inaugural year of the Western Academy for Advanced Research).

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 - 2023
- Member of Editorial Boards: *Encyclopedia of Mathematics.*
- Member, *American Mathematical Society Committee on Human Rights of Mathematicians* (2012-15).

- **Invited colloquium lecture**: Department of Mathematics, Illinois State University, April 27, 2023 (organizer: Sunil K. Chebolu).

- Invited Algebra Seminar lecture: Department of Mathematics, Michigan State University, April 24, 2023 (organizer: Preston Wake).

- Invited speaker, online mini-workshop: *Algebra and Geometry of Homogeneous Spaces*, June 2-4, 2021. Org.: Nikita Karpenko (Alberta), Nicole Lemire (Western Ontario), and Kirill Zaynullin (Ottawa).

- **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). *Postponed due to COVID-19 pandemic.*

- **Invited colloquium lecture**: "*The 13th 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**, *70th 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, 9/11-15, 2000.

Membership in learned societies and organizations: American Mathematical Society, Canadian Mathematical Society, Mathematical Association of America, American Association for the Advancement of Science, Scientific American.

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 research students, graduate students, and postdoctoral fellows – selected activities: 22 graduate students have completed their advanced degrees under my supervision: 14 PhD students and 8 master's students, with some joint supervision with other professors. Currently I am supervising and/or co-supervising 5 PhD students and two master's students. I have also been working with several postdoctoral fellows, including: N. D. Tân, T. T. Nguyen, F. W. Pasini and R. C. Budzinski. (In 2019 N. D. Tân received a prestigious award from the Vietnam Academy of Science and Technology for being "… a leading mathematician working in Vietnam under the age of 40.") We have been working together intensively and productively. I have also been mentoring a number of wonderful undergraduate students. The last two summers I jointly co-supervised with L. Muller, 7 outstanding undergraduate students in the NSERC USRA research program and 4 Fields Institute Undergraduate Summer Research Program students chosen internationally.

NSERC Grant Funding Support: Continuous NSERC research grant funding support since 1989. Current research grant funding support (2017 – 2023 approximately) $190,000.

A Selection of Publications (from over 100 published, accepted, or submitted 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 pth-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 pth-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 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 (ℓ^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 $U_4(F_p)$-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.
        Res. Math. Sci. **7** (2020), no. 2, Paper No. 10, 34 pp.

(40)   J. Mináč, F. W. Pasini, C. Quadrelli and N. D. Tân. Koszul algebras and quadratic duals in Galois
        cohomology. *Adv. Math.* **380** (2021), Paper No. 107569, 49 pp.

(41)   J. Mináč, L. Muller and T. T. Nguyen. Algebraic approach to the Kuramoto model. *Phys. Rev. E* **104**
        (2021), no. 2, Paper No. L022201, 5 pp.

(42)   J. Mináč, A. Schultz and J. Swallow. On the indecomposability of a remarkable new family of modules
        appearing in Galois theory. *J. Algebra* **598** (2022), 194-235.

(43) Budzinski, R. C., Nguyễn, T. T., Doan, J., Mináč, J., Sejnowski, T. J., Muller, L. (2022). Geometry unites synchrony, chimeras, and waves in nonlinear oscillator networks. *Chaos* **32** (2022), no. 3, Paper No. 031104, 7 p.

(44) J. Mináč, F. W. Pasini, C. Quadrelli and N. D. Tân. Mild pro-p groups and the Koszulity conjectures. *Expo. Math*. **40** (2022), no. 3, 432-455.

(45) Đoàn, J., Mináč, J., Muller, L., Nguyễn, T. T., Pasini, F. W. (2022). Joins of ciculant matrices. Linear Algebra Appl. 650 (2022), 190-209.

(46) J. Mináč, A. Schultz and J. Swallow. Galois module structure of the units modulo p^m of cyclic extensions of degree p^n. Will appear in *Manuscripta Math*. (2022).

(47) J. Mináč, N. D. Tân and T. T. Nguyễn. Fekete polynomials, quadratic residues, and arithmetic. Will appear in the *J. Number Theory* (2022).

(48) J. Mináč, N. D. Tân and T. T. Nguyễn. Further insights into the mysteries of the values of zeta functions at integers. Will appear in *Math. Slovaca* (2022).

(49) J. Mináč, A. Schultz and J. Swallow. Arithmetic properties encoded in the Galois module structure of K^x/K^{xp^m}. Will appear in the *J. Number Theory* (2022).

(50) F. Chemotti, J. Mináč, A. Schultz and J. Swallow. Galois module structure of square power classes for biquadratic extensions. Will appear in *Canad. J. Math.* (2022).

(51) T. T. Nguyễn, R. Budzinski, J. Đoàn, F. W. Pasini, J. Mináč and L. Muller. Equilibria in Kuramoto oscillator networks: An algebraic approach (submitted 2022).

(52) F. Chemotti, J. Mináč, T. T. Nguyễn, A. Schultz, J. Swallow and N. D. Tân. Quaternion algebras and square power classes over biquadratic extensions (submitted 2022).

(53) L. Heller, J. Mináč, T. T. Nguyễn, A. Schultz and N. D. Tân. Galois module structure of some elementary p-abelian extensions (submitted 2022).

(54) J. Merzel, J. Mináč, L. Muller, F. W. Pasini and T. T. Nguyễn. Spectral perturbation by rank-m matrices. (to be submitted).

(55) T. T. Nguyễn, J. Đoàn, F. W. Pasini, J. Mináč and L. Muller. Join of normal matrices with constant row sums (submitted 2022).

(56) S. K. Chebolu, J. Merzel, J. Mináč, L. Muller, T. T. Nguyễn, F. W. Pasini and N. D. Tân. On the joins of group rings (submitted 2022).

(57) S. K. Chebolu, J. Merzel, J. Mináč, L. Muller, F. W. Pasini, T. T. Nguyễn and N. D. Tân. On the arithmetic of the joins of group rings over finite fields (in preparation 2022).

(58) R. C. Budzinski, T. T. Nguyễn, G. B. Benigno, J. Đoàn, J. Mináč, T. J. Sejnowski and L. Muller. Analytical prediction of specific spatiotemporal patterns in nonlinear oscillator networks with distance-dependent time delays (submitted 2022).

(59)   J. Mináč, N. D. Tân and T. T. Nguyễn. On the arithmetic of generalized Fekete polynomials (submitted 2022).

(60)   T. T. Nguyễn, R. C. Budzinski, F. W. Pasini, R. Delabays, J. Mináč and L. Muller. Broadcasting solutions on multilayer networks of phase oscillators (submitted 2022).

Remark. From early childhood I have been fascinated with mathematics, science and art. Already when I was twelve years old, after the tragic death of my father, I found an escape from sorrow in investigations of the distribution of prime numbers and in learning about the ideas of calculus from texts of Leibniz and Newton. In fact through a complicated process via relentless curiosity and determination, I secured the privilege to borrow books from the university library, despite my youth.

Thus I succeeded in learning some basic mathematics from the collected works of Tschebyshev, and some selected translations of the work of Leibniz, Newton, Einstein, Galois, and others.

Although I could not at that time understand some fine points of their works, my excitement and enthusiasm for their investigations turned into a lifelong pursuit of my dream to be able to find enough time and leisure to dedicate myself to reflections on these and other beautiful, mysterious, and somewhat magical topics.

However my family and I encountered some challenging and difficult conditions in the former Czechoslovakia. Thanks to some great chance meetings with Professors M. Waldschmidt and G. Poitou, and their kind help, I was able (via some unusual ways) to arrange with Professor Paulo Ribenboim, my escape to Canada; first in 1982 for PhD studies at Queen's University and then in 1985 I completed my permanent escape from the former Czechoslovakia. I had to give up my Czechoslovakian citizenship and pay them for my education, in order that my family would not be punished for my escape.

I was a stateless person for many years, and the Canadian immigration process was complicated. However I have been richly compensated by being able to still live in some free and democratic countries; especially my new and truly wonderful home country that is Canada. Having had and continuing to have contact with and the support of some truly remarkable people like Professors Paulo Ribenboim, Tsit Yuen Lam, Alejandro Adem, Zinovy Reichstein, Andrew Granville, and many others; has truly meant the world to me, and has been a tremendous uplift and help in my life. Thus I've still been able to work productively on these beautiful topics. Gradually through many further miracles and truly magical occurrences, I have been able to obtain some wonderful students, postdoctoral fellows, and collaborators.

Some additional highlights in my research work include my long and continuing collaboration with Andrew Schultz and John Swallow on Galois modules, some exciting work with John Labute on mild groups, work with Sunil Chebolu and additional collaborators, Dan Christensen, David Benson and Jon Carlson, on Tate cohomology and new ghost invariants. In 2012 I obtained one more truly outstanding postdoctoral fellow, Nguyễn Duy Tân. We embarked on a number of exciting, adventurous, and rewarding projects. We have been able to prove that all triple Massey products in Galois cohomology with $\mathbf{F}_2$ coefficients when defined, must vanish for all fields. This was a welcome extension of Hopkins-Wickelgren's identical result from the case of global fields of char not equal to 2 to all fields.

This work, as well as our subsequent work, has led us to formulate the *n*-Massey vanishing conjecture in Galois cohomology for n greater than or equal to 3. This conjecture is now known as the Mináč-Tân conjecture. This conjecture has already attracted considerable attention, and some fascinating progress has been obtained by some remarkable mathematicians including Y. Harpaz, O. Wittenberg, A. Merkurjev, F. Scavia, Y. H. J. Lam, Y. Liu, R. Sharifi, P. Wake, J. Wang, I. Efrat, E. Matzri, P. Guillot, A. Topaz, A. Pal, E. Szabo, G. Quick, L. Positselski, C. Quadrelli, K. Wickelgren, M. Hopkins, T. Chinburg, F. M. Bleher, J. Gillibert, and others. With

Tân we have also been able to contribute some further results towards confirming this conjecture in some cases, either in joint work together, or also in some additional work with other collaborators. This conjecture and the results obtained, have important corollaries for the structure of absolute Galois groups, which is one of the central subjects in current number theory and arithmetical geometry.

More recently, together with my collaborator, Lyle E. Muller, we have been privileged to add to our team, several other extremely talented and dedicated new postdoctoral fellows: F. W. Pasini, T. T. Nguyễn, R. Budzinski, as well as some extraordinary new graduate students including: O. Hamza (co-supervised with Professors C. Maire and L. Muller), M. Čížek (PhD defence completed this summer 2022); and the following students (all co-supervised with Professor L. Muller): A. Busch, J. Đoàn, P. B. Jain, A. Shikder, and E. Yartey.

I have now entered the most exciting and creative period in my life, through some interdisciplinary collaborative work with Professor Lyle E. Muller and our awesome team composed of a number of gifted, enthusiastic and dedicated people. I am still currently pursuing work in Galois theory, number theory, topology and geometry; but I am also using my expertise in other topics in discrete mathematics and some theoretical physics and science, in order to pursue a new program in mathematical applications to the study of networks, machine learning, analysis, graph theory, dynamical systems, and neuroscience.

This is a very exciting and fascinating new interdisciplinary research program entitled "Mathematics of Neural Networks" which has evolved during these last two years. Our theme was chosen as the first inaugural theme for the newly established Western Academy for Advanced Research at Western University.

With Lyle Muller, I am a co-organizer of this 2022-23 research program. Lyle Muller is the "theme leader" and he is an expert both in computer neuroscience and applied mathematics. Lyle Muller, Marieke Muir and I belong to this first inaugural class of Western Fellows. We are also privileged to be collaborating with Professors Maria Chudnovsky (Princeton University) and Alexander Lubotzky (Weizmann Institute), who are official Western visitors at the Western Academy for Advanced Research.

I am now very grateful and excited about this possibility to fulfill my childhood dream and to dedicate myself to mathematics, science and the arts, and to still be able to work in adequate living and working conditions and to be included and respected for my diverse background and unique experience.