

Curriculum Vitæ et Studiorum

Claudio Quadrelli

Personal Data:

Day of birth: 14/08/1986

Nationality: Italy

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Phone: +39 329 88 49 613

Research Interests: Galois Theory, Profinite and pro- p groups, Cohomology of groups, Algebraic Number Theory, Lie algebras and graded structures associated to groups.

Positions

04/2017 - 03/2021: Post-Doctoral Fellow (*Assegnista di Ricerca*)

Department of Mathematics and Applications, University of Milano-Bicocca. Advisor: Prof. Th.S. Weigel

11/2016 - 03/2017: Post-Doctoral Fellow (*Assegnista di Ricerca*)

Department of Mathematics “U. Dini”, University of Firenze. Advisor: Prof. O. Puglisi

09/2015 - 09/2016: Post-Doctoral Fellow

Center for Advanced Studies in Mathematics, Ben-Gurion University of the Negev (Israel). Advisor: Prof. I. Efrat

Education

01/2011 - 02/2015: Doctor of Philosophy in Mathematics and

Dottore di Ricerca in Matematica Pura e Applicata
(double joint degree)

University of Western Ontario (Canada) and University of Milano-Bicocca (Italy). Advisors: Prof. J. Minac e Prof. Th.S. Weigel. Title of the thesis: «*Cohomology of absolute Galois groups*», available at <https://ir.lib.uwo.ca/etd/2600/>.

10/2008 - 10/2010: M.Sc in Mathematics (*Laurea Magistrale in Matematica*)

Final mark: 110/110 summa cum laude. University of Milano-Bicocca (Italy).

10/2005 - 07/2008: B.Sc in Mathematics (*Laurea Triennale in Matematica*)

Final mark: 110/110 summa cum laude. University of Milano-Bicocca (Italy).

Grants and Awards

Awards and Prizes

- **2017:** “*Giovani Talenti*” Prize, University of Milano-Bicocca and Accademia dei Lincei (Italy).
- **2015:** Department candidate for the *Governor General's Gold Medal* for PhD recipients, Department of Mathematics, University of Western Ontario (Canada).
- **2013:** *Graduate Thesis Research Award*, Faculty of Science, University of Western Ontario (Canada).
- **2011:** *Master Thesis Prize*, Istituto Nazionale di Alta Matematica “F. Severi” - INdAM (Italy).

Grants and Fellowships

- **2017-2021:** Post-Doc fellowship, Department of Mathematics and Applications, University of Milano-Bicocca (Italy).
- **2011-2021:** Several travel grants from GNSAGA, Istituto Nazionale di Alta Matematica “F. Severi” - INdAM (Italy), for attending conferences and schools, and for research visits.
- **2018 and 2020:** Grants from GNSAGA, Istituto Nazionale di Alta Matematica “F. Severi” - INdAM (Italy), for the organization of events (see section “Organization Expertise”)
- **2016-2017:** Post-Doc fellowship “*Giovani Ricercatori Protagonisti*” funded by Fondazione CR Firenze, Department of Mathematics “U. Dini”, University of Firenze (Italy).
- **2015-2016:** Post-Doc fellowship jointly funded by the Center for Advanced Studies in Mathematics and by the Israel Science Foundation grant no. 152/13, Ben-Gurion University of the Negev (Israel).
- **2011-2013:** Fellowship for PhD students, Department of Mathematics and Applications, University of Milano-Bicocca (Italy).
- **2010:** Grant *ExTra-ExternalTraining* for international mobility for Master students funded by Fondazione Cariplo, University of Milano-Bicocca (Italy).
- **2009:** Grant for Master Students in Mathematics; Istituto Nazionale di Alta

Matematica “F. Severi” - INdAM (Italy).

- **2005 - 2007:** Grant for Bachelor Students in Mathematics; Istituto Nazionale di Alta Matematica “F. Severi” - INdAM (Italy).

Scientific Publications

Published Articles:

1. *Bloch-Kato pro- p groups and locally powerful groups.* *Forum Math.* 26 (2014), no. 3, 793-814. Available at [arXiv:1211.4504](https://arxiv.org/abs/1211.4504).
2. *Finite quotients of Galois pro- p groups.* *Ann. Math. Québec* 39 (2015), no. 1, 113-120. Available at [arXiv:1503.06439](https://arxiv.org/abs/1503.06439).
3. *Detecting fast solvability of equations via small powerful Galois groups.* With S.K. Chebolu and J. Minac. *Trans. Amer. Math. Soc.*, 367 (2015), no. 2, 8439-8464. Available at [arXiv:1310.7623](https://arxiv.org/abs/1310.7623).
4. *A group theoretical version of Hilbert's theorem 90.* With Th. Weigel. *Bull. Lond. Math. Soc.* 47 (2015), no. 4, 704-714. Available at [arXiv:1502.01146](https://arxiv.org/abs/1502.01146).
5. *The Kummerian property and maximal pro- p Galois groups.* With I. Efrat. *J. Algebra* 525 (2019), 284-310, Available at [arXiv:1707.07018](https://arxiv.org/abs/1707.07018).
6. *Profinite groups with a cyclotomic p -orientation.* With Th. Weigel, *Doc. Math.* 25 (2020), 1881-1916. Available at [arXiv:1811.02250](https://arxiv.org/abs/1811.02250).
7. *Right-angled Artin groups and enhanced Koszul properties.* With A. Cassella, *J. Group Theory* 24 (2021), no. 1, 17-38. Available at [arXiv:1907.03824](https://arxiv.org/abs/1907.03824).
8. *Koszul algebras and quadratic duals in Galois cohomology.* With J. Minac, F. Pasini and N.D. Tân, *Adv. Math.* 380 (2021), issue in progress, published online. Available at [arXiv:1808.01695](https://arxiv.org/abs/1808.01695).
9. *Pro- p groups with few relations and universal Koszulity.* *Math. Scand.* 127, no. 1, 28-42 (2021). Available at [arXiv:2003.09186](https://arxiv.org/abs/2003.09186).
10. *One-relator maximal pro- p Galois groups and the Koszulity conjectures.* *Q. J. Math.*, published online (2021), in press. Available at [arXiv:1601.04480](https://arxiv.org/abs/1601.04480).

Accepted:

11. *Two families of pro- p groups that are not absolute Galois groups.* *J. Group Theory.* Available at [arXiv:2011.03233](https://arxiv.org/abs/2011.03233).

Submitted:

12. *1-smooth pro- p groups and the Bloch-Kato conjecture*. Available at [arXiv:1904.00667](https://arxiv.org/abs/1904.00667).
13. *On pro- p groups with quadratic Galois cohomology*. With I. Snopce and M. Vannacci. Available at [arXiv:1906.04789](https://arxiv.org/abs/1906.04789).
14. *Galois-theoretic features for 1-smooth pro- p groups*. Available at [arXiv:2004.12605](https://arxiv.org/abs/2004.12605).
15. *Oriented pro- l groups with the Bogomolov property*. With Th. Weigel. Available at [arXiv:2103.12438](https://arxiv.org/abs/2103.12438).

In preparation:

16. *Mild pro- p groups and the Koszulity conjectures*. With F. Pasini and N.D. Tân.
17. *Oriented right-angled Artin pro- p groups and absolute Galois groups*. With S. Blumer and Th. Weigel.
18. *Oriented groups*. With A. Cassella, S. Blumer, I. Foniqi and Th. Weigel.
19. *Bloch-Kato phenomena for pro- p groups – A Survey*. With Th. Weigel.

Teaching:

01/2021-03/2021: Teacher of the course «Profinite and pro- p groups» for the joint PhD program in Mathematics, University of Pavia – University of Milano-Bicocca – Istituto Nazionale di Alta Matematica - INdAM “F. Severi”.

Webpage: <https://sites.google.com/view/jointphd/courses>.

02/2020-06/2020: T.A. (*esercitatore*) for the course «Geometry and Linear Algebra» (teacher: Prof. M. Pedroni), Department of Engineering and Applied Sciences, University of Bergamo.

09/2019-01/2020: T.A. (*esercitatore*) for the courses «Calculus I» (teacher: Prof. L. Grenié) and «Calculus II» (teacher: Prof. G.D. Furioli), Department of Engineering and Applied Sciences, University of Bergamo.

01/2017-05/2020: Teacher for the project «*Sapere Minimo di Matematica*» of the *Piano Lauree Scientifiche* (PLS) of the Department of Mathematics and Applications, University of Milano-Bicocca (person in charge of the project: Prof. M.G. Kuhn).

03/2018-07/2018: T.A. (*esercitatore*) for the course «Linear Algebra and Geometry» (teacher: Prof. M.G. Kuhn), Department of Computer Science (DISCO), University of Milano-Bicocca.

10/2017-02/2018: T.A. (*esercitatore*) for the course «Calculus II» (teacher: Prof. V. Felli), Department of Material Sciences, University of Milano-Bicocca.

03/2017-07/2017: Tutor and T.A. (*esaminatore*) for the course «Algebra II» (teacher: Prof. L.G. Di Martino), Department of Mathematics and Applications, University of Milano-Bicocca.

03/2015-07/2015: T.A. (*esercitatore*) for the course «Linear Algebra and Geometry» (teacher: Prof.ssa M.G. Kuhn), Department of Computer Science (DISCO), University of Milano-Bicocca.

03/2015-07/2015: T.A. (*esercitatore*) for the course «Algebra II» (teacher: Prof. Th.S. Weigel), Department of Mathematics and Applications, University of Milano-Bicocca.

10/2013-01/2014 and **10/2014-01/2015:** Teacher of the course «*Recupero - richiami di Matematica*» for 1st year students of the Faculty of Science, University di Milano-Bicocca (person in charge of the course: Prof. M.G. Kuhn).

03/2014-05/2014: T.A. (*esercitatore*) for the course «Didactics of Mathematics» (teacher: Prof. M. Cazzola), Department of Pedagogy “R. Massa”, University of Milano-Bicocca.

11/2011-03/2012: Personal Tutor of students with special needs, Students with Disabilities Office, University of Milano-Bicocca.

03/2009-07/2009: Tutor for the course «Linear Algebra» (teacher: Prof. R. Raimondo), Faculty of Statistics, University of Milano-Bicocca.

Talks and Conferences

Invited Talks and Seminars:

- Webinar: «1-cyclotomic pro- p groups», at the seminar series *Bilbao Algebra Seminar*, University of the Basque Country (Spain), 21/04/2021.
Webpage: <https://sites.google.com/site/bilbaoalgebraseminar/>
- Lecture: «Mathematics and mathematicians in the Italian Renaissance», for the course *History of Mathematics* (course teacher: Prof. Sunil K. Chebolu), Illinois State University (USA), 15/10/2020.
<https://news.illinoisstate.edu/2021/01/humanitys-dreams-woven-through-mathematics/>
- Invited speaker at the conference *New trends around profinite groups*, Levico Terme (Italy), 14-18/09/2020, postponed due to COVID19.
Webpage: <http://reh.math.uni-duesseldorf.de/~internet/Levico2020/>
- Talk: «Pro- p groups with quadratic cohomology and generalised pro- p RAAGs», at the conference *Group Theory Days in Düsseldorf*, University di Düsseldorf

(Germany), 20-21/01/2020.

Webpage: <http://reh.math.uni-duesseldorf.de/~internet/GTD2020/index.html>

- Lecture: «Maximal pro- p quotients of absolute Galois groups: Questions and Answers», at the school *Advanced School on representations of pro- p groups*, Instituto de Ciencias Matemáticas - ICMAT (Spain), 8-12/06/2019.
Webpage: <https://www.icmat.es/congresos/2019/ASRPG/>
- Talk: «The Bloch-Kato conjecture and maximal pro- p Galois groups», University of Düsseldorf (Germany), 16/04/2018.
- Talk: «The Bloch-Kato conjecture and maximal pro- p Galois groups», University of Strasbourg (France), 20/03/2018.
- Talk: «The Kummerian property for pro- p groups», at the conference *Topics in Group Theory and representations*, Gargnano (Italy), 10/10/2017.
Webpage: <http://staff.matapp.unimib.it/~ldm70/>
- Talk: «Absolute Galois groups of fields and the cyclotomic character», at the conference *Nilpotent fundamental groups*, Banff International Research Station for Mathematical Innovation and Discoveries - BIRS (Canada), 19-23/06/2017.
Webpage: <https://www.birs.ca/events/2017/5-day-workshops/17w5112>
- Talk: «Knots, Galois groups and Massey products», at the seminar series *Seminari dei baby-geometri*, University of Pisa (Italy), 9/02/2017.
Webpage: <https://www.dm.unipi.it/webnew/it/dottorato/seminari-dei-baby-geometri>
- Talk: «A Massey salad with coho(bio)logical products, Galois grapes and knots», at the seminar series *Insalate di matematica*, University of Milano-Bicocca (Italy), 25/11/2016.
Webpage: <https://sites.google.com/view/insalate-di-matematica/speaker/20162017>
- Talk: «Koszul pro- p groups», at the conference *1st Joint Meeting Brazil-Italy in Mathematics* (Group Theory session), Instituto de Matemática Pura e Aplicada - IMPA (Brazil), 29-31/08/2016.
Webpage: <https://www.sbm.org.br/jointmeeting-italy/>
- Talk: «Good (and bad) candidates for maximal pro- p Galois groups», at the seminar series *Field Arithmetic seminars*, Tel-Aviv University (Israel) 13/01/2016.
Webpage: <http://www.math.tau.ac.il/~haran/Field-Arithmetic-Seminar/year2015-2016/>
- Talk: «Koszul algebras, quadratic duals and Galois cohomology», Israel Institute of Technology-Technion (Israel), 3/12/2015.
- Talk: «Koszul algebras, quadratic duals and Galois cohomology», Bar-Ilan University (Israel), 1/12/2015.
- Talk: «Galois pro- p groups on a diet of roots of the field», Illinois State University (USA), 25/02/2014.

- Talk: «Upper and lower bounds for maximal pro- p Galois groups», conference *Number Theory satellite session of the CMS Summer Meeting 2013*, Dalhousie University (Canada), 8/06/2013.

Communications at Italian Mathematical Union congresses:

- «The Bloch-Kato conjectures *without motives*» (Algebra session), XXI Congresso UMI, Pavia, 2-7/09/2019.
- «A group theoretic version of Hilbert 90» (Algebra session), XX Congresso UMI, Siena, 7-12/09/2015.

Contributed Talks:

- Talk: «Hilbert 90 and Bogomolov's conjecture for pro- p groups», at the conference *Gruppen und Topologische Gruppen Cetara 2019*, Cetara (Italy), 25-26/10/2019.
- Talk: «Generalized right-angled Artin pro- p groups», at the conference *SandGAL 2019*, Politecnico di Milano, 10-13/06/2019.
- Talk: «Cohomology of absolute Galois groups and the cyclotomic character», at the conference *Homological algebra and topological groups*, University of Southampton (UK), 10-14/07/2017.
- Talk: «The Zassenhaus filtration and Galois cohomology for profinite groups», at the conference *Ischia Group Theory 2016*, Ischia (Italy), 31/03/2016.
- Talk: «Profinite groups with a cyclotomic p -orientation», at the conference *Advances in Group Theory and Applications 2015*, Porto Cesareo (Italy), 16/06/2015.
- Talk: «Galois pro- p groups with constant generating number on open subgroups», at the conference *Ischia Group Theory 2014*, Ischia (Italy), 5/04/2014.
- Talk: «Cyclo-oriented pro- p groups and Demushkin groups», at the conference *Workshop on pro- p groups and Arithmetic*, University of Franche-Comté (France), 19/12/2013.
- Talk: «Rigid fields and powerful pro- p Galois groups», at the conference *Brauer groups and Galois groups*, Israel Institute of Technology-Technion (Israel), 11/01/2013.

Other Conferences and Schools (participation):

2019: *Gruppen und Topologische Gruppen Milano 2019* (University of Milano, Jun. 21-22).

2017: *3rd Workshop on Interactions between Arithmetic and Homotopy* (Imperial College London, Feb. 14-16/02).

2016: *22nd Amitsur Memorial Symposium* (University of Haifa, Jun. 20-21); *2nd Algebra and Number Theory Day* (Tel-Aviv University, Mar. 3).

2015: *Spring School on Algebraic K-theory of Topological Algebras* (University of Regensburg, Mar. 16-20); *Computations in Groups and Algebras*, (University of Jena, Feb. 16-19).

2014: *Bicocca School and Workshop in Representation Theory* (University of Milano-Bicocca, Jun. 16-18); *Young Algebraists Conference 2014* (EPFL Lausanne, Jun. 8-13).

2013: *Canadian Mathematical Society Summer Meeting 2013* (Dalhousie University, Jun. 04-08); *Spring School on Torsors, Motives and Cohomological Invariants* (Fields Institute, May 06-17, invited participant).

2012: *Canadian Mathematical Society Winter Meeting 2012* (Montréal, Dec. 7-10); *Colloquium in honor of Helmut Koch's 80th birthday* (Humboldt University, Oct. 26-27); *Oberwolfach Seminar: Algebraic groups and patching*, (MFO, Oct. 14-22, invited participant); *IBG Advanced International School on Galois Groups* (University of the Basque Country, Jul. 16-27); *Winter School on Galois Theory* (University of Luxembourg, Feb. 15-24).

2011: *Oberwolfach Seminar: Algebraic properties of profinite groups* (MFO, Jun. 12-18, invited participant).

2008-2009: *Interuniversity Mathematical School (SMI) Perugia 2009*, attended courses: Algebra (teacher: N. Vavilov), Complex Analysis (teacher: K. Diederich); and *Interuniversity Mathematical School (SMI) Perugia 2008*, attended courses: Algebra (teacher: G. Navarro); Differential Geometry (teacher: F. Mercuri).

Organization Expertise

- Algebra Seminar «*Al@Bicocca*» of the Department of Mathematics and Applications (webinar series «*Al@Bicocca take-away*» during COVID19 emergency), University of Milano-Bicocca, years 2018-19, 2019-20, and 2020-21.
Webpage: <https://sites.google.com/unimib.it/albicocca/seminario-di-algebra>
- Conference *GABY20 - Groups and Algebras in Bicocca for Young algebraists*, University of Milano-Bicocca (Italy), June 2020, with a funding from GNSAGA-INdAM (2000 €), member of the scientific commission; postponed due to COVID19.
Webpage: <http://staff.matapp.unimib.it/~gaby/gaby2018/index.html>
- Conference *GABY18 - Groups and Algebras in Bicocca for Young algebraists*, University of Milano-Bicocca (Italy), May 2018, with a funding from GNSAGA-INdAM (2500 €), member of the scientific and organizing commission.
Webpage: <http://staff.matapp.unimib.it/~gaby/gaby2020/index.html>
- Colloquium *Insalate di Matematica* del Department of Mathematics and Applications, University of Milano-Bicocca (Italy), year 2017-18.
Webpage: <https://sites.google.com/view/insalate-di-matematica/home>

- Conference *3rd Algebra and Number Theory Day*, Center for Advanced Studies in Mathematics, Ben-Gurion University of the Negev (Israel), 23/06/2016. Webpage: <https://www.math.bgu.ac.il/en/research/events/ant2016.pdf>

Other Academic Activities

Review Activities:

Referee for the peer-review of articles for the following mathematical journals: *Compositio Mathematica*, *Journal of the Institute of Mathematics of Jussieu*, *Journal of Pure and Applied Algebra*, *Canadian Journal of Mathematics*, *Czechoslovak Mathematical Journal*.

Reviewer for *MathReviews–MathSciNet*, since 2014 (total number of reviews: 42).

Memberships:

- **Group GNSAGA** - Istituto Nazionale di Alta Matematica “F. Severi” (INdAM), since 2011.
- Formerly: student member of the American Mathematical Society and student member of the Canadian Mathematical Society (2012-2015).

Student Advising:

Adviser of an *undergraduate research project* with A. Cassella, M.Sc. student in Mathematics, University of Milano-Bicocca (Italy), 2019. Title of the project: «algebraic structures associated to graphs» (the project contributed to the paper *Right-angled Artin groups and enhanced Koszul properties*, item n. 7 in the publications list).

Vice-adviser of a M.Sc. Thesis with J. Fariña, ALGANT M.Sc. student in Mathematics, University of the Basque Country (Spain), 2021. Main adviser: Prof. G.A. Fernandez-Alcober, University of the Basque Country. Topics of the thesis: Profinite groups and Galois theory.

Academic service:

Member of the council of the Department of Mathematics and Applications as representative of the Post-Doc fellows (*rappresentante degli assegnisti di ricerca*) of the Department, University of Milano-Bicocca, 2018-2021.

Research Visits:

- **05/2020:** with Dr. O. Garaialde-Ocaña and Dr. M. Vannacci, University of the Basque Country (Spain), postponed due to COVID19;
- **01/2020:** with Prof. I. Snopce, University of Düsseldorf (Germany);
- **04/2018:** with Prof. I. Snopce and Dr. M. Vannacci, University of Düsseldorf

(Germany);

- **03/2018:** with Dr. P. Guillot, University of Strasbourg (France);
- **01/2016:** with Prof. L. Bary-Soroker and Dr. M. Schusterman, Tel-Aviv University (Israel);
- **12/2015:** with Prof. D. Neftin and Prof. J. Sonn, Israel Institute of Technology-Technion (Israel);
- **12/2015:** with Prof. E. Matzri, Bar-Ilan University (Israel);
- **02/2014:** with Prof. S.K. Chebolu, Illinois State University (USA);
- **12/2013:** with Prof. J.P. Labute, McGill University (Canada);
- **01-06/2010:** semester spent at the University of Western Ontario (Canada) for writing the Master Thesis, grant *ExTra-ExternalTraining* for international mobility funded by Fondazione Cariplo.

Links:

- MathSciNet: <http://www.ams.org/mathscinet/MRAuthorID/1063146>
- zbMATH: <https://www.zbmath.org/authors/quadrelli.claudio>
- SCOPUS: <https://www.scopus.com/authid/detail.uri?authorId=56205655400>
- ORCID: <https://orcid.org/0000-0002-7819-5042>
- ResearchGate: https://www.researchgate.net/profile/Claudio_Quadrelli

Languages

- **Italian:** mother tongue.
- **English:** fluent.

Main References

- Prof. Sunil K. Chebolu, Illinois State University (USA)
- Prof. Ido Efrat, Ben-Gurion University of the Negev (Israel)
- Prof. Maria Gabriella Kuhn (for teaching experience), University of Milano-Bicocca (Italy)
- Prof. Jan Minac, University of Western Ontario (Canada)

- Prof. René Schoof (PhD thesis referee), University of Roma-Tor Vergata (Italy)
- Prof. Ilir Snopce, Federal University of Rio de Janeiro (Brasile)
- Prof. Thomas S. Weigel, University of Milano-Bicocca (Italy)

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000.

Milano, 13/04/2021

In fede