

## Employment

- 2021– **Universität des Saarlandes**, Saarbrücken, Professor of Computer Science and Mathemacis (W3).
- 2008–2021 **Georg-August University**, Göttingen, Professor of Mathematics (W3).
- 2004–2008 **École Polytechnique Fédérale**, Lausanne, Assistant Professor (PATT).
- 2001–2003 **University of California**, Berkeley, Charles B. Morrey Jr. Assistant Professor.
- 2000–2001 **Swiss National Fund**, Berkeley, Brasília, Jerusalem, Post-doctoral researcher.
- 1995–2000 **University of Geneva**, Geneva, Teaching Assistant.
- 1992 **University of Geneva**, Geneva, Programmer on a parallel computer.

## Education

- March 2000 **Ph.D. in Mathematics**, *University of Geneva*, advisor: Pierre de la Harpe. “Croissance de groupes agissant sur des arbres”
- May 1995 **Diploma in Mathematics**, *University of Geneva*, advisor: Michel Kervaire.
- 1991–1993 **Bachelor in Mathematics and Computer Science**, *University of Geneva*.

## Academic Interests

- Complexity and computability, game theory, computer algebra
- Geometric group theory and its applications
- Dynamical systems, in particular symbolic and holomorphic

## Invited Professorships

- 2022 **Mathematical Sciences Research Institute**, Berkeley, 5 months.
- 2019–2020 **École Normale Supérieure**, Lyon, 8 months.
- 2018–2019 **Institute of Advanced Studies**, Lyon, 10 months.
- 2015–2018 **École Normale Supérieure**, Paris, 3 years.
- 2014 **Institut Henri Poincaré**, Paris, 1 month.
- 2013 **University of Chicago**, Chicago, 1 month.
- 2013 **CIMI**, Toulouse, 6 months.
- 2012 **Mittag-Leffler Institute**, Stockholm, 1 month.
- 2012 **CNRS**, Paris, 1 month.

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- 2011 **CNRS**, *Paris*, 1 month.
- 2010 **Chinese Academy of Sciences**, *Beijing*, 6 months.
- 2008 **T.U. Graz**, *Graz*, 1 month.
- 2007 **CNRS**, *Marseille*, 1 month.
- 2005 **T.U. Graz**, *Graz*, 1 month.

## Prizes and funding

- 2019– ANR research grant “AlMaRe”, speaker G. Massuyeau, 120’400€
- 2018–2019 Fellowship at the Institute of Advanced Studies, Lyon
- 2016–2020 GIF research grant (project I-198-304.1-2015, “Geometric exponents of random walks and intermediate growth groups”), 200’000€
- 2015–2018 ACHN (hosting of high-level researchers, “@raction”) of the french ANR, project ANR-14-ACHN-0018-01, 550’000€
- 2013–2014 Scientific expert at CIMI, Toulouse for 6 months
- 2013–2017 DFG research grant (project BA 4197/6-1, “Spaces of rational maps”), 169’300€
- 2013–2017 DFG research grant (project BA 4197/5-1, “Algorithmic aspects of branched groups”), 169’100€
- 2013–2016 research grant of the Mercator foundation “KLEIN: Kulturell bildende Lernobjekte entwickeln, implementieren, neu machen”, with Stefan Halverscheid and Max Wardetzky, 122’000€
- 2010 Hua Luogeng prize of the Chinese Academy of Sciences , ~90’000 RMB
- 2010–2017 DFG research grant (project BA 4197/1-1, “Self-similar groups and algebras”), ~130’000€
- 2008 NSF travel grant for a conference (DMS 080xxxx, with V. Nekrashevych)
- 2006–2009 ANR research grant (JCJC06\_149094, with A. Erschler, S. Brofferio, C. Druţu, E. Breuillard, V. Guirardel, B. Rémy, and F. Dahmani)
- 2005–2008 SNF research grant (project 105469/1)
- 2006–2007 SNF research grant (project 111547/1)
- 2007 SNF international exchange grant (project 116966/1 for F. Guéritaud)
- 2006 SNF international exchange grant (project 113024/1 for C. Voll)
- 2003 NSF travel grant (DMS 0307231, with V. Jones)
- 2001 SNF Individual Support (project 83R-064282)
- 2000 SNF Individual Support (project 83R-063208)

## Students

- Olivier Siegenthaler Discrete and profinite groups acting on regular rooted trees (PhD 9.2009)
- Shariful Islam Julia sets as Martin boundary (PhD 7.2010)
- Dzmitry V. Dudko Algebraic invariants of branched coverings (PhD 2.2012)
- René Hartung Algorithmic aspects of infinitely presented groups (PhD 6.2012)
- Christian Bick Bifurcations and chaos in network dynamical systems (PhD 11.2012)

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Thorsten Groth	Algorithmic problems in self-similar group theory (PhD, 2.2018)
Elisa Hartmann	Coarse cohomology with twisted coefficients (PhD, 2.2019)
Thomas Sicking	Lie dimension subrings (PhD, 10.2020)
Patrick Neumann	Zeta functions of groups (Master 9.2011)
Thorsten Groth	The conjugacy problem in automata groups (Master 10.2014)
Robin Richter	Investigating the dynamics of a post-critically finite endomorphism [...] (Master 10.2015)
Julian Pape-Lange	Efficient algorithms for low entropy strings (Master 5.2018)
Patrick Neumann	Der Raum von endlich erzeugten Gruppen (Bachelor 7.2009)
Martin Nitsche	Streckenkomplexe (Bachelor 9.2012)
Michael Duppré	Lower bounds on the growth of Grigorchuk's group [...] (Bachelor 10.2012)
Anton Nickel	Hurwitz' Satz über summen von Quadraten (Bachelor 4.2013)
Robin Richter	Hubbard trees (Bachelor 10.2013)
Malin Lachmann	Bisets of commuting functions and their Julia sets (Bachelor 4.2014)
Sina Bittens	Free Products and Galois groups arising from Arithmetic Operations (Bachelor 10.2014)
Malo Jézéquel	Moyennabilité d'algèbres de Lie (Bachelor 06.2016)
Paul Philippe	Groupes de monodromie itérée en dynamique holomorphe (Bachelor 07.2019)
Salim Alloun	Calcul [...] de certains groupes engendrés par des automates (Bachelor 09.2020)

## Supervised post-docs

- 2020–2022 **Marialaura Noce**.
- 2018–2019 **Rachel Skipper**, *now at Ohio State University, USA*.
- 2015–2017 **Ivan Mitrofanov**, *now at ENS Paris, France*.
- 2012–2016 **Dzmitry Dudko**, *now at Stony Brook University, USA*.
- 2013 **Jean-François Planchat**.
- 2011–2013 **Bogdan Nica**, *now at Indiana University, USA*.
- 2011–2012 **Michele D'Adderio**, *now at Université Libre de Bruxelles, Belgium*.
- 2010–2011 **Colin Reid**, *now at University of Newcastle, Australia*.
- 2010 **Luc Guyot**, *now at Human Brain Project ÉPFL, Geneva*.
- 2009–2010 **Christopher Lipa**.
- 2009 **Jörg Lehnert**, *now at Max Planck Institute for Mathematics Leipzig, Germany*.
- 2007 **François Guéritaud**, *now at Université de Lille, France*.
- 2006 **Christopher Voll**, *now at University of Bielefeld, Germany*.
- 2007–2008 **Olivier Guichard**, *now at Université de Strasbourg, France*.
- 2004–2006 **H. Tracy Hall**.

## Teaching

- 2021– Regular 9h/week teaching at Bachelor level, Saarland University (“linear algebra”, “Geometric group theory”); Seminar on “computer-assisted proofs using Lean”

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- 2017–2021 Reduced-load 4.5h/week teaching at Bachelor and Master level, Göttingen University (1st year: “Discrete Mathematics for Data Science”; Bachelor-level: “Scientific writing”)
- 2016–2017 Advanced courses, École Normale Supérieure, Paris, France (Master-level: “Amenability”, “Complexity”)
- 2008–2016 Regular 9h/week teaching at Bachelor and Master level, Göttingen University (Bachelor-level: “Lie groups”, “Lie algebras”, “Complex analysis”, “Calculus 2”, “Calculus 1”, “Group theory”; Master-level: “Group theory”, “Associative algebras”)
- 2010 Advanced course, Chinese Academy of Sciences, Beijing (Master-level: “Iterated monodromy groups”)
- 2004–2008 Regular 6h/week teaching at Bachelor and Master level, ÉPFL, Lausanne, Switzerland (1st year: “Linear algebra”, “Theoretical computer science”; Bachelor-level: “Lie algebras”)
- 2001–2003 Regular 4.5h/week teaching at undergraduate and graduate level, U. C. Berkeley, USA

I have regularly run a weekly seminar, at ÉPFL and the University of Göttingen, aimed at advanced Bachelor and Master students.

I have also been invited numerous times to give advanced courses, concentrated on one or a few weeks.

## Scientific organizational activities

- 2020 Head of scientific committee, Young Geometric Group Theory X
- 2020 Member of scientific advisory committee, TDLC 2020, ÉPFL, Switzerland
- 2019 Main organizer and speaker (with H. Helfgott and M. Tointon) of Oberwolfach Seminar 1943a “Growth in finite and infinite groups”, Oberwolfach, Germany
- 2019 Member of scientific committee, GAGTA2019, Bar Ilan, Israel
- 2018 Main organizer (with H. Helfgott) of international conference “Number and group theory”, Florence, Italy
- 2015 Member of the scientific committee of GAGTA-9 at CIRM, Marseille, France
- 2014 One of the main organizers of the international conference “Holomorphic and symbolic dynamics” in Toulouse, France
- 2012 Main organizer of the workshop “Groups in action” in the Vercors mountains, France
- 2011 One of the main organizers of the summer school “Göttingen-Penn State International Summer School on Dynamical Systems” in Göttingen, Germany
- 2011 Main organizer of the workshop “Groups in action” in the Harz mountains, Germany
- 2009 One of main organizers of the symposium in honour of Vadim A. Kaimanovich, in Bremen, Germany

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



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- 2007 Main organizer of walkshop “Profinite groups and residually finite groups” in La Fouly-Champex-Trient, Switzerland
- 2005 One of main organizers of the conference “Asymptotic and Probabilistic methods in Group theory” in Geneva, Switzerland
- 2004 Main organizer of workshop “Around groups acting on trees” in Villars, Switzerland
- 2003 One of main organizers of the conference “Groups 2003” in Gaeta, Italy
- 1999 Co-organizer of conference “Groupes finis” in Geneva, Switzerland

## Community service, commissions of trust

- 2005– Editor of Quadrature  (journal targeted at undergraduate University students)
- 2011– Member of the GAP council  (steering committee)
- 2011–2021 Curator of the Göttingen Collection of Mathematical Models 
- 2012–2021 Member of Göttingen faculty committee on undergraduate studies
- 2018– Member of Scidolyse  (Machine Learning in Lyon / St-Étienne)
- 2019– Editor of Images des Mathématiques  (the CNRS portal for mathematical outreach)
- 2021– Member of Saarbrücken Info+Mathe Master student selection committee

## Computer skills

- C, C++ Developed and implemented algebraic and numerical standalone software
  - GAP Developed libraries, user support, steering committee
  - Julia Ported libraries, prototyping, interface with GAP
  - Scheme Wrote in 1992, with Marc Vuilleumier, the Scheme interpreter PCS/GE
- Also familiar with other mathematical languages (Maple, MATLAB/Octave, ...)

## Languages

French	Native speaker	English	Fluent
German	Proficient	Italian	Intermediate
Portuguese	Intermediate	Spanish	Intermediate
Russian	Basic	Chinese	Basic
Hungarian	Basic		

## Other Interests

- Plays the piano, the trumpet and the swiss alphorn.
- Plays bridge (participated in the world junior championships) and chess (participated twice in the junior Swiss championships)
- Programming (including the at-one-time strongest “giveaway chess” program (Iznogoud), a Scheme interpreter (PCS-GE), ...)
- Mathematical outreach, International Mathematical Olympiad training

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## Publications

All my publications are available online at [https://arxiv.org/a/bartholdi\\_1\\_1.html](https://arxiv.org/a/bartholdi_1_1.html).

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### Journal articles

- [1] Laurent Bartholdi, Serge Cantat, Tullio Ceccherini-Silberstein, and Pierre de la Harpe, *Estimates for simple random walks on fundamental groups of surfaces*, Colloq. Math. **72** (1997), no. 1, 173–193, [arXiv:math/0612409](https://arxiv.org/abs/math/0612409). MR1425552 (98d:60133a)
- [2] Laurent Bartholdi, *The growth of Grigorchuk’s torsion group*, Internat. Math. Res. Notices **20** (1998), 1049–1054, DOI 10.1155/S1073792898000622, [arXiv:math/0012108](https://arxiv.org/abs/math/0012108). MR1656258 (99i:20049)
- [3] Laurent Bartholdi, *Counting paths in graphs*, Enseign. Math. (2) **45** (1999), no. 1-2, 83–131, [arXiv:math/0012161](https://arxiv.org/abs/math/0012161). MR1703364 (2000f:05047)
- [4] Laurent Bartholdi, *Lamps, factorizations, and finite fields*, Amer. Math. Monthly **107** (2000), no. 5, 429–436, DOI 10.2307/2695298, [arXiv:math/9910056](https://arxiv.org/abs/math/9910056). MR1763395 (2001e:11118)
- [5] Laurent Bartholdi and Rostislav I. Grigorchuk, *Spectra of non-commutative dynamical systems and graphs related to fractal groups*, C. R. Acad. Sci. Paris Sér. I Math. **331** (2000), no. 6, 429–434, DOI 10.1016/S0764-4442(00)01658-X, [arXiv:math/0012174](https://arxiv.org/abs/math/0012174) (English, with English and French summaries). MR1792481 (2001i:37012)
- [6] Laurent Bartholdi and Rostislav I. Grigorchuk, *On the spectrum of Hecke type operators related to some fractal groups*, Tr. Mat. Inst. Steklova **231** (2000), no. Din. Sist., Avtom. i Beskon. Gruppy, 5–45, [arXiv:math/9910102](https://arxiv.org/abs/math/9910102); English transl., Proc. Steklov Inst. Math. **4** (**231**) (2000), 1–41. MR1841750 (2002d:37017)
- [7] Laurent Bartholdi, *Lower bounds on the growth of a group acting on the binary rooted tree*, Internat. J. Algebra Comput. **11** (2001), no. 1, 73–88, DOI 10.1142/S0218196701000395, [arXiv:math/9910068](https://arxiv.org/abs/math/9910068). MR1818662 (2001m:20044)
- [8] Laurent Bartholdi and Rostislav I. Grigorchuk, *Sous-groupes paraboliques et représentations de groupes branchés*, C. R. Acad. Sci. Paris Sér. I Math. **332** (2001), no. 9, 789–794, DOI 10.1016/S0764-4442(01)01946-2, [arXiv:math/0012175](https://arxiv.org/abs/math/0012175) (French, with English and French summaries). MR1836087
- [9] Laurent Bartholdi and Zoran Šunik, *On the word and period growth of some groups of tree automorphisms*, Comm. Algebra **29** (2001), no. 11, 4923–4964, DOI 10.1081/AGB-100106794, [arXiv:math/0005113](https://arxiv.org/abs/math/0005113). MR1856923 (2002i:20040)
- [10] Laurent Bartholdi and Tullio G. Ceccherini-Silberstein, *Salem numbers and growth series of some hyperbolic graphs*, Geom. Dedicata **90** (2002), 107–114, DOI 10.1023/A:1014902918849, [arXiv:math/9910067](https://arxiv.org/abs/math/9910067). MR1898155 (2003b:20060)
- [11] Laurent Bartholdi and Tullio G. Ceccherini-Silberstein, *Growth series and random walks on some hyperbolic graphs*, Monatsh. Math. **136** (2002), no. 3, 181–202, DOI 10.1007/s006050200043, [arXiv:math/0109069](https://arxiv.org/abs/math/0109069). MR1919644 (2003g:60010)
- [12] Laurent Bartholdi and Rostislav I. Grigorchuk, *On parabolic subgroups and Hecke algebras of some fractal groups*, Serdica Math. J. **28** (2002), no. 1, 47–90, [arXiv:math/9911206](https://arxiv.org/abs/math/9911206). MR1899368 (2003c:20027)

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- [13] Laurent Bartholdi, *A Wilson group of non-uniformly exponential growth*, C. R. Math. Acad. Sci. Paris **336** (2003), no. 7, 549–554, DOI 10.1016/S1631-073X(03)00131-6, [arXiv:math/0210471](#) (English, with English and French summaries). MR1981466 (2004c:20051)
- [14] Laurent Bartholdi, *Endomorphic presentations of branch groups*, J. Algebra **268** (2003), no. 2, 419–443, DOI 10.1016/S0021-8693(03)00268-0, [arXiv:math/0007062](#). MR2009317 (2004h:20044)
- [15] Laurent Bartholdi, *The 2-dimension series of the just-nonsolvable BSV group*, New Zealand J. Math. **33** (2004), no. 1, 17–23, [arXiv:math/0104076](#). MR2066313 (2005f:20063)
- [16] Laurent Bartholdi and Wolfgang Woess, *Spectral computations on lamplighter groups and Diestel-Leader graphs*, J. Fourier Anal. Appl. **11** (2005), no. 2, 175–202, DOI 10.1007/s00041-005-3079-0, [arXiv:math/0405182](#). MR2131635 (2006e:20052)
- [17] Laurent Bartholdi and Bálint Virág, *Amenability via random walks*, Duke Math. J. **130** (2005), no. 1, 39–56, DOI 10.1215/S0012-7094-05-13012-5, [arXiv:math/0305262](#). MR2176547 (2006h:43001)
- [18] Laurent Bartholdi, *Lie algebras and growth in branch groups*, Pacific J. Math. **218** (2005), no. 2, 241–282, DOI 10.2140/pjm.2005.218.241, [arXiv:math/0101222](#). MR2218347 (2007k:20069)
- [19] Laurent Bartholdi and Said N. Sidki, *The automorphism tower of groups acting on rooted trees*, Trans. Amer. Math. Soc. **358** (2006), no. 1, 329–358 (electronic), DOI 10.1090/S0002-9947-05-03712-8, [arXiv:math/0308127](#). MR2171236 (2006i:20036)
- [20] Laurent Bartholdi, Illya I. Reznikov, and Vitaly I. Sushchansky, *The smallest Mealy automaton of intermediate growth*, J. Algebra **295** (2006), no. 2, 387–414, DOI 10.1016/j.jalgebra.2004.08.040, [arXiv:math/0407312](#). MR2194959 (2006i:68060)
- [21] Laurent Bartholdi and Yves de Cornulier, *Infinite groups with large balls of torsion elements and small entropy*, Arch. Math. (Basel) **87** (2006), no. 2, 104–112, DOI 10.1007/s00013-005-1684-4, [arXiv:math/0510141](#). MR2249644 (2007f:20065)
- [22] Laurent Bartholdi, *Branch rings, thinned rings, tree enveloping rings*, Israel J. Math. **154** (2006), 93–139, [arXiv:math/0410226](#). MR2254535 (2007k:20051)
- [23] Laurent Bartholdi, André G. Henriques, and Volodymyr V. Nekrashevych, *Automata, groups, limit spaces and tilings*, J. Algebra **305** (2006), no. 2, 629–663, DOI 10.1016/j.jalgebra.2005.10.022, [arXiv:math/0412373](#). MR2266846 (2008a:20070)
- [24] Laurent Bartholdi, Benjamin Enriquez, Pavel Etingof, and Eric Rains, *Groups and Lie algebras corresponding to the Yang-Baxter equations*, J. Algebra **305** (2006), no. 2, 742–764, DOI 10.1016/j.jalgebra.2005.12.006, [arXiv:math/0509661](#). MR2266850 (2007g:17010)
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- [26] Laurent Bartholdi and Michael R. Bush, *Maximal unramified 3-extensions of imaginary quadratic fields and  $SL_2(\mathbb{Z}_3)$* , J. Number Theory **124** (2007), no. 1, 159–166, DOI 10.1016/j.jnt.2006.08.008, [arXiv:0602.5364](#). MR2320997 (2008c:11153)
- [27] Laurent Bartholdi and Illya Reznikov, *A Mealy machine with polynomial growth of irrational degree*, Internat. J. Algebra Comput. **18** (2008), no. 1, 1–24, DOI 10.1142/S0218196708004287, [arXiv:math/0506203](#). MR2394721 (2009b:68087)

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- [28] Laurent Bartholdi and Volodymyr V. Nekrashevych, *Iterated Monodromy Groups of Quadratic Polynomials, I*, Groups Geom. Dyn. **2** (2008), no. 3, 309–336, DOI 10.4171/GGD/42, arXiv:math/0611177. MR2415302 (2009d:37074)
- [29] Laurent Bartholdi, Markus Neuhauser, and Wolfgang Woess, *Horocyclic products of trees*, J. Eur. Math. Soc. (JEMS) **10** (2008), 771–816, DOI 10.4171/JEMS/130, arXiv:math/0601417. MR2421161 (2009m:05081)
- [30] Laurent Bartholdi, *On amenability of group algebras, I*, Isr. J. Math. **168** (2008), 153–165, DOI 10.1007/s11856-008-1061-7, arXiv:math/0608302. MR2448055 (2010a:43001)
- [31] Laurent Bartholdi, Bettina Eick, and René Hartung, *A nilpotent quotient algorithm for certain infinitely presented groups and its applications*, Internat. J. Algebra Comput. **18** (2008), no. 8, 1321–1344, DOI 10.1142/S0218196708004871, arXiv:0706.3131. MR2483125 (2010h:20002)
- [32] Laurent Bartholdi and Floriane Pochon, *On growth and torsion of groups*, Groups Geom. Dyn. **3** (2009), no. 4, 525–539, DOI 10.4171/GGD/68, arXiv:0712.4005. MR2529946 (2011b:20128)
- [33] Laurent Bartholdi, *Gardens of Eden and amenability on cellular automata*, J. Eur. Math. Soc. (JEMS) **12** (2010), no. 1, 241–248, DOI 10.4171/JEMS/196, arXiv:0709.4280. MR2578610 (2011e:05282)
- [34] Laurent Bartholdi and Pierre de la Harpe, *Representation zeta functions of wreath products with finite groups*, Groups Geom. Dyn. **4** (2010), no. 2, 209–249, DOI 10.4171/GGD/81, arXiv:0809.0131. MR2595090 (2011h:20010)
- [35] Laurent Bartholdi and Olivier Siegenthaler, *The twisted twin of the Grigorchuk group*, Internat. J. Algebra Comput. **20** (2010), no. 4, 465–488, DOI 10.1142/S0218196710005728, arXiv:0904.1600. MR2665774 (2011g:20031)
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- [38] Laurent Bartholdi, Olivier Siegenthaler, and Pavel A. Zalesskii, *The congruence subgroup problem for branch groups*, Isr. J. Math. **187** (2012), 419–450, DOI 10.1007/s11856-011-0086-5, arXiv:0902.3220. MR2891709
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