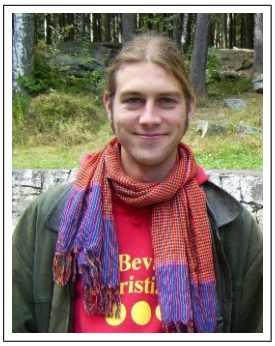
Florent Foucaud

Researcher in Graph Theory and Algorithms

LABRI, Université de Bordeaux
351, cours de la Libération
CS 10004
F-33405 Talence Cedex, France
☎ *+33 (0)6 75 54 31 96*
✉ *florent.foucaud@gmail.com*
https://ffoucaud.github.io
Born March 19th, 1986
Nationalities: French, German



(CV updated January 17, 2020)

Education and Employment

09.2019–today **Postdoctoral researcher**,
LaBRI, Université de Bordeaux, France,
Advisor: Éric Sopena.

03.2019–07.2019 **Teaching assistant**,
LIFO, Department of Computer Science, Université d'Orléans, Orléans (France).

01.2019–03.2019 **Visiting researcher**,
Research stays at IIT Madras, ISI Kolkata and IIT Dharwad (India).

01.2018–12.2018 **Postdoctoral researcher**,
LIMOS, Université Clermont Auvergne, Clermont-Ferrand, France,
Advisor: Lhouari Nourine.

03.2016–12.2017 **Independent researcher**,
Various research stays including at Thompson Rivers University (Kamloops, Canada) and Universidad Autonoma de Mexico (Querétaro, Mexico).

11.2014–02.2016 **Postdoctoral researcher**,
LIMOS, Université Blaise Pascal, Clermont-Ferrand, France,
Advisor: Laurent Beaudou.

01.2014–12.2014 **Postdoctoral researcher**,
Department of Mathematics, University of Johannesburg, South Africa & LAMSADE, Université Paris-Dauphine, France,
Advisor: Michael A. Henning.

02.2013–12.2013 **Postdoctoral researcher**,
Combgraph team, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain,
Advisors: Camino Balbuena and Oriol Serra.

09.2009–12.2012 **PhD in Computer Science and teaching assistant**,
LaBRI, Université Bordeaux 1, France, "mention Très Honorable".
Advisors: Ralf Klasing and André Raspaud
Thesis: Combinatorial and algorithmic aspects of identifying codes in graphs.

2007–2009 **Master in Computer Science, speciality "Algorithms and Formal Methods"**,
Université Bordeaux 1, France, "mention Très Bien".
Thesis: Identifying codes in special graph classes.

Publications: journal articles

[J32] F. Foucaud, S. Heydarshahi, A. Parreau. Domination and location in twin-free digraphs. *Discrete Applied Mathematics*, accepted. (arXiv link)

[J31] A. Dailly, F. Foucaud, A. Hansberg. Strengthening the Murty-Simon conjecture on diameter 2 critical graphs. *Discrete Mathematics* 342(11):3142–3159, 2019. (www link)

[J30] L. Beaudou, R. C. Brewster, F. Foucaud. Broadcast domination and multipacking: bounds and the integrality gap. *Australasian Journal of Combinatorics* 74(1):86–97, 2019. (www link)

[J29] L. Beaudou, F. Foucaud, R. Naserasr. Homomorphism bounds of signed bipartite K_4-minor-free graphs and edge-colourings of $2k$-regular K_4-minor-free multigraphs. *Discrete Applied Mathematics* 261:40–51, 2019. (DOI link)

[J28] C. Bazgan, F. Foucaud, F. Sikora. Parameterized and approximation complexity of PARTIAL VC DIMENSION. *Theoretical Computer Science* 766:1–15, 2019. (DOI link)

[J27] É. Bonnet, F. Foucaud, E. Kim, F. Sikora. Complexity of Grundy coloring and its variants. *Discrete Applied Mathematics* 243:99-114, 2018. (DOI link)

[J26] L. Beaudou, P. Dankelmann, F. Foucaud, M. A. Henning, A. Mary and A. Parreau. Bounding the order of a graph using its diameter and metric dimension: a study through tree decompositions and VC dimension. *SIAM Journal on Discrete Mathematics* 32(2):902–918, 2018. (DOI link)

[J25] F. Foucaud, R. Klasing. Parameterized and approximation complexity of the detection pair problem in graphs. *Journal of Graph Algorithms and Applications* 21(6):1039–1056, 2017. (DOI link)

[J24] F. Foucaud, A. Harutyunyan, P. Hell, S. Legay, Y. Manoussakis, R. Naserasr. The complexity of tropical graph homomorphisms. *Discrete Applied Mathematics* 229:64–81, 2017. (DOI link)

[J23] L. Beaudou, F. Foucaud, R. Naserasr. Homomorphism bounds and edge-colourings of K_4-minor-free graphs. *Journal of Combinatorial Theory, Series B* 124:128–164, 2017. (DOI link)

[J22] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Identification, location-domination and metric dimension on interval and permutation graphs. II. Complexity and algorithms. *Algorithmica* 78(3):914–944, 2017. (DOI link)

[J21] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Identification, location-domination and metric dimension on interval and permutation graphs. I. Bounds. *Theoretical Computer Science* 668:43–58, 2017. (DOI link)

[J20] O. Baudon, J. Bensmail, F. Foucaud, M. Pilsńiak. Structural properties of recursively partitionable graphs with connectivity 2. *Discussiones Mathematicae Graph Theory* 37(1):89–115, 2017. (DOI link)

[J19] F. Foucaud, G. Perarnau, O. Serra. Random subgraphs make identification affordable. *Journal of Combinatorics* 8(1):57–77, 2017. (DOI link)

[J18] R. C. Brewster, F. Foucaud, P. Hell, R. Naserasr. The complexity of signed and edge-coloured graph homomorphisms. *Discrete Mathematics* 340(2):223–235, 2017. (DOI link)

[J17] F. Foucaud, M. A. Henning. Location domination in line graphs. *Discrete Mathematics* 340(1):3140–3153, 2017. (DOI link)

[J16] F. Foucaud, M. A. Henning. Locating-total dominating sets in twin-free graphs: a conjecture. *The Electronic Journal of Combinatorics* 23(3):P3.9, 2016. (DOI link)

[J15] F. Foucaud, M. A. Henning. Location-domination and matching in cubic graphs. *Discrete Mathematics* 339(4):1221–1231, 2016. (DOI link)

[J14] F. Foucaud, M. A. Henning, C. Löwenstein, T. Sasse. Locating-dominating sets in twin-free graphs. *Discrete Applied Mathematics* 200:52–58, 2016. (DOI link)

[J13] C. Balbuena, F. Foucaud, A. Hansberg. Locating-dominating sets and identifying codes in graphs of girth at least 5. *The Electronic Journal of Combinatorics* 22(2):P2.15, 2015. (DOI link)

[J12] F. Foucaud. Decision and approximation complexity for identifying codes and locating-dominating sets in restricted graph classes. *Journal of Discrete Algorithms* 31:48–68, 2015. (DOI link)

[J11] F. Foucaud, M. Krivelevitch, G. Perarnau. Large subgraphs without short cycles. *SIAM Journal on Discrete Mathematics* 29(1):65–78, 2015. (DOI link)

[J10] F. Foucaud, R. Klasing, P. J. Slater. Centroidal bases in graphs. *Networks* 64(2):96–108, 2014. (DOI link)

[J9] F. Foucaud, T. Laihonen, A. Parreau. An improved lower bound for $(1, \leq 2)$-identifying codes in the king grid. *Advances in Mathematics of Communications* 8(1):35–52, 2014. (DOI link)

[J8] O. Baudon, F. Foucaud, J. Przybyło, M. Woźniak. On the structure of arbitrarily partitionable graphs with given connectivity. *Discrete Applied Mathematics* 162:381–385, 2014. (DOI link)

[J7] F. Foucaud, M. Kovše. Identifying path covers in graphs. *Journal of Discrete Algorithms* 23:21–34, 2013. (DOI link)

[J6] F. Foucaud, S. Gravier, R. Naserasr, A. Parreau, P. Valicov. Identifying codes in line graphs. *Journal of Graph Theory* 73(4):425–448, 2013. (DOI link)

[J5] F. Foucaud, R. Naserasr, A. Parreau. Characterizing extremal digraphs for identifying codes and extremal cases of Bondy's theorem on induced subsets. *Graphs and Combinatorics* 29(3):463–473, 2013. (DOI link)

[J4] F. Foucaud, R. Klasing, A. Kosowski, A. Raspaud. Bounds on the size of identifying codes in triangle-free graphs. *Discrete Applied Mathematics* 160(5-6):1532–1546, 2012. (DOI link)

[J3] F. Foucaud, I. Honkala, T. Laihonen, A. Parreau, G. Perarnau. Locally identifying colourings for graphs with given maximum degree. *Discrete Mathematics* 312(10):1832–1837, 2012. (DOI link)

[J2] F. Foucaud, G. Perarnau. Bounds on identifying codes in terms of degree parameters. *The Electronic Journal of Combinatorics* 19:P32, 2012. (DOI link)

[J1] F. Foucaud, E. Guerrini, M. Kovše, R. Naserasr, A. Parreau, P. Valicov. Extremal graphs for the identifying code problem. *European Journal of Combinatorics* 32(4):628–638, 2011. (DOI link)

Publications: conferences with refereed proceedings

[C13] D. Chakraborty, F. Foucaud, H. Gahlawat, S. K. Ghosh, B. Roy. Hardness and approximation for the geodetic set problem in some graph classes. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). To appear in *Lecture Notes in Computer Science*.

[C12] F. Foucaud, R. Klasing, M. Miller, J. Ryan. Monitoring the edges of a graph using distances. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). To appear in *Lecture Notes in Computer Science*.

[C11] L. Beaudou, F. Foucaud, R. Naserasr. Smallest not C_{2l+1}-colourable graphs of odd-girth $2k+1$. Proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2020). To appear in *Lecture Notes in Computer Science*.

[C10] F. Foucaud, H. Hocquard, D. Lajou, V. Mitsou, T. Pierron. Parameterized complexity of edge-colored and signed graph homomorphism problems. Proceedings of the 14th International Symposium on Parameterized and Exact Computation (IPEC 2019). *Leibniz International Proceedings in Informatics (LIPIcs)* 148,15:1-15:16, 2019. (DOI link)

[C9] L. Beaudou, F. Foucaud, L. Nourine, F. Madelaine, G. Richard. Complexity of regular path query homomorphisms. Proceedings of the 15th Conference on Computability in Europe, CIE 2019. *Lecture Notes in Computer Science* 11558:108-119, 2019. (DOI link)

[C8] C. Bazgan, F. Foucaud, F. Sikora. On the approximability of Partial VC Dimension. Proceedings of the 10th Annual International Conference on Combinatorial Optimization and Applications, COCOA 2016. *Lecture Notes in Computer Science* 10043:92–106, 2016. (DOI link)

[C7] F. Foucaud, G. B. Mertzios, R. Naserasr, A. Parreau, P. Valicov. Algorithms and complexity for metric dimension and location-domination on interval and permutation graphs. Proceedings of the 41st Workshop on Graph-Theoretic Concepts in Computer Science, WG 2015. *Lecture Notes in Computer Science* 9224:456–471, 2016. (DOI link)

[C6] É. Bonnet, F. Foucaud, E. Kim, F. Sikora. Complexity of Grundy coloring and its variants. Proceedings of the 21st International Conference on Computing and Combinatorics, COCOON 2015. *Lecture Notes in Computer Science* 9198:109–120, 2015. (DOI link)

[C5] F. Foucaud, R. Naserasr. The complexity of signed graph homomorphisms and signed constraint satisfaction. Proceedings of the 11th Latin American Symposium on Theoretical Informatics, LATIN 2014. *Lecture Notes in Computer Science* 8392:526–537, 2014. (DOI link)

[C4] F. Foucaud, G. Perarnau, O. Serra. Random subgraphs make identification affordable. Proceedings of the 7th European Conference on Combinatorics, Graph Theory and Applications, EUROCOMB 2013. *CRM Series* 16:415–420, 2013. (DOI link)

[C3] F. Foucaud. The complexity of the identifying code problem in restricted graph classes. Proceedings of the 24th International Workshop on Combinatorial Algorithms, IWOCA 2013. *Lecture Notes in Computer Science* 8288:150–163, 2013. (DOI link)

[C2] F. Foucaud, M. Kovše. On graph identification problems and the special case of identifying vertices using paths. Proceedings of the 23rd International Workshop on Combinatorial Algorithms, IWOCA 2012. *Lecture Notes in Computer Science* 7643:32–45, 2012. (DOI link)

[C1] F. Foucaud, S. Gravier, R. Naserasr, A. Parreau, P. Valicov. Edge identifying codes. Proceedings of the 6th European Conference on Combinatorics, Graph Theory and Applications, EUROCOMB 2011. *Electronic Notes in Discrete Mathematics* 38:343–348, 2011. (DOI link)

Publications: submitted work

[S3] F. Foucaud, B. Gras, A. Perez, F. Sikora. Parameterized complexity of broadcast domination and multipacking in digraphs. Submitted to *IWOCA'20*, 01.2020.

[S2] F. Dross, F. Foucaud, V. Mitsou, P. Ochem, T. Pierron. Complexity of planar signed graph homomorphisms to cycles. Submitted to *Discrete Applied Mathematics*, 07.2019.

[S1] S. Dey, F. Foucaud, S. C. Nandy, A. Sen. Discriminating codes in geometric setups. Submitted to *LATIN'20*, 09.2019.

Publications: work in preparation

[P1] L. Beaudou, F. Foucaud, R. Naserasr, G. F. Royle. Small 4-chromatic graphs with specific girth conditions.

[P2] F. Foucaud. Complexity of Metric Dimension with respect to various graph classes and parameters.

[P3] F. Foucaud, H. Hocquard, R. Naserasr, É. Sopena, P. Valicov. Exact square coloring of subcubic graphs.

[P4] Alcoloco team. The good, the bad, and the ugly: connected greedy colourings in various graph classes.

[P5] F. Foucaud, R. Naserasr, R. Xu. Improved homomorphism bounds for (signed) K_4-minor-free graphs.

Teaching

2020 3 lecture hours ("eq.TD") at Université de Bordeaux for "lecture d'articles", and 7.5 lecture hours at Université d'Orlénas for "Digital reresentation of information"

2019 128 lecture hours ("eq.TD") at the Computer Science departments of IUT d'Oréans and University of Orléans. Databases (MySQL, PLSQL, JDBC), Human-Computer interface, UML, Digital reresentation of information, Algorithms and programming in Python.

2009–2012 192 lecture hours ("eq.TD") at Computer Science Department of IUT Bordeaux 1. Programming in C++, C#, Java, JEE, UML, advanced object oriented programming, linear algebra, system programming. Responsible of two courses ("UML and object oriented programming", "mathematics for image processing").

Student supervision

2020 Master 2 internship of Sébastien Clauzel at LaBRI. Topic: Complete colorings of signed graphs. Co-supervised with Éric Sopena.

2020 Master 2 internship of Sara Vita at LaBRI. Topic: Switching homomorphisms of signed digraphs. Co-supervised with Éric Sopena.

2018 Master 1 internship of Tristan Benoit at LIMOS. Topic: Metric dimension of 2-trees. Co-supervised with Laurent Beaudou, Aurélie Lagoutte and Florent Madelaine.

Selected talks

06.2015 WG 2015: Workshop on Graph-Theoretic Concepts in Computer Science, Munich (Germany).
Algorithms and complexity for metric dimension and location-domination on interval graphs.

06.2014 SIAM conference on Discrete Mathematics 2014, Minneapolis (USA).
The complexity of signed graph homomorphisms. **Invited talk for minisymposium MS6 - Graph Homomorphisms: Edge Colours, Signs, and Crossings**

04.2014 LATIN 2014: Latin American Symposium on Theoretical Informatics, Montevideo (Uruguay).
The complexity of signed graph homomorphisms and signed constraint satisfaction.

07.2013 IWOCA 2013: International Workshop on Combinatorial Algorithms, Rouen (France).
The complexity of the identifying code problem in restricted graph classes.

11.2012 BGW 2012: Bordeaux Graph Workshop, Bordeaux (France).
Bounding K4-minor-free graphs in the homomorphism order.

07.2012 IWOCA 2012: International Workshop on Combinatorial Algorithms, Krishnankoil (India).
On graph identification problems and the special case of identifying vertices using paths.

08.2011 EUROCOMB'11: European Conference on Combinatorics, Graph Theory and Applications 2011, Budapest (Hungary).
Edge-identifying codes (identifying codes in line graphs).

09.2009 CID 2009: Colourings, Independence and Domination 2009 - 13th workshop on graph theory (Szklarska Poręba, Poland).
Bounds on the size of identifying codes for graphs of maximum degree Delta.

Selected international research visits

11.2015 +12.2017 (8 weeks) Mathematics Department, Universidad Autonoma de Mexico (Querétaro, Mexico). Visiting Adriana Hansberg.

06.2014 +06.2016 (5 weeks) Mathematics Department, Thompson Rivers University, (Kamloops, Canada). Visiting Richard C. Brewster.

09.2012 +11.2013 (7 weeks) Algorithms and Complexity theory team, TU Berlin (Berlin, Germany). Visiting Sepp Hartung, André Nichterlein, Rolf Niedermeier.

08.2011 (2 weeks) Foundations of Computing and Discrete Mathematics team, Turun Yliopisto (Turku, Finland). Visiting Tero Laihonen.

11.2010 (2 weeks) Department of Discrete Mathematics, Akademia Górniczno-Hutnicza w. Krakowie (Krakow, Poland). Visiting Monika Pilsńiak, Mariusz Woźniak.

10.2009 (1 week) Department of Algorithms and System Modelling, Gdańsk University of Technology (Gdańsk, Poland). Visiting Adrian Kosowski.

Other skills and scientific activities

• Member of Programme Committee of the conference *IWOCA 2020* `http://iwoca2020.labri.fr`

• Active member of the organizing committees of the conferences *BWIC 2011* `http://bwic2011.labri.fr`, *SEA 2012* `http://sea2012.labri.fr` and *IWOCA 2020* `http://iwoca2020.labri.fr` (co-chair)

• Member of the funded research projects:
–*IDEA: Identifying coDes in Evolving grAphs, ANR (PI: Ralf Klasing), 2009–2012* (`http://idea.labri.fr`)
–*Arbitrarily decomposable graphs, PHC Polonium (PI: Olivier Baudon), 2010–2012*
–*HOGRASI: HOmomorphismes de GRAphes SIgnés, PEPS CNRS (PI: Reza Naserasr), 2012–2013* (`http://www.irif.fr/~reza/pmwiki/pmwiki.php?n=Site.PEPS2013`)
–*IDIS: IdentificatIon dans les structures DIScrètes, PEPS CNRS (PI: Aline Parreau), 2015*
–*HOSIGRA: HOmomorphisms of SIgned GRAphs, ANR (PI: Reza Naserasr), 2018–2022* (`http://www.irif.fr/~hosigra/`)
–*AGraHom: Applications of Graph Homomorphisms*, IFCAM - Indo-French Center for Applied Mathematics (PI: Sagnik Sen), 2018–2021

• Programming skills: C/C++, C#, Python, Java, SAGE, graph manipulation software "Tulip"

Language skills

French, German: native speaker English: fluent Spanish: intermediate

Selected professional references

• Cristina Bazgan – Full Professor, LAMSADE, University of Paris-Dauphine
`bazgan@lamsade.dauphine.fr`
• Laurent Beaudou – Assistant Professor, LIMOS, Université Clermont Auvergne
`beaudou@isima.fr`
• Richard C. Brewster – Full Professor, Thomson Rivers University, Kamloops
`rcbrewster@tru.ca`
• Pavol Hell – Full Professor, Simon Fraser University, Vancouver
`pavol@sfu.ca`
• Michael A. Henning – Full Professor, University of Johannesburg
`mahenning@uj.ac.za`
• Ralf Klasing – Directeur de Recherche CNRS (Senior Researcher), LaBRI, Université de Bordeaux
`ralf.klasing@labri.fr`
• Reza Naserasr – Chargé de Recherche CNRS (Researcher), IRIF, Université Paris-Diderot
`reza@lri.fr`
• André Raspaud – Emeritus Professor, LaBRI, Université de Bordeaux
`andre.raspaud@labri.fr`

• Oriol Serra – Full Professor, Universitat Politècnica de Catalunya, Barcelona
oserra@ma4.upc.edu
• Éric Sopena – Full Professor, LaBRI, Université de Bordeaux
eric.sopena@labri.fr