

Clément Requilé | Curriculum Vitae

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Education

Ph.D. in Mathematics <i>Supervisor: Juanjo Rué</i> <i>Title: Asymptotic study of regular planar graphs</i>	Freie Universität Berlin 11/2017
Master in Computer Science <i>Modélisation, Optimisation, Combinatoire et Algorithmique</i>	Université de Montpellier 07/2014
Bachelor in Mathematics <i>Mathématiques Fondamentales et Appliquées</i>	Université de Montpellier 07/2011

Current affiliation

Postdoctoral researcher in Mathematics <i>Research group: Discrete Mathematics and Geometry</i>	Technische Universität Wien 05/2018 - present
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Past affiliations

Postdoctoral researcher in Mathematics <i>Research group: Institute for Algebra</i>	Johannes Kepler Universität Linz 10/2017 - 04/2018
Ph.D. student in Mathematics <i>Research group: Combinatorics and Graph Theory</i>	Freie Universität Berlin 09/2014 - 10/2017
Visitor <i>Research group: Discrete Mathematics</i>	Universitat Politècnica de Barcelona 03/2016 - 04/2017
Phase II student <i>Mentor: Raman Sanyal</i>	Berlin Mathematical School 02/2015 - 10/2017
Master student in Computer Science <i>Research group: AlGCo (algorithmes, graphes et combinatoire)</i>	LIRMM 03/2014 - 07/2014

Research interests

My main research consists in applying methods from *analytic combinatorics* and computer algebra to the study of *random discrete structures*. I am particularly interested in the study of topological graphs, tree-like structures and lattice paths. Another topic of interest is the design of *fixed-parameter tractable algorithms* to efficiently solve NP-Hard problems. I also like *extremal problems* on combinatorial structures, in particular those expressed in terms of *positional games*.

Preprints

- ▷ **On the expected number of perfect matchings in cubic planar graphs**, with Marc Noy and Juanjo Rué. *Submitted. arXiv:2005.13821.*
- ▷ **Asymptotic enumeration of labelled 4-regular planar graphs**, with Marc Noy and Juanjo Rué. *Submitted. arXiv:2001.05943.*
- ▷ **Block statistics in subcritical graph classes** (extended abstract), with Dimbinaina Ralaivaosaona and Stephan Wagner. *Analysis of Algorithms (AofA) 2020, Klagenfurt, Austria - to appear in the Leibniz International Proceedings in Informatics (LIPIcs), volume 159, 2020.*

Publications

7. **Further results on random cubic planar graphs**, with Marc Noy and Juanjo Rué. *Random Structures and Algorithms*, volume 56, Issue 3, May 2020, pp. 892-924. *arXiv:1802.06679*.
6. **Maximal independent sets and maximal matchings in subcritical graph classes**, with Michael Drmota, Lander Ramos and Juanjo Rué. *The Electronic Journal of Combinatorics*, volume 27, Issue 1, January 2020, P1.5. *arXiv:1904.10244*.
5. **Enumeration of labelled 4-regular planar graphs**, with Marc Noy and Juanjo Rué. *Proceedings of the London Mathematical Society*, volume 119, Issue 2, August 2019, pp. 358-378. *arXiv:1709.04678*.
4. **Proper coloring Painter-Builder game**, with Małgorzata Bednarska-Bzdęga, Michael Krivelevich and Viola Mészáros. *Discrete Mathematics*, volume 341, Issue 3, March 2018, pp. 658-664. *arXiv:1612.02156*.
3. **Strong Ramsey games: Drawing on an infinite board**, with Dan Hefetz, Christopher Kusch, Lothar Narins, Alexey Pokrovskiy and Amir Sarid. *Journal of Combinatorial Theory, Series A*, volume 150, August 2017, pp. 248-266. *arXiv:1605.05443*.
2. **FPT algorithms for plane completion problems**, with Dimitris Chatzidimitriou, Archontia C. Giannopoulou, Spyridon Maniatis, Dimitrios M. Thilikos and Dimitris Zoros. *41st International Symposium on Mathematical Foundations of Computer Science (MFCS)*, August 2016, Kraków, Poland - *Leibniz International Proceedings in Informatics*, volume 58, August 2016, pp. 26:1-26:13.
1. **Variants of plane diameter completion**, with Petr A. Golovach and Dimitrios M. Thilikos. *10th International Symposium on Parameterized and Exact Computation (IPEC) 2015*, Patras, Greece - *Leibniz International Proceedings in Informatics*, volume 43, November 2015, pp. 30-42. *arXiv:1509.00757*.

Extended abstracts in conference proceedings

- ▷ **Maximal independent sets and maximal matchings in series-parallel and related graph classes**, with Michael Drmota, Lander Ramos and Juanjo Rué. *Analysis of Algorithms (AofA) 2018*, Uppsala, Sweden - *Leibniz International Proceedings in Informatics*, volume 110, June 2018, pp. 18:1-18:15.
- ▷ **Enumeration of labeled 4-regular planar graphs**, with Marc Noy and Juanjo Rué. *European Conference on Combinatorics, Graph Theory and Applications (EuroComb) 2017*, Vienna, Austria - *Electronic Notes in Discrete Mathematics*, volume 61, August 2017, pp. 933-939.
- ▷ **Random cubic planar graphs revisited**, with Marc Noy and Juanjo Rué. *Discrete Mathematics Days (DMD) 2016*, Barcelona, Spain - *Electronic Notes in Discrete Mathematics*, volume 54, October 2016, pp. 211-216.
- ▷ **Triangles in random cubic planar graphs**, with Juanjo Rué. *European Conference on Combinatorics, Graph Theory and Applications (EuroComb) 2015*, Bergen, Norway - *Electronic Notes in Discrete Mathematics*, volume 49, November 2015, pp. 383-391.

Experiences as teaching assistant

Discrete Mathematics (english)

First semester of the Master in Computer Science

Technische Universität Wien

Winter semester 2019 - 30 hours

Discrete Mathematics (english)

First semester of the Master in Computer Science

Technische Universität Wien

Winter semester 2018 - 30 hours

Stochastic II (english)

Sixth semester of the Bachelor in Mathematics

Freie Universität Berlin

Summer semester 2015 - 30 hours

Experience as lecturer

ProInformatik I: Logik und Diskrete Mathematik (german)

First semester of the Bachelor in Computer Science

Freie Universität Berlin

Summer semester 2017 - 36 hours

Grants

Special Research Program (SFB) of the Austrian Science Fund (FWF) <i>Shape Characteristics of Planar Maps and Planar Graphs.</i> Principal investigator: Michael Drmota.	F50-02 Algorithmic and Enumerative Combinatorics <i>05/2018 - present</i>
Special Research Program (SFB) of the Austrian Science Fund (FWF) <i>Algorithmic lattice path counting using the kernel method.</i> Principal investigator: Manuel Kauers.	F50-04 Algorithmic and Enumerative Combinatorics <i>10/2017 - 04/2018</i>
FU Berlin Research Alumni Program <i>Size of the largest 2-connected component in a random cubic planar graph.</i> Principal investigator: Clément Requilé.	Travel grant to UPC, Barcelona <i>06 - 07/2016</i>
DAAD - CAMPUS FRANCE <i>Analytic, probabilistic and geometric methods for random constrained graphs.</i> Principal investigators: Juanjo Rué and Vlady Ravelomanana.	Bilateral Project ID - 57134837 <i>01/2015 - 12/2016</i>
Marie Skłodowska-Curie Career Integration Grant (Europe) FP7-PEOPLE-2013-CIG <i>Enumeration of discrete structures: algebraic, analytic, probabilistic and algorithmic methods for enriched planar graphs and planar maps.</i> Principal investigator: Juanjo Rué.	# 630749 CountGraph <i>03/2014 - 12/2016 (early termination)</i>

Internships

Parameterized complexity of modification problems on plane graphs <i>Supervisor: Dimitrios M. Thilikos</i>	LIRMM, Montpellier <i>03 - 06/2014</i>
Model reduction with many timescales of bio-chemical graphs <i>Supervisor: Ovidiu Radulescu</i>	DIMNP - Udm <i>06 - 08/2013</i>
Algorithms of approximation for the maximum clique problem <i>Joint with Gaëlle Hisler. Supervisor: Rodolphe Giroudeau</i>	Udm <i>03 - 06/2013</i>
Topological methods in combinatorics <i>Supervisor: Jorge Luis Ramírez Alfonsín</i>	Udm <i>03 - 06/2012</i>

Co-organization of scientific meetings

SFB Statusseminar 2018 <i>Member of the organizing committee (chair: Christian Krattenthaler)</i>	Strobl am Wolfgangsee <i>2 - 5/12/2018</i>
10th Jornadas de Matemática Discreta y Algorítmica <i>Member of the organizing committee (chair: Juanjo Rué)</i>	Barcelona <i>6 - 8/07/2016</i>
TAU-FUB Joint Workshop on Positional Games <i>Member of the organizing committee (chairs: Michael Krivelevich and Tibor Szabó)</i>	Berlin <i>22 - 26/02/2016</i>

Advanced courses and thematic meetings as student

Algorithmic and Enumerative Combinatorics <i>5th AEC Summer School</i>	RISC, Hagenberg <i>07/2019</i>
Algorithmic and Enumerative Combinatorics <i>4th AEC Summer School</i>	RISC, Hagenberg <i>07/2018</i>
Random Discrete Structures and Beyond <i>BGSMath Monthly Program</i>	UPC, Barcelona <i>06/2017</i>

Random Graphs
Cargèse Fall School

IES de Cargèse
09/2015

Additive Combinatorics
Block Course

Freie Universität Berlin
10/2014

Scientific visits

Department of Mathematical Sciences of Stellenbosch University, Western Cape, South Africa
Research group: Mathematics Division with Stephan Wagner 12/2018

Department of Mathematics of the Universitat Politècnica de Catalunya, Barcelona, Spain
Research group: Discrete Mathematics with Marc Noy 03/2016 – 04/2017

IRIF (Research Institute on the Foundations of Computer Science) at Université de Paris, France
Research group: Combinatorics with Vlado Ravelomanana 11/2016

Department of Mathematics of the National Kapodistrian University of Athens, Greece
Research group: Mathematical Analysis with Dimitrios Thilikos 02/2015

Conference talks

3rd Workshop on Analytic and Enumerative Aspects of Combinatorics Caen
Long cycles in cubic planar graphs 31/08/2019

Discrete Mathematics Workshop Stellenbosch
A census of planar maps and graphs 12/12/2018

CSASC 2018 Bratislava
Asymptotic enumeration of labelled 4-regular planar graphs 13/09/2018

Analysis of Algorithms 2018 Uppsala
Maximal independent sets and maximal matchings in series-parallel and related graph classes 25/06/2018

Workshop on Enumerative Combinatorics Oberwolfach
Asymptotic enumeration of 4-regular planar graphs 15/05/2018

SFB Statusseminar Strobl
Asymptotic study of regular planar graphs 4/12/2017

European Conference on Combinatorics, Graph Theory and Applications, 2017 Vienna
Enumeration of labelled 4-regular planar graphs 28/08/2017

Berlin-Poznań seminar on Discrete Mathematics Hamburg
On the enumeration of regular planar graphs 21/04/2017

Journées ALÉA 2017 Marseille
Énumération des graphes planaires 4-réguliers 20/03/2017

FUB-TAU Joint Research Workshop on Graph and Hypergraph Coloring Tel Aviv
On a version of the game of Painter-Builder 5/03/2017

10th Jornadas de Matematica Discreta y Algoritmica Barcelona
Random cubic planar graph, revisited 7/07/2016

10th International Symposium on Parameterized and Exact Computation Patras
Variants of plane diameter completion 16/09/2015

European Conference on Combinatorics, Graph Theory and Applications, 2015 Bergen
Triangles in random cubic 3-connected planar graphs 31/08/2015

Seminar talks

Seminar Arbeitsgemeinschaft Diskrete Mathematik

Long cycles in cubic planar graphs

Technische Universität Wien

22/10/2019

Seminar Arbeitsgemeinschaft Diskrete Mathematik

Enumeration of labeled 4-regular planar graphs

Technische Universität Wien

12/12/2017

Seminar Algebra

Enumeration of regular planar graphs

Johannes Kepler Universität Linz

23/11/2017

LIMDA Joint Seminar

The enumeration of 4-regular planar graphs

Universitat Politècnica de Catalunya

26/04/2017

Combinatorics reading seminar

Graph limits: graph parameters and connection matrices

Universitat Politècnica de Catalunya

31/01/2017

Combinatorics reading seminar

Sampling and random walks on expander graphs

Universitat Politècnica de Catalunya

27/10 - 03/11/2016

Combinatorics reading seminar

The phase transition in random graphs

Universitat Politècnica de Catalunya

12/04/2016

Seminar Discrete Geometry

Intrinsic volumes for polyconvex sets

Freie Universität Berlin

15/12/2016

LIMDA Joint Seminar

Variants of plane diameter completion

Universitat Politècnica de Catalunya

18/11/2015

Research Seminar Combinatorics

Triangles in random cubic planar graphs

Freie Universität Berlin

15/07/2015

Research Seminar Combinatorics

A parameterized algorithm for the diameter improvement problem for plane graphs

Freie Universität Berlin

27/11/2014

Séminaire AlGCo

Complexité paramétrée et complétion plane à diamètre borné

LIRMM

12/06/2014

Languages

Natural

French (native), *English* (fluent), *German* (good) and *Spanish* (good)

Programming

Python, *C* and *C++*, and mathematical softwares (*Maple*, *MatLab* and *Sage*)