

Clément Requile | 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

Beatriu de Pinós postdoctoral researcher in Mathematics (UPC) <i>Research group: Geometric, Algebraic and Probabilistic Combinatorics</i>	Universitat Politècnica de Catalunya 05/2021 - present
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Past affiliations

Postdoctoral researcher in Mathematics <i>Research group: Analysis and Probability Theory</i>	Uppsala University 09/2020 - 05/2021
Postdoctoral researcher in Mathematics <i>Research group: Discrete Mathematics and Geometry</i>	Technische Universität Wien 05/2018 - 06/2020
Postdoctoral researcher in Mathematics <i>Research group: Algebra</i>	Johannes Kepler Universität Linz 10/2017 - 04/2018
Phase II student <i>Mentor: Raman Sanyal</i>	Berlin Mathematical School 02/2015 - 10/2017
Ph.D. student in Mathematics <i>Research group: Combinatorics and Graph Theory</i>	Freie Universität Berlin 09/2014 - 09/2017
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

- ▷ **Enumeration of rooted 3-connected bipartite planar maps**, with Marc Noy and Juanjo Rué. *Submitted. arXiv:2202.13929.*
- ▷ **Enumeration of chordal planar graphs and maps**, with Jordi Castellví and Marc Noy. *Submitted. arXiv:2202.13340.*

- ▷ **Asymptotic enumeration of labelled 4-regular planar graphs**, with Marc Noy and Juanjo Rué. Submitted. *arXiv:2001.05943*.

Publications

14. **On the expected number of perfect matchings in cubic planar graphs**, with Marc Noy and Juanjo Rué. *Publicacions matemàtiques*, volume 66, issue 1, January 2022, pp. 325-353. *arXiv:2005.13821*.
13. **On the expected number of perfect matchings in cubic planar graphs** (extended abstract), with Marc Noy and Juanjo Rué. *European Conference on Combinatorics, Graph Theory and Applications (EuroComb) 2021, Barcelona, Spain - Trends in Mathematics*, volume 14, August 2021, pp. 167-174.
12. **Block statistics in subcritical graph classes**, with Dimbinaina Ralaivaosona and Stephan Wagner. *Analysis of Algorithms (AofA) 2020, Klagenfurt, Austria - Leibniz International Proceedings in Informatics (LIPIcs)*, volume 159, June 2020, pp. 24:1-24:14.
11. **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*.
10. **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*.
9. **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*.
8. **Maximal independent sets and maximal matchings in series-parallel and related graph classes** (extended abstract), 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.
7. **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*.
6. **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*.
5. **Enumeration of labeled 4-regular planar graphs** (extended abstract), 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.
4. **Random cubic planar graphs revisited** (extended abstract), 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.
3. **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.
2. **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*.
1. **Triangles in random cubic planar graphs** (extended abstract), 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) <i>First semester of the Bachelor in Computer Science</i>	Freie Universität Berlin <i>Summer semester 2017 - 36 hours</i>
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Grants

Beatriu de Pinós <i>Structural analysis of random planar graphs and maps.</i> Principal investigator: Clément Requilé.	BP-2019 AGAUR <i>05/2021 - 04/2024</i>
Special Research Program (SFB) of the FWF Combinatorics <i>Shape characteristics of planar maps and planar graphs.</i> Principal investigator: Michael Drmota.	F50-02 Algorithmic and Enumerative <i>05/2018 - 06/2020</i>
Special Research Program (SFB) of the FWF Combinatorics <i>Algorithmic lattice path counting using the kernel method.</i> Principal investigator: Manuel Kauers.	F50-04 Algorithmic and Enumerative <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 F50 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>
Analysis of discrete random structures <i>ALEA Young</i>	Domaine de la Tour, Caen <i>05/2019</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 <i>Cargèse Fall School</i>	IES de Cargèse <i>09/2015</i>
Additive Combinatorics <i>Block Course</i>	Freie Universität Berlin <i>10/2014</i>

Scientific visits

Department of Mathematical Sciences of Stellenbosch University, Western Cape, South Africa <i>Research group: Mathematics Division with Stephan Wagner</i>	<i>12/2018</i>
Department of Mathematics of the Universitat Politècnica de Catalunya, Barcelona, Spain <i>Research group: Discrete Mathematics with Marc Noy</i>	<i>03/2016 – 04/2017</i>
IRIF (Research Institute on the Foundations of Computer Science) at Université de Paris, France <i>Research group: Combinatorics with Vlado Ravelomanana</i>	<i>11/2016</i>
Department of Mathematics of the National Kapodistrian University of Athens, Greece <i>Research group: Mathematical Analysis with Dimitrios Thilikos</i>	<i>02/2015</i>

Conference talks

Analysis of Algorithms 2021 <i>The expected number of perfect matchings in cubic planar graphs</i>	Klagenfurt/Online <i>15/06/2021</i>
SFB F50 Statusseminar <i>Ising model on maps and enumeration of some classes of planar graphs</i>	Online <i>15/12/2020</i>
Analysis of Algorithms 2020 <i>Block statistics in subcritical graph classes</i>	Klagenfurt/Online recording <i>youtube.com/watch?v=-SJRssqq020</i>
3rd Workshop on Analytic and Enumerative Aspects of Combinatorics <i>Long cycles in cubic planar graphs</i>	Caen <i>31/08/2019</i>
Discrete Mathematics Workshop <i>A census of planar maps and graphs</i>	Stellenbosch <i>12/12/2018</i>
CSASC 2018 <i>Asymptotic enumeration of labelled 4-regular planar graphs</i>	Bratislava <i>13/09/2018</i>
Analysis of Algorithms 2018 <i>Maximal independent sets and maximal matchings in series-parallel and related graph classes</i>	Uppsala <i>25/06/2018</i>
Workshop on Enumerative Combinatorics <i>Asymptotic enumeration of 4-regular planar graphs</i>	Oberwolfach <i>15/05/2018</i>
SFB F50 Statusseminar <i>Asymptotic study of regular planar graphs</i>	Strobl <i>4/12/2017</i>

European Conference on Combinatorics, Graph Theory and Applications, 2017 <i>Enumeration of labelled 4-regular planar graphs</i>	Vienna 28/08/2017
Berlin-Poznań seminar on Discrete Mathematics <i>On the enumeration of regular planar graphs</i>	Hamburg 21/04/2017
Journées ALÉA 2017 <i>Énumération des graphes planaires 4-réguliers</i>	Marseille 20/03/2017
FUB-TAU Joint Research Workshop on Graph and Hypergraph Coloring <i>On a version of the game of Painter-Builder</i>	Tel Aviv 5/03/2017
10th Jornadas de Matematica Discreta y Algoritmica <i>Random cubic planar graph, revisited</i>	Barcelona 7/07/2016
10th International Symposium on Parameterized and Exact Computation <i>Variants of plane diameter completion</i>	Patras 16/09/2015
European Conference on Combinatorics, Graph Theory and Applications, 2015 <i>Triangles in random cubic 3-connected planar graphs</i>	Bergen 31/08/2015

Seminar talks

Séminaire de combinatoire énumérative et analytique de l'IRIF <i>Modèle d'Ising et couplages parfaits sur les graphes planaires cubiques</i>	Online 17/12/2020
Probability and Combinatorics Seminar <i>Random planar graphs</i>	Uppsala University 08/10/2020
Seminar Arbeitsgemeinschaft Diskrete Mathematik <i>Long cycles in cubic planar graphs</i>	Technische Universität Wien 22/10/2019
Seminar Arbeitsgemeinschaft Diskrete Mathematik <i>Enumeration of labeled 4-regular planar graphs</i>	Technische Universität Wien 12/12/2017
Seminar Algebra <i>Enumeration of regular planar graphs</i>	Johannes Kepler Universität Linz 23/11/2017
LIMDA Joint Seminar <i>The enumeration of 4-regular planar graphs</i>	Universitat Politècnica de Catalunya 26/04/2017
Combinatorics reading seminar <i>Graph limits: graph parameters and connection matrices</i>	Universitat Politècnica de Catalunya 31/01/2017
Combinatorics reading seminar <i>Sampling and random walks on expander graphs</i>	Universitat Politècnica de Catalunya 27/10 - 03/11/2016
Combinatorics reading seminar <i>The phase transition in random graphs</i>	Universitat Politècnica de Catalunya 12/04/2016
Seminar Discrete Geometry <i>Intrinsic volumes for polyconvex sets</i>	Freie Universität Berlin 15/12/2016
LIMDA Joint Seminar <i>Variants of plane diameter completion</i>	Universitat Politècnica de Catalunya 18/11/2015
Research Seminar Combinatorics <i>Triangles in random cubic planar graphs</i>	Freie Universität Berlin 15/07/2015
Research Seminar Combinatorics <i>A parameterized algorithm for the diameter improvement problem for plane graphs</i>	Freie Universität Berlin 27/11/2014

Languages

Natural

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

Programming

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