# Clément Requilé | Curriculum Vitae

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https://requile.github.io

## Education

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

## Current affiliation

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|---|---|
| **Beatriu de Pinós postdoctoral researcher in Mathematics** | **Universitat Politècnica de Catalunya (UPC)** |
| *Research group: Geometric, Algebraic and Probabilistic Combinatorics* | *05/2021 - present* |

## Past affiliations

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|---|---|
| **Postdoctoral researcher in Mathematics** | **Uppsala University** |
| *Research group: Analysis and Probability Theory* | *09/2020 - 05/2021* |
| **Postdoctoral researcher in Mathematics** | **Technische Universität Wien** |
| *Research group: Discrete Mathematics and Geometry* | *05/2018 - 06/2020* |
| **Postdoctoral researcher in Mathematics** | **Johannes Kepler Universität Linz** |
| *Research group: Algebra* | *10/2017 - 04/2018* |
| **Phase II student** | **Berlin Mathematical School** |
| *Mentor: Raman Sanyal* | *02/2015 - 10/2017* |
| **Ph.D. student in Mathematics** | **Freie Universität Berlin** |
| *Research group: Combinatorics and Graph Theory* | *09/2014 - 09/2017* |
| **Master student in Computer Science** | **LIRMM** |
| *Research group: AlGCo (algorithmes, graphes et combinatoire)* | *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. *To appear in Publicacions Matemàtiques. arXiv:2005.13821.*

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

## Publications

12. **Block statistics in subcritical graph classes**, with Dimbinaina Ralaivaosaona 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)**                    **Technische Universität Wien**
*First semester of the Master in Computer Science*                    *Winter semester 2019 - 30 hours*

**Discrete Mathematics (English)**                    **Technische Universität Wien**
*First semester of the Master in Computer Science*                    *Winter semester 2018 - 30 hours*

**Stochastic II (English)**                    **Freie Universität Berlin**
*Sixth semester of the Bachelor in Mathematics*                    *Summer semester 2015 - 30 hours*

## Experience as lecturer

**ProInformatik I: Logik und Diskrete Mathematik (German)**                    **Freie Universität Berlin**
*First semester of the Bachelor in Computer Science*                    *Summer semester 2017 - 36 hours*

## Grants

**Special Research Program (SFB)**        **F50-02 Algorithmic and Enumerative Combinatorics**
**of the Austrian Science Fund (FWF)**
*Shape Characteristics of Planar Maps and Planar Graphs.*      *05/2018 - 06/2020*
Principal investigator: Michael Drmota.

**Special Research Program (SFB)**        **F50-04 Algorithmic and Enumerative Combinatorics**
**of the Austrian Science Fund (FWF)**
*Algorithmic lattice path counting using the kernel method.*      *10/2017 - 04/2018*
Principal investigator: Manuel Kauers.

**FU Berlin Research Alumni Program**        **Travel grant to UPC, Barcelona**
*Size of the largest 2-connected component in a random cubic planar graph.*      *06 - 07/2016*
Principal investigator: Clément Requilé.

**DAAD - CAMPUS FRANCE**        **Bilateral Project ID - 57134837**
*Analytic, probabilistic and geometric methods for random constrained graphs.*      *01/2015 - 12/2016*
Principal investigators: Juanjo Rué and Vlady Ravelomanana.

**Marie Skłodowska-Curie Career Integration Grant (Europe)**        **# 630749 CountGraph**
**FP7-PEOPLE-2013-CIG**
*Enumeration of discrete structures: algebraic, analytic, probabilistic*      *03/2014 - 12/2016*
*and algorithmic methods for enriched planar graphs and planar maps.*      *(early termination)*
Principal investigator: Juanjo Rué.

## Internships

**Parameterized complexity of modification problems on plane graphs**        **LIRMM, Montpellier**
*Supervisor: Dimitrios M. Thilikos*      *03 - 06/2014*

**Model reduction with many timescales of bio-chemical graphs**        **DIMNP - UdM**
*Supervisor: Ovidiu Radulescu*      *06 - 08/2013*

**Algorithms of approximation for the maximum clique problem**        **UdM**
*Joint with Gaëlle Hisler. Supervisor: Rodolphe Giroudeau*      *03 - 06/2013*

**Topological methods in combinatorics**        **UdM**
*Supervisor: Jorge Luis Ramírez Alfonsín*      *03 - 06/2012*

## Co-organization of scientific meetings

**SFB Statusseminar 2018**        **Strobl am Wolfgangsee**
*Member of the organizing committee (chair: Christian Krattenthaler)*      *2 - 5/12/2018*

**10th Jornadas de Matemática Discreta y Algorítmica**        **Barcelona**
*Member of the organizing committee (chair: Juanjo Rué)*      *6 - 8/07/2016*

**TAU-FUB Joint Workshop on Positional Games**        **Berlin**
*Member of the organizing committee (chairs: Michael Krivelevich and Tibor Szabó)*      *22 - 26/02/2016*

## Advanced courses and thematic meetings as student

**Algorithmic and Enumerative Combinatorics**        **RISC, Hagenberg**
*5th AEC Summer School*      *07/2019*

**Algorithmic and Enumerative Combinatorics**        **RISC, Hagenberg**
*4th AEC Summer School*      *07/2018*

**Random Discrete Structures and Beyond**        **UPC, Barcelona**
*BGSMath Monthly Program*      *06/2017*

| **Random Graphs** | **IES de Cargèse** |
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| *Cargèse Fall School* | *09/2015* |

| **Additive Combinatorics** | **Freie Universität Berlin** |
|---|---|
| *Block Course* | *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 Vlady 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

| **Analysis of Algorithms 2020** | **Online/recording** |
|---|---|
| *Block statistics in subcritical graph classes* | *https://www.math.aau.at* |

| **SFB Statusseminar** | **Online** |
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| *Ising model on maps and enumeration of some classes of planar graphs* | *15/12/2020* |

| **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** |
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| *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

**Séminaire de combinatoire énumérative et analytique de l'IRIF**      **Online**
*Modèle d'Ising et couplages parfaits sur les graphes planaires cubiques*      *17/12/2020*

**Probability and Combinatorics Seminar**      **Uppsala University**
*Random planar graphs*      *08/10/2020*

**Seminar Arbeitsgemeinschaft Diskrete Mathematik**      **Technische Universität Wien**
*Long cycles in cubic planar graphs*      *22/10/2019*

**Seminar Arbeitsgemeinschaft Diskrete Mathematik**      **Technische Universität Wien**
*Enumeration of labeled 4-regular planar graphs*      *12/12/2017*

**Seminar Algebra**      **Johannes Kepler Universität Linz**
*Enumeration of regular planar graphs*      *23/11/2017*

**LIMDA Joint Seminar**      **Universitat Politècnica de Catalunya**
*The enumeration of 4-regular planar graphs*      *26/04/2017*

**Combinatorics reading seminar**      **Universitat Politècnica de Catalunya**
*Graph limits: graph parameters and connection matrices*      *31/01/2017*

**Combinatorics reading seminar**      **Universitat Politècnica de Catalunya**
*Sampling and random walks on expander graphs*      *27/10 - 03/11/2016*

**Combinatorics reading seminar**      **Universitat Politècnica de Catalunya**
*The phase transition in random graphs*      *12/04/2016*

**Seminar Discrete Geometry**      **Freie Universität Berlin**
*Intrinsic volumes for polyconvex sets*      *15/12/2016*

**LIMDA Joint Seminar**      **Universitat Politècnica de Catalunya**
*Variants of plane diameter completion*      *18/11/2015*

**Research Seminar Combinatorics**      **Freie Universität Berlin**
*Triangles in random cubic planar graphs*      *15/07/2015*

**Research Seminar Combinatorics**      **Freie Universität Berlin**
*A parameterized algorithm for the diameter improvement problem for plane graphs*      *27/11/2014*

**Séminaire AlGCo**      **LIRMM**
*Complexité paramétrée et complétion plane à diamètre borné*      *12/06/2014*

## Languages

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

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