Clément Requilé | Curriculum Vitae

Matematiska institutionen, Uppsala universitet.
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Education

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

Postdoctoral researcher in Mathematics — **Uppsala University**
Research group: Analysis and Probability Theory — *09/2020 - present*

Past affiliations

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. *Submitted. 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** (extended abstract), with Dimbinaina Ralaivaosaona and Stephan Wagner. *Analysis of Algorithms (AofA) 2020, Klagenfurt, Austria - Leibniz International Pro-*

ceedings 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) of the Austrian Science Fund (FWF) — **F50-02 Algorithmic and Enumerative Combinatorics**
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**
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

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 **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) and *Spanish* (good)

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