

Clément Requile | Curriculum Vitae

Department of Mathematics and Institute of Mathematics (IMTech), Universitat Politècnica de Catalunya (UPC).
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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 (UdM) 07/2014
Bachelor in Mathematics <i>Mathématiques Fondamentales et Appliquées</i>	UdM 07/2011

Current affiliation

Beatriu de Pinós postdoctoral researcher in Mathematics <i>Research group: Geometric, Algebraic and Probabilistic Combinatorics</i>	UPC 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>	UdM (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

15. **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](#).
14. **LNetReduce: Tool for reducing linear dynamic networks with separated timescales**, with Marion Buffard, Aurélien Desoeuvres, Aurélien Naldi, Ovidiu Radulescu and Andrei Zinovyev. *Computational Methods in Systems Biology (CSMB) 2021, Bordeaux, France - Lecture Notes in Computer Science (Bioinformatics)*, volume 12881, September 2021, pp. 238-244. [bioRxiv:10.1101/2021.05.11.443578](#).
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 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

Matemáticas Discretas y Optimización (English)
Third semester of the Bachelor in Bioinformatics

Universitat Pompeu Fabra (ESCI)
Fall semester 2021 - 60 hours

Diskrete Mathematik (English)
First semester of the Master in Computer Science

Technische Universität Wien
Winter semester 2019 - 30 hours

Diskrete Mathematik (English)
First semester of the Master in Computer Science

Technische Universität Wien
Winter semester 2018 - 30 hours

Stochastik 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 as principal investigator

Beatriu de Pinós (BP-2019): AGAUR and H2020 COFUND project # 801370
Structural analysis of random planar graphs and maps.
Duration: 05/2021 - 04/2024.

Freie Universität Berlin Research Alumni Program: travel grant to UPC Barcelona, Spain.
Size of the largest 2-connected component in a random cubic planar graph.
Duration: 06/2016 - 07/2016.

Grants as participant

Special Research Program (SFB) of the Austrian Science Fund (FWF) F50-02
Algorithmic and Enumerative Combinatorics - Shape characteristics of planar maps and planar graph.
Duration of participation: 05/2018 - 06/2020. Principal investigator: Michael Drmota.

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

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

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

Internships

Parameterized complexity of modification problems on plane graphs
Supervisor: Dimitrios M. Thilikos
UdM (LIRMM)
03 - 06/2014

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

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

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

Co-organization of scientific meetings

European Conference on Combinatorics, Graph Theory and Applications
Member of the organizing committee (chairs: Guillem Perarnau and Juanjo Rué)
Barcelona
6 - 10/09/2021

SFB F50 Statusseminar
Member of the organizing committee (chair: Christian Krattenthaler)
Strobl am Wolfgangsee
2 - 5/12/2018

10th Jornadas de Matemática Discreta y Algorítmica
Member of the organizing committee (chair: Juanjo Rué)

Barcelona
6 - 8/07/2016

TAU-FUB Joint Workshop on Positional Games
Member of the organizing committee (chairs: Michael Krivelevich and Tibor Szabó)

Berlin
22 - 26/02/2016

Advanced courses and thematic meetings as student

Algorithmic and Enumerative Combinatorics
5th AEC Summer School

RISC, Hagenberg
07/2019

Analysis of discrete random structures
ALEA Young

Domaine de la Tour, Caen
05/2019

Algorithmic and Enumerative Combinatorics
4th AEC Summer School

RISC, Hagenberg
07/2018

Random Discrete Structures and Beyond
BGSMath Monthly Program

UPC, Barcelona
06/2017

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 at UPC Barcelona, Spain
Research group: Discrete Mathematics with Marc Noy

03/2016 – 04/2017

IRIF 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

2nd Workshop on Geometric, Algebraic and Probabilistic Combinatorics
From the Ising model on maps to the enumeration of bipartite planar graphs

Montserrat
12/07/2021

Analysis of Algorithms 2021
The expected number of perfect matchings in cubic planar graphs

Klagenfurt/Online
15/06/2021

SFB F50 Statusseminar
Ising model on maps and enumeration of some classes of planar graphs

Online
15/12/2020

Analysis of Algorithms 2020
Block statistics in subcritical graph classes

Klagenfurt/Online recording
[youtube.com/watch?v=-SJRssqq020](https://www.youtube.com/watch?v=-SJRssqq020)

3rd Workshop on Analytic and Enumerative Aspects of Combinatorics
Long cycles in cubic planar graphs

Caen
31/08/2019

Discrete Mathematics Workshop
A census of planar maps and graphs

Stellenbosch
12/12/2018

CSASC 2018
Asymptotic enumeration of labelled 4-regular planar graphs

Bratislava
13/09/2018

Analysis of Algorithms 2018 <i>Maximal independent sets and maximal matchings in series-parallel and related graph classes</i>	Uppsala 25/06/2018
Workshop on Enumerative Combinatorics <i>Asymptotic enumeration of 4-regular planar graphs</i>	Oberwolfach 15/05/2018
SFB F50 Statusseminar <i>Asymptotic study of regular planar graphs</i>	Strobl 4/12/2017
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>	UPC 31/01/2017
Combinatorics reading seminar <i>Sampling and random walks on expander graphs</i>	UPC 27/10 - 03/11/2016
Combinatorics reading seminar <i>The phase transition in random graphs</i>	UPC 12/04/2016
Seminar Discrete Geometry <i>Intrinsic volumes for polyconvex sets</i>	Freie Universität Berlin 15/12/2016

LIMDA Joint Seminar*Variants of plane diameter completion***UPC***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), *Spanish* (good), *Catalan* (beginner) and *Swedish* (beginner)**Programming***Python*, *C* and *C++*, and mathematical softwares (*Maple*, *Sage*, *Mathematica* and *MatLab*)