

ACADEMIC CURRICULUM VITAE — JUAN JOSÉ RUÉ PERNA

PERSONAL INFORMATION

Date of birth: 26th August, 1982
Place of birth: Lleida, Catalunya
Gender: Male
Citizenship: Spanish

Affiliation: Universitat Politècnica de Catalunya,
Centre de Recerca Matemàtica
E-mail: juan.jose.rue@upc.edu
Webpage: <https://mat-web.upc.edu/people/juan.jose.rue/>

EDUCATION

09/2009 Ph.D. in Mathematics, UPC Barcelona.
01/2007 5-year Telecommunications Engineering degree, UPC Barcelona, under CFIS program.
02/2005 5-year Maths degree, UPC Barcelona, under CFIS program.

AFFILIATIONS

02/2016– *Professor Agregat*, UPC Barcelona,
Faculty member, Barcelona Graduate School of Mathematics,
(Since 01/2021) *Affiliated researcher* at *Centre de Recerca Matemàtica*.
(Since 03/2021) *Affiliated researcher* at *Institut de Matemàtiques de l'UPC – IMTech*.
10/2013–01/2016 *Professor–W1* in Discrete Mathematics, *Freie Universität Berlin*.
12/2013–01/2016 *Faculty member*, *Berlin Mathematical School*.
01/2014–01/2016 *Junior Faculty member*, *DFG Graduiertenkolleg "Methods for Discrete Structures"*, Berlin.
10/2010–09/2013 *Postdoctoral fellow*, *ICMAT*, under the JAE-DOC program (with Javier Cilleruelo).
10/2009–09/2010 *Postdoctoral fellow*, *LIX - École Polytechnique*, under the ERC ExploreMaps project (with Gilles Schaeffer).
01/2006–09/2009 *PhD student*, *Dep. MA2, UPC*. PhD advisor: Marc Noy.

MANAGEMENT DUTIES

12/2024– Director at CFIS.
04/2024–11/2024 Deputy Director at CFIS.
09/2023–12/2023 Mir-Puig Chair at UPC.
03/2023–08/2023 Academic Secretary of the School of Mathematics and Statistics at UPC.
03/2023–08/2023 Quality responsible the School of Mathematics and Statistics at UPC.
03/2019–03/2023 Deputy Chair of the School of Mathematics and Statistics at UPC:
 03/2019–03/2023 Coordinator of the Master MAMME *Master of Advanced Mathematics and Mathematics Engineering* at UPC.
 03/2019–04/2023 Coordinator of the Doctoral Program in Applied Mathematics at UPC.
11/2019–10/2021 Delegate of the Governing Board of the Barcelona Graduate School of Math.
07/2021–10/2021 Deputy Director at *Centre de Recerca Matemàtica*.

GRANTS (AS PRINCIPAL RESEARCHER)

- 12/2024–11/2027 Bilateral AEI+DFG 2024: SRC-ExCo - *Structure, Randomness and Computational Methods in Extremal Combinatorics*. (PI joint with Tibor Szabó at FU Berlin).
- 01/2018–09/2021 *Geometric, Algebraic and probabilistic Combinatorics*. Project from the Ministerio de Ciencia, Innovación y Universidad (Spain); reference number MTM2017-82166-P (PI joint with Oriol Serra).
- 2015 Ramón y Cajal 2014 research fellow (rank 3rd, Mathematics panel).
Research position declined by J.R.
- 03/2014–02/2018 *Enumeration of discrete structures: algebraic, analytic, probabilistic and algorithmic methods for enriched planar graphs and planar maps*. Project from the Marie Curie Career Integration Grant (Europe); reference number 630749 CountGraph FP7-PEOPLE-2013-CIG.
- 01/2015–12/2016 *Analytic, probabilistic and geometric Methods for Random Constrained graphs* (Project ID-57134837). Project from the *Deutscher Akademischer Austausch Dienst* and the *Agence française pour la promotion de l'enseignement supérieur, l'accueil et la mobilité internationale* (bilateral project between Germany and France, PI joint with Vlady Ravelomanana).
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SEXENIOS AND QUINQUENIOS

- 3 "sexenios de investigación" (awarded in 01/2017, 01/2018 and 01/2024).
- 2 "quinquenios de docencia" (awarded 01/2018 and 01/2020).
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INVITED RESEARCH VISITS (MORE THAN 1 MONTH)

- 06/2018–07/2018 *Visiting Professor* at *Université Paris 7*.
- 07/2013–08/2013 *Visiting researcher* at *Charles University Prague*, under the *CORES* Project.
- 02/2013–03/2013 *Visiting researcher* at *École Polytechnique* under the ERC *ExploreMaps* project.
- 09/2011–12/2011 *Visiting researcher* at *École Polytechnique* (under the ERC *ExploreMaps* project), and *LI-AFA* (under the ANR *MAGNUM* project).
- 09/2008–12/2008 *Visiting researcher* at *Simon Fraser University*, Vancouver, Canada.
- 07/2005–09/2005 *Traineeship* at *Instituto de Astrofísica de Canarias*, La Laguna, Spain.
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PUBLICATIONS

- Counting polygon dissections in the projective plane.** Marc Noy and Juanjo Rué. *Advances in Applied Mathematics*, (2008), 41 (4): 599 – 619 (20 pp.)
- On a question of Sárközy and Sós for Bilinear Forms.** Javier Cilleruelo and Juanjo Rué. *Bulletin of the London Mathematical Society*, (2009), 41 (2): 274 – 280 (6 pp.)
- Enumeration and limit laws of dissections on a cylinder.** Juanjo Rué. *Discrete Mathematics*, (2010), 310 (19): 2469 – 2570.
- A lower bound for the size of a Minkowski sum of dilates.** Yahya Ould Hamidoune and Juanjo Rué. *Combinatorics, Probability and Computing*, (2011), 20 (2): 249 – 256 (7 pp.)
- Asymptotic enumeration of subcritical graph classes.** Michael Drmota, Eric Fusy, Mihyun Kang, Veronika Kraus and Juanjo Rué. *SIAM Journal on Discrete Mathematics*, (2011), 25 (4) : 1615 – 1651 (36 pp.)
- Enumerating simplicial decompositions of surfaces with boundaries,** Olivier Bernardi and Juanjo Rué. *European Journal of Combinatorics*, (2012), 33 (3): 302 – 325 (23 pp.)
- Outerplanar obstructions for the vertex feedback set.** Juanjo Rué, Dimitrios Thilikos and Konstantinos Stavropoulos. *European Journal of Combinatorics*, (2012), 33 (5): 948 – 968 (20 pp.)
- On the sum of digits of some sequences of integers.** Javier Cilleruelo, Florián Luca, Juanjo Rué and Ana Zumalacárregui. *Central European Journal of Mathematics*, (2013), 11 (1): 188 – 195 (7 pp.)
- Asymptotic enumeration of non-crossing partitions on surfaces.** Juanjo Rué, Ignasi Sau and Dimitrios Thilikos. *Discrete Mathematics*, (2013) 313 (5): 635 – 649 (14 pp.)

10. **On the fractional parts of a^n/n .** Javier Cilleruelo, Angel Kumchev, Florián Luca, Juanjo Rué and Igor Shparlinski. *Bulletin of the London Mathematical Society*, (2013) 45 (2): 249-256 (7 pp.)
11. **Graph classes with given 3-connected components: asymptotic enumeration and random graphs.** Omer Giménez, Marc Noy and Juanjo Rué. *Random Structures & Algorithms*, (2013) 42 (4): 438-479 (41 pp.)
12. **On the error term of the logarithm of the lcm of a quadratic sequence.** Juanjo Rué, Paulius Šarka and Ana Zumalacárregui. *Journal Théorie des nombres de Bordeaux*, (2013) 25 (2): 457-470 (13 pp.)
13. **On polynomial representation functions for multilinear forms.** Juanjo Rué. *European Journal of Combinatorics*, (2013), 34 (8): 1429-1435. Special Volume in Honor of Yahya Ould Hamidoune (6 pp.)
14. **Dynamic programming for graphs on surfaces.** Juanjo Rué, Ignasi Sau and Dimitrios Thilikos. *ACM Transactions of Algorithms*, (2014) 10 (2): Article 8.
15. **Analytic combinatorics of chord and hyperchord diagrams with k crossings.** Vincent Pilaud and Juanjo Rué. *Advances in Applied Mathematics*, (2014) (57): 60-100 (40 pp.)
16. **The least common multiple of random sets of positive integers.** Javier Cilleruelo, Juanjo Rué, Paulius Šarka and Ana Zumalacárregui. *Journal of Number Theory*, (2014) (144): 92-104 (12 pp.)
17. **On the probability of planarity of a random graph near the critical point.** Marc Noy, Vldy Ravelomanana and Juanjo Rué. *Proceedings of the American Mathematical Society*, (2015) 143 (3): 925-936 (11 pp.)
18. **On the limiting distribution of the metric dimension for random forests.** Dieter Mitsche and Juanjo Rué. *European Journal of Combinatorics*, (2015) (49): 68-89 (21 pp.)
 - A corrigendum to the paper: *European Journal of Combinatorics*, (2018) (67): 275-277 (2 pp.)
19. **Many 2-level polytopes from matroids.** Francesco Grande and Juanjo Rué. *Discrete & Computational Geometry*, (2015) 54 (4): 954-979 (23 pp.)
20. **Spanning trees in random series-parallel graphs.** Julia Ehrenmüller and Juanjo Rué. *Advances in Applied Mathematics*, (2016) 75: 18-55 (37 pp.)
21. **Counting configuration-free sets on groups.** Juanjo Rué, Oriol Serra and Lluís Vena. *European Journal of Combinatorics*, (2017), 66 :281-307 (26 pp.)
22. **Subgraphs statistics in subcritical graphs classes.** Joint work with Michael Drmota and Lander Ramos. *Random Structures & Algorithms*, (2017), 51 (4): 631-673 (43 pp.)
23. **Threshold functions and Poisson convergence for systems of equations on random sets.** Joint work with Ana Zumalacárregui and Christoph Spiegel. *Mathematische Zeitschrift*, (2018), 288 (1-2): 333-360 (24 pp.)
24. **Memorial to Javier Cilleruelo: A Problem List.** Collection of problems joint with Pablo Candela and Oriol Serra. *Integers*, (2018), 18, paper A28 (9 pp.)
25. **On the optimality of the random strategy.** Christopher Kusch, Juanjo Rué, Christoph Spiegel, Tibor Szabó. *Random Structures & Algorithms* (2019), 55 (2): 371-401 (30 pp.)
26. **Enumeration of 4-regular planar graphs.** Marc Noy, Clément Requilé and Juanjo Rué. *Proceedings of the London Mathematical Society*, (2019), 119:2, 358-378 (20 pp.)
27. **Maximal independent sets and maximal matchings in series-parallel and related graph classes.** Joint work with Michael Drmota, Lander Ramos and Clément Requilé. *Electronic Journal of Combinatorics*, Volume 27, Issue 1 (2020), Paper P1.5. (36 pp.)
28. **Further results on random cubic planar graphs.** Joint work with Marc Noy and Clément Requilé. *Random Structures & Algorithms*, (2020) Volume 56 (3): 892-924 (31 pp.)
29. **Structure and enumeration of K_4 -minor-free links and link-diagrams.** Joint work with Dimitrios Thilikos and Vasiliki Velona. *European Journal of Combinatorics* (2020) Volume 89: 103-147 (44 pp.)
30. **On a problem of Sárközy and Sós on multivariate linear forms.** Joint work with Christoph Spiegel. *Revista Matemática Iberoamericana* (2020) 36 (7): 2107-2119 (12 pp.)
31. **Cycles of given lengths in unicyclic component in sparse random graphs.** M. Noy, V. Rasendrasahina, V. Ravelomanana, J. Rué. *Advances in Applied Mathematics* (2021) 125: Article 102162.
32. **On strong infinite Sidon and B_h sets and random sets of integers.** Joint work with David Fabian and Christoph Spiegel. *Journal of Combinatorial Theory, Series A* 182 (2021): Article 105460 (17 pp.)
33. **An Erdős-Fuchs Theorem for Ordered Representation Functions.** Gonzalo Cao-Labora, Christoph Spiegel and Juanjo Rué. *The Ramanujan Journal* (2021) 56, 183-201 (18 pp.)
34. **On Motzkin's Problem in the circle group.** Joint work with Pablo Candela, Carlos Catalá and Oriol Serra. Vinogradov Memorial Volume of the *Proceedings of the Steklov Institute of Mathematics*. (2021) 314: 44-63 (19 pp.)
35. **On the expected number of perfect matchings in random cubic planar graphs.** Joint work with Marc Noy and Clément Requilé. *Publicacions Matemàtiques* 66 (2022), 325-353 (28 pp.)
36. **Normal limiting distributions for systems of linear equations in random sets.** Joint work with Maximilian Wötzel. *Linear algebra and its applications* 649 (2022), 122-151 (31 pp.)
37. **Asymptotic enumeration of labelled 4-regular planar graphs.** Joint work with Marc Noy and Clément Requilé. *European Journal of Combinatorics*, 110 (2023), Article 103661 (19 pp.)
38. **Random cubic planar maps.** Joint work with Michael Drmota, Marc Noy and Clément Requilé. *Electronic Journal of Combinatorics* 30 (2)(2023), Paper 51 (41 pp.)

39. **Enumeration of rooted 3-connected bipartite planar maps.** Joint work with Marc Noy and Clément Requilé. *Comptes Rendues. Mathématique* 362 (2024), 143-158 (15 pp.)
40. **Product-free sets in the free group.** Joint work with Miquel Ortega and Oriol Serra. *Mathematika*, 70 (3) (2024), paper e12255.
41. **On the chromatic number of powers of subdivisions of graphs.** Joint work with Michael Anastos, Simona Boyadzhyska and Silas Rathke. *Discrete Applied Mathematics*, 360 (15) (2025), pages 506-511 (6 pp.)
42. **The Rado Multiplicity Problem in Vector Spaces over Finite Fields.** Joint work with Christoph Spiegel. Submitted.

Other publications (other research areas)

1. **Borane Polyhedra as Building Blocks for Unknown but Potentially Isolatable New Molecules – Extensions based on Computations of the Known $B_{18}H_{22}$ isomers.** Josep M. Oliva, Drahomír Hnyk, John D. Kennedy and Vladimir R. Rosenfeld and Juanjo Rué. *Croatia Chemica Acta*, (2013) 86 (4): 485–494 (9 pp.)
2. **Pentagonal chains and annuli as models for designing nanostructures from cages.** Andrey A. Dobrynin, Josep M. Oliva, Vladimir R. Rosenfeld and Juanjo Rué. *Journal of Mathematical Chemistry*, (2016) 54 (2): 765-776 (11 pp.)

Teaching Books

1. **Introducció a l'Anàlisi Real. 100 problemes resolts.** O. Rivero, S. Boza i J. Rué. Iniciativa Digital Politècnica, UPCGrau – 68 (ISBN 978-84-19184-53-5) (2022).

Book Chapters

1. **Handbook of Discrete and Combinatorial Mathematics.** New version of Chapter 3.6: Asymptotic sequences.

DISSEMINATION

Books

1. **El Arte de Contar. Combinatoria y Enumeración.** Collection *El mundo es matemático*. RBA Editorial. Translated from Spanish to Portuguese, Italian, Polish, Russian, French, English, Hungarian and Czech.
2. **Los números trascendentes.** Collection *Qué sabemos de?* Ediciones de La Catarata. Joint with Javier Fresán (in Spanish).
3. **El hombre que quiso entender el infinito: Ramanujan.** Collection *Genios de las matemáticas*. RBA Editorial. Translated from Spanish to French and Italian.
4. **El impulsor de las matemáticas de la colaboración: Erdős.** Collection *Genios de las matemáticas*. RBA Editorial. Translated from Spanish to French and Italian.
5. **Combinaciones, nudos matemáticos y los secretos del genoma.** Collection *Las matemáticas del mundo actual*. RBA Editorial (2021). Translated from Spanish to Italian.
6. **La revolución digital y el análisis de Fourier.** Collection *Las matemáticas del mundo actual*. RBA Editorial (2022). Translated from Spanish to Italian.

Articles in general media

1. **El aprendizaje automático ayuda a atacar problemas matemáticos clásicos** (joint with Ágata Timón). *El País* (19th November 2024, in Spanish).
2. **Caos, orden y preguntas no resueltas para Pi, el número más importante de las matemáticas** (joint with Ágata Timón). *El País* (3rd March 2023, in Spanish).
3. **Los misterios de los conjuntos de Sidon** (joint with Ágata Timón and Pablo Candela). *El País* (10th August 2021, in Spanish).
4. **El Premio Abel reconoce las relaciones de la matemática discreta con las ciencias de la computación.** *El País* (18th March 2021, in Spanish)
5. **Cómo visitar dos millones de estrellas en el menor tiempo posible.** *El País* (23rd November 2020, in Spanish).
6. **En las estructuras muy grandes siempre aparecen patrones.** *El País* (20th March 2020, in Spanish).
7. **Muere Alan Baker, el explorador de los números trascendentes** (joint with Ágata Timón). *El País* (2nd March 2018, in Spanish).
8. **El matemático mejor relacionado del mundo.** *El País* (15th May 2017, in Spanish).
9. **The art of counting - Interview with Mireille Bousquet-Mélou.** *Newsletter of the European Mathematical Society*, December 2017.

Chapters in Dissemination books

1. **Los números de Catalan**, in *Matemáticas para Estimular el Talento III*. Edited by Sociedad Andaluza de educación matemática Thales. ISBN: 978-84-15641-06-03 (in Spanish).
2. **Matemáticas y Redes**, in *Unidad Didáctica Matemáticas del Planeta Tierra*. Edited by *Fundación española para la ciencia y la tecnología*. NIPO: 720-13-031-3. Joint with Ana Zumalacárregui (in Spanish).

Dissemination articles

1. **Del teorema de los cuatro colores a la gravedad cuántica: enumeración de mapas.** *Gaceta de la Real Sociedad Matemática Española*, (2011), 14 (3): 545 – 564. In Spanish.
2. **Mathematical essentials of quantum computing.** Juanjo Rué and Sebastià Xambó. *Butlletí de la Societat Catalana de Matemàtiques*, (2013) 28 (2): 183–231. In Catalan.
3. **Domino tilings of the Aztec Diamond**, *Snapshots of modern mathematics from Oberwolfach*, number 16/2015.
4. **Lazlo Lovász i Avi Widergson: premis Abel 2021.** Albert Atserias, Josep Díaz, Jordi Guardia, Juanjo Rué, Oriol Serra. *Notícies de la Societat Catalana de Matemàtiques*, (2021): 49: 56–66.
5. **De la teoria de grafs clàssica a l'anàlisi de les grans xarxes.** *Butlletí de la Societat Catalana de Matemàtiques*, (2023) 38 (1): 67–105. In Catalan. Albert Dou award.

RESEARCH PROJECTS (AS COLLABORATOR)

- 01/2006–06/2009 *Métodos algebraicos y analíticos en combinatoria y aplicaciones.* Project from the Ministerio de Educación y Ciencia (Spain); reference MTM2005-086018-C02-01. Principal researcher: Marc Noy.
- 01/2009–12/2011 *Enumeración de estructuras discretas: métodos analíticos, probabilísticos y geométricos.* Project from the Ministerio de Educación y Ciencia (Spain); reference MTM2008-03020. Principal researcher: Marc Noy.
- 01/2009–12/2013 *Grup de Recerca Consolidat en Geometria Computacional i Matemàtica Discreta.* Project from the Generalitat de Catalunya (Catalunya); reference 2009SGR 1040. Principal researcher: Ferran Hurtado.
- 01/2008–12/2013 *ExploreMaps Project.* Project from the European Research Council, ERC Grant agreement 208471. Principal researcher: Gilles Schaeffer.
- 01/2012–12/2014 *Aplicaciones del análisis armónico a la teoría de los números y la física matemática.* Project from the Ministerio de Ciencia e Innovación (Spain); reference MTM2011-22851. Principal researcher: Antonio Córdoba.
- 10/2006–09/2015 *Methods for Discrete Structures*, DFG Training Network (GRK-1408, Germany).
- 01/2012–12/2015 *Programa de Excelencia Severo Ochoa.* Project from the Ministerio de Ciencia e Innovación (Spain); reference SEV-2011-0087. Principal researcher: Manuel de León.
- 09/2015–08/2018 *Estructuras discretas, geométricas y aleatorias.* Project from Ministerio de Economía y Competitividad (Spain); reference MTM2014-54745-P. Principal researchers: Marc Noy and Oriol Serra.
- 09/2015–08/2018 *Encuentros entre el análisis y la teoría de los números.* Project from Ministerio de Economía y Competitividad (España); reference MTM2014-56350-P. Principal researchers: Javier Cilleruelo and Antonio Córdoba.
- 01/2021–12/2024 *Randomness and learning in networks 'RandNET'.* Project from European Commission through the MSCA-RISE - Marie Skłodowska-Curie Research and Innovation Staff Exchange Programme (RISE); reference: 101007705. Principal researcher: Marc Noy.
- 09/2021–08/2024 *Combinatorics: new trends and real-world applications.* Project from Ministerio de Ciencia e Innovación; reference: PID-113082GB-100. Principal researchers: Simeon Ball and Guillem Perarnau.
- 01/2022-12/2025 *Unidad de Excelencia Maria de Maeztu at CRM.* Project from from Ministerio de Ciencia e Innovación; reference: CEX2020-001084-M. Principal researchers: Marcel Guàrdia.
- 11/2024- 10/2027 PID2023-147202NB-I00. COCOA: COntemporary COmbinatorics and its Applications; Principal researchers: S. Ball, G. Perarnau.

MENTORING AND ADVISING

PhD thesis (4)

- 09/2014–11/2017 Clément Requilé, Freie Universität Berlin.
Title: *Asymptotic study of regular planar graphs.*
First job after graduation: postdoctoral researcher at JKU Linz and TU Wien.
- 06/2016–07/2020 Christoph Spiegel, UPC Barcelona. Coadvised with Oriol Serra.
Title: *Additive Structures and Randomness in Combinatorics*
First job after graduation: researcher at Konrad Suze Institute ZIB Berlin.
- 04/2017–09/2021 Vasiliki Velona, UPC Barcelona and UPF. Coadvised with Gabor Lugosi.
Title: *A study on structure recovery and the broadcasting problem.*
First job after graduation: researcher at the Hebrew University of Jerusalem, Israel.
- 04/2017–01/2022 Maximilian Wötzel, UPC Barcelona. Coadvised with Oriol Serra.
Title: *Probabilistic and Extremal studies in Additive Combinatorics*
First job after graduation: researcher at Radboud University Nijmegen, Netherlands.

Master thesis (9+1)

- 01/2015 Maximilian Wötzel, Freie Universität Berlin.
Title: *Growth in groups: arithmetic combinatorics and expansion.*
- 03/2015 Eduard Schkolnik, Freie Universität Berlin.
Title: *Analytic techniques for the sum-free subset problem in the integers.*
- 10/2015 Gregor Lagodzinski, Freie Universität Berlin.
Title: *Asymptotic study of series-parallel graphs with vertex degree constraints.*
- 01/2016 Julian Volland, Humboldt Universität (Diploma Thesis).
Title: *Probability limiting distributions of arithmetic configurations in groups.*
Coadvised with Dirk Kreimer.
- 01/2016 Joscha Karsten, Freie Universität Berlin.
Title: *Analytic combinatorics of unlabelled discrete structures: explicit computations.*
- 06/2016 Vasiliki Velona, Kapodistrian University of Athens.
Title: *Asymptotic analysis of outerplanar graphs with subgraph obstructions.*
Coadvised with Dimitrios Thilikos.
- 07/2024 Alejandro Basilio, Universitat Politècnica de Catalunya.
Title: *Structure and enumeration of maximal K_5 -minor-free graphs.*
- 07/2024 Ali Ouafa, Universitat Politècnica de Catalunya.
Title: *A quantitative analysis of volatility indexes.*
Coadvised with Elisa Alòs.
- 07/2024 Adrián Hernández, Universitat Politècnica de Catalunya.
Title: *Teaching mathematics through theatre: a case study using random complex network models.*
Coadvised with Lluís Vena.
- 12/2023- Julian Huth, Freie Universität Berlin.
On-going Master Thesis. Coadvised with Tibor Szabó.

Bachelor thesis (22)

- 11/2014 Julian Huth, Freie Universität Berlin.
Title: *Analytic combinatorics of words: patterns and extremal parameters.*
- 09/2015 Alberto Espuny, Universitat Politècnica de Catalunya.
Title: *Classical and modern approaches for Plünnecke-type inequalities.*
Coadvised with Oriol Serra.
- 11/2015 David Fabian, Freie Universität Berlin.
Title: *Infinite Sidon sequences and related constructions.*
- 05/2016 Ignacio González, Universidad Autónoma de Madrid.
Title: *Pruebas combinatorias y topológicas del teorema de Van der Waerden.*
Coadvised with Javier Cilleruelo and Adolfo Quirós.
- 07/2019 Nil Redón, Universitat Politècnica de Catalunya.
Title: *Threshold phenomena in random graphs.*
- 07/2019 Dimitri Ganjour, Universitat Politècnica de Catalunya.
Title: *Continuous random trees.*
- 07/2020 Adrián Hernández, Universitat Politècnica de Catalunya.
Title: *Quasirandomness in Discrete Mathematics, Additive Combinatorics and Group Theory.*
- 02/2021 Jordi Castellví, Universitat Politècnica de Catalunya.
Title: *Bijjective enumeration of constellations in higher genus.*
Coadvised with Marie Albenque and Eric Fusy.
- 07/2021 Guillem Coderch, Universitat Politècnica de Catalunya.
Title: *Combinatorial, Geometric and Probabilistic aspects of infinite sphere packings.*
- 01/2022 Silvia Garcia, Universitat Politècnica de Catalunya.
Title: *Roth's theorem: combinatorial, analytic and ergodic proofs.*
- 01/2022 Mercè Vila, Universitat Politècnica de Catalunya.
Title: *Discrete complex analysis, parafermionic observables and self-avoiding walks.*
- 01/2022 Enric Rabasseda, Universitat Politècnica de Catalunya.
Title: *Topics on boolean functions.*
- 09/2022 Àlex Font, Universitat Politècnica de Catalunya.
Title: *Positional games in combinatorics.*
Coadvised with Lluís Vena.
- 05/2023 Pau Colomer, Universitat Politècnica de Catalunya.
Title: *The circle method.*
- 05/2023 Luis Sierra, Universitat Politècnica de Catalunya.
Title: *Graphical Models for Mixed Data with Categorical Latent Variables.*

- 07/2023 Mariona Sanchez, Universitat Politècnica de Catalunya.
Title: *The Szemerédi Regularity Lemma and Applications.*
- 07/2023 Laura Arribas, Universitat Politècnica de Catalunya.
Title: *Map enumeration on surfaces: from bijective techniques to Harer-Zagier formula.*
- 01/2024 Àlex Gil, Universitat Politècnica de Catalunya.
Title: *Graph limits.*
Coadvised with Lluís Vena.
- 01/2024 Miguel Alcañiz, Universitat Politècnica de Catalunya.
Title: *The Freiman-Ruzsa Theorem.*
- 07/2024 Lidia Rossell, Universitat Politècnica de Catalunya.
Title: Applications of LEAN in the graph theoretical context.
Coadvised with Christoph Spiegel (ZIB Berlin).
- 05/2024 Ruben Aciego, Universitat Politècnica de Catalunya. Title: *Improvements on coding and quantization of transform coefficients for AV2.*
Coadvised with Joel Solé (Netflix - Los Gatos).
- 07/2024 Albert López, Universitat Politècnica de Catalunya.
Title: *The graph container algorithm and further applications.*
Coadvised with Miquel Òrtega.

PhD Committee Member (6)

- 01/2015 Dennis Clemens, Freie Universität Berlin.
Doctoral Thesis: *Two-player games on graphs.*
- 01/2015 Ana Zumalacárregui, Universidad Autónoma de Madrid.
Doctoral Thesis: *Congruence problems and questions regarding sequences of numbers.*
- 11/2015 Tuan Tran, Freie Universität Berlin.
Doctoral Thesis: *On problems in Extremal Combinatorics.*
- 01/2016 Rafael Tesoro, Universidad Autónoma de Madrid.
Doctoral Thesis: *Set of integers with additive restrictions.*
- 03/2017 Lander Ramos, Universitat Politècnica de Catalunya.
Doctoral Thesis: *Graph enumeration and random graphs.*
- 05/2022 Carlos Catalá, Universidad Autónoma de Madrid.
Doctoral Thesis: *Contributions relating graph coloring to topics in ergodic theory and arithmetic combinatorics.*
- 02/2023 Hamilton Mauricio Ruiz, Universidad del Cauca.
Doctoral Thesis: *Correlación de códigos ortogonales ópticos en una y dos dimensiones.*

TEACHING EXPERIENCE

Academic Year	Semester	Place	Subject	Hours
2024 – 2025	Second	Master Mathematics, UPC	Combinatorics	12 hours
2024 – 2025	Second	Master Mathematics, UPC	Seminar Adv. Mathematics	12 hours
2024 – 2025	First	Bachelor Mathematics, UPC	Probability theory (Lecture)	36 hours
2024 – 2025	First	CFIS	Complements CFIS	28 hours
2023 – 2024	Second	Master Mathematics, UPC	Combinatorics	12 hours
2023 – 2024	Second	Master Mathematics, UPC	Seminar Adv. Mathematics	8 hours
2023 – 2024	Second	Bachelor Mathematics, UPC	Discrete Mathematics (Lecture)	72 hours
2023 – 2024	First	Bachelor Mathematics, UPC	Probability Theory (Problems)	24 hours
2023 – 2024	First	Bachelor Aeronautics, UPC	Algebra and geometry	65 hours
2023 – 2024	First	Bachelor Bioinformatics, UPF	Dis. Math and Optimization (Lecture)	24 hours
2022 – 2023	Second	Master Mathematics, UPC	Combinatorics	12 hours
2022 – 2023	Second	Master Mathematics, UPC	Seminar Adv. Mathematics	24 hours
2022 – 2023	Second	Bachelor Mathematics, UPC	Discrete Mathematics (Lecture)	36 hours
2022 – 2023	First	Bachelor Mathematics, UPC	Probability Theory (Problems)	24 hours
2022 – 2023	First	Bachelor Bioinformatics, UPF	Dis. Math and Optimization (Lecture)	24 hours
2021 – 2022	Second	Master Mathematics, UPC	Combinatorics	24 hours
2021 – 2022	Second	Master Mathematics, UPC	Seminar Adv. Mathematics	24 hours
2021 – 2022	Second	Bachelor Mathematics, UPC	Real Analysis (Lecture)	36 hours
2021 – 2022	Second	Bachelor Mathematics, UPC	Discrete Mathematics (Lecture)	36 hours
2020 – 2021	Second	Master Mathematics, UPC	Seminar Adv. Mathematics	24 hours
2020 – 2021	Second	Bachelor Mathematics, UPC	Real Analysis (Lecture)	36 hours
2020 – 2021	Second	Bachelor Mathematics, UPC	Discrete Mathematics (Problems)	24 hours
2019 – 2020	Second	Master Mathematics, UPC	Combinatorics	24 hours
2019 – 2020	Second	Bachelor Mathematics, UPC	Real Analysis (Lecture)	36 hours
2019 – 2020	First	Bachelor Mathematics, UPC	Probability theory (Lecture)	36 hours
2019 – 2020	First	Bachelor Data Science, UPC	Discrete Mathematics (Problems)	48 hours
2018 – 2019	Second	Master Mathematics, UPC	Combinatorics	24 hours
2018 – 2019	Second	Bachelor Aeronautics, UPC	Amplificació matemàtiques	60 hours
2018 – 2019	Second	Bachelor Mathematics, UPC	Complex analysis (Problems)	48 hours
2018 – 2019	First	Bachelor Mathematics, UPC	Probability theory (Lecture)	36 hours
2018 – 2019	First	Bachelor Data Science, UPC	Discrete Mathematics (Problems)	24 hours
2018 – 2019	First	Bachelor Mathematics, UPC	Projective Geometry (Problems)	24 hours
2018 – 2019	First	Bachelor Aeronautics, UPC	Amplificació matemàtiques	60 hours
2017 – 2018	Second	Bachelor Aeronautics, UPC	Amplificació matemàtiques	60 hours
2017 – 2018	Second	Bachelor Mathematics, UPC	Complex analysis (Problems)	24 hours
2017 – 2018	First	Bachelor Mathematics, UPC	Probability theory (Lecture)	36 hours
2017 – 2018	First	Bachelor Data Science, UPC	Discrete Mathematics (Problems)	24 hours
2017 – 2018	First	Bachelor Mathematics, UPC	Projective Geometry (Problems)	24 hours
2016 – 2017	Second	Bachelor Aeronautics, UPC	Calculus	30 hours
2016 – 2017	Second	Bachelor Aeronautics, UPC	Amplificació matemàtiques	60 hours
2016 – 2017	Second	Bachelor Mathematics, UPC	Complex analysis (Problems)	24 hours
2016 – 2017	First	Bachelor Aeronautics, UPC	Calculus	60 hours
2016 – 2017	First	Bachelor Mathematics, UPC	Projective Geometry (Problems)	24 hours
2015 – 2016	Second	Bachelor Aeronautics, UPC	Amplificació matemàtiques	60 hours
2015 – 2016	Second	Bachelor Telecom. engineering, UPC	Matemàtiques telecom.	60 hours
2015 – 2016	First	Bachelor Mathematics, FU	Seminar - Diskrete Mathematik I	30 hours
2014 – 2015	Second	Bachelor Mathematics, FU	Stochastik II	60 hours
2014 – 2015	First	Bachelor Mathematics, FU	Seminar - Diskrete Mathematik I	30 hours
2014 – 2015	First	Master Mathematics, FU	Seminar - Diskrete Mathematik III	30 hours
2013 – 2014	Second	Master Mathematics, FU	Diskrete Mathematik III	56 hours
2013 – 2014	First	Master Mathematics, FU	Diskrete Mathematik II	64 hours
2012 – 2013	First	Bachelor Mathematics, UAM	Discrete Mathematics	60 hours
2011 – 2012	Second	Bachelor Informatics, UAM	Calculus 2	60 hours
2010 – 2011	Second	Bachelor Informatics, UAM	Probability and Statistics	60 hours
2008 – 2009	Second	Diploma Informatics, UPC	Calculus (instruction)	30 hours
2007 – 2008	Second	Diploma Statistics, UPC	Algebra 2	30 hours
2004 – 2005	First/Second	Diploma Mathematics, UPC	Problem's instruction	300 hours
				2318 hours

COURSES IN EMERGENT COUNTRIES, NON-SPECIALIZED TALKS AND ADVANCED COURSES
 (♣ = EXPECTED)

Date	Place	Event
July 2023	Barcelona, Spain	Barcelona Introduction to Mathematical Research (2,3)
January 2023	Castelló, Spain	Introduction to Quantum Computing (2,3)
June 2019	Popayán, Colombia	Advanced course on Additive Combinatorics (2,3)
April 2017	Barcelona, Spain	BGSMath 6-hour course on Fourier analysis (3)
July 2016	Popayán, Colombia	6-hour course on combinatorial number theory (3)
November 2015	Berlin, Germany	Bundesciencia (1)
August 2015	Cusco, Perú	CIMPA-AGRA school on number theory (3)
July 2015	Barcelona, Spain	BarcelonaTech Mathematics Summer Camp (2)
July 2014	Bogotá, Colombia	4, 5-hour course on analytic combinatorics (3)
February 2014	Berlin, Germany	Café Scientifique (1)
October 2012	Madrid, Spain	Real Academia de Ciencias (2)
July 2012	Bogotá, Colombia	20-hour course on analytic combinatorics (3)
October 2010	Paris, France	Coloques du residents du College d'Espagne (1)
February 2010	Barcelona, Spain	Seminar on quantum processing (CRM-ICFO-SCM-FME) (2)
January 2010	Paris, France	Coloques du residents du College d'Espagne (1)

(1) General audience, (2) Undergraduate level, (3) Graduate level

ORGANIZATION OF SCIENTIFIC MEETINGS

- Organizer (joint with Marc Masdeu), workshop Interplays between algebra, combinatorics and proof formalization, 15 July 2024 CRM, Bellaterra.
- Organizer (joint with Tibor Szabó and Natasha Morrison), workshop ‘Graphs and Combinatorics’ in FOCM’23, June 2023 (Paris, France).
- Co-chair of the Organizing Committee of EuroComb 2021, September 2021 (Barcelona, Spain).
- Chair of the Organizing Committee of the 2nd GAPCOMB workshop, July 2021 (Montserrat, Spain).
- Organizing Committee of ‘Random Trees and Graphs Summer School’, July 2019 (CIRM, France).
- Program Committee Member of JMDA2018 – Discrete Mathematics Days 2018 (Sevilla, Spain, June 2018).
- Member of the Organizing Committee (joint with Antonio Córdoba, Pablo Candela, Oriol Serra, Ana Zumalacárregui and Gonzalo Fiz) of the conference ‘The music of numbers’ (ICMAT Madrid, Spain September 2017).
- Chair of the Organizing Committee (joint with Josep Díaz, Gabor Lugosi and Oriol Serra) of the BGSMath Monthly program ‘Random Discrete Structures and Beyond’ (Barcelona, Spain, May–June 2017).
- Chair of the Organizing Committee, *Discrete Mathematics Days*, Universitat Politècnica de Catalunya, (Barcelona, Spain, 6th-8th July 2016).
- Organizing Committee (joint with Tibor Szabó) of the *Symposium Diskrete Mathematik 2016*, Freie Universität Berlin (15th-16th July 2016).
- Member of the Scientific Committee, First ‘Julio Palacios’ International Symposium, A Coruña, Spain (20-22 July 2016).
- Program Committee Member of FPSAC 2015 (Daejeon, South Korea).
- Organizer (joint with Tibor Szabó) of the 20th Anniversary of the *Berlin-Poznań-Hamburg Seminar*, Freie Universität Berlin (29th-30th May 2015). Financially supported by Freie Universität Berlin and *Methods for Discrete Structures* DFG training network.
- Organizer (joint with Tibor Szabó) of the Block Course *Towards the Polynomial Freiman-Ruzsa Conjecture*, Freie Universität Berlin. (6th-23rd October 2014). Financially supported by Freie Universität Berlin and *Methods for Discrete Structures* DFG training network.
- Organizer of the Clay Summer Mathematical School 2014 *Periods and Motives: Feynman amplitudes in the 21st century*. Financially supported by Clay Foundation.
- Organizer (joint with Kurusch Ebrahimi-Fard and Vincent Pilaud) of the workshop *Recent trends in Algebraic and Geometric Combinatorics*, ICMAT, Madrid (27th-29th November 2013). Financially supported by Severo Ochoa Excellence Grant.
- Organizer of the Workshop *Exploratory Workshop New Approaches To Multiple Zeta Values*, ICMAT, Madrid (30th September- 2nd October 2013). Financially supported by ESF.
- Organizer of the course *Multiple Zeta Values, Multiple Polylogarithms, and Quantum Field Theory*, ICMAT, Madrid (7th-11th October 2013). Financially supported by Severo Ochoa Excellence Grant.
- Organizer (joint with Ana Bravo, Andrei Jaikin and Kurusch Ebrahimi-Fard) of the Algebra and Combinatorics Seminar (UAM-ICMAT). Academic year 2012 – 2013.
- Organizer of *ESF Perspectives in discrete mathematics*, CRM, Bellaterra (June 2012). Financially supported by the ESF.

- Organizer of *Jornadas sobre conjuntos de Sidon*. ICMAT, Madrid (20th March 2012). Financially supported by Universia-Banco Santander.
- Organizer of the *Young Workshop in Arithmetics and Combinatorics*. ICMAT, Madrid (20th-24th June 2011). Financially supported by I-math.

ADDITIONAL INFORMATION

Languages

Human: Catalan and Spanish (native), fluent in English and French, beginner in German (A2) and Italian.

Non-human: Programming skills (C, Java, assembler, Fortran), mathematical software (Maple, MatLab, LaTeX), design (Labview, PSpice).

Service: Mathematical and synergic activities

Management: – President of *Comite des Residents du College d’Espagne a Paris*. Academic year 2009–2010.

Editor: Responsible of the problem section of SCM–Notícies (02/2017–04/2021).

Editor (2): Editor of Trends in Mathematics book series (TM, volume 14): Extended Abstracts EuroComb 2021.

Grant evaluator: Evaluator for grant applications to Research Foundation – Flanders (FWO).

MathSciNet: 30 reviews done so far at MathSciNet.

zbMath: 20 reviews done so far at Zentralblatt MATH.

Olympiads: – Trainer of Catalan and Spanish team in the Mathematical Olympiad during several years (2000–).
– Judge in the Catalan Mathematical Olympiad (Barcelona 2016), Spanish Mathematical Olympiad (Torrelodones 2007, San Feliu de Guixols 2009, Pamplona 2011, Barcelona 2016, Calatayud 2023), and in the International Mathematical Olympiad. (Madrid 2008, Amsterdam 2011).

Secondary school: – ESTALMAT Madrid Project Member, Madrid (2011-2012, 2012-2013), Catalunya (2016-2021).
– Organizer of Olitele contest 2016.

Referee: Referee of the journals *Electronic Journal of Combinatorics*, *European Journal of Combinatorics*, *Discrete and Computational Geometry*, *Combinatorics*, *Probability and Computing*, *Journal of Combinatorial Theory. Series A*, *Journal of Combinatorial Theory. Series B*, *Graphs and Combinatorics*, *Revista Matemática Iberoamericana*, *Journal of Combinatorics*, *Journal of Number Theory*, *International Journal of Number Theory*, *Proceedings of the London Mathematical Society*, *Discrete Mathematics*, *Electronic Journal of Combinatorics*, *SIAM Journal of Discrete Mathematics*, *Ars Combinatorica*, *Algorithmica*, *ACM Journal of Experimental Algorithmics*, *Combinatorica*, *Annals of Probability*, *Combinatorics*, *Probability and Computing* and several conferences.