

Marc Noy: Currículum Vitae

Present Position

Full Professor
Department of Mathematics
Universitat Politècnica de Catalunya (UPC)
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Education

Ph.D. Computer Science, Universitat Politècnica de Catalunya, 1989
Master in Mathematics, Brandeis University MA, 1983
Bachelor in Mathematics, Universitat de Barcelona, 1981

Research Interests

Combinatorics and Graph Theory, Discrete Geometry
Probabilistic Methods, Computer Science

Posts and Responsibilities

Member of Sciences Committee for Research Personnel Evaluation, Catalan Quality Agency AQU, 2017-
Scientific Director, BGSMath/Maria de Maeztu excellence program (Spanish government), 2015-2019
Director of the Barcelona Graduate School of Mathematics, 2015-2018
Chair of the Scientific Committee, Barcelona Graduate School of Mathematics, 2013-2015
Vice-Dean for Studies, School of Mathematics and Statistics, UPC, 2009-11
Head of the Department of Applied Mathematics II, UPC, 1999-2005
Member of the Board of Governors (*Consell de Govern*), UPC, 2002-05

Awards and distinctions

Narcís Monturiol medal (2018) from the Catalan Government for contribution to the scientific progress
Invited Speaker at the International Congress of Mathematicians, Seoul, 2014
Von Neumann visiting Professor at Technical University of Munich, 2012-13
Humboldt Research Award 2012

Teaching

- Universitat Politècnica de Catalunya (since 1984):
 - School of Mathematics, undergraduate: Combinatorics and Graph Theory, Calculus in one variable, Complex Analysis, Computational Algebra, Discrete Mathematics, Foundations of Mathematics.
 - School of Mathematics, graduate: Combinatorics, Computer Algebra, Discrete and Computational Geometry, Graph Theory.
 - School of Computer Science, undergraduate: Algebra, Calculus, Mathematical Analysis, Discrete Mathematics, Foundations of Mathematics (degree in Computer Science). Logic and Discrete Mathematics (degree in Data Science and Engineering). Discrete Mathematics and Optimization (degree in Bioinformatics).
- Universitat de Barcelona: (1981-82) Algebra; (1995-97) Discrete Mathematics for Didactics
- Technical University of Munich (2013): Master course on Graph Theory
- Barcelona Graduate School in Economics (2015-), master in Data Science: Deterministic Models and Optimization.

Main research achievements

- Logical limit laws for planar graphs, graphs on surfaces and minor-closed classes graphs, in first order and in monadic second order logic.

- Study of extremal parameters in random planar graphs: maximum degree, diameter, largest k -connected components. Joint work with Omer Giménez and others.
- Complete solution of the problem of asymptotic enumeration of planar graphs (with Omer Giménez, 2005), an open problem since the 1970s. The solution opened the way to the fine analysis of random planar graphs, and has given rise to a very active area involving researchers from several countries.
- Systematic study of geometric non-crossing configurations (with Philippe Flajolet, 1999). The tools developed in this work have given rise to a number of new developments.
- First analysis (with Sergi Elizalde, 2003) of consecutive patterns in permutations. The topic has grown much since then and has given rise to a multitude of publications.
- Solution of the conjecture of Brylawski from 1970 (with Criel Merino and Anna de Mier), on the factorization of the Tutte polynomial of matroids.
- Systematic study (with Ferran Hurtado and Jorge Urrutia) of flips in plane triangulations. Numerous researchers have followed up this work.

Selected publications

1. The first order convergence law fails for random perfect graphs (with T. Müller). *Random Structures Algorithms* (2019).
2. Enumeration of 4-regular planar graphs (with C. Requilé and J. Rué). *Proc. London Math. Soc.* (2018).
3. Logical limit laws for minor-closed classes of graphs (with P. Heinig, T. Müller and A. Taraz). *J. Combinatorial Theory Ser. B* (2018).
4. On the probability of planarity of a random graph at the critical point (with J. Rué and V. Ravelomanana). *Proc. Amer. Math. Soc.* (2015)
5. On the diameter of random planar graphs (with G. Chapuy, E. Fusy and O. Giménez). *Combinatorics, Probability and Computing* (2015).
6. Random planar graphs and beyond. *Proceedings ICM*, Seoul 2014
7. Maximum degree of random planar graphs (with M. Drmota, O. Giménez, K. Panagiotou and A. Steger). *Proc. London Math. Soc.* (2014)
8. Graphs classes with given 3-connected components (with O. Giménez and J. Rué). *Random Structures Algorithms* (2013)
9. Clusters, generating functions, and asymptotics for consecutive patterns in permutations (with S. Elizalde). *Advances in Applied Math* (2012)
10. Asymptotic enumeration and limit laws for graphs of fixed genus (with G. Chapuy, E. Fusy, O. Giménez and B. Mohar). *J. Combinatorial Theory Ser. A* (2011)
11. Degree distribution in random planar graphs (with M. Drmota and O. Giménez). *J. Combinatorial Theory Ser. A* (2011)
12. Growth constants of minor-closed classes of graphs (with O. Bernardi and D. Welsh). *J. Combinatorial Theory Ser. B* (2010)
13. Counting planar graphs and related families of graphs (with O. Giménez). In *Surveys in Combinatorics* (2009), Cambridge University Press
14. Asymptotic enumeration and limit laws of planar graphs (with O. Giménez). *J. Amer. Math. Soc.* 22 (2009)
15. Computing the Tutte polynomial on graphs of bounded clique-width (with O. Giménez and P. Hliněný). *SIAM J. Discrete Math.* (2006)
16. Lattice Path Matroids: enumerative aspects and Tutte polynomials (with J. Bonin and A. de Mier). *J. Combinatorial Theory Ser. A* (2003)
17. Consecutive patterns in permutations (with S. Elizalde). *Advances Applied Math.* (2003)
18. Irreducibility of the Tutte polynomial of a connected matroid (with C. Merino and A. de Mier). *J. Combinatorial Theory Ser. B* (2001)
19. Lower bounds on the number of crossing-free graphs of K_n (with A. García and J. Tejel). *Computational Geometry: Theory and Applications* (2000)
20. Analytic Combinatorics of non-Crossing Configurations (with P. Flajolet). *Discrete Mathematics* (1999)
21. Flipping edges in triangulations (with F. Hurtado and J. Urrutia). *Discrete Comp. Geom.* (1999)
22. Enumeration of non-crossing trees on a circle. *Discrete Mathematics* (1998)

Ph.D. Thesis supervision

1. Lander Ramos, 2107: Graph enumeration and random graphs. Currently Engineer at Google, Dublin.
2. Juanjo Rué, 2009: Enumeration and limit laws of topological graphs. Currently Associate Professor at UPC.
3. Omer Giménez, 2005: Enumerative aspects and Tutte polynomials of graphs and matroids. Currently Engineer at Google, Palo Alto, CA.
4. Sergi Elizalde, 2004: Consecutive patterns and statistics on restricted permutations. Currently Associate Professor at Dartmouth College, NH.
5. Anna de Mier, 2003: Graphs and matroids determined by their Tutte polynomials. Currently Associate Professor at UPC.

Editorial service

Editor-in-Chief, Electronic Journal of Combinatorics, since 2014

Editor of Annals of Combinatorics (2019+), Butlletí de la Societat Catalana de Matemàtiques (2011+)

Editor of special volumes for Discrete Applied Mathematics (2001), Discrete Mathematics (2002, 2003), Advances in Applied Mathematics (2004), Annals of Combinatorics (2008)

Reviewer for Mathematical Reviews, 2002-07. Referee for more than 35 international journals

Research Grants

As project leader (last 10 years):

1. Geometric, Algebraic and Probabilistic Combinatorics SGR900 (2018-2020)
2. BGSMath/María de Maeztu programme MDM-2014-0445 (2015-2019)
3. Discrete, Geometric and Random Structures MTM2014-54745-P (2015-2017)
4. Combinatorics, Graph Theory and Discrete Geometry MTM2011-24097 (2012-2014)
5. Enumeration of Discrete Structures MTM2008-0302 (2009-2011)
6. Analysis of Recursive Algorithms, Bilateral Action Austria-Spain (2009-2010)
7. Algebraic and Analytic Methods in Combinatorics MTM2005-08618 (2006-2008)

Projects and personnel evaluation

Panels: Marie Curie actions (2014, 2016, 2017), Science Academy of Finland (2016), Catalan Quality Agency AQU (since 2017), Excellent Doctoral Programs (Austrian Science Fund 2017).

Projects: ANEP Spain, ANR France, ARRS Slovenia, DFG Germany, CINECA Italy, Grant Agency Czech Republic, NSA Mathematical Sciences Program, NSERC Canada, Swiss Academy of Technical Sciences, CSIC Uruguay.

Personnel: AQU Catalonia, Dartmouth College NH, École Polytechnique, Technical University Munich, Université Paris 7, Université de Grenoble, University of Ljubljana, University of Haifa, University of Magdeburg, UNAM Mexico.

Ph.D. Committees: École Polytechnique (3), U. Oxford (2), ENS Paris, ETH Zurich, Charles U. Prague, Monash U., U. Paris 7, U. Bordeaux I, U. Cantabria, U. Sevilla (3), U. Autònoma Madrid, U. Autònoma Barcelona, UPC (10).

Conference and workshop organization

As main organizer:

- Workshop on Logic and Random Discrete Structures. Dagstuhl 2020
- Workshop on Enumerative Combinatorics. MFO Oberwolfach, 2014 and 2018
- European Science Foundation Conference: Perspectives in Discrete Math. CRM, 2012
- DocCourse Combinatorics and Geometry: Discrete & Computational Geometry. CRM, 2009

- DocCourse Combinatorics and Geometry: Additive Combinatorics. CRM, 2008
- Thematic Program 'Enumerative Combinatorics and Random Structures'. CRM, 2006-07
- 2nd Workshop on the Tutte polynomial. CRM, 2005
- 1st European Conf. on Combinatorics, Graph Theory and Applications. CRM, 2001
- 1st Workshop on the Tutte polynomial. CRM, 2001
- Int. Conference on Formal Power Series and Algebraic Combinatorics . UPC, 1999

As member of the Program Committee:

- Formal Power Series and Algebraic Combinatorics, 1997, 1998, 1999, 2005, 2009, 2014
- European Conference on Combinatorics, Graph Theory and Applications 2001, 2009, 2015
- Asymptotic Enumeration and Random Structures 2007
- International Workshop on Combinatorial Algorithms 2009
- Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms 2010, 2012, 2016
- ESF Conference Perspectives in Discrete Mathematics 2012

Selected participation in conferences

As plenary speaker:

- Workshop on Graph-Theoretic Concepts in Computer Science, Vall de Núria 2019
- Symposium on Discrete Mathematics, Berlin 2016
- International Conference on the Analysis of Algorithms, Paris 2014
- Czech-Slovak Symp. on Graph Theory Combinatorics, Kosice 2013
- Formal Power Series and Algebraic Combinatorics, Reykjavik 2011
- Centennial Conference of the Real Sociedad Matemática Española, Ávila 2011
- Colloquim on Combinatorics, Saarbrücken 2010
- British Combinatorial Conference, St Andrews 2009
- Workshop on Analysis of Algorithms, Fréjus 2009
- European Conference on Combinatorics, Graph Theory and Applications, Sevilla 2007
- Séminaire Lotharingien de Combinatoire, Strasbourg 2006

As invited speaker:

- 150th Anniversary of the London Mathematical Society, Birmingham 2015
- International Congress of Mathematicians, Seoul 2014
- European Congress of Mathematics, Amsterdam 2008
- Meeting in Combinatorics, Oxford 2006

Lecturer at advanced courses and schools

1. ALEA, CIRM Luminy, 2018
2. ALEA in Europe Meeting, Munich, 2016
3. Fall school on Random Graphs, Cargèse (Corsica), 2015
4. Master course on 'Advanced Topics in Graph Theory' (12 weeks), Technical University of Munich, spring semester 2013
5. Summer School in Algebraic and Enumerative Combinatorics, Guimaraes, 2012
6. Summer School in Discrete Mathematics. Valparaíso, 2007
7. Spring School in Enumerative Combinatorics, Berlin, 2005

Languages knowledge

Native: Catalan, Spanish

Proficient: English, French

Advanced: Italian

Intermediate: German