

Marc Noy

Present Position

Full Professor
Department of Mathematics
Universitat Politècnica de Catalunya (UPC)
Jordi Girona 1-3
08023 Barcelona
marc.noy@upc.edu

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

Scientific Director of the María de Maeztu excellence program of the Spanish government, 2015-
Director of the Barcelona Graduate School of Mathematics, 2015-
Chair of the Scientific Committee, Barcelona Graduate School of Mathematics, 2013-2015
Vice-Dean for Studies, School of Mathematics and Statistics, UPC, 2009-11
Director 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

Humboldt Research Award 2012
Von Neumann visiting Professor at Technical University of Munich, 2012-13
Invited Speaker at the International Congress of Mathematicians, Seoul, 2014
Research profile in 'Árbol de las Matemáticas', www.arbolmat.com/category/investigadores/

Teaching

- Universitat Politècnica de Catalunya (since 1984):
 - Undergraduate courses at the School of Mathematics: Combinatorics, Complex Analysis, Computational Algebra, Discrete Mathematics, Foundations of Mathematics, Graph Theory.
 - Graduate courses at the School of Mathematics: Combinatorics, Computer Algebra, Discrete and Computational Geometry, Graph Theory.
 - Undergraduate courses at the School of Computer Science: Algebra, Calculus, Mathematical Analysis, Discrete Mathematics, Foundations of Mathematics
- 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

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

Ph.D. Thesis supervision

1. Juanjo Rué, 2009: Enumeration and limit laws of topological graphs. Currently Junior Professor at Free University Berlin
2. Omer Giménez, 2005: Enumerative aspects and Tutte polynomials of graphs and matroids. Currently Engineer at Google, Palo Alto, CA
3. Sergi Elizalde, 2004: Consecutive patterns and statistics on restricted permutations. Currently Associate Professor at Dartmouth College, NH
4. Anna de Mier, 2003: Graphs and matroids determined by their Tutte polynomials. Currently Associate Professor at UPC
5. Carmen Hernando, 1999: Complexity of geometric and combinatorial structures. Currently Associate Professor at UPC

Editorial service

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

Editor, Butlletí de la Societat Catalana de Matemàtiques, since 2011

Editor, Pure Mathematics and Applications, since 2005

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. Discrete, Geometric and Random Structures MTM2014-54745-P (2015-17)
2. Combinatorics, Graph Theory and Discrete Geometry MTM2011-24097 (2012-2014)
3. Enumeration of Discrete Structures MTM2008-0302 (2009-2011)
4. Analysis of Recursive Algorithms, Bilateral Action Austria-Spain (2009-2010)
5. Algebraic and Analytic Methods in Combinatorics MTM2005-08618 (2006-2008)

Projects and personnel evaluation

Projects: ANEP Spain, ANR France, ARRS Slovenia, CINECA Italy, CSIC Uruguay,

Grant Agency Czech Republic, NSA Mathematical Sciences Program, NSERC Canada, Swiss Academy of Technical Sciences.

Panels: Marie Curie actions (2014), Academy of Finland (2016)

Personnel: Dartmouth College NH, École Polytechnique, Technical University Munich, Université Paris 7, 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:

- Int. Conference on Formal Power Series and Algebraic Combinatorics . UPC, 1999
- 1st European Conf. on Combinatorics, Graph Theory and Applications. CRM, 2001
- 1st Workshop on the Tutte polynomial. CRM, 2001
- 2nd Workshop on the Tutte polynomial. CRM, 2005
- Thematic Program 'Enumerative Combinatorics and Random Structures'. CRM, 2006-07
- DocCourse Combinatorics and Geometry: Additive Combinatorics. CRM, 2008
- DocCourse Combinatorics and Geometry: Discrete & Computational Geometry. CRM, 2009
- European Science Foundation Conference: Perspectives in Discrete Math. CRM, 2012
- Workshop on Enumerative Combinatorics. MFO Oberwolfach, 2014

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:

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

As invited speaker:

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

Lecturer at advanced courses and schools

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

Languages knowledge

Native: Catalan, Spanish

Proficient: English, French

Advanced: Italian

Intermediate: German