

Oriol Serra

Short CV (updated September 2020)

Position

Full professor of Applied Mathematics in the *Departament de Matemàtiques* at the *Universitat Politècnica de Catalunya* (UPC) since 1999.

Co-chair Research group Geometric, Algebraic and Probabilistic Combinatorics at UPC
<https://gapcomb.upc.edu/en>

Visiting positions at University of California Santa Cruz (1994-95), ENS Télécommunications Paris (2000), Rényi Institute Budapest (2001), Charles University Prague (2005), Institute de Mathématiques de Bordeaux (2012).

Education

Degree in Mathematics, Univ. de Barcelona, 1984

PhD Degree in Mathematical Sciences, Univ. Politècnica de Catalunya, 1989.

Research interests

Combinatorics, Graph Theory, Combinatorial Number Theory, Combinatorial geometry

Research Highlights

- Proof of Freiman conjecture on maximum volume of sets with given cardinality and doubling for chains
Freiman, Gregory A.; Serra, Oriol On doubling and volume: chains. *Acta Arith.* 186 (2018), no. 1, 37–59.
- Proof of Matolcsi-Ruzsa conjecture on discrete Brunn-Minkowski inequality for convex sets and extension to higher dimensions
Böröczky, Károly J.; Matolcsi, Máté; Ruzsa, Imre Z.; Santos, Francisco; Serra, Oriol Triangulations and a discrete Brunn-Minkowski inequality in the plane. *Discrete Comput. Geom.* 64 (2020), no. 2, 396–426.
- Proof of a conjecture of Hou on linear versions of Kneser theorem
Bachoc, Christine; Serra, Oriol; Zémor, Gilles Revisiting Kneser's theorem for field extensions. *Combinatorica* 38 (2018), no. 4, 759–777.
- Extension to abelian groups of sparse Szemerédi versions for the existence of configurations
Serra, Oriol; Vena, Lluís On the number of monochromatic solutions of integer linear systems on abelian groups. *European J. Combin.* 35 (2014), 459–473.
- A removal lemma for linear systems in finite fields
D. Král, O. Serra and L. Vena, A removal Lemma for systems of linear equations in finite fields, *Israel J. Math.* 187 (2012), 193–207.

Publications

Preprints

- Anna Lladó, Hamid Mokhtar, Oriol Serra, Sanming Zhou, Distance-constrained labellings of Cartesian products of graphs, arXiv:2006.09690
- Josep Díaz, Öznur Yaşar Diner, Maria Serna, Oriol Serra, On List k -Coloring Convex Bipartite Graphs, arXiv:2002.02729
- Gonzalo Fiz Pontiveros, Simon Griffiths, Matheus Secco, Oriol Serra, Deviation probabilities for arithmetic progressions and other regular discrete structures, arXiv:1910.12835
- Javier Cilleruelo, Oriol Serra, Maximilian Wötzel, Sidon set systems, arXiv:1802.10511

Published Papers (last 5 years)

- Candela, Pablo; Serra, Oriol; Spiegel, Christoph A step beyond Freiman's theorem for set addition modulo a prime. *J. Théor. Nombres Bordeaux* 32 (2020), no. 1, 275–289.
- Böröczky, Károly J.; Matolcsi, Máté; Ruzsa, Imre Z.; Santos, Francisco; Serra, Oriol Triangulations and a discrete Brunn-Minkowski inequality in the plane. *Discrete Comput. Geom.* 64 (2020), no. 2, 396–426.
- Ramaré, Olivier; Srivastav, Priyamvad; Serra, Oriol Product of primes in arithmetic progressions. *Int. J. Number Theory* 16 (2020), no. 4, 747–766.
- Serra, O.; Vena, L. Extremal families for Kruskal-Katona theorem. *Acta Math. Univ. Comenian.* 88 (2019), no. 3, 1043–1048.
- Fiz Pontiveros, G.; Griffiths, S.; Secco, M.; Serra, O. Deviation probabilities for arithmetic progressions and other regular discrete structures. *Acta Math. Univ. Comenian. (N.S.)* 88 (2019), no. 3, 679–683.
- Freiman, Gregory A.; Serra, Oriol; Spiegel, Christoph Additive volume of sets contained in few arithmetic progressions. *Integers* 19 (2019), Paper No. A34, 16 pp.
- Freiman, Gregory A.; Serra, Oriol On doubling and volume: chains. *Acta Arith.* 186 (2018), no. 1, 37–59.
- Bachoc, Christine; Serra, Oriol; Zémor, Gilles Revisiting Kneser's theorem for field extensions. *Combinatorica* 38 (2018), no. 4, 759–777.
- Diego, Víctor; Serra, Oriol; Vena, Lluís On a problem by Shapozenko on Johnson graphs. *Graphs Combin.* 34 (2018), no. 5, 947–964.
- Candela, Pablo; Rué, Juanjo; Serra, Oriol Memorial to Javier Cilleruelo: a problem list. *Integers* 18 (2018), Paper No. A28, 9 pp.
- Bachoc, Christine; Serra, Oriol; Zémor, Gilles An analogue of Vosper's theorem for extension fields. *Math. Proc. Cambridge Philos. Soc.* 163 (2017), no. 3, 423–452.
- Rué, Juanjo; Serra, Oriol; Vena, Lluís Counting configuration-free sets in groups. *European J. Combin.* 66 (2017), 281–307.
- Foucaud, Florent; Perarnau, Guillem; Serra, Oriol Random subgraphs make identification affordable. *J. Comb.* 8 (2017), no. 1, 57–77.
- Perarnau, Guillem; Serra, Oriol Correlation among runners and some results on the lonely runner conjecture. *Electron. J. Combin.* 23 (2016), no. 1, Paper 1.50, 22 pp.
- Böröczky, Károly J.; Santos, Francisco; Serra, Oriol On sumsets and convex hull. *Discrete Comput. Geom.* 52 (2014), no. 4, 705–729.
- Perarnau, G.; Serra, O. On the tree-depth of random graphs. *Discrete Appl. Math.* 168 (2014), 119–126.
- Montejano, Amanda; Serra, Oriol Counting patterns in colored orthogonal arrays. *Discrete Math.* 317 (2014), 44–52.
- Serra, Oriol; Vena, Lluís On the number of monochromatic solutions of integer linear systems on abelian groups. *European J. Combin.* 35 (2014), 459–473.

Dissemination Papers

- Oriol Serra, Límits de graphs (Catalan) , Butlletí de la Societat Catalana de Matemàtiques, Vol. 35 (1) 2020
- Marc Noy, Oriol Serra. Perspectives in combinatorics (in Spanish). Boletín del a Real Soceidad Española de Matemáticas 19 (2016)
- Plagne, Alain; Lladó, Anna; Serra, Oriol. Yahya Ould Hamidoune, 1948–2011. (Catalan) SCM Not. No. 32 (2012), 14–17.
- Lugosi, Gábor; Serra, Oriol Endre Szemerédi, 2012 Abel Prize. (Catalan) Butl. Soc. Catalana Mat. 28 (2013), no. 1, 87–115, 118.
- Plagne, Alain; Serra, Oriol; Zémor, Gilles Yahya Ould Hamidoune's mathematical journey: a critical review of his work. European J. Combin. 34 (2013), no. 8, 1207–1222.
- Serra, Oriol. Endre Szemerédi, 2012 Abel Prize. (Catalan) SCM Not. No. 33 (2013), 42–43.
- Serra, Oriol The Brunn-Minkowski inequality. (Catalan) Butl. Soc. Catalana Mat. 26 (2011), no. 2, 185–220, 223.
- Serra, Oriol. 2006 Fields Medal: Terence Tao. (Catalan) SCM Not. No. 23 (2007), 52–53.
- Serra, Oriol. Andrei Nikolaievich Kolmogorov (1903–1987). (Catalan) SCM Not. No. 19 (2003), 10–12.
- Serra, Oriol Additive problems and Cayley graphs. (Spanish) Gac. R. Soc. Mat. Esp. 4 (2001), no. 3, 639–648.

Conferences, Workshops and Schools

Chair, PC member or Organizer (last 5 years)

- EuroComb 2019, European Conference on Combinatorics, Graph Theory and applications, Bratislava. <http://eurocomb2019.uniba.sk>
- CSASC 2018, Joint meeting of the Czech, Slovak, Austrian, Slovenian and Catalan Mat societies, Bratislava 2018 <http://www.math.sk/csasc2018>
- The Music of Numbers: a tribute to Javier Cilleruelo, 2017, ICMAT Madrid <http://musicofnumbers.kissr.com/>
- Random Discrete Structures and Beyond, Barcelona, June 2017 <https://bgsmath.cat/event/random-discrete-structures-and-beyond/>
- DMD 2018, Discrete Mathematical Days, Sevilla <http://congreso.us.es/dmd2018>
- CSASC 2016, Joint meeting of the Czech, Slovak, Austrian, Slovenian and Catalan Math. societies, Barcelona <http://csasc2016.espais.iec.cat/>
- IWONT 2016, International Workshop of Optimal Network Topologies, Tingshua Sanya http://ymsc.tsinghua.edu.cn/sanya/2016/IWONT2016/synopsis_and_organizers.aspx
- Gregory Freiman celebration, 2016, Tel Aviv <http://www.math.tau.ac.il/~nogaa/FREIMAN/>
- DMD 2016, Discrete Mathematical Days, Barcelona <http://discretemath.upc.edu/jmda16/>
- A conference celebrating 65th birthday of R. Balasubranian, 2015, Chennai <https://sites.google.com/site/aconferenceinnumbertheory/>
- EuroComb 15, European Conference on Combinatorics, Graph Theory and applications, Bergen <https://eurocomb2015.w.uib.no/>

- Barcelona Mathematical Days, 2014, Barcelona <http://bmd2014.espais.iec.cat/>
- JMDA 2014, Jornadas de Matemàtica Discreta y Algorítmica, Tarragona, Spain
<http://deim.urv.cat/~discrete-math/JMDA2014/>
- CIMPA Research School Graph labelings, graph decompositions and Hamiltonian cycles, Vientiane 2014 (Laos)
<http://archive.schools.cimpa.info/archivesecoles/20150209150855/index.html/>

Invited talks or Lecturer in Schools

- British Combinatorial Conference, Birmingham, July 2019
<https://www.birmingham.ac.uk/research/activity/mathematics/combinatorics-probability-algorithms/bcc/bcc-2019.aspx>
- DIAMANT Symposium, Eindhoven, April 2019
<http://websites.math.leidenuniv.nl/diamant/index.php?pid=symposium1904programme>
- 7th Polish Combinatorial conference, Bedlewo, 2018 <https://7pcc.tcs.uj.edu.pl/>
- 21st International Workshop for Young Mathematicians, Krakow 2018
<http://kmsuj.im.uj.edu.pl/workshop/index.php?action=publ>
- IRP on Discrete, Combinatorial and Computational Geometry, CRM 2018
http://www.crm.cat/en/Activities/Curs_2017-2018/Pages/IRP-on-Discrete,-Combinatorial-and-Computational-Geometry.aspx
- Discretaly: A Workshop on Discrete Mathematics, Roma, February 2018
<https://sites.google.com/site/discretaly/>
- Journées Combinatoire et Algorithmes du Littoral Méditerranéen, Barcelona, 2018
<http://www.lirmm.fr/~sau/JCALM-2018-Bcn-Eng>
- Interactions with Combinatorics, June 2017, University of Birmingham
<http://web.mat.bham.ac.uk/A.Treglown//interactionscombinatorics>
- Interactions of harmonic analysis, combinatorics and number theory, Barcelona May 2017
<https://bgsmath.cat/event/interactions-of-harmonic-analysis-combinatorics-and-number-theory-2>
- Bordeaux Graph Workshop, Bordeaux, November 2016 <http://bgw.labri.fr/2016/>
- Additive Combinatorics in Bordeaux, Bordeaux, April 2016
<https://indico.math.cnrs.fr/event/972/overview>
- Cargèse fall school on random graphs, Cargèse (Corsica), September 2015
<https://math.unice.fr/~dmitsche/Fallschool/Fallschool.html>
- Additive Combinatorics in Marseille 2015, CIRM, September 2015 https://www.cirm-math.fr/Listes/liste_pre_verif.php?id_renc=1107&num_semaine=0
- Workshop on Algebraic Combinatorics, Tilburg, June 2015
<https://workshoponalgebraiccombinatorics2015.weebly.com/>
- Bordeaux Graph Workshop 2014, Bordeaux November 2014 <http://bgw.labri.fr/2014/>

- Jornadas de Matemática Discreta y Algorítmica, JMDA2014, Tarragona, July 2014
<http://deim.urv.cat/~discrete-math/JMDA2014/>
- Second Joint International Meeting of the Israel Mathematical Union and the American Mathematical Society, Tel Aviv, June 2014
<https://imudotorgdotil.wordpress.com/Meetings/IMUAMS2014/>
- Workshop on Diophantine Problems, Graz, May 2014 <http://fuchsc.sbg.ac.at/fwf/Graz-Salzburg-Workshop.pdf>

Editorial Work (Guest Editor or Editorial Board)

- Oriol Serra, Jozef Siran and Sanming Zhou (Guest editors) IWONT 2016, J. of Interconnection Networks (2017)
- J. Nešetřil, O. Serra (Guest Editors) Combinatorics, Graph Theory and Applications, European J. Combin. 66 (2015)
- A. Plagne, O. Serra, G. Zémor (Guest Editors) Dedicated to Yahya O. Hamidoune, Europ. J. Combin. 34 (2013)
- J. Cilleruelo, O. Serra (Guest Editors) Additive Combinatorics, CRM Advanced Course Series, Birkhauser (2010)
- Márquez, Alberto; Nešetřil, Jaroslav; Serra, Oriol, (Guest Editors) Combinatorics, Graph Theory and Applications, European J. Combin. 30 (2009)
- Nešetřil, Jaroslav; Serra, Oriol (Guest Editors) Homomorphisms: structure and highlights, European J. Combin. 29 (2008)
- J. Kratochvíl, A. Proskurovsky, O. Serra (Guest Editors) Optimization Problems, Graph Classes and Width Parameters, Discrete Applied Mathematics (2005) Guest editor
- Nešetřil, Jaroslav; Noy, Marc, Serra, Oriol (Guest Editors) Combinatorics, Graph Theory and applications, Discrete Mathematics, Volume 273, Issues 1-3, (2003)
- Butlletí de la Societat Catalana de Matemàtiques, Editor in Chief (2005-2009)
- Integers. Electronic Journal on Combinatorial Theory, Editorial Board (from 2010)
- Electronic Journal of Graph Theory and Applications, Editorial Board (from 2012)
- Publicacions Matemàtiques, Editorial Board (from 2018)

Posts and responsibilities

Chair of the Department of Mathematics, UPC (2011-2017)

Member of the Scientific Committee of Barcelona Graduate School of Mathematics (2015-2016)

Member of the Executive Committee of Barcelona Graduate School of Mathematics (2012-2015)

Member of the Council of the European Mathematical society (2012-2017)

Vice-Dean of Research, School of Mathematics UPC (2007-2011)

Director of the Research Office for Mathematics, OSRM (2003-2009)
Member of the Executive Committee of the Catalan Mathematical Society (2007-2015)
Scientific Board of Ingenio Mathematica I-Math (2007-2009)
Scientific Board of Centre de Recerca Matemàtica, Barcelona (2001-2006)

PhD Students

Maximilian Wotzel (2020)
Christoph Spiegel (2020)
Guillem Perarnau (2013)
Lluís Vena (2011)
Amanda Montejano (2009)
Javier Barajas (2006)
Christian Barrientos (2003)
Sonia P. Mansilla (1998)
Ferran Hurtado (1992)
Margarida Espona (1991)

Funding

PI in competitive research projects

- Geometric, Algebraic and Probabilistic Combinatorics, MTM2017-82166-P, 2018-2020 (64000E) Spanish Research Council.
- Discete Mathematics, Logic and Algorithmics, Maria de Maeztu Excellence Program BGSMath, MDM-2014-0445, 2014-2018 (2000000E), Spanish Research Council.
- Discrete geomteric and random structures, MTM2014-54745-P, 2014-2018, (74000E), Spanish Research Council.
- Geosumsets, PIEF-GA-2009-235136, 2010-2012 (200000E) European Union
- Combinatorics, Graph Theory and applications 2009SGR1387, 2009-2013, (40000E), Catalan Research Council
- Extremal problems in Combinatorics, MTM2005-08990-C02-01, 2005-2008, (80000E), Spanish Research Council.
- Combinatorics, Graph Theory and applications 2005SGR00256, 2005-2008, (40000E), Catalan Research Council
- Discrete isoperimetric inequalities, MCyT/BFM2002-00412, 2002-2005, (74000E), Spanish Research Council.