# Oriol Serra

Short CV (updated March 2022)

## 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 Brun-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

### Published Papers (last 5 years)

- Fiz Pontiveros, Gonzalo; Griffiths, Simon; Secco, Matheus; Serra, Oriol Deviation probabilities for arithmetic progressions and other regular discrete structures. Random Structures Algorithms 60 (2022), no. 3, 367–405.
- Bartłomiej Bosek, Jarosław Grytczuk, Grzegorz Gutowski, Oriol Serra, Mariusz Zając, Graph polynomials and group coloring of graphs, European Journal of Combinatorics, Volume 102 (2022) 103505.
- Anna Lladó, Hamid Mokhtar, Oriol Serra, Sanming Zhou, Distance-constrained labellings of Cartesian products of graphs, Discrete Appl. Math. 304 (2021), 375–383.
- Candela, Pablo; Catalá, Carlos; Rué, Juanjo; Serra, Oriol On Motzkin's problem in the circle group. Proc. Steklov Inst. Math. 314 (2021), no. 1, 44–63.
- Cilleruelo, Javier; Serra, Oriol; Wötzel, Maximilian Sidon set systems. Rev. Mat. Iberoam. 36 (2020), no. 5, 1527–1548.
- 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.
- 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, Lluis 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.

### 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 6 years)

- EuroComb 2021, European Conference on Combinatorics, Graph Theory and applications, Barcelona EUROCOMB 2021 – Webpage of the EuroComb 2021 (upc.edu)
- 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, Chennaihttps://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, Vientianne  2014 (Laos)
  http://archive.schools.cimpa.info/archivesecoles/20150209150855/index.html/


## Invited talks or Lecturer in Schools

- Colloquia in Combinatorics, May 2021, London
- Krakow Combinatorics Seminar, May 2021, Krakow
- Nachmittagsseminar, June  2021, Ilmenau
- Combinatorics Today Series,  April 2021, Bandung (Indonesia)
- 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 201 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. Nesetril, 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. Kratochvil, 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 Thoery, Editorial Board (from 2010)
- Electronic Journal of Graph Theory and Applications, Editorial Board (from 2012)
- Publicacions Matemàtiques, Editorial Board (form 2018)

## Posts and responsabilities

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.