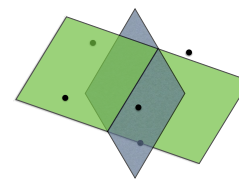


# Pablo Soberón

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Webpage: <http://www.psoberon.com>

Date of Birth: May 24th, 1988—Cuernavaca, Mexico.

Nationality: Mexican

Languages: Spanish, French, English

## Academic positions

2023-Present	Associate Professor. The Graduate Center, City University of New York. New York, USA.
2023-Present	Associate Professor. Baruch College, City University of New York. New York, USA.
2021-2023	Assistant Professor. The Graduate Center, City University of New York. New York, USA.
2018-2023	Assistant Professor. Baruch College, City University of New York. New York, USA.
2015-2018	Andrei Zelevinsky Postdoctoral Research Instructor. Northeastern University. Boston, USA.
2013-2015	Postdoctoral Assistant Professor. University of Michigan. Ann Arbor, USA.
2008-2010	Teaching Assistant A (Ayudante de profesor). Universidad Nacional Autónoma de México, Mexico.

## Education

2006-2010	BA in Mathematics, Universidad Nacional Autónoma de México Graduated with honors Thesis title: Perforando convexos ( <i>Piercing convex sets</i> ) Thesis supervisor: Luis Montejano
2010-2013	PHD in Mathematics, University College London Primary supervisor: Imre Bárány Secondary supervisor: Keith Ball Thesis title: Partition Problems in Discrete Geometry Available at <a href="http://discovery.ucl.ac.uk/1398297/">http://discovery.ucl.ac.uk/1398297/</a>

## Research interests

I am interested in the interaction between combinatorics, algebraic topology, and linear algebra. I have focused my research on discrete geometry and topological combinatorics.

## Grants / Fellowships

### External

2024-2030	NSF S-STEM Grant 2325822. <i>Sustained Cascade Mentoring in Mathematics</i> . Principal Investigator(s): Pablo Soberón. Co-PIs: Guy Moshkovitz, Tim Ridenour.
2023-2028	NSF DMS CAREER Grant 2237324. <i>CAREER: Discrete Geometry at the crossroads of Combinatorics and Topology</i>

Principal Investigator(s): Pablo Soberón

- 2021-2024 NSF DMS Grant 2054419. *Topology and Linear Algebra in Discrete Geometry*.  
Principal Investigator(s): Pablo Soberón
- 2021-2024 NSF REU site Grant DMS 2051026. *REU Site: New York City Discrete Mathematics REU*.  
Principal Investigator(s): Adam Sheffer. Co-PI: Pablo Soberón
- 2018-2021 NSF DMS Grant 1851420. *Combinatorial Properties of Convex Sets and Measures in Euclidean spaces*  
Principal Investigator(s): Pablo Soberón.
- 2019-2022 National Researcher Level 1 - CONACyT (Mexico)  
Sistema Nacional de Investigadores, Nivel 1.

### Internal

- 2023-2024 PSC CUNY research award, type B. Period 54  
Principal Investigator(s): Pablo Soberón
- 2021-2022 PSC CUNY research award, type B. Period 52  
Principal Investigator(s): Pablo Soberón
- 2020-2021 PSC CUNY research award, type B. Period 51  
Principal Investigator(s): Pablo Soberón
- 2019-2020 PSC CUNY research award, type B. Period 50  
Principal Investigator(s): Pablo Soberón

## Research papers and manuscripts

Citations count by engine:

Google Scholar: <https://scholar.google.com/citations?user=3moLEYcAAAAJ>

Scopus Author ID: 36873280200

ORCID: <http://orcid.org/0000-0003-2347-4279>

Papers with (\*) have undergraduate students as coauthors.

Number of papers with undergraduate coauthors: 14

- 2026a. 1 P. Soberón *KKM theorems and discrete geometry beyond matroids*  
arXiv version: <https://arxiv.org/abs/2606.16832>
- 2026b. 2 P. Soberón *Tverberg cores and Kalai's cascade conjecture*  
arXiv version: <https://arxiv.org/abs/2605.21305>
- 2026c. 3(\*) C. Yu and P. Soberón *High-dimensional envy-free partitions*  
*Combinatorial Theory* **6** (1), #11 1–18  
arXiv version: <https://arxiv.org/abs/2311.09905>
- 2026d. 4 P. Soberón *An elementary proof of Sierksma's conjecture for seven points in the plane*  
arXiv version: <https://arxiv.org/abs/2604.18485>
- 2025a. 5 P. Soberón *Fair distribution of bundles*  
To appear in *Proc. Amer. Math. Soc.*  
arXiv version: <https://arxiv.org/abs/2507.13421>
- 2025b. 6(\*) D. Lessure and P. Soberón *Partitions of mass assignments with spheres and wedges*  
arXiv version: <https://arxiv.org/abs/2507.06919>
- 2025c. 7(\*) T. Edwards and P. Soberón *Extensions of discrete Helly theorems for boxes*  
*SIAM J. Discrete Math.* **39** (2), 1349–1362  
arXiv version: <https://arxiv.org/abs/2404.14308>
- 2025d. 8 D. Oliveros, É. Roldán, P. Soberón and A. J. Torres *Tverberg Partition Graphs*  
*SIAM J. Discrete Math.* **39** (2), 863–880  
arXiv version: <https://arxiv.org/abs/2310.08563>

- 2025e. 9 P. Schnider and P. Soberón *Cookie cutters: Bisections with fixed shapes*  
Adv. Appl. Math. 171, 10257  
arXiv version: <https://arxiv.org/abs/2502.17176>
- 2025f. 10 P. Soberón *Tverberg's theorem and multi-class support vector machines*  
Found. Data Sci. **7** (2): 568-580 doi: 10.3934/fods.2024039  
arXiv version: <https://arxiv.org/abs/2404.16724>
- 2024a. 11(\*) I. Axelrod-Freed and P. Soberón *Bisections of mass assignments using flags of affine spaces*  
Discrete Comput. Geom. **72** (2), 550–568  
arXiv version: <https://arxiv.org/abs/2109.13106>
- 2024b. 12 N. Sadovek and P. Soberón *Bisections of mass assignments by parallel hyperplanes*  
arXiv version: <https://arxiv.org/abs/2412.04058>
- 2024c. 13 N. Sadovek and P. Soberón *Complex analogues of the Tverberg–Vrećica conjecture and central transversal theorems*  
To appear in Trans. Amer. Math. Soc.  
arXiv version: <https://arxiv.org/abs/2408.14337>
- 2024d. 14(\*) Michael N. Manta and P. Soberón, *Generalizations of the Yao–Yao partition theorem and central transversal theorems*  
Discrete Comput. Geom. **71** (4) pp. 1381–1402  
arXiv version: <https://arxiv.org/abs/2107.06233>
- 2024e. 15 A. Hubard and P. Soberón *Bisecting masses with families of parallel hyperplanes*  
arXiv version: <https://arxiv.org/abs/2404.14320>
- 2024f. 16 P. Soberón and S. Zerbib *Improved Tverberg theorems for certain families of polytopes*  
arXiv version: <https://arxiv.org/abs/2404.11533>
- 2023a. 17(\*) P. Soberón and Y. Takahashi *Lifting methods in mass partition problems*  
Int. Math. Res. Not. IMRN, **2023** (16) pp.14103-14130 <https://doi.org/10.1093/imrn/rnac224>  
arXiv version: <https://arxiv.org/abs/2109.03749>
- 2023b. 18(\*) C. Donovan, D. Paulson, and P. Soberón *Colorful and Quantitative Variations of Krasnosselsky's Theorem*  
arXiv version: <https://arxiv.org/abs/2304.04828>  
To appear in Studia Sci. Math. Hungar.
- 2023c. 19 P. Schnider and P. Soberón *Combinatorial Depth Measures for Hyperplane Arrangements*  
Proceedings of Symposium of Computational Geometry 2023 55:1 - 55:14 <https://doi.org/10.4230/LIPIcs.SoCG.2023.55>  
arXiv version: <https://arxiv.org/abs/2302.07768>
- 2022a. 20 P. Soberón *Fair distributions for more participants than allocations*  
Proc. Amer. Math. Soc., Ser. B **9** pp. 404–414  
arXiv version: <https://arxiv.org/abs/2110.03600>
- 2022b. 21(\*) J. P. Carvalho and P. Soberón *Counterexamples to the Colorful Tverberg Conjecture for Hyperplanes*  
Acta Mathematica Hungarica **167**, 385–392  
arXiv version: <https://arxiv.org/abs/2108.07680>
- 2022c. 22(\*) S. Sarkar and P. Soberón *Tolerance for colorful Tverberg partitions*  
European J. Combin. **103**, paper 103527.  
arXiv version: <https://arxiv.org/abs/2005.13495>
- 2022d. 23 E. Roldán-Pensado and P. Soberón *A survey of mass partitions*  
Bull. Amer. Math. Soc. **59** (2), pp. 227–267  
arXiv version: <https://arxiv.org/abs/2010.00478>
- 2022e. 24(\*) J. A. Messina and P. Soberón *Isometric and affine copies of a set in volumetric Helly results*  
Comput. Geom. **103**, paper 101855  
arXiv version: <https://arxiv.org/abs/2010.04135>
- 2021a. 25(\*) P. Soberón and Y. Tang *Tverberg's theorem, disks, and Hamiltonian cycles*  
Ann. Comb. **25** pp. 995–1005  
arXiv version: <https://arxiv.org/abs/2011.12218>
- 2021b. 26(\*) S. Sarkar, A. Xue, and P. Soberón *Quantitative combinatorial geometry for concave functions*  
J. Combin. Theory Ser. A. **182** article 105465  
arXiv version: <https://arxiv.org/abs/1908.04438>
- 2021c. 27(\*) A. Xue and P. Soberón *Balanced convex partitions of lines in the plane*  
Discrete Comput. Geom. **66**(3) pp. 1150–1167  
arXiv version: <https://arxiv.org/abs/1910.06231>
- 2021d. 28(\*) T. Dillon and P. Soberón *A mélange of diameter Helly-type theorems*

SIAM J. Discrete Math. **35** (3) pp.1615–1627

arXiv version: <https://arxiv.org/abs/2008.13737>

2021e. 29 E. Schulte, P. Soberón, and G. I. Williams, *Prescribing Symmetries and Automorphisms for Polytopes*  
Polytopes and Discrete Geometry, Contemporary Mathematics **764**, American Mathematical Society  
pp.221–233.

arXiv version: <https://arxiv.org/abs/1902.05439>

2021f. 30 A. Chirvasitu, F. Ladisch, and P. Soberón *Finite groups as prescribed polytopal symmetries*

Israel J. Math. **245**(1) pp. 75–91

arXiv version: <https://arxiv.org/abs/1907.10022>

2020a. 31 J. Fallon, K. Hogenson, L. Keough, M. Lomelí, M. Schaefer, and P. Soberón *A Note on the Maximum  
Rectilinear Crossing Number of Spiders*

J. Combin. Math. Combin. Comput. **113** pp 127–139

arXiv version: <http://arxiv.org/abs/arXiv:1808.00385>

2019a. 32 P.V.M. Blagojević, N. Palić, P. Soberón, and G.M. Ziegler, *Cutting a part of many measures*

Forum of Mathematics, Sigma **7** E37

arXiv version: <https://arxiv.org/abs/1710.05118>

2019b. 33 P. Soberón, *Tverberg partitions as weak epsilon-nets.*

Combinatorica **39** (2) pp 447–458.

arXiv version: <http://arxiv.org/abs/1711.11496>

2018a. 34 I. Bárány and P. Soberón, *Tverberg plus minus*

Discrete Comput. Geom. **60** (3) pp.588–598

arXiv version: <https://arxiv.org/abs/1612.05630>

2018b. 35 I. Bárány and P. Soberón, *Tverberg’s theorem is 50 years old: a survey*

Bull. Amer. Math. Soc. **55** (4) pp.459–492

arXiv version: <http://arxiv.org/abs/1712.06119>

2018c. 36 P. Soberón, *Robust Tverberg and colorful Carathéodory results via random choice*

Combinatorics, Probability and Computing. **27** (3) pp.427–440

arXiv version: <http://arxiv.org/abs/arXiv:1606.08790>

2018d. 37 P.V.M. Blagojević and P. Soberón, *Thieves can make sandwiches*

Bull. London Math. Soc. **50** (1) pp.108–123

arXiv version: <http://arxiv.org/abs/arXiv:1706.03640>

2017a. 38 A. Barvinok and P. Soberón, *Computing the Partition Function for Graph Homomorphisms.*

Combinatorica **37** (4) pp.633–650.

arXiv version: <http://arxiv.org/abs/1410.1842>

2017b. 39 P. Soberón, *Tensors, colors, and convex hulls*

Discrete Geometry and Convexity: in honour of Imre Bárány. Edited by Gergely Ambrus, Károly J.  
Böröczky and Zoltán Füredi. pp.97–101

ISBN 978 963 279 963 6

2017c. 40 J.A. De Loera, R. N. La Haye, D. Rolnick, and P. Soberón, *Quantitative Tverberg theorems over lattices  
and other discrete sets*

Discrete Comput. Geom. **58** (2) pp.435–458

arXiv version: <http://arxiv.org/abs/arXiv:1603.05525>

2017d. 41 D. Rolnick and P. Soberón, *Quantitative  $(p, q)$  theorems in combinatorial geometry.*

Discrete Math. **340** (10) pp.2516–2527

arXiv version: <http://arxiv.org/abs/1504.01642>

2017e. 42 A. Magazinov and P. Soberón, *Positive-fraction intersection results and variations of weak epsilon-nets.*

Monatsh. Math. **183** (1) pp.165–176.

arXiv version: <http://arxiv.org/abs/1506.02191>

2017f. 43 J.A. De Loera, R. N. La Haye, D. Rolnick, and P. Soberón, *Quantitative combinatorial geometry for  
continuous parameters*

Discrete Comput. Geom. **57**(2) pp.318–334

arXiv version: <http://arxiv.org/abs/arXiv:1603.05523>

2017g. 44 N. Amenta, Jesús A. De Loera, and P. Soberón *Helly’s Theorem: New Variations and Applications.*

Chapter in “Algebraic and Geometric Methods in Discrete Mathematics: AMS Special session on Alge-  
braic and Geometric Methods in Applied Discrete Mathematics”, Contemporary Math. **685**, published  
by American Math. Soc., edited by Heather A. Harrington, Mohamed Omar, and Matthew Wright. pp.  
55-95

arXiv version: <http://arxiv.org/abs/1508.07606>

- 2016a. 45 R. N. Karasev, E. Roldán-Pensado, and P. Soberón, *Measure Partitions Using Hyperplanes with Fixed Directions*  
Israel J. Math. **212**(2) pp 705–708  
arXiv version: <http://arxiv.org/abs/1408.4830>
- 2016b. 46 D. Rolnick and P. Soberón *Algorithmic aspects of Tverberg’s Theorem*  
arXiv version: <http://arxiv.org/abs/arXiv:1601.03083>
- 2016c. 47 A. Barvinok and P. Soberón, *Computing the Partition Function for Graph Homomorphisms with Multiplicities*.  
J. Combin. Theory, Ser. A **137** pp. 1–26  
arXiv version: <http://arxiv.org/abs/1406.1771>
- 2016d. 48 P. Soberón *Helly-type theorems for the diameter*  
Bull. Lond. Math. Soc. **48** (4): 577–588.  
arXiv version: <http://arxiv.org/abs/1509.07908>
- 2015a. 49 (Journal version of 2013a) P. Soberón, *Equal coefficients and tolerance in coloured Tverberg partitions*  
Combinatorica **35**(2) pp. 235–252  
arXiv version: <http://arxiv.org/abs/1204.1202>
- 2015b. 50 J. Jerónimo-Castro, A. Magazinov, and P. Soberón *On a Problem by Dol’nikov*.  
Discrete Math. **338**(9) pp 1577–1585  
arXiv version: <http://arxiv.org/abs/1310.4714>
- 2015c. 51 A. Montejano, L. Montejano, E. Roldán-Pensado, and P. Soberón *About an Erdős-Grünbaum conjecture concerning piercing of non bounded convex sets*.  
Discrete Comput. Geom. **53**(4) pp 941–950  
arXiv version: <http://arxiv.org/abs/1407.0642>
- 2014a. 52 E. Roldán-Pensado and P. Soberón *An Extension of a Theorem by Yao & Yao*. Discrete Comput. Geom. **51**(2), pp.285–289  
arXiv version: <http://arxiv.org/abs/1112.5737>
- 2013a. 53 P. Soberón *Equal coefficients and tolerance in coloured Tverberg partitions*. Proceedings of the 29th Annual Symposium on Computational Geometry. pp91–96.  
Journal version is item 2015a, arXiv version: <http://arxiv.org/abs/1204.1202>
- 2012a. 54 P. Soberón *Balanced Convex Partitions of Measures in  $\mathbb{R}^d$* . Mathematika **58**, pp.71–76, doi:10.1112/S0025579311001914  
arXiv version: <https://arxiv.org/abs/1010.6191>
- 2012b. 55 P. Soberón and R. Strausz *A Generalisation of Tverberg’s Theorem*.  
Discrete Comput. Geom. **47**(3), pp.455–460, doi: 10.1007/s00454-011-9379-z
- 2011a. 56 L. Montejano and P. Soberón *Piercing Numbers for Balanced and Unbalanced Families*.  
Discrete Comput. Geom. **45**(2), pp.358–364. doi:10.1007/s00454-010-9295-7

## Popularization/Outreach Publications

- 2017 P. Soberón *Gerrymandering, Sandwiches, and Topology*. Notices of the American Mathematical Society **64** (9), pp. 1010–1013  
<http://www.ams.org/publications/journals/notices/201709/rnoti-p1010.pdf>
- 2010 *El principio de las casillas (The Pigeonhole Principle, in Spanish)*. Tzaloa, 2010 (2) pp. 1–6 . Tzaloa is a popularization journal published by the Mexican Mathematical Olympiad. <http://www.ommenlinea.org/wp-content/uploads/2014/01/10-2.pdf>

## Editorial Work.

- 2022-present Associate editor for USA(J)MO (the United States of America Mathematical Olympiad and the United States of America Junior Mathematical Olympiad).

## Selected awards

- 2021 Feliks Gross award. CUNY.
- 2012 Davenport Prize in Pure Mathematics. University College London.
- 2009a Special Gold Medal. I CIIM (*Iberoamerican Interuniversity Mathematical Competition*) Girardot, Colombia.

- 2009b Gold Medal. XII Iberoamerican Mathematical Olympiad for University.
- 2006a Bronze Medal. Asian Pacific Mathematical Olympiad
- 2006b Gold Medal. XXI Iberoamerican Mathematical Olympiad.  
Guayaquil, Ecuador
- 2006c Gold Medal. XLVII International Mathematical Olympiad  
Ljubljana, Slovenia.
- 2005a Silver Medal. Asian Pacific Mathematical Olympiad
- 2005b Bronze Medal. XLVI International Mathematical Olympiad  
Mérida, Mexico.
- 2005c Silver Medal. XX Iberoamerican Mathematical Olympiad.  
Cartagena de Indias, Colombia.
- 2004 Gold Medal. VI Central American and the Caribbean Mathematical Olympiad. Managua, Nicaragua.

## Books

- 2013 *Problem-Solving Methods in Combinatorics: an Approach to Olympiad Problems*. Birkhäuser Basel. 174 p. 65 illus., 10 in color. ISBN 978-3-0348-0596-4
- 2010 *Combinatoria para Olimpiadas Internacionales*. Instituto de Matemáticas, UNAM. Series *Cuadernos de olimpiada*. ISBN 978-607-02-1710-4. Note: this is a Spanish version of the book above, distributed by the Mexican Mathematical Olympiad.

## Undergraduate Students Research Mentoring

Students with (\*) are coauthors in research papers.

- 2024 Deron Lessure (\*, Oberlin College), Iris Ye (Carnegie Mellon University)
- 2023 Timothy Edwards (\*, Gannon University), Christina Yu (\*, MIT)
- 2022 Connor Donovan (\*, Ursinus College), Danielle Paulson (\*, Harvard University)
- 2021 Ilani Axelrod-Freed (\*, MIT), João Pedro Carvalho (\*, Haverford), Michael N. Manta (\*, Caltech), Yuki Takahashi (\*, Grinnell)
- 2020 Phillip Chen (Baruch), Travis Dillon (\*, Lawrence University) John A. Messina (\*, NYU), Kukai Nakahata (Baruch), Shawn Roy (Baruch), Yaqian Tang (\*, Wesleyan)
- 2019 Sherry Sarkar (\*, Georgia Tech), Alexander Xue (\*, Cornell)
- 2017 Christina Nguyen (Northeastern)
- 2016 Adam Tobey (Northeastern).

## Teaching

- 2024a. MTH 4150 (Combinatorics). Baruch College, CUNY. Fall term, one section.
- 2024b. MTH 4005 (Problem-solving seminar). Baruch College, CUNY. Fall term, one section.
- 2024c. MTH 2610 (Calculus). Baruch College, CUNY. Spring term, one section.
- 2024d. MTH 4100 (Linear Algebra and Matrix Methods). Baruch College, CUNY. Spring term, one section.
- 2023a. MTH 4010 (Analysis). Baruch College, CUNY. Spring term, one section.
- 2022a. MTH 4030 (Topology). Baruch College, CUNY. Fall term, one section.
- 2022b. MTH 4100 (Linear Algebra and Matrix Methods). Baruch College, CUNY. Spring term, one section.
- 2021a. MTH 4005 (Problem-solving seminar). Baruch College, CUNY. Fall term, one section.
- 2021b. MTH 2610 (Calculus I). Baruch College, CUNY. Spring term, one section.
- 2021b. MTH 4100 (Linear Algebra and Matrix Methods). Baruch College, CUNY. Spring term, one section.
- 2020a. MTH 4005 (Problem-solving seminar). Baruch College, CUNY. Fall term, one section
- 2020b. MTH 4100 (Linear Algebra and Matrix Methods). Baruch College, CUNY. Spring term, one section.
- 2019a. MTH 4005 (Problem-solving seminar). Baruch College, CUNY. Fall term, one section
- 2019b. MTH 4100 (Linear Algebra and Matrix Methods). Baruch College, CUNY. Spring term, one section.
- 2019b. MTH 2610 (Calculus I). Baruch College, CUNY. Spring term, one section.
- 2018a. MTH 4430 (Mathematics of Inferential Statistics). Baruch College, CUNY. Fall term, one section.
- 2018b. MTH 2003 (Precalculus). Baruch College, CUNY. Fall term, one section.
- 2018c. “Dividiendo votos, pasteles y mapas: matemáticas y algoritmos”. *Dividing votes, cakes and maps*:

*mathematics and algorithms.* One-week summer course for high-school and undergraduate students, part of the project “Clubes de ciencias”. Ensenada, Mexico.

- 2018d Math 3150 (Introduction to Real Analysis). Northeastern University. Spring term, one section.
- 2018e Math 2331 (Linear Algebra). Northeastern University. Spring term, one section.
- 2017a Math 3150 (Introduction to Real Analysis). Northeastern University. Fall term, one section.
- 2017b Math 3150 (Introduction to Real Analysis) at Northeastern University. Spring term, one section.
- 2016a Math 2321 (Calculus 3 for Science and Engineering) at Northeastern University. Fall term, two sections.
- 2016a Teaching Methods in Mathematics Workshop (“*Métodos de enseñanza de matemáticas para alumnos del Siglo XXI*”), June 29th to July 1st, 24 hours, ITESM Estado de México, Mexico.
- 2016b Math 2331 (Linear Algebra). Northeastern University. Spring term, two sections.
- 2015a Math 1342 (Calculus 2 for Science and Engineering) at Northeastern University. Fall term, one section.
- 2015b Math 216 (Introduction to Differential Equations). The University of Michigan. Winter term, two sections.
- 2014a Math 216 (Introduction to Differential Equations). University of Michigan. Winter term, two sections.
- 2014b Math 116 (Calculus 2). University of Michigan. Fall term, two sections.
- 2013 Math 115 (Calculus 1). University of Michigan. Fall term, two sections.
- 2011 Combinatorics for international olympiads. “Workshop for olympiad trainers”. 12 hours. San Luis Potosí, Mexico.
- 2009 Geometry problem-solving workshop. “Workshop for olympiad trainers”. 8 hours. Guanajuato, Mexico.
- 2008-2010 Teaching Assistant A. UNAM. Courses included: Analytic Geometry I, Analytic Geometry II, Complex Variable I, Convex Sets. Mexico City, Mexico.
- 2007-2010 Training the Mexican teams for international mathematical olympiads.
- 2007 Inequalities problem-solving workshop. “Workshop for olympiad trainers”. 8 hours. Guanajuato, Mexico.

## Other activities / Broader impacts

- 2025a Mini-course instructor. Topological Methods in Combinatorics (summer school). Iowa State University. Ames, Iowa.
- 2025b Instructor. Math Olympiad Program (MOP). Aurora, Illinois
- 2024a Organizer of NYC Discrete Mathematics REU.
- 2023a Organizer of NYC Discrete Mathematics REU.
- 2023b Joint with Imre Bárány, Deborah Oliveros, and János Pach. Organizer of BIRS CMO Workshop 23w5023: New Trends from Classical Theorems in Geometry, Combinatorics, and Topology. Oaxaca, Mexico.
- 2022a Joint with Egon Schulte. Organizer of a special session titled “Discrete and Convex Geometry” for AMS Spring Eastern Virtual Sectional Meeting (Meeting #1176).
- 2022b Organizer of NYC Discrete Mathematics REU.
- 2021a Organizer of conference “celebrating the 70th birthday of Luis Montejano”, virtual conference.
- 2021b Organizer of NYC Discrete Mathematics REU.
- 2020a Organizer of Baruch College Combinatorics REU.
- 2020b Coach for the Panama Mathematical Olympiad international teams. Panama City, Panama.
- 2019a Training Putnam team. Supervising Putnam mathematical competition at Baruch College.
- 2019b Organizer of Baruch College Combinatorics REU. Co-organizers: Adam Sheffer, Frank de Zeeuw.
- 2018a Training Putnam team. Supervising Putnam mathematical competition at Baruch College.
- 2018b Organizer of special session titled “Algebraic, geometric, and topological methods in combinatorics” for AMS Spring Eastern Sectional Meeting (Meeting #1139).
- 2018c Training Putnam / Organizing reading Seminar of “Proofs from the book” at Northeastern University
- 2017a Training Putnam team for Northeastern University and supervising Putnam mathematical competition at Northeastern University.
- 2017b Organizer of “Pick my brain” seminar at Northeastern University.
- 2017c Assistant at MRC (Mathematical Research Communities) Workshop “Beyond Planarity: Crossing numbers of Graphs”. Snowbird, Utah, USA.
- 2016 Training Putnam team for Northeastern University and supervising Putnam mathematical competition at Northeastern University.
- 2007-2011 Organizing committee of the Mexican Mathematical Olympiad.

2010 Leader of Mexico. XII Central American Mathematical Olympiad. Mayagüez, Puerto Rico.

2009a Research assistant of L. Montejano. Funded by CONACyT.

2009b Deputy leader of Mexico. L International Mathematical Olympiad. Bremen, Germany.

2008 Deputy leader of Mexico. XXIII Iberoamerican Mathematical Olympiad. Salvador do Bahia, Brazil.

2007 Deputy leader of Mexico. IX Central American Mathematical Olympiad. Mérida, Venezuela

## Talks in conferences/seminars

2026a. 1 Fair division of bundles. *Combinatorics seminar*. Emory University. Atlanta, Georgia.

2026b. 2 Fair division of bundles and topology. *Colby College Mathematics Colloquium*. Colby College. Waterville, Maine.

2025a. 3 Bisections of measures with hyperplane arrangements. *Graduate Center combinatorics workshop*. The Graduate Center, CUNY. New York, New York.

2024a. 4 The topological nature of fairness. *MathFest*. The Graduate Center, City University of New York. New York, NY

2024b. 5 High-dimensional Envy-free distributions. *Mathematics Colloquium*. Iowa State University. Ames, IA.

2024c. 6 High-dimensional Envy-free distributions. *DIMACS - Rutgers Discrete Mathematics Seminar Series*. Rutgers University. New Brunswick, NJ.

2024d. 7 New results on envy-free distributions. *Seminar on applications of Geometry and Topology, GEOTOP-A*. Keynote. Merida, Mexico.

2023a. 8 High-dimensional envy-free results. *Oberwolfach Workshop 2350: Geometric, Algebraic, and Topological Combinatorics*. Oberwolfach, Germany.

2023b. 9 Art Galleries, Voting Theory, and Convex sets. *Vassar College Mathematics Department Colloquium*. Poughkeepsie, NY.

2023c. 10 The central transversal theorem revisited. *MIT's Richard Stanley Seminar on Combinatorics*. Cambridge, MA.

2023d. 11 The central transversal theorem revisited. *BIRS CMO Workshop 23w5023: New trends from Classical Theorems in Geometry, Combinatorics, and Topology*. Oaxaca, Mexico.

2023e. 12 Central Transversals and Hyperplane Arrangements. *University of Washington Combinatorics Seminar*. Seattle, Washington.

2023f. 13 Central Transversals and Hyperplane Arrangements. *Special Session on Topological and Geometric Methods in Combinatorics*. 2023 AMS Spring Central Sectional Meeting. University of Cincinnati, Ohio.

2023g. 14 Lifting Methods in Mass partitions. *MSRI special session on Geometric and Topological Combinatorics*, Joint Mathematics Meetings 2023. Boston, MA.

2022a. 15 Sparse colorful results in combinatorial geometry. *BIRS workshop 22w5009: Extremal Combinatorics and Geometry* Banff, Canada.

2022b. 16 The topology of fair partitions. *Lathinx in the mathematical sciences* IPAM, UCLA.

2022c. 17 Dos resultados de particiones justas (two results about fair partitions). *Seminario Tartaglia* Universidad Autónoma de San Luis Potosí (online).

2022d. 18 The topology of mass partitions. *Feliks Gross/Henry Wasser awards lecture series*. (online).

2022e. 19 Bisection of mass assignments using flags of affine spaces. *Joint Mathematics Meetings*. Special session on Geometric and Topological Combinatorics (online).

2022f. 20 La topología de las particiones de medidas. *Cibercoloquio latinoamericano de matemáticas*. (online)

2021a. 21 Stiefel Manifolds and Mass partitions. *AMS Fall Southeastern Sectional meeting 2021*. (online)

2021b. 22 Mass partitions, transversals, and Stiefel manifolds. *Big seminar*. (Moscow Institute of Physics and Technology, online)

2021c. 23 Stiefel Manifolds and Mass partitions. *NY Geometry seminar*. (online)

2021d. 24 Quantitative Helly Theorems. *SUNY Binghamton combinatorics seminar*. (online)

2021e. 25 Quantitative Helly Theorems. *Budapest Big Combinatorics and Geometry seminar*. (online)

2021f. 26 The topological Tverberg theorem beyond prime powers. *Copenhagen-Jerusalem Combinatorics Seminar*. (online)

2021g. 27 Quantitative Helly theorems. *University of Massachusetts Lowell mathematics colloquium*. (online)

- 2021h. 28 Quantitative Helly theorems. *Bard College mathematics seminar*. (online)
- 2021i. 29 Teoremas de Helly cuantitativos. *Seminario preguntón*. Usually in Juriquilla, Querétaro (online)
- 2021j. 30 The topological Tverberg theorem beyond prime powers. *IST Austria seminar* (online)
- 2020a. 31 A glimpse of discrete geometry. *Online Undergraduate Resource Fair for the Advancement in Academia of Marginalized Mathematicians*. (online)
- 2020b. 32 The topological Tverberg theorem beyond prime powers. *Combinatorics and Geometry Days III conference*. (online)
- 2020c. 33 Variations of Convex Equipartitions of Measures. *CoSP Seminar* (online, replaced a workshop to be held in Prague)
- 2020d. 34 Teoría de Tverberg sin potencias de primos. *CCM Coloquium*. Morelia, Mexico (online).
- 2020e. 35 The topological Tverberg theorem beyond prime powers. *Combinatorial and Additive Number Theory Conference* (online).
- 2019a. 36 Barvinok’s method to approximate the permanent II. *New York Number Theory Seminar*. Graduate Center CUNY, NY, USA.
- 2019b. 37 Matroids, Helly’s theorem, and Ellipsoids. *AMS Fall Southeastern sectional meeting*. University of Florida, FL, USA.
- 2019c. 38 Barvinok’s method to approximate the permanent I. *New York Number Theory Seminar*. Graduate Center CUNY, NY, USA.
- 2019d. 39 Probabilistic Methods for the colorful Tverberg theorem. *AMS sectional meeting 1151, special session on oriented matroids and related topics*. Binghamton University, NY, USA.
- 2019e. 40 Exact Quantitative Helly Theorems. *CMO-BIRS Workshop [19w5028] Helly and Tverberg theorems..* Casa Matemática Oaxaca, Oaxaca, México.
- 2019f. 41 Exact Quantitative Helly Theorems. *Rutgers Combinatorics Seminar*. Rutgers University. New Brunswick, NJ, USA.
- 2019g. 42 Prescribing symmetries of centrally symmetric polytopes. *AMS Southeastern sectional meeting*. University of Auburn. Auburn, AL, USA.
- 2019h. 43 Tverberg’s theorem and weak epsilon-nets. *NYC Geometry Seminar*. Courant Institute, NYU. New York, NY, USA.
- 2018a. 44 Random partitions and the Colorful Tverberg theorem. *ACO Seminar*. Carnegie Mellon University. Pittsburgh, PA, USA.
- 2018b. 45 Extending robust versions of Tverberg’s theorem. *Special session on Polytopes and Discrete Geometry, AMS Northeastern Sectional Meeting*. Northeastern University. Boston, MA, USA.
- 2018c. 46 Different approaches to the colorful Tverberg theorem. *Pick My Brain Seminar*. Northeastern University. Boston, MA, USA.
- 2018d. 47 Tverberg-type results, weak epsilon-nets, and the probabilistic method. *Worldwide Center of Math Lecture Series Seminar*. Cambridge, MA, USA.
- 2018e. 48 Packing densities, kissing numbers, and piercing numbers. *Northeastern University Math Club*. Boston, MA, USA.
- 2018f. 49 Tverberg’s theorem: a gem in discrete geometry. *Latinx in the Mathematical Sciences Conference*. Institute of Pure and Applied Mathematics, UCLA. Los Angeles, CA, USA.
- 2017a. 50 Problemas de particiones justas (Fair partition problems). *Coloquium of Centro de Ciencias Matemáticas*. Morelia, Mexico.
- 2017b. 51 Linear versions of Tverberg’s theorem: progress and problems. *Introductory Workshop: Geometric and Topological Combinatorics* MSRI program 309. Berkeley, CA, USA.
- 2017c. 52 Symmetries in mass partition problems. *BIRS-CMO Workshop 17w5015: Symmetries and Discrete Structures in Geometry*. Oaxaca, Oaxaca, Mexico.
- 2017d. 53 Fair division problems and high-dimensional necklaces. *Pacific Rim Mathematical Association 3rd Congress*. Oaxaca, Oaxaca, Mexico.
- 2017e. 54 Tensors, colors, convex hulls. *Discrete Geometry and Convexity, Bárány 70*. Rényi Institute, Budapest, Hungary.
- 2017f. 55 Thieves and High-dimensional necklaces. *University of Washington Combinatorics Seminar*. Seattle, USA.
- 2017g. 56 Robust Tverberg results via the probabilistic method. *Ninth Discrete Geometry and Algebraic Combinatorics Conference UTRGV*. South Padre Island, Texas, USA.
- 2016a. 57 A toolbox for topologists. *ICERM workshop: Topology and Geometry in a Discrete Setting*. Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI, USA.
- 2016b. 58 An application of the probabilistic method to Tverberg’s theorem. *CMO-BIRS workshop: Transversal, Helly and Tverberg type Theorems in Geometry, Combinatorics and Topology III*. CMO-BIRS Oaxaca,

Mexico.

- 2016c. 59 A probabilistic approach to Tverberg-type results. *2016 Fall Eastern Sectional Meeting*. Bowdoin College, Brunswick, ME, USA.
- 2016d. 60 Quantitative Helly-type theorems. *2016 SIAM Discrete Mathematics conference*. Atlanta, USA
- 2016e. 61 Quantitative and Colorful combinatorial geometry. *8-th Algebraic combinatorics and discrete geometry conference UTRGV*. South Padre Island, Texas, USA
- 2016f. 62 Positive-fraction results in combinatorial geometry. *MIT Combinatorics seminar*. Cambridge, USA.
- 2016g. 63 A glimpse of combinatorial geometry. *Northeastern University Mathematics Postdoc seminar*. Boston, USA.
- 2015a. 64 Measure partitions using hyperplanes with fixed directions. *Northeastern University GASC seminar*. Boston, USA.
- 2015b. 65 Quantitative Helly-type theorems in combinatorial geometry. *University of Massachusetts Colloquium*. Boston, USA.
- 2015c. 66 Fixed directions in mass partition problems. *University of Michigan combinatorics seminar*. Ann Arbor, USA.
- 2015d. 67 Quantitative Helly-type theorems. *Lászlo Fejes Tóth centennial conference*. Budapest, Hungary.
- 2015e. 68 Variations of positive-fraction intersection results in combinatorial geometry. *Freie Universität Topological Combinatorics seminar*. Berlin, Germany.
- 2014a. 69 Aproximando números de homomorfismos (*Approximating homomorphism numbers*, in spanish). II Reunión de Matemáticos Mexicanos en el Mundo (*II Meeting of Mexican Mathematicians in the World*). Guanajuato, Mexico.
- 2014b. 70 Variations of the ham sandwich theorem. *UC Davis Algebra & Discrete Math Seminar*. Davis, CA, USA.
- 2014c. 71 Mass Partitions with Hyperplanes of Fixed Directions. *Oberwolfach Workshop 1436*. Oberwolfach, Germany.
- 2014d. 72 Variations of Tverberg's theorem. *MIT Combinatorics Seminar* Boston, USA.
- 2014e. 73 Teoremas coloreados y productos tensoriales (Colorful theorems and tensor products) *CIM seminar*. Querétaro, Mexico
- 2014f. 74 Tverberg's theorem and the Birkhoff Polytope. *Discrete Mathematics Seminar, Freie Universität Berlin*. Berlin, Germany
- 2014g. 75 Splitting points and hyperplanes. *SIAM Conference on Discrete Mathematics, Discrete Geometry Session* Minneapolis, USA
- 2013a. 76 Tverberg's theorem: different approaches to the colorful version. *University of Michigan Combinatorics seminar*. Ann Arbor, USA.
- 2013b. 77 Equal Coefficients and Tolerance in Coloured Tverberg Partitions. *29th ACM symposium on Computational Geometry*. Rio de Janeiro, Brazil.
- 2013c. 78 Particiones balanceadas de medidas en  $\mathbb{R}^d$  (Balanced Partitions of Measures in  $\mathbb{R}^d$ ). *National Congress of the Royal Spanish Mathematical Society (RSME)*. Santiago de Compostela, Spain.
- 2013d. 79 Variaciones del teorema de Tverberg (Variations of Tverberg's Theorem). *Seminario de matemáticas discretas* Univeristy of Cantabria. Santander, Spain.
- 2013e. 80 Partitions of measures and combinatorial geometry. Warwick University, UK.
- 2012a. 81 Some generalisations of Radon's theorem *LSE lunchtime seminar*. London School of Economics.
- 2012b. 82 An extension of a theorem by Yao and Yao. *European workshop on computational geometry (EuroCG)*. Assisi, Italy.
- 2012c. 83 Variations of Tverberg's theorem. *Geometry seminar*. Rényi Institute. Budapest, Hungary.
- 2012d. 84 Equal coefficients in coloured Tverberg partitions. *Recent Advances in Transversal and Helly-type Theorems in Geometry, Combinatorics and Topology*. Banff, Canada.
- 2011a. 85 Balanced equipartitions of measures in  $\mathbb{R}^d$ . *Discrete mathematics seminar*. University College London.
- 2011b. 86 On the tolerated Tverberg theorem. *Discrete geometry workshop (ID 1136)*. Oberwolfach, Germany.
- 2011c. 87 Balanced partitions of measures in  $\mathbb{R}^d$ . *Convexity, Topology, Combinatorics, and Beyond: A workshop*

*in honor of Montejano's 60th birthday.*

Puerto Vallarta, Mexico.

2011d. 88 Round table for the 25 years of the Mexican Mathematical Olympiad. *National Congress of the Mexican Mathematical Society.*

San Luis Potosí, Mexico.

2009a. 89 Piercing numbers for balanced families. *Transversals and Helly-type theorems in Geometry, Combinatorics, and Topology.*

Banff, Canada.