

# Emerson Julián León Guerrero

## Curriculum Vitae

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## Education and Research

Postdoctoral position, Universidad de los Andes.

Bogotá, Colombia, (2015-2017).

Ph.D. Mathematics, Freie Universität Berlin, (2009-2015)

Technische Universität, Berlin, BMS Student, Phase I (2007-2008)

Bachelor Degree, Mathematics

Universidad Nacional de Colombia, Bogotá (2001-2006)

## Publications

*Combinatorial Relationship Between Finite Fields and Fixed Points of Functions Going Up and Down*, Emerson León, Julián Pulido, <https://arxiv.org/abs/2111.13745>, preprint, 2021

*Binomial Inequalities of Chromatic, Flow, and Ehrhart Polynomials*, Matthias Beck, Emerson León, *Discrete & Computational Geometry*, 2021, **66**, no. 2, 464–474, 2021. <https://arxiv.org/abs/1804.00208>.

*Spaces of Convex  $n$ -Partitions*, Emerson León, Günter Ziegler, “New trends in Intuitive Geometry”, G. Ambrus, I. Bárány, K. J. Böröczky, G. Fejes Tóth, J. Pach, eds., *Bolyai Society Mathematical Studies series*, 27. Springer, Berlin Heidelberg. p. 279-306, 2018. <https://arxiv.org/abs/1511.02904>.

Proceedings:

*Stapledon decompositions and inequalities for coefficients of chromatic polynomials*, Emerson León, Séminaire Lotharingien de Combinatoire - FPSAC **78B** (2017), Art. 24, 12. MR 3678606

Ph.D. Thesis:

*Spaces of convex  $n$ -partitions*, advisor: Günter M. Ziegler.

Bachelor Thesis:

*Conteos en Arreglos de Hiperplanos, Números de Catalan y Funciones de Parqueo*, advisors: Federico Ardila, Humberto Sarria.

In spanish:

*Conteos en Arreglos de Hiperplanos, Números de Catalan y Funciones de Parqueo*, advisors: Federico Ardila, Humberto Sarria.

*Tres Lecciones en Combinatoria Algebraica, I. Matrices totalmente no-negativas y funciones simétricas*, Emerson León, Federico Ardila, Mercedes Rosas, Mark Skandera, *universo.math* **1** (2014), No. 1.

*Tres Lecciones en Combinatoria Algebraica, II. Funciones simétricas y teoría de representaciones*, Emerson León, Federico Ardila, Mercedes Rosas, Mark Skandera, **universo.math** **1** (2014), No. 2.

*Tres Lecciones en Combinatoria Algebraica, III. Arreglos de hiperplanos*, Emerson León, Federico Ardila, Mercedes Rosas, Mark Skandera, **universo.math** **1** (2014), No. 3.

*Problemas y Soluciones de las Olimpiadas Colombianas de Matemáticas*, Mary Falk Losada, Oscar Bernal, Juan Manuel Hernandez, Ivan Contreras, Emerson León, 2003, 2004, 2005, 2006.

## Experience

El Cyborg Chamán, software developer, Bogotá (2022), project sponsored by Idartes in art and technology. Creation of a webpage using artificial intelligence `elcyborgchaman.pythonanywhere.com`

Academic Leave (2018-2021), Tena, Cundinamarca (Rural Area)

Universidad de los Andes, Bogotá, Colombia, (2015- 2017). Teaching Courses: Differential Calculus, Linear Algebra, Multivariate Calculus, Integral Calculus, Discrete Geometry

Olimpiadas Colombianas de Matemáticas, teacher and organizing committee, 2013-2014

Matematischer Zirkel, TU Berlin, 2009-2011

Colegio Fundación Colombia, courses in mathematical problem solving, 2001

Olimpiadas Colombianas de Matemáticas, teacher and organizing committee, 2002-2006

## Languages

Spanish, English, German

## Computer programming languages

python (django, flask, matplotlib, pandas, pygame, openai), javascript (three.js, node), polymake, julia, blender, sagemath,  $\text{\LaTeX}$ (beamer, tikz)

## Acknowledgements

First Place, Ecaes (National Exam for graduate studies) Matemáticas, primer semestre 2006

Honourable Mention, Universidad Nacional de Colombia, 2001-2006 (best grades and tuition reimbursement each semester)

International Mathematical Competition, IMC: Second Price, Macedonia 2004; Third Price, Bulgaria 2005, Romania 2003

Olimpiada Iberoamericana de Matemáticas Universitaria: Gold, 2004; Bronze, 2003

Olimpiada Colombiana de Matemáticas Universitaria: First Place, 2004; Second Place, 2003; Third Place, 2002

International Mathematical Olympiad, IMO: Bronze, USA 2001, Korea 2000; Silver, Romania 1999; Participation, Taiwan 1998.

Olimpiada Iberoamericana de Matemáticas: Gold, Cuba 1999, winner of the Olympiad; Bronze, Mexico 1997

Olimpiada Colombiana de Matemáticas Winner (Nivel superior) 1999, 2000, 2001, First place, 2000 (Nivel Superior) 1996, 1997, 1998 (Primer Nivel)

## Conferences and other activities

XXIII Congreso Colombiano de Matemáticas, Tunja, Colombia, June 2023, contributed talk

VII Encuentro Colombiano de Combinatoria (ECCO'22), Bogotá, Colombia, June 2022, poster presentation

Días de Combinatoria, Universidad del Cauca, Popayan, July 2019

Organizing Committee: VI Encuentro Colombiano de Combinatoria ECCO'18, Barranquilla, Colombia, June 2018

Organizer of the Discrete Geometry Seminar I and II, Ehrhart Theory, Universidad de los Andes, Bogotá, 2016 and 2017

V Congreso Latinoamericano de Matemáticas, Barranquilla, Colombia, July 2016

V Encuentro Colombiano de Combinatoria (ECCO'16), Medellín, Colombia, June 2016

Métodos combinatorios, 2015 Universidad Sergio Arboleda, invited speaker

International Mathematical Olympiad IMO, Coordinator, Chiang Mai, Thailand 2015; Cape Town, South Africa, 2014; Santa Marta, Colombia, 2013

Altencoa 6, Universidad de Nariño, Mini-course Lecturer (Totally non-negative matrices), San Juan de Pasto, August 2014

Encuentro Colombiano de Combinatoria (ECCO'14), Universidad de los Andes, Bogotá, Colombia, June 2014

Formal Power Series and Algebraic Combinatorics (FPSAC), Reykjavik, Island, 2011; San Francisco, USA, June 2010; Hagenberg, Austria, July 2009

Workshop: "Geometry and integrability", Obergurgl, Austria, December 2008

Mathematical Training, Olimpiadas Colombianas de Matemáticas, geometry, algebra, combinatorics and number theory, 1996-2001