

Alejandro Basilio Galván Pérez-Illzarbe

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PhD student in **Mathematics** at **Dartmouth College**. My research focuses on **enumerative combinatorics** and other areas of **discrete mathematics**.

Education

PhD in Mathematics Dartmouth College	2024 – 2029
Master's degree in Advanced Mathematics and Mathematical Engineering Universitat Politècnica de Catalunya (average grade: 9.65/10)	2023 – 2024
Bachelor's degree in Mathematics Universitat Politècnica de Catalunya (average grade: 7.96/10)	2018 – 2023
Bachelor's degree in Engineering Physics Universitat Politècnica de Catalunya (average grade: 7.78/10)	2018 – 2023
Enrolment Grant and Residence Grant in the Centre de Formació Interdisciplinària Superior (CFIS-UPC) to simultaneously study two bachelor's degrees.	

Publications and preprints

Triangular partitions: enumeration, structure, and generation, with Sergi Elizalde.
Advances in Applied Mathematics 163 (2025): 102807.

Properties of triangular partitions and their generalizations.
<https://reportsascm.iec.cat> ISSN electronic edition: 2385-4227 (2024): 31.

Combinatorial Properties of Triangular Partitions, with Sergi Elizalde.
Proceedings of the 36th International Conference on "Formal Power Series and Algebraic Combinatorics". FPSAC. (2024).

Rivet, RivetHZTool and HERA--A validation effort for coding HERA measurements for Rivet, with M. I. Abdulhamid, et al.
arXiv:2112.12598 (2021).

Talks

Discrete Math Days 2026 June 2026	<i>Enumeration of maximal K_5-minor-free graphs</i>
Enumerative Combinatorics Workshop - Oberwolfach January 2026	<i>Enumeration, structure and generation of triangular partitions</i>
LACIM seminar - UQAM November 2025	<i>Enumeration and structure of triangular and concave partitions</i>
2025 CMS Summer Meeting June 2025	<i>Enumeration, structure and generation of triangular partitions</i>

Dartmouth Combinatorics Seminar January 2025	<i>Structure and enumeration of maximal K_5-minor-free graphs</i>
FPSAC 2024 July 2024	<i>Combinatorial Properties of Triangular Partitions (poster)</i>
LIMDA Seminar - UPC February 2024	<i>Enumeration, structure and generation of triangular partitions and their generalizations</i>
Dartmouth Combinatorics Seminar May 2023	<i>On triangular partitions and their generalizations</i>

Research stays

Collaboration grant with UPC Department of Mathematics <i>Structure and enumeration of maximal K_5-minor-free graphs.</i> Supervisor: Juanjo Rué.	October 2023 – May 2024
Dartmouth College <i>Properties of triangular partitions and their generalizations.</i> Supervisor: Sergi Elizalde.	September 2022 – May 2023
DESY Summer Student Programme <i>New QCD predictions for deep inelastic scattering and comparison with measurements.</i> Supervisor: Hannes Jung.	July 2021 – September 2021

Teaching experience

Instructor of record (Dartmouth): Multivariable Calculus with Linear Algebra	Fall 2026
Teaching assistant (Dartmouth): Differential Equations Linear Algebra with Applications Calculus Introduction to Calculus	Spring 2026 Fall 2025 Winter 2025 Fall 2024

Outreach

Sonia Kovalevsky Day Designed and led mathematics workshops for middle school students.	2025 – 2026
Preparation classes for the Mathematical Olympiad Collaborated with Prof. Gustavo Ochoa of the Public University of Navarre preparing students for the Spanish Mathematical Olympiad.	2020 – 2022

Selected awards

- Premi Emmy Noether
Prize to the best bachelor's thesis in mathematics in Catalonia
- 1st *ex aequo* 2024

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| - Spanish Mathematical Olympiad (final stage) | Silver medal | 2018 |
| - Spanish Mathematical Olympiad (local stage in Navarre) | 1st place | 2018 |
| - Spanish Mathematical Olympiad (local stage in Navarre) | 1st place | 2017 |
| - Navarre, Aragon and Rioja Triangular Mathematical Olympiad | 1st place | 2018 |
| - Navarre, Aragon and Rioja Triangular Mathematical Olympiad | 1st place | 2017 |

Other awards

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| - PLANCKS physics competition (Spanish preliminaries) | 5th place | 2022 |
| - Spanish Biology Olympiad (local stage in Navarre) | 1st place | 2018 |
| - Spanish Philosophy Olympiad (local stage in Navarre) | 1st place | 2017 |
| - Regional History Olympiad (Navarre) | 1st place | 2016 |
| - Extraordinary Prize of Secondary Education | | 2016 |

Programming languages

C++, MATLAB, Maple, R, AMPL.

Languages

Spanish (native), English (C2), Catalan (C1), Basque (B1).