

CURRICULUM VITAE

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1 Personal information

- Surname: Gil Muñoz.
- Name: Daniel.
- Birth date: 21-07-1994.
- Nationality: Spanish.
- E-mail: daniel_gilmu(at)hotmail(dot)com
- Website: <https://danielgilmu.wixsite.com/mathematician>

2 Employment

- **Charles University, Prague.**
Postdoc Individual Fellowship grant holder. June 2024 - present.
- **Universitat de Barcelona.**
Postdoctoral researcher. September 2023 - May 2024.
- **Charles University, Prague.**
Postdoctoral researcher. August 2021 – June 2023.
- **Universitat Politècnica de Catalunya, Barcelona.**
Predoctoral fellow. February 2018 – May 2021.
- **Universitat de Barcelona.**
Adjunct professor. February 2017 – September 2017.

3 Education

- **Universitat Politècnica de Catalunya, Barcelona.**
PhD in Mathematics. December 2017 – July 2021.
- **Universitat de Barcelona.**
Master in Advanced Mathematics. September 2016 – September 2017.
- **Universidad de Málaga.**
Bachelor in Mathematics. September 2012 – July 2016.

4 Grants received

- **Postdoc Individual Fellowship Outgoing**
Dates: June 2024 - present.
Granting institution: Czech Science Foundation.
Description: Grant to develop the three-year individual project 'Arithmetic properties of Hopf-Galois extensions' at Charles University. It includes an uninterrupted two-year stay at the University of Pisa from 1st June 2024.
- **Predoctoral fellowship FPI-UPC**
Dates: February 2018 – May 2021.
Granting institution: Universitat Politècnica de Catalunya.
Description: Predoctoral fellowship to carry out my PhD thesis.

- **Beca de colaboración con departamentos**

Dates: October 2015 – June 2016

Granting institution: Spanish Ministry of Education and Science.

Description: Collaboration with the Algebra, Geometry and Topology department in the University of Malaga.

5 Publications

5.1 Research papers

9. T. Crespo, D. Gil-Muñoz, A. Rio, M. Vela. *Determining skew left braces of size np* . To appear in Communications in Algebra. ArXiv url: <https://arxiv.org/abs/2302.13098>.
8. D. Gil-Muñoz, M. Tinková. *Additive structure of non-monogenic simplest cubic fields*. The Ramanujan Journal **66**, 47 (2025). ArXiv url: <https://arxiv.org/abs/2212.00364>.
7. D. Gil-Muñoz. *A generalization of Kummer theory to Hopf-Galois extensions*. J. Algebra **660** (2024), pages 190-235. ArXiv url: <https://arxiv.org/abs/2305.08648>.
6. D. Gil-Muñoz, M. Tinková. *The lifting problem for universal quadratic forms over simplest cubic fields*. Bull. Aust. Math. Soc. **110** (2024), pages 77-89.
5. T. Crespo, D. Gil-Muñoz, A. Rio, M. Vela. *Inducing braces and Hopf Galois structures*. J. Pure Appl. Algebra **227** (2023), 107371. ArXiv url: <https://arxiv.org/abs/2206.03810>.
4. D. Gil-Muñoz. *The ring of integers of Hopf-Galois degree p extensions of p -adic fields with dihedral normal closure*. J. Number Theory **245** (2023), pages 65-118. ArXiv url: <https://arxiv.org/abs/2205.13517>.
3. T. Crespo, D. Gil-Muñoz, A. Rio, M. Vela. *Left braces of size $8p$* . J. Algebra **617** (2023), pages 317-339. ArXiv url: <https://arxiv.org/abs/2205.04201>.
2. D. Gil-Muñoz, A. Rio. *Hopf Galois module structure of quartic Galois extensions of $\mathbb{Q}$* . J. Pure Appl. Algebra **266** (2022), 107045. ArXiv url: <https://arxiv.org/abs/2107.13515>.
1. D. Gil-Muñoz, A. Rio. *Induced Hopf Galois structures and their Local Hopf Galois Modules*. Pub. Mat. **66** (2022), pages 99-128. ArXiv url: <https://arxiv.org/abs/1910.06083>.

5.2 Preprints

2. D. Gil-Muñoz. *Hopf-Galois module structure of monogenic orders in cubic number fields*. ArXiv url: <https://arxiv.org/abs/2506.12451>
1. D. Gil-Muñoz. *Hopf-Galois module structure of degree p extensions of p -adic fields*. ArXiv url: <https://arxiv.org/abs/2410.10383>.

5.3 Other publications

2. D. Gil-Muñoz. "Constructing normal integral bases of Hopf Galois extensions". TEMat monográficos, 2 (2021): Proceedings of the 3rd BYMAT Conference, pages 47-50. issn: 2660-6003. url: <https://temat.es/monograficos/article/view/vol2-p47>.
1. D. Gil-Muñoz. *El duodécimo problema de Hilbert para cuerpos cuadráticos imaginarios*. TEMat, 2 (2018), pages 15-30. issn: 2530-9633. url: <https://temat.es/articulo/2018-p15>.

6 Participation in research projects or grants

6.1 As principal investigator

- **Arithmetic properties of Hopf-Galois extensions**

Dates: June 2024 - present.

Granting institution: Czech Science Foundation.

6.2 As a member

- **Aritmética de formas modulares, ecuaciones diofánticas y functorialidad de Langlands**

Dates: September 2023 - present.

Granting institution: Spanish Ministry of Science and Innovation.

- **Universal quadratic forms and class numbers**

Dates: August 2021 - June 2023.

Granting institution: Czech Science Foundation.

Role: Professional colleague.

- **Methods of algebra and logic**

Dates: January - December 2022.

Granting institution: Charles University Research Center.

- **Técnicas computacionales en teoría de números**

Dates: January 2018 - December 2019.

Granting institution: Spanish Ministry of Economy.

7 Research stays

7.1 Long term

- **Università di Pisa**

Dates: 1 June 2024 - present.

Host: Ilaria Del Corso.

- **University of Exeter.**

Dates: 5 February - 5 May 2020.

Host: Nigel Byott.

7.2 Short visits

- **University of Luxembourg**

Dates: 19 - 23 November 2024.

Host: Félix Baril Boudreau.

- **Universidad de Santiago de Compostela**

Dates: 11 - 12 March 2024.

Host: Óscar Rivero.

- **University of Luxembourg**

Dates: 7 - 9 June 2023.

Host: Antonella Perucca.

- **Università di Pisa**

Dates: 11 - 12 May 2023.

Host: Ilaria Del Corso and Lorenzo Stefanello.

- **TU Graz**

Dates: 29 March - 1 April 2023.

Host: Magdaléna Tinková.

- **University of Debrecen**

Dates: 22 - 25 February 2023.

Host: László Remete.

- **University of Keele.**

Dates: 30 January - 3 February 2023.

Host: Paul J. Truman.

8 Teaching

8.1 Subjects with teaching duties

- **Estructuras algebraicas.**

Date: Winter Semester 2023 (30 hours).

Institution: Universitat de Barcelona.

- **Lenguaje y razonamiento matemático**

Date: Winter Semester 2023 (30 hours).

Institution: Universitat de Barcelona.

- **Students Number Theory Seminar.**

Dates: Winter Semester 2022 (21 hours) and Spring Semester 2023 (21 hours).

Institution: Charles University.

- **Algebraic Number Theory.**

Dates: Spring Semester 2022 (10.5 hours) and Spring Semester 2023 (10.5 hours).

Institution: Charles University.

- **Fundamentos Matemáticos.**

Dates: Winter Semester 2019 (30 hours) and Winter Semester 2020 (60 hours).

Institution: Universitat Politècnica de Catalunya.

- **Matemáticas 1.**

Dates: Winter Semester 2018 (15 hours) and Spring Semester 2019 (30 hours).

Institution: Universitat Politècnica de Catalunya.

- **Álgebra lineal.**

Date: Spring Semester 2017 (30 hours).

Institution: Universitat de Barcelona.

- **Cálculo Integral en Diversas Variables.**

Date: Spring Semester 2017 (15 hours).

Institution: Universitat de Barcelona.

- **Aritmética.**

Date: Spring Semester 2017 (15 hours).

Institution: Universitat de Barcelona.

8.2 Courses on teaching formation

- **Didáctica de las matemáticas**

Period: March 3-24 of 2025 (125 hours).

Institution: Universidad Nebrija.

9 Participations in scientific events

9.1 Invited talks

1. *Skew left braces with prime multiple size.* Advances in Group Theory and Applications, Naples, Italy, June 24-27 of 2025.

9.2 Conference talks

1. *On the possible indices of simplest cubic fields.* Monogenity and Power Integral Bases, Barcelona, July 8-10 of 2025.
2. *Module structure of monogenic orders in cubic number fields.* Journées Arithmetiques, Luxembourg, June 30 - July 4 of 2025.
3. *The ring of integers of degree p extensions of p -adic fields.* Hopf Algebras & Galois Module Theory conference, Connecticut, USA, June 4-5 of 2025 (online).
4. *Number fields with Hopf-Galois module structure repeating periodically.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, February 3-7 of 2025.
5. *Galois module structure of degree p extensions of p -adic fields.* Congreso bienal de jóvenes investigadores de la RSME, Bilbao, Spain, January 13-17 of 2025.
6. *The lifting problem for universal quadratic forms over totally real number fields.* 10as Jornadas de Teoría de Números, Madrid, Spain, July 8-12 of 2024.
7. *Hasta la teoría Hopf-Galois y más allá.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, February 5-9 of 2024.
8. *Una generalización de la teoría de Kummer mediante teoría Hopf-Galois.* Congreso bienal de la RSME 2024, Pamplona, Spain, January 22-26 of 2024.
9. *A generalization of Kummer theory to Hopf-Galois extensions.* Hopf Algebras & Galois Module Theory conference, Omaha, Nebraska, USA, May 29 - June 2 of 2023 (online).
10. *Non-monogenic simplest cubic fields with prime index.* Monogenity and power integral bases online conference, March 16 of 2023.
11. *Continued fractions and module structure of extensions of p -adic fields.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, January 23-27 of 2023.
12. *Left braces of size np .* Fourth BYMAT Conference, Valencia, Spain, November 9-11 of 2022 (online).
13. *The link between Hopf-Galois theory and skew braces.* XXIII International Workshop for Young Mathematicians “Number Theory”, Krakow, Poland, September 11-17 of 2022.
14. *Universal quadratic forms and indecomposables in simplest cubic fields.* 9as Jornadas de Teoría de Números, Logroño, Spain, June 28 – July 1 of 2022.
15. *Hopf-Galois module structure of degree p extensions of p -adic fields.* Hopf Algebras & Galois Module Theory conference, Omaha, Nebraska, USA, May 30 – June 3 of 2022.
16. *Universal quadratic forms and indecomposable elements over totally real cubic fields.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, January 31 – February 4 of 2022.
17. *Aritmética de extensiones cuárticas vía teoría Hopf-Galois.* Congreso bienal de la RSME 2022, Ciudad Real, Spain, January 17-21 of 2022.
18. *Generalized normal bases for Hopf Galois extensions.* Young Researchers in Mathematics 2021, Bristol, England, June 7-9 of 2021 (online).
19. *Hopf Galois module structure of quartic Galois extensions of $\mathbb{Q}$.* Hopf Algebras & Galois Module Theory virtual conference, Omaha, Nebraska, USA, May 24-27 of 2021 (online).

20. *The action of a Hopf Galois structure on the p -part of a dihedral degree $2p$ extension.* Third BYMAT Conference, Valencia, December 1-3 of 2020 (online).
21. *Describing the associated order in Hopf Galois structures of extensions of p -adic fields.* British Early Career Mathematicians' Colloquium (BECMC) virtual conference in Birmingham, United Kingdom, July 14-15 of 2020 (online).
22. *A method to compute the associated order in extensions of p -adic fields.* Hopf Algebras & Galois Module Theory virtual conference, Omaha, Nebraska, USA, May 25-29 of 2020 (online).
23. *Induced Hopf Galois module structure of extensions of p -adic fields.* 8as Jornadas de Teoría de Números, Vilanova i la Geltrú, Barcelona, Spain, June 25-28 of 2019.
24. *Integral Hopf Galois module structure of dihedral degree $2p$ extensions of local fields.* Second BYMAT Conference, Madrid, Spain, May 20-24 of 2019.
25. *Integral Hopf Galois structures of dihedral degree $2p$ extensions of p -adic fields.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, January 21-25 of 2019.
26. *Aritmética de ideales en anillos numéricos.* Encuentro Nacional de Estudiantes de Matemáticas (ENEM), Valencia, Spain, July 23-28 of 2018.
27. *Hopf Galois Theory: Generalizing Galois Theory with Hopf Algebras.* First BYMAT Conference, Madrid, May 7-9 of 2018.

9.3 Seminar talks

1. *Algebras de Hopf en teoría de Galois.* Invited by the Algebra, Geometry and Topology Department of the Universidad de Málaga, Malaga, Spain, May 12 of 2025.
2. *Module structure of the ring of integers in number fields.* Luxembourg Number Theory Seminar, Luxembourg, November 20 of 2024.
3. *The ring of integers in degree p extensions of p -adic fields.* Number Theory Seminar at Università di Pisa, Pisa, Italy, October 23 of 2024.
4. *Skew braces, estructuras Hopf-Galois y viceversa.* Seminario García-Rodeja, Santiago de Compostela, Spain, March 12 of 2024.
5. *The use of skew braces in Hopf-Galois theory.* Seminari Informal de Matemàtiques de Barcelona (SIMBa), Barcelona, Spain, October 4 of 2023.
6. *Non-Galois Kummer extensions with Hopf-Galois theory.* Luxembourg Number Theory Seminar, Luxembourg, June 8 of 2023.
7. *An introduction to Hopf-Galois theory.* Debrecen Number Theory Seminar, Debrecen, Hungary, February 24 of 2023.
8. *An overview of Hopf-Galois theory.* Number Theory Seminar at Charles University, Prague, Czech Republic, October 19 of 2021.
9. *On the possible ranks of universal quadratic forms over totally real number fields.* Seminari Informal de Matemàtiques de Barcelona (SIMBa), October 6 of 2021 (online).
10. *El método de reducción: Determinando el orden asociado en las estructuras Hopf Galois de una extensión de cuerpos p -ádicos.* Seminari Informal de Matemàtiques de Barcelona (SIMBa), June 10 of 2020 (online).
11. *Teoría de Hopf Galois: Introducción y enfoque arimético.* Invited by the Algebra, Geometry and Topology Department of the Universidad de Málaga, Malaga, Spain, October 15 of 2018.
12. *Teoría de Hopf Galois: Generalizando la teoría de Galois con álgebras de Hopf.* Seminari Informal de Matemàtiques de Barcelona (SIMBa), Barcelona, Spain, May 2 of 2018.
13. *Descripción de las estructuras Hopf Galois de una extensión separable.* Seminari de Teoria de Nombres de Barcelona (STNB), Barcelona, Spain, January 22-26 of 2018.

10 Other mathematical activities

- Coorganizer of the *Seminari Informal de Matemàtiques de Barcelona (SIMBa)* in Barcelona, Spain, February 2018 - June 2021 and September 2023 - May 2024.
- Coorganizer of the event *Junior Week of Mathematics* from SIMBa, in Barcelona, Spain, December 17-21 of 2018. Instructor of the three-session course *An introductory course to Galois representations*.
- Former external referee of the students journal TEMat.
- Coorganizer of the *Number Theory Seminar* at Charles University in Prague, Czech Republic, September 2022 - June 2023.
- Member of the scientific committee at the **Fifth BYMAT Conference** in Madrid, Spain, November 13-16 of 2023.
- Member of the scientific committee at the **Sixth BYMAT Conference** in Valladolid, Spain, November 4-7 of 2024.

11 Languages

- *Spanish*. Mother tongue.
- *English*. Fluent (C1 level with Cambridge Advance Certificate).
- *French*. Lower intermediate (B1 level with University of Barcelona).
- *Italian*. Basic (A2 level with Centro Linguistico Interdipartimentale).
- *Catalan*. Basic (A2 - Basic 1 level with CPNL).
- *Czech*. Some basic skills.