

France GHEERAERT

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Born October 17, 1997

Last update: October 1, 2025

Education

Academic curriculum

2020-2023 PhD in Mathematics at University of Liège (Liège, Belgium)

Thesis title: A study of dendricity through the lens of morphisms

Supervisor: Julien Leroy

Jury members: Marie-Pierre Béal, Julien Cassaigne, Émilie Charlier, Fabien Durand, Arnaud Hilion, Julien Leroy, Michel Rigo

2018-2020 Master in Mathematics with a professional focus in computer science at University of Liège (Liège, Belgium)

2015-2018 Bachelor in Mathematics at University of Liège (Liège, Belgium)

2015 CESS (secondary school diploma) from the Centre Scolaire Saint-Benoit Saint-Servais (Liège, Belgium)

Distinctions and prizes

2019 Prix Garnir awarded to a student in Mathematics at University of Liège

Employment

Sept.2024-Now Maître de conférence in the Laboratoire Amiénois de Mathématique Fondamentale et Appliquée at Université Picardie Jules Vernes (Amiens, France)

Mar.2024-Aug.2024 Postdoctoral researcher in the Institute for Mathematics, Astrophysics and Particle Physics at Radboud University of Nijmegen (Nijmegen, Netherlands)

2020-Feb.2024 FNRS Research fellow in the UR Mathematics at University of Liège (Liège, Belgium)

2018-2020 Student instructor in the Department of mathematics at University of Liège (Liège, Belgium)

Scientific work

Publications

- Journal papers

1. F. Gheeraert, H. Goulet-Ouellet, J. Leroy, P. Stas, Stability properties for subgroups generated by return words, *European Journal of Combinatorics*, **130**, 104224 (2025)
2. F. Gheeraert, H. Goulet-Ouellet, J. Leroy, P. Stas, Algebraic characterization of dendricity, *Electronic Journal of Combinatorics*, **32**(1), P1.51 (2025)
3. F. Gheeraert, J. Leroy, S-adic characterization of minimal dendric shifts, *Discrete Mathematics and Theoretical Computer Science*, **27**(2) (2025)
4. F. Gheeraert, G. Romana, M. Stipulanti, String attractors of some simple-Parry automatic sequences, *Theory of Computing Systems*, **68**, 1601-1621 (2024)
5. J. Cassaigne, F. Gheeraert, A. Restivo, G. Romana, M. Sciortino, M. Stipulanti, New string attractor-based complexities for infinite words. *Journal of Combinatorial Theory, Series A*, **208** (2024).
6. F. Gheeraert, Some properties of morphic images of (eventually) dendric words. *Monatshefte für Mathematik*, **202**(2), 335–351 (2023).
7. F. Gheeraert, M. Lejeune, J. Leroy, $\mathcal{S}$ -adic characterization of minimal ternary dendric shifts, *Ergodic theory and dynamical systems*, **42**(11), 3393–3432 (2022).

- Conference papers

1. F. Gheeraert, G. Romana, M. Stipulanti, String attractors of fixed points of k -bonacci-like morphisms. In: A. Frid, R. Mercas (eds) Combinatorics on Words. WORDS 2023. *Lecture Notes in Computer Science*, **13899**.

Accepted, submitted and working papers

1. P. Béaur, F. Gheeraert, B. Hellouin de Menibus, String attractors of bi-infinite words. *Work in progress*, arXiv: 2403.13449.

Posters

1. Sturmian and dendric words, *Journées du GDR IM*, IRIF (Paris, France), April 4, 2023.
2. S-adic characterization of dendric shift spaces, *Dyadisc 4*, Université Picardie Jules Verne (Amiens, France), July 8-9, 2021.

Talks

- International conferences

1. Dendric and eventually dendric words, CANT Research School, CIRM (Marseille, France), September-October 2025. **Invited lecture**
2. The link between return words and extensions of factors, WORDS 2025, Université de Lorraine (Nancy, France), July 4, 2025. **Invited talk**
3. How extensions impact the factor complexity of morphic images. Thematic month - Combinatorics on words, CIRM (Marseille, France), February 28, 2024.
4. String attractors of fixed points of k -bonacci-like morphisms, *WORDS 2023*, Umeå University (Umeå, Sweden), June 12, 2023.
5. Numeration systems and string attractors, *Numeration 2023*, University of Liège (Liège, Belgium), May 26, 2023.

6. Morphic images of (eventually) dendric words, *Journées montoises d'informatique théorique 2022*, Czech Technical University (Prague, Czech Republic), September 6, 2022.

- International workshops and seminars

1. Algebraic characterization of dendricity, *Dyadisc 7*, Université Picardie Jules Vernes (Amiens, France), December 9, 2024. **Invited talk**
2. Some known results and open questions about eventually dendric shift spaces, *Dyadisc 6*, Université Picardie Jules Verne (Amiens, France), July 6, 2023. **Invited talk**
3. S-adic characterization of minimal dendric shifts: an example, *Dyadisc 5*, University of Liège (Liège, Belgium), June 16, 2022. **Invited talk**
4. S-adic characterization of dendric languages: ternary case, *One World Combinatorics on Words Seminar*, online, October 11, 2021.

- Other conferences and seminars

1. Des sturmiens aux dendriques, *Journée du LAMFA*, LAMFA (Amiens, France), June 6, 2025.
2. Decidability of dendricity (through a construction of Durand), *Journées SDA2 2025*, LIRMM (Montpellier, France), June 2, 2025. **Invited talk**
3. Algebraic characterization of dendricity, *Workshop at IRIF*, IRIF (Paris, France), March 6, 2025.
4. Des sous-shifts Sturmien aux sous-shifts dendriques, *Groupe de Travail de Probabilités et Systèmes dynamiques*, LMRS (Rouen, France), December 2, 2024. **Invited talk**
5. String attractors de préfixes de mots infinis, *Journées SDA2 2024*, LIFO (Orléans, France), May 30, 2024.
6. Survol de la dendricité et de l'ultime dendricité, *Séminaire Rauzy*, I2M (Marseille, France), April 5, 2024. **Invited talk**
7. Dendricité : quand les mots rencontrent les graphes, *Journée Amiens-Calais de Dynamique et Probabilités*, LMPA (Calais, France), March 19, 2024. **Invited talk**
8. A study of dendricity through the lens of morphisms, *Discrete Mathematics Seminar*, University of Liège (Liège, Belgium), December 8, 2023.
9. Dendric words and morphisms, *Seminar of the Dipartimento di Matematica e Informatica*, University of Palermo (Palermo, Italy), March 14, 2023.
10. Caractérisations des sous-shifts dendriques, *Rencontre IZES 2022*, IMB (Bordeaux, France), November 14, 2022.
11. Dendric words and strongly left proper morphisms, *Séminaire du GT Combinatoire et Interactions*, LaBRI (Bordeaux, France), May 30, 2022.
12. Dendric preserving morphisms, *Séminaire des doctorants de l'UR Mathematics*, University of Liège (Liège, Belgium), April 25, 2022.
13. S-adic characterization of dendric languages: ternary case, *Journées SDA2 2021*, GREYC (Caen, France), November 30, 2021.
14. Caractérisation S-adique des dendriques, *Discrete Mathematics Seminar*, University of Liège (Liège, Belgium), May 5, 2021.
15. Caractérisation S-adique des sous-shifts dendriques ternaires, *Séminaire des doctorants de l'UR Mathematics*, University of Liège (Liège, Belgium), November 18, 2020.

Research stays

- Long research stays
 1. Università degli Studi di Palermo (Palermo, Italy) with Antonio Restivo, Giuseppe Romana, and Marinella Sciortino, March 11-21, 2023.
 2. LaBRI (Laboratoire Bordelais de Recherche en Informatique, Bordeaux, France) with Sébastien Labbé, May 21-June 11, 2022.
- Short research stays
 1. LAMFA (Laboratoire Aminénois de Mathématique Fondamentale et Appliquée, Amiens, France) with Fabien Durand and Samuel Petite, March 20-21, 2024.
 2. LaBRI (Laboratoire Bordelais de Recherche en Informatique, Bordeaux, France) with Sébastien Labbé, January 25-26, 2024.
 3. LISN (Laboratoire Interdisciplinaire des Sciences du Numérique, Orsay, France) with Pierre Béaur and Benjamin Hellouin de Menibus, December 20-21, 2023.
 4. IRIF (Institut de Recherche en Informatique Fondamentale, Paris, France) with Valérie Berthé and Herman Goulet-Ouellet, December 18-19, 2023.
 5. LaBRI (Laboratoire Bordelais de Recherche en Informatique, Bordeaux, France) with Sébastien Labbé, February 2-3, 2023.

Others

Outreach

- Mentoring of secondary school students for MATH.en.JEANS (a project promoting research in mathematics) since 2019.
- Fête de la science workshops (animation of mathematical games for secondary school students) in 2024.
- Maths à Modeler workshops (a project bringing mathematics to people from 7 to 77 through games) during the Printemps des Sciences in 2018 and 2019.

Organized conferences and seminars

- Dyadisc 8 Conference in Amiens in 2025.
- Dynamics and Probabilities Seminar at LAMFA since 2024.
- Phd Students Seminar of the UR Mathematics at University of Liège in 2021-2022.

Involvement in university life

- Representative of the PhD students of the UR Mathematics of the University of Liège from 2021 to 2023.
- Member of the council of the Department of Mathematics of the University of Liège from 2020 to 2022.

Programming languages

1. Advanced: SageMath, Python
2. Intermediate: C
3. Basics: Java, Mathematica

Foreign languages

1. Mother tongue: French
2. Advanced: English
3. Intermediate: Dutch