

# Raphaël Paegelow



Temporary Lecturer and Research Assistant

Université de Lille

## Research interests

- Geometric Representation theory
- Algebraic Combinatorics
- Quiver varieties
- Symmetric functions

## Current position

2024 – 2025 **Temporary Lecturer and Research Assistant**, *Université de Lille*

## Previous position

2023 – 2024 **Temporary Lecturer and Research Assistant**, *Polytech Montpellier*, (engineer school)

## Education

2019 – 2020 **Second year at ENSL**, *Representation Theory, from Schubert Calculus to Rewriting*

2018 – 2019 **First year at ENSL**, *advanced mathematics*, *École Normale Supérieure de Lyon*

2017 – 2018 **First year of Master**, *general mathematics*, *Université Claude Bernard Lyon 1*

2017 – 2018 **Second year at l'École Centrale Lyon**, *Engineer School*

2016 – 2017 **University degree (Licence bachelor)**, *general mathematics*, *Université Claude Bernard Lyon 1*

2016 – 2017 **First year at l'École Centrale Lyon**, *Engineer School*

## Scholarship

2020 – 2023 **CDSN**, *Doctoral contract for students of the École Normale Supérieure*

## Research experience

2020 – 2024 **PhD student with Cédric Bonnafé**, *On the action of the finite subgroups of  $SL_2(\mathbb{C})$  on the Jordan quiver variety and the Procesi bundle*, defended on June 19, 2024, Jury: G. Bellamy, C. Bonnafé, O. Schiffman, R. Terpereau, M. Varagnolo

04/20 – 09/20 **M2 internship with Cédric Bonnafé**, *Conjecture  $n!$  and Procesi bundle*, *University of Montpellier*

Summer 2019 **M1 internship with Cédric Bonnafé**, *On the McKay correspondence*, *University of Montpellier*

## Published article

August 2024 **Paegelow**, *Combinatorics of the irreducible components of  $\mathcal{H}_n^\Gamma$  in type D and E*, [arXiv:2408.08251](https://arxiv.org/abs/2408.08251), *Séminaire Lotharingien de Combinatoire*, Vol. 92

## Submitted articles

April 2024 **Bellamy, Paegelow**, *The Procesi bundle over the  $\Gamma$ -fixed points of the Hilbert scheme of points in  $\mathbb{C}^2$* , [arXiv:2404.17819](https://arxiv.org/abs/2404.17819)

June 2024 **Paegelow**, *The fixed point locus of the smooth Jordan quiver variety under the action of the finite subgroups of  $SL_2(\mathbb{C})$* , [arXiv:2407.01114](https://arxiv.org/abs/2407.01114)

February 2025 **Paegelow**, *Fixed points in Gieseker spaces and blocks of Ariki-Koike algebras*, [arXiv:2502.10586](https://arxiv.org/abs/2502.10586)

## Research visits

- 10 d. in 03/25 **Research visitor**, *University of Glasgow, Glasgow*, visiting Gwyn Bellamy  
10 d. in 02/24 **Research visitor**, *University of Glasgow, Glasgow*, visiting Gwyn Bellamy  
02/23 – 04/23 **Research visitor**, *University of California, Los Angeles*, visiting Raphaël Rouquier

## Teaching

- 2024 – 2025 **Temporary Lecturer and Research Assistant**, *University of Lille (160 hours)*
- Course in linear algebra and analysis (for first year engineer students)
  - Thematic studies (for undergraduate students)
  - Tutorials in geometry in the plane (for second year math students)
  - Tutorials in linear algebra and general analysis (for first year CS/math students)
- 2023 – 2024 **Temporary Lecturer and Research Assistant**, *Polytech Montpellier (160 hours)*
- Probability, modeling and statistics (for fourth year engineer students)
  - Statistics and data analysis (for fourth year engineer students)
  - Machine and Statistical learning (for fourth year engineer students)
  - Decision mathematics (for third year engineer students)
- 2021 – 2022 **Mission Complémentaire d'enseignement at the Université de Montpellier**, (64 hours)
- Mathematical tools (for first year students)
  - Reduction of endomorphisms (for second year students)
- 2020 – 2021 **Teaching assistant at the Université de Montpellier**, (64 hours)
- Euclidean geometry and bilinear algebra (for second year students)
  - Analysis (for second year students)
  - Data processing for ecology (for second year students)
- 2019 – 2020 **Khôlles de mathématiques in MPSI and TSI at the Lazaristes in Lyon**  
March-May 2019 **Khôlles de mathématiques in ATS at the highschool La Martinière**

## Community service

- June 2025 **Co-organisation of the Spring School "Group actions and symplectic singularities"**, *University of Lille*  
2021 – 2022 **Co-management of the doctoral student seminar**, *University of Montpellier*

## Talks and Working group

- April 2025 **Séminaire GAT**, *Fixed points in Gieseker spaces and blocks of Ariki-Koike algebras*, Amiens, France  
Mar. 2025 **Séminaire SPACE**, *Fixed points in Gieseker spaces and blocks of Ariki-Koike algebras*, Tours, France  
Mar. 2025 **Algebra and Number Theory Seminar**, *Fixed points in Gieseker spaces and blocks of Ariki-Koike algebras*, Glasgow, United Kingdom  
Mar. 2025 **Colloque Tournant du RT algèbre**, *Fixed points in Gieseker spaces and blocks of Ariki-Koike algebras*, Clermont-Ferrand, France  
Feb. 2025 **RéGA**, *Geometry of the Hilbert scheme and Procesi bundle*, Institut Henri Poincaré, France  
Feb. 2025 **Research Seminar on Algebra at ICJ**, *Geometry of the Hilbert scheme, from the viewpoint of finite subgroups of  $SL_2(\mathbb{C})$* , Lyon, France  
Jan. 2025 **Research Seminar on Algebra and Geometry at Graz**, *Geometry of the Hilbert scheme, from the viewpoint of finite subgroups of  $SL_2(\mathbb{C})$* , Graz, Austria  
Dec. 2024 **Research Seminar on Algebraic Geometry**, *Geometry of the Hilbert scheme, from the viewpoint of finite subgroups of  $SL_2(\mathbb{C})$* , Lille, France  
Dec. 2024 **Research Seminar of Reims**, *Geometry of the Hilbert scheme, from the viewpoint of finite subgroups of  $SL_2(\mathbb{C})$* , Reims, France  
Dec. 2024 **Research Seminar ART**, *Geometry of the Hilbert scheme, from the viewpoint of finite subgroups of  $SL_2(\mathbb{C})$* , Strasbourg, France  
June 2024 **Groups and their actions: algebraic, geometric and combinatorial aspects**, *Decomposition of the Procesi bundle over the  $\Gamma$ -fixed points of the punctual Hilbert scheme*, Levico Terme, Italy, [GaAGC](#)  
Dec. 2023 **Organization of a working group on Lie groups and algebras for interested PhD students**, based on: *Introduction to Lie groups and Lie Algebras*, A. Kirillov, University of Montpellier

Dec. 2022 **Working group: Complexes of Graphs and Spaces of Moduli of Curves**, *Introduction to group cohomology*, University of Montpellier

Sept. 2022 **Doctoral student seminar**, *Short story of Residues in Combinatorics*, University of Montpellier

## Participation to conferences/workshops/schools

Mar. 2024 **Conference for young researcher**, *GDR TLAG*

Aug. 2023 **Summer School on Geometric and Categorical Representation theory**, *Bath*

Jan. 2023 **Conference on Quivers, Clusters, Moduli and Stability**, *Oxford*

June 2023 **Conference on Geometric representation theory**, *Lyon*

Dec. 2022 **Conference on Geometric Representation Theory and Quantum Topology**, *Paris*

June 2022 **Summer School on Representation theory and flag or quiver varieties**, *Paris*

May 2022 **Spring School on Invariants in Algebraic Geometry**, *Dijon*

Apr. 2022 **Research school on Symplectic singularities in geometry and representation theory**, *CIRM*

Mar. 2022 **Conference for young researcher**, *GDR TLAG*

Dec. 2020 **Conference on Quantum Groups and Cohomology Theory of Quiver and Flag Varieties**, *CIRM*

## Computer Skills

Typesetting  $\text{\LaTeX}$

Programmation SageMath, Gap, Magma, Julia, C++, Haskell

Web Javascript, HTML, CSS

## Languages

French Native language

English Level C1

German Level B2/C1

*C.A.E.*

*Father's language*