

CONTACT

job.rock@ugent.be
<https://daisierock.github.io>

GENDER

Woman

PRONOUNS

She / Her

EDUCATION

Ph.D. in Mathematics from Brandeis University, Waltham, **USA**

24 May 2020

POSITIONS

FWO Senior Postdoctoral Fellowship

November 2024 – October 2027

Awarded by Fonds Wetenschappelijk Onderzoek (FWO)

Position taken at KU Leuven, Leuven, **Belgium**

BOF Postdoctoral Fellowship

February 2022 – October 2024

Universiteit Gent, Ghent, **Belgium**

Visiting Research Scholar

November – December 2021

Supported by Professor Fatemeh Mohammadi's BOF Grant

Universiteit Gent, Ghent, **Belgium**

Postdoctoral Fellowship

September – December 2020

Junior Trimester Program on “New Trends in Representation Theory”

Hausdorff Research Institute for Mathematics (Universität Bonn), Bonn, **Germany**

AWARDS

€250 000 (approx.) FWO Senior Postdoctoral Fellowship

2024

Competitive fellowship awarded based on ranking.

Fonds Wetenschappelijk Onderzoek (FWO), Brussels, **Belgium**

€160 000 (approx.) BOF Postdoctoral Fellowship

2021

Special Research Fund award based on FWO applications that achieved an interview.

Universiteit Gent, Ghent, **Belgium**

€8640 Postdoctoral Fellowship

2020

Junior Trimester Program on “New Trends in Representation Theory”

Hausdorff Research Institute for Mathematics, Bonn, **Germany**

US\$2000 Summer Research Fellowship

2018

Brandeis University, Waltham, **USA**

PAPERS

PEER REVIEWED

(with F. Mohammadi and F. Zaffalon) *Progress on Infinite Cluster Categories Related to Triangulations of the (Punctured) Disk*. Journal of Algebra and its Applications special issue on “Cluster Algebras and Related Topics.” <https://doi.org/10.1142/S0219498826501203>

(with S. Zhu) *Continuous Nakayama Representations*. Applied Categorical Structures (2023). <https://doi.org/10.1007/s10485-023-09748-7>

(with E. J. Hanson) *Composition series of arbitrary cardinality in modular lattices and abelian categories*. Advances in Mathematics (2023). <https://doi.org/10.1016/j.aim.2023.109292>

(with E. J. Hanson) *Decomposition of Pointwise Finite-Dimensional \mathbb{S}^1 Persistence Modules*. Journal of Algebra and its Applications (2022), <https://doi.org/10.1142/S0219498824500543>

Continuous Quivers of Type A (IV) Continuous Mutation and Geometric Models of E-clusters. Algebras and Representation Theory (2022), <https://doi.org/10.1007/s10468-022-10175-w>

(with K. Igusa and G. Todorov) *Continuous Quivers of Type A (III) Embeddings of Cluster Theories*. Nagoya Mathematical Journal (2022), <https://www.doi.org/10.1017/nmj.2021.16>

(with K. Igusa and G. Todorov) *Continuous Quivers of Type A (I) Foundations*. Rendiconti del Circolo Matematico di Palermo Series 2 (2022), <https://doi.org/10.1007/s12215-021-00691-x>

SUBMITTED FOR PEER REVIEW

(with C. Paquette and E. Yildirim) *Categories of generalized (thread) quivers*. Preprint: [arXiv:2410.14656](https://arxiv.org/abs/2410.14656) [math.RT] (2024)

(with K. Igusa) *Stability conditions for representations of continuous type \mathbb{A}* . Undergoing revision for Annals of Representation Theory. Preprint: [arXiv.org:2302.14792](https://arxiv.org/abs/2302.14792) [math.RT] (2023).

(with M. C. Kulkarni, J. P. Matherne, & K. Mousavand) *A continuous associahedron of type A*. Preprint: [arXiv:2108.12927](https://arxiv.org/abs/2108.12927) [math.RT] (2021)

Continuous Quivers of Type A (II) The Auslander-Reiten space. Awaiting peer review at Algebra and Discrete Mathematics, based in Ukraine. Preprint: [arXiv:1910.04140](https://arxiv.org/abs/1910.04140) [math.RT] (2019)

PREPRINTS AND PAPERS IN PREPARATION

(with K. M. Jacobsen) *Admissible ideals for \mathbb{k} -linear categories*. Preprint: [arXiv:2209.13944](https://arxiv.org/abs/2209.13944) [math.RT] (2022)

Cluster Theories and Cluster Structures of Type A. Preprint: [arXiv.org:2112.14795](https://arxiv.org/abs/2112.14795) [math.RT] (2022)

Higher Auslander categories from continuous quivers of type \mathbb{A} . In preparation.

(with R. Bennett-Tennenhaus) *Semilinear representations and persistence modules*. In preparation.

PRESENTATIONS

INVITED TALKS

Women In Non-commutative Algebra and Representation Theory 4 (WINART 4) March 2025
Banff International Research Station, Banff, **Canada**

SIAM Conference on Applied Algebraic Geometry (AG23) July 2023
Eindhoven University of Technology (TU/e), Eindhoven, **Netherlands**

Advances in Representation Theory of Algebras (ARTA) IX June 2023
Queen's University, Kingston, **Canada**

Combinatorial Aspects of Representation Theory March 2023
Centre of Advanced Study at the Norwegian Academy of Sciences and Letters, Oslo, **Norway**

Symposium on Koszul Algebras and Abelian Categories May 2022
Aarhus Universitet, Aarhus, **Denmark**

Flash Talks in Representation Theory January 2022
Norges Teknisk-Naturvitenskapelige Universitet (NTNU), Trondheim, **Norway**

AMS Sectional Meeting October 2021
Quiver representations: bridging theory and application
Virtual Conference
originally to be held at Creighton University in Omaha, Nebraska, **USA**

Representation Theory Seminar Universität Bielefeld, Bielefeld, Germany	June 2021
Algebra Seminar Norges Teknisk-Naturvitenskapelige Universitet (NTNU), Trondheim, Norway	May 2021
Théorie de Représentations et ses Applications et Connections Université de Sherbrooke, Sherbrooke, Canada	January 2021
Ghent Algebra and Geometry Seminars Universiteit Gent, Ghent, Belgium	November 2020
Representation Theory and Related Topics Seminar Northeastern University, Boston, USA	October 2020
Séminaire D'algèbre Université de Sherbrooke, Sherbrooke, Canada	April 2020
Representation Theory and Related Topics Seminar Northeastern University, Boston, USA	November 2019
Homological Methods and Tilting Theory of Finite Dimensional Algebras In Honor of Gordana Todorov's 70th Birthday University of Iowa, Iowa City, USA	August 2019
Functor Categories, Model Theory, and Constructive Category Theory University of Tartu, Pärnu College, Pärnu, Estonia	July 2019
Representation Theory and Related Topics Seminar Northeastern University, Boston, USA	May 2019
OTHER TALKS	
Tales of Geometries Université libre de Bruxelles, Brussels, Belgium	October 2018
Functor and Tensor Categories, Models And Systems At the request of the other organisers. Universidade de Santiago de Compostela, Santiago de Compostela, Spain	June 2024
Categories, Clusters and Completions Master Class Aarhus Universitet, Aarhus, Denmark	March 2023
Algebraic Analysis, Functor Categories, and Constructive Methods Universiteit Gent, Ghent, Belgium	March 2023
Logic Seminar Universiteit Gent, Ghent, Belgium	February 2023
International Conference on Representations of Algebras (ICRA) Universidad de Buenos Aires, Buenos Aires, Argentina	August 2022
Functor Categories, Model Theory, and Constructive Category Theory At the request of the other organisers. Universidad de Almería, Almería, Spain	July 2022
Trans Math Day Virtual Conference	December 2020
XXXIème Rencontre de Théorie des Représentations des Algèbres Université de Sherbrooke, Sherbrooke, Canada	September 2019
Maurice Auslander Distinguished Lectures and International Conference Woods Hole, USA	April 2019
XXXème Rencontre de Théorie des Représentations des Algèbres Université de Sherbrooke, Sherbrooke, Canada	September 2018

POSTER PRESENTATIONS

New developments in representation theory of algebras November 2024
Okinawa Institute of Science and Technology, **Japan**

Representation Theory and Geometry 2022 February 2022
Virtually hosted by Queen's University and the Royal Military College of Canada, **Canada**

Workshop and International Conference on Representations of Algebras (ICRA) November 2020
virtually hosted by Norges Teknisk-Naturvitenskapelige Universitet, Trondheim, **Norway**
originally to be held in Trieste, Italy

Rencontre de Théorie des Représentations des Algèbres - Édition Corona September 2020
virtually hosted by Université de Sherbrooke, Sherbrooke, **Canada**
originally to be held in Sherbrooke, Canada

CONFERENCES ORGANIZED

Functor and Tensor Categories, Models And Systems June 2024
Satellite Conference of the 9th European Congress of Mathematics (9ECM)
Universidade de Santiago de Compostela, Santiago de Compostela, **Spain**

Functor Categories, Model Theory, and Constructive Category Theory July 2023
Universidad de Málaga, Málaga, **Spain**

Algebraic Analysis, Functor Categories and Constructive Methods March 2023
Universiteit Gent, Ghent, **Belgium**

Functor Categories, Model Theory, and Constructive Category Theory July 2022
Universidad de Almería, Almería, **Spain**

RESEARCH INTERESTS

Continuous generalizations of **representations of quivers** to better understand the related **(higher) homological algebra** and **cluster algebras/categories** with motivation from **persistent homology** and **scattering diagrams**, combining techniques from **combinatorics** and **analysis**.

INTERNATIONAL RELATIONS

13 collaborators in **Belgium, Canada, China, Denmark, Germany, UK, USA**

16 invited talks and an additional **18** presentations hosted in **11** countries

PEER REVIEW

Banff International Research Station for Mathematical Innovation and Discovery
Journal of Algebra and its Applications
Journal of Algebraic Combinatorics
Journal of Pure and Applied Algebra
Mathematische Zeitschrift
Symmetry, Integrability and Geometry: Methods and Applications

MENTORSHIP AND TEACHING

PHD STUDENTS

Francesca Zaffalon November 2021 – September 2024
co-supervising with F. Mohammadi
Belgium

DIRECTED READINGS

Functors, Representations, and Persistent Homology Spring 2020
An introduction to persistent homology as both representations and functors
Brandeis University, Waltham, **USA**

Category Theory and Topoi Spring 2018
Refresher of basic category theory and an introduction to topoi
Brandeis University, Waltham, **USA**

Introduction to Category Theory Spring 2017
An introduction to category theory and abelian categories
Brandeis University, Waltham, **USA**

COURSES TAUGHT AS PRIMARY INSTRUCTOR

Mathematics Spring 2023, Spring 2024
Focus on understanding applications of mathematical concepts and techniques; includes numbers, variables and units, algebraic functions, transcendental functions, calculus, complex numbers, first-order differential equations, and linear algebra
Universiteit Gent, Ghent, **Belgium**

Applied Linear Algebra Summer 2019
Matrices, determinants, linear equations, vector spaces, eigenvalues, quadratic forms, linear programming with emphasis on techniques and applications
Brandeis University, Waltham, **USA**

Topology (Prepcamp) Summer 2018
Prep camp in topology for incoming graduate students
Brandeis University, Waltham, **USA**

Techniques of Calculus (b) Fall 2016, Spring 2017, Fall 2017, & Spring 2018
Introduction to integral calculus of one variable, with emphasis on techniques and applications
Brandeis University, Waltham, **USA**

LANGUAGES

English: Mother tongue
Dutch: Intermediate (B1)