# Laertis Vaso

# Employment

2021–2024 **Postdoctoral Fellow**, Department of Mathematical Sciences, NTNU – Norwegian University of Science and Technology, Trondheim, Norway.

Mentor: Steffen Oppermann

2020–2021 **Postdoctoral Fellow**, Max Planck Institute for Mathematics, Bonn, Germany.

Mentor: Jan Schröer

### Education

2015–2020 Ph.D. Mathematics, Uppsala University, Uppsala, Sweden.

Supervisor: Martin Herschend. Thesis title: Constructions of n-cluster tilting subcategories using representation-directed algebras.

2013–2015 M.Sc. Mathematics, Uppsala University, Uppsala, Sweden.

2007–2012 B.Sc. Mathematics, University of Ioannina, Ioannina, Greece.

# Research interests

Representation theory of quivers, algebras and categories, (higher) homological algebra, tilting theory and torsion classes

## Research articles

### Published

- 2023 *n*-cluster tilting subcategories for radical square zero algebras, Journal of Pure and Applied Algebra vol. 227.
- 2022 Existence of a 2-cluster tilting module does not imply finite complexity, with R. Marczinzik, Journal of Algebra vol. 598.
- 2018 Gluing of n-cluster tilting subcategories for representation-directed algebras, Algebras and Representation Theory vol. 24.
- 2017 Wide subcategories of d-cluster tilting subcategories, with M. Herschend and P. Jorgensen, Transactions of the American Mathematical Society vol. 373.
- 2017 *n*-cluster tilting subcategories of representation-directed algebras, Journal of Pure and Applied Algebra vol. 223.

#### Accepted for publication

2024  $n\mathbb{Z}$ -cluster tilting subcategories for Nakayama algebras, with M. Herschend and S. Kvamme, available at https://arxiv.org/abs/2208.13257, accepted for publication in the Mathematische Zeitschrift.

#### Preprints

- 2024 Higher homological algebra for one-point extensions of bipartite hereditary algebras and spectral graph theory, with K. M. Jacobsen and M. H. Sandøy, available at https://arxiv.org/abs/2411.00470.
- 2024  $\tau_d$ -tilting theory for linear Nakayama algebras, with E. S. Rundsveen, available at https://arxiv.org/abs/2410.19505.
- 2020 *n*-cluster tilting subcategories from gluing systems of representation-directed algebras, available at https://arxiv.org/abs/2004.02269.

## Invited talks

- 2024-12-06 **Higher**  $\tau$ **-tilting theory for linear Nakayama algebras**, NTNU Norwegian University of Science and Technology, Representation theory combinatorial aspects and applications to TDA.
- 2023-11-01  $\tau_d$ -tilting theory for Nakayama algebras, Aarhus University, Homological Algebra Symposium.

- 2023-07-10 **2-representation-finite quadratic monomial algebras via one point extensions of bipartite graphs**, *University of the Aegean*, Homological Algebra and Representation Theory.
- 2023-07-05 **2-representation-finite quadratic monomial algebras via one point extensions of bipartite graphs**, *Aalborg university*, 29th Nordic Congress of Mathematicians (Representation Theory & Combinatorics session).
- 2023-03-30 **2-hereditary quadratic monomial algebras via one point extensions of bipartite graphs**, Center for Advanced Studies Oslo, Combinatorial aspects of Representation Theory.
- 2023-01-19 n-cluster tilting subcategories for truncated path algebras, FD Seminar.
- 2022-10-18 Quadratic monomial 2-hereditary algebras and generalizations, Center for Advanced Studies Oslo, Representation Theory: Combinatorial Aspects and Applications.
- 2022-08-20 *n*-cluster tilting subcategories for truncated path algebras, *Aalto University*, 28th Nordic Congress of Mathematicians (Representation theory session).
- 2022-07-08 Truncated path algebras in higher-dimensional Auslander–Reiten theory, National Technical University of Athens, Second Congress of Greek Mathematicians (Algebra, Number Theory and Combinatorics session).
- 2021-02-01 **n-cluster tilting modules for radical square zero algebras**, *Université de Sherbrooke*, The TRAC seminar.
- 2021-01-08 **n-cluster tilting modules for radical square zero algebras**, NTNU Norwegian University of Science and Technology, Flash Talks in Representation Theory at NTNU.
- 2020-02-27 **Higher dimensional AR-theory through Nakayama algebas**, Aristotle University of Thessaloniki, Algebra Seminar visitor.

## — Contributed talks

- 2024-08-08 **Higher** τ-tilting theory for Nakayama algebras, Shanghai Jiao Tong University, International Conference on Representations of Algebras 2024.
- 2024-22-04  $\tau_d$ -tilting theory for Nakayama algebras, Okinawa Institute of Science and Technology, Spring Workshop on the Representation Theory of Algebras and related areas.
- 2024-03-19  $\tau_d$ -tilting theory for Nakayama algebras, Uppsala University, Algebra seminar.
- 2022-08-12 *n*-cluster tilting subcategories for truncated path algebras, *Universidad de Buenos Aires*, International Conference on Representations of Algebras 2022.
- 2021-11-09 Constructions of *n*-cluster tilting subcategories, *NTNU* Norwegian University of Science and Technology, Algebra seminar.
- 2019-10-25 Representations of quivers and Gabriel's theorem, KTH Royal Institute of Technology–Stockholm University, PhD Math Fest 2019.
- 2019-04-17 **Gluing of** *n***-cluster tilting subcategories for representation-directed algebras**, *University of Isfahan*, Isfahan School and Conference on Representations of Algebras.
- 2018-09-26 Quiver Grassmanians, Uppsala University, PhD seminar.
- 2018-08-14 Gluing of *n*-cluster tilting subcategories for representation-directed algebras, CTU Prague, International Conference on Representations of Algebras 2018.
- 2017-12-06 Dyck paths corresponding to 2-Gorenstein acyclic Nakayama algebras, *Uppsala University*, PhD seminar.
- 2017-05-23 An introduction to higher dimensional Auslander–Reiten theory, Stockholm University, Mini-Conference for PhD-Students in Mathematics.
- 2016-11-02 Colouring the Auslander–Reiten quiver of a Nakayama algebra, Uppsala University, PhD seminar.
- 2016-08-18 *n*-cluster tilting subcategories of Nakayama algebras, *Syracuse University*, International conference on representations of algebras 2016.
- 2016-06-04 *n*-cluster tilting subcategories of Nakayama algebras, *Uppsala University*, Representation Theory Conference 2016.
- 2015-06-02 *n*-cluster tilting modules over quotients of path algebras of type A, Uppsala University, Algebra and Geometry seminar.

Conferences and Workshops attended

- 2024-12 Representation theory combinatorial aspects and applications to TDA, Norwegian university of Science and Technology, Trondheim, Norway.
- 2024-08 International Conference on Representations of Algebras 2018, Shanghai Jiao Tong University, Shanghai, China.
- 2024-04 Spring Workshop on the Representation Theory of Algebras and related areas, Okinawa Institute of Science and Technology, Okinawa, Japan.
- 2024-01 Flash talks in Representation Theory 2024, NTNU Norwegian University of Science and Technology, Trondheim, Norway (online).
- 2023-07 Homological Algebra and Representation Theory, University of the Aegean, Karlovasi, Greece.
- 2023-07 **29th Nordic Congress of Mathematicians 2023 with EMS**, Aalborg University, Aalborg, Denmark.
- 2023-03 Combinatorial aspects of Representation Theory, Center for Advanced Studies Oslo, Oslo, Norway.
- 2023-01 Flash talks in Representation Theory 2023, NTNU Norwegian University of Science and Technology, Trondheim, Norway (online).
- 2022-08 **28th Nordic Congress of Mathematicians 2022**, Aalto University, Espoo, Finland.
- 2022-08 International Conference on Representations of Algebras 2022, Universidad de la República and Universidad de Buenos Aires, Montevideo and Buenos Aires, Uruguay and Argentina.
- 2022-07 Second Congress of Greek Mathematicians 2022, Hellenic Mathematical Society, Athens, Greece.
- 2022-06 Triangulated categories in representation theory and beyond, The Abel symposium 2022, Ålesund, Norway.
- 2022-06 Øyvind 60, NTNU, Trondheim, Norway.
- 2022-05 Online Workshop on Higher Dimensional Homological Algebra, *IPM-Isfahan and University of Isfahan*, Isfahan, Iran (online).
- 2022-01 Geometric and homological methods in representation theory, Lancaster University, Lancaster, United Kingdom (online).
- 2022-01 Flash talks in Representation Theory 2022, NTNU Norwegian University of Science and Technology, Trondheim, Norway (online).
- 2021-09 Conference in celebration of the work of Bill Crawley-Boevey, Various organizers, online.
- 2021-06 Braids, mutations and twists in algebra and geometry, *Uppsala University*, Uppsala, Sweden (online).
- 2021-05 Virtual Advances in Representation Theory of Algebras 2021, Various organizers, online.
- 2021-03 Additive categories between algebra and functional analysis, Various organizers, online.
- 2021-01 Flash Talks in Representation Theory 2021, NTNU Norwegian University of Science and Technology, Trondheim, Norway (online).
- 2020-11 International Conference on Representations of Algebras 2020, Various organizers, online.
- 2020-10 Winter School "Connections between representation theory and geometry", Hausdorff Research Institute for Mathematics, Bonn, Germany (online).
- 2020-09 **2020 Categorifications in Representation Theory**, *University of Leicester*, Leicester, United Kingdom (online).
- 2019-10 PhD Math fest, Stockholm university and KTH university, Stockholm, Sweden.
- 2019-04 Isfahan school and conference on representations of algebras, *University of Isfahan*, Isfahan, Iran.
- 2018-08 International Conference on Representations of Algebras 2018, CTU Prague, Prague, Czechia.
- 2017-05 Idun 75: a conference on representation theory of artin algebras on the occasion of Idun Reiten's birthday, NTNU Norwegian University of Science and Technology, Trondheim, Norway.
- 2017-05 Mini-Conference for PhD-Students in Mathematics, Stockholm University, Stockholm, Sweden.
- 2016-09 Algebraic mini-Workshop 2016, Uppsala University, Uppsala, Sweden.
- 2016-08 International conference on representations of algebras 2016, Syracuse University, Syracuse, USA.
- 2016-06 Representation Theory Conference 2016, Uppsala University, Uppsala, Sweden.

- 2024-10 **Center for Advanced Study**, under the project *Geometric Methods in Higher Homological Algebra*, Oslo, Norway.
- 2022-10 **Center for Advanced Study**, under the project Representation Theory: Combinatorial Aspects and Applications, Oslo, Norway.
- 2020-02 **Department of Mathematics of Aristotle University**, visited Chrysostomos Psaroudakis, Thessaloniki, Greece.

# Organisation of conferences and seminars

- 2023–2024 Algebra seminar, NTNU, Organized together with Mads Sandøy.
  - 2020 Uppsala Ph.D. Math conference, 2020-03-06, Uppsala University, Member of the organising committee.

# Scholarships

2018 Liljewalch travel scholarship for travel to conferences, for deserving, younger (less than 35 years old) researchers at the Faculty of Science and Technology at Uppsala University.

# Teaching experience

# Teaching activities

- 2024 Main lecturer, Galois theory, NTNU Norwegian University of Science and Technology.
- 2023 Main lecturer, Rings and modules, NTNU Norwegian University of Science and Technology.
- 2023 Main lecturer, Galois theory, NTNU Norwegian University of Science and Technology.
- 2022 **Lecturer**, *Homological algebra*, NTNU Norwegian University of Science and Technology, substituting the main lecturer for the last third of the course.
- 2019–2020 Main lecturer, Algebraic Structures, Uppsala University.
- 2018–2019 Main lecturer, Algebraic Structures, Uppsala University.
  - 2017 Main lecturer, Linear Algebra II, Uppsala University.
- 2016–2019 **Teaching assistant**, Probability and Statistics, Several Variable Calculus, Linear Algebra II, Uppsala University.

#### Reading seminars

- 2023 **Algebra group seminar**, Representation theory of Cohen-Macaulay modules, NTNU Norwegian University of Science and Technology, organised together with Sondre Kvamme.
- 2022 **Algebra group seminar**, Calabi–Yau structures for triangulated categories, NTNU Norwegian University of Science and Technology, organised together with Sondre Kvamme.

#### Student supervision

- 2024 Bachelor thesis supervisor of Peter Soelberg, Thesis: Triangulated structure of stable Frobenius categories and derived abelian categories, NTNU Norwegian University of Science and Technology.
- 2019 Bachelor thesis supervisor of Bim Gustavsson, Thesis: Representations of Finite-Dimensional Algebras and Gabriel's Theorem, Uppsala University.

## Pedagogical education

2018 Academic teacher training course, Uppsala University, five full-time weeks.

## Outreach activities

- 2024 Researchers' Night 2024, NTNU Norwegian University of Science and Technology, topic: Explore whimsical games. Together with three colleagues we introduced to high school students three versions of Tic-Tac-Toe inspired by different mathematical concepts.
- 2023 Researchers' Night 2023, NTNU Norwegian University of Science and Technology, topic: What is the shape of a bubble? I designed a poster and together with four colleagues we had a stand with a minimal surface soap bubble experiment for high school students to try.
- 2023 **Hyfer festival**, NTNU The Norwegian University of Science and Technology, topic: The art of mathematics. Together with 4 colleagues we gave a series of talks on different topics exploring the connection between mathematics, creativity and art.

2022 Researchers' Night 2022, NTNU – Norwegian University of Science and Technology, topic: The world's most difficult equation. I designed two posters and together with two colleagues we had a stand where we were visited by and discussed with high school students.

# Referee for the following journals

Transformation Groups.

Glasgow Mathematical Journal.

Communications in Algebra.

Transactions of the American Mathematical Society.

Journal of Algebra.

# Other

Relevant courses

2022 NTNU's Research Leadership course, Lars Christian Lassen, Mobilize Strategy Consulting.

Languages

Native **Greek** 

Fluent English

Intermediate Norwegian

Beginner German, Swedish

Computer skills

Good LATEX, Python

Basic MATLAB, GAP

Hobbies

Cooking, baking, improvisational theatre