

Francesco Galuppi

Room 5260, faculty of Mathematics, Informatics and Mechanics
Warsaw University, Banacha 2, 02-097 Warszawa, Poland
galuppi@mimuw.edu.pl
<https://www.mimuw.edu.pl/~galuppi>

EDUCATION AND PROFESSIONAL EXPERIENCE

2023 – Present	Assistant professor (adjunkt) , Warsaw University, faculty of Mathematics, Informatics and Mechanics.
2021 – 2023	Postdoc , IM PAN Warsaw, Algebraic geometry research group.
2020 – 2021	Postdoc (assegnista di ricerca) , University of Trieste, Algebraic Geometry and Commutative Algebra research group.
2018 – 2020	Postdoc , MPI MiS Leipzig, Nonlinear Algebra research group.
Aug – Nov 2016	Visiting Student , University of Oslo. Tutor: prof. Kristian Ranestad.
2014 – 2018	PhD in Algebraic Geometry – awarded with distinction University of Ferrara. Advisor: prof. Massimiliano Mella.
2011 – 2013	Master Degree in Mathematics , University of Padova.

GRANTS

Jul 2024 – Jun 2027	Tensor rank and its applications to signature tensors of paths Principal investigator, project 2023/51/D/ST1/02363, awarded under the funding program Sonata-19 by the National Science Center, Poland.
---------------------	---

PUBLICATIONS AND PREPRINTS

Symmetric rank of some reducible forms, with L. Colarte-Gómez, arXiv: 2410.20390.

Rank and symmetries of signature tensors, with P. Santarsiero, arXiv:2407.20405.

Non-defectivity of Segre-Veronese varieties, with H. Abo, M. C. Brambilla, A. Oneto, Proceedings of the American Mathematical Society - Series B 11 (2024), 589-602.

Geometry of first nonempty Terracini loci, with P. Santarsiero, D. Torrance, E. Turatti, arXiv:2311.09067.

Decomposing tensor spaces via path signatures, with C. Améndola, Á. Ríos, P. Santarsiero, T. Seynnaeve, Journal of Pure and Applied Algebra 229 (2025), n. 1, article 107807.

Characteristic polynomials and eigenvalues of tensors, with F. Gesmundo, E. Turatti, L. Venturello, arXiv:2308.10957.

Equations of tensor eigenschemes, with V. Beorchia and L. Venturello, Mathematics of Computation 93 (2024), n. 346, 589–602.

Generic identifiability of pairs of ternary forms, with V. Beorchia, Collectanea Mathematica 74 (2023), 529–545.

Spectral theory of weighted hypergraphs via tensors, with R. Mulas and L. Venturello, Linear and Multilinear Algebra 71 (2023), n. 3, 317-347.

Secant non-defectivity via collisions of fat points, with A. Oneto, Advances in Mathematics 409 (2022), part B, paper 108657.

Eigenschemes of ternary tensors, with V. Beorchia and L. Venturello, SIAM Journal on Applied Algebra and Geometry 5 (2021), n. 4, 620–650.

Veronese and Segre morphisms between non-commutative projective spaces, with F. Arici and T. Gateva-Ivanova, European Journal of Mathematics 8, 235–273 (2022).

Toric Varieties from cyclic matrix groups, with M. Stanojkovski,

- Rendiconti dell'Istituto di Matematica dell'Università di Trieste 52 (2021), article 17, 1-17.
- On the eigenpoints of cubic surfaces**, with T. Çelik, A. Kulkarni and M.-Ş. Sorea,
Le Matematiche 75 (2020), n. 2, 611-625.
- Toric geometry of path signature varieties**, with L. Colmenarejo and M. Michałek,
Advances in Applied Mathematics 121 (2020), 102102.
- The rough Veronese variety**, Linear Algebra and its Applications 583 (2019), 282-299.
- On the unique unexpected quartic in P^2** , with Ł. Farnik, L. Sodomaco and W. Trok,
Journal of Algebraic Combinatorics 53 (2021), 131-146.
- Collisions of fat points and applications to interpolation theory**, Journal of Algebra 534 (2019), 100-128.
- On the number of Waring decompositions for a generic polynomial vector**,
with E. Angelini, M. Mella and G. Ottaviani,
Journal of Pure and Applied Algebra 222 (2018), n. 4, 950-965.
- Identifiability of homogeneous polynomials and Cremona transformations**, with M. Mella,
Journal für die reine und angewandte Mathematik 757 (2019), 279-308.

INVITED TALKS

- | | |
|--------------|--|
| Apr 8, 2025 | Algebraic properties of signature tensors , Stochastic & Rough Analysis, TU Berlin |
| Feb 13, 2024 | Eigenvalues of tensors , AGaFe24, University of Ferrara |
| Sep 1, 2023 | Signatures from the geometric viewpoint ,
Structural aspects of signatures and rough paths, CAS Oslo |
| Jul 10, 2023 | (Partially) symmetric rank of reducible forms , SIAM AG 23, Eindhoven |
| Jan 9, 2023 | Signatures from the geometric viewpoint ,
Probabilistic methods, signatures, cubature and geometry, York University |
| Dec 2, 2022 | Schemes of eigenpoints in the plane , Subvarieties in projective spaces and their
projections, Mathematisches Forschungsinstitut Oberwolfach |
| Oct 14, 2021 | Defectivity of Segre-Veronese varieties , Tensor days, IM PAN Warsaw |
| Aug 18, 2021 | Defectivity of Segre-Veronese varieties , SIAM AG 2021, online |
| Apr 28, 2021 | Defectivity of Segre-Veronese varieties via collisions of fat points ,
Algebraic geometry days XV, Gargnano (Italy), online |
| Jul 11, 2019 | Identifiability of a general polynomial , SIAM AG 2019, Bern |

CONTRIBUTED TALKS

- | | |
|--------------|---|
| Jul 30, 2024 | Rank and symmetry of signature tensors , MEGA 2024, MPI MiS Leipzig |
| Jul 19, 2022 | Identifiability of pairs of ternary forms , Killing-Weierstrass colloquium, Gdańsk |
| Jun 18, 2019 | The rough Veronese variety , MEGA 2019, Universidad Complutense, Madrid |
| Jan 16, 2019 | The rough paths signature variety ,
Berlin-Leipzig workshop in analysis and stochastics, MPI MiS Leipzig |
| Sep 26, 2018 | Signature tensors and the rough Veronese variety ,
Summer school in Algebraic Statistics, Arctic University, Tromsø |
| Sep 11, 2018 | The rough Veronese variety , Summer school Tensors, Politecnico di Torino |

ORGANIZING ACTIVITY

- | | |
|-------------------|--|
| Jul 12 – 13, 2023 | Tensors in applications , mini-symposium,
SIAM AG 23 conference on applied algebraic geometry, Eindhoven |
| Sep – Nov 2022 | Algebraic geometry with applications to tensors and secants ,
thematic semester held at Warsaw University and IM PAN Warsaw. I was a local |

organizer for the whole semester, as well as a scientific organizer for the Introductory school (Sep 12 – 16), the Kickoff workshop (Sep 19 – 23) and the conference Tensors in statistics, optimization and machine learning (Nov 21 – 25).

Apr 9, 2021	Projective and birational higher dimensional geometry , online
Nov 2020 – Jun 2021	Algebra and geometry online seminars , University of Trieste
Sep 2019 – Mar 2020	Nonlinear Algebra weekly seminars , MPI MiS, Leipzig
Jul 9 – 10, 2019	Signature tensors of paths , mini-symposium, SIAM AG 19 conference on applied algebraic geometry, Bern
May 15, 2019	Otto-Sturmfels meeting , MPI MiS, Leipzig

TEACHING

Feb 2025 – Jun 2025	Teaching assistant of Algebraic geometry , faculty of Mathematics, Warsaw University Teaching assistant of Algebra II , faculty of Mathematics, Warsaw University
Oct 2024 – Feb 2025	Teaching assistant of Linear algebra , faculty of Economics, Warsaw University
Oct 2023 – Feb 2024	Teaching assistant of Linear algebra , faculty of Economics, Warsaw University
Mar 2022 – Jul 2022	Algebraic statistics , PhD course, IM PAN Warsaw
Sep 2021	Pre-course of Mathematics , bachelor degree in Engineering, University of Trieste
Aug 2021	Summer formative modules , for high school students, organized by the University of Trieste
Oct 2020 – Jan 2021	Pre-course of Mathematics , bachelor degree in Mathematics, University of Trieste
Apr 2019 – Sep 2019	Enumerative Geometry , PhD course, MPI MiS Leipzig
Ott 2017 – Feb 2018	Teaching assistant of Linear Algebra , bachelor degree in Chemistry, Ferrara University
Apr – Jun 2017	Teaching assistant of Topology , bachelor degree of Mathematics, Ferrara University
Apr – Jun 2016	Teaching assistant of Topology , bachelor degree of Mathematics, Ferrara University

SERVICE

I served as a referee for SIAM Journal on Matrix Analysis and Applications (2023, 2025), Vietnam Journal of Mathematics (2021), Journal of Symbolic Computation (2021), Mathematics of Computation (2020).

AWARDS AND HABILITATIONS

Prize for **Outstanding scientific publications 2022**, awarded by IM PAN Warsaw.

Italian habilitation to associate professor, valid until 01-06-2034, sector 01/MATH-02 – Algebra and geometry

Special mention at **Baldassarri Prize 2019**, organized by Unione Matematica Italiana.

IUSS 2018 Prize, awarded by University of Ferrara, for the best PhD thesis.

LANGUAGES

Italian	Native speaker
English	Fluent, certificate Cambridge English (CAE)
German	Intermediate
Polish	Beginner