

FLORIAN FÜRNSINN



CONTACT INFO

E-mail florian.fuernsinn@univie.ac.at

Homepage <https://homepage.univie.ac.at/florian.fuernsinn/>

Address University of Vienna
Faculty of Mathematics
Oskar Morgenstern Platz 1
Office 2.124
1090 Vienna
Austria

ABOUT ME

I am a PhD student at the University of Vienna at the Faculty of Mathematics. My supervisor is Herwig Hauser. I am working on the algebraic study of differential equations in characteristic zero as well as in positive characteristic. In particular, I am interested in work regarding the algebraicity of solutions of differential equations, (differential) Galois groups, the Tannakian formalism, hypergeometric functions, and work related to the Grothendieck p-curvature conjecture.

EXPERIENCE

PREDOCTORAL RESEARCH ASSISTANT **2021-**
University of Vienna | Vienna, Austria

- Research Project P 31338 "Artin approximation, Arc-spaces, resolutions of singularities" by the Austrian Science Fund FWF, PI: Herwig Hauser
- Research Project P 34765 "Algebraic solutions of Fuchsian differential equations" by the Austrian Science Fund FWF, PI: Herwig Hauser

TUTOR **2020-2022**
University of Vienna | Vienna, Austria

- Tutorials for first year students on introduction to mathematics, analysis, linear algebra and discrete mathematics

INTERNSHIP **2018, 2019**
Austrian Institute of Technology | Vienna, Austria
(Center for Mobility Systems)

- Predicting motorcycle accidents from dynamic data collected at motorcycle rides

EDUCATION

PHD STUDIES IN MATHEMATICS

2022-

University of Vienna | Vienna, Austria

- Topic: "Differential equations in positive characteristic"

MSc IN MATHEMATICS

2020-2022

University of Vienna | Vienna, Austria

- Specialisation in algebra, number theory and discrete mathematics
- Graduated with distinction
- Weighted average grade: 1,00 (on a scale from 5 (fail) to 1 (best))
- Thesis: "A normal form theorem for regular singular differential operators in positive characteristic", under the supervision of H. Hauser, available at <https://phaidra.univie.ac.at/open/o:1602690>

BSc IN MATHEMATICS

2017-2020

University of Vienna | Vienna, Austria

- Graduated with distinction
- Weighted average grade: 1,13 (on a scale from 5 (fail) to 1 (best))
- Thesis topic: "The Takeya problem"

ACHIEVEMENTS

Awards

- Early student award 2019 awarded by the Austrian mathematical society to the best undergraduate students
- Hans-Riegel Fachpreis 2016: Second best mathematical high school final project in Vienna

Scholarships

- Performance scholarship at the University of Vienna 2017-2022

Competitions

- International Mathematical Competition in Blagoevgrad 2019 (silver medal), 2020 and 2021 (gold medal)
- Vojtěch Jarník International Mathematical Competition in Ostrava 2018 (medal), 2019 and 2022 (5th place, medal)
- International Mathematical Olympiad 2015 and 2016 (honorable mention)
- Austrian Mathematical Olympiad 2012-2016, awarded a silver medal in 2015 and a gold medal in 2016
- Kangaroo of Mathematics 2008-2016, first place in Austria in 2008, 2012, and 2016, further top placements

PUBLICATIONS

Articles

Hula, A., Fürnsinn, F., Schwieger, C., Saleh, P., Neumann, M., and Ecker, H. (2021). "Deriving a joint risk estimate from dynamic data collected at motorcycle rides". In: *Accident Analysis and Prevention* 159, p. 106297. doi: 10.1016/j.aap.2021.106297.

Preprints

Fürnsinn, F., Hauser, H., and Kawanoue, H. (2024). "On Abel's Problem about Logarithmic Integrals in Positive Characteristic". submitted. DOI: 10.48550/arXiv.2401.14154.

Fürnsinn, F. and Hauser, H. (2023). "Fuchs' theorem on linear differential equations in arbitrary characteristic". submitted. DOI: 10.48550/arXiv.2307.01712.

Fürnsinn, F. and Yurkevich, S. (2023). "Algebraicity of hypergeometric functions with arbitrary parameters". To appear in the Bulletin of the London Mathematical Society. DOI: 10.48550/arXiv.2308.12855.

SCIENTIFIC ACTIVITIES

Talks

- February 15, 2024, "Fuchs' Theorem, an Exponential Function, and Abel's Problem in Positive Characteristic", *Workshop "Fuchsian Differential Equations in Zero and Positive Characteristic"*, Lisbon, Portugal.
- January 23, 2024, "Algebraicity of Hypergeometric Functions with Arbitrary Parameters", *Arbeitsgemeinschaft Diskrete Mathematik*, University of Vienna, Austria.
- November 9, 2023, "Fuchs' Theorem and an Exponential Function in Positive Characteristic", *Séminaire Calcul Formel*, XLIM, Université de Limoges, France.
- November 6, 2023, "Algebraicity of Hypergeometric Functions with Arbitrary Parameter", *Séminaire de l'équipe combinatoire et interactions*, LaBRI, Université de Bordeaux, France.
- October 18, 2023, "An Exponential Function in Characteristic p ", *Seminar Commutative Algebra & Differential Equations*, University of Vienna, Austria.
- February 17, 2023, "An Exponential Function in Characteristic p ", *Workshop "Periods"*, Lisbon, Portugal.
- May 13, 2022, "The Fuchs-Frobenius Method in Characteristic p ", *Workshop "Fuchsian Differential Equations"*, Lisbon, Portugal.

Research Stays

- November 2023, *XLIM, Université de Limoges*, France, three days
- October-November 2023, *IMB, Université de Bordeaux*, France, one month
- November 2022, *IMB, Université de Bordeaux*, France, one week

Conferences Attended (without Contribution)

- March 2023, *Recent Trends in Computer Algebra: Effective Aspects in Diophantine Approximation*, Institut Camille Jordan, Université Lyon 1, France
- January 2023, *Workshop G-functions, E-functions and Periods*, Institut Henri Poincaré, Sorbonne University, Paris, France

SKILLS



LaTeX



Python, Maple



SageMath, Wolfram Mathematica, R

- Languages**
- German (native)
 - English (fluent in speaking and writing)
 - French (intermediate)

REFERENCES

**Herwig
Hauser** Professor
Faculty of Mathematics
University of Vienna
herwig.hauser@univie.ac.at

**Xavier
Caruso** Directeur de Recherche
Institut Mathématique de Bordeaux (IMB)
Université de Bordeaux
xavier.caruso@math.u-bordeaux.fr