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## EDUCATION

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### Habilitation at the University of Münster, 2025

- Habilitationsschrift title: *Separation, Reduction, Uniformization and Forcing*.
- Date of the habilitation: 29.01.2025, University of Münster.
- Referees of the Habilitationsschrift: G. Sargsyan, R. Schindler and P. Welch.

### Doctoral degree in mathematical logic, 2016

- Thesis title: *Projective Wellorders and the Nonstationary Ideal*. With distinction (1,0).
- Date of defense: 09.09.2016, University of Vienna.
- Thesis advisor: Sy-David Friedman, Kurt Gödel Research Center, University of Vienna.

### Master's degree in mathematics, 2011

- Thesis title: *On the Saturation of the Nonstationary Ideal*. With distinction (1,0).
- Thesis advisor: Sy-David Friedman, Kurt Gödel Research Center.

## PROFESSIONAL APPOINTMENTS

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- March 2011–June 2017: PhD student, then postdoctoral fellow at the Kurt Gödel Research Center, University of Vienna.
- June 2017–December 2017: Postdoctoral fellow at Charles University Prague.
- January 2018–August 2024: Assistant at the Institut für Mathematische Logik und Grundlagenforschung under Prof. R. D. Schindler, University of Münster.
- Since November 2024: Project leader of the FWF Standalone Project P 37228-N, situated at the Technical University of Vienna.

## RESEARCH INTERESTS

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Mathematical logic, set theory, forcing, definability, large cardinals, inner model theory.

## GRANTS AWARDED

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- 2024–2028: FWF Einzelprojekt P 37228, *Investigating separation, reduction and uniformization*; 356,024 EUR. Grant DOI: [10.55776/P37228](https://doi.org/10.55776/P37228).

## SCIENTIFIC PUBLICATIONS

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1. *A  $\Sigma_4^1$  wellorder of the reals with NS saturated*, with S. D. Friedman, *Journal of Symbolic Logic* 84, No. 4, 1466–1483 (2019). DOI: [10.1017/jsl.2019.43](https://doi.org/10.1017/jsl.2019.43).
2. *A model where NS is saturated and  $\Delta_1$ -definable*, *Journal of Symbolic Logic* 86, No. 1, 25–59 (2021). DOI: [10.1017/jsl.2021.23](https://doi.org/10.1017/jsl.2021.23).
3. *Forcing the  $\Sigma_3^1$ -separation property*, *Journal of Mathematical Logic* 22, No. 2, Article ID 2250008, 38 pp. (2022). DOI: [10.1142/S0219061322500088](https://doi.org/10.1142/S0219061322500088).

4. *Forcing the  $\Pi_3^1$ -Reduction Property and a Failure of  $\Pi_3^1$ -Uniformization*, *Annals of Pure and Applied Logic* 174, No. 8 (2023). DOI: [10.1016/j.apal.2023.103292](https://doi.org/10.1016/j.apal.2023.103292).
5. *Forcing Axioms and the Definability of the nonstationary Ideal on the first Uncountable*, with P. Larson, R. Schindler and L. Wu, *Journal of Symbolic Logic* (2023). DOI: [10.1017/jsl.2023.40](https://doi.org/10.1017/jsl.2023.40).
6. *Forcing Axioms and the Uniformization Property*, *Annals of Pure and Applied Logic* 175, No. 10 (2024). DOI: [10.1016/j.apal.2024.103466](https://doi.org/10.1016/j.apal.2024.103466).
7. *PFA and the definability of the nonstationary ideal*, with P. Larson, R. Schindler and L. Wu, *Journal of Symbolic Logic*, accepted manuscript (2025). DOI: [10.1017/jsl.2025.31](https://doi.org/10.1017/jsl.2025.31).
8. *The global  $\Sigma_{n+2}^1$ -Uniformization Property and BPFA*, *Advances in Mathematics* (2025). DOI: [10.1016/j.aim.2025.110272](https://doi.org/10.1016/j.aim.2025.110272).
9. *MA( $\mathcal{I}$ ) and a Failure of Separation on the third Level*, *Annals of Pure and Applied Logic* (2026). DOI: [10.48550/arXiv.2507.01187](https://doi.org/10.48550/arXiv.2507.01187).

## SUBMITTED PUBLICATIONS (ALL TO BE FOUND ON ARXIV)

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1. *Forcing the  $\Pi_n^1$ -Uniformization Property*. Submitted DOI: [10.48550/arXiv.2103.11748](https://doi.org/10.48550/arXiv.2103.11748).
2. *A Failure of  $\Pi_{n+3}^1$ -Reduction in the Presence of  $\Sigma_{n+3}^1$ -Separation*. Submitted. DOI: [10.48550/arXiv.2312.02540](https://doi.org/10.48550/arXiv.2312.02540).
3. *A Universe with a  $\Delta_n^1$ -definable well-order of the reals, CH and  $\Pi_n^1$ -Uniformization*. Submitted. DOI: [10.48550/arXiv.2506.21778](https://doi.org/10.48550/arXiv.2506.21778).
4. *A Universe with large Continuum, global  $\Sigma$ -Uniformization and a projective Well-Order of its Reals*. Submitted. DOI: [10.48550/arXiv.2506.12393](https://doi.org/10.48550/arXiv.2506.12393).
5.  *$\text{NS}_{\omega_1}$  saturated,  $\Delta_1(\{\omega_1\})$ -definable and a  $\Delta_4^1$ -definable well-order of the reals*. Submitted. DOI: [10.48550/arXiv.2507.01183](https://doi.org/10.48550/arXiv.2507.01183).
6. *Forcing upper  $\Sigma$ -uniformization in the presence of lower  $\Pi$ -reduction or uniformization*. Submitted.
7. *On  $\Sigma_3^1$ - and  $\Sigma_4^1$  uniformization*. Submitted.
8. *On a local variant of the 12th Delfino Problem—the  $\Sigma$ -side*, with Sandra Müller. Submitted.
9. *On a local variant of the 12th Delfino problem—the  $\Pi$ -side*. Submitted
10. *Generalized Separation*. Submitted.
11. *On total graphs of projective functions*. Submitted.
12. *Martin's Axiom, large continuum and global  $\Sigma_n^1$ -uniformization*. Submitted.
13. *Projective maximal families of orthogonal measures and global  $\Sigma$ -uniformization*. Submitted.

## TEACHING EXPERIENCE

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All teaching from 2018 on took place at the University of Münster.

- Winter 2023:
  - Lecture: Theory of Computation; replacement of Prof. M. Hils.
  - Exercises in the Theory of Computation.
  - Seminar: Modern Techniques in Combinatorial Set Theory.
  - Oberseminar Mengenlehre.
- Summer 2023:
  - Lecture: Logic 4. An Introduction to Modern Set Theory.
  - Seminar: Descriptive Set Theory and Games.
  - Oberseminar Mengenlehre.

- Winter 2022:
  - Seminar: Infinite Ramsey Theory.
  - Oberseminar Mengenlehre.
  - Exercises in the Theory of Computation.
- Summer 2022:
  - Seminar: Descriptive Set Theory and Projective Determinacy.
  - Oberseminar Mengenlehre.
- Winter 2021:
  - Seminar: Exercises in the Theory of Computation.
  - Oberseminar Mengenlehre.
- Summer 2021:
  - Seminar: Combinatorial Set Theory.
  - Oberseminar Mengenlehre.
- Winter 2020:
  - Seminar: Cardinal Arithmetic without the Axiom of Choice.
  - Seminar: Exercises in the Theory of Computation.
  - Oberseminar Mengenlehre.
- Summer 2020:
  - Seminar: Exercises for Mathematical Logic 1.
  - Seminar: Set Theoretic Geology.
  - Oberseminar Mengenlehre.
- Winter 2019:
  - Seminar: Generalizations of Gödel’s Constructible Universe.
  - Seminar: Exercises in the Theory of Computation.
  - Oberseminar Mengenlehre.
- Summer 2019:
  - Seminar: The Keisler Order.
  - Oberseminar Mengenlehre.
- Winter 2018:
  - Seminar: Models of Arithmetic.
  - Seminar: Exercises in the Theory of Computation.
  - Oberseminar Mengenlehre.
- Summer 2018:
  - Seminar: The Banach–Tarski Paradox, WWU Münster.
  - Seminar: Exercises for Mathematical Logic 1.
  - Oberseminar Mengenlehre.
- Winter 2015: Seminar, Introduction to Mathematical Logic; Vienna, Kurt Gödel Research Center.
- Winter 2014: Seminar, Introduction to Mathematical Logic; Vienna, Kurt Gödel Research Center.
- Winter 2013: Seminar, Introduction to Mathematical Logic; Vienna, Kurt Gödel Research Center.
- Summer 2013: Seminar, Axiomatic Set Theory I; Vienna, Kurt Gödel Research Center.
- Summer 2012: Seminar, Axiomatic Set Theory I; Vienna, Kurt Gödel Research Center.

## **THESES SUPERVISED**

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Before my habilitation in 2025, I was not formally allowed to supervise master’s or bachelor’s students. I was, however, one of the referees, or contributed substantially through meetings, discussions and explanations of the mathematics of the respective theses.

- Andrea Godotti, *Consistency Results on Trees on  $\omega_1$* . Master's thesis, 2016; University of Torino and University of Vienna.
- Kira Sielenkämper, *Happy and MAD Families*. Bachelor's thesis, 2019, University of Münster.
- Kira Sielenkämper, *Models for Fragments of the Axiom of Choice*. Master's thesis, 2021, University of Münster.
- Mirko Bartsch, *Suslinbäume*. Bachelor's thesis, 2022, University of Münster.
- Mathis Brüggemann, *Comprehending Kanamori: Descriptive Set Theory, Various Set-Theoretical Hierarchies and Infinite Games*. Bachelor's thesis, 2023, University of Münster.
- Shervin Sorouri, *Making Threads of the Iteration of the Universe Generic*. Master's thesis, 2023, University of Münster.
- Arman Ahmadi, *Der Satz von Arrow*. Bachelor's thesis, 2023, University of Münster.

## TALKS AT CONFERENCES AND RESEARCH SEMINARS

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- *On a local variant of the 12th Delfino Problem*. Research Seminar, TU Vienna. May 2026.
- *Forcing Global Sigma-Uniformization in Various Contexts*. Vienna Research Seminar in Set Theory. November and December 2025.
- *The Global  $\Sigma_{n+2}^1$ -Uniformization Property and BPFA*, Baltic Set Theory Seminar, Gdansk, April 2025.
- *The Global  $\Sigma_{n+2}^1$ -Uniformization Property and BPFA*, New York Set Theory Seminar, March 2025.
- Invited speaker at the Jahrestagung der DMV 2023, Technical University of Ilmenau, September 2023. Talk title: *Separation, Reduction and Uniformization, New Results on Old Notions*.
- Invited speaker at the Fifth Inner Model Theory Conference, Münster, June 2022. Talk title: *Forcing the  $\Pi_n^1$ -Uniformization Property*.
- Invited speaker at the Logic Colloquium of the Kurt Gödel Research Center, University of Vienna, March 2022. Talk title: *Forcing and the Separation, the Reduction and the Uniformization Property*.
- Invited speaker at the set theory seminar of the Kurt Gödel Research Center, University of Vienna, March 2022. Talk title: *Forcing the  $\Pi_n^1$ -Uniformization Property*.
- Invited speaker at the set theory seminar of the Fields Institute, Toronto, Canada, November 2021. Talk title: *Forcing and the Separation, Reduction and Uniformization Property*.
- Contributed talk at *Set Theory Today: A Conference in Honor of Georg Cantor*, Vienna, 2018. Talk title: *The  $\Delta_1$ -Definability of NS in Various Contexts*.
- Invited talk at the ÖMG and DMV Conference, Salzburg, September 2017. Talk title: *NS Saturated and  $\Delta_1$ -Definable*.
- Invited speaker at the PhD Colloquium in Bayreuth of the Deutsche Vereinigung für Mathematische Grundlagen (DVMLG) in 2018. This equals winning the best PhD-thesis award in logic in Germany, Austria and Switzerland in the years 2016–2018, awarded by the Deutsche Vereinigung für Mathematische Grundlagen (DVMLG).

## ORGANIZED CONFERENCES

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- Part of the organizing and scientific committee, together with Jun. Prof. A. Kwiatkowska, Ass. Prof. S. Müller and Jun. Prof. F. Schlutzenberg, for the Young Set Theory Workshop 2023, held in Münster with approximately 80 attendees.

## ATTENDED CONFERENCES

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- Inner Model Theory Conference, Münster, 2022.
- Inner Model Theory Conference, Girona, 2019.
- Set Theory Today: A Conference in Honor of Georg Cantor, Vienna, 2018.

- ÖMG and DMV Conference, Salzburg, September 2017.
- European Set Theory Conference, Budapest, July 2017.
- Young Set Theory Conference, University of Copenhagen, June 2016.
- Young Set Theory Conference, Israel Institute of Advanced Studies, Jerusalem, October 2015.
- Joint Prague–Vienna Logic and Set Theory Meeting, Prague, October 2014.
- Summer of Logic, Technische Universität Wien, Vienna, July–August 2014.
- Young Set Theory Conference, Banach Center, Bedlewo, Poland, May 2014.
- Sy-David Friedman’s 60th Birthday Conference, Kurt Gödel Research Center, Vienna, July 2013.
- Forcing, Large Cardinals and Descriptive Set Theory, Erwin Schrödinger Institut, Vienna, September–October 2013.

## ACADEMIC REFERENCES

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- Prof. Sy-David Friedman: [sdf@logic.univie.ac.at](mailto:sdf@logic.univie.ac.at).
- Prof. Ralf-Dieter Schindler: [rds@uni-muenster.de](mailto:rds@uni-muenster.de).