Dr. Sergey Yurkevich, MSc

Curriculum Vitae

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Personal Information

Date of Birth	July 10, 1996 (27 years old)
Place of Birth	Moscow, Russian Federation
Nationality	Austrian

Research experience

01/10/2023– present	**Researcher for safe AI and computer vision**, In: Team *AI Alligators*, At: A&R Tech, Austria
01/08/2023– present	**Postdoctoral researcher in mathematics**, In: Research project *Algebraic Solutions of Fuchsian Differential Equations*, FWF P-34765, At: University of Vienna, Austria
01/09/2021– 31/07/2023	**Predoctoral researcher and PhD student**, In: Doctoral research project *Integer sequences, algebraic series and differential equations*, At: University of Vienna, Austria
01/02/2020– 31/08/2021	**Predoctoral researcher and PhD student**, In: Research project *Algebraic Solutions of Fuchsian Differential Equations*, FWF P-34765, At: University of Vienna, Austria
01/09/2020– 06/07/2023	**Predoctoral researcher and PhD student**, At: *SpecFun/MathExp*, Inria Saclay, France
01/09/2020– 06/07/2023	**Predoctoral researcher**, At: *De rerum natura*, ANR reserach project ANR-19-CE40-0018, France
01/09/2018– 31/01/2020	**Student employee**, In: research project *Artin Approx., Arc Spaces & Resolution of Singularities*, FWF P-31338, At: University of Vienna, Austria

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Education

01/02/2020– 06/07/2023	**PhD in Mathematics**, *Advisors*: Alin Bostan and Herwig Hauser, *Thesis*: Integer sequences, algebraic series and differential operators. University of Vienna, Faculty of Mathematics, Austria Université Paris-Saclay and Inria Saclay, France
01/10/2018– 15/09/2020	**Master of Science in Quantitative Finance**, *Advisor*: Kurt Hornik. Vienna University of Economics and Business (WU Vienna), Faculty of Quantitative Finance, Austria
01/10/2017– 31/01/2020	**Master of Science in Mathematics**, *Advisor*: Herwig Hauser. University of Vienna, Faculty of Mathematics, Austria
01/10/2015– 24/05/2018	**Bachelor of Science in Business Administration**. Vienna University of Economics and Business (WU Vienna), Faculty of Economics and Social Sciences, Austria

01/10/2014– 07/09/2017	**Bachelor of Science in Mathematics**. University of Vienna, Faculty of Mathematics, Austria
01/09/2006– 15/06/2014	**High School**. Bundesrealgymnasium GRG3 Radetzkystraße, Vienna, Austria
01/09/2006– 15/06/2014	**High School**. Russian Embassy School, Vienna, Austria

Scholarships

01/09/2021– 31/07/2023	**ÖAW DOC Fellowship P-26101**, Title: "Integer sequences, algebraic series and differential equations", Total funding: 80.000€, *Austrian Academy of Sciences*, Austria.
29/08/2023– 27/09/2023	**Bourse d'Excellence (Excellence scholarship)**, Mobility scholarship: Austria/France. Total funding: 1.704€, *Institut français d'Autriche*, Austria.
01/01/2021– 31/12/2022	**WTZ Austria-France Collaboration 46411Y & FR09/2021**, Total funding: 8.000€, *Agency for Education and Internationalisation*, Austria.
01/02/2018– 31/01/2024	**Scholarship for young talented researchers**, Total funding: 3.000€, *Pro Scientia*, Austria.
01/10/2015– 01/10/2020	**Scholarship of excellence (Leistungsstipendium)**, Total funding: 5.000€, *University of Vienna*, Austria.
01/10/2016– 01/10/2020	**Scholarship of excellence (Leistungsstipendium)**, Total funding: 5.000€, *Vienna University of Economics and Business*, Austria.

Competitions and Honors

4WARD	**Third Uniqa 4WARD Math Challange**. "Third Place", 500€ — Vienna, 01/06/2020.
NCUMC	**North Countries Universities Mathematical Competition**. "First Prize" — St. Petersburg, 15/04/2018.
IMC	**International Mathematical Competition**. "Honourable Mention" — Bulgaria, 06/08/2017, "Third Prize" — Bulgaria, 02/08/2015, 31/07/2016 & 28/07/2018.
VJIMC	**Vojtěch Jarník International Mathematical Competition**. "Honourable Mention" — Czech Republic, 27/03/2015, 08/04/2016 & 29/03/2019, "Third Prize" — Czech Republic, 01/04/2017 & 13/04/2018.
IMO	**International Mathematical Olympiad**. "Third Prize" (Bronze medal) — South Africa, 09/07/2014.
MEMO	**Middle European Mathematical Olympiad**. "Honourable Mention" — Hungary, 22/08/2013.

Publications

Published and accepted articles

December 2023	"**On the representability of sequences as constant terms**", with A. Bostan and A. Straub. In: *Journal of Number Theory*, vol 253, pp. 235–256. DOI: doi.org/10.1016/j.jnt.2023.06.015

July 2023	"**Beating binary powering for polynomial matrices**", with A. Bostan and V. Neiger. In: Proceedings of ISSAC'23, pp. 70–79, ACM Press. DOI: doi.org/10.1145/3597066.3597118
July 2023	"**Algebraicity for solutions of systems of functional equations**", with H. Notarantonio. In: Séminaire Lotharingien de Combinatoire , vol. 89B-13, pp. 1–12, 2023. Talk at FPSAC'23. DOI: https://www.mat.univie.ac.at/~slc/
April 2023	"**On the q-analogue of Pólya's Theorem**", with A. Bostan. In: *Electronic Journal of Combinatorics*, vol 30, pp. 2.9:1-9. DOI: doi.org/10.37236/11269
March 2023	"**Fast Computation of the N-th Term of a q-Holonomic Sequence and Applications**", with A. Bostan. In *Journal of Symbolic Computation*, vol 115, pp. 96–123. DOI: doi.org/10.1016/j.jsc.2022.07.008
January 2023	"**An algorithmic approach to Rupert's problem**", with J. Steininger, In: *Mathematics of Computation*, vol 92, pp. 1905–1929. DOI: doi.org/10.1090/mcom/3831
June 2022	"**Extended abstract for: solving Rupert's problem algorithmically**", with J. Steininger. In: *ACM Communications in Computer Algebra*, vol 56, issue 2, pp. 32–35. DOI: doi.org/10.1145/3572867.3572870
September 2022	"**The art of algorithmic guessing in gfun**". In: *Maple Transactions*, vol 2, No. 1, pp. 14421:1–14421:19. DOI: doi.org/10.5206/mt.v2i1.14421
February 2022	"**A hypergeometric proof that** Iso **is bijective**", with A. Bostan. In: *Proceedings of the American Mathematical Society*, vol 150, pp. 2131–2136. DOI: doi.org/10.1090/proc/15836
February 2022	"**On a Class of Hypergeometric Diagonals**", with A. Bostan. In: *Proceedings of the American Mathematical Society*, vol 150, pp. 1071–1897. DOI: doi.org/10.1090/proc/15693
May 2021	"**Diagonal Representation of Algebraic Power Series: A Glimpse Behind the Scenes**". In: Transcendence in Algebra, Combinatorics, Geometry and Number Theory (TRANS 2019). *Springer Proceedings in Mathematics and Statistics*, vol 373, pp. 309–339. DOI: doi.org/10.1007/978-3-030-84304-5_13

Preprints

October 2023	"**Systems of Discrete Differential Equations, Constructive Algebraicity of Solutions**", with H. Notarantonio. arXiv: arxiv.org/abs/2310.12812, 30 pages.
July 2023	"**Algebraicity of hypergeometric functions with arbitrary parameters**", with F. Fürnsinn. arXiv: arxiv.org/abs/2308.12855, 21 pages.
September 2022	"**On the First Fundamental Theorem for** $\mathrm{GL}_2(K)$ **and** $\mathrm{SL}_2(K)$", with H. Melánová. arXiv: arxiv.org/abs/2009.08904, 9 pages.

Research talks and participation at conferences

For **slides** and **recordings** see: *yurkevi.ch/me.html#presentations*.

Invited talks at conferences

27/07/2023	"**Beating binary powering for polynomial matrices**", at Internat. Symposium on Symbolic & Algebraic Computation *(ISSAC'23)*, Tromsø, Norway.
20/06/2023	"**The generating function of DYZ-like numbers is algebraic**", at Foundations of Computational Mathematics *(FoCM'23)*, Paris, France.
07/03/2023	"**Beating binary powering for computing the Nth power**", at Journées Nationales de Calcul Formel *(JNCF'23)*, Luminy, France.
13/12/2022	"**Algebraic solutions of continuous and discrete differential equations**", at *Enumerative Combinatorics*, Oberwolfach, Germany.

28/11/2022 "**Creative Telescoping for the Canham model in genus one**",
at Combinatorics and Arithmetic for Physics *(CAP'22)*, Bures-sur-Yvette, IHES, France.

14/09/2022 "**Hypergeometric diagonals and a step towards Christol's conjecture**",
at *Journées du GDR EFI 2022*, Toulouse, France.

06/07/2023 "**Solving Rupert's Problem Algorithmically**" (Poster presentation),
at Internat. Symposium on Symbolic & Algebraic Computation *(ISSAC'22)*, Lille, France.

29/03/2022 "**Conjecturing & proving that the g.f. of the Yang-Zagier numbers is algebraic**",
at Functional Equations in LIMoges *(FELIM'22)*, Limoges, France.

28/02/2022 "**The Art of Educated Algorithmic Guessing**",
at Journées Nationales de Calcul Formel *(JNCF'22)*, Luminy, France.

01/12/2021 "**How to conjecture & prove that the g.f. of the Yang-Zagier numbers is algebraic**",
at *Combinatorics and Arithmetic for Physics (CAP'21)*, Bures-sur-Yvette, IHES, France.

03/11/2021 "**The Art of Algorithmic Guessing (in gfun)**",
at *Maple Conference*, Virtual, Online.

20/08/2021 "**The Generating Function of the Yang-Zagier Numbers is Algebraic**",
at *Applied Algebraic Geometry (AG'21)*, Virtual, Online.

26/07/2021 "**Diagonals and Hypergeometric Functions**",
at *Applications of Computer Algebra (ACA'21)*, Toulouse, France.

01/03/2021 "**Computing the N-th term of a q-holonomic sequence**",
at Journées Nationales de Calcul Formel *(JNCF'21)*, Luminy, France.

Additional invited talks at seminars & workshops

09/11/2023 "**Biomembranes and creative telescoping**",
at *Seminar Algebra and Discrete Mathematics*, Linz, Austria.

13/10/2023 "**Rupert or not Rupert?**"
at CADE Kirchberger workshop, Kirchberg, Austria.

21/03/2023 "**Algebraic solutions of DDEs with one catalytic variable**",
at *AG Diskrete Mathematik*, Vienna, Austria.

27/02/2023 "**Algebraic solutions of DDEs**",
at *MathExp Seminar*, Saclay, France.

19/02/2023 "**Creative telescoping for periods**",
at *Workshop on Fuchsian ODEs: "Periods"*, Lisbon, Portugal.

02/12/2022 "**Algebraic functions and integer sequences**",
at *Kirchberger Workshop*, Kirchberg, Austria.

14/05/2022 "**On Yang-Zagier Numbers**",
at *Workshop on Fuchsian ODEs*, Lisbon, Portugal.

03/05/2022 "**The generating function of the Yang-Zagier Numbers is algebraic**"
at *LFANT Seminar*, Bordeaux, France.

20/04/2022 "**Rupert or not Rupert?**"
at *VSM Student Retreat*, Yspertal, Austria.

01/12/2022 "**Algebraicity of solutions of functional equations with one catalytic variable**",
at *Algebraic and Enumerative Combinatorics*, Waterloo, Canada.

22/10/2021 "**Algorithms for proving algebraicity**",
at *Workshop: Fuchs'sche Differentialgleichungen*, Steyr, Austria.

25/09/2020 "**On a class of hypergeometric diagonals**",
at *Transcendance et combinatoire*, Virtual, Online.

10/03/2022 "**The mysterious Apéry numbers**"
at *VSM Student Retreat*, Yspertal, Austria.

17/02/2020 "**Algebraic Power Series**",
at *Workshop on the arithmetic of ODEs*, Lisbon, Portugal.

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21/01/2020	"**Some mathematical riddles**", at *Workshop: Algebraic Geometry in Austria*, Seewalchen am Attersee, Austria.
25/10/2019	"**Künstliche Neuronale Netze**", at *Pro Scientia*, Vienna, Austria.
21/02/2019	"**Representation of Algebraic Power Series as Diagonals**", at *Workshop: Algebraic marvels in differential equations*, Lisbon, Portugal.
17/01/2019	"**Some words on the Queuing Theory**", at *Wesenufer Workshop*, Wesenufer, Austria.

Further participation at conferences and other scientific events

September 2023	Summer school: *"Pro Scientia Sommerakademie"*, Puchberg, Austria.
July 2023	Conference: *FPSAC 2023*, Davis, USA.
January 2023	Conference/workshop: *Atelier E-fonctions, G-fonctions et Périodes*, Paris, France.
September 2022	Summer school: *VSM Summer School*, Techendorf am Weißensee, Austria.
April 2022	Conference: *SLC (87)*, Saint-Paul-en-Jarez, France.
March 2022	Conference: *Journées ALEA*, Luminy, France.
September 2021	Summer school: *VSM Summer School*, Techendorf am Weißensee, Austria.
September 2021	Summer school: *"Pro Scientia Sommerakademie"*, Raabs, Austria.
July 2021	Conference: *ISSAC 2021*, Saint Petersburg, Russia (Online).
June 2021	Conference: *Lattice Paths, Combinatorics and Interactions*, Marseille, France.
June 2021	Conference: *EJCIM 2021*, Virtual, Online.
March 2021	Conference: *Journées ALEA*, Luminy, France.
July 2020	Conference: *ISSAC 2020*, Kalamata, Greece (Online).
September 2019	Summer school: *"Pro Scientia Sommerakademie"*, Bozen, Italy.
July 2019	Workshop: *"Lüsens Workshop"*, Lüsens, Austria.
May 2019	Conference: *"Transient Transcendence in Transylvania"*, Brașov, Romania.
September 2018	Summer school: *VDS Summer School*, Techendorf am Weißensee, Austria.
September 2018	Conference: *"Data Science in Finance with R"*, Vienna, Austria.
September 2018	Summer school: *"Pro Scientia Sommerakademie"*, Bad Aussee, Austria.

Peer Review Activities and other scientific activities

2023	Referee for *The Fibonacci Quarterly*
2023	Referee for *Geometriae Dedicata*
2022 – 2023	Reporter for the Oberwolfach Report 2250 on *Enumerative Combinatorics*
2022	Referee for *Research in Number Theory*
2021 – 2022	Referee for *ISSAC*
2021 – 2022	Referee for *European Journal of Combinatorics*
2021	Referee for *The American Mathematical Monthly*
2021	Referee for *Experimental Mathematics*

Languages

Russian (native), German (native), English (fluent), French (elementary)

SERGEY YURKEVICH