

Contact information

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65-30 Kissena Blvd, Queens, NY 11367-1597 and
CUNY Graduate Center, Ph.D. programs in Mathematics and Computer Science
365 Fifth Avenue, New York, NY 10016

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Research interests

Algebraic theory of differential and difference equations; parameter estimation and identifiability in dynamic models; differential Galois theory; symbolic and symbolic-numeric computation

Education

- Ph.D. 05/2008, Moscow State University, Department of Mechanics and Mathematics
“*Algorithmic Methods in Differential Ideal Theory*”
Advisor: Eugeny Pankratiev
- Ph.D. 05/2007, North Carolina State University, Department of Mathematics
“*Tannakian Categories and Linear Differential Algebraic Groups*”
Advisor: Michael F. Singer
- M.S. 12/2005, North Carolina State University, Department of Mathematics
Advisor: Michael F. Singer
- Diploma with honors, 06/2004, Moscow State University, Department of Mechanics and Mathematics
Advisor: Eugeny Pankratiev

Selected grants and awards

- 2022–2026 National Science Foundation, CCF–2212460, PI, “Collaborative Research: CCF: AF: Medium: Validated Soft Approaches to Parametric ODE Solving”, \$212,814 awarded to date
- 2019–2024 National Science Foundation, DMS–1853650, PI, “Collaborative Research: Efficient Methods for Identifiability of Dynamic Models”, \$237,333
- 2018–2023 National Science Foundation, DMS–1760448, PI, “FRG: Collaborative Research: Model Theory of Differential and Difference Equations with Applications”, \$271,591
- 2016–2020 National Science Foundation, CCF–1563942, PI, “AF: Medium: Collaborative Research: Numerical Algebraic Differential Equations”, \$640,703
- 2018–2019 National Security Agency, PI in the collaborative conference grant #H98230-18-1-0016 “International Symposium on Symbolic and Algebraic Computation”, \$20,096
- 2017–2019 National Science Foundation, CCF–1708884, PI, conference grant “International Symposium on Symbolic and Algebraic Computation”, \$18,000
- 2016–2017 National Science Foundation, DMS–1606334, PI, conference grant “Algebraic Theory of Differential and Functional Equations: from Foundations to Computation”, \$35,000
- 2010–2017 National Science Foundation, CCF–0952591, PI, “CAREER: Computational Differential Algebra”, \$599,991
- 2013–2014 Alfred P. Sloan Foundation, CUNY Junior Faculty Award, \$50,000
- 2009–2010 National Science Foundation, CCF–0901175, PI, “Computational Methods for Systems of Difference Equations”, \$89,310

Professional history

Dec 2016 – present	Doctoral faculty, Department of Computer Science, CUNY Graduate Center
Aug 2016 – present	Professor, Department of Mathematics, CUNY Queens College
Sep 2013 – Aug 2016	Associate Professor, Department of Mathematics, CUNY Queens College
Mar 2012 – present	Doctoral faculty, Department of Mathematics, CUNY Graduate Center
Sep 2009 – Aug 2013	Assistant Professor, Department of Mathematics, CUNY Queens College
Aug 2007 – Aug 2009	Research Assistant Professor, Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago

Seminars organized

Aug 2009 – present	Kolchin Seminar in Differential Algebra, Graduate Center of CUNY
Feb 2015 – present	Joint CUNY-NYU Symbolic-Numeric Computing Seminar

Publications

Preprints

1. O. Bassik, Y. Berman, S. Go, H. Hong, I. Ilmer, A. Ovchinnikov, C. Rackauckas, P. Soto, and C. Yap, *Robust Parameter Estimation for Rational Ordinary Differential Equations*, arXiv:2303.02159. Software: [ParameterEstimation.jl](#)
2. Y. Berman, J. Forrest, M. Grote, A. Ovchinnikov, and S. Rueda, *Symbolic-numeric algorithm for parameter estimation in discrete-time models with exp*, arXiv:2401.16220. Software: [code in Python and Julia](#)
3. H. Harrington, H. Byrne, A. Ovchinnikov, G. Pogudin, and H. Rahkooy, *Algebraic identifiability of partial differential equation models*, arXiv:2402.04241. Software: [code in MAPLE](#)
4. S. Falkensteiner, A. Ovchinnikov, and R. Sendra, *Algorithm for globally identifiable reparametrizations of ODEs*, arXiv: 2401.00762
5. N. Meshkat, A. Ovchinnikov, and T. Scanlon, *Algorithm for finding new identifiable reparametrizations of parametric ODEs*, arXiv:2310.03057. Software: [code in MAPLE](#)
6. A. Ovchinnikov, A. Pillay, G. Pogudin, and T. Scanlon, *Identifiable specializations for ODE models*, arXiv:2308.16273. Software: [code in MAPLE](#)
7. M. Bessonov, I. Ilmer, T. Konstantinova, A. Ovchinnikov, G. Pogudin, and P. Soto *Faster Gröbner Bases via Domain-Specific Ordering in Parameter Identifiability of ODE Models*, arXiv:2202.06297. Software: [SIAN in Julia](#) and [SIAN in MAPLE](#)
8. I. Ilmer, A. Ovchinnikov, G. Pogudin, and P. Soto, *More Efficient Identifiability Verification in ODE Models by Reducing Non-Identifiability*, arXiv:2204.01623. Software: [SIAN in Julia](#) and [SIAN in MAPLE](#)

Peer-reviewed publications

9. A. Ovchinnikov, G. Pogudin, and P. Thompson, *Input-output equations and identifiability of linear ODE models*, IEEE Transactions on Automatic Control **68** (2) (2023) 812–824.
10. A. Ovchinnikov, G. Pogudin, and P. Thompson, *Parameter identifiability and input-output equations*, Applicable Algebra in Engineering, Communication and Computing, **34** (2023) 165–182.

11. W. Li, A. Ovchinnikov, G. Pogudin, and T. Scanlon, *Algorithms yield upper bounds in differential algebra*, Canadian Journal of Mathematics **75** (1) (2023), 29–51.
12. A. Ovchinnikov, G. Pogudin, and N.T. Vo, *Bounds for elimination of unknowns in systems of differential-algebraic equations*, International Mathematics Research Notices **2022** (16) (2022) 12342–12377. Software: [DifferentialElimination in MAPLE](#)
13. A. Ovchinnikov, A. Pillay, G. Pogudin, and T. Scanlon, *Multi-experiment parameter identifiability of ODEs and model theory*, SIAM Journal on Applied Algebra and Geometry **6** (3) (2022). Software: [ExperimentsBound in Julia](#)
14. A. Ovchinnikov, A. Pillay, G. Pogudin, and T. Scanlon, *Computing all identifiable functions for ODE models*, Systems & Control Letters **157** (2021) 105030. Software: [AllIdentifiableFunctions in MAPLE](#)
15. I. Ilmer, A. Ovchinnikov, and G. Pogudin, *Web-based Structural Identifiability Analyzer*, Computational Methods in Systems Biology, Lecture Notes in Computer Science **12881** (2021) 254–265. Software: [MAPLE Web App](#)
16. A. Ovchinnikov, I. Pérez Verona, G. Pogudin, and M. Tribastone, *CLUE: Exact maximal reduction of kinetic models by constrained lumping of differential equations*, Bioinformatics **37** (12) (2021) 1732–1738. Software: [CLUE in Python](#)
17. W. Li, A. Ovchinnikov, G. Pogudin, and T. Scanlon, *Elimination of unknowns for systems of algebraic differential-difference equations*, Transactions of the American Mathematical Society **374** (1) (2021) 303–326.
18. H. Hong, A. Ovchinnikov, G. Pogudin, and C. Yap, *Global identifiability of differential models*, Communications on Pure and Applied Mathematics **73** (9) (2020) 1831–1879. Software: [SIAN in Julia](#) and [SIAN in MAPLE](#)
19. A. Ovchinnikov, G. Pogudin, and T. Scanlon, *Effective difference elimination and Nullstellensatz*, Journal of the European Mathematical Society **22** (8) (2020) 2419–2452. Software: [DifferenceElimination in MAPLE](#)
20. J. Nagloo, A. Ovchinnikov, and P. Thompson, *Commuting planar polynomial vector fields for conservative Newton systems*, Communication in Contemporary Mathematics **22** (2020), 1950025 [30 pages].
21. A. Minchenko and A. Ovchinnikov, *Triviality of differential Galois cohomologies of linear differential algebraic groups*, Communications in Algebra **47** (12) (2019), 5094–5100.
22. H. Hong, A. Ovchinnikov, G. Pogudin, and C. Yap, *SIAN: software for structural identifiability analysis of ODE models*, Bioinformatics **35** (16) (2019) 2873–2874.
23. R. Gustavson, A. Ovchinnikov, and G. Pogudin, *New order bounds in differential elimination algorithms*, Journal of Symbolic Computation **85** (2018) 128–147.
24. A. Minchenko and A. Ovchinnikov, *Calculating Galois groups of third order linear differential equations with parameters*, Communications in Contemporary Mathematics **20** (2018) 1750038 [25 pages].
25. C. Hardouin, A. Minchenko, and A. Ovchinnikov, *Calculating Galois groups of differential equations with parameters and hypertranscendence*, Mathematische Annalen **368** (1) (2017) 587–632.
26. A. Ovchinnikov and M. Wibmer, *Tannakian categories with semigroup actions*, Canadian Journal of Mathematics **69** (3) (2017) 687–720.
27. R. Gustavson, M. Kondratieva, and A. Ovchinnikov, *New effective differential Nullstellensatz*, Advances in Mathematics **290** (2016) 1138–1158.

28. O. León Sánchez and A. Ovchinnikov, *On bounds for the effective differential Nullstellensatz*, Journal of Algebra **449** (2016) 1–21.
29. R. Gustavson, A. Ovchinnikov, and G. Pogudin, *Bounds for orders of derivatives in differential elimination algorithms*, Proceedings of the ACM on International Symposium on Symbolic and Algebraic Computation, ISSAC 2016, ACM Press, 239–246.
30. A. Ovchinnikov and M. Wibmer, *σ -Galois theory of linear difference equations*, International Mathematics Research Notices **2015** (12) (2015) 3962–4018.
31. A. Minchenko, A. Ovchinnikov, and M.F. Singer, *Reductive linear differential algebraic groups and the Galois groups of parameterized linear differential equations*, International Mathematics Research Notices **2015** (7) (2015) 1733–1793.
32. A. Minchenko, A. Ovchinnikov, and M.F. Singer, *Unipotent differential algebraic groups as parameterized differential Galois groups*, Journal of the Institute of Mathematics of Jussieu **13** (4) (2014) 671–700.
33. S. Gorchinskiy and A. Ovchinnikov, *Isomonodromic differential equations and differential categories*, Journal de Mathématiques Pures et Appliquées **102** (2014) 48–78.
34. R. Miller, A. Ovchinnikov, and D. Trushin, *Computing constraint sets for differential fields*, Journal of Algebra **407** (2014) 316–357.
35. B. Antieau, A. Ovchinnikov, and D. Trushin, *Galois theory of difference equations with periodic parameters*, Communications in Algebra **42** (9) (2014) 3902–3943.
36. A. Ovchinnikov, *Difference integrability conditions for parameterized linear difference and differential equations*, Advances in Applied Mathematics **53** (2014) 61–71.
37. H. Gillet, S. Gorchinskiy, and A. Ovchinnikov, *Parameterized Picard–Vessiot extensions and Atiyah extensions*, Advances in Mathematics **238** (2013) 322–411.
38. A. Minchenko and A. Ovchinnikov, *Extensions of differential representations of SL_2 and tori*, Journal of the Institute of Mathematics of Jussieu **12** (1) (2013) 199–224.
39. M. Bessonov, A. Ovchinnikov, and M. Shapiro, *Integrability conditions for parameterized linear difference equations*, Proceedings of the 38th International Symposium on Symbolic and Algebraic Computation, ISSAC 2013, ACM Press, 45–52.
40. A. Minchenko and A. Ovchinnikov, *Zariski closures of reductive linear differential algebraic groups*, Advances in Mathematics **227** (3) (2011) 1195–1224.
41. R. Miller and A. Ovchinnikov, *Adapting Rabin’s theorem for differential fields*, Lecture Notes in Computer Science **6735** (2011) 211–220.
42. O. Golubitsky, M.V. Kondratieva, A. Ovchinnikov, and A. Szanto, *A bound for orders in differential Nullstellensatz*, Journal of Algebra **322** (11) (2009) 3852–3877.
43. A. Ovchinnikov, *Differential Tannakian categories*, Journal of Algebra **321** (10) (2009) 3043–3062.
44. A. Ovchinnikov, *Tannakian categories, linear differential algebraic groups, and parameterized linear differential equations*, Transformation Groups **14** (1) (2009) 195–223.
45. O. Golubitsky, M.V. Kondratieva, and A. Ovchinnikov, *Algebraic transformation of differential characteristic decompositions from one ranking to another*, Journal of Symbolic Computation **44** (4) (2009) 333–357.
46. O. Golubitsky, M.V. Kondratieva, and A. Ovchinnikov, *On the generalised Ritt problem as a computational problem*, Journal of Mathematical Sciences **163** (5) (2009) 515–522.

47. A. Ovchinnikov, *Tannakian approach to linear differential algebraic groups*, Transformation Groups **13** (2) (2008) 413–446.
48. O. Golubitsky, M.V. Kondratieva, M. Moreno Maza, and A. Ovchinnikov, *A bound for the Rosenfeld-Gröbner algorithm*, Journal of Symbolic Computation **43** (8) (2008) 582–610.
49. O. Golubitsky, M.V. Kondratieva, and A. Ovchinnikov, *Canonical characteristic sets of characterizable differential ideals*, Moscow University Mathematics Bulletin **63** (2) (2008) 79–81.
50. A. Ovchinnikov, *Orders of derivatives in decompositions of radical differential ideals*, Russian Mathematical Surveys **63** (2) (2008) 383–385.
51. A. Ovchinnikov, *Sections of a differential spectrum and factorization free computations*, Journal of Mathematical Sciences **135** (5) (2006) 3355–3362.
52. M.V. Kondratieva and A. Ovchinnikov, *Characteristic sets of ordinary differential equations*, Programming and Computer Software **31** (2) (2005) 91–96.
53. A. Ovchinnikov, *Characterizable radical differential ideals and some properties of characteristic sets*, Programming and Computer Software **30** (3) (2004) 141–149.
54. A. Ovchinnikov, *Computation of characteristic sets of radical differential ideals*, Proceedings of the conference Computer Algebra in Scientific Computing (2004) 371–378.
55. M.V. Kondratieva and A. Ovchinnikov, *On computing characteristic sets of arbitrary radical differential ideals*, Proceedings of the conference Applications of Computer Algebra (2004) 38–48.
56. A. Ovchinnikov and A. Zobnin, *Classification and applications of monomial orderings and the properties of differential term-orderings*, Proceedings of the conference Computer Algebra in Scientific Computing (2002) 237–252.

Other published articles

57. M. Barkatou, T. Cluzeau, A. Ovchinnikov, and G. Regensburger, *Special issue on computational aspects of differential/difference algebra and integral operators*, preface to the special issue, Advances in Applied Mathematics **72** (2016) 1–3.
58. A. Ovchinnikov, *Difference Algebra by A. Levin*, invited book review, Bulletin of the London Mathematical Society **43** (4) (2011) 818–823.
59. O. Golubitsky, M.V. Kondratieva, A. Ovchinnikov, and A. Szanto, *Orders in effective differential Nullstellensatz*, Le Matematiche, volume LXIII (2008), 67–69.
60. O. Golubitsky, M. Kondratieva, M. Moreno Maza, and A. Ovchinnikov, *Bounds and algebraic algorithms in differential algebra: the ordinary case*, Proceedings of the 9th International Conference on Intelligent Systems and Computer Science, Moscow (2006) 7–11.
61. A. Ovchinnikov, *On characterizable ideals and characteristic sets*, Contributions to General Algebra **14** (2004) 91–108.
62. A. Ovchinnikov and A. Zobnin, *A new approach to classification of monomial orderings*, Proceedings of the Workshop on Under- and Overdetermined Systems of Algebraic or Differential Equations, Karlsruhe, Germany (2002) 129–140.
63. V. Mityunin, A. Ovchinnikov, A. Semyonov, and A. Zobnin, *Involutive and classical Gröbner bases construction from the computational viewpoint*, Proceedings of the international workshop Computer Algebra and its Application to Physics (Dubna, June 28–30, 2001), JINR (2002) 221–230.

Postdoctoral scholars and students

Postdoctoral scholars mentored and supported

- Joel Nagloo, CUNY Graduate Center, currently an Associate Professor at UIC
- Gleb Pogudin, CUNY Graduate Center, currently an Assistant Professor at École Polytechnique

Graduate students supervised and supported

- Carlos Arreche, Ph.D. 09/2014, CUNY Graduate Center, currently an Assistant Professor at the University of Texas at Dallas
- Richard Gustavson, Ph.D. 06/2017, CUNY Graduate Center, currently an Assistant Professor at Manhattan College
- Eli Amzallag, Ph.D. 09/2018, CUNY Graduate Center, currently a Lecturer at the City College
- Mengxiao Sun, Ph.D. 06/2019, CUNY Graduate Center, currently a Lecturer at the University of Colorado at Boulder
- Peter Thompson, Ph.D. 06/2019, CUNY Graduate Center
- Iliia Ilmer, Ph.D. 06/2023, CUNY Graduate Center, CS program

Other students mentored and supported

- Benjamin Antieau, Ph.D. 2010, supported and co-advised with Henri Gillet, UIC, currently a Professor at Northwestern University
- Camilo Sanabria, Ph.D. 2010, supported and mentored, R. Churchill was thesis advisor, CUNY, currently an Associate Professor at Universidad de los Andes
- Thieu Vo Ngoc, visiting graduate student from Johannes Kepler University, mentored at CUNY, currently a Lecturer at Ton Duc Thang University
- Shlomo Ben-Har, graduate student, supported, CUNY
- York Kitajima, high school student, mentored on a research project, Paul Schreiber High School
- Esha Sawant, high school student, mentored on a research project, Queens High School for the Sciences
- Maxwell Shapiro, undergraduate and graduate student, mentored and supported, CUNY, currently in the applied mathematics Ph.D. program at Stony Brook
- Jean Steve, undergraduate student, mentored, CUNY

Teaching experience

- **City University of New York, Queens College and Graduate Center:**
Calculus I and II, Differential Algebra, Differential Algebra and its Applications, Discrete Mathematics, Introduction to Algebraic Structures, Abstract Algebra, Linear Algebra I and II, Symbolic Computing, Data Mining, Numerical Analysis I and II, Mathematical Models, Differential Equations with Numerical Methods
- **Stevens Institute of Technology:**
Differential Equations

- **University of Illinois at Chicago:**
Introduction to Symbolic Computation, Linear Algebra, Calculus III, Applied Linear Algebra
- **North Carolina State University:**
Applications of Algebra, Calculus I

Recent conference organization, editorial work, and service

- Journal of Computational Algebra, editorial board member, 2023 – present
- Journal of Symbolic Computation, editorial board member, 2020 – present
- Advances in Applied Mathematics, editorial board member, 2016 – present
- Journal of Symbolic Computation, guest editor of the ISSAC 2018 special issue
- Advances in Applied Mathematics, guest editor of the special Issue on Computational Aspects of Differential/Difference Algebra and Integral Operators
- Computer Algebra in Scientific Computing 2024, 9/2–6/2024, Rennes, France, PC member
- Workshop on Differential Algebra and Modeling, 7/20–22/2024, Raleigh, NC, USA, co-organizer
- Differential Algebra and Related Topics XII, 4/9–12/2024, Kassel, Germany, PC member
- Differential Algebra and Related Topics XI, 6/5–6/9/2023, Queen Mary University of London, co-organizer and PC member
- MSRI summer graduate summer school “Algebraic Theory of Differential and Difference Equations, Model Theory, and their Applications”, July 4–15, 2022, lead organizer
- Differential Algebra and Related Topics X, 2/10–2/14/2020, CUNY Graduate Center, local co-organizer
- Differential Algebra and Related Topics IX, 7/30–8/2/2018, University of Leeds, co-organizer
- 43rd International Symposium on Symbolic and Algebraic Computation (ISSAC 2018), 07/15–07/19, 2018, CUNY and NYU, co-Chair
- Differential Algebra and Related Topics VIII, 09/11–09/14/2017, Johannes Kepler University, Linz, Austria, Program Committee member
- AMS Spring Eastern Sectional Meeting, 05/06–07/2017, CUNY Hunter College, local co-organizer
- Research and training Kolchin workshops for professional development of junior researchers, 04/07–09/2017, 04/21–23/2017, 05/05–07/2017, CUNY Graduate Center, Baruch College and Hunter College, co-Chair
- Differential Algebra and Related Topics VII, 09/30–10/04/2016, CUNY Graduate Center and Hunter College, co-Chair and Program Committee member
- Research and training Kolchin workshops for professional development of junior researchers, 04/08–10/2016 and 05/13–15/2016, CUNY Graduate Center and Hunter College, co-Chair
- AMS Joint Mathematics Meeting, 01/06–09/2016, Seattle, co-organizer of the Special Session on Algebraic Theory of Differential and Functional Equations
- Mathematical Aspects of Computer and Information Sciences conference (MACIS 2015), 11/11–13/2015, Berlin, Germany, Program Committee member
- Differential Algebra and Related Topics VI, 08/10–14/2015, Beijing, China, Program Committee member
- Applications of Computer Algebra (ACA 2015) conference, 07/20–23/2015, Kalamata, Greece, co-organizer of the special session on Computational Differential and Difference Algebra

- Applications of Computer Algebra (ACA 2014) conference, 07/09–12/2014, Fordham University, Bronx, NY, organizer of the special session on Computational Differential and Difference Algebra
- Served 4 times as an NSF panelist and multiple times as an ad-hoc reviewer for the NSF and for the FWF (Austrian Science Fund)
- Served 3 times as a judge at NYC Science and Engineering Fairs for high school students at CUNY City College and the Museum of Natural History