

Contact information

Work address: CUNY Queens College, Department of Mathematics
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

E-mail: aovchinnikov@qc.cuny.edu

Website: <http://qcpages.qc.cuny.edu/~aovchinnikov/>

Research interests

Algebraic theory of differential and difference equations; parameter identification in dynamic models; differential Galois theory; representation theory; 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

- 2019–2022 National Science Foundation, DMS–1853650, PI, “Collaborative Research: Efficient Methods for Identifiability of Dynamic Models”, \$237,333
- 2018–2021 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
- 2015–2017 National Security Agency, PI in the collaborative conference grant #H98230-15-1-0245
“Series of workshops in differential and difference algebra”, \$20,400
- 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. A. Ovchinnikov, G. Pogudin, and P. Thompson, *Input-output equations and identifiability of linear ODE models*, arXiv:1910.03960
2. W. Li, A. Ovchinnikov, G. Pogudin, and T. Scanlon, *Elimination of unknowns for systems of algebraic differential-difference equations*, arXiv:1812.11390.
3. A. Ovchinnikov, G. Pogudin, and N.T. Vo, *Bounds for elimination of unknowns in systems of differential-algebraic equations*, arXiv:1610.04022.
4. H. Hong, A. Ovchinnikov, G. Pogudin, and C. Yap, *Global identifiability of differential models*, arXiv:1801.08112.

Peer-reviewed publications

5. A. Ovchinnikov, G. Pogudin, and T. Scanlon, *Effective difference elimination and Nullstellensatz*, accepted for publication in the Journal of the European Mathematical Society, arXiv:1712.01412.
6. J. Nagloo, A. Ovchinnikov, and P. Thompson, *Commuting planar polynomial vector fields for conservative Newton systems*, accepted for publication in Communication in Contemporary Mathematics, arXiv:1802.00831, doi:10.1142/S0219199719500251.
7. A. Minchenko and A. Ovchinnikov, *Triviality of differential Galois cohomologies of linear differential algebraic groups*, Communications in Algebra **47**(12) (2019), 5094–5100.
8. H. Hong, A. Ovchinnikov, G. Pogudin, and C. Yap, *SIAN: software for structural identifiability analysis of ODE models*, Bioinformatics **35**(16) (2019), 2873–2874.
9. R. Gustavson, A. Ovchinnikov, and G. Pogudin, *New order bounds in differential elimination algorithms*, Journal of Symbolic Computation **85** (2018) 128–147.
10. 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].

11. C. Hardouin, A. Minchenko, and A. Ovchinnikov, *Calculating Galois groups of differential equations with parameters and hypertranscendence*, *Mathematische Annalen* **368** (1) (2017) 587–632.
12. A. Ovchinnikov and M. Wibmer, *Tannakian categories with semigroup actions*, *Canadian Journal of Mathematics* **69** (3) (2017) 687–720.
13. R. Gustavson, M. Kondratieva, and A. Ovchinnikov, *New effective differential Nullstellensatz*, *Advances in Mathematics* **290** (2016) 1138–1158.
14. O. León Sánchez and A. Ovchinnikov, *On bounds for the effective differential Nullstellensatz*, *Journal of Algebra* **449** (2016) 1–21.
15. 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.
16. A. Ovchinnikov and M. Wibmer, *σ -Galois theory of linear difference equations*, *International Mathematics Research Notices* **2015** (12) (2015) 3962–4018.
17. 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.
18. 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.
19. S. Gorchinskiy and A. Ovchinnikov, *Isomonodromic differential equations and differential categories*, *Journal de Mathématiques Pures et Appliquées* **102** (2014) 48–78.
20. R. Miller, A. Ovchinnikov, and D. Trushin, *Computing constraint sets for differential fields*, *Journal of Algebra* **407** (2014) 316–357.
21. B. Antieau, A. Ovchinnikov, and D. Trushin, *Galois theory of difference equations with periodic parameters*, *Communications in Algebra* **42** (9) (2014) 3902–3943.
22. A. Ovchinnikov, *Difference integrability conditions for parameterized linear difference and differential equations*, *Advances in Applied Mathematics* **53** (2014) 61–71.
23. H. Gillet, S. Gorchinskiy, and A. Ovchinnikov, *Parameterized Picard–Vessiot extensions and Atiyah extensions*, *Advances in Mathematics* **238** (2013) 322–411.
24. 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.
25. 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.
26. A. Minchenko and A. Ovchinnikov, *Zariski closures of reductive linear differential algebraic groups*, *Advances in Mathematics* **227** (3) (2011) 1195–1224.
27. R. Miller and A. Ovchinnikov, *Adapting Rabin’s theorem for differential fields*, *Lecture Notes in Computer Science* **6735** (2011) 211–220.
28. 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.
29. A. Ovchinnikov, *Differential Tannakian categories*, *Journal of Algebra* **321** (10) (2009) 3043–3062.

30. A. Ovchinnikov, *Tannakian categories, linear differential algebraic groups, and parameterized linear differential equations*, Transformation Groups **14** (1) (2009) 195–223.
31. 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.
32. 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.
33. A. Ovchinnikov, *Tannakian approach to linear differential algebraic groups*, Transformation Groups **13** (2) (2008) 413–446.
34. 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.
35. O. Golubitsky, M.V. Kondratieva, and A. Ovchinnikov, *Canonical characteristic sets of characterizable differential ideals*, Moscow University Mathematics Bulletin **63** (2) (2008) 79–81.
36. A. Ovchinnikov, *Orders of derivatives in decompositions of radical differential ideals*, Russian Mathematical Surveys **63** (2) (2008) 383–385.
37. A. Ovchinnikov, *Sections of a differential spectrum and factorization free computations*, Journal of Mathematical Sciences **135** (5) (2006) 3355–3362.
38. M.V. Kondratieva and A. Ovchinnikov, *Characteristic sets of ordinary differential equations*, Programming and Computer Software **31** (2) (2005) 91–96.
39. A. Ovchinnikov, *Characterizable radical differential ideals and some properties of characteristic sets*, Programming and Computer Software **30** (3) (2004) 141–149.
40. A. Ovchinnikov, *Computation of characteristic sets of radical differential ideals*, Proceedings of the conference Computer Algebra in Scientific Computing (2004) 371–378.
41. 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.
42. 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

43. 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.
44. A. Ovchinnikov, *Difference Algebra by A. Levin*, invited book review, Bulletin of the London Mathematical Society **43** (4) (2011) 818–823.
45. O. Golubitsky, M.V. Kondratieva, A. Ovchinnikov, and A. Szanto, *Orders in effective differential Nullstellensatz*, Le Matematiche, volume LXIII (2008), 67–69.
46. 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.
47. A. Ovchinnikov, *On characterizable ideals and characteristic sets*, Contributions to General Algebra **14** (2004) 91–108.

48. 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.
49. 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 Assistant Professor at CUNY BCC

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
- Peter Thompson, Ph.D. 06/2019, CUNY Graduate Center

Other students mentored and supported

- Benjamin Antieau, Ph.D. 2010, supported and co-advised with Henri Gillet, UIC, currently an Associate Professor at the University of Illinois at Chicago
- Camilo Sanabria, Ph.D. 2010, supported and mentored, R. Churchill was thesis advisor, CUNY, currently an Assistant Professor at Universidad de los Andes
- 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
- Thieu Vo Ngoc, visiting graduate student from Johannes Kepler University, mentored at 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, Linear Algebra I and II, Symbolic Computing
- **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

- Advances in Applied Mathematics, editorial board member
- Journal of Symbolic Computation, guest editor of the ISSAC 2018 special issue
- 43rd International Symposium on Symbolic and Algebraic Computation (ISSAC 2018), July 16-19, 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
- 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 3 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