Elena Bunina

Curriculum Vitae

Born May 12, 1976, Moscow

# Contacts

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# Research interests

Chevalley Groups, Elementary Equivalence, Model Theory of Linear Groups

# Education and ACADEMIC degrees

* Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Dept. of Higher Algebra, 1998 (full 5 years)
* Independent Moscow University, Mathematical College, 1998 (full 5 years)
* Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Dept. of Higher Algebra, Ph.D. thesis *Elementary equivalence of linear and algebraic groups* defended in 2001, Scientific advisor prof. Mikhalev A.V.
* Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Dept. of Higher Algebra, D.Sc. thesis *Automorphisms and elementary equivalence of Chevalley roups and other derivative structures* defended in 2010.

# ACADEMIC positions

* Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Laboratory of Computational Methods, researcher (2001–2006)
* Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Dept. of Higher Algebra, researcher and assistant professor (2006–2011), full professor (2011–2022)
* Bar Ilan University (Israel), Department of Mathematics, professor (2022– )

# selected publications

More than 60 articles, including:

* Bunina E.I., Miasnikov A.G., Plotkin E.B. The Diophantine problem in Chevalley groups. 2023, Arxiv.org/abs/2304.26259, 44 pp.
* Bunina E.I. Regular bi-interpretability of Chevalley groups over local rings. European Journal of Mathematics, 2023, to appear (Arxiv.org/abs/2208.13623)
* Bunina E.I., Mikhalev A.V., Soloviev I.O. Elementary equivalence of stable linear groups over fields of characteristics 2. Journal of Mathematical Sciences, 2023, to appear
* Bunina E.I., Lazarev A.M. Universal equivalence of symplectic groups. Journal of Mathematical Sciences, 2023, 269(4), 453-468.
* Bunina E., Sosov K. Endomorphisms of the semigroup of nonnegative invertible matrices of order two over commutative ordered rings. Journal of Mathematical Sciences, 2023, 269(4), 469-478.
* Bunina E.I. Isomorphisms and elementary equivalence of Chevalley groups over commutative rings. Sbornik: Mathematics, 2019, 210(8), 1067-1091.
* Bunina E.I., Kaleeva G.A. Universal equivalence of general and special linear groups over fields. Journal of Mathematical Sciences, 2019, 237, 387-409.
* Bunina E.I., Mikhalev A.V., Roizner M.A. A criterion for the elementary equivalence of endomorphism rings and automorphism groups of Abelian p-groups. Doklady Mathematics, 2014, 90, 399-400.
* Bunina E.I. Automorphisms of Chevalley groups of different types over commutative rings. Journal of Algebra, 2012, 355(1), 154-170.
* Bunina E.I. Automorphisms of Chevalley groups of type F4 over local rings with ½. Journal of Algebra, 2010, 323, 2270-2289.
* Bunina E.I. Elementary equivalence of Chevalley groups over local rings. Sbornik: Mathematics, 2010, 201(3), 321-337
* Bunina E.I., Mikhalev A.V. Elementary equivalence of endomorphism rings of Abelian p-groups. Journal of Mathematical Sciences, 2006, 137, 5212-5274.
* Bunina E.I., Mikhalev A.V. Combinatorial and logical aspects of linear groups and Chevalley groups. Acta Applicandae Mathematicae, 2005, 85(1-3), 57-74.

A monography:

* Bunina E.I., Mikhalev A.V., Pinus A.G. Elementary and relative logical equivalences of classical and universal algebras. Moscow, MCCME, 2015, 360 pages. (In Russian).

[Scopus web page](https://www.scopus.com/authid/detail.uri?authorId=6601993842)

# selected conferences

* “Algebraic groups, their friends and relations”, International Algebraic Conference, September 2022, Saint-Petersburg, Russia. Plenary talk “Regular bi-interpretability of Chevalley groups”.
* Federated Logic Conference 2022, August 2022, Haifa, Israel. Invited talk “How to teach Logic for CS-undergraduates? Step-by-step!”.
* GAGTA 2022 Conference “Modern Group Theory and Related Subjects”, July 2022, USA. Plenary talk “Universal and AE theories of linear groups”
* Workshop “Lie and Jordan Algebras”, November 2020, San Paulo, Brasilia. Talk “Geometric algebra: automorphisms and isomorphisms, elementary equivalence, and second order logic of derivative structures”
* International Conference “Maltsev Meeting 2017”, November 2017, Novosibirsk, Russia. Talk “Universal equivalence of linear groups”
* International Conference “Graded Structures in Algebra and their Applications”, September 2016, Dubrovnik, Croatia. Plenary talk “Elementary equivalence of linear groups over graded rings with finite number of central idempotents”
* International Conference “Algebra and Mathematical Logic: theory and applications”, June 2014, Kazan, Russia. Plenary talk “Elementary equivalence of derivative structures of classical and universal algebras and second order logic”
* Workshop on Geometric, Asymptotic, Combinatorial Group Theory with Applications (GAGTA), August 2010, Montreal, Canada. Plenary talk “Automorphisms, isomorphisms and elementary equivalence of Chevalley groups over commutative rings”

# teaching and ACADEMIC ADVISING

* Lectures and seminars for bachelor’s degree students at Moscow State University, Faculty of Mechanics and Mathematics, since 2001:
  + Programming
  + Computer Science
  + General algebra
  + Linear algebra
* Lectures for students at Bar Ilan University, Department of Mathematics, 2022/2023:
  + Special course “Elementary equivalence of Abelian groups”
  + Lectures in the course “Mathematical Logic”
  + Additional lectures for Russian-speaking students in Linear Algebra and Group Theory
* Head of academic seminar “Algebra and Model Theory” for master’s degree and PhD students at Moscow State University, Faculty of Mechanics and Mathematics, since 2007
* Special courses for master’s degree and PhD students at Moscow State University, Faculty of Mechanics and Mathematics, since 2005:
  + Root Systems and Lie Algebras
  + Semisimple Lie algebras and Chevalley groups
  + Chevalley groups and their automorphisms
  + Elementary equivalence of Abelian groups
  + Machine learning and its applications to algebra
  + Model theory and its applications
  + Category theory
  + Elementary equivalence of nilpotent power groups
  + Localization and automorphisms of linear groups
* Supervisor of 42 master’s degree theses (including 4 in progress), since 2007
* Supervisor of 3 PhD theses:
  + Pavel Semenov “Automorphisms, endomorphisms and elementary equivalence of semigroups of nonnegative matrices”, 2013
  + Mikhail Roizner “Elementary equivalence of endomorphism rings and automorphism groups of Abelian p-groups”, 2014
  + Agata Atkarskaya “Isomorphisms of linear groups over associative rings”, 2014

# executive and managing positions in academy and education

* Co-founder and Director of the *Yandex School of Data Analysis*, an advanced master’s level program in big data and data science which has expanded into seven centers in Russia and Israel, its graduates are now sought after by global tech employers, since 2007
* Co-founder of the *Faculty of Computer Science* at the Higher School of Economics in Moscow (2014). Today it is the Russia’s/CIS best IT faculty, a major hub for AI research and practice with QS ranking in CS higher than 200
* Director of all educational projects of Yandex (Russia, Kazakhstan, Armenia, Israel), including:
  + Project “*Lyceum of Yandex Academy*” for teaching programming to school students. This project now runs in 162 locations and has had thousands of graduates since its start in 2016.
  + Digital learning platform *Yandex Textbook*, which helped thousands of teachers and ~800,000 school students during the pandemic. This project also aimed to create a learning environment for the digital age.
  + Several joint bachelor’s and master’s degree programs in Computer Science and Data analysis: Yandex together with Moscow Institute of Physics and Technology, St. Petersburg State University, Higher School of Economics, Belarussian State University, Novosibirsk State University, Ural Federal University, N. I. Lobachevsky State University of Nizhny Novgorod, ITMO University, New Economic School, European University at Saint Petersburg
* Science Director of *Practicum*, Online bootcamp aiming to help millions of people around the world change their career to tech. Practicum launched at 2019, teach 25K students now in Russia, Belorussia, Ukraine, Israel, US, Latin America with 80% employment rate.