

# Roman Lubkov

## Curriculum Vitae

### Positions

- 2025–present **Assistant professor**, *Mathematics and Computer Science Department, St. Petersburg University*
- 2025–present **Prime instructor**, *St. Petersburg Center for Artificial Intelligence and Information Technologies*
- 2023–present **Postdoctoral researcher**, *Leonhard Euler International Mathematical Institute, St. Petersburg*
- 2022–2023 **Junior researcher**, *Chebyshev Laboratory at St. Petersburg University*
- 2019–2022 **Research assistant**, *St. Petersburg Department of Steklov Mathematical Institute of The Russian Academy of Sciences, St. Petersburg*
- 2017–2020 **Research assistant**, *Mathematics and Mechanics Department, St. Petersburg University*

### Summary of Qualifications

- Author of 10 publications in peer-reviewed mathematical journals, see full list on p. 4;
- Experienced instructor in advanced mathematics, having taught core undergraduate algebra courses and led specialized seminars for undergraduate and graduate students;
- Awarded multiple research grants as principal investigator and co-investigator, funded by the Russian Science Foundation (RSF) and other agencies;
- Proficient in scientific computing and IT infrastructure, with practical skills in Linux server management, containerization (Docker), and tools for collaborative research.

### Education

- 2017–2021 **Ph.D. in Mathematics and Physics**, *St. Petersburg Department of Steklov Mathematical Institute of The Russian Academy of Sciences*  
Advisors: Nikolai Vavilov & Victor Petrov      *Overgroups of The Elementary Subgroups of Reductive Groups in Irreducible Representations*
- 2015–2017 **M.Sc. in Mathematics**, *St. Petersburg University*, Diploma *Summa Cum Laude*  
Advisor: Nikolai Vavilov      *Overgroups of Exterior Powers of an Elementary Group*
- 2011–2015 **B.Sc. in Mathematics**, *St. Petersburg University*, Diploma *Summa Cum Laude*  
Advisor: Nikolai Vavilov      *Overgroups of Exterior Square of an Elementary Group*

### Research Interests

- Algebraic groups: structure theory over rings (Chevalley groups, Steinberg groups, and their relatives; representation theory of such groups)
- Invariant theory: geometry and structure problems defining algebraic groups via invariants; algebro-geometric [Grothendieck] aspects
- Non-associative algebras: Jordan algebras and superalgebras, Poisson algebras and superalgebras and their generalizations, deformations and degenerations

### Funding and research groups

- RSF: [Russia] Russian Scientific Foundation
- RFBR: [Russia] Russian Foundation for Basic Research

- 2025–2027 **Co-coordinator**, *New trends in non-associative algebras*, RSF No 25-21-00545, 19.500 US\$, head: Gleb Nenashev, [Link](#)

- 2025 **Participant**, *Analysis, geometry, mathematical physics and their applications*, RSF No 19-71-30002 (extension), head: Anton Baranov, [Link](#)
- 2023–2025 **Leader**, *Groups and non-associative algebras*, RSF No 22-71-10001, 133.000 US\$  
Collective research grant (participants: I. Kaygorodov, A. Generalov, A. Petukhov, I. Karimjanov, V. Lopatkin, K. Vyatkina, M. Venchakov), [Link](#)
- 2023–2024 **Participant**, *Non-associative algebraic structures*, RSF No 22-11-00081, head: Ilya Gorshkov, [Link](#)
- 2019–2022 **Co-coordinator**, *Decomposition of unipotents in polyvector representations and applications*, RFBR, individual grant for doctoral students No 19-31-90072, 17.000 US\$, head: Victor Petrov, [Link \(in Russian\)](#)
- 2017–2019 **Participant**, *Split reductive groups over rings and their relatives*, RSF No 17-11-01261, head: Alexei Stepanov, [Link](#)

## Awards and scholarships

- 2025 **Researcher Award Competition in Mathematics, Theoretical Computer Science, and Theoretical Physics**, winner, [Link \(in Russian\)](#)
- 2023 **The “School” competition of Theoretical Physics and Mathematics Advancement Foundation “BASIS”**, junior postdoctoral award, [Link \(in Russian\)](#)
- 2022 **Scholarship of the program “Home towns”**, Gazprom Neft PJCS, junior postdoctoral award, [Link \(in Russian\)](#)
- 2018 **Rokhlin Stipends for Young Mathematicians**, graduate student award, [Link \(in Russian\)](#)
- 2013 **Scholarship of Chebyshev Laboratory at St. Petersburg University**, undergraduate student award
- 1999–2011 Multiple winner and prize winner in chess

## Visits

- 2025 **Short-term visit of Peking University via Sino–Russian Mathematics Center**, July 29 – August 27, Beijing, China
- **CIMPA school “Modern trends in non-associative algebras”**, April 28 – May 9, Tashkent, Uzbekistan  
co-author of poster talk “The algebraic and geometric classification of Jordan superalgebras”
- 2024 **Short-term visit of Peking University via Sino–Russian Mathematics Center**, September 1 – 22, Beijing, China
- 2024 **Mathematics Summer School “Algebraic Transformation Groups III”**, August 5 – 10, Pyalovo, Moscow  
lecturer of the mini-course “Why do we need geometry of schemes?”
- 2015 **Scuola Matematica Interuniversitaria (Mathematics Summer School)**, August, Perugia, Italy
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|--------------------|-----------------|---------------------------|
|                    | Jürgen Appell & | <i>Analisi Funzionale</i> |
| Completed courses: | Martin Văth     |                           |
|                    | Nikolai Vavilov | <i>Algebra</i>            |
- 2015 **Short-term visit of Bielefeld University via Leonhard Euler DAAD program**, April, Bielefeld, Germany, research advisor: Anthony Bak

## Conference Talks

- 2024 **Clear about the benefits of schemes for algebraic groups**, *Lie algebras, algebraic groups, and invariant theory*, August 19–24, Samara University, Samara, Russia
- 2023 **Invariants of polyvector representations of  $GL_n(\mathbb{R})$** , *Lie algebras, algebraic groups, and invariant theory*, January 28 – February 2, National Research University Higher School of Economics and Steklov Mathematical Institute, Moscow

- 2022 **Plücker polynomials and their applications (poster)**, *Random Point Processes*, November 1–5, Suzdal, Russia
- 2020 **Variation of the inverse decomposition of unipotents for exterior square**, *Lie algebras, algebraic groups, and invariant theory*, January 27 – February 1, Moscow State University and Steklov Mathematical Institute, Moscow
- 2018 **Overgroups of exterior powers of elementary groups (poster)**, *Modern Algebraic Geometry*, July 21–25, Silkroad Mathematics Center, Beijing
- 2017 **Overgroups of exterior powers of an elementary group**, *St. Petersburg Algebraic D. K. Faddeev Seminar*, May 8, St. Petersburg Department of Steklov Mathematical Institute
  - **Overgroups of exterior squares of an elementary group**, *Lie algebras, algebraic groups, and invariant theory*, January 31 — February 5, Moscow State University and Independent University of Moscow

## Teaching Experience

- MM SPbU: [Russia] Mathematics and Mechanics Department, St. Petersburg University  
 MCS SPbU: [Russia] Mathematics and Computer Science Department, St. Petersburg University
- since 2023 **Abstract algebra**, *undergraduate course, primary instructor*, MCS SPbU, 5 full semesters
  - 2024 Fall **Algebraic groups over rings**, MCS SPbU, organizer of a seminar for PhD students, [Link \(in Russian\)](#)
  - 2024–2025 **Lie algebras**, MCS SPbU, organizer of a seminar for undergraduate students, [Link \(in Russian\)](#)
  - 2014 and 2016, Fall **Abstract algebra**, *undergraduate course, primary instructor*, MM SPbU

## Academic Service & Contributions

- MM SPbU: [Russia] Mathematics and Mechanics Department, St. Petersburg University  
 MCS SPbU: [Russia] Mathematics and Computer Science Department, St. Petersburg University
- since 2025 **Faculty IT Contributor**, MCS SPbU  
 Server administration and maintenance for departmental needs, provided ad-hoc technical support to faculty members, developed for the official faculty website using a CMS and HTML/CSS.
  - 2025 Fall **Supervising Instructor for a graduate teaching assistant**, MCS SPbU
  - 2015–2017 **Headman of group (25–35 master students)**, MM SPbU
  - 2014 **Coordinator of group (15–25 students)**, MM SPbU
  - 2011–2015 **Headman of group (50+ bachelor students)**, MM SPbU

## Other scientific activities and professional development

- since 2025 **Journal referee** for “Communications in Mathematics”.
- since 2024 **Referee** for Theoretical Physics and Mathematics Advancement Foundation “BASIS”, Russia
- since 2023 **Referee** for Student Research Paper Competition, National Research University Higher School of Economics, Moscow

## Technical Proficiencies

### Infrastructure & DevOps Engineering

Expertise in end-to-end management of Linux servers and self-hosted infrastructure. Experienced in deploying containerized collaboration tools and web services using Docker, alongside automating workflows and implementing CI/CD practices.

### Scientific Computing & Computer Algebra Systems

Advanced user of computer algebra systems (CAS) for symbolic and numerical computations. Proficient in Wolfram Mathematica and Maple for academic research and problem-solving.

## Infrastructure Security & Operations

Practical experience in implementing secure service configurations (including VPN tunnels for secure device interconnection) and maintaining system stability. Working knowledge of core network protocols and security practices for self-hosted environments.

## Programming & Typesetting

Familiar with C++ fundamentals. Proficient in  $\text{\LaTeX}$  and Typst for professional document preparation.

## Additional Competencies

- **Databases:** Operational knowledge of containerized DBMS (MariaDB, MongoDB, Redis).
- **Mobile Platforms:** Android firmware flashing, fine-tuning via ADB, and device integration.
- **System Administration Skills:** Proficient in managing personal workstations, configuring user environments, and maintaining peripheral devices.
- **Emerging Tech:** Experimentation with local LLMs (Ollama, OpenWebUI).

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## Publications and Preprints

- **Subgroups of general linear groups, containing the exterior square of the elementary subgroup, work in progress with A. Stepanov**
- **The algebraic and geometric classification of derived Jordan and bicommutative algebras, preprint with H. Abdelwahab and I. Kaygorodov**  
[ArXiv](#)
- 2026 **The algebraic and geometric classification of right alternative and semi-alternative algebras, with H. Abdelwahab and I. Kaygorodov**  
J. Algebr., vol. 687, no. 1, pp. 792–824. DOI: [10.1016/j.jalgebra.2025.09.019](#), [ArXiv](#)
- 2025 **The algebraic and geometric classification of Jordan superalgebras, with K. Abdurasulov and A. Saydaliyev**  
Sib. Electron. Math. Reports, vol. 22, no. 1, pp. 813–852, DOI: [10.33048/semi.2025.22.052](#), [ArXiv](#)
- **The algebraic and geometric classification of  $\delta$ -Novikov algebras, with H. Abdelwahab and I. Kaygorodov**  
Boletín la Soc. Matemática Mex., vol. 31, no. 3, pp. 145, DOI: [10.1007/s40590-025-00827-4](#)
- **The reverse decomposition of unipotens in polyvector representation**  
J. Math. Sci., vol. 288, no. 3 pp. 350–361, DOI: [10.1007/s10958-025-07703-6](#)
- 2024 **Overgroups of elementary groups in polyvector representations**  
J. Math. Sci., vol. 531, pp. 101–116.
- **Overgroups of exterior powers of an elementary group. Normalizers, with I. Nekrasov**  
Doc. Math., vol. 29, no. 5, pp. 1243–1268, DOI: [10.4171/DM/956](#), [ArXiv](#).
- 2022 **Overgroups of exterior powers of an elementary group. Levels, with I. Nekrasov**  
Linear Multilinear Algebr., vol. 72, no. 4, pp. 563–584, DOI: [10.1080/03081087.2022.2160422](#), [ArXiv](#).
- 2021 **The reverse decomposition of unipotents for bivectors**  
Commun. Algebr., vol. 49, no. 10, pp. 4546–4556, DOI: [10.1080/00927872.2021.1924183](#), [ArXiv](#).
- **Subgroups of Chevalley Groups Over Rings, with A. Stepanov**  
J. Math. Sci., vol. 252, no. 6, pp. 829–840, , DOI: [10.1007/s10958-021-05203-x](#).
- 2019 **Explicit Equations for Exterior Square of the General Linear Group, with I. Nekrasov**  
J. Math. Sci., vol. 243, no. 4, pp. 583–594, DOI: [10.1007/s10958-019-04559-5](#), [ArXiv](#).