

# ALEXEY GORDEEV

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## EDUCATION

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### *Ph.D.:*

**St.Petersburg Department of V.A.Steklov Institute of Mathematics** 2017 – 2022  
**of the Russian Academy of Sciences (PDMI RAS)**

*Mathematics*

Thesis title: Applications of polynomial method in combinatorics

### *Specialist degree (equivalent to B.Sc. + M.Sc.):*

**Saint Petersburg State University** 2012 – 2017

*Fundamental Mathematics and Mechanics*

Thesis title: Applications of polynomial method to Dyson-type identity

Advisor: Fedor Petrov

## RESEARCH POSITIONS AND VISITS

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**Umeå University, Department of Mathematics and Mathematical Statistics** 2023 – 2025

Umeå, Sweden

*Postdoctoral Researcher*

**Bulgarian Academy of Sciences, Institute of Mathematics and Informatics** June 2023

Sofia, Bulgaria

*Visiting Researcher*

**The Euler International Mathematical Institute** 2019 – 2022

Saint Petersburg, Russia

*Junior Researcher*

## RESEARCH INTERESTS

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list colorings of graphs and hypergraphs, polynomial method in combinatorics, extremal hypergraph problems, maximal distance minimizers, row-column designs

## PUBLICATIONS

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**A. Gordeev**, *Combinatorial Nullstellensatz and Turán numbers of complete  $r$ -partite  $r$ -uniform hypergraphs*, <https://doi.org/10.1016/j.disc.2024.114037>, Discrete Mathematics, 347(7), 114037, 2024. arXiv version: <https://arxiv.org/abs/2307.04447>.

D. Cherkashin, **A. Gordeev**, G. Strukov, *Erdős–Hajnal problem for  $H$ -free hypergraphs*, <https://doi.org/10.1007/s00373-023-02737-6>, Graphs and Combinatorics, 40(1), 1–15, 2024. arXiv version: <https://arxiv.org/abs/2207.05840>.

**A. Gordeev**, Y. Teplitskaya, *On regularity of maximal distance minimizers in  $\mathbb{R}^n$* , [https://doi.org/10.2422/2036-2145.202208\\_004](https://doi.org/10.2422/2036-2145.202208_004), The Annali della Scuola Normale di Pisa - Classe di Scienze, 2023. arXiv version: <https://arxiv.org/abs/2207.13745>.

Z. Li, Z. Shao, F. Petrov, **A. Gordeev**, *The Alon–Tarsi Number of A Toroidal Grid*, <https://doi.org/10.1016/j.ejc.2023.103697>, European Journal of Combinatorics, 111, 103697, 2023. arXiv version: <https://arxiv.org/abs/1912.12466>.

D. Cherkashin, A. Gordeev, *On list chromatic numbers of 2-colorable hypergraphs*, <https://mipt.ru/upload/medialibrary/745/05.pdf>, Proceedings of MIPT, 14(1), 49–57, 2022. arXiv version: <https://arxiv.org/abs/2102.02746>.

F. Petrov, A. Gordeev, *Alon–Tarsi numbers of direct products*, <https://doi.org/10.2140/moscow.2021.10.271>, Moscow Journal of Combinatorics and Number Theory 10(4), 271–279, 2021. arXiv version: <https://arxiv.org/abs/2007.07140>.

A. Gordeev, *Constant terms of near-Dyson polynomials*, <https://doi.org/10.37236/7087>, The Electronic Journal of Combinatorics 25(4), 2018.

## PREPRINTS

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D. Cherkashin, A. Gordeev, G. Strukov, Y. Teplitskaya, *Maximal distance minimizers for a rectangle*, <https://arxiv.org/abs/2106.00809>, 2021.

D. Cherkashin, A. Gordeev, G. Strukov, Y. Teplitskaya, *On minimizers of the maximal distance functional for a planar convex closed smooth curve*, <https://arxiv.org/abs/2011.10463>, 2020.

## TEACHING

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### *Teaching as a Lecturer at Saint Petersburg State University*

a 3 semester undergraduate course on algorithms and data structures

*“Modern Programming” Bachelor programme*

Algorithms and Data Structures II	Fall 2021
Algorithms and Data Structures I	Spring 2021
Algorithms and Data Structures III	Fall 2020
Algorithms and Data Structures II	Spring 2020
Algorithms and Data Structures I	Fall 2019
Algorithms and Data Structures III	Fall 2019
Algorithms and Data Structures II	Spring 2019

### *Teaching to high school students at Summer Informatics Camp*

a 3 week course with lectures and practice sessions on algorithms and data structures

*Perm, Russia, <https://sicamp.ru>*

August 2013 – 2019, September 2021

## TALKS

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**“Planar bubble cluster. Connectivity and other problems”** December 1, 2021

*Conference of Small Research Groups (Saint Petersburg, Russia)*

**“On list chromatic numbers of 2-colorable hypergraphs”** August 13, 2021

*Groups and Graphs, Semigroups and Synchronization (the talk was given online via zoom)*

**“Proof of the List Coloring Conjecture for line perfect graphs”** May 14, 2019

*Conference on Graphs, Networks, and Their Applications (Moscow, Russia)*

**“Constant terms of near-Dyson polynomials”** June 29, 2017

*TuCo 2017 (Saint Petersburg, Russia)*

## PARTICIPATION IN EVENTS

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**Conference of Small Research Groups**

November 29 – December 2, 2021

*Saint Petersburg, Russia*

**Groups and Graphs, Semigroups and Synchronization**

August 9 – 13, 2021

*Sirius Mathematics Center, Sochi, Russia*

<b>International School-conference in Algorithms, Combinatorics, and Complexity</b> <i>Saint Petersburg, Russia (was held online)</i>	May 24 – 28, 2021
<b>Workshop on Open Problems in Combinatorics and Geometry</b> <i>Adygea, Russia</i>	October 13 – 19, 2019
<b>3rd Hungarian-Russian Combinatorics workshop</b> <i>Moscow, Petrozavodsk, Russia</i>	May 20 – 25, 2019
<b>Conference on Graphs, Networks, and Their Applications</b> <i>Moscow, Russia</i>	May 13 – 18, 2019
<b>The Second Alan Turing Contest in Theoretical Computer Science and Discrete Mathematics for Russian-speaking students (TuCo 2017)</b> <i>Saint Petersburg, Russia</i>	June, 2017

## ACADEMIC AND COMMUNITY SERVICE

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Reviewed papers for: SIAM Journal on Discrete Mathematics, Combinatorica, etc.

Took part in organizing the Summer Informatics Camp in Perm, Russia (<https://sicamp.ru>) in 2013–19 and 2021

Supervised “Steiner trees” track during the Science School in Mathematics and Computer Science for high school students in Sirius, Sochi, Russia in January 2022

Gave a lecture “Approximate algorithms” and prepared a training competition on the usage of the Fast Fourier Transform at the preparation camp of the Bulgarian team for the International Olympiad in Informatics (IOI) in July 2023

## OTHER EMPLOYMENT

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<b>WorldQuant Research (Eurasia), Saint Petersburg Research Office</b> <i>Quantitative Researcher</i>	2017 – 2019
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## ACHIEVEMENTS

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<b>VK Cup</b> <i>Awardee, 8th absolute place</i>	2018
<b>Google Hash Code</b> <i>Finalist</i>	2017
<b>ACM ICPC World Finals</b> <i>World champion as part of SPbSU team</i>	2016
<b>International Olympiad in Informatics</b> <i>Gold medal, 20th absolute place</i>	2013

## PROGRAMMING SKILLS

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C++, Python, SageMath