

Fedor Sandomirskiy

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Personal information:

- **Date of birth:** 1988, July 07
- **Citizenship:** Russia
- **Marital status:** married

Research interests:

mechanism design, fair division, algorithmic game theory, incomplete information, dynamic games, dynamical systems, probability theory, typical properties of large random structures

Research experience:

- **Senior research fellow, 2015—present**, International Laboratory of Game Theory and Decision Making, National Research University Higher School of Economics (NRU HSE)
<http://scem.spb.hse.ru/en/ilgt/about/>
- **Senior research fellow, 2014—present**, Laboratory of Theoretical Economics, St.Petersburg Institute for Economics and Mathematics, Russian Academy of Sciences
- **Researcher, 2012—2015**, Chebyshev Laboratory (Faculty of Mathematics, St.Petersburg State University)
- **Research assistant, 2008—2011**, Department of Mathematical Physics (Faculty of Physics, St.Petersburg State University)

Selected publications:

published:

- Competitive division of a mixed manna (with A. Bogomolnaia, H. Moulin, E. Yanovskaya)
Econometrica, 2017, vol.85:6, p.1847-1871
preprint: [arXiv:1702.00616](https://arxiv.org/abs/1702.00616)
- On repeated zero-sum games with incomplete information and asymptotically bounded values
Dynamic Games and Applications, 2017, doi:10.1007/s13235-017-0217-7
preprint: [arXiv:1509.01727](https://arxiv.org/abs/1509.01727)
- Repeated games of incomplete information with large sets of states
International Journal of Game Theory, 2014, vol.43:4, p.767-789
preprint: [arXiv:1205.6791](https://arxiv.org/abs/1205.6791)
- An exact renormalization formula for the Maryland model (with Alexander Fedotov)
Communications in Mathematical Physics, 2015, vol.334:2, p.1083-1099
preprint: [arXiv:1311.6930](https://arxiv.org/abs/1311.6930)

- Variation of measure-valued martingales and repeated games with incomplete information
Doklady Mathematics (English translations of Proceedings of the Russian Academy of Sciences), 2012, vol.86 p.796-798

submitted:

- Dividing goods or bads under additive utilities (with A. Bogomolnaia, H. Moulin, E. Yanovskaya)
Social Choice and Welfare
preprint: [arXiv:1608.01540](https://arxiv.org/abs/1608.01540)

Education:

• **Game Theory:**

- **PhD in Math (Game Theory)**, December 2013,
Central Economics and Mathematics Institute, RAS, Moscow
Thesis: “Extremal asymptotic regimes for the value of information in repeated games”
Advisers: Victor Domansky, Ernst Presman
Graduated Summa cum Laude

• **Mathematics:**

- **Master Degree in Mathematical Physics**, 2011,
Faculty of physics, St.Petersburg State University
Thesis: “Monodromization and the Maryland equation”
Adviser: Alexander Fedotov
Graduated with honors, GPA: 9/10

• **Computer science:**

- **Advanced training in Computer Science Center**, St.Petersburg, 2015-2017
direction: theoretical computer science
Programming skills: C++, Matlab/Octave, Python

• **Additional training:**

- COST IC1205 Summer School on Computational Social Choice (San Sebastian, 2016)
- The 28th Jerusalem School in Economic Theory: mechanism design (2017)
- The Workshop on soft skills for teaching and research by William Thomson (2018)
- Schools on computational aspects of fair division (organizer, see below)

Selected presentations:

I made more than 50 talks on scientific events. The list of the most important:

- “Competitive division of a mixed manna”, 22nd Coalition Theory Network Workshop, 2017, Glasgow, UK
- “Competitive fair division of goods, bads, and satiable items”, Matching under preferences (MATCH UP), 2017, Boston, USA
- “On repeated zero-sum games with incomplete information and asymptotically bounded values”, GAMES 2016, the 5th World Congress of the Game Theory Society, 2016, Maastricht, Netherlands
- “Competitive fair division of bads, hairy ball theorem and concentration effects” Sixth International Workshop on Computational Social Choice (COMSOC 2016), 2016, Toulouse, France

- “Infinite games where information is revealed in finite time” Mathematical Aspects of Game Theory and Applications, 2014, Roscoff, France
- “On repeated games with incomplete information having bounded values” The 5th Israeli Game Theory conference, 2013, Tel-Aviv, Israel
- “Extremal asymptotic regimes for the value of information” Games and Strategy in Paris (in honor of Sylvain Sorins 60th birthday), 2012, Paris, France

Organizational activities:

I was a member of organizing committee of

- International Conference “Algorithmic aspects of Social Choice and Auctions”, August 9-10, 2018
- International Summer School “Fair Division: Between Economics, Mathematics and Computer Science”, August 7-8, 2017
- International Conference “Advances in Fair Division”, August 9-11, 2017
- International Autumn School “Computational Social Choice and Fair Division”, October 20-22, 2016
- International conference “Game Theory and Mechanism Design” in memory of Victor Domansky, May 22-27, 2016.

All these events were conducted on the base of the Laboratory of Game Theory, see <http://scem.spb.hse.ru/en/ilgt/conferences/>

I was also involved in organization of the first Russian Game Theory Olympiad (September–October 2017) and organized several local workshops, a weekly research seminar on Economics (2015—present) and series of popular lectures on Game Theory and Mechanism Design for undergrads and school students.

Teaching and supervision:

Apart from popular lectures, I have experience of regular teaching activities:

- lectures and tutorials for a course “Introduction to mechanism design” (joint with A.Nesterov), Higher School of Economics, 2017
- tutorials Probability, Analysis 1, Linear algebra, St.Petersburg State University, 2013-2014

Two theses were completed under my supervision:

- Yulia Ibragimova “Competitive market mechanisms for fair division of indivisible goods”, bachelor thesis
- Yulia Ibragimova “Online Procurement Auctions up to 500 Thousand Rubles: Participants Behavior Patterns at Micro and Macrolevels”, master thesis
- Alisa Maricheva “Fair division of indivisible goods with or without money transfers”, master thesis

For now, I officially supervise research of 5 students and informally advise many more. Topics range from dynamic matching problems, cake-cutting algorithms, to analyzing data from fair division web-platform Spliddit.org or cheap-talk games with unknown bias.

Awards:

- B.L. Ovsievich memorial prize (2013) for the research on repeated games with incomplete information
- V. Deych fund prize (2009) for outstanding bachelor thesis in mathematical physics
- 2008-2011: Several prizes (from first to third), Annual Math Olympiad for students of Russian universities

Grants:

Principal Investigator:

- RFBR 16-01-00269, “Asymptotic problems of game theory”
- RFBR 13-01-00462, “Game-theoretic analysis of multistage social and economic interactions with asymmetrically informed agents and variability of beliefs during Bayesian learning”

Ordinary investigator:

- RFBR 14-01-00760, “Spectral and asymptotic problems of quantum mechanics and mathematical physics”
- RFBR 13-01-00784, “Controlled random processes”

Reviewing for:

- Economic Theory
- Mathematics of Operations Research
- Games and Economic Behavior
- Eurasian Mathematical Journal
- Recent Advances in Game Theory and Applications
- Mathematical Game Theory and Applications (in Russian)