

DMITRY CHELKAK – CURRICULUM VITAE

• **General:**

- Name: Dmitry Chelkak
- Birthday/place: Jan 1979/St. Petersburg (former Leningrad, USSR)
- Citizenship: Russian Federation
- Family status: married, two children: Aleksandra (2006), Mikhail (2017)
- Languages: Russian (native), English (fluent), French (intermediate)
- E-mail address: `dmitry.chelkak@ens.fr`, `dchelkak@pdmi.ras.ru`
- Postal address: Département de Mathématiques et Applications
École Normale Supérieure, 45 rue d’Ulm
F-75230 Paris Cedex 05

• **Employment:**

- 2016/17–2021/22 : professor, ENS-MHI Chair, École Normale Supérieure (Paris)
- 2015/16 : visiting professor, University of Geneva
- 2014/15 : senior fellow, Institute for Theoretical Studies, ETH Zürich
- 2009 – ... : [on leave since 2014] senior researcher, Mathematical Analysis Laboratory at St. Petersburg Department of Steklov Institute (PDMI RAS)
- 2010–2014 : senior researcher, Chebyshev Lab at St. Petersburg University (SPbSU)
- 2006/07 : senior research assistant, University of Geneva
- 2004–2010 : docent (associate professor), Dept. of Mathematical Analysis at SPbSU

• **Education:**

- Dec 2003: PhD (PDMI RAS, St. Petersburg, co-advisors: P. Kargaev & E. Korotyaev)
“Inverse problem for the 1D harmonic oscillator perturbed by a potential”
- 2000 – 2003: PhD student (SPbSU & Potsdam University, Germany)
- 1995 – 2000: St. Petersburg University (SPbSU), *diploma cum laude*

• **Awards:**

- 2014: Salem Prize
- 2008: Pierre Deligne Contest Award (research scholarship for 2009–2011)
- 2004: “Young Mathematician” Prize of the St. Petersburg Math. Society
- 1995: Gold Medal of IMO (36th Int. Math. Olympiad of school students, Toronto)

• **Selected Talks:**

- ICM2018 (International Congress of Mathematicians, Rio de Janeiro, August 2018):
“Planar Ising model at criticality: state-of-the-art and perspectives”
(invited, “Analysis and Operator Algebras” & “Probability and Statistics” sections)
- ICMP2018 (International Congress on Mathematical Physics, Montreal, July 2018):
“Tau-functions à la Dubédat and cylindrical events in the double-dimer model”
(invited, “Equilibrium Statistical Mechanics” session)
- SPA2017 (Stochastic Processes and Their Applications, Moscow, July 2017):
“2D Ising model: correlations, interfaces and a priori estimates” (plenary)
- ECM2016 (European Congress of Mathematics, Berlin, July 2016):
“2D Ising model: correlations via boundary value problems”
(invited, “Applied Mathematics and Probability” section)

- **Research Interests:** interplay of Complex Analysis, Probability & Mathematical Physics
[notably planar Ising and bipartite dimer models, discrete holomorphicity and SLE/CLEs]

• **Administrative Activity and Other Services:**

- *Chebyshev Lab at SPbSU* (established in Dec 2010 under the ‘megagrant’ program of the Russian Federation Government, project leader: Prof. Stanislav Smirnov):
Spring 2011: vice head, Fall 2011: acting head.
- Summer School “*St. Petersburg School in Probability and Statistical Physics – 2012*” (two weeks, 150+ participants), member of the Organizing Committee;
- 2009–2014: member of the St. Petersburg Mathematical Society Council;
- reviewer for a number of mathematical and physical journals.

• **Research grants:**

- Paris 2019–2022: member of the ANR-18-CE40-0033 project DIMERS (Paris–Lyon)
- St. Petersburg 2010–2014: principal member of the ‘megagrant’ 11.G34.31.0026 of the Russian Federation Government ($\sim 1\text{M}\$$ per year, project leader: S. Smirnov).
- St. Petersburg 2008–2012: several starting grants: MK-4306.2008.1, MK-7656.2010.1, Pierre Deligne Contest Award (research scholarship for 2009-2011).

• **Students supervised:**

- *ÉNS Paris*:
 - * Post-docs: Sanjay Ramassamy (2018/19); Mikhail Basok (2021/22);
 - * PhD: Rémy Mahfouf, Yijun Wan (both 2018/19–2021/22);
 - * master: Hugo Falconet (P6, 2017), Chengyang Shao (ENS-Tsinghua exchange program, 2017), Rémy Mahfouf (P11, 2018), Yijun Wan (P6, 2018);
- *Université de Genève*:
 - * PhD: Marianna Russkikh (2014/15–2018/19, joint supervision with S. Smirnov);
- *Saint-Petersburg State University*:
 - * master: Sergey Matveenko (2009), Alexey Vorotov (2010), Pavel Lepekhin (2011).

• **Selected papers:**

- Dmitry Chelkak, Benoît Laslier, Marianna Russkikh, Bipartite dimer model: p-embeddings and Lorentz-minimal surfaces. [arXiv:2109.06272](https://arxiv.org/abs/2109.06272)
- Dmitry Chelkak, Ising model and s-embeddings of planar graphs, [arXiv:2006.14559](https://arxiv.org/abs/2006.14559)
- Mikhail Basok, Dmitry Chelkak, Tau-functions à la Dubédat and probabilities of cylindrical events for double-dimers and CLE(4), *J. Eur. Math. Soc. (JEMS)*, 23 (2021), no. 8, 2787–2832.
- Dmitry Chelkak, Robust discrete complex analysis: a toolbox, *Ann. Probab.* 44 (2016), no. 1, 628–683.
- Dmitry Chelkak, Clément Hongler, Konstantin Izyurov, Conformal invariance of spin correlations in the planar Ising model, *Ann. Math.* 181 (2015), no. 3, 1087–1138.
- Dmitry Chelkak, Stanislav Smirnov, Universality in the 2D Ising model and conformal invariance of fermionic observables, *Invent. Math.*, 189 (2012), no. 3, 515–580.
- Dmitri Chelkak, Pavel Kargaev, Evgeni Korotyaev, Inverse problem for harmonic oscillator perturbed by potential: characterization. *Comm. Math. Phys.* 249 (2004), no. 1, 133–196.

• **Teaching experience:**

- **High-school level (1995–2000):** teaching and organization duties in ‘mathematical circles’, from local to all-Russia events and Russian IMO team training schools.
- **Saint-Petersburg University (2004 – 2010):**
 Extensive teaching: $(6+) \times 90$ min per week on average, both lectures and TA sessions
Standard curriculum: ‘Mathematical Analysis – I, II, III’ (basic calculus, several variables, complex variable, measure theory, Fourier analysis, functional analysis);
Advanced courses: ‘Inverse Sturm–Liouville problem’, ‘Extensions of symmetric operators’, ‘Spectral theory of self-adjoint operators’;
Honors courses (advanced group of 2nd year students): ‘Divergent series and prime numbers’, ‘Intro to entire functions’, ‘Intro to smooth manifolds’, ‘Intro to fractals’.
- **Université de Genève (2015/16):** ‘Brownian motion and stochastic calculus’ (part of a one-year SwissMAP master class in planar statistical physics).
- **ÉNS Paris (2016/17 – 2021/22):**
‘Processus stochastiques’ (M1 level): discrete time martingales (optional stopping, inequalities, convergence), Markov chains, intro to the Brownian motion;
‘Topologie et calcul différentiel’ (L3 level): general topology, basic notions of functional analysis, calculus and differential equations in Banach spaces.

• **Research-oriented mini-courses:**

- *Saint-Petersburg (2008–2014):* ‘SLE (Schramm-Loewner evolution)’ (2008), ‘Dimers on planar graphs and GFF’ (2008, 2011), ‘Intro to the conformal invariance of lattice models’ (2010), ‘Random walk in domino world’ (2014);
- *Tel-Aviv University (2009):* ‘Conformal invariance in the 2D Ising model’;
- *YEP Workshop ‘Two-dimensional statistical mechanics’, Eindhoven (2012):* ‘Discrete complex analysis on the microscopic level: conformal invariants without conformal invariance’;
- *Moscow Independent University (2013):* ‘Spin correlations in the 2D Ising model’, Dubna summer school (2013): ‘Planar random walks and their limits: SRW, LERW and SAW’;
- *ETH Zürich (2014/15):* reading group ‘Conformal invariance of spin correlations in the planar Ising model’; mini-course ‘Ising correlations and orthogonal polynomials’;
- *Winter School in Mathematical Physics at Les Diablerets (2018), Virginia Integrable Probability Summer School (2019):* ‘Planar Ising model: from combinatorics to CFT and s-embeddings’.

• **Research statement:**

short version: [https://www.pdmi.ras.ru/~dchelkak/Chelkak_Research_2021\(short\).pdf](https://www.pdmi.ras.ru/~dchelkak/Chelkak_Research_2021(short).pdf)
 long version: https://www.pdmi.ras.ru/~dchelkak/Chelkak_Research_2021.pdf

• **Teaching statement:**

https://www.pdmi.ras.ru/~dchelkak/Chelkak_Teaching_2021.pdf