

Born in Moscow, 28/10/1987.

French citizenship.

Professional address: CMAP, École polytechnique, Route de Saclay, 91128 Palaiseau Cedex, France.

☎ +33-(0) 1 69 33 45 94

✉ igor.kortchemski@normalesup.org

🌐 www.kortchemski.com

Positions held

2015 – **CNRS researcher**, *École polytechnique*, Palaiseau.

2015 – **Part time Professor**, *Applied Mathematics Department, École polytechnique*, Palaiseau.

2014 – 2015 **Postdoc**, *Zürich Universität*, Zürich.

2012 – 2014 **Agrégé-préparateur (~ Lecturer)**, *École Normale Supérieure*, Paris.

2011 – 2012 **Doctorant contractuel (PhD grant)**, *Université Paris-Sud*, Orsay.

Education

2016 **Habilitation HDR**, *Université Paris-Sud*, Orsay.

2010 – 2012 **PhD student under the supervision of Jean-François Le Gall**, *Université Paris-Sud*, Orsay.

2010 **Master 2 de mathématiques (MS in Mathematics)**, *Major in probability theory*, Université Paris-Sud, Orsay.
Summa Cum Laude

2009 **Agrégation externe de mathématiques**.
Competitive examination in the French public education system.

2008 **Licence 3 de mathématiques (BS in Mathematics)**, Université Paris-Sud/ENS.
Summa Cum Laude

2007 **Admission to École Normale Supérieure (Paris)**.

Publications and preprints

Preprints

📄 J. Bertoin, N. Curien, I. Kortchemski, “On conditioning a self-similar growth-fragmentation by its intrinsic area”, [arXiv:1908.07830](https://arxiv.org/abs/1908.07830), submitted.

Publications

📄 I. Kortchemski, L. Richier, “The boundary of random planar maps via looptrees”, to appear in *Ann. Fac. Sci. Toulouse Math.*

📄 V. Féray, I. Kortchemski, “Trajectories in random minimal transposition factorizations” *ALEA, Lat. Am. J. Probab. Math. Stat.* **16**, 759–785 (2019).

📄 I. Kortchemski, L. Richier, “Condensation in critical Cauchy Bienaymé-Galton-Watson trees”, *Ann. Appl. Probab.* **29(3)** 1837-1877 (2019).

📄 V. Féray, I. Kortchemski, “The geometry of random minimal factorizations of a long cycle via biconditioned bitype random trees”, *Ann. H. Lebesgue* **1** 109-186 (2018).

📄 J. Bertoin, T. Budd, N. Curien, I. Kortchemski, “Martingales in self-similar growth-fragmentations and their connections with random planar maps”, *Probab. Theory Related Fields* **172(3)**, 663-724 (2018).

📄 J. Bertoin, N. Curien, I. Kortchemski, “Random planar maps & growth-fragmentations”, *Ann. Probab.* **(46)(1)** 207-260 (2018)

- ☞ I. Kortchemski, C. Marzouk “Simply generated non-crossing partitions”, *Combin. Probab. Comput.* **26(4)** 560–592 (2017).
- ☞ I. Kortchemski, “Sub-exponential tail bounds for conditioned stable Bienaymé–Galton–Watson trees”, *Probab. Theory Related Fields* **168(1-2)** 1-40 (2017).
- ☞ J. Bertoin, I. Kortchemski “Self-similar scaling limits of Markov chains on the positive integers”, *Ann. Appl. Probab.* **26(4)** 2556-2595 (2016).
- ☞ I. Kortchemski, “Predator-prey dynamics on infinite trees: a branching random walk approach”, *J. Theor. Probab.* **29** 1027-1046 (2016).
- ☞ I. Kortchemski, C. Marzouk “Triangulating stable laminations”, *Electron. J. Probab.* **21(11)**, 1–31 (2016).
- ☞ N. Curien, I. Kortchemski, “Percolation on random triangulations and stable looptrees”, *Probab. Theory Related Fields* **163(1-2)** 303–337 (2015).
- ☞ N. Curien, B. Haas, I. Kortchemski, “The CRT is the scaling limit of random dissections”, *Random Struct. Alg.* **47(2)** 304–327 (2015).
- ☞ I. Kortchemski, “Limit theorems for conditioned non-generic Galton–Watson trees”, *Ann. Inst. H. Poincaré Probab. Statist.* **15(2)**, 489–511 (2015).
- ☞ N. Curien, T. Duquesne, I. Kortchemski, I. Manolescu, “Scaling limits and influence of the seed graph in preferential attachment trees”, *J. Éc. polytech. Math.* **2** 1-34 (2015).
- ☞ I. Kortchemski, “A predator-prey SIR type dynamics on large complete graphs with three phase transitions”, *Stoch. Proc. Appl.* **125(3)** 886–917 (2015).
- ☞ N. Curien, I. Kortchemski, “Random stable looptrees”, *Electron. J. Probab.* **19(108)**, 1–35 (2014).
- ☞ N. Curien, I. Kortchemski, “Random non-crossing plane configurations: A conditioned Galton-Watson tree approach”, *Random Struct. Alg.* **45(2)**, 236–260 (2014).
- ☞ I. Kortchemski, “Random stable laminations of the disk”, *Ann. Probab.* **42(2)**, 725–759 (2014).
- ☞ I. Kortchemski, “A simple proof of Duquesne’s theorem on contour processes of conditioned Galton-Watson trees”, *Séminaire de Probabilités XLV*, Lecture Notes in Mathematics, 537–558 (2013).
- ☞ I. Kortchemski, “Invariance principles for Galton-Watson trees conditioned on their number of leaves”, *Stoch. Proc. Appl.* **122** 3126–3172 (2012).
- ☞ I. Kortchemski, “Asymptotic study of permutation records”, *J. Comb. Theory Ser. A*, **116** 1154-1166 (2009).
- ☞ I. Kortchemski, “Good Sequences, Bijections and Permutations”, *Undergrad. Math J.* **6(2)** (2005).

Proceedings

- ☞ C. Abraham, J. Bettinelli, G. Collet et I. Kortchemski, “Random maps”, *ESAIM: Proceedings* **51** 133-149 (2015)

Collective works

- ☞ *Probabilités - Classes préparatoires scientifiques* (with Roger Mansuy), Vuibert, 2018.
- ☞ *Arbres et marches aléatoires*, Journées mathématiques X-UPS 2016. Editorial committee: Pascale Harinck, Alain Plagne, Claude Sabbah. Authors: Vincent Beffara, Igor Kortchemski, Grégory Miermont.

Popular-science articles

- ⇒ N. Curien, I. Kortchemski, “Raconte moi ... l’arbre brownien continu” *Gaz. Math.* **162** 51-59 (2019).
- ⇒ I. Kortchemski, “Autour des diviseurs premiers de $a^n \pm b^n$ ”, *RMS* **125-4** (2015).
- ⇒ X. Caruso, I. Kortchemski, “Statistiques du nombre de cycles d'une permutation”, *RMS* **121-4** (2011).
- ⇒ I. Kortchemski, “Bonnes suites et permutations”, *Quadrature* **62**, 24-34 (2006).

Awards and distinctions

- 2013 **Perrissin–Pirasset / Schneider PhD prize awarded by the Chancellery of the University of Paris.**
- 2006 **International Physics Olympiad**, Singapour.
Silver medal
- 2005 **Fermat Junior prize**, *for the work* Bonnes suites et permutations.
- 2005 **International Mathematical Olympiad**, Mérida, Mexico.
Bronze Medal
- 2005 **Concours Général in mathematics.**
First prize. The Concours General is a highly national competitive contest for 12th grade students.
- 2004 **International Mathematical Olympiad**, Athens, Grece.
Bronze Medal
- 2004 **Olympiades Académiques de Mathématiques.**
First prize. The Olympiades Academiques is a highly competitive national contest for 11th grade students.

Referee work

Referee for *ALEA–Latin American Journal of Probability and Mathematical Statistics* (x5), *Annals of Applied Probability* (x2), *Annals of Probability* (x3), *Annales de l’Institut Henri Poincaré Probabilités et Statistiques* (x6), *Bernoulli* (x2), *Discrete Mathematics* (x1), *Electronic Communications in Probability* (x1), *Electronic Journal of Probability* (x8), *Israel Journal of Mathematics* (x1), *ESAIM: Probability and Statistics* (x1), *Journal of Applied Probability* (x2), *Probability Theory and Related Fields* (x4), *Random Structures and Algorithms* (x4), *Statistics and Probability Letters* (x2), *Stochastic processes and their applications* (x1).

Invitations at international events

- 2019 Random Trees and Graphs Summer School (CIRM)– *invited course.*
- 2018 Seventh Strasbourg–Zürich Meeting : Frontiers in Analysis and Probability (Strasbourg) – *invited talk.*
- 2018 Young Probabilists Workshop (Chern Institute of Mathematics) – *invited talk.*
- 2018 Spring School about Spin Systems (Darmstad) – *invited talk.*
- 2017 SPA 2017 (Moscow) – *talks in two invited sessions*
- 2016 Lévy 2016 Summer school on Lévy processes – *Invited lecture*
- 2015 SPA 2015 (Oxford) – *talk in an invited session*

- 2014 11th International Vilnius Conference on Probability and Mathematical Statistics, SIAM conference on discrete mathematics 2014 (Minneapolis) – *talks in invited sessions*.
- 2013 Symposium of Probability and Stochastic Processes à Guanajuato (Mexique)– *talk in an invited session*.
- 2012 Rhein-Main-Kolloquium Stochastik, CLAPEM 2012 (Chili) – *talk in an invited session*.

Invited talks

- 2019 Journées de combinatoire de Bordeaux, Journée cartes (Paris-Diderot)
- 2018 Probability seminar in Toulouse, Philippe Flajolet Seminar, Random Geometry followup workshop (Newton Institute, Cambridge), 7th seminar "Frontiers in analysis and probability" (Strasbourg), workshop on Branching-Type Structures (Zürich), working seminar (CMAP)
- 2017 Seminar of the thematic trimester *Combinatorics and interactions* at IHP.
- 2016 Probability seminar in Nice, Oxford, Paris 6 and Zürich, X-UPS 2016 days, Lévy 2016 Summer school on Lévy processes (invited lecture), Opening days of the Master of Fondation Mathématique Jacques Hadamard (invited lecture), Stable Processes Workshop (CMO, Oaxaca), Growth-fragmentation day at Paris 13.
- 2015 Zürich Spring School on Lévy Processes (Invited lecture, joint with N.Curien), 3rd Lévy Workshop (Mannheim), Workshop Random Planar Structures (Newton Institute, Cambridge), Probability seminar (Bonn), Combinatorics seminar (Liafa, Paris 7), Colloquium (Paris 5), Probability working group (École polytechnique), Midlands Probability Theory Seminar (Warwick)
- 2014 Swiss probability seminar (Bern), workshop Probability on Trees and Planar Graphs (Banff, Canada), Journées MAS 2014 in Toulouse (two talks), conférence Two-Dimensional statistical mechanics (Les Diablerets). Probability seminars at Queen Mary (London), Zürich, Cambridge, Bath, ENS Paris.
- 2013 Journées Alea in Europe (Marseille), Students Probability Day at the Weizmann Institute (Israel), Working group *Les probas du vendredi* (Paris 6), Journée Cartes Aléatoires, Journées Aléa 2013. Probability seminars in Lyon, Orsay, Nancy, Grenoble, Dauphine.
- 2012 Journée de rentrée at DMA (ENS Paris), Workshop on Continuum Random Trees and Applications (Marseille), Journées MAS (Clermont-Ferrand), PIMS summer school 2012 (Vancouver), ANR A3 seminar, Colloque jeunes probabilistes et statisticiens (Marseille), Workshop Young European Probabilists (Eindhoven), Graduate students séminal (Orsay), Journée des doctorants (Orsay). Probability seminars in Lille, Versailles, Paris 13, Marseille, École Polytechnique, Genève, MIT, Grenoble.
- 2011 Journées ANR A3 (Orléans), Saint Flour summer school, ANR A3 seminar, Working group on random maps (Orsay), Graduate students in probability seminar (Paris 6), Probability seminar in Angers.

Teaching and advising

Teaching experience

- 2019 **Invited course**, *Random Trees and Graphs Summer School (CIRM)*.
 - Course "Condensation in random trees" of doctoral level (3 lectures of 1h15 and one 1h15 exercise session).

- 2015 – **Professeur chargé de cours**, *Applied Mathematics Department, École polytechnique.*
- MAP 311 (Probability theory, \simeq MSc), TA for the course of Josselin Garnier (36 hours/year for two years)
 - Modal MAP 474 (Simulation of rare events, \simeq MSc), simulation projects. Head: Emmanuel Gobet (30 hours for four years)
 - MAA 103 (Discrete mathematics, BSc), instructor of the course (24 hours/year for two years)
 - MAP575 (Foundations of probability and applications, \simeq MSc). Creation of the course.
- 2016 **Invited lecture**, *Journée de rentrée des Master de la Fondation Mathématique Jacques Hadamard.*
- Lecture *Random trees and random walks* for Master students (4h30).
- 2016 **Summer school on Lévy processes.**
- Lecture *Lévy processes and large random discrete structures* for graduate students (6 hours).
- 2016 **Invited lecture**, *Journées X-UPS 2016.*
- Lecture *Random trees and random walks* for mathematic teachers in Classes Préparatoires (2 hours).
- 2016 **PSL (Paris-Sciences-Lettres).**
- Course “Advanced probability” for second year university students (36 hours).
- 2014 – 2015 **Postdoc**, *University of Zürich.*
- Course “Geometry of random trees” for master and PhD students (26 hours).
- 2012 – 2014 **Agrégé préparateur (~ Lecturer)**, *ENS Paris.*
- TA for the course *Measure theory and Probability* intended for first year students in ENS Paris and taught by Zhan Shi (2012-2013) and Thomas Duquesne (2013-2013), 56 hours per year.
 - “Leçon de mathématiques”, intended for second year students in ENS on the theme *Arbres aléatoires: thème et variations* (4 hours course, then five one-hour long presentations by students).
- 2011 – 2012 **Ph.D grant**, *Université Paris-Sud, Orsay*, 64 heures of teaching.
- 50 hours of teaching at Polytech’ Paris-Sud (Engineering school), as TA for the mathematics course for first year students, taught by Pascal Auscher.
 - 16 hours of mathematics oral interrogations for first-year university students in Biology.
- 2015 – 2016 **Oral interrogations in mathematics in the second year of classes préparatoires (MP*) in lycée Louis-le-Grand.**
- 2012 – 2014 **Oral interrogations in mathematics in the second year of classes préparatoires (MP*) in lycée Louis-le-Grand.**
- 2008 – 2012 **Oral interrogations in mathematics in the first year of classes préparatoires (MPSI) in lycée Louis-le-Grand.**
- 2008 **Oral interrogations in mathematics in the second year of classes préparatoires (MP*) in lycée Louis-le-Grand.**

Doctoral evaluation

- Oct. 2018 **Examiner of Camille Pagnard’s thesis.**
 “Limites locales et profils de grands arbres Markov branchants”, Université Paris-Dauphine, under the supervision of Bénédicte Haas.
- Juin 2017 **Examiner of Loïc Richier’s thesis.**
 “Géométrie et percolation sur des cartes à bord aléatoires”, ÉNS Lyon, under the supervision of Grégory Miermont.
- Oct. 2016 **Reviewer and examiner of Quan Shi’s thesis.**
 “Fragmentations, growth-fragmentations, and random structures”, Zürich University, under the supervision of Jean Bertoin.
- Dec. 2015 **Reviewer and examiner of Alessandra Caraceni’s thesis.**
 “The geometry of large outerplanar and half-planar maps”, Université Paris-Sud and l’ÉNS de Pise, under the supervision of Nicolas Curien and Franco Flandoli.

Sept. 2015 **Examiner of Cyril Marzouk's thesis.**

"Random trees, fires and non-crossing partitions", Zürich University, under the supervision of Jean Bertoin.

Students

2017 – **PhD advisor of Paul Thevenin.**

2017 – 2018 **Postdoc referent of Loïc Richier.**

2016 – 2017 **Research internship of Paul Thevenin.**

on the behavior of degrees in large random trees

2016 – 2017 **Supervision of a long project of Agathe Soret and Philippe Cherabier (third year in École polytechnique) .**

On the analysis of interactions between individuals in random graphs.

2016 **Supervision of a short project of Chenlin Gu (third year in École polytechnique) .**

On the article "Random recursive triangulations of the disk via fragmentation theory" of Curien & Le Gall.

2014 **Supervision of the first year mémoire in'ÉNS of Élie Casbi and Kaitong Hu.**

On the article "Fluctuations of the Bose-Einstein condensate" of Diaconis & Chatterjee.

Scientific outreach

2019 **General public presentation at Aromaths**, Seminar for BSc/MSc students at Sorbonne Université.

2019 **General public presentation at the national award ceremony of the Olympiades Académiques de Mathématiques de Première.**

2019 **Supervisor of the team l"es i-pi" at TFJM².**

The "Tournoi Français des Jeunes mathématiciennes et mathématiciens" is open to teams of high school students, who have several months to solve open mathematical problems under the guidance of supervisors.

2018 **General public presentation at a *MATH.en.JEANS* congress, Berlin.**

2017 **General public presentation (for 800 people) during the *Pi* tour.**

2006 – **Training of the French team for International Mathematical Olympiads.**

2008 – **Teaching at mathematical olympiad camps.**

The goal of these camps, organized by [Animath](#), is to teach "olympiad" style mathematics to young students in high school.

2012 – **Team leader and deputy leader of the French team to different Mathematical Olympiads, Mediterranean Youth Mathematical Competition 2015 (Trieste, Italy), Junior Balkan Mathematical Olympiad 2013 (Antalya, Turkey), Balkan Mathematical Olympiad 2012 (Antalya, Turkey).**

2011 **Team Leader of the Louis-le-Grand team at TFJM.**

The "French Tournament of Young Mathematicians" ([TFJM](#)), is the French version of the "International Tournament of Young Mathematicians"

2010 **Team Leader of team France 3 at the ITYM.**

The "International Tournament of Young Mathematicians" ([ITYM](#)) is a mathematics competitions intended for teams of high school students, who have several months to solve (open) mathematical problems known several months in advance, under the supervision of their "Team Leaders"

Administrative and scientific duties

2019 – **Examinator for the entrance exam in mathematics in ÉNS Paris (MPI contest, specific oral examination for ENS Paris).**

- 2018 – **Co-organiser of the opening day of CMAP (one day meeting in the beginning of October).**
- 2011 – **Co-organiser of the seminar Mathematic Park, Institut Henri Poincaré, Paris.**
The seminar [Mathematic Park](#) is intended for students in their first years after high school graduation. Its aim is to present mini-courses in different mathematical fields.
- 2019 – **Member of the Gender and Professional Equality of CMAP (École polytechnique).**
- 2020 **Co-organizer of the conference “Journées ALEA 2020”, CIRM.**
- 2019 **Co-organizer of the conference “Journées de Probabilités 2019”, Dourdan.**
- 2019 **Member of a selection committee for an Assistant Professor position (Orsay).**
- 2017 **Member of a selection committee for an Assistant Professor position (Département de mathématiques appliquées, École polytechnique).**
- 2015 – 2018 **Examinator for the entrance exam in mathematics in ÉNS Paris (for students studying social and economic sciences).**
- 2018 **Organiser of the invited session “Graphes, réseaux et cartes aléatoires” at “journées MAS 2018”, Dijon.**
- 2014 **Member of the steering committee of the Night of Science, ENS Paris.**
- 2012 **Co-organiser of the 4th International Tournament of Young Mathematicians, 3 – 10 July in Université Paris-Sud, France.**
- 2012 **Co-organiser of the second French Tournament of Young Mathematicians, 14 – 16 April in École polytechnique, France.**
- 2011 – 2015 **Organiser of the Parimaths club.**
[Parimaths](#) is a mathematics club intended for high school students who enjoy mathematics. Sessions are organized each Saturday afternoon at Ecole Normale Supérieure in Paris.
- 2012 – 2014 **Organiser of the informal probability seminar (DMA, ENS Paris).**
- 2012 – 2015 **Member of the board of Animath.**
- 2012 – 2014 **Designated member of the laboratory board (DMA, ENS Paris).**

Language skills French, Russian (mother tongues), English (fluent).