

Constanza Rojas-Molina

Born on April 7th, 1983 in La Serena, Chile (Chilean citizenship).

Address: CY Cergy Paris Université

Laboratoire AGM and Dept. de mathématiques

2 Av Adolphe Chauvin

95302 Cergy-Pontoise cedex, France.

e-mail: crojasmo@cyu.fr

<http://www.crojasmolina.com>

Education

- Sept 2008–Aug 2012 **Ph.D. in Mathematics**, *Laboratoire AGM, Université de Cergy-Pontoise, France.*
Thesis: The mathematical study of electronic transport in random Schrödinger operators with quasicrystalline structures.
Advisor: Prof. François Germinet.
- 2007–2008 **Master in Fundamental Mathematics (Master 2 Recherche)**, *mention "très bien", Université Pierre et Marie Curie-Paris 6, France.*
- 2005–2007 **Studies in the M.Sc. in Mathematics Program**, *Universidad de La Serena, Chile.*
All courses approved, Master thesis incomplete due to starting Master in France.
- 2001–2005 **B. Sc. in Mathematics**, *obtained with honours, Universidad de La Serena, Chile.*

Experience

- 2019– **Enseignante-Chercheuse**, (*lecturer*), *CY Cergy Paris University, International Bachelor Data Science by Design.*
- 2018–2019 **Junior-Professor (W1)**, (*fixed-term Assistant Professor*) *Group of Mathematical Statistics and Probability Theory, University of Düsseldorf.*
- 2015–2018 **Postdoctoral researcher**, *Group of Probability, Mathematics Center University of Bonn,*
Supervisors: Prof. Anton Bovier and Prof. Margherita Disertori.
- 2013–2015 **Postdoctoral Researcher- Marie Curie Fellow**, *Group of Analysis, Mathematisches Institut, LMU University of Munich,* Supervisor: Prof. Peter Müller.
Project: A Mathematical Study of Electronic Transport in Aperiodic Media (ETAM)
- Jan-Sep 2013 **Visiting Researcher**, *Center for Applied Mathematics and Theoretical Physics (CAMTP),*
University of Maribor, Slovenia.
- Sep-Dec 2012 **Postdoctoral Researcher**, *Mittag-Leffler Institute, Sweden.*
- 2008–2012 **PhD Student-Teaching Assistant**, *Mathematics Department-Laboratoire AGM, Université de Cergy-Pontoise, France.*

Teaching Experience

Teaching at CY Cergy Paris Université 2019-2021 (in English unless specified)

- 2021/22 **Applied Mathematics for Data Science**, 2nd year and 4th year students -International Bachelor Data Science by Design, CY Cergy Paris University.
- 2021/22 **Project-based-learning course**, 3d year students - International Bachelor Data Science by Design.
30h Project on Time Series Analysis with R and applications
- 2020/21 **(online) Applied Mathematics for Data Science**, 2nd year students -International Bachelor Data Science by Design, CY Cergy Paris University.
- 2020/21 **(online) Series**, 2nd year students - International Bachelor Data Science by Design.
- 2020/21 **(online) Project on Data Visualization and Storytelling**, 2nd year students - International Bachelor Data Science by Design.
15h focused on: sketchnotes, infographics, recording data, manipulation of data and public opinion, data-driven storytelling
- 2020/21 **(online) Project-based-learning week (15h, 60-minute hours)**, 2nd year students - International Bachelor Data Science by Design.
Topic: Filter Bubbles, in collaboration with Smart Cities Research Group at Vrije Universiteit Brussel.
- 2019/20 **(partially online) Topology and functional analysis (in French)**, 3th year Engineering Students in Mathematical Finance, EISTI Engineering School.
- 2019/20 **Linear Algebra II**, 2nd year student - International Bachelor Data Science by Design.
- 2019/20 **Distribution theory and PDEs (in French)**, 4th year Engineering Students in Mathematical Finance, EISTI Engineering School.
- 2019/20 **Project-based-learning course (15h, 60-minute hours)**, International Bachelor Ygrec in Data Science.
Topic: Data Visualization.

Teaching 2016-2019 (in English)

- 2018-19 **Stochastic Processes and Stochastic Analysis I and II**, Master Programme, Mathematics Institute, University of Düsseldorf, (3 semesters).
- 2018/19 **(Co-responsible) Seminar for Bachelor and Master students**, with Dr. Ercan Sönmez, Mathematics Institute, University of Düsseldorf.
Topic: Random Graphs and Complex Networks.
- 2016-18 **Assistant for Master and Bachelor Seminars**, Institute of Applied Mathematics, University of Bonn.
Assistant to Prof. A. Bovier (Extreme Value Theory), to Prof. P. Ferrari (Random Matrices), Prof. M. Disertori (Operators kernels and applications, Random Schrödinger operators, The ubiquity of Gaussian measures).

Teaching 2008-2011

- 2008–2011 **Teaching Assistant for undergraduates (Monitrice) (in French)**, Mathematics Department, Université de Cergy-Pontoise (Calculus, Variational Methods, C2I (Certification Informatique et Internet)).
- 2005–2007 **Lecturer for undergraduates (in Spanish)**, Mathematics Department, Universidad de La Serena.
Courses: Calculus, Algebra, Functional Analysis, Analysis of Complex Variable

March-Jul 2005 **Teaching Assistant for undergraduates (in Spanish)**, *Nursing School, Universidad Santo Tomás, La Serena, Chile.*

2002-2005 **Teaching activities (in Spanish)**, *Exercise sessions for the Teaching in Mathematics and Physics Program (U. de La Serena), for Technical Program (Centro de Formación Técnica Salesianos Don Bosco), private lessons to high-school and undergraduate students.*

Mini-courses (in English)

2018 **Mini-course (5h)**, *Summer School on Operator Algebras, Spectral Theory and Applications to Topological Insulators, 17-21 September, Tbilisi, Georgia.*

Topic: Random Schrödinger Operators.

2016 **Mini-course (7.5h)**, *CIMPA School 'Spectral Theory on Graphs and Manifolds', 7-19 November, Kairouan, Tunisia.*

Topic: Random Schrödinger Operators.

Supervision of Theses

PhD Thesis, *Roberto Maturana*, University of Bonn, funded by DFG Research Grant, Topic: Study of Random Schrödinger operators in connection with reinforced random processes. Co-mentor: Prof. Margherita Disertori (Bonn).

2019–

PhD Thesis, *Leonard Pleschberger*, University of Düsseldorf, funded by the Mathematics Institute, Topic: The Integrated Density of States of the fractional Anderson Model, Co-mentor: Prof. P. Kern (Düsseldorf). Currently, Mr Pleschberger is continuing his PhD with Prof. Kern at the University of Düsseldorf..

Oct 2018-August 2019

Master Thesis U. Pierre et Marie Curie, Paris 6, *Baptiste Coquinot*, Topic: Integrated Density of States and Lifshitz Tails for the Anderson model, Co-mentor: H. Boumaza (Paris Nord), Spring 2021.

Bachelor Thesis at University of Düsseldorf, *Mr. Lennart Sperling*, Topic: Scale-free percolation. Co-mentor: Prof. P. Kern (Düsseldorf) and Dr. Ercan Snönmez, Spring 2019.

Publications (Mathematical-Physics Research)

- M. Gebert, C. Rojas-Molina, Lifshitz tails for random diagonal perturbations of Laurent matrices, *Accepted for publication in Ann. Henri Poincaré (2021).*
- P. Müller, C. Rojas-Molina, Localisation for Delone operators via Bernoulli randomisation, arXiv:2003.06325 (2020) (*Accepted. To appear in Journal d'Analyse mathématique*).
- C. Rojas-Molina, Random Schrödinger Operators and Anderson localization in aperiodic media. *Rev. Math. Phys.* 32, 2060010 (2020)
- M. Gebert, C. Rojas-Molina, Lifshitz tails for the fractional Anderson model. *J. Stat. Phys.* 179, 341–353 (2020).
- C. Rojas-Molina, Random Schrödinger Operators on discrete structures. *Collection Séminaires et Congrès SMF* 32, 147-187 (2018).
- A. Klein, S. Nguyen, C. Rojas-Molina, *Characterization of the Anderson metal-insulator transport transition for the two-particle Anderson model.* *Ann. Henri Poincaré* 18, 2327-2365 (2017).
- F. Germinet, P. Müller, C. Rojas-Molina, *Ergodicity and dynamical localization for Delone-Anderson operators.* *Reviews in Mathematical Physics* 27 (9) (2015).

- C. Rojas-Molina, *The Anderson model with missing sites*, Operators and Matrices 8 (1) 287-299 (2014).
- C. Rojas-Molina, I. Veselić, *Scale-free unique continuation estimates and applications to random Schrödinger operators*, Commun. Math. Physics 320 (1) 245-274 (2013).
- C. Rojas-Molina, *Characterization of the Anderson metal-insulator transport transition for non ergodic operators and application*, Ann. Henri Poincaré 13 (7) 1575-1611 (2012).
- F. Germinet, C. Rojas-Molina, *Dynamical mobility edge for various random Landau Hamiltonians*, RIMS Kokyuroku Bessatsu, Proceedings of the Conference "Spectra of Random Operators and Related Topics", B27, 25-34 (2011).
- M. Corgini, C. Rojas-Molina, D.P. Sankovich, *Coexistence of Non-Conventional Condensates in Two-Level Bose Atom System*, International Journal of Modern Physics B, Vol 22, (27): 4799-4815 (2008).

Publications (Mathematical Communication/Outreach)

- *Visualization and social media as tools for Mathematics Communication*. Chapter to appear in *Handbook on Mathematical Science Communication*, Eds. Erin Henning and Anna Hartkopf, FU Berlin, Germany (2021)
- Book "Four seasons of Mathematics", for Editorial Planeta, Chile. Co-author: Leslie Jimenez (U. de Chile). *In development (2021), expected publication in 2023.*

Third Party Funding

- 2021 **CY Fellow in Residence Grant**, *Funding for one month to host Prof. O. Bourget at the CY Institute of Advanced Studies, Cergy, September 2021.*
- 2020-22 **ANR JCJC (Jeunes chercheurs/jeunes chercheuses)-Principal Investigator**, Research grant from the French government for young researchers.
61.560 Euros for trips, guests, conference organization and equipment for 2 years
- 2020 **Conference organization at Lorentz Center, The Netherlands, in August 2021**, *Title: "Learning from Insulators: New Trends in the Study of Conductivity of Metals", co-organized with G. de Nittis (PUC Chile), M. Lein (Tohoku Japan), and M. Seri (Groningen, NL), 20.000 Euros for organization expenses.*
- 2020 **Research in Paris (RIP) Programme**, One-month research stay (May 2021) at Institut Henri Poincaré for collaboration with Martin Gebert (UC Davis), 2.500 Euros.
- 2019-2022 **DFG Research Grant -Principal Investigator**, *Project: "Random Schrödinger Operators arising in the study of reinforced random processes"*, Formerly hosted by U. of Düsseldorf, the funds are hosted now by the U. of Bonn under Prof. M. Disertori's management.
196.000 Euros, includes one PhD student position and funding for travel.
- 2013-2015 **Marie Curie Intra-European Fellowship (IEF) for Career Development**, *Seventh Framework Programme (FP7) of the European Commission.*
168.794 Euros for postdoctoral stay at LMU Munich.
- 2013 **Humboldt Research Fellowship for Postdoctoral Researchers**.
63.600 Euros in Total Netto Income for 24 months (declined in favor of Marie Curie IEF).
- 2012 **Postdoctoral grant - Mittag Leffler Institute**, *Participation in the program "Hamiltonians in magnetic fields"*.
ca. 7197 Euros : 60.000 SEK plus housing and trips (at Sep 2012 conversion rate)

2008-2012 **Grant CONICYT for Doctoral Studies**, *Chilean Commission for Research and Technology- Comisión Nacional de Investigación Científica y Tecnológica, Chile.*
ca. 67.200 Euros Total Netto income for 4 years.

Other Awards and Grants

- 2019- **Fellow of the Elisabeth-Schiemann-Kolleg (Physics)**, *Career development program of the Max Planck Society for women in the natural sciences.*
- 2016 **Romberg Grant to participate in the 4th Heidelberg Laureate Forum.**
- 2015 **Visiting Fellowship**, *Isaac Newton Institute for Mathematical Sciences*, Program Periodic and Ergodic Spectral Problems.
Housing covered by INI
- 2011 **Erasmus mobility fellowship for PhD students**, *Université de Cergy-Pontoise.*
900 Euros Support
- 2011 **Oberwolfach Leibniz Graduate Student Grant**, *M. F. Oberwolfach, Germany.*
- 2006 **Valedictorian, Awards “Universidad de La Serena” and “Facultad de Ciencias”**, *Universidad de La Serena, Chile*, For graduating with honours.

Visits 2015-

- 2020 **(postponed due to COVID-19) Research visit**, *Mathematics Department, University of Groningen (Prof. M. Seri).*
- 2019 **Research visit**, *Mathematics Faculty, University of Warsaw (Prof. K. Pietruska-Paluba).*
- 2016,2018 **Research visits**, *Mathematics Faculty, P. Universidad Católica de Chile (Prof. O. Bourget).*
- 2015 **Visiting Fellowship**, *Newton Institute for Mathematical Sciences*, Program Periodic and Ergodic Spectral Problems, 3 months.

Talks 2017-

- Aug 2021 **(remotely) Seminar Tohoku University**, *Senday, Japan.*
- Jun 2021 **(remotely) 5th Great Lakes Mathematical-Physics Meeting**, *Oberlin College, USA.*
- May 2021 **(remotely) One World Seminar on Mathematical Physics**, *International Association in Mathematical Physics (IAMP).*
- May 2021 **(remotely) Online joint Seminar CIMAT – Universidad Autonoma de Aguascalientes**, *Aguascalientes, Mexico.*
- May 2021 **(remotely) MESS seminar**, *Essex University, UK.*
- Apr 2021 **(remotely) Mathematical Physics Seminar**, *Texas A&M, USA.*
- Mar 2021 **(remotely) Online seminar Mathematics department, University of Pisa (remotely)**, *Pisa, Italy.*
- Mar 2021 **(remotely) Seminar Centre de Physique Theorique de Marseille (CPT)**, *Marseille, France.*
- Mar 2021 **(remotely) Rencontre GDR DynQua 2021**, *Dijon, France.*
- Mar 2021 **(remotely) Seminario de probabilidad hispanohablante**, *Online seminar.*
- Feb 2021 **(remotely) Analysis Seminar**, *U. Sorbonne Paris Nord, France.*
- Jan 2021 **(remotely) Analysis Seminar**, *FU Hagen, Germany.*

- Nov 2020 **(remotely) Mathematics Colloquium**, PUC, Santiago, Chile.
- Nov 2020 **(remotely) Mathematics Colloquium**, University of Arizona, USA.
- Sep 2020 **(remotely) Minisymposium, DMV annual meeting**, TU Chemnitz, Germany.
- February 2020 **Workshop on NCG, analysis and topological insulators**, Leiden University, Netherlands.
- August 2019 **QMath 14, Session on Random Systems**, University of Aarhus, Denmark.
- May 2019 **Mini-Conference Spectral Theory and Probability in Mathematical Physics**, University of Strasbourg, France.
- Dec 2018 **Results in Contemporary Mathematical Physics**, PUC, Santiago, Chile.
- Dec 2018 **Conference Random Physical Systems, Patagonia 2018**, Puerto Natales, Chile.
- Dec 2018 **Conference Spectral Theory and Mathematical Physics**, PUC, Santiago, Chile.
- Nov 2018 **Workshop Spectral Theory of Quasi-Periodic and Random Operators**, Centre de Recherches Mathématiques, Montréal, Canada.
- Sep 2018 **Young Women in Mathematical Physics**, University of Bonn, Germany.
- Jul 2018 **Seminar series Konstanz: Women in Maths**, University of Konstanz, Germany.
- May 2018 **Kolloquium of the Mathematics Institute**, University of Düsseldorf, Germany.
- Feb 2018 **Annual meeting of the DMV, Session on PDEs and Dynamical Systems**, Paderborn, Germany.
- Jul 2017 **Workshop "Women in Probability"**, TU Munich, Germany.
- Apr 2017 **Analysis Seminar**, TU Delft, Netherlands.
- Apr 2017 **Aachen-Augsburg Applied Analysis Workshop**, RWTH Aachen, Germany.
- Jan 2017 **Mathematical-Physics Seminar**, Université de Grenoble, France.
- Jan 2017 **Seminar Probability and Applications**, Queen Mary University of London, UK.

Other academic activities

Organization of scientific events

Organizer of the Online Graduate School RAW "Random Schrödinger Operators arising in the study of random walks", June/July 2021, Part of the ANR Grant RAW, 5-day event.

Organizer of the Workshop "Learning from Insulators: New Trends in the Study of Conductivity of Metals", August 2021, Lorentz Center, Leiden, Netherlands.

(postponed to 2022 due to COVID-19) Co-organizer of the Conference "New Directions in Disordered Systems" June 2020, University of Cergy-Pontoise.

Organizer of event "Women in Maths Get-Together", May 8, 2019, University of Düsseldorf.

Working Session on Topological Insulators, Feb 27, 2019, Max Lein (Sendai, Japan) gave a mini-course and seminar talk on topological insulators addressed to Master students, as part of an on-going collaboration.

Organizer of event "The Mathematics of Disorder", 4 - 8 October 2016, Graduate School Young Women in Mathematical-Physics followed by a workshop, University of Bonn, Germany.

Organizer of the meeting "Electrons in quantum disordered media", 12 March 2014, Université de Cergy-Pontoise.

Responsibilities

2021-2023, Member of Project ECOS/CONICYT for bilateral collaboration between France and Chile.

June 2020 Member of PhD thesis committee, PhD defense of M. S. Zalczer, University of Toulon and CPT, Marseille. Advisor: J.-M. Barbaroux.

Co-responsible for Group Oberseminar April 2018-August 2019, Group of Mathematical Statistics and Probability Theory, University of Düsseldorf.

Co-responsible for Group Oberseminar October 2016-March 2018, Group of Probability Theory, University of Bonn.

Researcher in the Programme MATH.en.JEANS, Lycée Français de Düsseldorf.

Referee for Journals

Journal of Spectral Theory, Journal of Functional Analysis, Annales Henri Poincaré, Operators and Matrices.

Memberships

Member of IAMP (International Association of Mathematical Physics).

Member of the European Women in Mathematics Association.

Member of the Lise-Meitner-Gesellschaft e.V.

Languages

Spanish	Native
English	Fluent
French	Fluent
German	Intermediate (B2)
Greek	Beginner (A2)

Outreach activities

Science communication through illustrations, sketchnotes and comics, For more details, visit my website.

Website **www.crojasmolina.com/illustration/**.

Social Media **Twitter: @coni777 ; Instagram: @e.a.casanova.**

Member **Scientific Committee of Association Les maths en scène and its Maths Festival, France**, The association seeks to bring school pupils in contact with professional mathematicians and artists to make interdisciplinary work around mathematics.

Member **DIMATCHILE**, Network of Mathematical Science Communicators of Chile.

Member **Colectivo de Mujeres matemáticas de Chile**, Colective of Chilean Women Mathematicians.

2014– **Blog**, Author of the blog *The RAGE of the Blackboard*, <http://ragebb.wordpress.com/>. Interviews with female mathematicians and other articles around academia and the scientific life. This blog was the subject of an article on the website AMS Blogs in 2020

Public engagement

Dec 2021 **(to come) Speaker**, Seminar FUNDAPROMAT (online), Panama.

Sep 2021 **Speaker**, Imaginary and MATRIX Conference (online), Institut Henri Poincaré, France.

- Jul 2021 **Speaker**, *Maths Festival (online)*, Chilean Mathematical Society (SOMACHI), Chile.
- Jun 2021 **Panel member**, *Panel discussion to commemorate the Day of Mathematicians*, Mate Pop collective, UNAM, Mexico.
- May 2021 **Speaker**, *Online event 'Discovering Emmy Noether'*, Commemoration of May 12, Day of Women in Mathematics, Organized by Collective Resistencia Noetheriana.
- Feb 2021 **Moderator**, Panel discussion on Science communication, Organized by EUTOPIA Alliance of European Universities.
- Jan 2021 **Panel member**, Panel discussion on Science communication, gender and stereotypes, Organized by EU-funded Project Our Space, Our Future.
- Jan 2021 **Speaker**, First Chilean Meeting on Mathematical Communication (remotely), Chile.
- Aug 2020 **Panel member**, Panel discussion on Science communication and gender, Organized by Proyecto Anillo Matemáticas y género (Mathematics and gender) CONICYT, Chile.
- Jan 2020 **Scicomm**, Collaboration with Communication team, Proyecto Anillo Matemáticas y género (Mathematics and gender) CONICYT, Chile.
On going collaboration
- Apr 2020 **Illustration**, Contributor to Images de Mathématiques with *sharp*Mathyear Drawing challenge, CNRS France, On going contribution.
- Feb 2020 **Illustrator**, *Biographies of latin-american mathematicians*, Collaboration with mathematician and writer Alberto Mercado, On going project.
- 2017-21 **Blogger/Illustrator**, Member of the Blog Team of the Heidelberg Laureate Forum, Germany in 2017, 2018, 2021.
- Apr 2019 **Participation and abstract**, *NaWik Symposium*, NaWik- Institut für Naturwissenschaftskommunikation, Karlsruhe.
Scientists who do science communication throughout Germany gathered to discuss their work
- March 2019 **Interviewee**, The Newsletter of the European Women in Mathematics Association (EWM).
- 2019 **Social media/Illustration**, Co-host of Twitter drawing challenge #Mathyear.
Weekly drawings about maths and interactions
- Nov 2018 **Social media/Illustration**, Creator of the Twitter drawing challenge #Noethember, daily drawings on the life and work of Emmy Noether, Collaboration with Blog The Aperiodical (UK). The results can be seen here <https://aperiodical.com/2019/01/noethember-a-retrospective>.
This initiative was the subject of an article on the website AMS Blogs in 2018
- May 2018 **Twitter Rocur**, Curator for one week at the account @IamSciArt, for details see <https://iamsciart.com/past-curators/>.
- Jan 2018 **Illustration**, French version of Mathematician Sylvie Paycha's interview. Collaboration with Images de Mathématiques, CNRS France.
- 2017 **Illustration**, An original illustration with title "Women in Science" was published in the magazine "Resist!" (USA) (<http://www.resistsubmission.com/>), Edited by Françoise Mouly (New Yorker) and Nadja Spiegelman..
- 2017 **Interviewee**, Conversation with G. Thäter in the Modellansatz Podcast, Episode 121, Karlsruhe Institute of Technology (KIT) <<http://www.math.kit.edu/ianm4/page/math-blackboard/en>>.
- Nov 2017 **Oral Presentation and Poster**, *10.Forum für Wissenschaftskommunikation*, Presentation and poster on the Project the RAGE of the Blackboard.

Jul 2016 **Workshop moderator**, *Imaginary Conference 2016, Berlin*, Moderator for the Workshop "Curriculum for a maths communication course", assisting the workshop leaders and keeping updated the Collaborative Hackpad.