

# César Barilla

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## Education

- 2019–2024 **Columbia University, New York,**  
(expected) Economics PhD.
- 2019 **Paris School of Economics, Paris,**  
Masters APE (Analysis and Economic Policy).  
Summa Cum Laude
- 2018 **Université Paris 6 (Pierre et Marie Curie – Jussieu), Paris,**  
MSc in Mathematics, specialized in Mathematics for Modeling.  
Magna cum laude
- 2016 **Université Paris Dauphine, Paris,**  
B.A. in Economics.  
Magna cum laude
- 2015–2019 **École Normale Supérieure, Paris,**  
*Élève fonctionnaire stagiaire* (Student civil servant, 4 years full scholarship).
- 2012–2015 **Lycée Henri IV, Paris,**  
*Classe Préparatoire B/L* in Humanities and Social Sciences.

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## Working papers

- 2020 **A Mean-Field Game Model for Cities** (joint with Guillaume Carlier and Jean-Michel Lasry)  
*Abstract* : We propose a (toy) MFG model for the evolution of residents and firms densities, coupled both by labour market equilibrium conditions at each time and competition for land use (congestion). This results in a system of two Hamilton-Jacobi-Bellman and two Fokker-Planck equations with a new form of coupling related to optimal transport. This MFG has a convex potential which enables us to find weak solutions by a variational approach. In the case of quadratic Hamiltonians, the problem can be reformulated in Lagrangian terms and solved numerically by an IPFP/Sinkhorn-like scheme. We present numerical results based on this approach, these simulations exhibit different behaviours with either residential or business centers depending on the initial conditions and parameters.

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## Research experience

- 2019 **Masters Thesis in Economics, Paris School of Economics,**  
under the supervision of Alfred Galichon (NYU).  
Subject : Many to one matching problem under complementarities with two-sided heterogeneity and applications to the labour market.
- 2018 **Research Internship/Masters Thesis in Mathematics,**  
*Université Paris-Dauphine and INRIA Paris*, 6 months,  
under the joint supervision of Guillaume Carlier and Jean-Michel Lasry.  
Subject : Optimal transport coupling in multi-populations mean-field games, dynamic matching equilibrium with externalities and applications to urban planning.

- 2016 **Research Assistantship/Internship in Economics**,  
*Observatoire Français des Conjonctures Économiques (OFCE)*, 3 months,  
 under the supervision of Jérôme Creel (director of the Dpt. of Studies).  
 Subject : Theoretical modeling of financial instability, building on empirical work  
 by Creel, Hubert, Labondance (2015).
- 2016 **Student research project in Econometrics**,  
 Subject : Empirical study of savings behaviour with idiosyncratic effects of social  
 status and unexpected budget rise, using self-collected data on ENS students.

## Relevant Graduate Level Coursework

### ***Advanced Field courses in Economics (PSE M2 Courses) :***

- Network Economics (Demange, Bloch, Comola) ;
- Behavioral Economics and bounds on rationality (Jehiel, Compte) ;
- Information, Design and Markets (Lamy, Tercieux) ;
- Business cycles and stabilization policies (Hairault, Ferriere) ;
- Advanced Decision Theory (Tallon) ;
- The Theory of Incentives (Martimort) ;
- Collective Choice and Democracy (Laslier) ;
- Social Interactions (Verdier) ;
- From Statistical Physics to Social Sciences (Bouchaud).

### ***Advanced Field courses in Mathematics (Paris 6 M2 Courses) :***

- Optimal Transport and Calculus of Variations (Carlier) ;
- Mean-Field Games (Cardaliaguet) ;
- Continuous Optimization (Chambolle) ;
- Optimal Control in Finite and Infinite Dimension (Trélat) ;
- Stochastic Control (Pham) ;
- Statistics and Learning (Biau) ;
- Optimization (Lamboley) ;
- Partial Differential Equations (Béthuel) ;
- Functional Analysis (Cordero-Erausquin) ;
- Stochastic Calculus (Shi).

### ***Advanced General courses in Economics (PSE M1 Courses) :***

- Microeconomics sequence (Geoffard, Gagnepain, Bloch, Caillaud) ;
- Macroeconomics sequence (Hairault, Saint-Paul, Cohen, D'Autume) ;
- Econometrics Sequence (Jacquemet, Fack, Ben Salem, Doz, Behaghel) ;
- International Economics (Verdier, Imbs) ;
- Economic History (Piketty) ;
- Economic Policy (Benassy-Quéré).

## Numerical and software skills

Matlab ; Python ; Freefem++ ; Stata ; SAS ; L<sup>A</sup>T<sub>E</sub>X.

## Languages

French	Native	English	Fluent
Spanish	Fair	Italian	Fair
Russian	Beginner	German	Beginner

## Other professional experiences

- 2016–2019 **Colleur (Interrogator) in Classe Préparatoire**, in *Mathematics*,  
*CPGE ECE* (Business and Economics), Lycée Carnot (Paris), for prof. J. Bureaux.
- 2013–2019 **Private Lessons**, in *Economics, Mathematics and English*,  
 Frequent teaching of private lessons at University or High School level.
- 2012–2014 **Part time tour guide**,  
*Museum of the Paris sewers*.

2009 **Short internship,**  
*Universal Music France, Paris.*

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## Other activities

**Music** Long-standing musical experience and practice, frequent concerts in semi-professional contexts, professional studio and home studio recordings, arrangement, composition, band-leading

**Instruments** Bass, Clarinet, Guitar, Tenor Saxophone, Keys.

**Chiara & César Trio (2016-)** Bass/guitar/clarinet/vocals and band leader, frequent concerts, composition of original songs, recording ;

**Caravan quartet (2018-2019)** Bass, private concerts for galas or cocktails, organisation of jam sessions ;

**Enswing Big Band (2017-2019)** Bass (initially saxophone/clarinet), arrangement, administrative and logistic responsibilities ;

**Fanfare (brass band) of the ENS (2015–2017)** Saxophone/clarinet, Musical and administrative direction ;

**Courses in music theory** Department of Music Theory of the ENS (harmony and writing, "music and poetry", german romanticism) ;

**Side projects or former projects** Band projects (rock, pop, folk, jazz), choir singing.

**Photography** Digital and 35mm film.

**Graphic Design** Creation of logos, posters and other formats. Conception and edition using Adobe Photoshop or Quark XPress.

**Sports** Squash, Tennis, Kendo, Iaido.