

# Benjamin De Bruyne

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Enthusiastic, curious and engaged in lifelong learning.

## Education

- 2020–2023 **PhD. in Statistical Physics**, *Paris-Saclay University*, France.  
PhD candidate in stochastic processes, extreme value statistics and large deviations.
- 2020–2023 **MBA**, *Collège des Ingénieurs*, France.  
MBA fellow in the Science & Management program, class of 2020.
- 2019–2020 **MSc. in Physics**, *Perimeter Institute for Theoretical Physics*, Canada.  
Valedictorian of the 2019 Perimeter Scholars International class.
- 2017–2019 **MSc. in Engineering**, *CentraleSupélec*, France.  
Valedictorian of the 2017 CentraleSupélec class.
- 2015–2017 **Bachelor of Engineering**, *Liège University*, Belgium.

## Employment

- 2020 **Data Scientist**, *Gambit Financial Solutions*, Belgium.  
Machine learning modelling in market crisis forecasting.
- 2020 **Data Scientist**, *InvestSuite*, Belgium.  
Causal inference on financial time-series for portfolio performances.
- 2015–2020 **Teaching assistant**, *Paris-Saclay and Liège Universities*, France and Belgium.  
Mathematics, Quantum Physics and Thermodynamics.
- 2019 **Summer intern in Intellectual Property**, *Gevers*, Belgium.  
Patentability of machine learning algorithms at the European and US patent offices.
- 2017–2018 **President of the Science Club (volunteer)**, *CentraleSupélec*, France.

## Computer skills

**Julia, Python, Linux, Git.**

## Awards

- 2021 **Academy of Science**, *French Academy of Sciences*, France.  
First of the class at CentraleSupélec.
- 2020 **Individual PhD Grant**, *Luxembourg National Research Fund*, Luxembourg.  
Individual grant of €48.000/year to support PhD position.
- 2019 **Perimeter Institute Scholar**, *Perimeter Institute*, Canada.  
Perimeter Scholars International scholarship of \$45.000.
- 2019 **CentraleSupélec Talents**, *CentraleSupélec*, France.  
Leading scientific work and outstanding academic results.
- 2019 **Best Poster Presentation**, *International Charge Density Meeting*, Germany.
- 2018 **Physics Tournament Gold Medal**, *École Normale Supérieure*, Paris.

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## Publications

- 2022 **B De Bruyne, S N Majumdar and G Schehr**, *Universal order statistics for random walks & Lévy flights*, arXiv 2206.15057.
- 2022 **B De Bruyne, J Randon-Furling and S Redner**, *First-Passage-Driven Boundary Recession*, arXiv 2203.14400.
- 2022 **B De Bruyne, S N Majumdar and G Schehr**, *Optimal Resetting Brownian Bridges*, Phys. Rev. Lett. 128 200603.
- 2021 **B De Bruyne and F Mori**, *Resetting in Stochastic Optimal Control*, arXiv 2112.11416.
- 2021 **B De Bruyne, O Bénichou, S N Majumdar and G Schehr**, *Statistics of the maximum and the convex hull of a Brownian motion in confined geometries*, J. Phys. A : Math. Theor. 55 144002.
- 2021 **B De Bruyne, S N Majumdar, H Orland and G Schehr**, *Generating stochastic trajectories with global dynamical constraints*, J. Stat. Mech. 2021 123204.
- 2021 **G Pozzoli and B De Bruyne**, *Survival probability of random walks leaping over traps*, J. Stat. Mech. 2021 123203.
- 2021 **B De Bruyne, J Randon-Furling and S Redner**, *A Tale of Two (and More) Altruists*, J. Stat. Mech. 2021 103405.
- 2021 **B De Bruyne, S N Majumdar and G Schehr**, *Generating constrained run-and-tumble trajectories*, J. Phys. A : Math. Theor. 54 385004.
- 2021 **B De Bruyne, S N Majumdar and G Schehr**, *Expected maximum of bridge random walks & Lévy flights*, J. Stat. Mech. 2021 083215.
- 2021 **B De Bruyne, S N Majumdar and G Schehr**, *Generating constrained random walks and Lévy flights*, Phys. Rev. E. 104 024117.
- 2021 **B De Bruyne, D S Dean, P Le Doussal, S N Majumdar and G Schehr**, *Wigner function for noninteracting fermions in hard wall potentials*, Phys. Rev. A. 104 013314.
- 2021 **B De Bruyne, S N Majumdar and G Schehr**, *Survival probability of a run-and-tumble particle in the presence of a drift*, J. Stat. Mech. 043211.
- 2020 **B De Bruyne, J Randon-Furling and S Redner**, *Optimization and growth in first-passage resetting*, J. Stat. Mech. 1 013203.
- 2020 **B De Bruyne, J Randon-Furling and S Redner**, *Optimization in first-passage resetting*, Phys. Rev. Lett. 125 050602.
- 2020 **B. De Bruyne and J-M. Gillet**, *Inferring the one-electron reduced density matrix of molecular crystals from experimental data sets through semidefinite programming*, Acta Crys. A, 76 1.

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## Review activities

**Reviewer**, Phys. Rev., J. Stat. Mech., Physica A.

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## Conferences and Summer Schools

- 2021 **Fundamental Problems in Statistical Physics XV**, *Bruneck*, Poster presentation.
- 2021 **PSL Soft Matter Days**, *Paris*, Talk presentation.
- 2021 **Bangalore School on Statistical Physics - XII**, *Online*.
- 2021 **Lattice Paths, Combinatorics and Interactions**, *Online*, Poster presentation.
- 2021 **Youth in High-Dimensions**, *Online*, Poster presentation.
- 2021 **Oxy-jeunes Program**, *Les Houches School of Physics*, Talk presentation.
- 2021 **Young Physicists Meeting**, *Online*, Talk presentation.
- 2019 **International Charge Density Meeting**, *Germany*, Poster presentation.