# Gérald Gurtner

*Curriculum Vitae*

## Scientific Interests

- Network science in Air Traffic Management and other fields,
- Agent-Based Modelling in Air Traffic Management and other fields,
- Emergent properties in large physical/biological/social systems,
- Optimization in networks and biological/social systems,
- Statistic analysis of large data-sets,
- Market clearing mechanisms in Finance.

## Research Employment

Nov 2015 – present **Research Associate**, *University of Westminster*, London, UK.
Recruited as a permanent researcher with the aim of using techniques coming from network science applied to the Air Traffic Management with a strong emphasis on data analysis and numerical models.

Nov 2014 – Nov 2015 **Senior Consultant**, *Deep Blue srl*, Rome, Italy.
Data Analyst and Agent-Based Modelling expert for different European projects including ELSA : Empirically grounded agent based models for the future ATM Scenario.

Nov 2013 – Oct 2014 **Research Assistant**, *Scuola Normale Superiore*, Pisa, Italy.
Part of the European research project CRISIS : Complexity Research Initiative for Systemic Instabilities with Prof. Fabrizio Lillo.

Jan 2012 – Oct 2013 **Research Assistant**, *Scuola Normale Superiore*, Pisa, Italy.
Part of the European research project ELSA : Empirically grounded agent based models for the future ATM Scenario with Prof. Fabrizio Lillo.

## Education

2007–2011 **Ph. D.**, *Geometry, Topology and Optimization in Networks and Cellular Materials*.
Under the supervision of M. Durand and J.-M. Di Meglio at the Laboratoire Matière et Systèmes Complexes, Université Paris-Diderot
Obtained with the "congratulations of the jury", highest distinction for a Ph. D. in France.

2007 **Master of Science**, *Theoretical Physics of Complex Matter*, summa cum laude.
Université Paris-Diderot & École Normale Supérieure de Cachan.

2006 **"Agrégation"**, *General Physics*, received.
Fifth year of university study and most prestigious competitive exam for the recruitment of secondary school teachers and first years of University professors.

2004 **Bachelor of Science**, *Physics*, magna cum laude.
Université Pierre et Marie Curie & Ecole Normale Supérieure de Cachan.

*University of Westminster – 35 Marylebone Street – NW1 5LS London, UK*
*+44 (0)7 54 92 59 042 • g.gurtner@westminster.ac.uk*

2003–2007 **Studies at the Ecole Normale Supérieure de Cachan**, *Physics*.
One of only three prestigious institutions of higher education providing post graduate degrees to students who will become professors and researchers in their field.

## Teaching Experience

2007–2010 **Teaching Assistant**, *Statistical Physics, Mathematics and Wave Physics,*.
Université Paris-Diderot.

2007–2010 **Tutor**, *Physics and Mathematics*.

Jan – May 2004 **Teaching Assistant**, *Physics in sixth form*.
Fénelon high school, Paris.

## Training Periods

Feb – Mar 2007 **Non-perturbative renormalization methods : an application to fermionic systems**.
Under the supervision of D. Mouhanna and J. Vidal,
Laboratoire de Physique de la Matière Condensée,
Université Pierre et Marie Curie, Paris.

May - Aug 2005 **Optimization of the flow in the food path of ants**.
Under the supervision of M. Burd,
Department of Biological Sciences, Monash University, Melbourne.

Jun 2004 **Preliminary study of X-Cyg, a pulsing star**.
Under the supervision of D. Gillet,
Observatoire de Haute Provence, France.

## Computer skills

Advanced Python, MySQL, Fortran, Mathematica, and Unix/Linux Systems

Intermediate Java, C, Labview, Latex, Microsoft Windows Systems.

Basic Matlab

## Languages

Mothertongue **French**

Advanced **English, Italian** *Good skills, both oral and written*

Basic **Spanish, Portuguese** *Basic words and phrases only*

## General Interests

- Folk/classical/percussive guitar
- capoeira angola
- (old) video games : RPG, RTS, and 4X strategy
- programming (small softwares/games)
- rollerskating
- reading (science-fiction, philosophical essays, fantasy) & writing
- hard rock, folk music & rap music
- strategic boardgames
- social sciences, economy

## Publications

- G. Gurtner and M. Durand, *"Structural Properties of stiff elastic networks"*, EPL, **87** (2009) 24001.
- G. Gurtner and M. Durand, *"Stiffest elastic networks"*, Proc. R. Soc. A. **470** (2014), 20130611.
- G. Gurtner et al, *"Statistical Regularities in ATM : Network properties, trajectory deviations and delays"*, presented at the SESAR Innovation Days (2012).
- B. Monechi et al *"Exploratory analysis of safety data and their interrelation with flight trajectories and network metrics"* presented at $4^{th}$ International Air Transport and Operations Symposium (ATOS), (2013).
- G. Gurtner et al, *"An Agent Based Model of the Air Traffic Management"*, presented at the SESAR Innovation Day (2014).
- G. Gurtner et al, *"Multi-scale analysis of the European airspace using network community detection"*, PLoS ONE, doi :10.1371/journal.pone.0094414 (2014).
- G. Gurtner, L. Valori and F. Lillo, *"Competitive allocation of resources on a network : an agent-based model of air companies competing for the best routes"*, J. Stat. Mech. (2015) P05028
- C. Bongiorno et al, *"Adaptative air traffic network : statistical regularities in air traffic management"*, presented at the 11th USA/EUROPE Air Traffic Management R& D Seminar (2015).
- C. Bongiorno et al *"An Empirically grounded Agent Based Model for the SESAR scenario"*, in preparation (2015).
- J. K. Philips and G. Gurtner, *"Mixed Clearing Networks"*, in preparation (2015).
- C. Lancia et al, *"Against the memorylessness of air traffic arrivals"*, in preparation (2015).