

# Curriculum Vitae

Guillaume Kon Kam King

Nationality: French, Mauritian

Born on ....., 1988 in Paris.

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## Curriculum

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**2016-present** : Post-Doctorate at **Università degli Studi di Torino** and **Collegio Carlo Alberto**, under the supervision of Matteo Ruggiero.

**October 2015-March 2016** : Post-Doctorate at the **Collegio Carlo Alberto**, under the supervision of Igor Prünster.

**2012-2015** : Ph.D. in Biostatistics, **Université Claude Bernard Lyon 1**, 2015  
Supervisors: Sandrine Charles, Marie Laure Delignette-Muller

**Thesis:** Revisiting SSD - modelling species variability to protect communities.

**Jury:**

- Frédéric Yves Bois, Professor at Institut Universitaire Technologique de Compiègne
- Peter Craig, Professor at the Department of Mathematical Sciences, Durham University
- Sylvain Dolédec, Professor at Université Lyon 1
- Sabine Duquesne, researcher at the department of System Ecotoxicology, UFZ, Leipzig.
- Marie Laure Delignette-Muller, Professor at Université Lyon 1

Thesis defended on October 29th 2015

**2010-2012** : Master in physics from **École Polytechnique Fédérale de Lausanne**, Switzerland. (99/90 ECTS credits, grade: 5.21/6)

**2010** : Exchange for the spring semester at the **National Taiwan University**, Taipei.

**2009-2010** : Master 1 in physics from **École Normale Supérieure de Cachan**, France.

**2008-2009** : Bachelor in physics from **Université Pierre et Marie Curie** (Paris 6).

**2008-2012** : **Élève Normalien** at École Normale Supérieure de Cachan, selected after a national competitive exam.

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## Academic contributions

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### • Publications

- Kon Kam King, G., Canale, A., Ruggiero, M. (2018) Bayesian functional forecasting with locally-autoregressive dependent processes. *Bayesian Analysis*, advance publication.
- Bray J.P., Reich J., Nichols S.J., Kon Kam King G., Mac Nally R., Thompson R., O'Reilly-Nugent A., Kefford B. (2018) Biological interactions mediate context and species-specific sensitivities to salinity, *Philosophical Transactions of the Royal Society B: Biological Sciences* 374
- Kon Kam King G., Papaspiliopoulos O., Ruggiero M. (2018) Bayesian inference for hidden Markov models via duality and approximate filtering distributions. *In: Abbruzzo A., Brentari E., Chiodi M., Piacentino D. (eds), Book of short Papers SIS 2018*, Pearson, ISBN-9788891910233
- Kon Kam King G., Arbel J., Prünster I. (2017) A Bayesian Nonparametric Approach to Ecological Risk Assessment. *In: Argiento R., Lanzarone E., Antoniano Villalobos I., Mattei A. (eds) Bayesian Statistics in Action: BAYSM 2016. Proceedings in Mathematics & Statistics, vol 194*. Springer, Cham
- Kon Kam King, G., Delignette-Muller, M. L., Kefford, B. J., Piscart, C., & Charles, S. (2015). Constructing time-resolved Species Sensitivity Distributions using a hierarchical Toxico-Dynamic model. *Environmental Science and Technology*, 49(20), 12465–12473.
- Kon Kam King, G., Larras, F., Charles, S., & Delignette-Muller, M. L. (2015). Hierarchical modelling of species sensitivity distribution: development and application to the case of diatoms exposed to several herbicides. *Ecotoxicology and environmental safety*, 114, 212-221.
- Kon Kam King, G., Veber, P., Charles, S., & Delignette-Muller, M. L. (2014). MOSAIC.SSD: A new web tool for species sensitivity distribution to include censored data by maximum likelihood. *Environmental Toxicology and Chemistry*, 33(9), 2133-2139.
- Tizzoni M, Bajardi P, Decuyper A, Kon Kam King G, Schneider CM, Blondel V, et al. (2014) On the Use of Human Mobility Proxies for Modeling Epidemics. *PLoS Computational Biology* 10(7)

### • Open source packages

- Ernesto Barrios, Antonio Lijoi, Luis E. Nieto-Barajas, Igor Prünster, Guillaume Kon Kam King, BNPdensity: Ferguson-Klass Type Algorithm for Posterior Normalized Random Measures.  
*This is an R package for Bayesian Nonparametric density estimation using flexible nonparametric processes. It is available on CRAN: <https://CRAN.R-project.org/package=BNPdensity>*
- Marie Laure Delignette-Muller, Philippe Ruiz, Sandrine Charles, Wandrille Duchemin, Christelle Lopes, Guillaume Kon Kam King, Philippe Veber, morse: MOdelling Tools for Reproduction and Survival Data in Ecotoxicology  
*This R package is a suite of tools for the statistical analysis of bioassay data, using Bayesian inference. It is available on CRAN: <https://CRAN.R-project.org/package=morse>*

- Guillaume Kon Kam King, `ExactWrightFisher.jl`: Exact simulation of the neutral Wright-Fisher diffusion.  
*This Julia package implements part of the exact simulation scheme of Jenkins, P. A., Spanò, D. (2017). It is available on GitHub: <https://github.com/konkam/ExactWrightFisher.jl>*

- **Ongoing projects**

- Inference on Hidden Markov Models using the dual process  
Joint work with Papaspiliopoulos, O. and Ruggiero, M., *in preparation*
- `BNPdensity`: a package for Bayesian Nonparametric density estimation using Normalised Random Measures with Independent Increments.  
Joint work with Arbel, J., Lijoi, A., Nieto-Barajas, L. E., and Prünster, I., *in preparation for a special issue of the Journal of Statistical Software.*
- Rapid toxicity tests and Bayesian time resolved analysis: Simplifying pesticide community risk assessment Joint work with Bray, J. P. and Kefford, B. J., *in preparation.*
- A Bayesian Nonparametric approach to Species Sensitivity Distributions.  
Joint work with Arbel, J. and Prünster, I., *in preparation.*
- Modelling long time exposure with Toxicokinetic Toxicodynamic models Joint work with Bray, J. P. and Kefford, B. J., *in preparation.*

- **Invited talks at conferences**

- (Exact) Bayesian inference for hidden Markov models via duality, and approximate filtering distributions, **CMStatistics 2018**, Pisa, IT.
- Optimal filtering with dual processes, **SIS 2018** (Scientific meeting of the Italian Society of Statistics), Palermo, IT.
- A Bayesian nonparametric approach to ecological risk assessment, **CMStatistics 2016 (ERCIM 2016)** (Computational and Methodological Statistics, European Research Consortium for Informatics and Mathematics), Sevilla, ES.

- **Contributed talks at conferences**

- (Exact) Bayesian inference for hidden Markov models via duality and approximate filtering distributions, **ISBA World meeting** (International Society for Bayesian Analysis), 2018, Edinburgh, UK.
- Bayesian Nonparametric functional forecasting with locally-autoregressive particle systems, **ABC in Edinburgh**, 2018, Edinburgh, UK.
- Bayesian Nonparametric functional forecasting with locally-autoregressive particle systems, **Mathematical Methods of Modern Statistics**, 2017, Centre International de Rencontres Mathématiques, Marseille, FR.
- A Bayesian nonparametric approach to ecological risk assessment, **BAYSM** (Bayesian Young Statisticians Meeting), 2016, Florence, IT.

- Bayesian Nonparametric Density Estimation in Ecotoxicology, **JDS 2016** (Journées de la Statistique), Montpellier, FR.
- Hierarchical modelling of species sensitivity to a contaminant, **GDR ECOSTAT Annual Meeting** (Annual meeting of the French Statistical Ecology Group), 2015, Lyon, FR.
- Hierarchical modelling of species sensitivity distribution: a case study with diatoms exposed to several herbicides. Session: Statistical challenges in Ecotoxicology, **SETAC** (Science and Technology for Environmental Protection), 2014, Basel, CH.
- MOSAIC.SSD: A new web-tool to include censored data in SSD. **SETAC** (Science and Technology for Environmental Protection), 2013, Glasgow, UK.
- Hierarchical modelling of species sensitivity distribution: a case study on diatoms exposed to several herbicides. **AppliBUGS** (Applications of the Bayesian Unified Group of Statisticians), 2013, Paris, France.

- **Invited talks at seminars**

- Bayesian nonparametric modelling of locally trended functional time series, INRIA Grenoble - Rhône-Alpes, February 2017, FR.

- **Posters**

- Bayesian Nonparametric functional forecasting with locally-autoregressive particle systems, **ABC in Edinburgh**, June 2018, Edinburgh, UK.
- Bayesian Nonparametric functional forecasting with locally-autoregressive particle systems, **BayesComp**, March 2018, Barcelone, SP.
- Bayesian nonparametric modelling of trended monotonic functional data, 11th conference on Bayesian Nonparametrics **BNP11**, June 2017, Paris, FR.
- Bayesian nonparametric modelling of trended monotonic functional data, International Workshop on Bayesian Inference in Stochastic Processes **BISP10**, June 2017, Bocconi University, Milano, IT.
- Revisiting SSD : A Bayesian hierarchical model to account for interspecific variability. **CREAM** Open Conference : Mechanistic Effect Models for Ecological Risk-Assessment of Chemicals, Leipzig, Germany.

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## Teaching duties

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- 2019 (*Università degli Studi di Torino/Collegio Carlo Alberto*) Bayesian statistics, Allievi Honors Program, Collegio Carlo Alberto.
- 2018 (*Centre International de Rencontres Mathématiques, Marseille*) Instructor at the research school: Masterclass in Bayesian Statistics.
- 2018 (*Università degli Studi di Torino*) Probability course, master level.
- 2014 (*SETAC Summer School, Lyon*): instructor at the PREDITOX summer school in Ecotoxicology and Predictive Modelling (Risk assessment and fitting of dose-response models with frequentist and bayesian tools).
- 2013-2014 (*Université Claude Bernard Lyon 1*):
  - assistant for bachelor and master students, dynamical systems and bifurcations in biology.
  - assistant for 1<sup>st</sup> and 2<sup>nd</sup> year university students, exercise sessions in mathematics.
- 2010-2011 (*École Polytechnique Fédérale de Lausanne*): assistant for 1<sup>st</sup> and 2<sup>nd</sup> year university students, exercise sessions in physics.

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## Specific skills

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- **Statistics**
  - Bayesian hierarchical models
  - Nonlinear regression
  - MCMC algorithms
  - Bayesian Nonparametric models
  - Statistical software (R, JAGS, Stan)
- **Computer programming**
  - Parallel Computing
  - Code optimisation
  - Package development (R, Julia)
  - Basics in Functional Programming (OCaml, R)
  - Programming languages used: Fortran, Julia, Matlab, Python, R

- **Physics**

- Background in Nonlinear Dynamics
- Background in Soft Matter Physics
- Background in Solid State Physics

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### Fellowships and awards

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- **Best oral presentation award** (SDS2018, Turin, May 2018)
- **Post-doc fellowship from the University of Turin and the Italian Ministry for Education, University and Research** (2017-2018)
- **Post-doc fellowship from the University of Turin and the Italian Ministry for Education, University and Research** (2016-2017)
- **Best scientific poster** (Doctorales E2M2, Lyon, March 2013)
- **Ph.D. fellowship from la Région Rhone-Alpes** (2012-2015)
- **Fellowship from École Normale Supérieure de Cachan** (2008-2012 Normalien ENS Cachan)

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### Administrative duties

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Reviewer for:

- **Environmental Science & Technology**
- **Applied Stochastic Models in Business and Industry**
- **Ecotoxicology and Environmental Safety**

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### Volunteering and outreach

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- *2019 (Data is everywhere, CIRM)*: scientific presentation at the Centre International de Rencontres Mathématiques, Marseille, in front a high-school and university students. (video available at: <https://library.cirm-math.fr/Record.htm?idlist=3&record=19285731124910039139>)
- *2016-2019 (association Maths en Jeans)*: Volunteer activity as the scientific tutor of highschool students for research projects in mathematics.

- *2016 (La semaine des Maths)*: scientific presentation to a highschool audience at Lycée Jean Giono, Turin, during the Mathematics Week, a yearly event around mathematics organised by the French Ministry for Education.

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## Foreign Languages

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- **French** first language
- **English** TOEFL: 115/120 pts, TOEIC: 170/200, followed a master taught in English.
- **Italian** working capacity.
- **Spanish** reading.