

# Marc Joiret | Curriculum Vitae

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birthdate : July 6th,1967

*We are drowning in information and starving for knowledge.  
-Rutherford D. Rogers*

## Education

<b>Université de Liège, ULiège, Faculté des Sciences Appliquées</b> <i>Biomech Dept.   GIGA In Silico Medicine   PhD ongoing</i>	<b>Liège, Belgium</b> 2018 – 2023
<b>Interuniversity Institute for Biostatistics and Bioinformatics</b> <i>Master of Biostatistics, English taught Program</i> <i>Magna cum Laude (2<sup>nd</sup> Master: Great Distinction, 1<sup>st</sup> Master: Distinction)</i>	<b>Hasselt, Belgium</b> 2015–2017
<b>Université de Liège, ULiège</b> <i>Master of Science in Physics, specialized in Theoretical Physics</i> Great Distinction	<b>Liège, Belgium</b> 2002–2004
<b>Université de Liège, ULiège</b> <i>Bachelor of Science in Physics</i>	<b>Liège, Belgium</b> 1996–1998
<b>Faculté universitaire des Sciences agronomiques, FUSAGx</b> <i>ir. , Dipl. in Chemistry and Biomolecular Engineering</i> Great Distinction	<b>Gembloux, Belgium</b> 1987–1990
<b>Faculté universitaire des Sciences agronomiques, FUSAGx</b> <i>Bachelor of Agriculture and Life Sciences</i> Distinction	<b>Gembloux, Belgium</b> 1985–1987
<b>Faculté polytechnique de Mons, FPMS</b> <i>Entrance Admission test to Civil Engineering, 4th out of 260 candidates</i>	<b>Mons, Belgium</b> July 1985

## Masters Thesis

**Title:** *M. Sc. Biostatistics, specialization Bioinformatics. Thesis : The impact of correlated genetic markers on large-scale DNA-based gene-gene interaction studies, 2017.*

**Supervisors:** Prof. Kristel Van Steen (KUL & ULG) & Prof. Ziv Shkedy (UHasselt).

**Description:** Genome-wide association simulation study of a pair of interacting functional variants associated to human complex diseases taking into account linkage disequilibrium as confounding.

**Title:** *M. Sc. Phys. Thesis : The speed of gravity in General Relativity, 2004.*

**Supervisors:** Prof. Jean Surdej & Yves De Rop & Jean-René Cudell & André Burnel.

**Description:** My M. Sc. Phys. thesis was in Relativistic Gravitation and dealt with the gravitomagnetic effects of matter currents on the time delay of electromagnetic signals.

**Title:** *Bio-engineer Thesis : Modeling and Production of Poly- $\beta$ -hydroxybutyric Acid (PHB) by *Alcaligenes eutrophus* in a pilot fermentor, 1990.*

**Supervisors:** Prof. Philippe Thonnart & Raphaëlle Rikir & Eric de Buyl.

**Description:** My Bio-engineer thesis took place at the Solvay Research Center in Neder-over-Heembeek and aimed at developing indirect (software) sensors for a microbiological process monitoring. PHB was used as source of enantiomerically pure monomers used in pharmacology as a cardiotoxic molecule when esterified to the arginine amino acid.

## Work Experience

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### **Liège University | GIGA-R In Silico Medicine**

**Liège, Belgium**

*PhD student*

*2018–Present*

Researcher & Biostatistician | Bioinformatician on FNRS-FWO EOS funded program.

Profs Liesbet Geris and Pierre Close are my PhD supervisors. My PhD research addresses the translational control of protein synthesis. *mRNA translation rate modeling with extended TASEP incorporating tRNAs modifications effects.*

### **AQUATION s.a.**

**Liège, Belgium**

*Managing Director*

*2007–2017*

I founded AQUATION s.a. and settled on my own as an independent consultant specialised in life science engineering and modeling for health, agro-industry, environment, water treatment. My strength lies in providing new knowledge-based services to public or private owned companies in the bio-economy market model.

Detailed achievements:

- Statistical experimental design for the measurement of the effect on bitterness of water sulfate/chloride ratio in the brewing of trappist beers by a panel of rating judges
- Water treatment engineering projects for general contractors and public tenders in Belgium and abroad (Vietnam, Tunisia, Indonesia, Algeria, Sri Lanka)
- Water Demineralisation engineering projects for the industry
- Water Thermal Desalination research projects for the industry
- Anaerobic water treatment process engineering projects for the industry
- Auditing for water source treatment in the brewing industry
- External reviewer for the European Commission to rank applicants calling for FP7 funding under water or circular economy thematic

### **BALTEAU s.a., John Cockerill group**

**Sprimont, Belgium**

*R&D Manager and Senior Project Engineer*

*1999–2007*

Research program coordinator, in charge of public fund raising and senior project engineer.

Detailed achievements:

- Research program project leader on membrane bioreactor technology for waste water treatment : process modelling, pilot tests on membrane ultrafiltration modules
- Waste water treatment plant design, engineering, construction follow-up and plant starting-up. Budget in charge in the range 0.3 to 6 millions euros

### **WATCO s.a., Tractebel group**

**Welkenraedt, Liège, Brussel, Belgium**

*Project Engineer and business development*

*1992–1999*

Project Engineer and business unit leader in Landfill Engineering and Biogas to Energy Sector.

Detailed achievements:

- New Landfill site project set up near Warsaw (Tractebel, Poland)
- Design, permitting procedures, environmental impacts follow-up of landfill extension projects in Wallonia and Flanders
- Design, call for tender, execution follow-up of a complete biogas collection and valorisation unit (gas collecting pits, piping network, blowers, gas analysers, high temperature flare and 1.8 MW gas engines) at the Engis landfill site. Budget in charge : 3.5 millions euros.

### **Morgan Guaranty Trust Company of New York**

**Brussel, Belgium**

*Analyst Programmer, IT Dept.*

*1992–1992*

Database queries programming on the Eurobonds clearing organization (EUROCLEAR) for the Information Management.

Detailed achievements:

- IBM 3090 Mainframe application programming (RDBMS, SQL, DB2 and PL1)
- Team work in an English speaking environment for 7 months.

## Publication record in Biophysics, Bioinformatics and Computational Biology, Orcid ID: <https://orcid.org/0000-0001-5381-4196>

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**2023:** Joiret, M., Leclercq, M., Lambrechts, G., Rapino, F., Close, P., Louppe, G., Geris, L. Cracking the genetic code with neural networks, *Frontiers in Artificial Intelligence*. Submitted, under peer review.

**2022:** Joiret, M., Kerff, F., Rapino, F., Close, P., Geris, L. Ribosome Exit Tunnel Electrostatics, *Physical Review E*, 105, 2022. <https://journals.aps.org/pre/abstract/10.1103/PhysRevE.105.014409>.

**2019:** Joiret, M., Mahachie John, J.M., Gusareva, E.S, Van Steen, K. Confounding of linkage disequilibrium patterns in large scale DNA based gene-gene interaction studies. *BioData Mining*, 2019.

**all publications:** <https://orbi.uliege.be/ph-search?uid=U179427>

**Google Scholar:** <https://scholar.google.com/citations?user=cWxbqhYAAAAJ>

## Computer and software skills

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**Intermediate:** HTML5, CSS, JavaScript,  $\LaTeX$ , Matlab.

**Advanced:** UNIX/Linux scripts, **Python**, C++, **R**, Mathematica, DBMS MS Access, SQL, Excel, Visual Basic, FORTRAN, PASCAL, SAS Statistical Analysis (SAS Certified Base Programmer), OpenBUGS and JAGS (Bayesian methods), PLINK, simuPOP, MB-MDR (GWAS), Ingenuity Pathway Analysis, Netlogo,

**Python libraries** (BioPython SeqIO, regular expression, Scikit-Learn, Numpy, Pandas, PyTorch, TensorFlow, Database querying API, Matplotlib).

**Artificial Intelligence, Deep Learning and data mining:** General knowledge and projects experience in ML/AI methods, e.g., neural networks, computer vision, CNN, auto-encoders, GAN.

**Classical Biostatistics:** advanced knowledge of classical statistical inference methods and tools.

**Bioinformatics and Computational Biology:** QC|alignment|mapping tools|genomic repositories|downstream analysis of NGS repositories SRA, ENA, fastqc, trimmomatic, cutadapt, bowtie2, STAR, RiboProfiling tools, Snakemake data analysis workflows, PyMol for X-Ray crystallography or EM biomolecular structural analysis, AlphaFold, OpenMM for molecular dynamics simulations.

## Advising and Teaching Experience

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**2007–2021:** Invited lecturer for water treatment and environmental sciences at the Polygone de l'Eau, Verviers & Mons, 18 ECTS credits per year.

**2017-2022:** Invited lecturer for Energy course at HEC ULG Liege in the Master in Environmental Management, 3 ECTS credits per year.

**2020-2021:** Teaching Assistant of Prof. Liesbet Geris at ULiege in Biophysics: lecture on optical tweezers and applications to the study of biomolecules and biological structures.

**2021-2022:** Teaching Assistant of Prof. Liesbet Geris at ULiege in Biophysics: lecture on the application of PyMol and AlphaFold for the study of biomolecules and biological structures.

**2022-2023:** Graduate student master thesis adviser in Biomedical Engineering, KUL Leuven university.

## Languages

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**French:** Mothertongue

**English:** Professional proficiency

*Level 4 | CEFR C1 | TOEFL 550*

**German:** Basic

*Zertificat Deutsch als Fremdsprache, Goethe-Institut*

**Dutch:** Basic

## Interests

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- Reading | Learning | Writing | Science outreach
- Chess
- Epistemology
- Swimming
- Mountain hiking with teammates
- Yachting and Sailing