Marc Joiret | Curriculum Vitae

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What I cannot create, I do not understand.
- Richard Feynman

Education

Université de Liège, ULiège, Faculté des Sciences Appliquées — **Liège, Belgium**
Biomech Dept. | GIGA In Silico Medicine | PhD ongoing — *2018 – 2024*

Interuniversity Institute for Biostatistics and Bioinformatics — **Hasselt, Belgium**
Master of Biostatistics, English taught Program — *2015–2017*
Magna cum Laude (2^{nd} Master: Great Distinction, 1^{st} Master: Distinction)

Université de Liège, ULiège — **Liège, Belgium**
Master of Science in Physics, specialized in Theoretical Physics — *2002–2004*
Great Distinction

Université de Liège, ULiège — **Liège, Belgium**
Bachelor of Science in Physics — *1996–1998*

Faculté universitaire des Sciences agronomiques, FUSAGx — **Gembloux, Belgium**
ir. , Dipl. in Chemistry and Biomolecular Engineering — *1987–1990*
Great Distinction

Faculté universitaire des Sciences agronomiques, FUSAGx — **Gembloux, Belgium**
Bachelor of Agriculture and Life Sciences — *1985–1987*
Distinction

Faculté polytechnique de Mons, FPMS — **Mons, Belgium**
Entrance Admission test to Civil Engineering, 4th out of 260 candidates — *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-β-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 cardiotonic molecule when esterified to the arginine amino acid.

Work Experience

Liège University | GIGA-R In Silico Medicine **Liège, Belgium**
PhD student *2018–Present*
Researcher & Computational biologist on FNRS-FWO EOS and ERC funded program.
Profs Liesbet Geris and Pierre Close are my PhD supervisors. My PhD research addresses the translational control of protein synthesis. *Protein synthesis by ribosomes - Agent-based modeling of mRNA translation rate 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-indutry, environment, water treatment. My strength lies in providing knowledge-based services to public or private owned companies.
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 million euros

WATCO s.a., Tractebel group **Welkenraedt, Liège, Brussels, 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 million euros.

Morgan Guaranty Trust Company of New York **Brussels, 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

2024: **Joiret, M.**, Rapino, F., Close, P., Geris, L. Reversing the relative time courses of the peptide bond reaction with oligopeptide of different lengths and charged amino acid distributions in the ribosome exit tunnel, Comput Struct Biotechnol J. 2024 May. https://doi.org/10.1016/j.csbj.2024.05.045

2023: **Joiret, M.**, Rapino, F., Close, P., Geris, L. A simple geometrical model of the electrostatic environment around the catalytic center of the ribosome and its significance for the elongation cycle kinetics, Comput Struct Biotechnol J. 2023 Jul 26;21:3768-3795. https://doi.org/10.1016/j.csbj.2023.07.016.

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, 6, 2023. https://doi.org/10.3389/frai.2023.1128153

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.

Google Scholar:: https://scholar.google.com/ marc joiret

Computer and software skills

Intermediate: HTML5, CSS, JavaScript, LaTeX, Matlab.

Advanced: UNIX/Linux scripts, SLURM jobs for HPC, **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, RNA-Seq (single cell and bulk), RiboProfiling tools, Snakemake data analysis workflows, PyMol for X-Ray crystallography or EM biomolecular structural analysis, Alphafold.

Mentoring and Teaching Experience

2007–2023: Invited lecturer for water treatment and environmental sciences at the Polygone de l'Eau, Verviers & Mons, 18 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 mentor in Biomedical Engineering, KUL Leuven university.

Languages

French: Mothertongue

English: Professional proficiency — *Level 4 |CEFR C1 | TOEFL 550*

German, Dutch: Basic — *Zertificat Deutsch als Fremdsprache, Goethe-Institut*

Interests

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