

Yuba Amoura, PhD

4 years experience in **Python** programming, **statistical analysis**, and **data visualization**. Equipped with a strong foundation in data manipulation and **simulation** techniques. Uniquely able to bring **adaptability**, **resilience**, and a **global perspective** to any team. Excited to apply my **problem-solving**, **analytical reasoning** and **communication** skills towards creating impactful solutions to challenging problems.

EXPERIENCE

Doctoral Researcher

May 2019 – Aug 2023

University of Waterloo, Waterloo, ON, Canada

- Led a project to design an original method to use galaxy cluster data. Improves our Universe comprehension using existing data, at no extra cost.
- Acquired, cleaned and transformed raw simulation data (TBs) from various sources with different formats to a universal usable set of data (**Python, Numpy, SQL, Matplotlib, Pandas**)
- Predicted Universe properties using the cleaned data and **regression** methods
- Developed a set of 25 simulations of the Universe, generated 100TB of a unique data set which will be the basis for new projects over the next decade (**Cloud computing, Linux, Bash, C++**)

Teaching Assistant

Sept 2019 – Dec 2022

University of Waterloo, Waterloo, ON, Canada

- Designed lesson materials, visuals and digital presentations to supplement lesson plans for 9 different courses.
- Consulted with and supported more than 100 students to solve technical and personal issues
- Collaborated with other TA's and instructors for the design and implementation of teaching material

Research Intern

March 2016 – July 2016

Institut d'Astrophysique de Paris, Paris, France

- Developed a model to test the accuracy of Euclid, an ESA telescope (**Python, Numpy, Matplotlib, Scipy, scikit-learn**)
- Created a probabilistic model and used a maximum likelihood estimator and a minimization routine in Python to predict optimal galaxy parameters matching the data
- Discovered a discrepancy in part of the data, which would have caused years of delay if uncorrected.

MACHINE LEARNING PROJECTS

- Classification competition: detecting windmills from satellite images. Used a superlearner with svm, random forest and glm. 91% accuracy obtained (**R, Python, OpenCV**)
- Clustering using K-means for image size reduction. Reducing number of colors with minimal impact on quality (**Python, Pycharm, OpenCV**)
- Principal Component Analysis (PCA) to predict which combination of genes are linked to different cancer types (**R**)
- PCA to on galaxy cluster structural properties and age ([GitHub](#))

SOFT SKILLS

- **Analytical reasoning** and **Problem solving** acquired through studying Physics and solving complex research problems
- **Communication** and **Collaboration** through teaching, presentations and collaborating on research projects
- **Quantitative skills, rigor** and **attention to detail** through studying math and physics, analyzing research papers, writing and debugging code.

CONTACT

- Waterloo, ON, Canada
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- amourayuba@gmail.com
- [Linkedin](#)
- [GitHub](#)
- [Personal website](#)

TECHNICAL SKILLS

Advanced Python: Numpy, Scipy, Matplotlib, Jupyter. LaTeX, Linux
Intermediate OpenCV, Scikit-learn, SQL, Pandas, Git/GitHub, seaborn
Familiar R, C/C++, Matlab, TensorFlow, PyTorch

EDUCATION

- **Ph. D. in Astrophysics**

May 2019 – June 2023

University of Waterloo, Canada

- **Masters in Statistics Modelling-ML**

Sept 2018 – March 2019

Université Paris Descartes, France

Optimization, Stochastic Algorithms, Classification, Poissonian Processes

Ranked first in the masters

- **Masters in High Energy Physics**

Sept 2014 – Mar 2016

Sorbonne Université, France

COMMUNICATION

Fluent in English, French, Berber and Arabic

OTHER

- Tutored 100+ students (high school and university) in Math, Physics, Statistics
- Teaching chess to visually deficient students using original and innovative learning techniques adapted to the students

PUBLICATIONS (SELECTION)

Full list at [google scholar](#)

“Cluster Assembly Times as a Cosmological Test”, **Y. Amoura et al.**, Monthly Notices of the Royal Astronomical Society (2021)

“Halo Growth as a Cosmological Test”, **Y. Amoura et al.**, MNRAS (2024)