Hugo Alexandre, M.Sc

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Photo taken in the west arm of Virgo

Education

2024 – now
- **International Master's Degree in Computational Physics,** *Université Marie-Louis Pasteur (UMLP).* Specialization in Machine Learning and Numerical Simulations.

2021 – 2023
- **Master's Degree in Subatomic Physics & Cosmology,** *Université Grenoble Alpes (UGA).* Specialization in Cosmology, Astroparticles and Gravitational Waves.
- **Magister's Degree in Fundamental Physics,** *Université Grenoble Alpes (UGA).* Specialization in Research and Mathematics of General Relativity.

2018 – 2021
- **Bachelor's Degree in Physics,** *Université Grenoble Alpes (UGA).*

2018 – 2019
- **Research Passport University Diploma,** *Université Grenoble Alpes (UGA).*

Employment History

2025 – now
- **YouTube Video Scriptwriter (Freelance).**
  Scientific consultant for Zebroloss (ESA partner). Self-employed (autoentrepreneur) as a scriptwriter and scientific lead. I write video and documentary scripts on astrophysics, cosmology, and quantum mechanics. I am responsible for the scientific accuracy, numerical calculations, and the design of simulations used in Zebroloss projects.

2023 – 2024
- **Physics-Chemistry Teacher.** Middle School (full-time position).
  I worked as a full-time physics-chemistry teacher at a middle school, applying core scientific concepts to teach students effectively and manage classroom dynamics.

Additional Experiences

06/2025 (upcoming)
- **Participant at the 4th MaNiTou Summer School on Gravitational Waves,**
  Marseille, Luminy Campus, Aix-Marseille Université.
  Comprehensive training in gravitational wave science: theory, instrumentation, data analysis, and applications to astrophysics and cosmology.
  Attended lectures and hands-on sessions by leading researchers on topics including LVK, LISA, source modeling, stochastic background, AI methods, and multi-messenger astronomy. The school gathered M.Sc, PhD students, and researchers in the Calanques National Park.

02/2025 – now
- **M2 Internship at OCA/ARTEMIS (Nice),**
  Inferring a Model of the Galaxy with Compact Binaries Observed by LISA.
  Supervised by Dr. Natalia KORSAKOVA.
  Contributing to the development of methods for inferring a model of the galaxy based on gravitational wave observations of galactic binaries by LISA with machine learning.

Additional Experiences (continued)

09/2024 • **Visit to Virgo Gravitational Wave Interferometer,**
Visited the Virgo interferometer for a documentary filming, guided by physicist Jérôme Degallaix. Participated in technical discussions on the detector's design and performance.

02/2023 – 07/2023 • **M2 Internship at LAPP (Annecy),**
Influence of Cosmology on the Gravitational Wave Background of Compact Binaries.
Supervised by Pr. Tania REGIMBAU.
Studied the impact of cosmological parameters and models (e.g., H_0, Ω_M, dark energy, quintessence...) on the SGWB in ΛCDM and alternative models.

06/2022 – 08/2022 • **M1 Internship at APC Laboratory (Paris).**
The Cosmic-Ray Boron-over-Carbon Ratio Observed by Voyager 1.
Supervised by Pr. Stefano GABICI.
Analyzed cosmic-ray spallation in the ISM and calculated the B/C ratio using analytical and numerical tools.

02/2022 • **Participant, 9th French Physicists' Tournament (ENSTA, Paris).**
Presented a physics research problem in English to a jury and competing teams as part of a collaborative and competitive scientific event.

01/2022 – now • **Founder of 1minute2physique (TikTok).**
Produce short videos with numerical simulations, mathematical insights, and popular physics content to communicate science effectively.

Skills

Languages

- French – Mother tongue
- English – B2/C1 Level, strong reading, writing and speaking competencies

Coding

Python • Machine Learning (Pytorch, Normalizing Flow), Data Analysis (Bayesian Inference, MCMC), Simulation (FDTD Method, Matplotlib), Coding on Cluster (CCIN2P3)...

LaTeX • Scientific reports and presentation documents, CVs, posters, and complex equations formatting...

Fortran • Basic Skills and Non-Analytical Problem Solving

Misc.

- Teaching, writting skills, theoretical and numerical skills...

References

Available on Request