PhD candidate in astrophysics and software engineer, responsible for the development and maintenance of simulation and data reconstruction tools for the QUBIC experiment. Specialized in High Performance Computing, CPU/GPU parallelism, performance optimization, and data analysis. Seeking a position in numerical simulation, HPC, or software development.

PROFIL

tomlaclavere@gmail.com

0643382043

Driving licence B/A2

TomLaclavere

Website

LinkdIn

COMPÉTENCES

- Languages: C++, Python (expert), Shell, Fortran (intermediate), Rust, Julia (basic)
- HPC: TBB, OpenMP, MPI, SYCL
- GPU/ML: CUDA, Thrust, PyTorch, JAX
- Tools: Git, CMake, Docker, Valgrind, MAQAO, SLURM
- Data Analysis: Scipy, Pandas, sklearn, PyTorch

TRANSVERSAL

- Strong rigor and structured workflow
- Autonomy and adaptability
- Technical ownership and sense of responsability
- Clear written and oral communication
- Ability to explain technical concepts

INTERESTS

- Sport: Boxing, badminton
- Programming, video games, moto, hiking

TOM LACLAVÈRE

PhD in Astrophysics · Software Engineer – Numerical Simulation & HPC

EXPERIENCES

2023-2026 — **Laboratoire APC**

PhD - QUBIC Experiment

- Lead developer and main maintainer of the production simulation and data reconstruction software (>500 commits).
- Design of map-making and astrophysical component separation algorithms (Numerical Methods & Neural Networks).
- Deployment and execution on HPC clusters (SLURM).
- Development of calibration and noise analysis tools for data validation.

2025- — **GitHub Project**

Personal Project - 3DPhysicsEngine (C++/HPC)

- Development of a modular 3D physics simulation engine.
- Implementation of physical models and performance optimization.
- Objective: efficient and realistic real-time simulation, applicable to video games and interactive rendering.

EDUCATION

2026 — **PhD in Fundamental Physics - Astrophysique**

- QUBIC Data Analysis: Realistic astrophysical comonents reconstruction and atmosphereic mitigation using spectral imaging (APC)

2023 — **Master's Degree - NPAC** - Graduated with Honors - (Université Paris-Cité)

2021 — **Bachelor's Degree in Fundamental Physics** - Graduated with Highest Honors (Université Paris-Cité)

2020 — **CPGE Physics & Chemistery** - Admissible to Centrale engineering schools (Cité Scolaire Bertran-de-Born)

TEACHING

2023-2024 — **Ecole d'Ingénieur Denis Diderot**

Teaching Assistant

- Electromagnetic Fields - 1st year - Tutorials (24h)
- Noise - 2nd year - Lab sessions (24h)

2024 & 2025 — **Université Paris-Cité**

Teaching Assistant

- Numerical Physics - Master 1 - Tutorials (36h)

PUBLICATIONS

- Atmosphere mitigation in Time-Ordered-Data using Spectral Imaging with QUBIC instrument : ongoing
- Spectral Imaging with QUBIC: building frequency maps from Time-Ordered-Data using Bolometric Interferometry (arXiv:2409.18698)
- Spectral Imaging with QUBIC: building astrophysical components from Time-Ordered-Data using Bolometric Interferometry (arXiv:2409.18714)
- Neural-Network Map-Making : ongoing
- Contribution to the 2024 Cosmology session of the 58th Rencontres de Moriond: Bolometric interferometry and spectral: a QUBIC overview (arXiv:2406.15414)
- Contribution to the 2026 Cosmology session of the 59th Rencontres de Moriond: ongoing

CONFERENCES & TRAININGS

- 59th Rencontres de Moriond, Cosmology session, 2026, Italie, La Thuile
  - Presenter, "Spectral Imaging with QUBIC: Component separation methods using Bolometric Interferometry and application on atmospheric mitigation". (20 min)
- Gray Scott School, 2025, France, Annecy
  - Summer School, "The GRAY SCOTT SCHOOL 2025 - Revolutions will be a deep dive into High Performance Computing, computing optimisation, profiling, and software engineering, to guide you through important topics such as CPU/GPU architectures, Unit Tests, Computing Precision, Memory Allocation and profiling, with modern C++, Rust, Fortran and Python languages, and libraries such as Sycl, EVE, Vulkan, CUDA, Thrust, PyTorch."
- Machine learning in Python with scikit-learn, 2025, Inria, online
  - Training session, Data Analysis with scikit-learn
- Groupement De Recherche in Cosmological Physics (GDR CoPhy) Episode 3, 2025, France, Paris, ENS
  - Presenter, "Spectral Imaging with QUBIC: Component separation methods using Bolometric Interferometry". (25 min)
- Scientific Python Training CC-IN2P3, 2025, France, Lyon
  - Training session, Python training focused on High Performance Computing with Python and utilisation of IN2P3 Computational Center (using SLURM)
- Ecole Rodolphe Cledassou, 2024, France, Hendaye
  - Summer School, "L'école Rodolphe Cledassou forme les jeunes chercheurs francophones à la science des futurs grands relevés cosmologiques. Son fonctionnement est assuré par les organismes et instituts français impliqués dans la mission spatiale Euclid".
- 58th Rencontres de Moriond, Cosmology session, 2024, Italie, La Thuile
  - Poster, "Bolometric interferometry and spectral: a QUBIC overview"