

Ethan

PUYAUBREAU

Research Software Engineer

HPC · Scientific computing · Open source

C++ · EDF R&D · Oak Ridge (USA)

Available January 2027

CONTACT

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 github.com/ethan-puyaubreau

 ethan-puyaubreau.github.io

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TECHNICAL SKILLS

HPC & Scientific Computing

C++17/20 · CUDA · Kokkos · CMake

Performance Profiling · MPI · OpenMP

Infrastructure & Platform

Kubernetes (K3s) · Docker · Ceph

Proxmox VE · VyOS · Ansible · Traefik

Linux / Debian

CI/CD & DevOps

GitLab CI/CD · Jenkins · GitHub Actions

Debian Packaging · Git

Languages

C++ · Python · TypeScript · Java · Bash

Rust (working knowledge) · Learning: Go

Data & Backend

PostgreSQL · MySQL · JSON/XML/XSD

Research Software

Unit and regression tests · CI

Versioned releases · citation metadata

Public data and reproduction scripts

Docs

Sphinx · LaTeX · Typst

LANGUAGES

French

Native

English

CI — TOEIC 970/990 (Oct. 2025)

Spanish

BI

INTERESTS

Flight Simulation (DCS World, KSP, VR)

3D & VFX · Music · Self-hosting

PROFILE

Research software engineer in high-performance computing, trained through a work-study program: three years at EDF R&D on the platform that simulates the group’s nuclear reactor cores, including a research stay at Oak Ridge National Laboratory (USA), where I built GPU energy measurement tools for Kokkos (the AMD version ran on Frontier) and submitted them upstream through public code review. I care about the engineering that makes research code trustworthy: bit-for-bit validation, tests, packaging, CI/CD and documentation. Available for full-time positions from January 2027.

WORK EXPERIENCE

Software Architecture & Scientific Computing Engineer (work-study)

EDF Lab Paris-Saclay · Palaiseau, France

Sept. 2023 – Sept. 2026

- Developed a prototype for nuclear reactor core computation following a more modular, component-oriented paradigm: results rigorously identical to the reference, **bit-for-bit**, up to **12% faster** and **38% lower peak memory** (neutronic solvers, C++).
- Built two performance diagnostic tools for this **500k+ line-of-code** platform developed by **30+ engineers**: memory consumption analysis and compute-time measurement (C++, Python bindings); they were used to validate the prototype.
- Automated the test and delivery chain: cluster execution, result checking and storage, release packaging (Jenkins, GitLab CI/CD, XML/XSD, PostgreSQL, Scibian).
- Teamwork: code reviews given and received, leading technical meetings, user support (e.g. a blocking memory blow-up the team had chased for days, identified with the profiling tool).
- Written communication: **5 internal technical notes**, **3 apprenticeship reports** with annual defenses.

Graduate Research Fellow — GRO Program

Oak Ridge National Laboratory · Oak Ridge, TN, USA

June – Aug. 2025

- Research stay during the apprenticeship: built GPU energy measurement for Kokkos, a major scientific computing framework: a sampling daemon, measurement connectors and the analysis tool; the AMD version ran on **Frontier**, the world’s first exascale supercomputer.
- Measured on ArborX DBSCAN (one input, one H100) that the faster implementation saves more energy than time: **19% less time**, **25% less energy** (medians of 64 runs; **traces and script public**).
- Connectors through NVML and the vendor-neutral Variorum library, and the AMD one through ROCm-SMI (not yet public); preliminary exploration of multi-node simulations (LAMMPS, MPI).
- Open source contributions: **9 PRs to kokkos-tools and LAMMPS**, **3 merged**: the sampling daemon, carried through review by my ORNL mentor, and two build fixes; analysis tool published as **energy-dashboard-for-kokkos** (Rust, rewritten in 2026).

C++17 · Kokkos · CUDA · MPI · SLURM · HPC · Open source

PUBLICATIONS & TALKS

- Software: **energy-dashboard-for-kokkos v0.3.0**, archived on Zenodo, doi:10.5281/zenodo.22943410.
- E. Puyaubreau, D. Arndt, J. Bludau, D. Lebrun-Grandié. **Understanding GPU Energy Dynamics in HPC Applications**. Poster, SMC 2025 (Chattanooga, TN) and an ORNL internal session.
- Cited in the S4PST 2024–2025 Project Report (OSTI 3016977); invited to SC25 (declined); findings presented back at EDF Lab.

EDUCATION

Engineering Degree (M.Eng. equivalent) — Computer Science & Applied Math

Polytech Paris-Saclay · Université Paris-Saclay, France

Sept. 2023 – Sept. 2026

Work-study program (3 years in industry). CTI-accredited, equivalent to a Bologna-process M.Eng./M.Sc. Scientific computing · HPC · Parallel programming · Software architecture · Networks & security · ML.

Bachelor of Science (B.S.) — Sciences and Technology

Institut Villebon Georges Charpak · Orsay, France

Sept. 2019 – June 2023

PROJECTS

Personal Multi-Server Infrastructure

ethan-puyaubreau.github.io/cluster

June 2020 – Present

Designed and operated end to end, solo, since 2020: Proxmox VE virtualization, segmented network (VyOS, VLANs), Kubernetes (K3s), and over the years Ceph storage and CI/CD with GitLab and Ansible. **Around twenty services running continuously** for ~60 regular users.

Proxmox VE · Kubernetes · Ceph · Docker · VyOS · Ansible · GitLab CI/CD

Vireli — Carbon Footprint PWA (team lead)

Polytech Paris-Saclay · industry partnership with Viveris

2025 – 2026

Led a team of six (554 cumulative hours): overall architecture, backend (Hono, Bun, Prisma), deployment infrastructure (Docker, Gitea CI, Coolify, PostgreSQL, Redis). **18/18 functional requirements delivered** and validated.

TypeScript · PostgreSQL · Docker · CI/CD · Team lead

Large-Scale Online Event Organization

2021 – Present

Multiplayer events with **150 to 180+ participants**: coordination of a 4–5 person staff, live technical monitoring (Grafana, Prometheus), systematic debriefs.

Coordination · Monitoring · Communication