Academic background & Professional Experiences

Summary

I am Jules Perret, a PhD candidate in gravitational astrophysics at the Laboratoire Astroparticule et Cosmologie (APC, CNRS). My research focuses on Bayesian methods for the parameter estimation of gravitational waves originating from binary compact object systems, including Binary Neutron Stars (BNS), Binary Black Holes (BBH), and Neutron Star-Black Hole (NSBH) binaries. I am also a member of the LIGO-Virgo-KAGRA (LVK) collaboration and part of the collaboration Einstein Telescope to prepare the futur parameter estimation methods for the third generation of gravitationnal waves.

I am particularly interested in numerical simulations applied to astrophysics. With my Master's degree from École Normale Supérieure Paris-Saclay - Université Paris-Saclay, I developed a strong interest in High-Performance Computing (HPC) and massive parallel development on CPU/GPU.

Education

PhD in Astrophysics

- **Institution:** Laboratoire Astroparticule et Cosmologie APC-CNRS
- **Duration:** 2022 - Present
- **Description:**
    - Development of Python package: Deep Hamiltonian Monte Carlo (DeepHMC) for parameter estimation of gravitational wave sources.git
    - Bayesian statistics and numerical applications.
    - Member of the Ligo-Virgo-Kagra (LVK) Collaboration.

Master's Degree in High Performance Computing & Numerical Simulation

- **Institution:** Ecole Normale Supérieure Paris-Saclay, Paris, FR
- **Duration:** 2020 - 2022
- **Description:**
    - Multiscale computing and domain decomposition method
    - Simulation and modeling in fluid mechanics
    - Classical mechanics
    - Linear algebra for very large problems
    - Programming for GPU architecture and supercomputing

Bachelor's in Computer Science & Full Stack Web Development

- **Institution:** Université de Bourgogne
- **Duration:** 2016 - 2020

- **Description:**
    - Database (Oracle, SQL, PostgreSQL)
    - Web development (PHP, HTML5/CSS, JavaScript, AJAX)
    - Software engineering, graphic interface (JavaFX, MVC model)
    - Using a GNU/Linux environment
    - Java, C, C++, assembler programming
    - Multithreading and networking
    - Image analysis (Matlab, OpenCV)
    - Image synthesis and Ray-Tracing technologies

Preparatory Year / 1st Year Bachelor in Physics

- **Institution:** Université de Montréal
- **Duration:** 2014 - 2016
- **Description:**
  - Linear algebra, analysis, integral calculus
  - Classical mechanics, electromagnetics, and astrophysics
  - Numerical physics, numerical modeling of physical phenomena, particle interaction
  - Environmental chemistry

Professional Experience

PhD in Gravitational Wave Physics & Data Analysis

- **Institution:** Laboratoire Astroparticule & Cosmologie, Paris, CNRS, FR
- **Duration:** 2022 - Present
- **Responsibilities:**
  - Devellopment of Deep Hamiltonian Monte-Carlo (DeepHMC) for Parameter Estimation (PE) of gravitaionnal waves data.
  - Bayesian statistics
  - General relativity and simulation
  - Python devellopment using PE LVK's collaboration package : Bilby
  - Simulation of Gravitationnal waves detection and analysis for the third generation of Graviationnal waves detector: Einstein Telescope.

Intern at Lawrence Berkeley National Laboratory (UC BERKELEY - LBNL)

- **Position:** Astrophysics Internship
- **Location:** Berkeley, CA, USA
- **Duration:** 2017 - 2018
- **Responsibilities:**
  - Modelisation of Continious Gravitationnal Waves from pulsar.
  - Data Analysis of data from the LIGO and VIRGO detectors.
  - Development of parallel FFT algorithms on GPU.
  - Python, C/C++ programming

Intern in Software Development (Université de Bourgogne)

- **Position:** IT Internship
- **Location:** Dijon, France
- **Duration:** 2017 - 2018
- **Responsibilities:**
    - Development of mixed reality applications for the Microsoft Hololens platform
    - design, develop and test an application using : C#, Unity, Microsoft, MRTK.
    - Using 3Dslicer to process tomography of brain image data.

Footer

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