# EFRÉN RODRÍGUEZ RODRÍGUEZ

## INSTRUMENTATION PHYSICIST

### CONTACT


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### PROGRAMMING

- Python
- WinCC
- VHDL
- C ++
- LabVIEW
- Fortran
- ROOT

### LANGUAGES

English
(Intermediate, B2)

German
(Beginner, A1.1)

Galician
(Native, Celga4)

Spanish
(Native)

### PERSONAL PRESENTATION

PhD student in Nuclear and Particle Physics at the Galician Institute of High Energy Physics (IGFAE), specializing in vertex detectors for high energy physics. In over four years of experience, I have contributed to design, construction and communication of LHCb's silicon pixel vertex detector and the Timepix4 Beam Telescope. My expertise in electronics for physics experiments and passion for research fuel my commitment to making impactful discoveries in high energy physics.

### WORKING EXPERIENCE

#### PhD Candidate

IGFAE - USC | Sep. 2019 - Sep. 2024

ASIC characterization and sensor technologies for pixel silicon particle detectors. Commissioning for the improved VELO silicon pixel detector of the LHCb experiment at CERN. This includes construction of high-speed data transmission lines and the development of characterization set-ups for signal integrity. Development and calibration of an automatic X-ray irradiation set-up for radioactive aging of electronic systems. Algorith development for fast equalization for the VELO detector, programming control applications and FPGAs. Characterization, development and timing analysis of the Timepix4 Beam Telescope for silicon pixel detector research.

#### Invited Researcher

Nikhef | Jun. 2022 - May 2023

Characterized the Timepix4 ASIC for silicon pixel detector readouts and contributed significantly to the design, construction, and control of the Timepix4 Beam Telescope for research in silicon pixel detectors. Actively participated in six test beam campaigns, taking a leading role in coordinating one. Developed the timing analysis for the telescope, achieving an impressive 90 ps track resolution. Enabling the research of new high-performance silicon pixel sensors and ASICs with enhanced timing capabilities.

#### Invited Researcher

CERN | Aug. 2021 - Dec 2021

Commissioning of the VELO silicon pixel vertex detector for the LHCb experiment at CERN, installation and calibration tools development, counting algorithm development, WinCC programming and analysis. Development of testbeam set-up with a EUDAT-type Beam Telescope for irradiated and non-irradiated 3D column silicon sensors with LGAD sensor as time reference, designed automatic DAQ control board that allows a simple interface of any system with EUDET TLU.

## SKILLS

- Electronic design
- Leading coordination
- Set-up development
- Project management
- LaTex y programming

## OTHER KNOWLEDGE

- Critical thinking
- Adaptability
- Creative problem solving
- Team collaboration

## HOBBIES

- Coding
- Artificial Intelligence
- Computer electronics
- Photography
- Hiking
- Volleyball

### Internship

IGFAE - USC | Jun. 2018 - Jun. 2019

Set-up desing for 3D mapping and characterization of an X-ray beam. Development of positioning automatic system for equivalent dose irradiation, mimicking the radiation conditions of the LHCb experiment at CERN. Analysis of the deterioration in pixel silicon sensors due to ionizing radiation.

## EDUCATION

### PhD in Nuclear and Particle Physics

University of Santiago de Compostela | Sep. 2020 - Sep 2024

### Physics Master's Degree

University of Santiago de Compostela | Sep. 2019 - Sep. 2020

- Specialized in Nuclear and Particle Physics

### Physics Degree

University of Santiago de Compostela | 2019

## COURSES AND SEMINARS

**INF-303: Python IT Specialist certification** Nov. 2023
Pearson

**Applied Machine Learning Using Python** Jun. 2022
Smart Mind

**4th HEP C++ Course and Hands-on Training** Apr. 2022
Software Institute for Data Intensive Sciences

**The 39th RD50 Workshop - Radiation hard semiconductor devices for very high luminosity collider** Nov. 2021
CERN

**Data Science: Workflow and Programming Principles** Nov. 2021
University of Santiago de Compostela

**Introduction to thermography, use and management of Flir A400** Apr. 2021
Álava Ingenieros

**Course online on semiconductor radiation detectors** Apr. 2021
Barcelona Techno Week - University of Barcelona

**GitHub CI+CD Introductory Course and Hands-on Training** Feb. 2021
HEP Software Foundation and IRIS-HEP

**Quantum Computation and High Performance Computing 2019 Workshop**
CiTiUs - University of Santiago de Compostela

**VHDL language and design flow** (Leuven, Belgium) Sep. 2019
IMEC academy