Hassane **Hamdaoui**

POSTDOCTORAL RESEARCHER · DATA SCIENTIST

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Summary

PhD in Physics with expertise in advanced data analysis, statistical modeling, and machine learning. Led precision measurements and new physics searches using data from world-class experiments, including ATLAS, KM3NeT and IceCube. Skilled in extracting insights from complex and large datasets and applying analytical techniques in high-performance computing environments.

💼 Work Experience

Uppsala University *Uppsala, Sweden*
POSTDOCTORAL ASSOCIATE *Feb. 2024 – Present*
- Leading efforts in **data analysis** and **software development** to support high-impact research projects
- Using LHC data collected by ATLAS experiment for search for exotic particles using data driven background estimation.
- Developing and optimizing a web application to query run data from multiple databases, process relevant information, and store it in a dedicated PostgreSQL database on the back end, with ReactJS powering the front-end operations.
- Collaborating with cross-functional teams in the field of data-driven analysis, physics and software.

Stony Brook University *Stony Brook, NY, US*
POSTDOCTORAL ASSOCIATE *Nov. 2021 - Nov. 2023*
- Conducted multi-year data analysis of neutrino sources using cascade event data from the IceCube Neutrino Observatory, leveraging Boosted Decision Trees (BDTs) for advanced data modeling and classification
- Utilized Python DataFrames and HDF5 format for efficient data manipulation, analysis, and storage, along with creating detailed visualizations and plots for insightful data representation.
- Collaborated with a multidisciplinary team, contributing to innovative research in particle astrophysics.

Mohammed V University *Rabat, Morocco*
DOCTORATE (PHD) IN HIGH ENERGY PHYSICS & DATA ANALSYSIS *Nov. 2016 - Jun 2021*
- Designed and implemented complex data analysis pipelines using large-scale datasets from the ATLAS detector.
- Developed and optimized statistical models for signal extraction and uncertainty quantification.
- Utilized advanced machine learning techniques for pattern recognition and particle identification (keras, DNN).
- Extensive experience with Python, ROOT, and other high-performance computing tools

🎓 Education

Faculty of sciences, Mohammed V University *Rabat, Morocco*
PHD HIGH ENERGY PHYSICS ATLAS EXPERIMENT *Nov. 2016 - Jun. 2021*
- Thesis: Observation of light-by-light scattering in heavy-ion collisions with the ATLAS detector at the LHC.
- Relevant skills: Large scale data analysis, statistical modeling, machine learning.

Faculty of sciences, Mohammed I University *Oujda, Morocco*
MASTER OF SCIENCE IN PHYSICS OF MATTER AND RADIATION *Nov. 2014 - Jun 2016*
- Developed strong analytical, statistical, and programming skills during coursework and research.
- Relevant skills: Python programming, data analysis.

Faculty of sciences, Mohammed I University *Oujda, Morocco*
BACHELOR OF SCIENCE IN PHYSICS *Nov. 2011 - Jun 2014*

🔧 Skills

PROGRAMMING:	C/C++, **Python, SQL, Matlab, LaTeX, JavaScript, Shell scripting**
SOFTWARE AND TOOLS:	**Git, Jenkings, Bitbucket, Docker, OKD, Power BI, QlikView, SQLite, Microsoft Office, ROOT, Geant4, Origin**
FRAMEWORKS & LIBRARIES:	**Flask, pyspark, pandas, numpy, scikit-learn, Django, ReactJS, ...**
OPERATING SYSTEMS:	**Windows, Linux, macOS**
MANAGEMENT:	**Web manager of ESMaR group**
PERSONAL:	**Multitasking, organized, analytical mind ...**

Conferences, Presentations, and Trainings

PyHEP workshop PyHEP2022
Online
PARTICIPANT
12-16 Sep 2022
- Python tools for data analysis in HEP .

The fourth school on tools, techniques and methods for Computational and Data Science for High Energy Physics CoDaS-HEP
Princeton, NJ, US
PARTICIPANT
11-15 Oct 2021
- Large Data analysis technique and computing software .

PyHEP workshop PyHEP2021
Online
PARTICIPANT
5-9 Jul 2021
- Python tools for data analysis in HEP .

12th International workshop on Multiple Partonic Interactions at the LHC: 12th MPI @ LHC
Online
PRESENTER: JETS AND UPC PHYSICS IN HEAVY-ION COLLISIONS AT THE LHC
11-15 Oct 2021

The LXXI International conference, Nuclear physics and elementary particle physics. Nuclear physics technologies: NUCLEUS - 2021
Online
PRESENTER: ULTRA-PERIPHERAL PHYSICS WITH ATLAS
20-25 Sep 2021

CERN-Fermilab Hadron Collider Physics Summer SchoolHCPSS 2019
CERN, Geneva, Switzerland
PARTICIPANT (SCHOLARSHIP)
28 Aug - 6 Sep 2019
- Statistics + Machine Learning Lectures with Hands on Tutorials .

National Center for Physics (NCP), Islamabad, Pakistan School on LHC Physics
Islamabad, Pakistan
AWARDED 1ST PRIZE IN PRESENTATION COMPETITIONS
6-17 August 2018

Publication

- Observation of Light-by-Light Scattering in Ultraperipheral Pb+Pb Collisions with the ATLAS Detector. PhysRevLett.123.052001.

- Measurement of light-by-light scattering and search for axion-like particles with 2.2 nb^{-1} of Pb+Pb data with the ATLAS detector. JHEP03(2021)243.

- Photon-photon physics at the LHC and laser beam experiments, present and future. j.ppnp.2021.103889.

- Search for invisible Higgs boson decays with vector boson fusion signatures with the ATLAS detector using an integrated luminosity of 139 fb^{-1}. JHEP08(2022)104.

- The Control Unit of the KM3NeT Data Acquisition System. j.cpc.2020.107433.

- The KM3NeT multi-PMT optical module JINST 17 (2022) 07, P07038.

Languages

	ENGLISH		FRENCH		ARABIC (Native)
Reading	●●●●●	Reading	●●●●●	Reading	●●●●●
Writing	●●●●○	Writing	●●●●○	Writing	●●●●●
Speaking	●●●●○	Speaking	●●●●●	Speaking	●●●●●
Listening	●●●●●	Listening	●●●●●	Listening	●●●●●

Interests

SPORTS: ⚽ Football , 🚶 Hiking , ⛰ Camping , ⛷ Skiing...
ARTS: 📷 Photography , 🎞 Cinema.
MISC: 🏄 Traveling , 📕 Reading , Ex member of Moroccan association for development action (AMAD) .