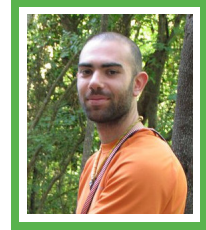University Of Zurich
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Alessandro Manfredini
Curriculum Vitae

Personal Details

Birth   *November 11th 1985*, Rome, Italy.

Nationality   *Italian.*

Education

2018–Present   **Postdoctoral Fellow in Astroparticle Physics**.
University Of Zurich, Zurich, Switzerland.

2014–2018   **Postdoctoral Fellow in Astroparticle Physics**.
Weizmann Institute of Science, Rehovot, Israel.

2011–2014   **Ph.D. Student of International Max Planck Research School.**
Max-Planck Institute For Physics, Munich, Germany.

2008–2010   **Master of Science in Nuclear and Sub-nuclear Physics.**
University of Roma Tre, Rome, Italy. Grade: 110/110 magna cum laude.

Highlights

2016–2018   XENON1T's statistical inference co-coordinator.

2019 –   DARWIN's electrodes and high voltage sub-group coordinator.

2017   Awarded *"senior postdoctoral fellow"* at Weizmann Institute of Science.

Since 2014   Member of XENON1T's slow control developers team.

2011–2014   Data analyst in the ATLAS experiment.

Second Postdoc

2018–Present   I joined the group of Prof. Laura Baudis as co-leader of an ERC funded R&D project for the future DARWIN dark matter detector. DARWIN will be a 50 tonne liquid-xenon time projection chamber. The aim of this project is to demonstrate electron drift in liquid-xenon above 2.6 m, crucial for the realization of DARWIN. I have been coordinating the effort for the design and construction of this experiment and I am responsible for its fully automated monitoring and control system. During this time I was also appointed coordinator of the DARWIN's electrodes and high voltage sub-group.

First Postdoc

2014–2018 — I joined the XENON dark matter project in 2014 in the group of Prof. Ran Budnik. The XENON project features deep underground experiments that aim to detect dark matter with a dual phase liquid xenon Time Projection Chamber. XENON1T holds the strongest limit on WIMPs searches to date.

Statistics: For two years I was coordinator of the statistical inference effort of the XENON1T experiment. In this framework I gave key contributions to the analysis strategy of the two main publications of the experiment. Previously, I was part of a team that performed the statistical combination of the three science runs of the XENON100 experiment. Currently one of my main interests is the development of statistical methods particularly aimed for low rate experiments.

Data Analysis: I contributed to two independent searches of the XENON100 experiment, being one of the main analyzers. One performing dark matter search in the framework of Effective Field Theory. The other investigating inelastic dark matter scattering on ^{129}Xe isotope.

Slow Control: I was part of the XENON1T slow control developers team. My main contribution was to design the safety and motion control systems for a set of motors and belts used to move calibration sources in the experiment. I also developed the XENON1T PMTs high voltage module controller, and the safety system of the experiment's water recirculation facility.

Research during Ph.D.

I joined the ATLAS experiment in 2011 under the supervision of Prof. Siegfried Bethke and Dr. Sandra Kortner. ATLAS is a general purpose particles detector and part of the Large Hadron Collider project.

Thesis Title: "Search for Neutral MSSM Higgs Bosons in $A/h/H \rightarrow \tau^+\tau^- \rightarrow e\mu + 4\nu$ Decays with the ATLAS Detector."

Data Analysis I was part of the ATLAS Beyond Standard Model Higgs sub-group. I contributed to the neutral MSSM Higgs boson search of which I was one of the main analyzer. My contribution was focused on the estimation of the backgrounds and their systematics, the implementation of the probability model for hypothesis testing, and on studies aimed to improve the signal sensitivity at low mass employing flavor tagging techniques.

Software Skills

Data Analysis Proficient in C++, ROOT framework, ROOSTAT and RooFit. Good knowledge of Python and C#.

Automation PLC ladder diagram, structured text and SCADA programming.

Web Proficient in HTML, CSS, JavaScript, SQL and NoSQL database. Server-side (NodeJS/Django) and client-side programming. Good knowledge of Kubernetes and the Kafka streaming platform.

My Git Repositories

Xephyr	- A statistical framework (C++).
ImperaJS	- An app-state managment framework (Javascript).
Brick-Element	- A web-component generator (Javascript).
OPC-Proxy	- A modular OPC gateway (C#).
JaS-HMI	- A Javascript Human-Machine-Interface framework.
IOTpy	- A Python framework to expose devices trough REST API.

Language Skills

Mother tongue	Italian
English	Fluent - (CEFR C1)
Spanish	Good understanding - (CEFR B1)
German	Basics - (CEFR A2)