Federico Battisti

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PERSONAL PROFILE

Nuclear and Subnuclear Physics undergraduate student. Native language: Italian. Fluent in English. Basic French. Data analysis skills gained from research at University and within the ANTARES-Bologna group activity. Studious and competitive, with ability to manage stress heavy situations and happy to work with others in a multicultural environment.

EDUCATION

09/2017 – Present

Alma Mater Studiorum - Università di Bologna | Bologna, Italy

Nuclear and Subnuclear Physics degree (M.Sc.)

09/2014 – 10/2017

Alma Mater Studiorum - Università di Bologna | Bologna, Italy

Physics degree (B. Sc), 110/110 cum laude

09/2009 – 09/2014

Liceo Scientifico Fulceri Paolucci di Calboli | Forlì, Italy

Scientific Diploma , 100/100 cum laude

PHYSICS DEGREE THESYS

Title:

Studio dei neutrini dal piano galattico con il telescopio ANTARES

(Study of neutrinos from the galactic plane with ANTARES telescope)

Supervisor and Co-Supervisor:

Maurizio Spurio (Maurizio.Spurio@bo.infn.it) | Luigi Antonio Fusco (LuigiAntonio.Fusco@bo.infn.it)

Abstract:

My thesys was devided in three main chapters. In the first chapter I described the problem regarding the means of acceleration for High Energy Cosmic Rays. I then listed some of the possible galactic and extragalactic sites able of producing such a phenomenon, giving particular enphasis to gamma rays and neutrino production mechanisms. In the second chapter I then illustrated the techniques used in neutrino detection and how these could possibly be used in multi-messenger astrophysics. I also described the functioning of neutrino telescopes , strarting from the AMANDA and IceCube experiments and finishing with the ANTARES submarine telescope. In the third and last chapter, finally, I described my original contribution to the statistical analysis performed on the data collected by ANTARES between 2009 and 2015, regarding neutrinos from the galactic plane. In this study we tried to assess the extent of the background noise and its energy trend with respect to the one of cosmic neutrinos, using data scrambling techniques.

INTERNSHIPS AND EXPERIENCE

Istituto Nazionale di Fisica Nucleare (INFN) | Bologna, Italy | 2017

Mondo lavoro, Supervisor: Maurizio Spurio (Maurizio.Spurio@bo.infn.it) (**Maurizio.Spurio@bo.infn.it**)

Introduction to scientific calculus and data analysis at the ANTARES neutrino telescope project. In particulare I became more familiar with the powerfull ROOT tool and with C++ programming. Using this abilities I was able to create my first data analysis program using data scrambling techniques. I also learned how to produce and edit a

file using the LaTex text editing program.

University of Oxford |Oxford, England (UK) | 2018

Oxford Summer Student Program – Moving Knowledge 2018,

Supervisor: Luigi Marchese (oxford.ssprogram@gmail.com)

Two weeks of summerschool, following talks on many different topics of high energy physics and review of articles regarding the SBN experiment in preparation for the production of a talk on new possibilities for cosmic ray tagging in the Icarus detector.

University of Pisa |Fermilab, Chicago (USA) | 2018

University of Pisa – Summer Student Program at Fermilab and other US facilities,

Supervisor: Minerba Betancourt (betan009@fnal.gov)

Two months of Internship at the Fermilab laboratories producing new code for cosmic ray muon tagging in Icarus and SBND (SBN experiment), using machine learning techniques (Boosted Decision Trees) previously used in NoVA.

University of Bologna |Bologna (Italy) and Cargese (France)| 2018-2019

Erasmus+ project- iTHEPHY (innovative team teaching for physics),

Supervisor: Matteo Negrini (matteo.negrini@bo.infn.it)

Internship project regarding top-quark measurements at the LHC and beyond in the SMEFT framework, and presentation oft he results at the annual summer-school on high energy physics in Cargese (Corse, France).

LANGUAGES

Italian: native speaker

English: C1

French: A2

SOFTWARE AND COMPUTING SKILLS

- **C++:** Root (including Roofit, Roostat, TMVA) **Text editing:** LaTex, Office packages
- **Image Editing:** GIMP
- **DAQ:** Labview
- **FPGAs:** VHDL, Xylinx Vivado

Forlì, lì 28/02/2019 FIRMA