

Yuriy Volkotrub

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Curriculum vitae

Young researcher with extensive scientific experience gained in a recognized high-energy physics experiment. I am experimental particle physicist (PhD in theoretical nuclear physics) with an extensive experience in data analysis: selection optimization, statistical interpretation; models building (utilizing also Monte Carlo methods) and validation. In addition to my practical experience, I possess excellent data analysis skills, particularly in the programming languages Python/C++ and ROOT,

Experience

Research Experience

- March 2023 – **Author of the ATLAS Collaboration**, AGH University of Kraków, Kraków, Poland.
present
 - Analysis support in validation of data processing from experimental measurements
 - The total of 1 month at CERN.
- Oct. 2021 – **Assistant Professor (Postdoctoral Researcher)**, AGH University of Kraków, Kraków, Poland.
Oct. 2023 Engaged in pioneering research in nuclear physics through active participation in the prestigious ATLAS Collaboration at CERN, Switzerland:
 - Reconstructing and calibrating physics objects, optimization of optimization of electromagnetic part of ATLAS detector for heavy-ion physics
 - Writing automation scripts (Python, Bash) and C++ code for measuring background in the production of top-quark pairs in proton-lead collisions
 - Data analysis (Python/C++, ROOT)
 - Monte Carlo event generation
 - Combination of the ATLAS and CMS results on the tau-lepton anomalous magnetic moment in ultra-peripheral lead-lead collisions under the STRONG-2020 project
- Jun. 2021 – **Scientific Researcher/BAND Summer Fellowship**, BAND Collaboration, USA.
Sept. 2021 The project involved remote collaboration with four institutions across the USA to pursue an accurate description of the properties of atomic nuclei and collisions between nuclei:
 - Conducted testing on innovative emulation and calibration tools to address the challenge of uncertainty quantification parameters used theoretical nuclear physics tasks. Emphasis was placed on automating the interface between surrogate models, also known as emulators and calibration techniques.
- 2016 – 2021 **Scientific Researcher (Junior Associate)**, Dpt. of Theory of Nuclear Systems, Jagiellonian University, Kraków, Poland.
Application of the newest theoretical models of the nuclear force, with particular attention to low-energy nuclear physics problems:
 - Utilized statistical tools to investigate the impact of various theoretical uncertainties, encompassing Bayesian parameter estimation and correlation analysis.
 - Developed programs/automation scripts (Python, Bash), performed calculations (Mathematica[®]).

Teaching Experience

- Summer semester 2023 **Teaching Assistant**, AGH UST, Kraków, Poland.
 - Tutor of exercise classes in Data Analysis for students in Technical Physics of the second cycle, AGH UST.
- 2017 – 2019 **Teaching Assistant**, Jagiellonian University, Kraków, Poland.
 - Tutored weekly laboratory classes for “Advanced Materials and Nanotechnologies” students each summer semester.
 - Prepared statistical web applets for students’ practice (in Javascript).
 - Led Physics laboratory classes for schoolchildren.
 - Conducted “Probability and Statistics” course for students of the second year of computer science.

Oct. 2014 – **Private tutor**, Odesa, Ukraine.

Jul. 2015 ◦ Private tutoring the students at the primary school level, a secondary school in Maths, Chemistry, and Physics. Also preparing students to apply for universities.

Education

Oct. 2016 – **Doctor of Philosophy in Physics**, Jagiellonian University, Kraków.

Sept. 2021

Sept. 2015 – **Erasmus Mundus exchange program for master students**, Jagiellonian University, Kraków, Poland.

Full time graduate study in the field of physics and astronomy.

Sept. 2014 – **Master of Science in Physics of nucleus and high energies**, ONPU, Odesa.

Jun. 2016 *with honours*

Sept. 2010 – **Bachelor of Science in Physics**, ONPU, Odesa.

Jun. 2014 *with honours*

Selected courses

- Advanced Quantum Mechanics (Path Integrals)
- Introduction to Data Science
- Time Series Analysis
- Few-body nuclear physics
- Quantum Mechanics in Nuclear Physics
- Relativistic Heavy-Ion collisions

Skills

Programming

Confident in *Mathematica*, ROOT, C++, Python (NumPy, SciPy, Seaborn, Pandas, Matplotlib, Scikit-learn etc.), Fortran, SQL, JavaScript (basics), PySpark (basics), GEANT4 (basics)

Tools/Software

Mathematica[®], Jupyter Notebook, Bash, Gnuplot, L^AT_EX, Vim

Computer/Technical

Git and version control, Jira, Confluence, Linux (Debian, Mint), Docker, ssh etc.

Laboratory equipment

Multimeters, oscilloscopes, spectrum analyzers

General

Data visualization and manipulation

Other

Strong mathematics and statistics background

Languages

English (Upper Intermediate), Polish (Upper Intermediate), Ukrainian (Native)

Professional Interests

Research Nuclear physics, Statistics and Machine Learning, Nuclear Theory, Quantum Few-Body Physics, Data Science, Bayesian Statistics

Interests

- Mountaineering
- Solving mathematical problems and coding
- Mushroom hunting
- History
- Music

Online-Courses

- Python, Kaggle
- Data Visualization, Data Analysis, Data Analysis, Machine Learning using Python, IBM/Coursera

- [Python Programmer Track, Data Scientist with Python, DataCamp](#)

Outreach

Coordination of activities on [Fan Page Cząstki AGH on facebook](#)

Attended the MCnet Summer School and Cracow School of Theoretical Physics [in June 19-25 \(2022\)](#)