

KADİR MURAT TAŞTEPE

• ktastepe@cern.ch

SUMMARY

I am a physics M.Sc. student with a keen interest in computational science. I have strong analytical and computational skills as well as the experience of working in a research environment. I am willing to learn how does universe works and develop new scientific skills, as in the future I am planning to be a researcher in High Energy Physics.

EDUCATION

Ruprecht-Karls-Universität Heidelberg, Heidelberg, Germany

▪ M.Sc. in Physics

28 Apr 2022 – Present

Hacettepe University, Beytepe, Ankara, Turkey

▪ B.Sc. in Physics Engineering

04 Oct 2021

Duisburg-Essen University (Erasmus+), Duisburg, Germany

▪ B.Sc. in Physics

Oct 2017 – Mar 2018

INTERNSHIP EXPERIENCE

SAP, Walldorf, Germany (Working Student)

15 Jun 2023 – Present

- Build a cloud-based system using REST API, Flask, Docker, OpenSearch and PostgreSQL. (Reference information available on request)
- Develop anonymized pipelines for generative AI analysis, model training, and SlackBot interaction.
- Script automation and data analysis.

Physikalisches Institut Heidelberg (Scientific Assistant)

01 Jul 2022 – 30 Sep 2022

- Project: Impact of a higher B field and sensor thickness on Mu3e experiment physics performance.
- Project: Magnetic field simulation of the spectrometer with neodymium magnets ($\text{Nd}_2\text{Fe}_{14}\text{B}$) that separate electrons and positrons implemented in Mathematica. (Reference information available on request)

Max Planck IPP Summer University for Plasma Physics and Fusion Research, Greifswald, Germany

12 Sep 2022 – 16 Sep 2022

Wolfram Summer School (Visitor)

28 Jun 2021 – 16 Jul 2021

The Scientific and Technological Research Council of Turkey High Performance and Grid Computing Center(TUBITAK 2247 - ULAKBIM), Ankara, Turkey

- TRUBA2023(Reference information available on request)

15 Mar 2021 – 15 Sep 2021

Istanbul University Particle Physics Winter School (PFBW-2020), İstanbul, Turkey

- The processing of simulated data from the LHC collisions using an Analysis Description Language and its runtime interpreter called CutLang. Data Analysis, ROOT, CutLang.

03 Feb 2020 – 07 Feb 2020

The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences(IFJ-PAN), Particle Physics Summer Student Programme, Kraków, Poland

▪ The ATLAS Experiment Department (NZ14)

08 Jul 2019 – 02 Aug 2019

- Project: Charged Particle Production in Xe-Xe Collisions.(Reference information available on request)
- Focus: Data Analysis, Compatibility of ATLAS (CERN) data and MC events.

▪ Department of Cosmic Ray Research and Neutrino Studies (NZ15)

04 Aug 2019 – 22 Aug 2019

- Project: Baikal-GVD (Reference information available on request)
- Focus: Simulation of the Laser Light Propagation for the Baikal-GVD Calibration System, implemented in MATLAB and C++.

**SIGNIFICANT
COURSEWORK**

Master Project: FPGA Implementation of the General Triplet Track Fit with High-Level Synthesis
An early-stage FPGA implementation of the General Triplet Track Fit algorithm, exploring its potential performance across various number of detector layers to accelerate track fitting process in future high energy physics experiments.

Advanced Particle Physics Project: Charged Pion Lifetime Measurement at PSI
The lifetime and branching ratio of the charged pion were measured over two weeks at the PSI (Paul Scherrer Institut) in Villigen, Switzerland, at the secondary beam line $\pi M1$. Using a setup of scintillators, a degrader, and a calorimeter, the lifetime was found to be $\tau_{\pi} = 26.35 \pm 0.78 (syst.) \pm 0.25 (stat.) ns$.

GPU Accelerated Computing

Simple algorithm design, performance improvements achieved with GPUs and multiple nodes were analyzed, and the results were compared with Amdahl's Law to understand the impact of communication overhead and load balancing for speedup.

(Introduction to GPU Accelerated Computing Course)

Bachelor Project: Monte Carlo Simulations in High Energy Physics

Generating Higgs pair production events at 14 TeV proton-proton collisions and analysing transverse momentum and pseudorapidity distributions by using combination of MadGraph, Pythia, Delphes and ROOT.

Laser Light Propagation

Dispersion and pulse compression with prism/grating system algorithm, implemented in MATLAB. (Ultrashort Time Physics Class)

LSF and MTF Measurement of a Digital Camera

Analysis of effects of spatial frequency of objects to spatial resolution of a digital camera implemented in Mathematica and MATLAB. (Fundamentals of Medical Imaging Class)

Simulation of Rutherford's Alpha Scattering Experiment

Incoming positively charged alpha particle repelled by positive nucleus, implemented in MATLAB. (Nuclear Physics Class)

**CAMPUS
ACTIVITIES**

Physics Society, Hacettepe University

- Board Member Oct 2019 – Oct 2021
- President Sep 2018 – Oct 2019
- Founder Member Nov 2017

LANGUAGES

- Turkish: Native language
- English: C1(CEFR)
- German: B1(CEFR)
- French: A1(CEFR)

**COMPUTING
SKILLS**

- **Programming Skills**
 - \LaTeX , High-Level Synthesis, C/C++, Python, ROOT(Data Analysis Framework), MATLAB, Mathematica, Autodesk 3DS Max, CutLang, MadGraph, MadAnalysis, Pythia, Delphes, Geant4, CUDA, Cloud Foundry, Docker, LangChain, Flask, OpenSearch, OpenAI
- **Operating Systems**
 - DOS, Linux(Ubuntu, CentOS 7, OpenSUSE), Windows, Mac OS

**FIELD OF
INTERESTS**

- High Energy Physics
- Computational Science
- Mathematical Methods in Physics
- Data Analysis

HOBBIES

Hiking, Backpacking, Kayaking, Playing Electric Guitar, Birdwatching, Science Communication