Arda Kayaalp

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Education

Katholieke Universiteit Leuven **Oct. 2024 – Present**
Ph.D. in Physics, Arenberg Doctoral School *Leuven, Belgium*
Project: Exploring the Nuclear Structure Using Laser Spectroscopy Techniques

Middle East Technical University **Mar. 2021 – Aug. 2024**
M.Sc. in Physics, Department of Physics *Ankara, Turkey*
Thesis Title: Application of the Quantal Diffusion Approach Based on the SMF Theory

Hacettepe University **Aug. 2015 – Jun. 2019**
B.Sc. in Nuclear Engineering (Honours) *Ankara, Turkey*
Graduation Project : A Study of $p - B^{11}$ Fusion Reaction using Geant4 Toolkit

Research & Employment Experience

Doctoral Researcher **Oct. 2024 – Present**
Nuclear Moments Group at the IKS *Leuven, Belgium*

- Research on nuclear structure using laser spectroscopy techniques.
- Participating in teaching and other educational activities.

R&D Engineer **Jul. 2022 – May 2023**
Oncotech Medical Systems *Ankara, Turkey*

- Researched and developed algorithms for medical data and image processing.
- Prototyped a MATLAB-based DICOM-RT viewer with a GUI.
- Developed a low-cost optical surface tracking system for SGRT in C++ using OpenCV and CUDA.

Scientific Project Specialist **Jan. 2020 – Jun. 2022**
The Research and Application Center for Space and Accelerator Technologies, METU *Ankara, Turkey*

- Performed magnetic alignment and proton beam parameter calculations.
- Led Monte Carlo simulations and radiation dose calculations.
- Developed image processing tools for chaotic system analysis and mentored interns.

Undergraduate Researcher **Dec. 2018 – Jan. 2020**
The Research and Application Center for Space and Accelerator Technologies, METU *Ankara, Turkey*

- Developed MATLAB image processing software for beam diagnostics.
- Assisted in proton beamline calculations and irradiation test design.

Awards & Grants

The Scientific and Technical Research Council of Turkey (TUBITAK) **Mar. 2022 – Aug. 2024**
TUBITAK Graduate Scholarship *Ankara, Turkey*

Published Works

1. Kayaalp, A. *et al.* A quantal diffusion approach for multinucleon transfer in heavy-ion collisions. *Nuclear Physics A,* 122916 (2024)

2. Kayaalp, A. *et al.* A theoretical study on quasifission and fusion–fission processes in heavy-ion collisions. *The European Physical Journal A* **60,** 79 (2024)

Technical Skills

Hardware Experience : I possess fundamental skills in electronic laboratory work and soldering, along with hands-on experience in radiation detector electronics and radiation counting statistics. Furthermore, I have a basic understanding of ARM-based Linux development and proficiency in edge computing, making use of platforms such as Jetson Nano and Raspberry Pi.

Software Experience :

- **MATLAB:** Moderate to advanced proficiency. Developed radiation shielding models, detector readout interfaces, and applications for data and image processing. Created several GUI-based prototype applications.
- **Python:** Intermediate proficiency. Utilized for data processing, analysis, and visualization in various projects.
- **C++:** Intermediate proficiency. Employed in developing Geant4-based particle simulations and currently used for nuclear evaporation calculations.
- **Fortran:** Basic proficiency. Applied for simple manipulations of legacy physics codes.
- **CMAKE:** Basic proficiency. Used to build and manage cross-platform C++ applications.
- **Git:** Basic proficiency. Utilized for version control in local development projects.
- **MCNP & SERPENT:** Basic to intermediate proficiency. Modeled radiation shielding geometries with MCNP and calculated reactivity and modeled fuel burn-up cycles for LWR fuel rod geometry using SERPENT.
- **Geant4:** Basic to intermediate proficiency. Modeled simple nuclear interactions and radiation transport problems.
- **Linux:** Intermediate proficiency. Utilized as the primary development OS for all projects.
- **LaTeX:** Intermediate proficiency. Used for writing academic papers and various types of documentation.

Teaching Experience

I occasionally tutor undergraduate students, focusing on concepts from nuclear physics courses.

Internships

Çekmece Nuclear Research and Education Center **Jun. – Jul. 2018**
Studied reactor physics, radiation protection and radioactive waste management. *Istanbul, Turkey*

OMV Samsun Thermal Power Plant **Jul. – Aug. 2017**
Studied thermodynamical aspects of a power plant. *Samsun, Turkey*

Language Proficiency

- Turkish - Native
- English - TOEFL iBT Score : 104 (C1)

Extracurricular Activities

Digital photography, charcoal drawing, fountain pen collecting.

References

- **Prof. Osman Yılmaz - M.Sc. Academic Advisor**
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- **Prof. Şakir Ayık - M.Sc. Academic Co-Advisor**
  e-mail : ayik@tntech.edu
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- **Assoc. Prof. Erol Çubukçu - B.Sc. Graduation Project Advisor**
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