



ACADEMIC HISTORY

Lebanese University, Faculty of Sciences II

Oct 2021 - Jul 2024

Bachelor of Science in Physics

GPA: 3.6 (passing grade 60%)

Rank: first year:1/17; second year:1/3; third year:1/1

Elective courses: Waves and vibrations, Fluid mechanics, Classical Field Theory, Laser Physics, Thermal Transfer, Material Science, Molecular Physics, Medical Imaging

American University of Beirut

Masters of Science in Physics: fully funded

Jan 2025 - Present

Summer schools

The fourth MPFuS

Summer 2024

Attended the fourth MPFuS summer school for plasma and fusion physics held in Gammarth, Tunisia.

Online courses ([coursera.org](https://www.coursera.org)):

Particle Physics: An Introduction, From the Big Bang to Dark Energy, Astro 101: Black Holes, Astronomy: Exploring Time and Space, Astrobiology: Exploring Other Worlds, The Science of the Solar System, How to Write and Publish a Scientific Paper

Supplemental studies (books):

Introduction to Electrodynamics by Griffith, Tensor calculus for physics, A first course in general relativity 2E

GRANTS AND SCHOLARSHIPS

- Graduate and Research Assistantship (GRA) by American University of Beirut:
Full tuition coverage and monthly stipend for graduate studies.

QUALIFICATIONS AND SKILLS

- Teamwork, Communication, Problem Solving, Time Management, Teaching, People Management
 - Python, MATLAB, C++, Rust
 - COMSOL Multiphysics, AutoCAD, Latex, Origin Lab, Blender, Inventor, Raspberry Pi
 - Knowledge of tools and procedures used in labs and experiments
 - Arabic (native), English (fluent), French (francophone)
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PROFESSIONAL EXPERIENCE

Research assistant, American University of Beirut (AUB)

Sept 2023 – Present

- Project lead on developing a high-speed stereoscopic diagnostics device in order to detect and identify UFOs, Flakes and Dust particles in the plasma flow of a magnetic confinement nuclear fusion reactor. The objective of this project is to determine particles' sizes as well as their positions in three dimensions and their velocities in component form. This data plays a pivotal role in informing the necessary adjustments to the input parameters of the device, enabling us to anticipate and mitigate potential disruptions to the plasma flow with greater precision. As I am writing this, we are in the midst of authoring the corresponding paper.

Access The Project Documents: [here](#)

Intern, Lebanese American University (LAU)

Jul 2023 – Sep 2023

- Assisted in data collection, organization, and analysis for a Research project on the water-energy-food nexus studying the impact of the Lebanese economic and energy crisis on water security. Worked on finalizing the paper for publication.

PUBLICATIONS AND PRESENTATIONS

Publications: [Google Scholar](#)

- [Navigating the water–energy nexus amidst the Lebanese economic crisis](#)

Presentations

- Presented my project on imaging disruptions in magnetic confinement fusion devices at the first MENA region plasma fusion physics (MPFu) conference in Gammarth, Tunisia, as the youngest presenter.

PROJECTS

**Investigating High-Efficiency Thermoelectric Metals for
Integration with Hollow Blocks**

Dec 2024 – Present

Numerical Analysis II course, Lebanese University, Faculty of Sciences II, Department of Physics

- In this project, we aim to design an innovative system for sustainable energy generation by leveraging the temperature gradient between the interior and exterior of buildings. Working as a team of two, we are researching thermoelectric metals with high Seebeck coefficients for integration into hollow blocks (bricks). Our goal is to identify materials that are not only efficient in converting heat to electricity but are also cost-effective and abundant, ensuring scalability and accessibility for widespread use.

To achieve this, we are utilizing COMSOL Multiphysics to create detailed simulations of the proposed device, enabling us to model and optimize its performance under real-world conditions. By combining advanced material analysis with cutting-edge simulation tools, this project has the potential to pave the way for practical applications of thermoelectric technology in building materials, contributing to energy-efficient infrastructure and renewable energy solutions.

Developing an Interactive Virtual Assistant Display

Mar 2024 – Jun 2024

Open Laboratory, Lebanese University, Faculty of Sciences II, Department of Physics

- Developing a 3D interface for the laboratory's virtual assistant using Blender, with the goal of enhancing user interaction and visualization. The interface is designed to be displayed on an anamorphic screen, providing a dynamic and immersive visual experience. This project serves as a foundation for creating a more advanced projection system, aimed at improving display technologies for laboratory applications and beyond.

Studying the Barber pole effect in sucrose solution

Oct 2023 – Feb 2024

Optics Laboratory Project, Lebanese University, Faculty of Sciences II

- As part of a student project supervised by a professor at the Laboratory of Biomedical Imaging (LBMI), Lebanese University, Faculty of Sciences II, our team conducted a series of experiments to investigate the barber pole effect. The project involved designing and performing experiments to observe the phenomenon and collect relevant experimental data.

Through comprehensive data analysis, we validated the theoretical concepts identified during the literature review, demonstrating alignment between our findings and existing research. The results were presented to the supervising professor and peers, showcasing our approach, methodology, and key insights. This project provided valuable hands-on experience in experimental design, data analysis, and effective scientific communication.

Studying and Using a Prism Spectrometer Goniometer

Oct 2023 – Jan 2024

Optics Laboratory Course, Lebanese University, Faculty of Sciences II

- Calibrated a non-digital spectrometer goniometer using a mercury lamp to ensure accuracy in subsequent measurements. The calibrated setup was utilized to determine the Balmer spectra of a hydrogen lamp and calculate the Rydberg constant.

A theoretical geometrical optical analysis was conducted to achieve the best fit for the measured data, with results visualized using Python's matplotlib library. To further enhance understanding, the studied concept was modeled in Blender, providing a 3D representation of the optical system. This project integrated experimental techniques, computational analysis, and 3D modeling to deepen insights into spectroscopic phenomena.

The Effects of Photon Energy and Magnetic Fields on the Germination/Growth of Plants

Aug 2023 – Oct 2023

Student-led project under the supervision of a professor (LBMI, Lebanese University, Faculty of Sciences II)

- Designed and optimized experimental methods for seed germination and growth under controlled conditions. The experiments investigated the effects of blue and red light (individually) on germination, as well as the influence of a magnetic field on the process.

The study aimed to explore the potential role of quantum processes in seed germination and growth, providing insights into how environmental factors such as light wavelength and magnetic fields impact these biological mechanisms. This project combined experimental precision with theoretical exploration to advance understanding in biophysics and plant sciences.

Certifications

- Raspberry Pi Certification from IEEE
 - First Aid Certification from Red Cross
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EXTRACURRICULAR

Martial arts instructor

Oct 2021 – Dec 2023

PROFESSIONAL ASSOCIATIONS

Mario El Tahchi, PhD (Professor at the Lebanese University): mtahchi@ul.edu.lb

Roland Habchi, PhD (Professor and head of the physics department at the Lebanese University): rhabchi@ul.edu.lb

Ghassan Antar, PhD (Professor at the American University of Beirut): ga40@aub.edu.lb

Jimmy Romanos, PhD (Professor at the Lebanese American University): jimmy.romanos@lau.edu.lb