Bruno Gehlen F. da Silva

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"We are what we repeatedly do. Excellence, then, is not an act, but a habit." – Aristotle

Personal Profile

Hi, I'm a soon-to-be graduate with a Bachelor's degree in Physics at USP. Throughout my studies, I've developed a strong passion for the theoretical aspects of physics, particularly in the realm of particle physics and its intricate mathematical foundations. I'm fascinated by the interplay between physics and advanced mathematics, especially differential geometry and functional analysis, which I believe are crucial tools for understanding the universe at its most fundamental level beyond the Standard Model of Particles.

In addition to my academic pursuits, I enjoy exploring the world of UI/UX and front-end programming during my free time. I find it incredibly rewarding to bring ideas to life through visually engaging and user-friendly web interfaces. I'm always eager to learn new technologies and expand my skillset in this area.

Education

University of Sao Paulo *Sao Paulo-SP, Brazil*

B.Sc in Physics *April 2021 - December 2024*

Sartre | Escola SEB *Lauro de Freitas-BA, Brazil*

High School *Apr 2018 - Apr 2020*

Work Experience

Scientific Initiation - Institute of Theoretical Physics IFT UNESP *São Paulo, Brazil*

Mathematica Demonstrations in an introduction to Quantum Field Theory and Particle Physics *Jun 2024 - Dec 2024*

- It is of paramount importance to expose undergraduate students to cutting-edge physics topics as soon as they have the capacity to grasp them. In this project, our aim is to enhance candidates' education by delving into introductory texts on Particle Physics and Field Theory. In addition to the usual approach of reading books and presentations, we will complement it with the creation of Mathematica programs that will perform relevant calculations for this study. These programs will not only facilitate simulations and demonstrations, offering candidates a deeper understanding of the subject, but will also be made available to other students or the general public.

Scientific Initiation - Institute of Physics IF-USP *São Paulo, Brazil*

Study of Hadron Production from Thermal Models in Collisions between Relativistic Heavy Ions *Aug 2023 - Jun 2024*

- This project aims to study the production of hadrons composed of heavy quarks using thermal models in order to assess whether there is evidence of thermalization of these particles in the medium formed in collisions between relativistic heavy ions. Studies of hadron production using a thermodynamic approach are of interest on several fronts, especially with regard to the hadronization of the medium formed in these collisions. The possible finding that charm and beauty quarks exhibit similar behavior to lighter quarks during hadronization may reveal an intricate mechanism of thermalization of these particles with the medium formed. In addition to the scientific interest of this investigation, the didactic nature of this approach should be highlighted, as it is suitable for students beginning the advanced cycle of a bachelor's degree in physics.

Extracurricular

III Escola de Inverno Jayme Tiomno *São Paulo-SP, Brazil*

Universidade de São Paulo *Aug 2021*

- Introdução aos Fundamentos Filosóficos da Mecânica Quântica
- Introdução à Teoria de Supercordas
- Métodos Algébricos da Física Teórica

Curso de Verão do IF-USP *São Paulo-SP, Brazil*

Universidade de São Paulo *Mar 2022*

IV Escola de Inverno Jayme Tiomno *São Paulo-SP, Brazil*

Universidade de São Paulo *Aug 2022*

- Física Além do Modelo Padrão
- Introdução aos Modelos Científicos a Partir da Filosofia da Ciência: Uma Abordagem Pela Física
- Sistemas Hamiltonianos em Espaços Vetoriais Simpléticos
- Uma Introdução À Teoria Quântica de Campos em Espaços-Tempos Curvos

Curso de Verão do IF-USP *São Paulo-SP, Brazil*

Universidade de São Paulo *Feb 2023*

Skills

Programming Python (specifically science/data packages, as Pandas, NumPy, SciPy, Matplotlib), Fronted in general (the triad HTML/CSS/JavaScript), Wolfram Mathematica

Miscellaneous Linux, LaTeX, Microsoft Office, A personal Homelab where I take time to test new technologies

Soft Skills Problem-solving, Efficiency Enthusiast,Documentation, Organized, Optimizer.

Achievements

2019 **Bronze Medal,** Mathematical Kangaroo *Brazil*

2020 **Gold Medal,** National Science Olympiad (ONC) *Brazil*

2020 **Bronze Medal,** Brazilian Olympics of Astronomy (OBA) *Brazil*

Interests

Physics I have always been passionate about it, especially the mathematical formalism. I am currently applying for a master's degree in pure mathematics at Institute of Mathematics and Statistics of USP.

Open source Since 2021, I have been exploring the world of Linux and the open source. Currently using Arch.

Music I enjoy almost all types of music, as long as it's Brazilian. I particularly listen to rap, R&B and jazz.

Art I have always enjoyed drawing since I was a child. Sometimes I sketch something to distract myself.

Languages

Portuguese Native proficiency

English Bilingual proficiency

French Beginner proficiency