Ibraheem Faisal Al-Yousef

Senior Undergraduate Physics Student

s201831580@kfupm.edu.sa (966)054-437-3016

GitHub LinkedIn

EDUCATION

B.S. in Physics, KFUPM, expected to graduate in Spring 2022.

RESEARCH EXPERIENCE

Condensed Matter Theory Working on analytical Jordan-Wigner solutions in condensed matter theory. Specifically, using Jordan-Wigner transformation to exactly solve models related to Kitaev honeycomb model. Under the supervision of Dr. Michael Vogl, KFUPM, Aug 2022-present.

Alternative Formulation of Quantum Mechanics (Background) Working with Prof. Bahlouli and Prof. Alhaidari in projects related to the formulation of quantum mechanics based on orthogonal polynomials, KFUPM, Feb 2022-present.

COMPUTATIONAL SKILLS & EXPERIENCE

Mathematica Done multiple numerical projects including quantum and classical physics using Mathematica. Mainly on symbolic calculations, derivations, and visualizations. [Samples]

Python Used python in computational chemistry course, calculating atomic and molecular properties using a variety of quantum and classical methods including Hartree-Fock, Monte Carlo, and DFT. [Samples]

LaTeX Have been using LaTeX to typeset all my academic reports and presentations. [Samples]

RELEVANT COURSES

Undergraduate Research (PHYS497) Second Quantization; Jordan-Wigner Transformation; Bogoliubov Transformation; Phase Diagrams; Correlation Functions. [Fall]

Computational Chemistry (CHEM313) Hartree-Fock Theory; Density Functional Theory; Molecular Mechanics; Molecular Dynamics; Monte Carlo simulations; Confirmation Search. [Grade: A]

Computational Physics (PHYS373) Monte Carlo simulations; Simulation techniques; Programming methods; Comparison of ideal and realistic systems; Limitations of physical theory. [Spring]

WORK EXPERIENCE

Physics Club's President Worked as the president of the physics club at KFUPM for a year. This experience has helped me to be a contributing team member and leader, especially in physics related areas.

Physics Grader Worked as a part-time job grader for PHYS102. This work experience has further enriched my knowledge in physics and exposed me to some common mistakes.

REFERENCES

Prof. Hocine Bahlouli

Professor · Theoretical Condensed Matter ·Physics Department, KFUPM

Email: bahlouli@kfupm.edu.sa Phone: (966)013-860-2097

Prof. Bahlouli [Website, Scholar] is my instructor for three undergraduate courses: quantum mechanics I and II as well as classical mechanics.

Dr. Michael Vogl

Assistant Professor · Theoretical Condensed Matter ·Physics Department, KFUPM

Email: michael.vogl@kfupm.edu.sa Phone: (966)013-860-4056

Dr. Vogl [Website, Scholar, arXiv] is my undergraduate research supervisor.