

## EDUCATION

---

- Bachelor of Science in Physics** 2018 – 2022  
*Taibah University (TU)*
- Visiting Student, Applied Mathematics and Computer Science Department** 2022 – 2023  
*King Abdullah University of Science and Technology (KAUST)*  
**Courses:** Applied Mathematics; Riemannian Geometry; Vector Calculus; Differential Equations; Discrete Mathematics; Linear Algebra; and Probability & Statistics.
- PSI Summer School** May 2023 – Aug. 2023  
*Perimeter Institute for Theoretical Physics, online*  
Path Integrals; Numerical Methods; Quantum Information; Symmetries.
- Nanodegree (Programming for Data Science with Python)** Sep. 2022 – Jan. 2023  
*Udacity, sponsored by Saudi Digital Academy*

## PUBLICATIONS

---

- M. M. Almarashi, F. Alhazmi, R. Abdulhafidh and S. A. Basir, [Dark matter in the NMSSM with small  \$\lambda\$  and  \$\kappa\$](#) , *Results Phys.* **49**, 106531 (2023) doi:10.1016/j.rinp.2023.106531 [arXiv:2204.06082 [hep-ph]].
- F. Alhazmi, R. Al Jahdali and M. Parsani. [Perform and Analyze Optimized Explicit Runge-Kutta Schemes for High-order Collocated Discontinuous Galerkin Methods Applied to the NASA Juncture Flow Experiment](#). Poster presented at: Saudi Summer Internship E-poster Competition; KAUST, Thuwal, 2022.

## RESEARCH INTERESTS

---

- Dark matter phenomenology and its detection at particle colliders, with an emphasis on supersymmetric models.
- Application of numerical simulations and computational techniques to study particle dynamics in complex systems, such as around black holes.
- Utilizing machine learning and statistical methods to analyze and interpret data from particle physics experiments, particularly in the search for new physics beyond the Standard Model.

## EMPLOYMENT

---

- King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia** Aug. 2022  
Summer Research Intern at the Department of Applied Mathematics and Computer Science (AMCS), working in the Advanced Algorithms and Numerical Simulations Laboratory (AANSLab) under the supervision of Prof. Matteo Parsani. The research focused on optimizing numerical methods for simulating particle motion across magnetic quadruples in particle accelerators. These methods preserve motion invariants over a long time interval and entail a considerable computational cost.
- King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia** Jan. 2024  
Physics 102 Lab instructor.
- Syllabus: Data Analysis, Resonance on String, Resonance in Air Column, Specific Heat, Perfect Gas Law, Electric Field Mapping, Capacitors, Ohm's Law, Kirchhoff's Laws, e/m of electron, Current Balance.

## RESEARCH PROJECTS

---

- Collaborator** **Sep. 2023 - present**  
*Collaboration between KFUPM and KAUST, KSA*
- Working on topics such as: Simulation of Circular orbits of Charged Particles around Black Holes.
- Research Intern - Saudi Summer Internship (SSI), AANSLab** **Jun. 2022 - Aug. 2022**  
*KAUST, Thuwal, KSA*
- Worked under the supervision of Prof. Matteo Parsani and Dr. Rasha Al Jahdali on performing and analyzing optimized time integration methods applied to the NASA juncture flow experiment.
  - Created a poster to summarize the internship and presented it to a panel of judges from within and outside the field, and won first place.
- Undergraduate Research Assistant - Physics Department** **Nov. 2021 - Feb. 2022**  
*Taibah University, Medinah, KSA*
- Worked under the supervision of Dr. Mosleh Almarashi to investigate the features of the lightest neutralino in the NMSSM as a dark matter candidate.
  - Determined the parameter space compatible with all current theoretical and experimental constraints by using the NMSSMTools and scanning over five million random points in the parameter space of small  $\lambda$  and  $\kappa$ .
- Undergraduate Research Assistant - Nanoengineering Research Lab** **Jul. 2021 - Present**  
*Saudi Space Commission & AlFaisal University, Riyadh, KSA*
- Worked under the supervision of Dr. Edreese Alsharaeh on preparing novel polymer nanocomposites for space-based applications.
  - Submitted the work to Cubes in Space, a program providing students access to space for designing and testing experiments on NASA missions. The samples were launched to the Stratosphere for testing and subsequent characterization.

## ALUMNI INVOLVEMENT

---

### Mckinsey & Co. Qimam Fellow

Selected to join Qimam's fellowship class of 2023 out of +21,000 applicants.

## ACADEMIC AND PUBLIC TALKS

---

- KAUST, Applied Mathematics School** – Analysis of Integration Techniques Related to Invariants of Motion **2022**
- Taibah University, Physics department** – Dark Matter Particle in the NMSSM **2022**
- Taibah University, World Space Week, Space NAO club** – Supermassive Black Holes and their Host Galaxies **2021**
- Taibah University, Scientific Evenings Series, Space NAO club** – Black Holes and the Milky Way's darkest secret (Nobel Prize in Physics) **2020**
- Taibah University, Scientific Evenings Series, Space NAO club** – Confirmation of Moon Water – Sunlit Surface **2020**

## HONORS & AWARDS

---

- CCIR STEM Scholarship** – A scholarship awarded to student researchers that exhibit great passion and academic interest in their fields, Cambridge Future Scholar Programme **2024**
- First place winner** – Saudi Summer Internship (SSI) e-poster competition, KAUST **2022**
- The best graduation project award** – Physics department, Taibah University **2022**
- Global nominee and 4th place winner on KSA with the project Astrolight Fitter** – NASA Space Apps Challenge **2021**
- 7th place and grant recipient (the only undergraduate winner)** – TU Initiative for COVID-19 Research **2020**
- 1st place winner** – The 8th national robotics olympiad - STEM **2016**

## EXTRACURRICULAR ACTIVITIES

---

- Volunteer – Organizer** May 2022  
*The Final Fair of the National Olympiad for Scientific Creativity (Mawhiba Organization), Medinah, KSA*
- Volunteer – Dark Energy Explorer** Nov. 2021  
*The Hobby-Eberly Dark Energy Experiment (HETDEX), Zooniverse, online*
- Identified +5000 distant galaxies to help measure dark energy
  - Prepared and translated a [guide on galaxy classification](#) to get students involved
- Member of the Student Consultant Committee of the Saudi Space Commission (SSC)** Jan. 2021 - Jan. 2022  
*Ajyal Space Program, SSC, Riyadh, KSA*
- Contributed to the enrichment of the program by providing feedback on efforts to raise awareness, motivate students, identify obstacles they face in the field of space science, and proposed project ideas that assist in overcoming these obstacles
- Vice-President and Co-Founder of NAO Space Club** Aug. 2020 - Jan. 2022  
*A student club dedicated to space sciences and technologies, Taibah University, Medinah, KSA*
- Led more than 220 members and achieved 1000 volunteering hours
  - Managed [Twitter account](#), delivered several talks, and wrote several articles
  - One of the most outstanding clubs at Taibah University award
- Volunteer – Lectures Translator** Aug. 2020 - Aug. 2021  
*Mueen initiative, YouTube - lectures on quantum mechanics (MIT 8.04) provided by Prof. Barton Zwiebach*
- Part-time Employee – Riddles Designer** May 2020 - Mar 2022  
*King Abdulaziz International Cultural Center - Ithra, Dhahran, KSA*
- Developed 40 high-level scientific riddles for [Halhel & PiCon](#)
- Full-time Employee – Mentor & Content Creator** Jan. 2018 - Aug. 2018  
*Kids scientists | An educational entertainment platform, Medinah, KSA*
- Volunteer – Leader of the Natural Sciences Department & Articles Scrutinizer** Mar. 2017 – Sep. 2021  
*N Scientific | A diversified scientific articles platform, Online*
- Volunteer – Trainer Assistant (Robotics Workshop)** Aug. 2016  
*Mawhiba Summer Enrichment Program, Al Fusha National Schools, Medinah, KSA*

## SELECTED GITHUB PROJECTS

---

- [General Relativity Particle Tool for Researchers](#)
- [Tensor Framework](#)
- [Numerical Methods for Solving Differential Equations \(Python\): Runge-Kutta Method and Symplectic Methods](#)
- [Investigate a Relational Database \(SQL\)](#)
- [Explore US Bikeshare Data \(Python\)](#)

## SKILLS

---

<b>Languages and Software</b>	$\LaTeX$ (Kile, MacTex and overleaf), NMSSMTools, Gnuplot, MATLAB, Mathematica, Python, SQL, GitHub, Git, Blender, and Fusion 360
<b>Libraries</b>	numpy, matplotlib, astropy, pandas etc.
<b>Operating Systems</b>	Linux and OSX
<b>Communication</b>	Arabic (native), English (fluent)