PERSONAL INFORMATION

Name: Mohammad Hasan M. Alhakami

Academic Rank: Associate Professor

College: Science

Department: Physics and Astronomy

University: King Saud University

CAREER

Associate Professor | 2022-Present

Department of Physics and Astronomy, King Saud University

Associate Professor | 2020-2022

Nuclear Science Research Institute, KACST

Seconded to King Saud University | 2019-2020

Department of Physics and Astronomy

Assistant Professor | 2015-2020

Nuclear Science Research Institute, KACST

Researcher A | 2009-2015

The National Centre for Mathematics and Physics, KACST

Researcher | 2005-2009

The National Centre for Mathematics and Physics, KACST

Researcher | 2004-2005

The Atomic Energy Research Institute, KACST

ACADEMIC QUALIFICATIONS

- **PhD in Theoretical Physics**

  2012-2014

  Nuclear Theory Group, University of Manchester, UK

- **Master of Advanced Study in Mathematics**

  2010-2011

  DAMTP, University of Cambridge, UK

- **Master of Science in Physics**

  2007-2009

  Michigan State University, Lansing, USA

- **Bachelor of Science in Physics with the second honor degree**

  2001-2004

  King Saud University, Riyadh, Saudi Arabia

FELLOWSHIPS

Honorary Research Fellow

2017-2021

School of Physics and Astronomy, Particle Physics Theory Group, University of Glasgow, UK

FIELDS OF INTEREST

Theoretical nuclear and particle physics, effective field theories, hadron and heavy quark physics

MEMBERSHIPS

- Saudi Physical Society
- Saudi Association for Mathematical Sciences

STUDENT SUPERVISION

- Supervision of several PhD theses in the Department of Physics and Astronomy
- High School Research Projects:
  - Supervised the "2030 Visionaries" team participated in the Beamline for Schools competition 2023 in CERN.
  - Supervised students in the 2018 Mawhiba Research Enrichment Program at KACST (1-26/7/2018).

TEACHING EXPERIENCE

Bachelor's Degree:

Phys 101: General Physics I

Phys 102: General Physics II

Phys 104: General Physics

Phys 210: Classical Mechanics I

Phys 301: Mathematical Physics II

Phys 323: Electromagnetism II

Phys 404: Mathematical Physics III

Phys 452: Quantum Mechanics

Phys 481: Nuclear Physics I

Master's Degree:

Phys 501: Mathematical Physics I

Phys 505: Advanced Quantum Mechanics

PhD:

Phys 652: Quantum Mechanics II

Phys 653: Quantum Electrodynamics

Phys 657: Advanced Quantum Field Theory

Phys 663: Advanced Particle Physics

Phys 664: Quantum Chromodynamics

ADMINISTRATIVE WORKS

- 2025-: Member of the Council of the Higher Diploma Program in Radiation Protection and Safety of Radioactive Sources
- 2022-present: Head of Nuclear and High Energy Physics Group, Department of Physics and Astronomy, King Saud University
- 2016-2019: Head of the Department of Theoretical Nuclear Physics, KACST
- 12/2-30/9/2010: The Deputy Director of the National Centre for Mathematics and Physics, KACST

SCHOOLS, WORKSHOPS, AND CONFERENCES ATTENDED

2/11/2021:	The role and achievements of Tabuk University in the Bell II experiment meeting. Department of Physics, University of Tabuk
18-20/12/2017:	Annual Theory Meeting, IPPP, Durham University, UK
4-6/9/2017:	UK Flavor Meeting, IPPP, Durham University, UK
26/6-7/7/2017:	Methods of Effective Field Theory & Lattice Field Theory, TU Munich, Germany
28/8-4/9/2016:	XIIth Quark Confinement and the Hadron Spectrum, Thessaloniki, Greece
31/8-3/9/2013:	The 6th International Workshop on Charm Physics, University of Manchester, UK
13-20/2/2010:	ITEP Winter School in Physics, ITEP, Russia
20/5-27/7/2005:	CERN Summer students program, CERN, Switzerland

SEMINARS AND PRESENTATIONS

9/11/2021:	Talk, title: B meson physics: application to B factories, Department of Physics and Astronomy, King Saud University
2/11/2021:	Talk, title: B meson physics: application to Belle experiment, Department of Physics, University of Tabuk
9/01/2019:	Talk, title: Effective field theories for heavy quark systems, the National Centre for Laser and Optoelectronics, KACST
28/11/2016:	Talk, title: Hadron Physics and non-perturbative QCD for pedestrian, the National Centre for Applied Physics, KACST
18/10/2016:	Talk, title: D and B mesons masses in heavy meson effective theory, Physics Department, Al-Imam Muhammad Ibn Saud Islamic University
29/08/2016:	Talk, title: D and B mesons masses in chiral perturbation theory with heavy quark symmetry, XIIth Quark Confinement and the Hadron Spectrum, Thessaloniki, Greece
13/07/2009:	Talk, title: Elementary particle Physics, The National Centre for Mathematics and Physics, KACST
27/07/2005:	Talk, title: Time Projection Chamber, ALICE Group, CERN, Switzerland

SCIENTIFIC ACTIVITIES

- 2025-present: Faculty Supervisor of the Physics and Astronomy Club
- 2024-205: Chair of the Public Relations and Community Partnership Committee
- 2022-present: Coordinator of the Physics and Astronomy Department Library
- Internal examiner in a number of PhD defense committees
- 2020: Manuscript reviewer for Annals of Physics
- 2017: Exam questions reviewer at Qiyas
- Member in theoretical physics research group
- Member in nuclear physics research group
- Member in the following committees in Physics Department at King Saud University: Higher studies and research committee, Students affairs committee, and Study plans and learning resources committee
- 17-22/12/2015: Presented six training hours in the program: Introduction to Accelerator Physics. Nuclear Science Research Institute, KACST
- Presented seven intensive lectures on “The relativistic quantum mechanics” at the National Centre for Laser and Optoelectronics, KACST
- 18/6-25/7/2019: Presented twenty-six training hours in the program: The development of research capacity for academics in the field of Laser and Optoelectronics. KACST

- Summer 2018: Participated in the training program of students from Technical College in Riyadh
- 2004-2005: Participated in designing and constructing the Ion Beam Accelerator at KACST

COMPUTATIONAL SKILLS

- Programming Languages: Python, Fortran
- Mathematical software: Mathematica
- Text formatting and office computing: LaTeX, Word, Excel, PowerPoint
- Operating systems: Linux, Windows

PUBLICATIONS

1. The Belle and Belle II collaborations., I. Adachi, *et al*., Search for $P_{c\bar{c}s}(4459)^0$ and $P_{c\bar{c}s}(4338)^0$ inclusive decays at Belle, Physical Review Letters (PRL) **135**, 041901 (2025).
2. The Belle and Belle II collaborations., I. Adachi, *et al*., Measurement of the $D^0 \to K^-\pi^+e^+e^-$ branching fraction and search for $D^0 \to \pi^+\pi^-e^+e^-$ and $D^0 \to K^+K^-e^+e^-$ decays at Belle, Physical Review D (PRD) **112**, L071101 (2025).
3. The Belle and Belle-II collaborations, M. Abumusabh, *et al.,* Observation of the decays $B^+ \to \Sigma_c(2455)^{++}\Xi_c^-$ and $B^0 \to \Sigma_c(2455)^0\Xi_c^0$, Physical Review D (PRD) **112**, L051101 (2025).
4. The Belle II collaboration., I. Adachi, *et al*., Charged-hadron identification at Belle II, European Physical Journal C (EPJ C) **85**, 1237 (2025).
5. The Belle II collaboration., I. Adachi, *et al*., Search for a dark Higgs boson produced in association with inelastic dark matter at the Belle II experiment, Physical Review Letters (PRL) **135**, 131801 (2025).
6. The Belle and Belle II collaborations., I. Adachi, *et al*., Search for lepton flavor-violating decay modes $B^0 \to K^{*0}\,\tau^{\pm}l^{\mp}$ $(l = e, \mu)$ with hadronic B-tagging at Belle and Belle II, Journal of High Energy Physics (JHEP) **08**, 184 (2025).
7. The Belle II collaboration., I. Adachi, *et al*., Measurement of the time-integrated CP asymmetry in $D^0 \to \pi^0\pi^0$ decays at Belle II, Physical Review D (PRD) **112**, 012006 (2025).
8. The Belle and Belle II collaborations., I. Adachi, *et al*., Search for lepton-flavor-violating $\tau^- \to l^-K_S^0$ decays at Belle and Belle II, Journal of High Energy Physics (JHEP) **08**, 092 (2025).
9. The Belle and Belle II collaborations., I. Adachi, *et al*., Measurement of the time-integrated CP asymmetry in $D^0 \to K_S^0K_S^0$ decays using opposite-side flavor tagging at Belle and Belle II, Physical Review D (PRD) **112**, 012017 (2025).

10. The Belle II collaboration., I. Adachi, *et al*., Test of lepton flavor universality with measurements of $R(D^+)$ and $R(D^{*+})$ using semileptonic B tagging at the Belle II experiment, Physical Review D (PRD) **112**, 032010 (2025).
11. The Belle II collaboration., I. Adachi, *et al*., Search for $B^0 \to K^{*0}\tau^+\tau^-$ decays at the Belle II experiment, Physical Review Letters (PRL) **135**, 151801 (2025).
12. The Belle and Belle II collaborations., I. Adachi, et al., Measurements of the branching fractions of $\Xi_c^+ \to \Sigma^+ K_S^0$, $\Xi_c^+ \to \Xi^0\pi^+$ and $\Xi_c^+ \to \Xi^0 K^+$ at Belle and Belle II, Journal of High Energy Physics (JHEP) **08**, 195 (2025).
13. The Belle and Belle II collaborations., I. Adachi, *et al*., Measurement of the branching fraction of $\Lambda_c^+ \to pK_S^0\pi^0$ at Belle, Physical Review D (PRD) **112**, 012013 (2025).
14. The Belle II collaboration., I. Adachi, *et al*., Measurement of $B^+ \to \tau^+\nu_\tau$ branching fraction with a hadronic tagging method at Belle II, Physical Review D (PRD) **112**, 072002 (2025).
15. The Belle II collaboration., I. Adachi, *et al*., Measurement of the branching fraction, polarization, and time-dependent CP asymmetry in $B^0 \to \rho^+\rho^-$ decays and constraint on the CKM angle ϕ_2, Physical Review D (PRD) **111**, 092001 (2025).
16. The Belle and Belle II collaborations., I. Adachi, *et al*., Search for lepton-flavor-violating decay modes $B^0 \to K_S^0\tau^\pm l^\pm$ with hadronic B tagging at Belle and Belle II, Physical Review Letters (PRL) **135**, 041801 (2025).
17. The Belle II collaboration., I. Adachi, *et al*., Measurement of the branching fraction and CP-violating asymmetry of the decay $B^0 \to \pi^0\pi^0$ 387 million $\Upsilon(4S)$ decays in Belle II data, Physical Review D (PRD) **111**, L071102 (2025).
18. The Belle II collaboration., I. Adachi, *et al*., Observation of the decay $B^0 \to J/\psi\omega$ at Belle II, Physical Review D (PRD) **111**, 3, 032012 (2025).
19. The Belle and Belle II collaborations., I. Adachi, *et al*., Observations of the singly Cabibbo-suppressed decays $\Xi_c^+ \to pK_S^0$, $\Xi_c^+ \to \Lambda\pi^+$, and $\Xi_c^+ \to \Sigma^0\pi^+$ at Belle and Belle II, Journal of High Energy Physics (JHEP) **03**, 061 (2025).
20. M. Alhakami, K. El-Nasser, N. Althubiti, T. Taha, Composition-dependent variations in structural, optical and shielding characteristics of CuO-containing borate glasses, Nuclear Engineering and Technology 58, 103925 (2025).
21. M. Alhakami, H. Amin, M. Sayyed, M. Alotiby, E. Sedqy, M. Sadeq, Effect of zinc oxide on the structure and radiation shielding efficiency of ZnO-Fe_2O_3-Na_2O-B_2O_3 glass, Journal of Electronic Materials **54**, 10678-10691 (2025).
22. M. Alhakami, H. Amin, M. Sayyed, M. Alotiby, E. Sedqy, M. Sadeq, Spectroscopic inquiry and radiation-shielding parameters of the La_2O_3-Na_2O-Fe_2O_3-B_2O_3 glass system through La^{3+}-doping assistance, Journal of Materials Science-Materials in Electronics **36**, 1194, (2025).
23. M. Alhakami, M. Alotaibi, R. Malidarreh, S. Issa, K. Alharbi, H. Zakaly, Advancements in construction Materials: Boron cement composites for improved physical, structural properties and radiation shielding, Radiation Physics and Chemistry **237**, 112967 (2025).

24. M. Alhakami, A. Abouhaswa, N. Althubiti, T. Taha, Investigation of optical and radiation shielding properties in bismuth oxide-doped barium borate glasses, Nuclear Engineering and Technology **57**, 103633 (2025).
25. K. Alharbi, R. Alsulami, M. Alhakami, *etl*., Investigation of adsorption isotherms and thermodynamic models of uranium biosorption from aqueous solutions by Rumex Acetosella, Journal of Radioanalytical and Nuclear Chemistry **334**, 2251–2270 (2025).
26. M. Alhakami, A. Abouhaswa, T. Taha, N. Althubiti, Design and characterization of borosilicate glass modified with TiO2 for enhanced optical and radiation shielding applications, Radiation Physics and Chemistry **225**, 112150 (2024).
27. M. Alhakami, A. Abouhaswa, N. Althubiti, T. Taha, Exploring the interplay of structure, optical, magnetic and radiation shielding properties in GeO_2/Bismuth borate glasses, Radiation Physics and Chemistry **223**, 111920 (2024).
28. T. Taha, M. Alhakami, N. Althubiti, K. Saron, M. Dong, M. Ibrahim, S.A. Saad, Melt-quenched zinc sodium borate glasses: Understanding the role of ZnO/ Na_2O ratio in density, band gap, and radiation attenuation, Radiation Physics and Chemistry **222**, 111791 (2024).
29. Mohammad H. Alhakami, Numa A. Althubiti, Nwuyer A. Al-shammari, Hadronic loop effects to excited scalar charmed mesons revisited, Journal of Physics G: Nuclear and Particle Physics (J. Phys. G) **50**, 4, 045002 (2023).
30. Mohammad H. Alhakami, Predictions for the beauty meson spectrum, Physical Review D (PRD) 103, 034009 (2021).
31. Mohammad H. Alhakami, Spectroscopy of excited charmed mesons, Physical Review D (PRD) **101**, 016001 (2020).
32. Mohammad H. Alhakami, Low-energy constants of heavy meson effective theory in lattice QCD, Physical Review D (PRD) **98**, 016008 (2018).
33. Mohammad H. Alhakami, Short-range interactions and narrow resonances in effective field theory, Physical Review D (PRD) **96**, 056019 (2017).
34. Mohammad H. Alhakami, Mass spectra of heavy-light mesons in heavy hadron chiral perturbation theory, Physical Review D (PRD) **93**, 094007 (2016).