



FAISAL AKRAM

PROFILE

My area of interest is particle physics, that deals with the study of matter at smallest possible scale. About 50 years ago particle physicists developed a theory of interactions of fundamental particles. This theory, which is called the standard model, is a quantum field theory that describes electroweak and strong interactions so successfully that to date we have no serious evidence against it despite testing it in thousands of different ways. I am specialized in the methods which the physicists use to calculate physical observable using the standard model or its effective field theories.

CONTACT

☎ 92 42 99231137 ext: 187

☎ 92 03334391383

✉ faisal.chep@pu.edu.pk

HOBBIES

Literature and Painting

QUALIFICATION

PhD in theoretical particle physics

Thesis Title: "*Hadronic cross sections of B_c mesons*"

M. Phil in Particle Physics

Thesis Title: " *B_c absorption cross sections by pions*"

M.Sc. Physics

Thesis Title: "*CP Violation in the Standard Model*"

WORK EXPERIENCE

University of the Punjab: Assistant Professor

06/06/2013–to date

Research and teaching. I have been teaching physics and particle physics courses at undergraduate and graduate levels.

University of the Punjab: Lecturer

03/06/2000–06/06/2013

Research and teaching.

Punjab Education Department: Lecturer in Physics

22/09/1997–03/06/2000

Teaching physics at higher secondary and undergraduate levels.

RESEARCH PUBLICATIONS

1. Sohail Gilani, Imran Jamil, Bilal Masud, and Faisal Akram ' $\rho J/\psi$ scattering in improved many body potential', **Eur. Phys. J. A (2019)**.
2. Bushra Shafaq and Faisal Akram '*The Effect of the Earth Matter on Three Neutrino Oscillations and Sensitivity to CP Phase Parameter*', **Eur. Phys. J. P (2019)**.
3. Shaheen Irfan, Faisal Akram, Bilal Masud, Bushra Shafaq, '*Interactions of B_c meson in relativistic heavy-ion collisions*', **Phys. Rev. C 100, 065906 (2019)**.
4. Ishrat Asghar, Faisal Akram, Bilal Masud, and M. Atif Sultan, '*Properties of excited charmed-bottom mesons*', **Phys. Rev. D 100, 096002 (2019)**.
5. Nosheen Akbar, Faisal Akram, Bilal Masud, Atif Sultan, '*Conventional and hybrid B_c mesons in an extended potential model*' **Eur. Phys J. A54, 127 (2018)**.
6. Faisal Akram, et. el., '*Decays and spectrum of bottom and bottom strange mesons*' **Eur. Phys J. A54, 127 (2018)**.
7. Faisal Akram, et. el., '*Higher hybrid bottomonium in extended potential model*', **Phys. Rev. D 95, 074018 (2017)**.
8. M. Imran Jamil, Bilal Masud, Faisal Akram and S. M. Sohail Gilani, '*DD System in QCD-improved many body potential*' **Chin. Phys. C 41, 013103 (2017)**.
9. Faisal Akram and Bilal Masud, '*Upsilon absorption cross Sections by nucleons*', e-Print arXiv:1309.2923 (2014).
10. Faisal Akram, et. al., '*Higher hybrid charmonia in extended potential model*', **Phys. Rev. D 90, 054001 (2014)**.
11. Ghulam Mustafa, Faisal Akram, and Bilal Masud, '*Optimization of neutrino oscillations parameters using differential evolution technique*', **Commun. Theor. Phys. 59, 324-330 (2013)**.
12. Faisal Akram, et. al., '*Vacuum polarization and dynamical chiral symmetry breaking*', **Phys. Rev. D 87, 013011 (2013)**.
13. Faisal Akram and M.A.K Lodhi, ' *B_c absorption cross sections by nucleons*', **Nucl. Phys. A 877, 95 (2012)**.
14. Faisal Akram and M.A.K Lodhi, ' *B_c absorption cross sections by ρ mesons*', **Phys. Rev. C 84, 064912 (2011)**.
15. M.A.K Lodhi, Faisal Akram, Shaheen Irfan, '*Hadronic absorption cross sections of B_c* ', **Phys. Rev. C 84, 034901 (2011)**.
16. Equalization of response functions of SK and SNO, e-Print archive hep-ph/0403006.
17. Faisal Akram, '*Equalization of response functions of Cl and Ga detectors*', **Journal of Natural Sciences and Mathematics vol. 42, 133 (2002)**.

CONFERENCES/SEMINARS/WORKSHOPS

#	Type	Title	Status	Role	Place	Dates
1	Workshop	First school on advanced topics on particle physics	National	Invited speaker	NCP, Islamabad	02/09/2019 to 20/09/2019
2	School	8 th LHC school on high energy physics	International	Invited speaker	NCP, Islamabad	19/08/2019 to 30/08/2019
3	School	First international school on physics and allied disciplines	International	Invited speaker	NCP, Islamabad	11/03/2019 to 15/03/2019
4	Symposium	16 th National symposium on frontiers in physics	National	Invited speaker	GCU, Lahore	29/01/2019 to 31/01/2019
5	School	7 th LHC school on high energy physics	International	Invited speaker	NCP, Islamabad	06/08/2018 to 17/08/2018
6	Symposium	15 th National symposium on frontiers in physics	National	Invited speaker	GCU, Lahore	29/01/2018 to 30/01/2018
7	Conference	First International meeting to science and society	International	Organizer and speaker	University of Punjab, Lahore	22/11/2017 to 24/11/2017
8	School	6 th LHC school on high energy physics	International	Invited speaker	NCP, Islamabad	21/08/2017 to 31/08/2017
9	Conference	International scientific spring	International	Invited speaker	NCP, Islamabad	06/03/2017 to 10/03/2017
10	Symposium	14 th National symposium on frontiers in physics	National	Invited speaker	GCU, Lahore	21/11/2016 to 25/11/2016
11	Conference	8 th International meeting on particles and field	International	Invited speaker	COMSATS, Lahore	21/04/2016 to 23/04/2016
12	Conference	7 th International meeting on particles and fields	International	Organizer and speaker	University of Punjab, Lahore	01/04/2015 to 04/04/2015
12	Symposium	International symposium of physics beyond the standard model	International	Invited speaker	NCP, Islamabad	Aug 2015
13	Conference	6 th International meeting on particles and fields	International	Invited speaker	NCP, Islamabad	26/4/2014
14	Conference	5 th International meeting on particles and fields	International	Organizer and speaker	University of Punjab, Lahore	26/3/2013

COURSES TAUGHT

I have taught following courses in the institution where I have been serving.

Post Graduate Level:	Undergraduate level:
<ol style="list-style-type: none"> 1. Advanced quantum field theory 2. The standard model of particle physics 3. Supersymmetry 4. Electroweak phenomenology 5. Advanced scientific computations 6. Quantum field theory 7. Introduction to high energy physics 8. Relativistic quantum mechanics 	<ol style="list-style-type: none"> 1. Classical Mechanics 2. Electromagnetic Theory 3. Statistical Physics 4. Nuclear Physics 5. Quantum Mechanics 6. Mathematical Methods 7. Electronics 8. General Physics 9. Scientific Computation 10. Computational Physics 11. Modern Physics Lab

M.PHIL/PHD PRODUCED

#	Degree	Status	Title of Research
1	PhD	Completed	Chiral symmetry breaking through full quark gluon interaction
2	PhD	Completed	Investigations in Neutrino Oscillations
3	PhD	Under process	Study of properties of light mesons using Schwinger Dyson Equations
4	PhD	Under process	Chiral symmetry breaking at finite temperature
5	PhD	Under process	Open Charm Meson in an Extended Quark Potential Model
6	PhD	Under process	QCD phase diagram.
7	MPhil (2013-15)	Completed	Quark-Propagator at finite temperature
8	MPhil (2013-15)	Completed	Study of properties of pion using DSE's and BSE
9	MPhil (2014-16)	Completed	Solutions of QED SDE using CP vertex
10	MPhil (2014-16)	Completed	Solutions of QED SDE using KP vertex
11	MPhil (2014-16)	Completed	Quark condensate in finite temperature QCD
12	MPhil (2015-17)	Completed	Schwinger-Dyson approach in finite temperature QED
13	MPhil (2015-17)	Completed	Light meson spectroscopy using MT model
14	MPhil (2015-17)	Completed	Upsilon absorption cross sections by light hadrons
16	MPhil (2016-18)	Completed	Dynamical breaking chiral symmetry in QED using BB vertex
17	MPhil (2016-18)	Completed	Dynamical breaking chiral symmetry in QED using bare and CP vertices
18	MPhil (2017-19)	Completed	Review on Supersymmetry
19	MPhil (2017-19)	Completed	Quarkonia in non-relativistic potential model
20	MPhil (2017-19)	Completed	QCD propagators in SDEs
21	MPhil (2018-20)	Under process	Status of supersymmetric theories
22	MPhil (2018-20)	Under process	Effective field theories of QCD
23	MPhil (2018-20)	Under process	Effective field theories of the standard model

RESEARCH PROJECTS

#	Title of research project	Investigator as	Starting and ending dates	Funding agency	Funding amount
1	QCD propagators in Schwinger-Dyson Equations.	Principal Investigator	01/06/2017 to 31/05/2020	HEC, Pakistan	3,716,800 PKR
2	To study characteristics of magnetic fields present in interplanetary space by using galactic cosmic ray sun shadow.	Co-investigator	29/09/2018 to 28/09/2019	HEC, Pakistan	444,500 PKR
3	Study of B_c meson production in Relativistic Heavy-Ion Collision.	Principle investigator	2012-13	University of Punjab, Lahore	125,000 PKR
4	Pion electromagnetic and transition form factors	Principle investigator	2013-14	University of Punjab, Lahore	150,000 PKR
5	Dynamical Chiral Symmetry Breaking in QCD.	Principle investigator	2014-15	University of Punjab, Lahore	150,000 PKR
6	Pion mass and decay constant.	Principle investigator	2015-16	University of Punjab, Lahore	150,000 PKR
7	Study of Υ meson production in Relativistic Heavy-Ion Collision.	Principle investigator	2016-17	University of Punjab, Lahore	150,000 PKR

RESEARCH GROUPS

I am affiliated/leading the following research groups.

1. Quarkonium Physics Group:

Group heads: Bilal Masud and Faisal Akram

Group full members: Nosheen Akbar, Atif Sultan, Ishrat Asghar

The objective of the group is to provide best possible estimates for the properties charmonia, bottomonia, and B_c mesons.

2. SDE group:

Group heads: Adnan Bashir and Faisal Akram

Group full members: Bilal Masud and Atif Sultan

The objective of the group is to study the properties of hadrons using non-perturbative techniques based on Schwinger Dyson and Bethe Salpeter equations.

CURRICULUM DEVELOPMENT

I have developed the courses of following degree programs for Centre for High Energy Physics, Punjab University.

1. BS computational physics
2. MSc computational physics

COMPUTING SKILLS

I am proficient in Windows and LINUX operating systems, MS office, LaTeX, Scientific workplace word processors, have a long experience of developing series and parallel computer programs in Mathematica, C, and C++, and using application packages of high energy physics including PYTHIA, FeynArts, FeynCalc, SARAH, and other packages of loop calculation.

MY WORK ON PUBLIC ENGAGEMENT OF SCIENCE

1. I have delivered several public lectures in my institution as well as in other universities and colleges on following topics.

- i. Origin of mass in the universe
- ii. The Standard Model for Layman
- iii. An introduction to Hawking's universe

2. I used to visit local public schools with my PhD/MS students, where we interact with junior students in their classrooms. We explain them difficult ideas and concepts of high energy physics and cosmology in the language which they can understand. We also answer their spontaneous questions about science and technology.