

Curriculum Vitae

Zafar Iqbal

Bussiness Address:

Salam Chair in Physics department G C University, Lahore

Home Address:

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Lahore, Pakistan

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Objective:

To obtain such a position that may offer growth, challenge, career opportunity and enhance my organizational, technical and research skills by equipping myself with the latest knowledge through hardworking in a dynamic and challenging environment.

Brief Summary of my work:

I am working on both the classical plasma (space plasma) and quantum plasma

Contribution in space plasma. We first time generalize dispersions of kinetic Alfven waves for the bi-Maxwellian distribution plasma. New dispersion relation describing oblique propagation of the Alfvenic modes is determined. These results were used by various authors to study the damping/growth of kinetic Alfven waves. We further studied the perturbed electromagnetic field and Poynting flux of kinetic Alfven waves

in an isotropic kappa distributed plasma. These results are useful to explain the energizing the plasma over long distances in the direction of ambient magnetic field that would probably lead to the generation of electron beam which may, in turn, find applications in the auroral emission and broadband electrostatic noise. We move step forward and invoke the standard Vlasov model and the steady-state Poynting theorem to unlock then mysterious coronal heating mechanism in terms of inertial and kinetic Alfven waves whose electromagnetic energies turn into heat during wave-particle interaction. Work in dense plasma systems Quantum plasma is one of the emerging fields and getting interest in the plasma physics community due to its relevance in astrophysics and high-pressure laboratory physics. Electron spin plays an important role in the electronic structure of matter. In solid state materials spin polarization is a prerequisite for spintronic devices as well as magnetoelectronic devices. Since the electron gas is spin polarized in the magnetically ordered metals (like Fe, Co, Ni, or MnAs) it is used in developing spintronic devices. We have reported the existence of new linear and nonlinear structures in the dense magnetized plasma. I am sure such studies will open up new areas of research with possible important applications in the future.

Personal Profile:

Father's Name:	Ghulam Qadir
CNIC No.	31102-3702234-3
Date of Birth	10-10- 1985
Gender	Male
Nationality	Pakistani

Domicile	Bahawalnagar (Punjab)
Religion	Islam
Marital Status	Married
Languages Spoken	Urdu, English, Punjabi

Educational Profile:

Certificate/ Degree	Session	% Marks	Division	Grade	Board/University
PhD (Plasma Physics)	2012- 2016	-	-	-	GC University, Lahore.
M. Phil (Plasma Physics)	2008- 2010	3.49/4	1st	A	GC University, Lahore.
M. Sc (Physics)	2006- 2008	80 CGPA 3.18/4	1st	A	GC University, Lahore.
B. Sc Phys+Math(A+B)	2004- 2006	70	1st	A	Islamia University Bahawalpur
F. Sc (Pre-Engineering)	2002- 2004	62.5	1st	B	B.I.S.E Bahawalpur.
Matriculation (science)	2000- 2002	70	1st	A	B.I.S.E Bahawalpur.

PhD Thesis:

Parallel and Perpendicular Propagating Modes and Instabilities in Degenerate and Non- Degenerate Plasmas supervised by Prof. Dr. G. Murtaza.

Job Experience:

Designation	Institution	Period
M. Phil Fellow	Salam Chair in Physics GCU, Lahore	06-07-2009 to 01-11-2010
Subject Specialist (Physics)	Govt. of Punjab Education Department	01-12-2010 to 15-03-2016
Postdoc Fellow	Mathematical Institute, Oxford University, UK	21-12-2022 to 30-09-2023
Assistant Professor	Salam Chair in Physics department GCU, Lahore	16-03-2017 Continue till date

Distinction:

- Best poster presentation award at First ICTP-NCP conference on Plasma Physics, November 2013
- Awarded Six-month research grant From HEC to visit Moscow State University, Russia
- Awarded Partial travel grant for Joint ICTP-IAEA College on Plasma Physics 29 October – 9 November 2018 Trieste, Italy
- Awarded Fully funded grant for Joint ICTP-IAEA College on Plasma Physics 7-18 November 2022 Trieste, Italy
- Win the research grant for Postdoc fellowship from HEC under Post-Doctoral Fellowship Program

Memberships

- Lifetime Membership of Pakistan Physical Society (PPS)
- Member of American Physical Society
- Member of European Geoscience Union

Teaching Courses

1. Particle Physics
2. Heat and Thermodynamics
3. Fluid dynamics
4. Statistical Physics
5. Waves and Oscillations
6. Lab mechanics
7. Quantum Mechanics
8. Calculus-I and II
9. Basics Mathematics
10. Natural science

Supervised the following BS(Hons) Theses:

Total number of students =08

Supervised the following M.Phil. Theses:

Name of Researcher	Year of Award	Title of Thesis
1. Mehak Younas	(2018-2019)	study of spin magnetoacoustic wave
2. Hazrat Ali	(2018-2019)	Obliquely propagating electrostatic waves in Cairns Distributed plasma.
3. Sana Munwar	(2020-2021)	Coupling of electrostatic waves in non-thermal plasma
4. Arsalan Tariq	(2020-2021)	On the characteristics of low frequency electrostatic waves in an electron beam interacting non-Maxwellian plasma.
5. Rehan Ullah	(2022-2023)	Study of Karpman- Washimi magnetization in solid state plasma
6. Shahid Ayub	(2022-2023)	Proton energization by double layers in the solar wind
7. Raz Muhammad	(2022-2023)	Influence of Cairns-Tsallis distribution on solitary kinetic Alfvén waves in the Earth's magnetosphere
8. Wasim abbas	(2024-2025)	topic to be decide

Supervising/Co-Supervising the following PhD. Theses:

Name of Researcher	Year of Award	Title of Thesis
1. Uzma Khanum	(completed)	Electrostatic waves and instabilities in spin Polarized plasma
2. Esha Shahid	Thesis submitted	Study of shock waves in non- Thermal dissipative plasma
3. Sania Butt	Continue	Nonlinear periodic electrostatic waves in a

			spin polarized quantum plasma
4.	Nourina Nadeem	Continue	Nonlinear instabilities induced by wave-wave interactions in degenerate quantum plasma
5.	Sumyaia Shahab	continue	topic to be decided

List of key publications

1. Z Iqbal, JE Allen, F Causa, G Abbas, Wesley JM Ridgway, V Koukouloyannis, *Phys. Plasmas* **31**, 102303 (2024)
2. Imran A Khan, Z Iqbal, G Murtaza, *Monthly Notices of the Royal Astronomical Society*, Volume **491**, Issue 2, January 2020
3. Z Iqbal, Pavel A Andreev, *Phys. Plasmas* **23**, 062320 (2016).
4. Pavel A Andreev, Z Iqbal, *Phys. Rev. E* **93**, 033209

Details of Publications:

Total publications=65,

Total impact Factor=130.53

Citations=628 (Google Scholar)

H-index=15

i10-index=26

Google Scholar

<https://scholar.google.co.uk/citations?hl=en&user=CN2kCa4AAAAJ&user=CN2kCa4AAAAJ>

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=57212102652>

ORCID: <https://orcid.org/0009-0003-5928-8387>

Research Grants

1. As a PI research grant of Rs 0.250 M from ORIC office G C University Lahore

2. As a Co-PI research grant of Rs 1.4 M, national National Research Program for Universities, Higher education commission Pakistan

Professional Service

- Reviewer of Pakistan Science Foundation
- Reviewer of international impact factor journals:

Physics of Plasmas; Plasma research express, Journal of plasma Physics, Waves in Random and Complex Media, The European Physical Journal D, Indian Journal of Physics, Physics Letter A, Wave motion, Journal of magnetism and magnetic material, Physics of fluids

Languages

- Urdu (native),
- English (fluent).

Full list of publications (Note all publication are in the international impact factor journal)

Sr. No	Date of publication	Title	Publishing publication or conference	Catalogue	Order of authors
1	20 September 2010	Alfvenic modes in a bi-Maxwellian electron-ion plasma	Physics of plasmas	w	M. F. Bashir, Z. Iqbal , I. Asalm and G. Murtaza
2	28 June 2013	On the kinetic Alfvén waves in non-relativistic spin Quantum plasmas	Physics Letter A	w	A. Hussain Z. Iqbal , G. Brodin, G. Murtaza

3	16 July 2013	Whistler instability in a semi-relativistic bi-Maxwellian plasma	Physics Letter A	w	M.F. Bashir S. Zaheer, Z. Iqbal and G. Murtaza
4	18 March 2014	On the ordinary Mode and whistler mode instabilities in the degenerate anisotropic plasmas	Physics of plasmas	w	Z. Iqbal , A. Hussain, G. Murtaza, and N. L. Tsintsadze
5	9 December 2014	On the damping of right hand circularly polarized waves in spin quantum plasmas	Physics of plasmas	W	Z. Iqbal , A. Hussain, G. Murtaza, and M. Ali
6	9 March 2015	On the perpendicular propagating modes in the ultra-relativistic weakly magnetized plasma	Physics of plasmas	W	Gohar Abbas, Z. Iqbal , and G. Murtaza
7	28 January 2015	R- and L-waves in electron–positron Spin quantum plasmas	Physica Scripta	W	M Shahid, Z. Iqbal , A. Hussain and G. Murtaza

8	15 June 2016	Nonlinear separate spin evolution in degenerate electron-positron ion plasmas	Physics of plasmas	W	Z. Iqbal and Pavel A Andreev
9	28 March 2016	Rich eight-branch spectrum of the oblique propagating longitudinal waves in partially spin polarized electron positron- ion plasmas	Physical Review E	W	Pavel A Andreev and Z. Iqbal
10	21 September 2017	Raman three- wave interaction in partially spin polarized plasma	Physics of plasmas	W	M. Shahid, Z. Iqbal , M. Jamil, and G. Murtaza
11	30 September 2017	Parallel propagating modes and anomalous spatial damping in the	Chinese Physics B	X	H. Farooq, M. Sarfraz, Z. Iqbal , G. Abbas and H A Shah

		ultra-relativistic electron plasma with arbitrary degeneracy			
12	December 1, 2017	Linear Analysis of Obliquely Propagating Longitudinal Waves in Partially Spin Polarized Degenerate Magnetized Plasma	Communication in Theoretical Physics	X	Z. Iqbal, G. Murtaza and A. Hussain
13	30 October 2017	Beam driven temporal growth and spatial amplification of electrostatic waves in a partially spin polarized degenerate magnetized plasma	Physics of plasmas	W	Z. Iqbal and G. Murtaza

14	29 November 2017	On the Bernstein mode in a degenerate anisotropic quantum plasma	Physics of plasmas	W	Z. Iqbal , G. Murtaza, K. Azra, A. Hussain, and G. Abbas
15	18 October 2017	Nonlinear analysis of obliquely propagating spin electron acoustic wave in a partially spin polarized degenerate plasma	Physics Letter A	W	Z. Iqbal and G. Murtaza
16	June 1, 2018	Ordinary Mode Instability in a Cairns Distributed Electron Plasma	Communication in Theoretical Physics	X	K. Azra, Z. Iqbal and G. Murtaza
17	6 June 2018	Waveguide instability in streaming e-p-i dense plasmas	Physics of plasmas	W	M. Jamil, R. Ayesha, A. Rasheed, Z. Iqbal , and M. Asif
18	22 March 2018	Langmuir instability in partially spin	Physics of plasmas	W	Z. Iqbal , M. Jamil, and G. Murtaza

		polarized bounded degenerate plasma			
19	24 October 2018	Role of electron quantization on plasma shielding potentials	Physics of plasmas	W	M.S. Hussain, A. Hussain, Z. Iqbal , and G. Murtaza
20	15 February 2018	Dispersion characteristics of anisotropic unmagnetized ultra-relativistic transverse plasma wave with arbitrary electron degeneracy	Physics of plasmas	W	M. Sarfraz, H. Farooq, G. Abbas, S. Noureen, Z. Iqbal , and A. Rasheed
21	23 July 2018	Obliquely propagating magnetosonic waves in a plasma modeled by anisotropic	Physics of plasmas	W	Imran A. Khan, Z. Iqbal , H. Naim, and G. Murtaza

		Cairns Distribution			
22	14 September 2018	Overlapping of the harmonics of the cyclotron frequency in the Bernstein waves due to relativistic effects	Physics of plasmas	W	Waseem Khan, Muddasir Ali, Z. Iqbal , Gohar Abbas, and Zahida Ehsan
23	23 April 2018	A transverse separate-spin evolution streaming instability	Physics of plasmas	W	Z. Iqbal , Pavel A. Andreev and G. Murtaza
24	2 June 2018	On the upper hybrid wave instability in a spin polarized degenerate plasma	Physics of plasmas	W	Z. Iqbal , Imran A. Khan, and G. Murtaza
25	16 October 2018	Lower hybrid wave instability in a spin polarized	Contribution to plasma physics	X	Z. Iqbal U. Khanum and G. Murtaza

		degenerate plasma			
26	28 February 2019	Perturbed electromagnetic field and Poynting flux of kinetic Alfven waves in kappa distributed space plasmas	European Physical Journal Plus	W	Imran A. Khan, Z. Iqbal and G. Murtaza
27	10 April 2019	Separate spin evolution of electrostatic energy flow in a degenerate quantum plasma	Physics of Plasmas	W	M. Ayub, Z. Iqbal , H. A. Shah and G. Murtaza
28	10 June, 2019	A transverse separate-spin-evolution streaming instability and new wave solutions in electron–positron–ion plasmas	Astrophysics and Space Science	W	Z. Iqbal , Pavel A Andreev and G. Murtaza
29	6 June 2019	Energy behavior of spin electron cyclotron wave in a spin polarized plasma	Physics Letter A	W	Z. Iqbal , M. Ayub, H. A. Shah and G. Murtaza

30	12 September 2019	Effect of Anisotropic Cairns Distribution on Drift Magnetosonic Wave	European Physical Journal Plus	W	H. Naim, Imran A. Khan, Z. Iqbal and G. Murtaza
31	30 September 2019	On the two- stream instability with electron spin effects	Physics of plasmas	W	A. Hussain Z. Iqbal , G. Murtaza and G. Mustafa
32	01 November 2019	Spin magnetoacoustic wave	Physics of plasmas	W	Z. Iqbal , Mehak Younas, Imran A. Khan and Murtaza
33	01 January 2020	Solar coronal heating by Alfvén waves in bi-kappa distributed plasma	Monthly Notices of the Royal Astronomical Society	W	Imran A. Khan, Z. Iqbal and Murtaza
34	21 February 2020	Alfvén waves in temperature anisotropic Cairns distributed plasma	Communication to theoretical physics	X	Syed Ayaz Imran A. Khan, Z. Iqbal and Murtaza
35	14 January 2020	Energy transport for ion acoustic waves in a spin polarized quantum plasma	Communication to theoretical physics	X	M. Ayub, Z. Iqbal , H. A. Shah and G. Murtaza
36	9 June 2020	Hydrodynamic analysis of electrostatic	Contribution to plasma physics	X	U. Khanum Z. Iqbal and G. Murtaza

		counter streaming instability in spin polarized electron-positron-ion plasma			
37	08 Sep 2020	Gravitating–radiative magnetohydrodynamic surface waves	Journal of plasma Physics	W	R. Ruby Ch. Rozina N. L. Tsintsadze and Z. Iqbal
38	20-02-2021	Raman Scattering Instability of Transverse Electromagnetic Waves in Degenerate Spin Polarized Plasma	<i>Plasma Physics Reports</i>	X	Ch. Rozina N. Maryam and Z. Iqbal
39	13 April 2021	On the formation of spin dependent double layer structure in astrophysical plasmas	Contribution to plasma physics	X	U. Khanum Z. Iqbal , M. Shamir and G. Murtaza
40	15 June 2021	On the Characteristics of Magnetosonic Waves in a Spin-Polarized Degenerate Electron–Positron–Ion Plasma	IEEE TRANSACTIONS ON PLASMA SCIENCE	X	Z. Iqbal , Imran A. Khan, Tajammal H. Khokhar, and G. Murtaza
41	07-10--2021	Energy transport in degenerate anisotropic electron plasma	Contribution to plasma physics	X	Tajammal H. Khokhar , Imran A. Khan, Z. Iqbal , and G. Murtaza
42	30-12-2021		Physica Scripta	W	M. S. Afify, Z. Iqbal and G. Murtaza

43	28-01-2022	Coupling and instability of electrostatic waves in spin magnetized degenerate plasmas	IEEE TRANSACTIONS ON PLASMA SCIENCE	X	Z. Iqbal , R. Chaudhary and G. Murtaza
44	6-1-2022	Drifts effect on the ordinary plasma wave and the existence of new spin dependent electron drift in the spin quantum plasma	Physics of plasmas	W	M Shahid, Sana Usmani, Z. Iqbal , A Hussain, Shujahat Hussain Bukhari
45	11-7-2022	Study of hydromagnetic solitary waves in the Earth's inner magnetosphere via the Adlam-Allen model	Euro Physics Letters	X	SS Abbas, G Abbas, JE Allen, Z. Iqbal , M Shamir
46	01-01-2023	On the O-mode instability generated by dual core-halo solar wind electrons	Zeitschrift für Naturforschung A	X	M. Sarfraz, F. Ahmad, Z. Iqbal , G. Abbas
47	26-06-2023	Specific features of electromagnetic waves in degenerate two stream electron-ion plasma: self-induced magnetic field	Zeitschrift für Naturforschung A	X	Ch Rozina, M. Pervaiz, Z. Iqbal , N. Nadeem
48	14-08-2023	Instability and energy transport of kinetic Alfvén waves in the solar corona	The European Physical Journal Plus	W	S. Xunaira, Imran A Khan, M Shamir,

					Z. Iqbal , G Murtaza
49	09 -12- 2023	On effective radiational gravity acceleration at the interface of dense plasmas and vacuum	Indian Journal of Physics	X	A.Asma,Ch. Rozina, Z. Iqbal and S. Poedts
50	13 -06 - 2023	Oblique Bernstein wave propagation in electron-ion plasma with electron quantization effects	Contribution to the Plasma Physics	w	A Hussain, A Majeed, M Ayub, G Murtaza, Z Iqbal
51	11-02- 2024	Excitation of nonlinear longitudinal structures in spin-1/2 quantum plasma in the presence of ion beam	Contribution to the Plasma Physics	w	Z. Iqbal , G. Abbas, Ch. Rozina, Nourina and G. Murtaza.
52	15-07- 2024	Effect of finite temperatures on the dispersion properties of Surface Magnetoplasmon Polaritons in the Voigt reflection geometry	Optics Communications	X	G Murtaza, G Abbas, Z Iqbal
53	14-10- 2024	The effect of dust on the propagation of a hydromagnetic solitary wave along the magnetic field in a cold collision-free plasma	Physics of plasmas	W	Z Iqbal , JE Allen, F Causa, G Abbas, Wesley JM Ridgway, V Koukouloyannis

54	26-12-2024	Nonlinear wave-wave interaction of quantized upper hybrid waves with low frequency modes	Physica Scripta	W	N Nourina, Ch Rozina, Z Iqbal , S Poedts and G Abbas
55	24-12-2024	Effects of temperature anisotropy on the flow-driven Alfvén wave instabilities in interpenetrating plasmas	Physics of plasmas	W	S Ramzan, G Abbas, Z Iqbal , I Zeba
56	04-12-2024	Ion acoustic waves in generalized electron distributed unmagnetized plasmas	Fourth iiScience International Conference 2024: Recent Advances in Photonics and Physical Sciences	X	E. Shahid, M. Shamir, Z. Iqbal , I. Zeba, G. Murtaza
57	08-04-2025	Ion acoustic and spin electron acoustic cnoidal waves in a spin polarized plasma with exchange effects	Physics of Fluids	W	B. Sania, Z. Iqbal , Ch. Rozina, Hafeez ur Rehman, and G. Abbas
58	10-02-2025	Nonlinear solitary wave parallel propagation and particle dynamics in a cold, collision-free, magnetized plasma in the presence of dust	Physics Plasmas	W	F Causa, JE Allen, Z Iqbal
59	08-04-2025	Solitary waves propagating across the magnetic field in cold, collision-	Physics Plasmas	W	F Causa, JE Allen, Z Iqbal

		free plasmas in the presence of positively or negatively charged dust			
60	02-02-2025	comparative study of the nonrelativistic and ultrarelativistic linear dispersion relations of electromagnetic waves in anisotropic classical plasmas: an alternative approach	Eur. Phys. J. Plus	W	G Abbas, G Murtaza, H Fatima, Z Iqbal , M Shahid, Ch Rozina
61	23-03-2025	Impact of temperature anisotropy on longitudinal and transverse wave dynamics in unmagnetized partially degenerate electron plasmas	Eur. Phys. J. D	W	H. Anwar, G. Abbas ¹ , H. Fatima, H. Khalid, M. A. Rehman, and Z. Iqbal

Conferences /Workshops/ Talks:

1. Invited talk on “Electron counter streaming effects on the kinetic Alfvén waves” 3rd International conference on “Recent Trends in Physics”, 9 - 11 April, 2025 FCCU,
2. Invited talk on “Hydromagnetic solitary waves in a cold collisionless dusty plasma” 18th National Symposium on Frontiers in Physics, QAU Islamabad 11th - 13th February 2025.
3. Invited talk on “Interesting features of separate spin evolution in a quantum plasma” 4th INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN PHYSICS 13-15-01-2025 Lahore women College University, Lahore.
4. Poster presentation “Parallel propagating hydromagnetic solitary wave in a cold collisionless dusty plasma: near the E-ring of Saturn” AGU 9-13 -12-2024

5. Invited talk on “Interesting features of separate spin evolution in a quantum plasma” 1st international conference on advance in Physics Islamia University Bahawalpur-Bahawalnagar Campus (21-22 May, 2024).
6. Invited talk on propagation of hydromagnetic solitary waves in dusty plasma: 2nd conference on the recent trends in plasma Physics **28-30 November 2023**, FCCU, Lahore
7. Invited talk On the Hydrodynamic Solitary waves: Adlam-Allen model, Khalifa University, College of Arts and Sciences, Department of Mathematics, Abu Dhabi, UAE, 23-10-2023.
8. New spin dependent nonlinear structures in a magnetized quantum plasma, Joint ICTP-IAEA College on Plasma Physics for Fusion Applications (smr 3748), 7-18 NOV 2022)
9. Delivered an invited talk on the topic “spin dependent solitary structures in a beam interacting spin polarized plasma”, International conference Emerging trends in Physics Nov-23-25, 2021 LCWU
10. Delivered an invited talk on the topic “Occurrence of spin electron acoustic soliton in a beam interacting spin polarized plasma” **NCP, Islamabad, (09 March 2021).**
11. Delivered an invited talk on the topic “Ordinary mode instability in the spin polarized plasma” at the 16th National Symposium on Frontiers in Physics GC University Lahore (**January 29-31, 2019**).
12. Delivered an invited talk on the topic “**A transverse separate-spin-evolution streaming instability**” at Joint ICTP-IAEA College on Plasma Physics (**October- 29 to November 9 2018**).
13. Attended three days training on andrigogical and pedagogical skills at Punjab Higher Education Commission staff development academy Lahore on January 18-21, 2018.
14. Delivered an invited talk on the topic “Spin polarization Effects on Low Frequency Electrostatic waves” at the 14th National Symposium on Frontiers in Physics GC University Lahore (**Nov 21-23, 2016**).
15. Delivered an invited talk on the topic “Spin electron acoustic wave and positron acoustic waves in partially spin polarized Plasma” **International Scientific Spring (ISS) 2015** (07-11 March 2016) held at National Center for Physics (NCP), Islamabad
16. Participated in the **International Scientific Spring (ISS) 2015** (16-20 March 2015) held at National Center for Physics (NCP), Islamabad
17. Delivered an invited talk on the topic “On the damping of Right handed circularly polarized waves in spin Quantum Plasmas” in the **International Scientific Spring (ISS) 2014** (10-14 March 2014) held at National Center for Physics (NCP), Islamabad.
18. Poster Presentation in the **First ICTP-NCP International College on Plasma Physics** (11-15 November 2013) held at National Center for Physics (NCP), Islamabad.
19. Participated in **13th National Symposium on Frontiers in Physics** at University of Peshawar, Peshawar (KPK) December (19-21) 2012.
20. Participated in **International Workshop on Plasma Science** held at COMSTECH Islamabad November (19-21) 2012.
21. Participated in **12th National Symposium on the Frontiers in Physics** (02-04 February 2011), held at GC University Lahore.
22. Participated in the **2nd National Conference on Radiation, Particles and Matter** (26-28 October 2010), held at GC University Lahore.
23. Participation in the **Workshop on Astrophysics and Dense Plasmas** (01-03 June 2010), held at National Centre for Physics, Islamabad.
24. Poster Presentation in the **1st National Conference on Radiation, Particles and Matter** (22-24 December 2009), held at GC University Lahore.

25. Participated in **11th National Symposium on the Frontiers in Physics** (29-31 January 2009), held at GC University Lahore.