Curriculum Vitae - Muhammad Asjad

Personal details

Full Name: Muhammad Asjad
Date of Birth: April 03, 1983
Nationality: Pakistani
Sex: Male
NIC #
Marital Status: Single
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Educational qualifications and professional affiliations:

M.Phil: Master of Philosophy, Quaid-i-Azam University, Islamabad, Pakistan 2009-2011. I won Chancellor Medal, securing top position in the Department of Electronics, Faculty of Natural Sciences.

M.Sc: Master of Science, Quaid-i-Azam University, Islamabad, Pakistan 2005-2007.

B.Sc: Bachelor of Science, University of Punjab, Lahore, Pakistan 2003-2005.

F.Sc: Intermediate in Faculty of Sciences (Pre-engineering), Board of Intermediate and Secondary Education Rawalpindi, Pakistan (2002).

Academic highlights

- I have received First Class grades for my entire academic career i.e. I have secured first division throughout the academic career.
- 2nd Position in college in B.Sc in annual exam, 2005.
- Winner of Chancellor Medal (Gold Medal) in M.Phil securing, 2009-2011. This medal is awarded on the basis of securing maximum number of A grades in courses and securing over all top position in the relevant department.
- Two time winner of award Best Student of Year in course work and research work during M.Phil at Quaid-i-Azam University, Islamabad. (2010-2011)

Extra-curricular activities:

- Lab Coordinator of Electronics Student Society (ESS) in Department of Electronics QAU during M.Sc.
- Member of Quaidian Blood Donor Society (QBDS) Quaid-i-Azam University.

Employment history

I worked as a Research Associate in the Department of Electronics, Quaid-i-Azam University Islamabad during my M.Phil from 2010-2011.

Research publications

Muhammad Asjad,
M. Phil Thesis on "Optomecanics with Bose-Einstein condensate",
Quaid-i-Azam University, Islamabad, Pakistan (2011).

Published / accepted:

1. * ***Muhammad Asjad*** *and Farhan Saif,*
   Steady-state entanglement of a Bose-Einstein condensate and a nanomechanical resonator,
   Physical Review A. 84, 033606 (2011).
   Impact factor 2.878 (ISI, 2012),
   My supervisor assigned this problem to me for my thesis, and. I performed all the mathematical and numerical calculations. My supervisor outlined the plan for the manuscript and I wrote the initial draft, before my supervisor completed the final editing. Physical Review A is an excellent journal with high standards that sets the bar for research in atomic, molecular, and optical physics.

2. * ***Muhammad Asjad*** *and Farhan Saif,*
   Engineering entanglement mechanically,
   Physics Letters A. 376, 2608-2612 (2012) .
   Impact factor 1.632 (ISI, 2012),
   In this paper we extended the work from the paper described published in Physical Review A. I performed all the mathematical and numerical calculations. My supervisor outlined the plan for the manuscript and I wrote the initial draft, before my supervisor completed the final editing. Physics Letters A is another good journal.

3. ****Muhammad Asjad,***
   Cavity Optomechanics with a Bose-Einstein Condensate: Normal mode splitting,
   Journal of Modern Optics 59:10, 917-922 (2012).
   Impact factor 1.170 (ISI, 2012),
   I independently conceived and solved this research problem, and wrote the manuscript myself. This is a good journal covering the entire field of classical and quantum optics.

4. ***Muhammad Asjad,***
   Electromagnetically-Induced Transparency in Optomechanical Systems with Bose-Einstein condensate
   Journal of Russian Laser Research: Volume 34, Issue 2 , Page 159-165, (2013).
   Impact factor 0.74 (ISI, 2012).
   I independently conceived and solved this research problem, and wrote the manuscript myself. This is a good journal covering the entire field of classical and quantum optics.

5. ***Muhammad Asjad,***
Optomechanically dark state in hybrid BEC-optomechanical System
Accepted for publication in Journal of Russian Laser Research
Impact factor 0.74 (ISI, 2013).
In this manuscript I independently performed all the mathematical and numerical calculations, and wrote the manuscript myself. In this paper I extended the work from the paper described published in Journal of Russian Laser Research. This is a good journal covering the entire field of classical and quantum optics.

Under consideration:

6. ***Muhammad Asjad,*** *Adnan Shahzad and Farhan Saif,*
Entanglement of Degenerate Fermi Gas in Optomechanical System
Submitted to The European Physical Journal D
Impact factor 1.47 (ISI, 2010),
This idea was conceived by Dr. Farhan Saif, who gave it to Mr Shahzad (a PhD student) and myself. I contributed to the calculations with Mr. Shahzad. I performed the numeric as well. EPJD is an excellent journal with high standards that sets the bar for research in atomic, molecular, and optical physics

7. ***Muhammad Asjad,***
EIT in Cavity Optomechanical System with Degenerate Fermi Gas,
Under consideration by Laser Physics
Impact factor 3.6 (ISI, 2012). *In this manuscript I performed all the mathematical and numerical calculations. This is an excellent journal with high standards that sets the bar for research in atomic, molecular, and optical physics.*

Description of most significant publications:

1. Steady-state entanglement of a Bose-Einstein condensate and a nanomechanical resonator
Quantum nanomechanical systems have been a hot topic in physics over the past few years. In this paper we describe how to create a new hybrid opto-mechanical quantum system by interfacing this with another important area of modern physics - quantum degenerate gases. He we describe how to engineer the steady-state entanglement between mechanical degrees of freedom of a macroscopic mirror and a mode of the Bose-Einstein condensate (BEC) mode using an optical field.

2. Engineering entanglement mechanically
Following on from the paper above, we analyze the entanglement of three bipartite subsystems of the proposed experiment, i.e. mirror-field, atoms-field and atoms-mirror, and consider the effects of thermal environment on the entanglement of these three subsystems.

3. Cavity Optomechanics with a Bose-Einstein Condensate: Normal mode splitting
In this independent work I determined the normal mode splitting in the position spectrum of Bose-Einstein condensates being trapped inside a Fabry-Perot cavity. I analyzed the variation in the frequency and damping rate of the BEC mode in the presence of the optical field. I also determined the normal mode splitting in the transmission spectrum of the optical field.

Research grants:

- Higher Education Commission (HEC) merit based fellowship during M.Phil, 2009-2011.
- HEC Research project fellow, "Nano-Devices: Theoretical, Experimental and Technological Implementation", during M.Phil Research work 2010-2011.
- Talent based Financial Assistant scholarship award during M.Sc. at Department of Electronics, Quaid-i-Azam University Islamabad. (2006)

Conferences/Presentations/ Workshops:

- I have presented my work in "International Conference and Workshop on Nano Sciences and Technology" (October, 2012), at Quaid-i-Azam University Islamabad, Pakistan.
- I have Participated in "PCS-CAS, Bi-national Conference on nano Sciences and Technology (July, 2012) , which was jointly organized by Chinese Academy of Sciences and Pakistan Academy of Sciences.
- I have Participated in Workshop on " Nano-Scale Electronics Devices and Systems" (June , 2012), at Quaid-i-Azam University Islamabad, Pakistan.
- I have Participated in "Technology Workshop on Atomic Physics and Nanofabrication" (April, 2012), which was jointly organized by National Institute of Lasers and optronics (Nilope), Pakistan and Institute of Physics, University of Sau Paulo, Brazil.
- I have presented my work in "NUST Conference on Application and Methods of Physics (Nov, 2011)", at National University of Science and Technology (NUST), Islamabad, Pakistan.
- I have participated in "5th and 6th International symposium on Quantum Optics (2010-2011)", at COMSATS Institute of Information Technology, Islamabad, Pakistan.