

Prof. Dr. Abdul MAJID Abdul Majeed



Professor
Department of Physics
Faculty of Science,
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Majmaah University

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Research Interests:

Nanostructure synthesis and Characterization
Nanostructured device fabrication and Characterization
Semiconductor materials and devices (3rd Generation Solar Cells)

Language Skills

English (R,W,S), Urdu (R,W,S), Punjabi (R,W,S) and Arabic (R,W)

Qualification (Career and University Education)

1983	B. Sc. Degree (Physics, Pure Mathematics, Applied Mathematics)	University of Punjab, Lahore. Pakistan
1986	M.Sc. Degree (Physics)	University of Peshawar, Peshawar, Pakistan.
2006	PhD Degree (Semiconductor Physics)	Quaid-i-Azam University, Islamabad, Pakistan Title: <i>Study of Deep Levels Associated with some Heavy Transition-Metals in MOCVD GaAs.</i> Supervisor: Dr. M. Zafar Iqbal (Meritorious Professor).
2009	Post Doctorate (<i>Nanotechnology,</i>)	Department of Electronic Materials Engineering (EME), Research School of Physical Sciences and Engineering (RSPHYSSE), Australian National University (ANU), Canberra ACT-0200, Australia Title: <i>Experimental Study of Quantum Structured Optoelectronic Devices: Intermediate Band Solar Cells</i> Supervisor: Professor Chennupati Jagadish (Federation Fellow)

Career

Full-time Faculty Member

Mar. 26, 2013 – Continue	<i>Professor,</i> Department of Physics, Majmaah University, College of Science, Alzulfi, Saudi Arabia
May 30, 2007 – Mar. 25, 2013 (Conti.....On Ex-Pakistan Leave)	<i>Professor (BPS-21)</i> Department of Physics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Jun 24, 2008 – Mar. 26, 2009	<i>Visiting Fellow</i> (Academic) at Australian National University Canberra, Australia. (Post Doctoral Fellowship awarded by Higher Education Commission (HEC) of Pakistan,

Feb. 10, 2007 - May 29, 2007	<i>Professor (BPS-20)</i> Department of Physics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Aug. 12, 2004 – Feb. 09 2007	<i>Associate Professor</i> Department of Physics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Feb. 12, 1994 – Aug. 11, 2004	<i>Assistant Professor</i> Department of Physics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Sep. 21, 1987 – Feb. 11, 1994	<i>Lecturer in Physics</i> Department of Physics, University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan

Experience Administrative (Extra-Responsibilities)

Jan. 01, 2009– Mar. 25, 2014	Chairman, Department of Physics, University of AJ&K
Oct. 01, 2009 – Mar. 25, 2014	Director, High-tech centralized instrumental Lab.
Jun. 01, 2009– Mar. 25, 2014	Incharge/Supervisor, Nanotechnology/Semiconductor Physics Lab, Department of Physics, University of AJ&K
Oct. 31, 2006 – Jun 24, 2008	Additional Controller of Examinations
Aug. 15, 2005 – Sept 10, 2012	Member, University Affiliation Committee
Aug. 01, 2005 – Oct. 8, 2005	Chairman, University Technical Committee: Equipment
Aug. 08, 2004– Oct. 8, 2005	Chairman, University (AJ&K) Web Site Developer

Short Visits

Jul. 09-16, 2011	Scanning Electron Microscope: Jeol JSM-6510LV/JSM-6610LV, One week Training at Jeol Instruments Ltd. Tokyo, Japan
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Publication

2014	M. Fakhar-e-Alam, Shubana Rahim, M. Atif, M. Hammad Aziz, M. Imran Malick, S. S. Z. Zaidi, R. Suleman, Abdul Majid, ZnO Nanoparticles as Drug Delivery Agent for Photodynamic Therapy, Laser Phys. Lett. 11, 025601
2014	Sajad Hussain, Chuanbao Cao, Waheed S. Khan, Ghulam Nabi, Zahid Usman, Abdul Majid, Thamer Alharbi, Zulfiqar Ali, Faheem K Butt, Muhammad Tahir, Muhammad Tanveer, and Faryal Idress, "Cu2O/TiO2 nanoporous thin-film heterojunctions: Fabrication and electrical characterization" Materials Science in Semiconductor Processing (Available online 28 November 2013) http://dx.doi.org/10.1016/j.mssp.2013.11.018
2012	Nasar Ahmed, A. Majid, M. Rashid, B. Shakeela, Z. Aziz, Ayaz. Arif Khan, M. A. Khan, Naghma Haider and R. H. Siddiqui, Growth of Zn/ZnO core/shell system supported by indented sites, (manuscript: submitted to Nano Research Letters)
2011	Muhammad Rafique, Matiullah, Saeed Ur Rahman, Said Rahman, Muhammad Ikram Shahzad, Bushra Azam, Ishfaq Ahmed, Abdul Majid & Muhammad Iqbal Siddique - Assessment of indoor radon doses received by the dwellers of Balakot – NWFP, Pakistan: a pilot study, Carpathian Journal of Earth and Environmental Sciences, 6, 133-140.
2010	A. Majid, C. Jagadish, L. Fu and H. Tan, MOCVD grown Quantum Dot-in-a-Well Solar Cells, Key Engineering Materials, 442, p-398-403, Trans Tech Publications, Switzerland.
2009	Nazir A. Naz, Umar S. Quarashi, A. Majid and M. Zafar Iqbal, Ruthenium related deep-level defects in n-type GaAs, Physica B, 404, 4956.
2008	M. Zafar Iqbal, A. Majid, Nazir A. Naz and Umar S. Qurashi, 4d transition-metal impurity rhodium in GaAs grown by metal-organic chemical vapor deposition, J. Appl. Phys., 104, 113708.
2008	L. Fu, A. Majid, G. Jolley, S. Makkopati, H. H. Tan, and C. Jagadish, Application of self-assembled quantum dots for optoelectronic devices, Australia Japan Nanophotonics Workshop ANU,

Canberra, December 09-10.

- 2008 **Khizar-ul-Haq, M. A. Khan, U.S.Qurashi and Abdul Majid**, *Interaction of alpha radiation with iron doped n-type silicon*, **Microelectronics Journal** 39, 797.
- 2007 **Nazir A. Naz, Umar S. Qurashi, Abdul Majid, M. Zafar Iqbal**, *Doubly-charged state of EL2 defect in MOCVD grown Gas*, **Physica B**, 401, 250.
- 2007 **Suleman Khan, Naseer Ahmed, Akhlaq Ahmad Khan Amanullah Khan and A. Majid**, *Lie Group Analysis of a linear Nonholonomic Dynamical System*, **Sci. Int.** 19, 83.
- 2007 **Abdul Majid**, *Efficient Low Level Signal Measuring Instrument Lock-In Amplifier*, **Sci. Echo**, 15 July.
- 2006 **M. Zafar Iqbal, A. Majid, A. Dadgar and D. Bimberg**, *Electric-field-enhanced thermal emission from osmium-related deep level in n-GaAs*, **Advances in Science and Technology Vol. 46 pp. 73**, **Trans Tech Publications, Switzerland**.
- 2005 **A. Majid, M. Zafar Iqbal, A. Dadgar and D. Bimberg**, *Osmium Related Deep Levels in MOCVD Grown GaAs*, **J. Appl. Phys.**, 98, 083709.
- 2005 **M. Zafar Iqbal, A. Majid, A. Dadgar and D. Bimberg**, *Deep Levels in Osmium Doped p-type GaAs Grown by Metal-organic Chemical Vapor Deposition*, **27th International Conference on the Physics of Semiconductors**, Arizona, USA. **AIP Conf. Proc.** 772, 147.
- 2005 **A. Majid, M. Zafar Iqbal, A. Dadgar and D. Bimberg**, *Deep Levels in Ruthenium Doped p-type MOCVD GaAs*, **27th International Conference on the Physics of Semiconductors**, Arizona, **AIP Conf. Proc.** 772, 143.
- 2003 **A. Majid, M. Zafar Iqbal, A. Dadgar and D. Bimberg**, *Deep Levels in Rhodium-Doped p-type MOCVD GaAs*, **Physica B**, 340, 362.
- 2003 **M. Zafar Iqbal, A. Majid, A. Dadgar and D. Bimberg**, *Osmium Related Deep Levels in n-type GaAs*, **Physica B**, 340, 358.
- 2003 **A. Majid, M. Zafar Iqbal, Shah Haidar Khan, Akbar Ali, Nasim Zafar, A. Dadgar and D. Bimberg**, *Characteristics of Deep Levels Associated with Rhodium Impurity in type GaAs*, **J. Appl. Phys.**, 94, 3115.
- 2001 **M. Zafar Iqbal, A. Majid, Shah Haidar Khan, Akbar Ali, Nasim Zafar, A. Dadgar and D. Bimberg**, *Rhodium Related Deep Levels in n-type MOCVD GaAs*, **Physica B**, 308, p816-819.
- 1999 **M. Zafar Iqbal, U. S. Qurashi, A. Majid, Aurangzab Khan, Nasim Zafar, A. Dadgar and D. Bimberg**, *Deep Levels Associated with Alpha Irradiation of n-type MOCVD InP*, **Physica B**, 273, 839.
- 1997 **A. Majid, A. Hussain and M. A. R. Khan**, *Determination of Optical Constant and Thickness of Zn_{0.9}Cd_{0.1}S Thin Films*, **Kashmir Res. J. N. Sci.**, Vol 1 (1), 27.
- 1997 **A. Majid and G. A Khan**, *A Proposed Automated Computerized Hall Profiling System for Characterization of Semiconductor Materials*, **Kashmir Res. J. N. Sci.**, Vol 1 (2), 87.
- xxxx **Abdul Majid**, *Effect of lambda correct electric field on emission rates of osmium related deep level in n-type Gas* (Manuscript ready for submission).
- xxxx **A.Majid, C. Jagadish, L. Fu. and H. Tan**, *Luminescence behaviour of MOCVD grown 10 layers Quantum Dot and quantum Well in GaAs*, (to be submitted in **Physica Status Solidi - Rapid Research Letters**)
- xxxx **A.Majid, L. Fu. H. Tan and C. Jagadish**, *Comparison of MOCVD grown AlGaAs and InGaAs Dot-in-a-Well Intermediate Band Solar Cells*, (manuscript in process for **Applied Physics Letters**)
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Conference Presentations

- Nov. 07-11, 2010 **Fu, L. Jolley, G. Lu, H.F. Majid, A. Tan, H.H. Jagadish, C.**, *Temperature effect on device characteristics of InGaAs/GaAs quantum dot solar cell*, **23rd Annual Meeting of the IEEE Photonics Society, 2010, Denver, CO**,
- Dec. 14-16, 2009 **Fu, L. Jolley, G. Mokkaapati, S. Majid, A. Lu, H.F. Tan, H.H. Jagadish, C.** *III-V quantum dots for optoelectronic device applications*, **International Conference on**
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Computers and Devices for Communication, 2009 (CODEC 2009). Kolkata Print ISBN: 978-1-4244-5073-2 INSPEC Accession Number: 11136798, Date of Current Version: 05 February 2010.

- Dec. 09–11, 2009** L. Fu, G. Jolley, A. Majid, S. Mokkaḡti, H. H. Tan, and C. Jagadish, *Application of self-assembled quantum dots for optoelectronic devices*, **International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2009) Guwahati, Assam (India),.**
- Jun. 26-31, 2002** A. Majid, M. Zafar Iqbal, Akbar and Ali, *A Hole Emitting Metastable Defect in n-type GaAs*, presented at 27th **International Nathiagali Summer College; Nathiagali, NWFP, Pakistan.**
- Jun. 26-31, 2002.** A. Majid, M. Zafar Iqbal, Akbar and Ali *Extended Defect of Rhodium in MOCVD Grown n-GaAs*, presented at 27th **International Nathiagali Summer College; Nathiagali, NWFP, Pakistan.**
- Jul. 02- 08, 2001** A. Majid, M. Zafar Iqbal and Akbar Ali, *Investigation of Rhodium Related Deep Levels in MOCVD Grown n-GaAs*, presented at 26th **International Nathiagali Summer College; Nathiagali, NWFP, Pakistan.**
- Nov. 20-22, 2000.** A. Majid, S. H. Khan, M. Zafar Iqbal and Akbar Ali, *Deep Level Transient Spectroscopy of Rhodium Doped n-GaAs*, presented at 8th **National Symposium on “Frontiers in Physics”, Govt. College University, Lahore.**
- Nov. 20-22, 2000** S. H. Khan, A. Majid, M. Zafar Iqbal and Akbar Ali, *Field Effect on Thermal Electron Emission from Rhodium in n-GaAs*, presented at 8th **National Symposium on “Frontiers in Physics”, Govt. College University, Lahore.**

Teaching Experience

Semiconductors	PHYS473	BS Physics	Majmaah University, College of Science, Al-Zulfi, Saudi Arabia.
Solid State Physics	PHYS471	BS Physics	Majmaah University, College of Science, Al-Zulfi, Saudi Arabia.
Method of Mathematical Physics	PHYS203	BS Physics	Majmaah University, College of Science, Al-Zulfi, Saudi Arabia.
Solid State Physics	PHY-5602	M.Sc. Physics.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Physics Lab-VI: Solid State Physics	PHY-5606	M.Sc. Physics.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Elective Advance Course-I: (Solid State Physics): Band Theory of Solids	PHY-636	M.Sc. Physics.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Elective Advance Course-II :(Solid State Physics) Dielectric and Magnetics properties of Solids	PHY-646	M.Sc. Physics.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Elective Advance Course-Composite Advance topics in Solid State Physics (Research Students)		M.Sc. Physics.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Physics of Semiconductors	PHY-7105	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Physics of Semiconductors Devices	PHY-7205	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Nanoscience and technology	PHY-7214	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Electrodynamics.	PHY-7102	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Material Studies Of Electron Emission	PHY-7211	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Defects In Materials And Measuring Techniques	PHY-7212	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan
Surface Science And Scanning Techniques	PHY-7213	M.Phil./Ph.D.	University of Azad Jammu and Kashmir, Muzaffarabad, Pakistan

Supervision of Research Students:

Ph.D. Research Thesis: (Listed as Enrolment Year)

- 2012 **Nasar Ahmed**, *Synthesis and characterization of Metal Oxide Core/shell system for drug delivery.* (Status: Research work in progress)
- 2012 **Muhammad Rashid Khan**, *Doping effect of transition metals in ZnO tetrapods for device fabrication.* (Status: Research work in progress)
- 2011 **Muhammad Athair**, *Optical Properties of Quantum Structured Semiconductor Materials for Solar Cells.* (Status: Research work in progress)

M. Phil. Research Thesis: (Listed as Enrolment Year)

- 2012 **Khurrum Shahzad**, *Study of Chemical Vapour Deposition (CVD) System for fabrication of Zinc Oxide nanostructures* (Status: Research work in progress)
- 2012 **Majid Khalil**, *Characterization of thermally annealed ZnO nano-structures* (Status: Research work in progress)
- 2012 **Shahbana Raheem**, *Biomedical applications of ZnO nanoparticles* (Status: Research Lab work completed Thesis write-up in progress)
- 2012 **Bushra Aziz**, *Irradiation Effect on ZnO Nano Structures* (Status: Thesis submitted for evaluation)
- 2011 **Muhammad Iftikhar**, *n-ZnO/p-Si Based junction Diode and its Characteristics* (Status: Thesis submitted for evaluation)
- 2011 **Nasar Ahmed**, *Fabrication and Characterization Zn/ZnO Core/Shell System* (Status: Completed/Awarded)
- 2011 **Muhammad Rashid Khan**, *Catalyst Assisted Growth and Characterization of ZnO Nano-Structures* (Status: Completed/Awarded)
- 2011 **Shakeela Bibi (in progress)**, *Dark Current Analysis of Quantum Dot Intermediate Band Solar Cell,* (Status: Completed/Awarded)
- 2011 **Zubia Aziz (in progress)**, *Study of Nanoporous Anodic Aluminium Oxide* (Status: Completed/Awarded)

M.Sc. Student's Reports:

- 2012 **M. Umar Fayaz**, *Characterization of Cobalt doped ZnO nanoparticle*
- 2012 **Usman Hamza and Tousef Ahmed**, *Characterization of Cadmium doped ZnO Tetrapods.*
- 2011 **Atif Bashir**, *Synthesis and Characterization of Metal doped ZnO nano particles.*
- 2011 **Jan Muhammad**, *Study of size dependent parameters on Synthesis of Copper doped ZnO nano particles*
- 2009 **Mohammad Habib Yasin and Mohammad Asif Latif**, *Effect of Etching Parameters on Porosity of Fabricated Porous Silicon.*
- 2009 **Ghazala Razaq, Raqia Khatoon and Mizrah Tariq**, *Optical properties of thermally annealed chlorine doped Zn_{0.2}Cd_{0.8}S.*
- 2008 **M. Rashid Khan, Raja Kurram Shazad and Wajid Taj**, *Fabrication of Porous p-type Silicon.*
- 2007 **Muhammad Yousaf**, *Energy Band Structure of Carbon Nanotubes using Atomistix Virtual Nano Lab.*
- 2007 **Saeed-ul Hassan Gilani**, *Fabrication of porous on n-Type Silicon.*
- 2007 **Ishtiaq Ahmed and Naem Akhtar**, *Study of Organic Light Emitting Diode.*
- 2007 **Darakshanda Jabeen**, *Study of Fabrication of porous on p-Type Silicon.*
- 2006 **Habib-ur-Rehman**, *Study the Formation Porous Silicon.*
- 2006 **Khalid Mehmood**, *Fabrication & Characterization of Carbon Nanotubes.*
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2006 **Zulqar-Nain Habib**, *Fabrication and Characterization of Metal Nanotubes.*

2006 **Mohsin Rafique**, *Study and numerical calculation of electronic structure of Si.*

2006 **Tariq Aziz**, *Study of electronic structure of GaAs with the help of Density Function Theory.*

1996 **Akhtar Hussain and M. Abdul Rauf Khan**, *Optical Properties of Chlorine Doped Zn_{0.9}Cd_{0.1}S Thin Films.*

1992 **Akram-ul-Haq**, *Optical Properties of Zn_xCd_{1-x}S Thin Films Evaporated by Electron Bombardment.*

1990 **Nigahat G. M. and Fauzia Tayyib**, *Temperature Dependent Electrical Conductivity of Doped Germanium.*

1990 **Ajaz Hassan Raza**, *Temperature Dependent Hall Effect of Doped Germanium.*

1989 **Abdul Hamid Khan**, *Measurement of Lattice Parameters of Potassium Bromide by X-Ray Diffraction.*

1989 **Muhammad Rafique**, *Study of Lattice Parameters of Sodium Chloride.*

1989 **Najam-ul Hassan**, *Determination of Lattice Parameters of Potassium Iodide by X-Ray Diffraction.*

Projects/Reports:

2010-2011 **AJ&K University research support project - Fabrication and Characterisation of Porous Silicon.** (In progress)

2010-2011 **HEC project maintenance of Scientific equipments (Scanning electron microscope: Jeol JSM-6510LV) (Done final report submitted).**

2008-2009 **Post Doctoral Research Report on Experimental Study of Quantum Structured Optoelectronic Devices: Intermediate Band Solar Cells, Submitted in partial fulfilment of requirement of postdoctoral fellowship of Higher Education Commission (HEC) of Pakistan/Australian National University (ANU) Department of Electronic Materials Engineering (EME), Research School of Physical Sciences and Engineering (RSPHysSE), Canberra ACT-0200, Australia**

1995-1996 **University/ U.G.C. Project - Characterisation of some Technologically important Materials in Thin Films form (done and facilitated the two M.Sc. research projects).**

1999-2005 **Commission of European Communities project No. CII-CT93-0076. A partially supported for Collaborative Study on Transition Metal Doped III-Vs Compound Semiconductors (Done as research project of Ph.D.)**

xxxx **HEC Infrastructure Facilities project: Provision of Liquid Nitrogen Plant: A Basic Infrastructure for Experimental Sciences "Cryogenics, Key to Advanced Science and Technology" (submitted via UAJK).**

Training Experience

Mar. 10-13, 2011 Sputter coater: **Jeol JFC-1600**

Jun 15-20, 2010 Fourier Transform Infrared Spectrometer: **Perkin Elmer Spectrum 100 with ATR**

May 23-26 2010 UV-Vis-IR Spectrometer: **Perkin Elmer Lambda-950**

Computer Courses:

Oct. 1989 - Jan. 1990, FORTRAN-77, Computer Centre, Azad Jammu and Kashmir University (AJ&KU), Muzaffarabad, Pakistan.

Jan. 1987 to Aug. 1987 Computer Orientation, P.O.F. Welfare Computer Centre, Wah Cantt, Pakistan.

Technical Courses:

Oct. 1983 to May 1984, Electrician Course, Allama Iqbal Open University, Islamabad, Pakistan.

Oct. 1982 to May 1983, Electrical Wiring, Allama Iqbal Open University, Islamabad, Pakistan.

Jun. 1977 to Jan. 1978, Photography, London Institute of Photography (Pvt), Karachi, Pakistan.

Conferences/ Seminar Organized

June 08, 2011 Seminar on “Vacuum Science and Technology”, University of Azad Jammu and Kashmir, Muzaffarabad.

April 12-14, 2004 Tutorial Course and Symposium on Topics in Semiconductors, Quaid-i-Azam University, Islamabad, Pakistan.

April 15-17, 2004 Workshop on Nanotechnologies, Quaid-i-Azam University, Islamabad, Pakistan.

April 08-10, 1999 Tutorial Course and Symposium on Topics in Semiconductors, Quaid-i-Azam University, Islamabad, Pakistan.

Computer Experience Application Programmes

Microsoft Windows, Origin, Sigma Plot, Microsoft Excel, Microsoft Word, Microsoft Power Point, Corel Draw, Adobe PhotoShop, Home suite, Netscape composer etc.

Membership of Scientific and Technical Societies

- Life member Pakistan Institute of Physics (PIP), Lahore, Pakistan.
 - Life member Pakistan Society for Semiconductor Science and Technology (PS³T), Quaid-i-Azam University, Islamabad; Pakistan.
 - Member Pakistan Physical Society (PPS). Islamabad; Pakistan.
 - Associate Member, Institute of Nanotechnology (IoN), USA.
 - Member Test and Technology Technical Council (ttc), USA, a sister society of IEEE, USA.
 - Member, The Australian Research Council Nanotechnology Network (ARCNN), Australia.
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