

DR.-ING. MUHAMMAD ATIF MAKHDOOM

MATERIALS ENGINEER | PROJECT MANAGER

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📍 Institute of Metallurgy & Materials Engineering
University of the Punjab Lahore 54590, Pakistan



Safety-focused and strategically agile credited with over 19 years' total experience and 16 years leadership delivering highly valued and engineered solutions, leading processes in automotive & Material Processing sector as senior Researcher and Project Manager.

Expert In: Semiconductor Processes & Thin-Film Deposition | Industrial Cleanroom Operations & Contamination Management | Research on Energy Storage & Harvesting | Project Management | Quality Management | Health, Safety & Environment

Dynamic researcher and materials engineer with a Ph.D. in Materials Engineering and extensive expertise in semiconductor technologies, and advanced thin-film processes. Proven experience in industrial cleanroom operations, contamination management, and materials research for energy storage, sensors, and energy harvesting. Committed to advancing sustainable solutions through innovative research and interdisciplinary collaboration.

Highly resourceful engineer and project manager with hands-on experience in processing materials with the purpose of transforming into useful products, from precision-made parts to huge components. Adept at determining client requirements, investigating product feasibility, completing product research, running tests, overseeing quality control, and monitoring product fatigue. Proven ability to drive sustained strategy, deliver production growth form strategic partnerships and successfully overseeing complex projects.

~ Technically proficient in ANSYS • SAP • MS Office, Visio • Origin • CATIA • SOLIDCast ~

ACADEMIC CREDENTIALS

- 2018 Ph.D Materials Engineering** | Friedrich Alexander Universität (FAU) Erlangen-Nürnberg, Germany
Title – Low temperature processing route of silicon nanoparticle layers for solar cell applications
- 2011 M.Sc Metallurgical and Materials Engineering** | University of Engineering & Technology Lahore, Pakistan
Title – Effect of alloying elements on the kinetics of carburising process
- 2005 B.Sc Metallurgical and Materials Engineering** | University of Engineering & Technology Lahore, Pakistan
Title: Development and characterization of Al-Si-C composite via stir casting.

EMPLOYMENT HISTORY

July 2009 – Present

UNIVERSITY OF THE PUNJAB | Lahore, Pakistan

Assistant Professor (Institute of Metallurgy & Materials Engineering – IMME)

Conduct research and supervise student projects in areas such as materials science, semiconductor processes, and energy-efficient solutions.

Develop and deliver innovative teaching materials and methodologies, continuously improving based on performance analysis and feedback.

Key Accomplishments/Responsibilities:

- Frequently organise seminars, colloquia, technical sessions and workshops on advanced materials for energy harvesting and storage, emphasizing sustainable practices.
- As a tutor for multiple student groups, supervised projects on the development of thin films and their integration into semiconductor devices, phosphor materials and other advanced material topics.
- As a University Teacher & core member of board of studies, lead and participate in the development and continuous upgradation of the curriculum for B.Sc and M.Sc/M.Phil engineering level in line with the regional and international technological needs.
- As a convener of Objective Base Education (OBE) system – Washington accord, involve in devising the new, and controlling the existing teaching methodologies within the institute along with the liaison of various institutional, alumni and industrial stake holders.
- Conduct lectures on key subjects as per expertise, directed individuals for competence enhancement in key areas using various exercises, tasks, assignments and projects.
- Committed to delivering top-notch support and fostering a positive learning environment for all students under my care.

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April 2008 – June 2009

KSB PUMPS COMPANY LIMITED | Hassanabdal, Pakistan

Assistant Manager (QHSE)

Stellar role as a core team member, actively participated in the rollout of IMS (Integrated Management System) & “HSE Transformation 2007” throughout the organization across the country.

Challenged with the responsibility of propelling strategic initiatives, and credited for effectively managing resources and utilised different statistical tools for the identification of problematic activity and took up issues with management for corrective actions.

Key Accomplishments:

- ↳ Strengthened compliance with standards for operations; developed and implemented QA system for KSB Foundry & Suppliers.
- ↳ Worked and led project for implementation of “Lean Six Sigma” in KSB Pumps in parallel to different Kaizen activities.

Oct. 2005 – April 2008

MILLAT EQUIPMENT LIMITED | Lahore, Pakistan

Assistant Manager (QA)

Being pioneer and core team member of PKR 700 million project, defined strategy to capitalize a holistic view on production, delivered strategic directions to a cross-functional and technically sophisticated team of individuals whilst effectively monitored the project status.

Cultivated professional relationships with a wide range of engineering and manufacturing personnel, both internal and external (3rd parties, Vendors) to the company, in order to expedite projects and ensure quality of incoming and outgoing manufactured products.

Key Accomplishments:

- ↳ Developed the complete QA department from design, construction, man-power hiring, training and system development.
- ↳ Enhanced operational efficiency by addressing the safety & operational requirements by deployment & dissemination of technology & best practices also supervised installation and initialization of equipment and machines.

Nov. 2004 – Aug. 2005

RIYADH HOUSE ESTABLISHMENT | Jeddah, Saudi Arabia

Site Engineer

Conceptualized and initiated site-planning projected to preparation for installation of machines and equipment by implementing best practices.

Entrusted with overall responsibility to supervise and perform all repair and operational activities to augment production.

Key Accomplishment:

- ↳ Delivered consistent quality of production by developing and enforcing good manufacturing practice and trouble shooting at site.

CONSULTANCY SERVICES

Nov. 2016 – April 2018

MATCHLESS ENGINEERING (PVT) LIMITED | Lahore, Pakistan

Chief Consultant (≤ 200 employees)

Supervised PKR 50 million project and expertly performed duties as a strategic overlay for institutionalization of Project Management Framework, rendered expertise in organisational development, technology solutions & evaluation of products development at all phases.

Steered strategies, propose and execute tactics to control and administer B2B and B2C supply chain cycle to ensure adherence to time frames, budgets and levels of performance through the project life cycle.

Key Accomplishment:

- ↳ With a focus towards continuous improvement and organizational development, devised appropriate HSE controls and QA systems for compliance within manufacturing segment while directing overall organizational systems.

April 2012 – Nov. 2012

RAVI AUTOS (PVT) LIMITED | Lahore, Pakistan

Foundry Technical Consultant

Directed stratagems and proficiently executed duties as a technological consultant, monitoring & assessment of products development at all phases from raw material to final product.

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Key Accomplishments:

- ↳ Streamlined, rectified and clarified all operations and activities in accordance with the standard operating procedures for optimum product development.
- ↳ Spearheaded all project and supply chain endeavours with health and safety by implementing best practices.

PROFESSIONAL DEVELOPMENT

Trainings & Certifications:

- ↳ SOLIDCast® Simulation Software for Castings - USA
- ↳ BUEHLER Course on Metallography - Germany
- ↳ ELSEVIER Certified Peer Reviewer Course
- ↳ Material Oriented Micro/Nano Manufacturing: Modelling, Experiment and Applications - Germany
- ↳ Balance Score Card and KPIs Development - Pakistan
- ↳ Application of Feeder Sleeves on Ductile Iron Casting and Preventing the Potential Defects - PFA, Pakistan & Cukurova Kimya Endüstrisi A.S, Turkey
- ↳ 4th CENEM Summer School for X-Ray Scattering 2018 - Germany
- ↳ Operational & Basic Troubleshooting of SHIMADZU Testing Equipment - Singapore
- ↳ Entrepreneurship I: Laying the Foundation - UIUC, USA
- ↳ Certified Quality Professional - Pakistan
- ↳ PRIMAVERA Advance - PEC, Pakistan
- ↳ Filtration and Gating System Calculation - PFA, Pakistan & FOSECO, UK

Journal Reviewer:

- ↳ ACS Omega
- ↳ Materials Chemistry and Physics

Conferences, Symposia and Workshops:

Attended

- ↳ MS&T 12 at Pittsburgh, USA (Speaker)
- ↳ TestXpo 2011 - 20th International Forum for Materials Testing at Zwick/Roell Ulm, Germany
- ↳ International Workshop on "Biomaterials and Tissue Engineering" at IST Islamabad, Pakistan.
- ↳ Workshop on "Objective Based Education (OBE)" at IMME- University of the Punjab Lahore, Pakistan
- ↳ "International Conference on Advances in Material Science and Environmental Engineering 2021" at NED- UET Karachi, Pakistan (Invited speaker)
- ↳ Workshop on "Casting for Industrial Applications" at IST Islamabad, Pakistan (Invited speaker)
- ↳ Workshop on "Capacity Building on Objective Based Education (OBE) Implementation" at IQTM-University of the Punjab Lahore, Pakistan
- ↳ 7th International Conference on "Energy Conservation and Efficiency (ICECE) 2024" at UET Lahore, Pakistan (Invited speaker)
- ↳ "AFS Venture Spark 2023" at MNS University of Agriculture Multan, Pakistan
- ↳ Engineering CAPSTONE Expo-22 at Lahore, Pakistan
- ↳ Workshop on OBE/OBA for PEC PEVs, Faculty and Quality Directors by Pakistan Engineering Council
- ↳ Workshop on "Quality Improvement of Castings" at DESCOM, Heavy Industries Taxila, Pakistan (Invited speaker)

Organised

- ↳ Workshop on "ASME Section VIII - division-1" at IMME- University of the Punjab Lahore, Pakistan
- ↳ Workshop on "Non-Destructive Evaluation of Weldments & their Remedies" at IMME-University of the Punjab Lahore, Pakistan
- ↳ Symposium on "Frontiers of Engineering Materials 2024" at IMME-University of the Punjab Lahore, Pakistan
- ↳ Seminar on "Additive Manufacturing of Bio-Materials" at IMME- University of the Punjab Lahore, Pakistan
- ↳ Seminar on "US Patent Application Process" at IMME-University of the Punjab Lahore, Pakistan

Awards and Achievements:

- ↳ 2nd Prize at Engineering CAPSTONE Expo-22.
- ↳ 3rd Prize at National Projects Competition at Pakistan Auto Show-22.
- ↳ Research Award 2023 by Pakistan Engineering Council
- ↳ 3rd Prize at "Invention to Innovation Summit 2024" held at National level.
- ↳ Incentive Awards for the years 2016, 2017, 2019, 2021 by University of the Punjab Lahore, Pakistan.
- ↳ Special Prize at "AFS Venture Spark 2023" at MNS University of Agriculture Multan, Pakistan.

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Membership of Professional Bodies:

- ↪ Association for Iron & Steel Technology (AIST)
- ↪ Pakistan Engineering Council
- ↪ The American Ceramic Society (ACerS)

Community Services:

Member

- ↪ Focal Person of Career Counselling & Placement Centre, University of the Punjab Lahore, Pakistan
- ↪ Member of Board of Studies, IMME-University of the Punjab Lahore, Pakistan
- ↪ Member of Board of Faculty, Faculty of Chemical and Materials Engineering, University of the Punjab Lahore, Pakistan.
- ↪ Member of Departmental Doctoral Program Committee (DDPC), IMME-University of the Punjab Lahore, Pakistan
- ↪ Member of Program Management Committee of IMME-University of the Punjab Lahore, Pakistan
- ↪ Member of Examination Committee of IMME-University of the Punjab Lahore, Pakistan
- ↪ Member of GRE/HAT Test Committee of IMME-University of the Punjab Lahore, Pakistan

Convener

- ↪ Convener of Curriculum revision committee of IMME-University of the Punjab Lahore, Pakistan for B.Sc. Metallurgy and Materials Engineering program for the intake 2024-25 onwards.
- ↪ Convener of Curriculum development committee of IMME-University of the Punjab Lahore, Pakistan for M.Sc. Materials Science program for the intake 2023-24 onwards.
- ↪ Convener of IMME journal, Website and Media Committee
- ↪ Convener of Career Counselling Centre of IMME-University of the Punjab Lahore, Pakistan
- ↪ Convener of QEC & OBE Committee of IMME-University of the Punjab Lahore, Pakistan.
- ↪ Convener of Science Communication Society (SciComS) of IMME-University of the Punjab Lahore, Pakistan
- ↪ Convener of Seminar/Conferences Committee of IMME-University of the Punjab Lahore, Pakistan
- ↪ Organiser of Industrial Tours, Trainings and Linkages at IMME-University of the Punjab Lahore, Pakistan.

Languages:

- ↪ English (Expert User)
- ↪ Urdu (Native)
- ↪ German (A2)
- ↪ Arabic (Moderate User)

REFERENCES

- ↪ Prof. Dr. Furqan Ahmad
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PATENT & PUBLICATIONS

Patent:

- ↪ V. Sgobba, **M. Atif Makhdoom**, N. Gawehns, E. Stern, H. J. Egelhaaf, C. J. Brabec, Verfahren zum Entfernen einer Oxidschicht bei Silizium-Nanopartikeln.
(Patent application No: DE 10 2016 216 125.3).

Publications:

- ↪ **Muhammad Atif Makhdoom***, Muhammad Abubakar Qamar, Iftikhar Ahmed Channa, Muhammad Awais, Muhammad Umer, Muhammad Asad, Zaeem ur Rehman, Abdulaziz Alhazaa, (2024), "High Strength Resistance Spot Welding of Dissimilar Metals without Cover Plate", ACS Omega, (Submitted).
- ↪ Rabia Hayee, Mehwish Iqtedar, Norah A. Albekairi, Abdulrahman Alshammari, **Mauhammad Atif Makhdoom**, Muhammad Islam, Nadeem Ahmed, Muhammad Fawad Rasool, Chen Li, Hamid Saeed. (2024), "Levofloxacin Loaded Chitosan and Poly-lactic-co-glycolic acid Nano-particles against Resistant Bacteria; Synthesis, Characterization and Antibacterial Activity", Journal of Infection and Public Health, 17 (5), 906-917.

- **Muhammad Atif Makhdoom***, Carola Krysch, (2024) "Progress on Solution Processed Si-Nanoparticle Solar Cells towards New Generation Photovoltaics", *Optik*, 300, 171626.
- Ehsan Ul Haq, Furqan Ahmed, Faseeh U Rehman, Iftikhar Ahmed Channa, **Muhammad Atif Makhdoom**, Junaid Shahzad, Tooba Shafiq, Muhammad Zain-ul-Abdein, Muhammad Ali Shar, Abdulaziz Alhazaa, (2023), "Synthesis and Characterization of a Titanium-Based Functionally Graded Material-Structured Biocomposite using Powder Metallurgy", *ACS Omega*, 8 (32), 28976-28983.
- Laraib Sarfaraz Khanzada, **Muhammad Atif Makhdoom***, Xianzhong Lin, Hamed Azimi, Christoph J. Brabec, (2023), "Photocurrent Generation and Charge Transport Mechanism Study in Solution-Processed CZTS Thin Films", *Optik*, 272, 170381.
- **Muhammad Atif Makhdoom***, Furqan Ahmad, Iftikhar Ahmed Channa, Aqil Inam, Fahad Riaz, Sajid Hussain Siyal, Muhammad Ali Shar, Abdulaziz Alhazaa, (2022), "Effect of Multiple Thermal Cycles on the Microstructure and Mechanical Properties of AISI 1045 Weldments", *ACS Omega*, 7 (46), 42313.
- Muhammad Zain-ul-Abdein, Furqan Ahmed, Iftikhar Ahmed Channa, **Muhammad Atif Makhdoom**, Raza Ali, Muhammad Ehsan, Abdullah Aamir, Ehsan Ul Haq, Muhammad Nadeem, Hafiz Zahid Shafi, Muhammad Ali Shar, Abdulaziz Alhazaa, (2022), "Synthesis of Geopolymer from a Novel Alumino-Silicate Based Natural Soil Precursor Using Electric Oven Curing for Improved Mechanical Strength", *Materials*, 15, 7757.
- Muhammad Faheem Maqsood, Mohsin Ali Raza, Zaeem Ur Rehman, Asima Tayyeb, **Muhammad Atif Makhdoom**, Faisal Ghafoor, Umar Latif, Muhammad Farooq Khan, (2022), "Role of Solvent Used in Development of Graphene Oxide Coating on AZ31B Magnesium Alloy: Corrosion Behavior and Biocompatibility Analysis", *Nanomaterials*, 12, 3745.
- Fatima Masood, **Muhammad Atif Makhdoom***, Iftikhar Ahmed Channa, Sadaf Jamal Gilani, Ahmad Khan, Rabia Hussain, Syeda Ammara Batool, Kiran Konain, Saeed Ur Rahman, Abdul Wadood, May Nasser bin Jumah, Muhammad Atiq ur Rehman, (2022), "Development and Characterization of Chitosan and Chondroitin Sulfate Based Hydrogels Enriched with Garlic Extract for Potential Wound Healing/Skin Regeneration Applications", *Gels*, 8, 676.
- Syeda Ammara Batool, Ushna Liaquat, Iftikhar Ahmed Channa, Sadaf Jamal Gilani, **Muhammad Atif Makhdoom***, Muhammad Yasir, Jaweria Ashfaq, May Naseer Bin Jumah, Muhammad Atiq ur Rehman, (2022), "Development and Characterization of Zein/Ag-Sr Doped Mesoporous Bioactive Glass Nanoparticles Coatings for Biomedical Applications", *Bioengineering*, 9, 367.
- Furqan Ahmed, Muhammad Zain-ul-abdein, Iftikhar Ahmed Channa, Muhammad Kamran Yaseen, Sadaf Jamal Gilani, **Muhammad Atif Makhdoom**, Muhammad Mansoor, Usman Shahzad, May Nasser Bin Jumah, (2022), "Effect of Ultrasonic Surface Mechanical Attrition Treatment Induced Nanograins on the Mechanical Properties and Biocompatibility of Pure Titanium", *Materials*, 15 (15), 5097.
- Iftikhar A. Channa, Jaweria Ashfaq, Sadaf Jamal Gilani, Ali Dad Chandio, Sumra Yousuf, **Muhammad Atif Makhdoom**, May Nasser bin Jumah, (2022), "Sustainable and Eco-Friendly Packaging Films Based on Poly (Vinyl Alcohol) and Glass Flakes" *Membranes*, 12 (7), 701.
- Muhammad Ans, **Muhammad Atif Makhdoom***, Muhammad Faisal Irfan, Anzum Al Abir, (2022), "Optimized Modelling and Kinetic Analysis of Nickel Recovery from Waste Orthodontic Implants using Response Surface Methodology", *Journal of Minerals Engineering*, 175, 107279.
- Iftikhar Ahmed Channa, Muhammad Rizwan, Ali Dad Chandio, **Muhammad Atif Makhdoom**, Aqeel Ahmed Shah, Muhammad Ali Shar, Asif Mahmood, (2021), "Process Parameter Optimization of a Polymer Derived Ceramic Coating for Producing Ultra-High Gas Barrier", *Materials*, 14 (22), 7000.
- **Muhammad Atif Makhdoom***, Vito Sgobba, Iftikhar Ahmed Channa, Nidia Ghewins, (2021), "Producing Oxide Free Silicon Nanocrystals – A Novel & Benign Approach", *Optik*, 246, 167789.
- Ali Dad Chandio, Iftikhar Ahmed Channa, Muhammad Rizwan, Shakeel Akram, Muhammad Sufyan Javed, Sajid Hussain Siyal, Muhammad Saleem, **Muhammad Atif Makhdoom**, Tayyaba Ashfaq, Safia Khan, Shahid Hussain, Munirah D. Albaqami, Reham Ghazi Alotabi, (2021), "Polyvinyl Alcohol and Nano-clay based Solution Processed Packaging Coatings", *Coatings*, 11 (8), 942.
- N Jhamat, H Amaad, G Mustafa, N. A Nawaz, M Bashir, **Muhammad Atif Makhdoom**, (2021), "Entropic Distance-based Classification of Tourist Attractions Using K* Learner: An Instance-based Approach", *Journal of the Research Society of Pakistan*, 58 (1), 123.
- **Muhammad Atif Makhdoom***, Vito Sgobba, Laraib Sarfaraz Khanzada, S. Fladischer, E. Spiecker, (2019), "Tailoring the Charge Transport Properties of Printable Silicon Nanocrystals by Conjugated Organic Ligands", *Physica Status Solidi A*, 216 (11), 1900040.
- **Muhammad Atif Makhdoom***, Laraib Sarfaraz Khanzada, Vito Sgobba, (2019), "Charge Transport Mechanism in Thick-Films of Surface Functionalized Silicon Nanocrystals", *Journal of Nanoelectronics and Optoelectronics*, 14 (10), 1401-1407.
- **Muhammad Atif Makhdoom***, Akhlaq Ahmad, Muhammad Kamran, Kamran Abid, Waseem Haider, (2017), "Microstructural and Electrochemical Behavior of 2205 Duplex Stainless Steel Weldments", *Surfaces and Interfaces*, 9, 189-195.
- Tahir Ahmad, Syed Shehzad Raza, Ehsan Aleem, Muhammad Kamran, Umar Manzoor, **Muhammad Atif Makhdoom**, Rafiq Ahmad, S. Mukhtar (2017). "Improvement in Mechanical and Thermal Properties of Unsaturated Polyester-Based Hybrid Composites", *Iranian polymer journal*, 26 (4), 305-311.
- T. Kazmi, K. A. Bhatti, Gul Hameed Awan, W. Amin, Tahir Ahmad, Muhammad Kamran, **Muhammad Atif Makhdoom**, (2016), "Structural, Morphological, and Mechanical Properties of Laser Irradiated AA-2024-T3 Aluminum Alloy Sheet", *Journal of Pakistan Institute of Chemical Engineers*, 44 (1).

- **Muhammad Atif Makhdoom***, Muhammad Kamran, Gul Hameed Awan and S. Mukhtar (2013). "Effect of Multipasses on Microstructure and Electrochemical Behavior of Weldments", Metallurgical and Materials Transactions A, 44 (12), 5505-5512.