Muhammad Ejaz Khan, PhD

Associate Professor

School of Computing, C-1 Building, Room 102, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF-IAST), Kanpur Road Mang, Haripur, Pakistan
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Total Experience: 19 Years

PROFESSIONAL SUMMARY

As an innovative computational scientist and seasoned educator with a Ph.D. from KAIST, I offer about two decades of expertise, currently serving as an Associate Professor at School of Computing School of Computing, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF-IAST), Pakistan. I have also held leadership roles including Department Chairperson and Director of the Local Quality Enhancement Cell at NUTECH, Pakistan. Moreover, I have a proven track record in research. My research mainly focuses on simulation of bulk as well as low-dimensional nanostructures for electronic, optoelectronic, renewable energy harvesting, and biomedical devices. As a Research Scientist at KAIST, an Assistant Professor at COMSATS, and Associate Professor at NUTECH, I bring proficiency in theoretical modelling and development of advanced quantum computational methods and tools utilizing power of high-performance computing for various applications including a commercial quantum dot simulation software for LG Display Korea. Additionally, over the past few years, I am actively involved in developing AI-powered platforms for disabled individuals and medical assistive technologies. Passionate about integrating cutting-edge research with dynamic teaching, I am well-equipped to contribute effectively to the integration of academia and pioneering research.

EDUCATION

02.2010-11.2015	PhD in Nanoscience and Technology, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea
10.2007-09.2008	MS in Microelectronics and System on Chip Engineering, Lancaster University, United Kingdom
09.2002-08.2006	BS in Computer Engineering, COMSATS Institute of Information Technology, Pakistan

PROFESSIONAL QUALIFICATION

05.2024-Present **Professional Engineer**, Pakistan Engineering Council (PEC), Islamabad, Pakistan (PEC No. COMP/05476)

04.2025-Present **Program Evaluator (PEV)** in PEC Expert Pool, Pakistan Engineering Council (PEC), Islamabad, Pakistan

RESEARCH INTESESRTS

Approaches

Computational Approaches and Algorithm Development

- Expertise in developing and implementing algorithms through computational approaches, including density functional theory, force field, tight-binding, effective mass approximation, and artificial intelligence & machine learning.

Applications:

Organic-Inorganic Hybrid Halide Perovskites-based Devices

- Design and optimization of materials for high-efficiency solar cells and electronic devices, integrating coding for performance enhancement.

Semiconducting Devices

- Utilizing coding expertise integrated experimental collaborations to design and develop the industrial semiconductor devices for electronic and optoelectronic applications.

Thermoelectric Devices

- Development of sustainable energy solutions by combining programming and simulation skills with the advancement of thermoelectric technologies.

Heat and Electronic Spin Transport in Nanomaterials

- Investigating fundamental aspects of heat and electronic spin transport in nanomaterials.

AI-powered Assistive Technologies for Disabilities and Biomedical Applications

- AI platform integrated devices to support disabilities and assistive technology-based devices for biomedical applications.

PROFESSIONAL EXPERIENCE

05.2025-present **Associate Professor**, School of Computing, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF-IAST), Kanpur Road Mang, Haripur, Pakistan

01.2025-04.2025	**Professor**, Computer Engineering Department, National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
06.2022-04.2025	**Associate Head of Department**, Computer Engineering Department, National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
08.2019-12.2024	**Associate Professor**, Computer Engineering Department, National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
06.2024-09.2024	**Visiting Scientist,** Shanghai Institute of Ceramics, Chinese Academy of Sciences (SICCAS), Shanghai, China
10.2019-07.2023	**Director,** Local Quality Enhancement Cell (LQEC), National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
05.2020-07.2020	**Head of Department**, Computer Engineering Department, National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
09.2016-08.2019	**Research Scientist**, School of Electrical Engineering, KAIST, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea
01.2016-08.2016	**Assistant Professor**, Electrical Engineering Department, COMSATS Institute of Information Technology, Pakistan
02.2010-12.2015	**Research Fellow**, Graduate School of Nano Science and Technology, KAIST, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea
02.2007-01.2010	**Lecturer**, Electrical Engineering Department, COMSATS Institute of Information Technology, Pakistan

PROFESSIONAL/MASTER TRAINER

May 16, 2024	**Training on Outcome-Based Education (OBE) System,** National University of Technology (NUTECH), IJP Road, Sector I-12, Islamabad 44000, Pakistan.

Aug 02-10, 2023	**Steam Xplorer Camp: Game Development, Web Development, AI & Robots, Programming Drones**, National University of Technology (NUTECH), Sector H-12 Islamabad 44000, Pakistan.
Dec 01, 2022	**Density Functional theory Approach to Simulate Perovskite Material Properties and their Environmental Stabilization: A one Day Hands-on Workshop,** CPD 1.0, National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan.
Sept 29, 2022	**One-day Hands-on Workshop Towards fabrication of Photovoltaic and Optoelectronic Devices,** CPD 1.0, US-Pakistan Center for Advanced Studies in Energy (USPCAIS-E), Peshawar, Pakistan.
Feb 15-16, 2022	**Training on Outcome-Based Education (OBE) System,** National University of Technology (NUTECH), IJP Road, Sector I-12, Islamabad 44000, Pakistan.
July 15-31, 2019	**Pre-Undergraduate Research Program (Pre-URP): Introduction to First-Principles Calculations**, School of Electrical Engineering, Korea Advanced Institute of Science & Technology (KAIST), 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

PROFESSIONAL TRAININGS/PERSONAL DEVELOPMENT

Aug 22-23, 2022	**Advanced level training session on Outcome-Based Education (OBE)** to implement quality benchmarking according Washington Accord (WA) regulations by Prof. Megat Johari from Malaysia (a senior WA Reviewer), National University of Technology (NUST), Sector H-12 Islamabad 44000, Pakistan
Feb 09-10, 2022	**Training on Accreditation of Undergraduate Engineering Programs,** National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
Nov 01-02, 2021	**Outcome-Based Education (OBE) Training Workshop,** National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
July 28-30, 2021	**Training on Outcome-Based Education (OBE) System,** National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan

Feb 10-17, 2020	**Faculty Training on Effective Teaching and Learning in Context of Outcome-Based Education (OBE),** National University of Technology (NUTECH), IJP Road, Sector I-12 Islamabad 44000, Pakistan
Dec 04-05, 2019	**International Conference on Quality Assurance System, Standards and Polices: issues and challenges**, Serena, Islamabad, Pakistan.
Feb 12-23, 2007	**Faculty Development Workshop**, COMSATS Institute of Information Technology, Pakistan
May 08-09, 2007	**Organizer**, All Pakistan Student Competition on Embedded Systems and Microcontroller Applications, COMSATS Institute of Information Technology, Pakistan

INVITED TALKS

[6] Muhammad Ejaz Khan, "Atomic-scale view of degradation mechanism and improving stability of halide perovskites for solar cells", 5th International Chemistry Conference on "Recent Trends in Chemistry", Allama Iqbal Open University, Islamabad, March 15-16, 2023

[5] Muhammad Ejaz Khan, "The Time-Dependent Schrödinger Equation", Scientific Computing Seminar, May 23, Korea Advanced Institute of Science and Technology, Daejeon, Korea, (2019).

[4] Muhammad Ejaz Khan, "Development of an effective mass approximation approach based on first-principles data for the design of quantum nanostructures", NP-O-15, 2019 EDISON Challenge, Jan. 24-25, Daejeon, Korea, (2019).

[3] Muhammad Ejaz Khan, "Nano-Thermodynamic: Stability of Defects, Edges, Surfaces and Interfaces", First-Principles Calculations for Nano Materials Colloquium, Dec. 6, Korea Advanced Institute of Science and Technology, Daejeon, Korea, (2018).

[2] Muhammad Ejaz Khan, "Transmission Eigenchannels and Eigenvectors", 2018 DFT & Beyond Winter Workshop, Feb. 12-14, Muju, Korea, (2018).

[1] Muhammad Ejaz Khan, "Development of EMA Simulation Platform for Multidimensional Quantum Dots", EDISON-Nanophysics Winter Meeting, Busan, Korea, (2016).

JOURNAL PUBLICATIONS

[21] Muhammad Ejaz Khan, * Muhammad Aamir, Chen Ming, Yi-Yang Sun, Yong-Hyun Kim, "Interfacial thermal resistance modulation in low-dimensional graphene/boron nitride Heterostructures for energy harvesting applications" *FlatChem*, **51**, 100846 (2025). (***Corresponding Author)** IF = 5.9

[20] Muzayyab masood, Muhammad Aamir, **Muhammad Ejaz Khan**, Muhammad Sher, khushbakhat khan, Hafiz Zahid Shafi , Md. Akhtaruzzaman, Hamad Almohamadi, and Md. Shahiduzzaman "Unrevealing the Potential of Multicomponent Metal Ion Incorporation and Sulfide Modification in Cobalt Oxide for Efficient Water Oxidation" *Energy Adv*., **3**, 2042-2050 (2024). IF = 3.2

[19] Uzma Yunus, **Muhammad Ejaz Khan**,* Saiqa Sadiq, Muhammad Aamir, Zakir Ullah, Moazzam H Bhatti, Mohammad Sher "Methotrexate-loaded Fe-metal organic frameworks: Synthesis, characterizations, and drug release investigations" *Drug Deliv. Sci. Technol.*, **97**, 105790 (2024) (***Corresponding Author**). IF = 5

[18] Qamar Wali, **Muhammad Ejaz Khan**, Muhammad Aamir, Rajan Jose, Wei Fan, and Shengyuan Yang "Tin Oxide as an Electron Transport layer in Perovskite Solar Cells: Advances and Challenges", *Sol. Energy,* **270**, 112382 (2024). IF = 7.188

[17] Farva Nayab, Muhammad Aamir, **Muhammad Ejaz Khan,*** Qamar Wali Muhammad Sher, Hafsa Khurshid, and Javeed Akhtar "Color-Tunable Stable Quasi-2D Hybrid Metal Halide Perovskites: Synthesis, Characterization, and Optical Analysis" *Phys. Chem. Chem. Phys.,* **26**, 6058-6067 (2024) (***Corresponding Author**). IF = 3.945

[16] Saba Pervaiz, Muhammad Aamir, Qamar Wali, **Muhammad Ejaz Khan**, Mamoona Sattar, Muhammad Sher, **"**Fabrication of aqueous stable CH3NH3PbBr3 perovskite: Addressing optoelectronics and fluorescent sensing applications", *Sustain. Chem. Env.,* **5**, 100059 (2024)

[15] Qamar Wali, Faiza Jan Iftikhar, **Muhammad Ejaz Khan**, Andrew Balilonda, Muhammad Aamir, Wei Fan a , Shengyuan Yang, "High Efficiency (>20%) and Stable Inverted Perovskite Solar Cells: Current Progress and Future Challenges", *J. Mater. Chem. C,***10**, 12908-12928 (2022). IF = 8.067

[14] Muhammad Ejaz Khan, Qamar Wali, Muhammad Aamir, Yong-Hyun Kim, "Spin Transport Properties of Carbon Nanotubes by Ferromagnetic Zigzag Triangular Defects: A first-principles study", *Mater. Today Commun.,* **32,** 104074 (2022). (***Corresponding Author**). IF = 3.662

[13] Juho Lee†, **Muhammad Ejaz Khan**†, and Yong-Hoon Kim "Quantum hybridization negative differential resistance from non-toxic halide perovskite nanowire heterojunctions and its strain control", *Nano Converg.*, **9**, 1-8 (2022). (**†: Co-First Author: Equal contribution)** IF = 11.7

[12] Tariq Jamil, Shamsa Munir, Qamar Wali, **Muhammad Ejaz Khan,** Rajan Jose, "Water purification through a novel electrospun carbon nanofibers membrane", *ACS Omega,* 6, 34744–34751 (2021). IF = 3.512

[11] Qamar Wali, Muhammad Aamir, Abid Ullah, Faiza Jan Iftikhar, **Muhammad Ejaz Khan**, Javeed Akhtar, Shengyuan Yang, "Fundamentals of Hysteresis in Perovskite Solar Cells: From Structure-Property Relationship to Neoteric Breakthroughs", *Chem. Rec.,* **21**, 1-28 (2021). IF= 6.771

[10] Faiza Jan Iftikhar, Qamar Wali, Shengyuan Yang, Yaseen Iqbal, Rajan Jose, Shamsa Munir, Irfan A Gondal, **Muhammad Ejaz Khan**[*], "Structural and Optoelectronic Properties of Hybrid Halide Perovskites for Solar Cells" *Org. Electron.*, **91**, 106077 (2021) (***Corresponding Author**). IF = 3.721

[9] Nikolai Tsevtkov[†], **Muhammad Ejaz Khan[†],** Byeong Cheul Moon, Yong Hoon Kim, and Jeung Ku Kang, "Strain-Induced Metallization and Defect Suppression at Zipper-like Interdigitated Atomically Thin Interfaces Enabling High-Efficiency Halide Perovskite Solar Cells", *ACS Nano*, **15**, 1805 (2021), (**†: Co-First Author: Equal contribution**). IF = 18.027

[8] Hyeonwoo Yeo, Jun Seong Lee, **Muhammad Ejaz Khan**, Hyo Seok Kim, Duk Young Jeon, Yong-Hoon Kim, "First-Principles-Derived Effective Mass Approximation for the Improved Description of Quantum Nanostructures", *J. Phys. Mater.* **3**, 034012 (2020). IF = 5.665

[7] Qamar Wali, Faiza Jan Iftikhar, **Muhammad Ejaz Khan**, Abid Ullah, Yaseen Iqbal, Rajan Jose, "Advances in stability of perovskite solar cells" *Org. Electron.*, **78**, 105590 (2020). IF = 3.721

[6] Joong Il Jake Choi[†], **Muhammad Ejaz Khan[†]**, Zafer Hawash, Hyunhwa Lee, Luis K. Ono,Yabing Qi, Yong-Hoon Kim, Jeong Young Park, "Surface Termination-Dependent Nanotribological Properties of Single-Crystal $MAPbBr_3$ Surfaces," *J. Phys. Chem. C*, **124**, 1484-1491 (2020) (**†: Co-First Author: Equal contribution**) IF = 4.309

[5] Joong Il Jake Choi[†], **Muhammad Ejaz Khan[†]**, Zafer Hawash, Hyunhwa Lee, Luis K. Ono, Yabing Qi, Yong-Hoon Kim and Jeong Young Park, "Atomic-scale view of stability and degradation of single-crystal $MAPbBr_3$ surfaces", *J. Mater. Chem. A*, **7**, 20760 (2019). **(†: Co-First Author: Equal contribution**) IF = 12.732

[4] Muhammad Ejaz Khan, Juho Lee, Seongjae Byeon, and Yong-Hoon Kim, "Semimetallicity and Negative Differential Resistance from Hybrid Halide Perovskite Nanowires", *Adv. Funct. Mater.*, **29**, 1807620 (2019). **Journal Cover Page + Media Coverage**. IF = 18.808

[3] Jaehyeon Kim, **Muhammad Ejaz Khan**, Jae-Hyeon Ko, Jong Hun Kim, Eui-Sup Lee, Joonki Suh, Junqiao Wu, Yong-Hyun Kim, Jeong Young Park, and Ho-Ki Lyeo, "Bimodal Control of Heat Transport at Graphene–Metal Interfaces Using Disorder in Graphene", *Scientific Reports* **6**, 34428 (2016). IF = 4.610

[2] Muhammad Ejaz Khan, Peng Zhang, Yi Yang Sun, S.B. Zhang, Yong-Hyun Kim, "Tailoring graphene magnetism by zigzag triangular holes: A first-principles thermodynamics study", *AIP Advances*, **6**, 035023 (2016). IF = 1.579

[1] Muhammad Ejaz Khan, S. F. Shaukat and S. Monk, "Monte Carlo GPS Based Solution for Speed Limit Indicator", *World Applied Science Journal*, **6**, 1691, (2009). IF = 0.470

BOOKS/MAGAZINES

[1] Book "Smart Multifunctional Nano-inks: Fundamentals and Emerging Applications" Chapter "MXenes for energy applications", Elsevier, ISBN: 978-0-323-91145-0, October 28, 2022

[2] "Developing High Efficiency Perovskite Solar Cells through Additive Engineering", *in press* (2025)

CONFERENCE PAPERS/TALKS/POSTERS

[23] Min Jong Noh, **Muhammad Ejaz Khan**, Yong-Hoon Kim "Atomistic Mechanism of MoS_2 Oxidation Induced by Reactive Superoxide and Ozone Treatment: A First-principles Study", Talk R59.00012, American Physical Society (APS) March Meeting 2021, March 15–19, Virtual, USA, (2021).

[22] Muhammad Ejaz Khan, Hyeonwoo Yeo, and Yong-Hoon Kim, "Environmental Effects on Degradation Mechanisms of Hybrid Perovskite Surface and Work Function Controlling through Ligand Change", Talk H4-06, Korean Physical Society (KPS) Fall 2019 Meeting, Oct 23-25, Gwangju, Korea, (2019).

[21] Muhammad Ejaz Khan, Hyo Seok Kim, Jun Seong Lee and Yong-Hoon Kim, "First-Principles Based Effective-Mass Approximation for the Improved Description of Quantum Nanostructures", Poster P-co-205, Korean Physical Society (KPS) Fall2019 Meeting, Oct 23-25, Gwangju, Korea, (2019).

[20] Choi, Joong Il Jake, **Muhammad Ejaz Khan**, Jafer Hawash, Hyunhwa Lee, Luis Ono, Yabing Qi, Yong-Hoon Kim, and Jeong Young Park. "Atomic-scale study of the degradation

process on single-crystal perovskite surfaces: From ultra-high vacuum to ambient pressures." In Abstracts of Papers of The American Chemical Society, Vol. 258. 1155 American Chemical Society (ACS) Fall 2019 Meeting, August 25-29, San Diego Convention Center, San Diego, USA, 2019.

[19] Junga Ryu, **Muhammad Ejaz Khan**, Juho Lee, Hanseul Kim, Yong-Hoon Kim, "First-principles investigation of the mechanisms of oxidation in atomic layered MoS2 structures", Graphene 2019, June 25-28, Phantoms Foundation, Rome, Italy (2019)

[**18] Muhammad Ejaz Khan** and Yong-Hoon Kim, "Atomic-Scale Degradation Mechanisms of Hybrid Perovskite $CH_3NH_3PbBr_3$ Surface: An Ab Initio Study", Poster B. 5.44, European Materials Research Society (E-MRS) Spring 2019 Meeting, May 26-31, Nice, France, (2019).

[17] Muhammad Ejaz Khan and Yong-Hoon Kim, "Degradation Mechanisms of the Hybrid Halide Perovskite and Protection of Environmental Stability through Surface Passivation", Talk I3-06, Korean Physical Society (KPS) Spring 2019 Meeting, April 24-26, Daejeon, Korea, (2019).

[16] Muhammad Ejaz Khan, Juho Lee, Seongjae Byeon, and Yong-Hoon Kim, "Prediction of Semimetallicity and Negative Differential Resistance from Hybrid Halide Perovskite Nanowires", Poster PO-44, The 21st Asian Workshop on First-Principles Electronic Structure Calculations, Oct. 29-31, Daejeon, Korea, (2018).

[15] Muhammad Ejaz Khan, Seongjae Byeon and Yong-Hoon Kim "Nanostructuring of Hybrid Halide Perovskites Down to stable Low-Dimensional and Semi-Metallic Allotropes: An *ab initio* study", Talk H7.06, Korean Physical Society (KPS) Spring 2018 Meeting, April 25-27, Daejeon, Korea, (2018).

[14] Muhammad Ejaz Khan, Seongjae Byeon and Yong-Hoon Kim "Nanostructuring of Hybrid Halide Perovskites Down to stable Low-Dimensional and Semi-Metallic Allotropes: An *ab initio* study", Talk MAR18-2891536, American Physical Society (APS) March Meeting 2018, March 5-9, Los Angeles, California, USA, (2018).

[13] Muhammad Ejaz Khan, Hyo Seok Kim, and Yong-Hoon Kim, "First-Principles Data-based Effective Mass Approximation Approach for the Design of Quantum Nanostructures for Optoelectronic Applications", Poster P-083, The 20th Asian Workshop on First-Principles Electronic Structure Calculations, Oct. 30-Nov. 1, Nanjing, China, (2017).

[12] Han Seul Kim, **Muhammad Ejaz Khan**, Hyo Seok Kim, Yong-Hoon Kim, "Development of non-equilibrium first-principles simulation methods for the design of next-generation nanodevices", '*invited talk given by Prof. Yong-Hoon Kim*', The 20th Asian Workshop on First-Principles Electronic Structure Calculations, Oct. 30-Nov. 1, Nanjing Univ., Nanjing, China, (2017).

[11] Tae Hyung Kim, Hu Sung Kim, **Muhammad Ejaz Khan**, Yong-Hoon Kim, "Electrical and thermal transport properties ofcarbon chains encapsulated within single-walled carbon nanotubes", Poster P-098 , The 20th Asian Workshop on First-Principles Electronic Structure Calculations, Oct. 30-Nov. 1, Nanjing University, Nanjing, China, (2017).

[10] Yong-Hoon Kim, **Muhammad Ejaz Kha**n, Hyo Seok Kim, "OORI-QNANO: An Effective Mass Approach Code for the Design of Semiconductor Nanostructures for Optoelectronic Applications", Satellite Session Poster, Nano Korea Symposium 2017, July 12-14, Ilsan, Kintex, Korea, (2017).

[9] Muhammad Ejaz Khan, Hyo Seok Kim, and Yong-Hoon Kim, "Development of an effective mass approximation approach based on first-principles data for the design of quantum nanostructures", Talk O1701_1039, Nano Korea Symposium 2017, July 12-14, Ilsan, Kintex, Korea, (2017).

[8] Muhammad Ejaz Khan, Hyo Seok Kim, and Yong-Hoon Kim, "Development of an effective mass approach for CdS quantum rods based on first-principles", Talk E9-04, Korean Physical Society (KPS) Spring 2017 Meeting, April 19-21, Daejeon, Korea, (2017).

[7] Muhammad Ejaz Khan, Jae-Hyeon Ko and Yong-Hyun Kim, "First-Principles Study on Thermal Transport Properties of Graphene/Hexagonal Boron Nitride Heterostructure", Poster, SRC Winter Workshop on Quantum Coherence & Topological Matter, Pyeongchang, Korea, (2017).

[6] Muhammad Ejaz Khan, Hyo Seok Kim, and Yong-Hoon Kim, "Development of an effective mass approach for CdS quantum rods based on first-principles", Poster, Korean Vacuum Society (KVS) Winter Meeting, Feb. 15-17, Welly Hill Park, Hoengseong, Pyeongchang, Korea, (2017).

[5] Muhammad Ejaz Khan, Eui-Sup Lee and Yong-Hyun Kim, "First-Principles Study of Anisotropic Thermal Transport Through Graphene/h-BN Nanoribbon Interface", Poster 04-POS, Korea Institute of Advanced Studies (KIAS) Electronic Structure Workshop, Jun. 18-19, Seoul, Korea, (2015).

[4] Muhammad Ejaz Khan and Yong-Hyun Kim, "First-Principles Electronic Structure and Transmission Calculations of Spin-Filtering Carbon Nanotubes with Magnetic Impurities", Talk DG-80, Korean Physical Society (KPS) Fall 2013 Meeting, Oct. 30-Nov. 1, Changwon, Korea, (2013).

[3] Muhammad Ejaz Khan and Yong-Hyun Kim, "First Principles Study of Spin-Filters in Carbon Nanotubes with Magnetic Zigzag Triangular Holes", Korea Institute of Advanced Studies (KIAS) Electronic Structure Workshop, Jun. 20-21, Seoul, Korea, Poster 40-POS (2013).

[2] Muhammad Ejaz Khan, Sung-Jae Woo, Yi Yang Sun, S.B. hang, Yong-Hyun Kim, "Magnetism of Zigzag Triangular Holes in Graphene: A First-Principles Study", Poster W7.38, Materials Research Society (MRS) 2012 Fall Meeting, Nov. 25-30**,** Boston, MA, USA**,** (2012).

[1] Muhammad Ejaz Khan, Sung-Jae Woo, Yi Yang Sun, S.B. hang, Yong-Hyun Kim, "Magnetism of Zigzag Triangular Holes in Graphene: A First-Principles Study", Talk DG-09, Korean Physical Society (KPS) Fall 2012 Meeting, Oct. 24-26, Pyeongchang, Korea**,** (2012).

PATENTS

[2] Muhammad Ejaz Khan, Juho Lee, and Yong-Hoon Kim "NDR Device and Circuit Having a Negative Differential Resistance Based on Organic-Inorganic Hybrid Halide Perovskite", Control Number: P-17632-US, US Patent App. 16/673,116, 2020, Pub. No. US 2020/0295284 A1, Aug 17, 2021.

[1] Muhammad Ejaz Khan, Juho Lee, and Yong-Hoon Kim "Embodiment Method of Negative Differential Resistance Device and its Mechanism from Hybrid Halide Perovskite Nanowires", Pub. No.10-2019-0096130, Sept 23, 2020.

COURSES TAUGHT

Undergraduate Level

[1] Information and Communication Technologies
[2] Applied Physics for Scientists and Engineers
[3] Computer Programming using Python for Scientists and Engineers
[4] Electric Circuit Analysis
[5] Electronic Devices and Circuits
[6] VLSI Design

Graduate Level

[1] Electronic Structure Theory for Nano Materials
[2] Quantum Transport in Semiconductors

STUDENTS ADVISED/Co-ADVISED

Under Graduates

20+ Undergraduate Groups

MS Students

6 Master's Students

PhD Students
2 PhD Students

FUNDING

[4] Prediction of low-dimensional materials for electronic and optoelectronic devices, Chinese Academy of Sciences, 2024PVB0067, PKR 3,717,000, June 2024. Principle Investigator (Completed)

[3] VisionaryWear: Empowering the Blind with Smart Glasses, Pakistan Engineering Council, PEC/CS/FYDP/2023, PKR 100,000/Year, 2023-2024, Principal Investigator. (Completed)

[2] Automating Electric Load of a Building, Pakistan Engineering Council, PEC/PPDC/22/254, PKR 200,000/Year, 2022-2023, Principal Investigator. (Completed)

[1] Simulation of halide perovskite photovoltaic devices, Global Institute for Materials Research Tohoku Japan, 2106SC0513, September 2021. Supercomputing resources and travelling cost. Co-Principal Investigator. (Completed)

RESEARCH COLLABORATIONS

National Collaborators:

1. Dr. Khizar Hayat From AWKUM, Mardan, Pakistan
2. Dr. Qamar Wali From NUTECH, Islamabad, Pakistan
3. Dr. Muhammad Amir from MUST, AJK
4. Dr. Muhammad Sohail, PIEAS, Islamabad, Pakistan

International Collaborators:

1. Prof. Yong-Hoon Kim, KAIST, South Korea
2. Prof. Yong-Hyun Kim, School of Electrical Engineering, KAIST, Korea
3. Prof. Hannes Raebiger, Yokohama National University, Japan
4. Prof. Rajan Jose, UMP, Malaysia
5. Prof. Yi-Yang Sun, Shanghai Institute of Ceramics Chinese Academy of Sciences, China

AWARDS and ACHIEVEMENTS

- “Appreciation Award on Academic Excellence and Mentorship” by National University of Technology (NUTECH), Islamabad, Pakistan (2024).

- PIFI Award of Visiting Scientist, Chinese Academy of sciences (CAS) President's International Fellowship Initiative (PIFI) for scientific exchanges and research cooperation (2024).
- "Best Researcher Award", by International Research Awards on Advanced Nanomaterials and Nanotechnology, Paris, France, 19-20 October 2023.
- "Appreciation Award on Best Research Paper" by National University of Technology (NUTECH), Islamabad, Pakistan (2021).
- "Best Research Presentation Awards" (translation) in Korean Physical Society (KPS) Fall 2013 Meeting (2013).
- "Fully Funded Scholarship for PhD at KAIST Korea" by Korea Advanced Institute of Science and Technology (KAIST), Korea (2010).
- "Fully Funded Scholarship for MS at Lancaster University UK" by Higher Education Commission, Pakistan (2007).

MEMBERSHIP of INTERNATIONAL SCIENTIFIC SOCIETIES

- Member of Korean Physical Society (KPS) since 2011
- Member of Material Research Society (MRS) since 2012
- Member of Society of Porphyrins & Phthalocyanines (SPP) since 2012
- Member of American Physical Society (APS) since 2014
- Member of Korean Vacuum Society (KVS) since 2017
- Member of European Material Research Society (E-MRS) since 2019

SERVICE AND COMMITTEES

- Lead of Technical Scrutiny of Lab Equipment and Labs Establishment, National University of Technology (NUTECH).
- Lead Member Technical Review Board for New Faculty Hiring, National University of Technology (NUTECH).
- Director, Local Quality Enhancement Cell (LQEC), National University of Technology (NUTECH).
- Chairperson and Associate Chairperson, Computer Engineering Department, NUTECH.
- Head of Outcome-Based Education (OBE) Team, Computer Engineering Department, NUTECH.
- Officer in charge (OIC) Labs at Computer Engineering Department of NUTECH.
- Internal Auditor in internal quality assurance audit of academic departments and offices of NUTECH.
- Student Academic Advisor and Mentor
- Curriculum Development and Enhancement of the Computer Engineering curriculum, aligning it with industry trends and academic standards.
- Interdisciplinary Collaboration amongst various departments of NUTECH.

SKILLS

Research and Academic Skills

- Expertise in organic-inorganic hybrid halide perovskites for solar cells and electronic devices.
- Proficient in the design and optimization of thermoelectric devices for renewable energy.
- Strong background in nanostructures for industrial optoelectronic devices.
- In-depth knowledge of heat and electronic spin transport in nanomaterials.
- AI-integrated hardware/software platforms for biomedical applications.
- Advising the BS, MS and PhD students in research

Computational Skills

- Advanced proficiency in computational methods, including DFT, force field, tight-binding, effective mass approximation, and AI & ML.
- Software development skills in C/C++, Python, FORTRAN, Shell, MATLAB, etc.
- Developed a sophisticated FORTRAN-based software for simulating atomistic-level heat transport in heterostructures, interfaced with VASP, SIESTA, GULP, and PHONOPY.
- Over a decade experience of Supercomputers for simulations and software development.

Teaching and Leadership

- Associate Head of the Computer Engineering Department, National University of Technology.
- Associate Professor with a proven track record in academic leadership.
- Director of the Local Quality Enhancement Cell (LQEC).
- Experience as Head of the Computer Engineering Department.
- Lecturer and Assistant Professor roles in Science and Engineering.

Communication

- Clear and effective communication skills, essential for teaching, research collaboration, and leadership roles.