MUHAMMAD Asim
Division of Science, Engineering and Health Studies (SEHS)
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Qualifications

Doctorate, (Energy & Environment - Advanced HVAC Systems), City University of Hong Kong
14 Jul 2016 → 24 Sept 2019
Award Date: 14 Feb 2020

Master, (Energy Innovation), KTH Royal Institute of Technology
1 Aug 2012 → 24 Aug 2013
Award Date: 23 Aug 2013

Master, (Renewable Energy), Universitat Politecnica De Catalunya
1 Sept 2011 → 14 Jul 2012
Award Date: 25 Jul 2012

Bachelor, (Mechanical Engineering), University of Engineering and Technology Lahore
1 Sept 2005 → 30 Jun 2009
Award Date: 30 Jun 2009

7 Jan 2025 → … Corporate Member , The Hong Kong Institute of Engineers, MHKIE

Employment

Division of Science, Engineering and Health Studies (SEHS)
College of Professional and Continuing Education (CPCE)
1 Feb 2021 → present

Research outputs

Architectural integration and thermodynamic optimization of VCC-driven single-stage ORC system for ultra low-grade waste heat recovery
Asim, M., Riaz, F., Khan, S. & Leung, M. K. H., Dec 2026, In: Energy Nexus. 24, 100829.

Exploratory numerical insights of surface and through-thickness thermal response of high heat flux devices deploying innovative hybrid nanofluid impingement cooling technique
Asim, M., Khan, S., Siddiqui, F. R., Sallar, H. & Riaz, F., 12 Nov 2026, In: Results in Engineering. 32, 114145.

A Robust Lightweight Deep Learning Network with Deformable Convolutions for Efficient Segmentation of Optical Coherence Tomography Images
Nawaz, M., Abbasi, S. M. T., Khan, S., Hamza, M. A., Bibi, K., Abbasi, S. A., Daud, M., Asim, M. & Yuan, W., 15 Aug 2026 , In: Frontiers in Digital Health. 8, 1892323.

Two-dimensional materials in nanolubrication
Zia, A. W., Asim, M., Hussain, S. A., Rasul, S. & Ishfaq, K., 14 Aug 2026, *Graphene and 2D Materials in Heat Transfer: Fundamentals and Applications.* Elsevier, p. 159-192 34 p.

Semi-analytical predictive thermal and hydraulic modelling of hybrid nanofluid spray cooling for high heat flux devices: Exploratory insights from numerical simulations
Asim, M., Khan, S., Siddiqui, F. R. & Riaz, F., 11 Jul 2026, In: Results in Engineering. 32, 111939.

Experimental investigation of gallium and hexagonal boron nitride composite-based PCM for battery thermal management
Khan, S. A., Asim, M., Thakur, A. K., Alshahrani, M. Y., Cheng, C. K. & Zhaoa, J., 3 Jul 2026, In: Thermal Science and Engineering Progress. 76, 104822.

Retrofit Pathways for HVAC Decarbonization: A sustainable solution for harnessing ultra-low-grade waste heat for energy efficiency and net-zero buildings
Muhammad, A., Siddiqui, M. F. & Siddiqui, F. R., 9 Jun 2026, *The 12th International Conference on Indoor Air Quality, Ventilation & Energy Conservation in Buildings (IAQVEC 2026).* 2026 ed. E3S Web of Conferences , Vol. 716.

A layered self-supervised knowledge distillation framework for efficient image representation learning
Dahri, T., Memon, Z. A., Yu, Z., Khan, S., Ahmad, S., Asim, M., Aziz, S. & Qureshi, R., Jun 2026, In: Computing. 108, 6, 81.

MOSAIC: Multimodal OA Staging with Adaptive Interpretable Clinical Constraints for Evidence-Grounded Knee MRI Grading
Ali, B., Khan, S., Qureshi, R., Asim, M., Nawaz, M. & Azam, B., 25 May 2026, *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2026.* p. 6866 6873 p.

Magneto-bioconvective Oldroyd-B nanofluid flow over a porous stretching surface with motile microorganisms
Haider, I., Said, Z. & Asim, M., 1 Mar 2026, In: Results in Engineering. 29, p. 108986

Advancing deep learning based knee cartilage segmentation in MRI: Innovations, challenges and applications
Khan, S., Khawer, M. A., Zhong, J., Qureshi, R., Asim, M. & Chen, W., Mar 2026, In: Osteoarthritis and Cartilage Open. 8, 1, 100702 p.

Hexagonal boron nitride-based composite PCM for battery thermal management given fast charging/discharging applications
Khan, S. A., Thakur, A. K., Asim, M., Dong, K., Ahamed, M. S., Mubashir, M. & Zhao, J., 1 Jan 2026, In: Journal of Energy Storage. 141, 119407 p.

Decarbonizing air-conditioning systems via ultra-low grade waste heat recovery − A comprehensive energy, exergy, economic and environmental assessment with novel desuperheating based adaptive pinch point approach
Asim, M., Siddiqui, M. F., Siddiqui, F. R., Khan, S. & Leung, M. K. H., 2026, In: Energy Conversion and Management. 348

Hybrid Nanofluid Spray Cooling Based Predictive Model Development for Advanced Thermal Management of Next Generation Electric Vehicles High-Power Electronics
Asim, M., Siddiqui, F. R., Khan, S. & Sallar, H., 2026, *17th International Conference on Applied Energy - "Nurturing Sustainable Energy Innovations," United Nations Conference Centre in Bangkok, Thailand.* Vol. 67. (Energy Proceedings).

A machine learning based multi-objective optimization for flue gas desulfurization enhancement in coal power plants
Riaz, F., Awan, M. R., Nabi, H. Z., Uddin, G. M., Sultan, M. & Asim, M., Dec 2025, In: Energy Nexus. 20

Synergistic approach to colloidal stability and thermophysical optimisation of multi-walled carbon nanotubes, aluminium nitride, and silver-based hybrid nanofluids
Babar, H., Wu, H., Zhang, W., Asim, M. & Kosar, A., 1 Jul 2025, In: Powder Technology. 465, p. 121348

A novel air-cooled based desuperheating approach for maximizing sustainable energy generation potential from ultra-low grade waste heat – Energy, exergy and environmental (3E) evaluation
Asim, M., Siddiqui, M. F., Siddiqui, F. R., Khan, S. & Leung, M. K. H., 18 Jun 2025, In: Energy and Built Environment. 7, 4 , p. 991-1003 13 p.

MXene/transition metal sulfide composites in energy storage applications: A review
Jaywant Kewate, O., Jan, H., Al Mahmud, A., Batool, A., Singh, K., Rosaiah, P., Asim, M., Lama Tamang, T. & Hussain, I., 7 Jun 2025, In: Materials Today Chemistry. 47, p. 102816

Semi-Supervised Knee Cartilage Segmentation with Successive Eigen Noise-assisted Mean Teacher Knowledge Distillation
Khan, S., Ammar Khawer , M., Nawaz, M., Asim, M., Qureshi, R., Chen , W. & Yan, H., 2 Apr 2025, In: IEEE Transactions on Medical Imaging. 44, 7, p. 3051-3063 13 p.

Diamond-like carbon coating applications in MEMS
Usman, M., Ilahi, H. M., Farooq, M. U., Rauf, M., Asim, M. & Khan, S. A., 17 Mar 2025, *Applications of Diamond-like Carbon Coatings.* wiley, p. 345-372 28 p.

Thermal analysis and optimal fluid selection for the novel integrated vapor compression cycle and ORC system for ultra-low grade waste heat recovery using the desuperheating method
Asim, M., Khan, S., Khan, S. A., Baig, T., Imran, M., Zia, A. W., Riaz, F. & Leung, M. K. H., Mar 2025, In: Energy Nexus. 17, 25 p., 100357.

Improving Autonomous Vehicle Cognitive Robustness in Extreme Weather with Deep Learning and Thermal Camera Fusion
Nawaz, M., Khan, S., Daud, M., Asim, M., Anwar, G. A., Shahid, A. R., Ho, H. P. A., Chan, T., Kong, L. P. & Yuan, W., 15 Jan 2025, In: IEEE Open Journal of Vehicular Technology. p. 1 - 15

Advancements in thermal management solutions for electric vehicle high-power electronics: Innovations, cooling methods, and future perspectives
Asim, M., Baig, T., Siddiqui, F. R., Khan, S., Khan, S. A., Babar, H., Said, Z., ZHAO, J. & Abidi, I. H., 4 Jan 2025, In: Journal of Energy Storage. 111, 115344.

Thermal performance enhancement of novel integrated vapor compression and organic rankine cycle for electricity production: a full-condensing vs. desuperheating approach comparison in ultra-low-grade waste heat recovery
Asim, M., Khan, S., Zia, A. W., Siddiqui, F. R. & Leung, M. K. H., 7 Mar 2024, In: e-Prime - Advances in Electrical Engineering, Electronics and Energy. 7, 100493, p. 1 19 p., 100493.

The potential of plasma-derived hard carbon for sodium-ion batteries
Zia, A. W., Rasul, S., Asim, M., Samad, Y. A., Shakoor, R. A. & Masood, T., 17 Feb 2024, In: Journal of Energy Storage. 84, 14 p., 110844.

Renewable Energy Systems
Asim, M., 7 Apr 2023, *Handbook of Energy Transitions.* Asif, M. (ed.). CRC Press, Taylor & Francis, p. 63-93 30 p. 10.1201/9781003315353-6

Design and modeling of solar energy systems
Asim, M., Zia, A. W., Siddiqui, F. R. & Hussain, S. A., 1 Jan 2023, *Solar Energy Harvesting, Conversion, and Storage: Materials, Technologies, and Applications.* Elsevier, p. 251-291 41 p.

Performance Assessment of Direct Vapor Generation Solar Organic Rankine Cycle System Coupled with Heat Storage
Asim, M., 17 Nov 2022, In: Sustainability (Switzerland). 14, 22, p. 15296-15315 19 p., https://doi.org/10.3390/su142215296.

Renewable energy systems
Muhammad, H. A., Asim, M., Imran, M., Khan, Z. A., Wilberforce, T. & Baik, Y. J., 14 Oct 2022, *Handbook of Energy Transitions.* CRC Press, p. 63-94 32 p.

Hybrid Nanofluids—Next-Generation Fluids for Spray-Cooling-Based Thermal Management of High-Heat-Flux Devices
Asim, M., 1 Feb 2022, In: Nanomaterials. 12, 3, p. 507-537

Performance assessment and working fluid selection for novel integrated vapor compression cycle and organic rankine cycle for ultra low grade waste heat recovery
Asim, M., Kashif, F., Umer, J., Alvi, J. Z., Imran, M., Khan, S., Zia, A. W. & Leung, M. K. H., 20 Oct 2021, In: Sustainability (Switzerland). 13, 21, 11592.

Design and energy analysis of a solar desiccant evaporative cooling system with built-in daily energy storage
Riaz, F., Qyyum, M. A., Bokhari, A., Klemeš, J. J., Usman, M., Asim, M., Awan, M. R., Imran, M. & Lee, M., 24 Apr 2021, In: Energies. 14, 9, 2429.

A review on independent and integrated/coupled two-phase loop thermosyphons
Cao, J., Zheng, Z., Asim, M., Hu, M., Wang, Q., Su, Y., Pei, G. & Leung, M. K. H., 15 Dec 2020, In: Applied Energy. 280, 115885.

Thermal activation Eyring energy approach to characterise the dependence of nanoscale friction on the surface roughness
Umer, J., Saleem, F., Asim, M., Usman, M., Kamran, M. S., Alam, K. & Mohammadpour, M., Nov 2020, In: Tribology International. 151, 106532.

Performance characteristics of variable conductance loop thermosyphon for energy-efficient building thermal control
Cao, J., Hong, X., Zheng, Z., Asim, M., Hu, M., Wang, Q., Pei, G. & Leung, M. K. H., 1 Oct 2020, In: Applied Energy. 275, 115337.

Thermo-economic and environmental analysis of integrating renewable energy sources in a district heating and cooling network
Asim, M., Saleem, S., Imran, M., Leung, M. K. H., Hussain, S. A., Miró, L. S. & Rodríguez, I., 1 Jan 2020, In: Energy Efficiency. 13, 1, p. 79-100 22 p.

Comparative Analyses Between Organic Rankine Cycle (ORC) And Alternatives Using Wet Gases As Low-Grade Heat Sources
Zheng, Z., Hong, X., Wu, W., Feng, Y. Q., Cheung, T. F., Asim, M. & Leung, M. K. H., 2019, In: Energy Proceedings. 5

Mapping past, current and future energy research trend in Pakistan: a scientometric assessment
Farooq, M., Asim, M., Imran, M., Imran, S., Ahmad, J. & Younis, M. R., 1 Dec 2018, In: Scientometrics. 117, 3, p. 1733-1753 21 p.

Recent research trends in organic Rankine cycle technology: A bibliometric approach
Imran, M., Haglind, F., Asim, M. & Zeb Alvi, J., 2018, In: Renewable and Sustainable Energy Reviews. 81, p. 552-562 11 p.

Experimental analysis of solar thermal integrated MD system for cogeneration of drinking water and hot water for single family villa in dubai using flat plate and evacuated tube solar collectors
Asim, M., Imran, M., Leung, M. K. H., Kumar, N. T. U., Martin, A. R. & Kashif, F., Oct 2017, In: Desalination and Water Treatment. 92, p. 46-59 14 p.

Cogeneration of Desalinated Water and Domestic Hot Water using Membrane Distillation Technique for a Family Villa in the Gulf Region
Asim, M., 2017, *11th International Conference on Applied Energy (ICAE 2019): Innovative Solutions for Energy Transitions - Västerås, Sweden.* p. 397 409 p.

Thermodynamic and Thermo-economic Analysis of Integrated Organic Rankine Cycle for Waste Heat Recovery from Vapor Compression Refrigeration Cycle
Asim, M., Leung, M. K. H., Shan, Z., Li, Y., Leung, D. Y. C. & Ni, M., 2017, In: Energy Procedia. 143, p. 192-198 7 p.

Feasibility analysis of solar combi-system for simultaneous production of pure drinking water via membrane distillation and domestic hot water for single-family villa: pilot plant setup in Dubai
Asim, M., Uday Kumar, N. T. & Martin, A. R., 1 Oct 2016, In: Desalination and Water Treatment. 57, 46, p. 21674-21684 11 p.

Prizes

CPCE Active Scholar Award 2025
Asim, M. (Recipient), 26 Jun 2026

Fully funded Masters under EIT KIC Innoenergy umbrella to pursue MSc in at least 02 European Universities
Asim, M. (Recipient), 2011

Outstanding Academic Performance award for achieving outstanding grades for the year awarded by City University of Hong Kong.
Asim, M. (Recipient), 2016

Outstanding Academic Performance award for achieving outstanding grades for the year awarded by City University of Hong Kong.
Asim, M. (Recipient), 2018

Outstanding Academic Performance award for achieving outstanding grades for the year awarded by Islamic Union of Hong Kong.
Asim, M. (Recipient), 2017

Outstanding Academic Performance award for achieving outstanding grades for the year awarded by Islamic Union of Hong Kong.
Asim, M. (Recipient), 2018

Partial Support Program Scholarship worth US$10,200 from Higher Education Commission Pakistan for supporting PhD studies abroad. The scholarship has been awarded to the top 50 students studying in QS Ranked top 100 Universities in the world on merit basis.
Asim, M. (Recipient), 2019

Research Tuition Scholarship of 35,080HK$ awarded by the City University of Hong for outstanding research and academic performance for the year.
Asim, M. (Recipient), 2018

UGC Fully Funded PhD Studentship in Hong Kong to pursue my PhD studies in City University of Hong Kong
Asim, M. (Recipient), 2016

Projects

An Innovative Hybrid Nanofluid Spray Cooling Based Thermal Management System for Efficient Cooling of Electric Vehicle High Power Electronics | Faculty Development Scheme (FDS), Research Grants Council (RGC) Competitive Research Funding Schemes for the Local Self-financing Degree Sector 2023/24 | Project Reference No.: UGC/FDS24/E09/23 | HK$ 1,006,465
Asim, M. (PI)
1/01/24 → 31/12/26

Design and Energy Analysis of novel thermally driven hybrid power and refrigeration systems for sustainable development| Collaborative Research Project Funding Scheme | Project Reference No.: ADU/IR/E1215/24 | HK$ 105,550 (AED 50,000)
Riaz, F. (PI) & Asim, M. (CoPI)
1/11/24 → 30/11/26

Development of novel integrated vapor compression refrigeration cycle (VCC) with the organic Rankine cycle for ultra-low grade waste heat recovery for electricity production – A Green Initiative for sustainable waste heat recovery
Asim, M. (PI)
21/06/21 → 20/06/22

Energy analysis and machine learning based optimization for a sustainable thermal system: oxygenated fuels testing in internal combustion engines for emission reduction and low-temperature heat recovery | Collaborative Research Project Funding Scheme | Project Reference No.: ADU/IR/E19301035/24 | HK$ 149,275 (AED 70,000)
Riaz, F. (PI), Asim, M. (CoPI) & Imran, M. (CoPI)
6/04/26 → 6/04/28

Low-Grade Heat Driven novel hybrid cooling, power and desalination systems.
Asim, M. (PI)
1/04/22 → 31/08/23

Mathematical modeling and energy analysis of novel combined thermal-desalination and HVAC systems
Asim, M. (CoPI)
1/07/23 → 31/08/24

Maximizing the Sustainable Energy Generation Potential from Ultra-Low Grade Waste Heat: Thermo-4E Optimization and Decision Making Analysis for Novel Integrated Vapor Compression Cycle and the Organic Rankine Cycle with Zeotropic Working Fluids | Faculty Development Scheme (FDS), Research Grants Council (RGC) Competitive Research Funding Schemes for the Local Self-financing Degree Sector 2024/25 | Project Reference No.: UGC/FDS24/E12/24 | HK$ 636,901
Asim, M. (PI)
1/01/25 → 31/12/26

RCGETB: Research Centre for Green Energy, Transport and Building (RCGETB) | Institutional Development Scheme Research Infrastructure Grant | UGC/IDS(R)24/20 |HK$2,972,423
Asim, M. (PI), Leung, C. W. (PI), Loh, W. K. A. (PI), Zhang, H. F. (PI), Lam, K. C. A. (PI), Lam, W. M. E. (PI), Liang, S. J. (PI) & Wu, Y. A. (PI)
1/01/21 → 31/12/23