DR.MUHAMMAD SULTAN IRSHAD

PROFILE

I do perform well under pressure and work hard to achieve my goals. Possessing excellent problem-solving, analytical, and logical skills makes me suitable to work as a team member as well as an individual. I am always ready to meet deadlines, do challenging work, and am eager to learn new things.

OBJECT

A part-time challenging position in a competitive sector or organization where my education and work experience can have a profound impact, resulting in mutual growth, and productivity of the organization.

CONTACT

2030, 2nd Floor, School of Material Science & Engineering, Hubei University, Wuhan, 368 Youyi Dadao, Wuchang, 430062, Wuhan/China, China.

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(+86) 156-23138982

WeChat: Sultan-Rana

EDUCATION AND TRAINING

Post-doctoral Researcher

August 2022 to Present
College of Mechatronics and Control Engineering, Shenzhen University, Shenzhen 518060, P. R. China.

Graduate Research Assistant

Sep 20 to May 2022
School of Material Science & Engineering
Hubei University, Wuhan, 368 Youyi Dadao, Wuchang, 430062, Wuhan/China, China.

Key Responsibilities

Maintain, update, and process the graduate research database. and assist the senior researchers or professors. Supervises any undergraduate students working on assigned research projects. Write research reports based on the data results. Performs research work in archives, through interviews, online, or whatever may be appropriate to assist the assistant's supervisor. Assists with the editing and preparation of manuscripts and assists with duties related to the production of academic journals. Performs routine clerical duties as instructed, if essential to the research activities of the supervisor or project to which the research assistant is assigned.

Ph.D. in Material Science & Engineering

Sep 19 to May 2022
School of Material Science & Engineering, Hubei University, Wuhan, China.

QQ: 3149779742

https://scholar.google.com.pk/citations?user=2i8eYmYAAAAJ&hl=en.

https://www.researchgate.net/profile/Muhammad-Sultan-Irshad.

https://www.linkedin.com/in/muhammad-sultan-irshad-bba45613a/

https://publons.com/researcher/3373352/muhammad-sultan-irshad/metrics/

https://orcid.org/0000-0002-2242-9874.

RESEARCH INTERESTS

- Multi-functional photothermal materials for efficient solar water evaporation, and wastewater treatment
- Organic/inorganic composites for energy conversion applications such as photocatalysis for wastewater treatment & Fuel Generation
- Flexible hydrogels and nanofibers inspired membranes for solar evaporation, piezoelectricity, and tactile sensing
- COMSOL Multiphysics Simulations for Heat Transfer Modeling
- Chemical Fluid Dynamics Simulations (CFDs) for Salt-rejection via membrane technology
- Disinfection from organic &

Research Area: Design, Modelling, Characterization, and Fabrication of multi-functional photothermal materials and their research applications e.g., solar-driven steam & energy generation devices coupled with thermoelectric, piezoelectric, and environmental applications.

Thesis Title: Design and preparation of multifunctional composite materials and their application research in solar steam and energy conversion.

MS in Physics
Sep 16 to July 2018
Department of Physics, COMSATS University Islamabad, Lahore (54000), Pakistan.

B.Sc. (Hons) Physics
Aug 11 to July 16
Department of Physics, University of Wah, Wah Cantt (47040), Pakistan.

EXPERIENCE (STARTED FROM PRESENT)

Science lecturer
Aug 18 to Sep 19
SISA Schooling System (Private Organization for O & A level).

Secondary School Teacher
Sep 14 to Aug 19
Subjects: Science, basic concepts of Physics, Chemistry, and Biology, basic and spoken English language.
Key Responsibilities: Teaching, and look after on-going teaching projects, students' assessments, and curriculum orientation.

PEER-REVIEWED PUBLICATIONS

1. **Muhammad Sultan Irshad**, Xianbao Wang,* Naila Arshad, M. Qasim Javed, Tariq Shamim, Zhenzhen Guo, Hong Rong Li, Jianying Wang, and Tao Mei" Bifunctional in-situ polymerized nanocomposites for convective solar desalination and enhanced photo-thermoelectric power generation" **Environmental Science: Nano**, **RSC**, 2022.
2. **Muhammad Sultan Irshad,** Naila Arshad, Xianbao Wang, Hong Rong Li, M.Qasim, Xu You, Lina Abdullah Alsherani, Jinhua Li, and Tao Mei. " Intensifying solar interfacial heat accumulation for clean water generation excluding heavy metal ions, and oil emulsions." **Solar RRL, Wiley** (2021) 5: 2100427.
3. **Muhammad Sultan Irshad,** Xianbao Wang, Adil Abbas, Fang Yu, Jinhua Li, Jianying Wang, Tao Mei, Jingwen Qian, Shuilin Wu, and M. Qasim Javed. "Salt-resistant carbon dots modified solar steam system enhanced by chemical advection." **Carbon** 176 (2021): 313-326.
4. **Muhammad Sultan Irshad,** Xianbao Wang, Misbah Sehar Abbasi, Naila Arshad, Zihe Chen, Zhenzhen Guo, Li Yu, Jingwen

inorganic polluted species
- Antibacterial, and Antioxidant properties of Metal Oxides

REVIEWER OF INTERNATIONAL JOURNALS

- Materials Chemistry and Physics, Elsevier
- Frontiers Energy Research

CONFERENCES & AWARDS

- Most Excellent PhD student award
- Nominated for excellent thesis award
- Best oral presentation award & prize winner" The 5th international conference on energy materials and nanotechnology, October 24, 2021(Energy and Environmental Materials, Wiley)
- Chinese Government Scholarship Council for Ph.D.
- 2nd International conference on the impact of nanoscience on energy technologies (NanoSET-2017)

https://lahore.comsats.edu.pk/nanoset/nanoset-2017.aspx

- International Symposium on Contemporary Approaches in the Arena of Medical, Biophysics, and Energy Materials. (2018)

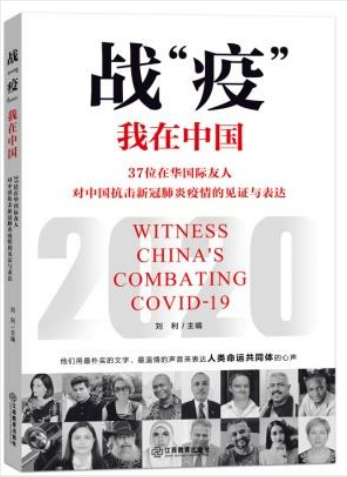
https://lahore.comsats.edu.pk/Gallery/symposium-BEM.aspx

Qian, Jun You, and Tao Mei. "Semiconductive, Flexible MnO2 NWs/Chitosan Hydrogels for Efficient Solar Steam Generation." **ACS Sustainable Chemistry & Engineering** (2021), 3887-3900.

5. **Muhammad Sultan Irshad,** Naila Arshad, and Xianbao Wang. "Nanoenabled Photothermal Materials for Clean Water Production." **Global Challenges** 5, no. 1 (2021): 2000055.
6. **Muhammad Sultan Irshad,** Naila Arshad, Gang Liu, Naveed Mushtaq, Arshad Ali Lashari, Wancheng Qin, M.Sohail Asghar, Xianbao Wang, and Hongrong Li" Biomass-printed solar evaporator derived from bio-polluted invasive species, a potential step towards carbon neutrality" **ACS Applied Materials & Interfaces** (Under-review).
7. **Muhammad Sultan Irshad,** Naila Arshad, Xiuqiang Li, Wancheng Qin, Guo Zhenzhen, Naveed Mushtaq, Yang Fu, and Tao Mei, Xianbao Wang" Highly charged nanospheres for simultaneous wastewater remediation and power generation"Chemical Engineering Journal, Elsevier **(Under-review)**.
8. Song, Changyuan, **Muhammad Sultan Irshad**, Yin Jin, Junhua Hu, and Wentao Liu. "Arabic-dome-inspired hierarchical design for stable and high-efficiency solar-driven seawater desalination." **Desalination** 544 (2022): 116125.
9. Zhenzhen Guo, Wei Zhou, Naila Arshad, Zexian Zhang, Di Yan, **Muhammad Sultan Irshad**, Li Yu, Xianbao Wang." Excellent energy capture of hierarchical MoS2 nanosheets coupled with MXene for efficient solar evaporators and thermal packs". **Carbon** (2021).
10. Fang Yu, Zhenzhen Guo, You Xu, Zihe Chen, **Muhammad Sultan Irshad,** Jingwen Qian, Tao Mei, Xianbao Wang" Biomass-derived bilayer solar evaporator with enhanced energy utilization for high-efficiency water generation" **ACS Applied Materials & Interfaces,** 5(2021) 57155-57164.
11. Ming Peng, Weideren Dai, Liangyou Lin, Bichen Xiao, Songyang Guo, Mingqing Fang, Hairen Wang*, Yanzhuo Gou, **Muhammad Sultan Irshad**, Junbo Gong, and Jinhua Li* Performance Improvement of Perovskite Solar Cells by Using Ionic Liquid BMIMPF6 as an Interface Modifier. **ACS Applied Energy Material** (2021).
12. Arshad, Naila, Iftikhar Ahmed, **Muhammad Sultan Irshad**, Hong Rong Li, Xianbao Wang, Shafiq Ahmad, Mohamed Sharaf, Muhammad Firdausi, Mazen Zaindin, and Muhammad Atif. "Super Hydrophilic Activated Carbon Decorated Nanopolymer Foam for Scalable, Energy Efficient Photothermal Steam Generation, as an Effective Desalination System." **Nanomaterials** 10, no. 12 (2020): 2510. (first equal author)
13. Fang Yu; Jinxing Wang; Lei Yan; Zhenzhen Guo; Zihe Chen; **Muhammad Sultan Irshad**; Jingwei Qian; Tao Mei" Bio-inspired Molybdenum Carbide/Caron-based Aerogel with Advanced Thermal Management as a Solar Evaporator" **Solar Energy Materials & Solar Cells**, 2022, (Accepted).
14. Yu, Fang, Zihe Chen, Zhenzhen Guo, **Muhammad Sultan Irshad**, Li Yu, Jingwen Qian, Tao Mei, and Xianbao Wang."Molybdenum carbide/carbon-based chitosan hydrogel as an effective solar water evaporation accelerator." **ACS Sustainable Chemistry & Engineering** 8, no. 18 (2020): 7139-7149.
15. Zhou Wei, Naila Arshad, Chen Hui, **Muhammad Sultan Irshad**, Naveed Mushtaq, Shahid Hussain, Matiullah Shah, Syed Zohaib

KEY SKILLS AND CHARACTERISTICS

- Excellent listener
- Possess excellent problem skills
- Friendly, courteous, and service-oriented
- Poised under pressure
- Solid written and verbal communicator
- Initiative and self-directed learner
- Self-motivated and dynamic personality
- Budget management
- Eager to learn new skills



https://doi.org/10.24103/TETE5.en.2020.3

ACTIVITIES AND INTERESTS

- Gardening
- Hiking and camping
- Playing chess
- Cycling
- Swimming
- Playing cricket
- Watching Documentaries
- Travel
- Food pantry volunteer
- Fundraising activates for the sake of good
- Poetry and literature
- Cultural activities

Hassan Naqvi, Muhammad Rizwan, Naeem Shahazad, Hong Rong Li, Yuzheng Lu *, Xianbao Wang *"Interfacial photothermal heat accumulation for simultaneous salt rejection and freshwater generation; an efficient solar energy harvester" **Nanomaterials**, 2022.

16. Zhou Wei, **Muhammad Sultan Irshad**, Naila Arshad, Laila Noureen Noureen, Iftikhar Ahmed, Naveed Mushtaq, Muhammad Sohail Asghar, Qaisar Hayat, Uzma Ghazenfar, Muhammad Idrees, Naeem Shahzad, Yuzheng Lu* "Nanocomposite-enhanced efficient evaporation system for solar-driven seawater desalination; an optimized design for clean water production" **Nanomaterials**, 2022 (Accepted). **First Equal Author**
17. Liu, Gang, Fang Yu, **Muhammad Sultan Irshad**, Xin Xiong, Zhenzhen Guo, Junshi Wang, Bo Xiao, Liangyou Lin, and Xianbao Wang. "Biomass - inspired solar evaporator for simultaneous steam and power generation enhanced by thermal - electric effect." Energy Technology.
18. Arshad, Naila, **Muhammad Sultan Irshad**, Misbah Sehar Abbasi, Saif Ur Rehman, Iftikhar Ahmed, M. Qasim Javed, Shafiq Ahmad, Mohamed Sharaf, and Muhammad Dzulqarnain Al Firdausi. "Green thin film for stable electrical switching in a low-cost washable memory device: proof of concept." **RSC Advances** 11, no. 8 (2021): 4327-4338. **First equal author**
19. Asghar, Muhammad Sohail, Jinhua Li, Iftikhar Ahmed, Uzma Ghazanfar, **Muhammad Sultan Irshad***, Muhammad Idrees, Zeenat Haq, Muhammad Rizwan, Farzeen Sheikh, and Farhat Yasmeen. "Antioxidant, and enhanced flexible nano porous scaffolds for bone tissue engineering applications." **Nano Select** (2021). **Coressponding author**
20. Lu, Yuzheng, Naveed Mushtaq, MAK Yousaf Shah, **Muhammad Sultan Irshad**, Sajid Rauf, Muhammad Yousaf, and Bin Zhu. "A cobalt free triple charge conducting Sm0. 2Ce0. 8O2-δ-Ba0. 5Sr0. 5Fe0. 8Sb0. 2O3-δ heterostructure composite cathode for protonic ceramic fuel cell." **Ceramics International** (2022).
21. Ming Peng, Weideren Dai, Liangyou Lin, Bichen Xiao, Songyang Guo, Mingqing Fang, Hairen Wang, Yanzhuo Gou, **Muhammad Sultan Irshad,** Junbo Gong, Jinhua Li "Performance Improvement of Perovskite Solar Cells by Using Ionic Liquid BMIMPF6 as an Interface Modifier" **ACS Applied Energy Materials,** 2021, 4, 11, 12421–12428.
22. Zhou Wei, Naila Arshad, **Muhammad Sultan Irshad**, Muhammad Idrees, Iftikhar Ahmed, Hong Rong Li, Hum-mad Habib Qazi, Muhammad Yousaf, Lina Abdullah Alshahrani, and Yuzheng Lu "A scalable prototype by in-situ polymerization of biodegradables, cross-linked molecular mode of vapor transport, and metal ion rejection for solar-driven seawater desalination" **Crystals**, 2021.
23. Yuzheng Lu, Naila Arshad, **Muhammad Sultan Irshad***, Iftikhar Ahmed, Shafiq Ahmad, Lina Abdullah Alshah-rani, Muhammad Yousaf, Abdelaty Edrees Sayed, and Muhammad Nauman" Fe_2O_3 nanoparticles deposited over self-floating facial sponge for facile interfacial seawater solar desalination" **Crystals**, 2021.
24. Chuankun Zhang, Tariq Shamim, Naila Arshad, **Muhammad Sultan Irshad,** Muhammad Naveed Mushtaq, Muhammad Yousaf, Lina Abdullah Alshahrani, M.Akbar, Yuzheng Lu" In-situ

polymerized Fe_2O_3@PPy/Chitosan hydrogels as a hydratable skeleton for solar-driven evaporation" **Journal of the American Ceramic Society**, 2022.

25. Peng Zhou; Xinyu Xu; **Muhammad Sultan Irshad**; Yajun Qi; Tianjin Zhang "Enhanced output performance of piezoelectric energy harvester based on hierarchical Bi3.15Nd0.85Ti3O12 microspheres/PVDF-HFP composite" **Sensors and Actuators: A. Physical**, 2021.
26. Chen, Zihe, Ao Liao, Zhenzhen Guo, Fang Yu, Tao Mei, Zexian Zhang, **Muhammad Sultan Irshad**, Chengcheng Liu, Li Yu, and Xianbao Wang**.** "A controllable flower-like FeMoO4/FeS2/Mo2S3 composite as efficient sulfur host for lithium-sulfur batteries." **Electrochimica Acta** 353 (2020): 136561.
27. Fan, Qin, Jinhua Li, Jianying Wang, Zilu Yang, Tao Shen, Yizhong Guo, Lihua Wang, **Muhammad Sultan Irshad**, Tao Mei, and Xianbao Wang. "Ultrasensitive Fe 3+ ion detection based on carbon quantum dot-functionalized solution-gated graphene transistors." **Journal of Materials Chemistry C** 8, no. 14 (2020): 4685-4689.
28. Abdul Raouf Malik, Muhammad Hammad Aziz, Muhammad Atif, **Muhammad Sultan Irshad**, Hafeez Ullah, Tuan Nguyen Gia, Hijaz Ahmed, Shafiq Ahmad, Thongchai Botmart" Lime peel extract induced NiFe2O4 NPs: Synthesis to applications and oxidative stress mechanism for anticancer, antibiotic activity" **Journal of Saudi Chemical Society, Elsevier,** 2022.
29. Xiang Song, Weiqing Guo, Yuhong Guo, Naveed Mushtaq, MAK Shah, **Muhammad Sultan Irshad**, Peter D Lund, Muhammad Imran Asghar" Nanocrystalline surface layer of WO3 for enhanced proton transport during fuel cell operation" **Crytsals**, 2021.
30. Yuzheng Lu; M.A.K Yousaf Shah; Muhammad Yousaf; **Muhammad Sultan Irshad**; Rizwan Raza" Optimizing the oxygen vacancies and electrochemical performance of CeO2-δ nanosheets through the combination of di and tri-valent doping**" International Journal of Hydrogen Energy**, 2022.
31. Yuzheng Lu; M.A.K Yousaf Shah; Muhammad Yousaf; **Muhammad Sultan Irshad**; Rizwan Raza "Ba0.5Sr0.5Fe0.8Sb0.2O3-d- Sm0.2Ce0.8O2-d bulk heterostructure composite: A cobalt free Oxygen Reduction Electrocatalyst for low-temperature SOFCs; **" International Journal of Hydrogen Energy**, 2022.
32. Yuzheng Lu; M.A.K Yousaf Shah; Muhammad Yousaf; **Muhammad Sultan Irshad**; Rizwan Raza "Improved Self-Consistency and Oxygen Reduction Activity of $CaFe_2O_4$ for Protonic Ceramic Fuel Cell by porous NiO-Foam Support" **Renewable Energy"** 2022, Accepted.
33. Abbasi, Misbah Sehar, **Muhammad Sultan Irshad**, Naila Arshad, Iftikhar Ahmed, Muhammad Idrees, Shafiq Ahmad, Zhou Wei, Mohamed Sharaf, and Muhammad Dzulqarnain Al Firdausi. "Biomaterial-Induced Stable Resistive Switching Mechanism in TiO2 Thin Films: The Role of Active Interstitial Sites/Ions in Minimum Current Leakage and Superior Bioactivity." **ACS omega** 5, no. 30 (2020): 19050-19060.
34. **Muhammad Sultan Irshad**, Naila Arshad, Iftikhar Ahmed, Misbah Sehar Abbasi, Muhammad Idrees, Shafiq Ahmad, Mohamed Sharaf, Muhammad Sohail Asghar, and Mazen Zaindin. "Low-

cost green recyclable biomaterial for energy-dependent electrical switching and intact biofilm with antibacterial properties." **Scientific Reports, Nature** 10, no. 1 (2020): 1-16.

35. Qazi, Hummad Habib, Mohd Rashidi bin Salim, Abu Sahmah Bin Mohd Supa'at, Iftikhar Ahmed, Misbah Sehar Abbasi, Muhammad Mahmood Ali, Sevia Mahdaliza Idrus, Abu Bakar bin Mohammad, **Muhammad Sultan Irshad**, and Farhat Yasmeen. "Modified fiber optic sensor for highly precise identification of mercuric ion (Hg2+) concentrations in aqueous solution." **Engineering Research Express** (2021).
36. **Muhammad Sultan Irshad**, Adil Abbas, Hummad Habib Qazi, M. Hammad Aziz, Matiullah Shah, Ashfaq Ahmed, and M. Idrees. "Role of point defects in hybrid phase TiO2 for resistive random-access memory (RRAM)." **Materials Research Express** 6, no. 7 (2019): 076311.
37. **Muhammad Sultan Irshad**, Muhammad Hamamd Aziz, Mahvish Fatima, Saif Ur Rehman, M. Idrees, Saba Rana, Fozia Shaheen, Ashfaq Ahmed, Muhammad Qasim Javed, and Qing Huang. "Green synthesis, cytotoxicity, antioxidant and photocatalytic activity of CeO2 nanoparticles mediated via orange peel extract (OPE)." **Materials Research Express** 6, no. 9 (2019): 0950a4.
38. Qazi, Hummad Habib, Sanober Farheen Memon, Muhammad Mahmood Ali, **Muhammad Sultan Irshad**, Siddique Akhtar Ehsan, Mohd Rashidi bin Salim, Abu Bakar bin Mohammad, Mohd Zamani Zulkifli, and Muhammad Idrees. "Surface roughness and the sensitivity of D-shaped optical fibre sensors." **Journal of Modern Optics** 66, no. 11 (2019): 1244-1251.

NEWS ARTICLES DURING THE EPIDEMIC PERIOD OF COVID-19

- 'I'll stand firm with my iron brothers,' A Pakistani student in Wuhan.
  http://www.china.org.cn/china/2020-02/20/content_75725619.htm
- Pakistani lauds effort to curb the epidemic in Wuhan.
  https://www.chinadaily.com.cn/a/202006/30/WS5efa9275a310834817256061.html
- 巴基斯坦留学生苏坦在武汉做志愿者——"向全世界展示中国抗疫的真实情况"
  https://epaper.hubeidaily.net/pad/content/202004/27/content_27657.html
- 《战"疫"，我在中国》 | 做一名抗疫志愿者
  https://mp.weixin.qq.com/s/ILW0zU5v-oRdvjjfmsI8-A
- Foreign students vaccinated in Wuhan.
  https://enapp.chinadaily.com.cn/a/202103/18/AP6052ac41a310f03332f9977e

VOLUNTEERING

Certificate of Honour

REFERENCES

1. **Prof. Dr. Zhang Han**
International Collaborative Laboratory of 2D Materials for Optoelectronics Science and Technology of Ministry of Education, Institute of Microscale Optoelectronics, Shenzhen University, Shenzhen 518060, P.R. China.
Email: hzhang@szu.edu.cn
Homepage:
http://icoe.szu.edu.cn/en/people/2014/0829/1317.html

2. **Prof. Dr. Xianbao Wang**
Dean and Director of School of Material Science & Engineering, Hubei University, Wuhan China.
Tel: +86 27 8866 2132; Fax: 86 27 8866 1729
Email: wangxb68@aliyun.com
Homepage: http://matsci.hubu.edu.cn/wxb.htm

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http://matsci.hubu.edu.cn/info/1105/2715.htm

4. **Prof. Dr. Tariq Shamim**
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https://www.niu.edu/ceet/about/directory/shamim-_tariq.shtml

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Guangdong Provincial Key Laboratory of Micro/Nano Optomechatronic Engineering, College of Mechatronics and Control Engineering, Shenzhen University, Shenzhen 518060, P. R. China.
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E-mail: whao@szu.edu.cn (Hao Wang)