

Name: Badreyya Ali AlShehhi

Academic Rank: Assistant Professor, College of Sciences, University of Sharjah

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Specialization: Physics, Materials Science

Research interests:

Perovskite - solar cells, 2D materials - Graphene – Micro/Nano fabrication

Technical Skills:

- **Micro and nano-electronic fabrication tools:** ALD, PECVD, CVD, Electron-beam lithography, SUSS MA8 lithography, Plasma Etch Asher, Sputtering, E-beam Evaporator, Thermal evaporator, Dicing Saw, Micro Test Wire bonder, Laser writer, Inkjet printing graphene, CVD graphene and 2D material exfoliation, fishing and preparation. Gloves Box, solar simulator.
- **Software Knowledge:** TCAD, LabVIEW, SOLIDWORK, Abaqus CAE, COMSOL Multiphysics, kLayout, ImageJ, Origin Lab Pro, Cadence, Verilog, MS Office.
- **Characterization of Micro-devices:** Optical microscope, Keyence microscope, SEM, FIB, TEM, AFM, Raman, XRD, Filmetrics, Dektak, Ellipsometer, Electrical probing characterization (Manual and semi-automated) Keithley, Agilent, Vacuum system setup and particle size analyzer.

Education:

- PhD in Interdisciplinary Engineering, Thesis Title: 1D, 2D Current Transport and Material Interface Studies on Si Junction, Khalifa University (in collaboration with MIT) Abu Dhabi, UAE
- Master of Science in Microsystems Engineering, Thesis Title: Ultra-Low-Power, Small Footprint, 120 GHz, CMOS Radio Transceiver with On-Chip antenna for Internet of Things (IOT), Masdar Institute of Science and Technology (now Khalifa University) (in collaboration with MIT) Abu Dhabi, UAE
- Bachelor of Communication Engineering, Final Project: Wireless Communication System for Soccer Robot, University of United Arab Emirates (UAEU) Al Ain, UAE

Publications:

- **Alshehhi, Badreyya** & Baloch, Ahmer & Albadwawi, Omar & Parida, Bhaskar & Sundaray, Madhulita & Alberts, Vivian. (2023). Consolidation of Temperature Coefficients of Perovskite-Based Absorbers. 1-4. 10.1109/MENA-SC54044.2023.10374536.
- Parida, Bhaskar & Najar, Adel & Baloch, Ahmer & **AlShehhi, Badreyya** & Albadwawi, Omar & Alberts, Vivian. (2023). Plasmonic Au@SnO₂ Core-Shell Hybrid Electron Transport Layer for Highly Efficient Planar Perovskite Solar Cells. 1-3. 10.1109/MENA-SC54044.2023.10374475.
- Baloch, Ahmer & Albadwawi, Omar & **AlShehhi, Badreyya** & Parida, Bhaskar & Alberts, Vivian. (2023). Balancing Aesthetics and Performance of Colored Perovskite-Silicon Tandem Solar Cells Through Simulation-Assisted Design. 1-4. 10.1109/MENA-SC54044.2023.10374473.

- Baloch, Ahmer & Albadwawi, Omar & **AlShehhi, Badreyya** & Alberts, Vivian. (2022). Bandgap model using symbolic regression for environmentally compatible lead-free inorganic double perovskites. 0452-0455. 10.1109/PVSC48317.2022.9938842.
- Baloch, Ahmer & Albadwawi, Omar & **AlShehhi, Badreyya** & Alberts, Vivian. (2022). Impact of mixed perovskite composition based silicon tandem PV devices on efficiency limits and global performance. Energy Reports. 8. 504-510. 10.1016/j.egyr.2022.10.215.
- Taha, I., Rajput, N. S., Baik, H., Ravaux, F., **AlShehhi, B.**, & Choi, D. (2020). Investigation on the interaction between a gallium nitride surface and H2O using a nanometer-scale GaN lamella structure. Journal of Physics D: Applied Physics, 53(46), 465103.
- **AlShehhi, B.**, Rezk, A., Abbas, Y., Saadat, I., Nayfeh, A., & Rezeq, M. D. (2019, October). Impact of Silver Nanoparticles on Current Transport in CVD Mono-layer Graphene/Si Junctions. In 2019 IEEE 14th Nanotechnology Materials and Devices Conference (NMDC) (pp. 1-5). IEEE.
- Sanduleanu, M.; **Alshehhi, B.**, " An 800uW Peak Power Consumption, 24GHz (KBand), Super-Regenerative Receiver with 200pJ/bit Energy Efficiency, for IoT," in 29th International Conference on VLSI Design, 15th International Conference on Embedded Systems in 2016.
- **Alshehhi Badreyya**, Rida Gadhafi, and Mihai Sanduleanu. "Ultra-low-power, small footprint, 120 GHz, CMOS radio transmitter with on-chip antenna for Internet of Things (IoT)" Electronic Devices, Systems and Applications (ICEDSA), 2016 5th International Conference on. IEEE, 2016.
- **Badreyya AlShehhi**, Irfan Saadat, Ayman Rezk, Yawar Abbas, Ammar Nayfeh and Moh'd Rezeq. "Impact of Silver Nanoparticles on Current Transport in CVD Mono-layer Graphene/Si Junctions", IEEE Nanotechnology Materials and Devices Conference (NMDC), Stockholm, Sweden, 2019 – oral presentation.
- **Badreyya AlShehhi**, Srinivasa Reddy Tamalampudi, Irfan Saadat. "InSe performance as a FET sensor device", Graduate Students Research Conference (GSRC), Zayed University, Abu Dhabi, UAE, 2019 – oral presentation.
- **Badreyya AlShehhi**, Srinivasa Reddy Tamalampudi, Irfan Saadat, and Ibraheem Almansouri. "InSe metal contact optimization for enhanced InSe FET performance", Compound Semiconductor Week (CSW), Cambridge, US, 2018- poster.
- **Badreyya AlShehhi**, Srinivasa Reddy Tamalampudi, Irfan Saadat, and Ibraheem Almansouri. "InSe performance as a FET sensor device", Materials Research Society (MRS), Boston, US, 2018- poster.
- **Badreyya AlShehhi**, Rida Gadhafi and Mihai Sanduleanu. "Ultra-low-power, small footprint, 120 GHz, CMOS radio transmitter with on-chip antenna for Internet of Things (IoT), the International Journal of Embedded Systems (IJES), American university of Ras Al-Khaimah (AURAK) RAK, UAE, 2016 -oral presentation.

Industry Experience:

- **Dubai's Electricity and Water Authority R&D center (DEWA R&D)**, *Senior R&D Technologist/ Solar Cell Technology / Solar Research Programs*, Dubai, UAE
- **Technology Innovation Institute (TII)**, Senior Researcher/ Self-Healing Group/ Advanced Materials Research Centre Abu Dhabi, UAE
- **Masdar Institute of Science and Technology /Khalifa University**, *PhD candidate / Research/Teaching / Laboratory Assistant*, Abu Dhabi, UAE

External Trainee/Online Courses

- 'Python for Beginners,' 'Introduction to Internet of Things,' and 'Introduction to Artificial Intelligence and Machine Learning'. DEWA R&D, Dec 2023
- Workshop with Fraunhofer CSP for uncertainty measurement, SOP, and best practices for indoor and outdoor I-V and EL measurement, DEWA R&D, Sept 2022.
- Training course under the title of Dealing with Difficult Personalities, DEWA, July 2022.
- Seminar on Future Governments, June 2022.
- Workshop by DEWA R&D Advanced Materials Research program, Nov 2021.
- Online workshop on self-confidence by Government of Sharjah, Nov 2021.
- Online course on Introduction to Modeling with Solidworks, Aug 2021.
- Online course on Finite Element Modeling Using COMSOL Multiphysics Course, July 2021.
- Worked in a joint collaboration project related to graphene sensing application with University of Manchester, Manchester, UK, Oct, 2016.
- Training in Cadence to explore options for low power VCO in Global Foundries, Dresden, Germany, Jun 2015.