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Dr. Khan Alam
Assistant Professor

Department of Physics and Interdisciplinary Research Center for Renewable Energy and Power Systems (IRC-REPS)
King Fahd University of Petroleum & Minerals, Saudi Arabia

Executive Summary:
Dr. Khan Alam has received his Ph.D. degree from Ohio University, USA in condensed matter physics with research focus on semiconductors, magnetism, and low temperature physics. At Ohio University, he lead the efforts of developing a growth and characterization facility for nitride semiconducting thin films that included a low temperature spin polarized scanning tunneling microscopy connected with a molecular beam epitaxy (MBE). He then accepted a joined offer of a Postdoctoral Researcher position from the Department of Molecular Engineering, University of Chicago (UC), USA and a Resident Associate position from Argonne National Laboratory (ANL), USA. At UC and ANL, he carried out research on growing oxide thin films by MBE, RF/DC sputtering, and atomic layer deposition system and used clean room facility for different characterizations of the thin films. In 2018, he joined the Department of Physics at King Fahd University of Petroleum and Minerals as Assistant Professor. His current research interest include growing nitride thin films by RF/DC sputtering system and studying structural, electronic, and magnetic properties of nitride thin films that niche corrosion resistance, ultraviolet protection, and thermoelectric applications.

Education:
- ❑ PhD Condesed Matter Physics, Ohio University

Job:
- ❑ Postdoctoral Research, University of Chicago
- ❑ Resident Associate: Argonne National Laboratory

Distinguished Projects

- *Project title* “Studied of Nitride Thin Films” funding by *DSR KFUPM*, Dhahran, Saudi Arabia, Role: *PI*.
- *Project title* "In-situ copolymerization of ethylene with polar monomer using nitride-based nanomaterials and metallocene catalyst” funding by *IRC-REPS, KFUPM*, Dhahran, Saudi Arabia, Role: Co-PI.

Teaching

- PHYS 432
- PHYS 101 course and lab
- PHYS102 course and lab
- Developing Virtual labs for students during the COVID-19 pandemic

Award and Recognitions

- Fellowship from Condensed Matter and Surface Science Institute, Ohio University
- Best Poster Award, Nanoscale and Quantum Phenomena Institute, Ohio University
- Spot Award from Argonne National Laboratory
- Guest Editor Hindawi , Advances in Condensed Matter Physics

Publications

Following are selected publications

- Alam, Khan, Andrew Foley, and Arthur R. Smith. "Native Gallium Adatoms Discovered on Atomically-Smooth Gallium Nitride Surfaces at Low Temperature." Nano letters 15, no. 3 (2015): 2079-2085.
- Alam, Khan, Steven M. Disseler, William D. Ratcliff, Julie A. Borchers, et al. "Structural and magnetic phase transitions in chromium nitride thin films grown by rf nitrogen plasma molecular beam epitaxy." Physical Review B 96, no. 10 (2017): 104433.
- Alam, Khan, Keng-Yuan Meng, Rodrigo Ponce-Pérez, et al. "Exchange bias and exchange spring effects in Fe/CrN bilayers." Journal of Physics D: Applied Physics 53, no. 12 (2020): 125001.

Skills and Expertise

- Growth of nitride and oxide thin films by molecular beam epitaxy, RF/DC sputtering, and atomic layer deposition system.
- Designing low temperature facilities for different characterizations.
- Prototyping, Experimental Analysis and Environmental Assessment;
- Phase Change Material, Thermoelectric, and Nanomaterials.
- Exchange biasing and exchange spring effects