

Anas I Abutaha

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EDUCATION:

King Abdullah University of Science and Technology (KAUST) May 2015 (Expected)

Thuwal, Kingdom of Saudi Arabia
PhD Candidate in Materials Science and Engineering
GPA (3.60/4.00)
Dissertation Title: "Nanostructured thermoelectric oxides for energy harvesting applications"
Thesis Advisor: Prof. Husam Alshareef

The University of Jordan Aug 2010

Amman, Jordan
M.Sc. in Nuclear Physics
GPA (3.73/4.00)

The University of Jordan Jan 2007

Amman, Jordan
B.Sc. in Physics
GPA (3.43/4.00)

RESEARCH INTERESTS:

- Thermoelectric materials and devices for waste-heat recovery and energy harvesting applications
- Thin film growth and technology for microelectronics and nano-devices
- Nano-Fabrication and characterization using state-of-the-art facilities

WORK EXPERIENCE:

RESEARCH EXPERIENCE

King Abdullah University of Science and Technology (KAUST)
Thuwal, Kingdom of Saudi Arabia
Materials Science and Engineering Department

PhD Researcher Feb 2011 – present

- Conducted multiple researchers on the areas of physics, chemistry, and materials science
- Developed novel metal oxide superlattices which can be used in high-temperature thermoelectric energy harvesting devices

- Studied the thermoelectric properties of different oxide thin films, such as electron doped SrTiO₃ and ZnO, fabricated by pulsed laser deposition system
- Operated many Nano-Fabrication and materials characterization tools independently in order to do comprehensive experimental studies on oxide thin films and superlattices
- Committed to a weekly meeting for the research group in order to present my research results and findings
- Became a member in the first international student chapter of Materials Research Society (MRS) at KAUST

TEACHING EXPERIENCE

The University of Jordan
Amman, Jordan
Physics Department

Teaching Assistant

Sep 2006 – Jan 2010

- Lead academic discussions in general physics laboratories for fresh students and sophomores in physics and engineering departments, resulted in a better understanding for the basic applied physics experiments and contributed to improve their academic performance
- Evaluated the experimental works done by the students, and suggested novel strategies on how to conduct research

CONFERENCES & PRESENTATIONS:

- [Materials Research Society \(MRS\) Fall Meeting and Exhibit](#), Boston, USA (Nov 25–30, 2012)
Project presented: “Laser energy tuning of carrier effective mass and thermopower in epitaxial La doped SrTiO₃ thin films”
Al Abutaha, SR Sarath Kumar, HN Alshareef
- [International Conference on Thermoelectrics \(ICT\)](#), Kobe, Japan (Jun 29–July 4, 2013)
Project presented: “Crystal Orientation dependent thermoelectric properties of highly oriented Al doped ZnO thin films”
Al Abutaha, S.R. Sarath Kumar, and H. N. Alshareef
- [Materials Research Society \(MRS\) Fall Meeting and Exhibit](#), Boston, USA (Nov 30–Dec 5, 2014)
Project to be presented: “Enhanced thermoelectric properties of SrTiO₃-based superlattices”
Al Abutaha, SR Sarath Kumar, HN Alshareef
- “X-ray crystallography”, presented to Dr. Iyad Al-Qasir (The University of Jordan) in Fall 2008
- “Nuclear Fuel Exploration”, presented to Dr. Saed Dababneh (Al-Balqa' Applied University) in Spring 2009
- “Radioactive nuclides identification in some building materials (Ceramics & Cements) using high resolution detector (High Purity Germanium "HPGe" Detector)”, Presented to Dr. Khalifeh Abu Saleem (The University of Jordan) in Fall 2009. This project was sponsored by Jordan Atomic Energy Commission
- “Nanostructured Thermoelectrics”, presented to Prof. Husam Alshareef (KAUST) in Spring 2011

PUBLICATIONS:

1. *Laser energy tuning of carrier effective mass and thermopower in epitaxial La doped SrTiO₃ thin films*
AI Abutaha, SR Sarath Kumar, HN Alshareef
[Applied Physics Letters](#), 100 (16), 162106 (2012)
2. *Crystal orientation dependent thermoelectric properties of highly oriented Al doped ZnO thin films*
AI Abutaha, SR Sarath Kumar, HN Alshareef
[Applied Physics Letters](#), 102 (5), 053507 (2013)
3. *Doping-site dependent thermoelectric properties of epitaxial strontium titanate thin films*
AI Abutaha, S.R. Sarath Kumar, AM Dehkordi, TM Tritt, HN Alshareef
[Journal of Materials Chemistry C](#), 2 (45), 9712 (2014)
4. *Enhanced Thermoelectric Figure of Merit in Thermally Robust, Nanostructured Superlattices based on SrTiO₃*
AI Abutaha, S.R. Sarath Kumar, Kun Li, HN Alshareef
“Submitted”
5. *Integrating Carbon Nanotubes to Silicon by means of Vertically Aligned Carbon Nanotube Field-effect Transistors*
Jingqi Li, Qingxiao Wang, Weisheng Yue, Zaibing Guo ; LIANG LI, Chao Zhao Xianbin Wang; **AI Abutaha**, H. N. Alshareef, Xixiang Zhang
[Nanoscale](#), 6, 8956 (2014)
6. *Modeling the transport properties of epitaxially grown thermoelectric oxide thin films using spectroscopic ellipsometry*
SR Sarath Kumar, **AI Abutaha**, MN Hedhili, HN Alshareef
[Applied Physics Letters](#), 100 (5), 052110 (2012)
7. *Effect of oxygen vacancy distribution on the thermoelectric properties of La doped SrTiO₃ epitaxial thin films*
SR Sarath Kumar, **AI Abutaha**, MN Hedhili, HN Alshareef
[Journal of Applied Physics](#), 112 (11), 115104 (2012)
8. *Vertically aligned carbon nanotube field-effect transistors*
Jingqi Li, C Zhao, Q Wang, Q Zhang, Z Wang, X Zhang, **AI Abutaha**, HN Alshareef
[Carbon](#), 50 (12), 4628 (2012)

HONORS & AWARDS:

- **Dow Sustainability Innovation Student Challenge Award (SISCA)** **2014**
1st place “Grand Prize Winner”
- **Sustainability at my school** **2014**
Competition held in Materials Research Society (MRS) Fall Meeting
3rd place
- **PhD Fellowship** **2011**
King Abdullah University of Science and Technology (KAUST)
- **King Abdullah (II) Fund for Development (KAFFD) Scholarship** **2010**
for Nuclear Physics M.Sc. Students in Jordan

TECHNICAL & COMPUTER SKILLS:

- **Technical Skills**

NANOFABRICATION SKILLS

- Pulsed Laser Deposition (PLD)
- Atomic Layer Deposition (ALD)
- Sputtering
- Chemical Vapor Deposition (CVD)
- Photolithography
- e-beam lithography (EBL)
- Dry and wet etching
- Rapid Thermal Processing (RTP) & different annealing processes

CHARACTERIZATION SKILLS

- Four-point thermoelectric tester
- Physical properties measurement system (PPMS)
- Atomic Force Microscopy (AFM)
- Scanning Electron Microscope (SEM)
- High resolution x-ray diffraction (HRXRD),
- Profilometer Dektak

- **Computer Skills**

- Mathematica[®], Mat lab[®], Origin[®], CrystalMaker[®], Diamond[®], Comsol[®], L-edit[®]

REFERENCES:

- **Prof. Husam Alshareef** (husam.alshareef@kaust.edu.sa)
Professor of materials science and engineering
King Abdullah University of Science and Technology (KAUST), KSA
- **Dr. Mahmoud Alhussein** (m.alhussein@ju.edu.jo)
Associate Professor of physics
The University of Jordan, Jordan
- **Dr. Khalifa Abusaleem** (k.abusaleem@ju.edu.jo)
Associate Professor of physics
The University of Jordan, Jordan
- **Dr. Iyad Al-Qasir** (ialqasir@sharjah.ac.ae)
Assistant professor of Physics
University of Sharjah, UAE