Husam N. Alshareef

King Abdullah University of Science & Technology (KAUST)
e-mail: husam.alshareef@kaust.edu.sa

Web of Science Researcher ID: A-2000-2015
Google Scholar: Google Scholar Profile

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EDUCATION

• Post-Doctoral Researcher	Sandia National Laboratory, USA	1995-1996
• Ph.D. in Materials Science & Engineering	North Carolina State University, USA	1992-1995
• M.S. in Materials Science & Engineering	North Carolina State University, USA	1990-1991
• B.S. in Ceramics Engineering	Alfred University, New York, USA	1986-1990

PROFESSIONAL APPOINTMENTS

- **Dean** 2026-current
  Physical Science & Engineering Division
  KAUST, Saudi Arabia

- **Distinguished Professor** 2025
  Ibn Alhaytham Distinguished Professor
  Materials Science & Engineering, KAUST, Saudi Arabia

- **Founding Director** 2024-current
  Center for Renewable Energy and Storage Technologies (CREST)
  KAUST, Saudi Arabia

- **Program Chair** 2013-2016
  Materials Science & Engineering, KAUST, Saudi Arabia

- **Full Professor** 2013-2025
  Materials Science & Engineering, KAUST, Saudi Arabia

- **Associate Professor** 2009-2013
  Materials Science & Engineering, KAUST, Saudi Arabia

- **Research Professor** 2007-2009
  Materials Science & Engineering, University of Texas at Dallas, USA

- **Member of Technical Staff** 2000-2007
  Texas Instruments, Inc., Dallas, USA

- **Member of Technical Staff** 1996-1999
  Micron Technology, Inc., Boise, USA

RESEARCH INTERESTS

Development of Nanoscale Materials for Semiconductor Device and Energy Applications

EXPERIENCE

My background combines nearly 12 years of industrial experience in the semiconductor industry, where I deployed several technologies in volume production in the USA, and 18 years in academia, where I have demonstrated excellence in research and education.

SCHOLARLY IMPACT

- **650** journal publications, **100** conference publications, **58 Highly Cited papers**
- **84,000** citations with an H-index of **156** (Google Scholar)
- **80** issued and pending patents, several of which entered volume production
- **$26M** of Research Funding including US Sources
- **200** invited/contributed presentations and tutorials
- **30** Ph.D., **6** MS students, **30** post-doctoral researchers supervised (including current ones)

HONORS/AWARDS

- **Elected as Ibn Alhaytham Distinguished Professor** at KAUST (November, 2025)
- Highly Cited Researcher in Materials Science 2023 (Web of Science & Clarivate Analytics Ranking)
- Highly Cited Researcher in Materials Science 2022 (Web of Science & Clarivate Analytics Ranking)
- Highly Cited Researcher in Materials Science 2021 (Web of Science & Clarivate Analytics Ranking)
- Highly Cited Researcher in Materials Science 2020 (Web of Science & Clarivate Analytics Ranking)
- Highly Cited Researcher in Materials Science 2019 (Web of Science & Clarivate Analytics Ranking)
- **Fellow** of the Materials Research Society (**MRS**), USA, 2025
- **Fellow** of Institute of Electrical and Electronics Engineers (**IEEE**), USA, 2024
- **Fellow** of the US National Academy of Inventors (**NAI**), USA, 2022
- **Fellow** of the UK Institute of Physics (**IoP**), UK, 2022
- **Fellow** of the Institute of Materials, Minerals, & Mining (**IMMM**), UK, 2021
- **Fellow** of the American Physical Society (**APS**), USA, 2019
- **Fellow** of the Royal Society of Chemistry (**RSC**), UK, 2018
- Kuwait Prize in Clean and Sustainable Energy Technologies (2018)
- **KAUST Distinguished Teaching Award (2018)**
- IEEE Distinguished Lecturer in Nanotechnology (2017-2018)
- A.H. Shoman Prize for Excellence in Energy Research (2016)
- DOW Sustainability Competition Award (2014) (with my student Dr. Anas Abu-Taha)
- Chair of the Materials Research Society (MRS) Fall Meeting (2014). The meeting was held in Boston, USA, with 52 simultaneous symposia and 6500 attendees.
- DOW Sustainability Competition Award (2011) (with my student Dr. Wei Chen)
- SEMATECH Corporate Excellence Award (2006)
- Senior Member of IEEE (2004)
- Sandia National Laboratory Post-doctoral Fellowship (1995-1996)
- U.S. Department of Education Electronic Materials Fellowship (1991-1994)
- North Carolina State University Dean's Fellowship (1990)
- BS Degree with High Honors, Magna Cum Laude (1990)
- Seth Sprague Physics Award (1988)
- UNDP Outstanding Undergraduate Student Fellowship (1986 - 1990)

SERVICE AND LEADERSHIP AT KAUST

- **Dean,** Physical Science & Engineering Division (January 2026-now)
- **Director**, Center of Excellence on Renewable Energy and Storage Technologies (July 2024-present)
- **Program Chair**, Materials Science and Engineering (MSE) Program Chair (2013-2016)

- **Chair**, Division Faculty Hiring Committee (2023-present)
- **Chair**, Nanofab User Committee from 2010-2017. This committee was responsible for all issues, equipment purchases, policies, etc., in KAUST Nanofab and the thin film lab
- **Lead,** developed Energy Transition Curriculum that is being taught throughout the entire Kingdom
- **Member**, Materials Science and Engineering Program Hiring Committee (2010- present)
- **Member,** President's Task Force to Establish a Roadmap for Semiconductor Research in the Kingdom
- **Member**, KAUST Promotion and Appointment Committee (2015-2017)
- **Member**, Academic Space and Equipment Planning Committee (2023-now)
- **Member,** KAUST Academic Council 2018-2020
- **Thrust Lead**, Sensors Initiative. Led project to develop Self-powered Wearable Sweat-based Sensors that were demonstrated successfully in KAUST's gym athletes (2013-2018)
- **Founder**, established the first MRS Student Chapter outside the USA at KAUST
- **Member**, MSE program curriculum committee since 2010
- **Member**, University Curriculum Committee (2009-2010)
- **Member**, KAUST Analytical Chemistry Lab Committee 9/2010-9/2012
- **Advisor**, Advisor for the Materials Research Society Chapter at KAUST
- **Member**, Winter Enrichment Program Committee for several years (2010-2013)
- **Member**, task force that drafted the first visiting student policy program (9/2011- 12/2011)
- **Member**, Core Laboratory Policy Task Force (2011-2012)
- **Member**, KAUST Community Affairs Community (2015-2017)

PROFESSIONAL SOCIETIES AND SERVICES

- Professional Memberships:
  - Materials Research Society (MRS), Fellow Member
  - Institute of Electrical and Electronics Engineers, Fellow Member
  - American Physical Society (APS), Fellow Member
  - National Academy of Inventors (NAI), Fellow Member
  - Royal Society of Chemistry (RSC), Fellow Member
  - Institute of Physics (IoP), Fellow Member
  - Institute of Materials, Minerals, & Mining (IMMM), Fellow Member
  - Electrochemical Society (ECS), Lifetime Member
  - American Ceramic Society (ACS), Member
  - American Association for the Advancement of Science (AAAS), Member

- Editorial Engagement and Service:
  - Member of International Advisory Board, **Advanced Materials**, Wiley, 2022-now
  - Member of the Editorial Board, **eScience**, Elsevier 2022-now
  - Guest Editor, "Advances in Zn-Based Batteries", **Energy Storage Materials** 2022-now
  - Member of the Editorial Board, "**Nano Research Energy**", Tsinghua University 2021-now
  - Member of the Editorial Board, "**Materials Today Energy**", Elsevier 2021-now
  - Member of the Editorial Board, "**Small Methods**", Wiley 2017-now
  - Member Editorial Board "**Small Structures**", Wiley 2017-now
  - Member of Editorial Board "**EnergyChem**", Elsevier 2018-now
  - Member of Editorial Board, ACS Applied Materials & Interfaces, ACS 2015-2017
  - 2019-now, Chair, **IEEE Nanotechnology Council** (Western Saudi Arabia Section)
  - 2017-2018, IEEE Distinguished Lecturer in Nanotechnology
  - 2016-2020**, Chair, MRS University Chapter Subcommittee**
  - 2013-2018, Member, **MRS New Meetings Subcommittee**
  - 2010-2013, **Associate Editor**, J. Electronic Materials
  - 2012, **Founding Faculty Advisor** of the MRS Student Chapter at KAUST (1st MRS Student Chapter ever established outside the USA)
  - 2011, **Guest Editor**, MRS Bulletin, Materials Research Society (February 2011)

Meetings & Symposia

- 2023 Lead Organizer of MRS Symposium on Capacitive Energy Storage (S2023)
- 2017, Member of the International Advisory Board of the "Frontiers in Theoretical and Applied Physics Meeting" at the American University of Sharjah, February 2017 (FTAPS 2017). MRS-Endorsed meeting.
- 2012, Member of Scientific Committee, 4th International Conference on Nanomaterials, IIT Madras, India, held in October 2012.
- 2011, Member of Scientific Committee, Thermoelectric Symposium, European Materials Research Society (E-MRS), May 2011 (Nice, France).
- 2013, Member of Scientific Committee, Fourth International Meeting on Dielectric Materials, May 29-31, 2013, (Marrakesh, Morocco).
- 2018, Lead Organizer of Symposium titled "Capacitive Energy Storage: Fundamentals, Materials, and Devices", for the MRS 2018 Spring Meeting in Phoenix, USA (April 2-6, 2018).
- 2016, Co-Organizer of Symposium ES1, "Materials & Chemistries for Grid Scale Energy Storage", at the Materials Research Society (MRS) Meeting, Boston, USA, Nov. 28-December 2, Fall 2016
- 2016, Faculty Advisor for the First Ever Student-Organized Symposium at the Materials Research Society (MRS) Fall Meeting, Nov. 28-December 2, Fall 2016 (Boston, MA).
- 2015, Lead Organizer, "Symposium on Flexible & Large Area Electronics" at the International Materials Research Congress (IMRC, Cancun MRS), August 16-20, 2015, Cancun, Mexico.
- 2014, Co-Organizer, "International Conference on Functional Nanomaterial Design, Synthesis, and Applications", KAUST. March 16-20, 2014.
- 2014, **Co-Chair of the Materials Research Society (MRS) Fall Meeting (2014**)
- 2013, Lead Organizer, "1st International Workshop on Energy Storage at KAUST", which was held at KAUST on September 23 and 24, (2013).
- 2012, Co-Organizer, Special Session on Thermoelectric Thin Films at the Materials Research Society (MRS) Meeting in Boston, USA (November, 2012).
- 2012, Co-Organizer of the "Large-Area & Flexible Electronics" symposium at the International Materials Research Congress (IMRC, Cancun MRS) in August 2012, Cancun, Mexico.
- 2010, Co-Organizer of the "Large-area & Flexible Electronics" symposium at the International Materials Research Congress (IMRC, Cancun MRS) in August 2010, Cancun, Mexico.
- 2006, Member of Metal-high K Consortium Representing TI at Sematech

SUPERVISION & MENTORSHIP

Research Scientist Advising

Dr. Abdullah Hamdi	KAUST	6/2026-NOW
Dr. Yunpei Zhu	KAUST	2021-now
Dr. Mrinal Hota	KAUST	2019-2023

Post-Doctoral Fellow Advising

Post-doc Name	University	Duration
Dr. Wenli Zhao	KAUST	2022-now
Dr. Wandi Wayhidu	KAUST	2024-now
Dr. Fangwang Ming	KAUST	2024-now
Dr. Yizhou Wang	KAUST	2024-now
Dr. Dong Guo	KAUST	2023-now
Dr. Jinlin	KAUST	2023-now
Dr. Yongjiu Lei	KAUST	2023-now
D. Xiangming Xu	KAUST	2021-now
Dr. Jehad El-Demellawi	KAUST	2021-2023
Dr. Sharat Barman	KAUST	2021-now
Dr. Lin Shi	KAUST	2021-now
Dr. Zhiming Zhao	KAUST	2020-now
Dr. Yunpei Zhu	KAUST	2017-2020

Dr. Seunghyun Hong	KAUST	20018-2021
Dr. Guodong Zou	KAUST	2019-2021
Dr. Dazhen Zhu	KAUST	2019-2021
Dr. Gang Huang	KAUST	2019-2021
Dr. Jian Yang	KAUST	2019-2021
Dr. Dhinesh Velusamy	KAUST	2015-2019
Dr. Mrinal Hota	KAUST	2013-2019
Dr. Wenli Zhang	KAUST	2017-2020
Dr. Yizhou Zhang	KAUST	2017-2020
Dr. Kang-Hyuck Lee	KAUST	2016-2020
Dr. Saurabh Kumar	KAUST	2017-2018
Dr. Rajesh Kumar	KAUST	2015-2017
Dr. Hanfeng Liang	KAUST	2015-2017
Dr. Narendra Kurra	KAUST	2012-2017
Dr. Pranati Nayak	KAUST	2015-2017
Dr. Sarath Kumar	KAUST	2010-2015
Dr. R.B. Rakhi	KAUST	2010-2015
Dr. Pradipta Nayak	KAUST	2011-2015
Dr. Nagaraju Doddahalli	KAUST	2013-2015
Dr. Ji Hoon Park	KAUST	2013-2015
Dr. Shahid Muhammad	KAUST	2012-2014
Dr. Unnat Bhansali	KAUST	2010-2013
Dr. Mahmoud AlAhamd	KAUST	2010-2011

Graduate Student Advising

Student Name	University	Degree	Graduation
Fay Alsafi	KAUST	Ph.D.	2030
Thesis Title	Development of Separators for High Temperature Batteries		
Shahad Alalwan	KAUST	Ph.D.	2030
Thesis Title	Hybrid Electrolyte for Solid-state Batteries		
Zainab Al Hubail	KAUST	Ph.D.	2028
Thesis Title	Hard Carbon Anodes for Na-ion Batteries		
Dekang Zhu	KAUST		
Thesis Title	MXene Based Smart Windows		2028
Arwa Albar	KAUST	Ph.D.	2028
Thesis Title	MXene-GaN Photodetectors		
Ning Chu	KAUST		2027
Thesis Title	MXenes for Wide abnd Gap Semiconductor Devices		2027
Yusuf Khan	KAUST	Ph.D.	2026
Thesis Title	Microsupercapacitor and Microbatteries		
Zixiong Shi	KAUST	Ph.D.	6/2023
Thesis title:	Metal-Sulfer Batteries: Engineering the Electrolyte		
Zahra Bayhan	KAUST	Ph.D.	6/2022
Thesis title:	MXene-2D Material Composite Electrodes for Mobile Ion Batteries		
Rajeh Asaadi	KAUST	MS	6/2022
Thesis title:	Wafer-scale Growth of Mo_2C by Epitaxial Phase Conversion		
Tianchao Guo	KAUST	Ph.D.	6/2023
Thesis title	P-type Te Nanostructures for Device Applications		
Yizhou Wang	KAUST	Ph.D.	6/2023
Thesis title	Strategies for Control of Metal Dendrites in Zinc ion Batteries		
Zhengnan Tian	KAUST	Ph.D.	5/2021
Thesis title	Metal-free Mobile ion Batteries		
Zhixiong Liu	KAUST	Ph.D.	10/2021
Thesis title:	Halide Perovskite-2D Material Optoelectronic Devices		
Eman Elhajji	KAUST	Ph.D.	6/2022
Thesis Title:	Laser-Scribed Graphene for Energy Applications		

Wenxi Wang	KAUST	Ph.D.	10/2021
Thesis Title:	Covalent Organic Framework Electrodes for Zinc Ion Batteries		
Guo Jing	KAUST	Ph.D.	10/2021
Thesis Title:	Vanadium-based cathodes for high-performance zinc ion batteries		
Fangwang Ming	KAUST	Ph.D.	6/2022
Thesis Title:	Layered Electrodes for Rechargeable Batteries Beyond the Lithium		
Yongjiu Lei	KAUST	Ph.D.	3/2022
Thesis Title:	MXene-Based Wearable and Self-Powered Biosensors		
Fan Zhang	KAUST	Ph.D.	6/2021
Thesis Title:	Two-Dimensional Materials for Advanced Sodium-Ion Battery Anodes		
Hyunho Kim	KAUST	Ph.D.	9/2020
Thesis Title:	MXenes for Electronic and Energy Harvesting Applications		
Shaobo Tu	KAUST	Ph.D.	6/2020
Thesis Title:	MXene-Derived Functional Materials & Devices		
Jehad El Demellawi	KAUST	Ph.D.	11/2020
Thesis Title:	Surface Plasmons in MXenes for Advanced Optoelectronics		
Xiangming Xu	KAUST	Ph.D.	11/2020
Thesis Title:	Wafer-scale Growth of 2D Materials by Epitaxial Phase Conversion		
Chuan Xia	KAUST	Ph.D.	2018
Thesis Title:	Ternary Metal Chalcogenide Electrodes for Energy Storage		
Ahmed Bilal	KAUST	Ph.D.	2018
Thesis Title:	MXene Composites for Na Ion Battery Applications		
Zhenwei Wang	KAUST	Ph.D.	2018
Thesis Title:	p-type Oxide Semiconductors for Transparent Electronics		
Jiang Qiu	KAUST	Ph.D.	2019
Thesis Title:	Electrochemical Microsupercapacitors for on-Chip Energy Storage		
Fwza Alshamari	KAUST	Ph.D.	2018
Thesis Title:	Thin Film Transistors with Multilayer Channel and Dielectrics		
Nuha Al-Hebshi	KAUST	Ph.D.	2015
Thesis Title:	Ni-Based Electrodes for Energy Storage Applications		
Anas Abu Taha	KAUST	Ph.D.	2015
Thesis Title:	Nanostructured Thermoelectric Oxides for Energy Harvesting		
Wei Chen	KAUST	Ph.D.	2013
Thesis Title:	Nanostructured MnO_2 Electrodes for Supercapacitor Applications		
M. Adnan Khan	KAUST	Ph.D.	2013
Thesis Title:	Polymer Ferroelectric Memories for Flexible & Transparent Electronics		
Alfonso Caraveo	KAUST	Ph.D.	2013
Thesis Title:	p-Type Transparent Oxide Semiconductors for Emerging Electronics		
Mahmoud Almadhoun	KAUST	MS	2011
Thesis Title:	Graphene-Polymer Nanocomposites for Capacitive Energy Storage		
Yaocai Bai	KAUST	MS	2012
Thesis Title:	Reduced Graphene Oxides as Electrode Materials for Supercapacitors		
Nulati Yesibolati	KAUST	MS	2013
Thesis Title:	Modification of SnO_2 Anodes by ALD for Lithium-Ion Batteries		
Amir Hanna	KAUST	MS	2012
Thesis Title:	Transport Properties of Ferroelectric Polymer P(VDF-TrFE) Memories		
Erika Fuentes	UT Dallas	Ph.D.	2013
Thesis Title:	Relaxor Thin Films for Energy Harvesting Using the Piezoelectric Effect		
Rahul Gupta	UT Dallas	Ph.D.	2011
Thesis Title:	Electrical Contacts for Bi2Te3 Thermoelectrics		
Wardia Debray	UT Dallas	MS	2010
Thesis Title:	Solution-Derived Piezoelectric Thin Films for Energy Harvesting		

AWARDS FOR MY STUDENTS AND POST-DOCS

- MIT Innovators under 35 Prize for my post-doc Jehad El-Demellawi (2023)
- "Best Poster Award" for my student Jehad El-Demellawi in Symposium "MXenes" at the Materials Research Society (MRS), November 29, 2022 (Boston, MA, USA)
- "Best Poster Award" for my student Eman Alhajji in the Symposium of the Material Research Society (MRS), Spring 2021 Virtual Meeting.
- Eman Alhajji was selected as a "Young Change Maker" from MEM (Middle East, Mediterranean) Region and invited to attend the 2021 Summer Summit in Lugano, Switzerland (August 21-28, 2020). Eman started one of the most active groups on the KAUST campus: *Students for Sustainability*.
- 1000 Young Talent Award (China) for my student Chuan Xia (now Prof. Xia at UESTC) in 2020
- "Young Researcher Award" for my student Xiangming Xu at the 12th International Symposium on Flexible Organic Electronics, ISFOE 2019, Thessaloniki, Greece, July 1-4, 2019
- Best Poster Award for my post-doc Hao Wu at the International Conference on Advanced Materials Technologies (ICMAT) 2019 (organized and run by the Singapore Materials Research Society, S-MRS), June 22-28, 2019
- Winner (2nd Place) Falling Walls Competition by post-doc Yizhou Zhang at KAUST's Annual Falling Walls Competition (Based on His Work on Artificial Skin). Yizhou traveled to Berlin to participate in the International Falling Wall Competition in December 2018.
- Best Poster award for Kaust Gifted Student Program Student Eman Elhajji at the BASF Poster Competition held April, 2018 in Research Triangle Park (BASF Research Center), NC, USA, for her work on laser-assisted formation of hard carbon anodes for Na ion batteries
- Best Poster Award for Ph.D. student Chuan Xia at the Singapore Materials Research Society Meeting (ICMAT), June 2017 for his work on ternary transition metal chalcogenides for energy applications
- Post-doc Rakhi Raghavan's paper in Nano Letters (Nano Letters 12, 2559 (2012)) was the most cited science article in Saudi Arabia between 2006 and 2016 (with all indigenous authors) according to Thomson-Reuters report on scientific research in the Middle East (Report published Jan. 28, 2017).
- Best Poster Award (1st Place) for my student Zhenwei Wang in the IEEE Electron Device Society Competition, KAUST, January 23, 2017.
- Best Poster Award (2nd place) for post-doc Dhinesh Velusamy in the Annual Winter Enrichment Competition at KAUST(campus-wide competition), January 15, 2017
- Best Ph.D. Student Award in the Division of Physical Sciences & Engineering & KAUST for my student Chuan Xia for Publishing 18 papers during the first three years of his Ph.D. (2016)
- Best Poster Award for my student Zhenwei Wang at the 6th Annual Meeting on Transparent Conducting Materials (TCM), Chania, Greece (2016)
- Second Place Award ($6000 prize) for my student Nuha Alhebshi by the Arab League for Education, Culture, & Science (ALECSO). Awards are for Creativity and Technical Innovation for the Young Researchers of the Arab Homeland (2015).
- National Saudi Olympiads Award (Third place) for my summer intern Mansour Dabbagh for his work on Sodium-Ion Batteries (March 2016).
- Best Poster Award for Student Bilal Ahmed at the 2015 WEP Poster Competition at KAUST for his work on Sodium-Ion Batteries (January 2015)
- Outstanding Post-Doc Award ($5000 prize) for my post-doc Narendra Kurra for his work on flexible energy storage devices by SABIC Sponsored Competition (June 2015)
- Best Poster Award (third place) for my student Anas Abu-Taha at the MRS Sustainability Poster Competition at the Materials Research Society in Boston, MA (December 2014).
- Best Poster Award for Ph.D. student Alfonso Caraveo at the International Colloquium on Flexible Electronics and Photovoltaics, KAUST (November 3-5, 2013).
- Best Presentation Award, Ph.D. Student Wei Chen at the 2013 Nanotechnology Conference in Macau, China (2013).
- SABIC Award for Innovations in Plastic Electronics for Ph.D. student Adnan Khan (April 2013)
- Outstanding Post-Doc Award ($5000 prize) for my post-doc Rakhi Raghavan for her work on energy storage (SABIC sponsored competition) (June, 2013)

- Academic Excellence Award for my Ph.D. student Adnan Khan ($10000 prize, January, 2013)
- Academic Excellence Award for my Ph.D. student Wei Chen ($10000 prize, January, 2012)
- Best Poster Award at IMRC-MRS Meeting for my Ph.D. student Alfonso Caraveo (8/2011)
- INTEL Corporation ISEF Award -Third place in Best of Category Competition at the Intel International Science Fair for my student Fatimah Al-Ajaji (Pittsburgh, USA, May 13-18, 2012)
- Best Poster Award, Second Place, in the National Science Olympiads for our Student Intern Fatimah Al-Ajaji (Riyadh, Saudi Arabia on March 21, 2012).
- Best Poster Award (1st place) at the Annual Materials Science Poster Competition at KAUST for my student Wei Chen (November 2011)
- Best Poster Award (second place) during the university-wide poster competition held during the KAUST Winter Enrichment Program (WEP) in 2011 for my student Wei Chen (2011)
- Best Presentation Award, Ruiqi Wang, Summer Intern through Saudi Research Summer Institute (SRSI), KAUST, July 2014.

TEACHING EXPERIENCE

Class	University	Level	Frequency
Electronic Properties of Materials	KAUST	Graduate	4 semesters
Thermodynamics of Materials	KAUST	Graduate	6 semesters
Energy Storage Materials & Devices	KAUST	Graduate	6 semesters
Crystallography & Diffraction	KAUST	Graduate	1 Semester
Nanoelectronics**	KAUST	Graduate	1 Semester
Introduction to Materials Science	KAUST	Graduate	1 Semester
Functional Oxides*	KAUST	Graduate	2 semesters
Defects & Diffusion*	UT Dallas	Graduate	1 Semester

*Newly developed course,**co-taught

OUTREACH ACTIVITIES

- Frequent tutorials and lectures at universities and schools in the Kingdom of Saudi Arabia and the Middle East region
- Regular hosting of KAUST elementary and high school students for science demonstrations in my laboratory
- Annual participation in the Saudi Research Science Institute (SRSI), where gifted high school students are hosted in our laboratory at KAUST. Modeled after the MIT RSI program
- Hosting engineers from Saudi companies (eg SABIC & ARAMCO) in my laboratory
- Thesis committee membership at multiple schools in the Middle East and USA
- Member of the KAUST Schools parent council (2011-2012)
- Frequent evaluator of university promotion files for regional and international universities
- Proposal reviewer for Asia, EU, and USA funding agencies

RESEARCH GRANTS

- Principal Investigator, “Center for Renewable Energy & Storage Technologies (CREST). Grant Amount **US$12.5M**. Funding Source: KAUST and ARAMCO. I am the lead PI of this Center Proposal involving 18 Co-PIs from within and outside the Kingdom. Start Date: July 1, 2024-June 30, 2029.

- Principal Investigator, “High-Temperature Battery for Oil Recovery Applications”. Grant Amount **US$200,000.** Funding Source: Saudi ARAMCO. Awarded. Start Date: January 2024-January 2026.

- Principal Investigator, “Synthesis Strategies for More Stable MXenes”, Grant Amount: **US$100,000**. Funding Source: Saudi ARAMCO. Awarded. Start Date: January 2024-January 2026

- Principal Investigator, “Membrane-Free Zn-based Redox Flow Batteries”. Grant amount: **US$200,000**. Funding Source: KAUST Internal Competitive Research Grant program. KAUST. Awarded: January 2024 – December 2026

- Principal Investigator, “Molecular Design of Metal-organic Framework Electrodes for Mobile Ion Batteries”. Grant amount: **US$948,000** (my portion is $500,000 over three years. Funding Source: KAUST Internal Competitive Research Grant program. Co-PI: Professor Mohamed Eddaoudi, KAUST. Awarded: April 2022 – March 2025

- Co-Principal Investigator, “MXene-derived Metal-organic Frameworks”. Grant amount: **US$450,000** over two years (My portion is $225,000). Funding Source: KAUST Internal Competitive Research Grant program. PI: Professor Mohamed Eddaoudi, KAUST. Not Funded.

- Principal Investigator, Seed Fund “Scalable Production of MXene & its Membranes for Salinity Gradient Energy Harvesting”. Grant amount: **US$100,000** for 1 year. Funding Source: KAUST Impact Acceleration Fund. October 2020 – September 2021.

- Principal Investigator, “MXetronics: Electronic and Optical Applications of MXenes”. Grant amount: **US$1,035,000** (my portion is $662,000 over three years. Funding Source: KAUST Internal Competitive Research Grant program. Co-PI: Professor Mohamed Eddaoudi, KAUST, and Prof. Yury Gogotsi, Drexel University. Not funded.

- Principal Investigator, “Rational Design of Electrode Materials for Capacitive Deionization of Water”. Grant amount: **US$1,037,800** (my portion is $662,000 over three years). Funding Source: KAUST Internal Competitive Research Grant program. Co-PI: Professor Noreddine Ghaffour, KAUST, and Prof. Yury Gogotsi, Drexel University. Not funded.

- Principal Investigator, “Rational Design of Electrode Materials for Aqueous Zn Ion Batteries”. Grant amount: **US$840,000** (my portion is $500,000 over three years). Funding Source: KAUST Internal Competitive Research Grant (CRG 7) program. Start Date: 01 April 2019- 31 March 2022. Co-PI: Professor Yi Cui, Stanford University.

- Principal Investigator, “Metal-Organic Frameworks for Capacitive Energy Storage”. Grant amount: **US$1,039,000** (my portion is $550,000 over three years). Funding Source: KAUST Internal Competitive Research Grant (CRG 6) program. Start Date: 01 April 2018, End Date: 31 March 2021. Co-PI: Professor Mohamed Eddaoudi.

- Principal Investigator, “Double Transition Metal Carbides for Capacitive Energy Storage”. Grant amount: **US$1,045,000** (my portion is $700,000 over three years). Funding Source: KAUST Internal Competitive Research Grant (CRG) program. Start Date: 01 April 2017, End Date: 30 March 2020. Co-PI (Yury Gogotsi at Drexel University, USA).

- Co-principal Investigator, “Direct Elemental Quantification of Carbon-Based Electrode Materials”, Grant amount: **US$1,000,000** (my portion is $200,000 over three years). Funding Source: KAUST Internal Competitive Research Grant (CRG) program. Start Date: 01 April 2017, End Date: 30 March 2020.

- Principal Investigator, Capital Equipment Grant for Atomic Layer Deposition System. Grant Amount: **US$172,000**. Funding Source: KAUST Central Capital Equipment Funds Managed by Office of Vice President for Research. Start Date: December 2016 to End Date: N/A.

- Principal Investigator, “Polymer-Assisted Exfoliation of Two-Dimensional Materials for Energy Storage Applications”. Funding Source: Saudi Basic Research Industries Corporation (SABIC). Grant amount **US$622,000**. Start Date: January 2016 and End Date: January 2019.

- Principal Investigator, “Self-Powered Sensors for Wearable Personalized Healthcare Monitoring”, Grant Amount **US$2.1 Million** (my portion is $360,000 over 3 years). Start Date: January 2016 to End Date: January, 2019. This is a four-institution grant (KAUST, Georgia Tech, UCLA, and Regensburg University).

- Principal Investigator, Capital Equipment Grant for Automated Spray Coating System. Funding Source: KAUST Central Capital Equipment Funds Managed by Office of the Vice President for Research. Grant Amount: **US$92,000**. Start Date: April 2016 to End Date: N/A.

- Principal Investigator, “Two-Dimensional MXenes for Electronics and Energy Applications”, Grant amount **US$ 1.35** Million (my portion is $800,000 for three years). Funding Source: KAUST Internal Competitive Research Grant (CRG) Program. Start Date: March 2015 and End Date: March 2018. Co-PI (Yury Gogotsi at Drexel University, USA).

- Co-Principal Investigator, “Design and Processing of Electroactive Materials for Energy Storage and Delivery”. Funding Source: KAUST Internal Competitive Research Grant (CRG) Program. Grant Amount: **US$ 987,816** (my portion was $450,000 for three years). Start Date: October 2012 and End Date: October 2015. (PI: Pierre Beaujuge at KAUST).

- Principal Investigator, Capital Equipment Grant for Thermoelectric Measurement System. Funding Source: KAUST Central Capital Equipment Funds Managed by Office of the Vice President for Research. Grant Amount: **US$92,000**. Start Date: April 2016 to End Date: N/A.

- Co-Principal Investigator, “Fully Printable Complimentary Electronics on Flexible Substrates”, Collaborative Project with Imperial College, England. Funded by the KAUST-Imperial Academic Excellence Alliance Fund. Grant amount: **US$2.4 Million** (my portion was $360,000 for three years).Start Date: July 2012 and End Date: July 2015. (PI: Natalie Stingeli at Georgia Tech, USA).

- Principal Investigator, “Liquid Cell Microscopy of Supercapacitor and Battery Electrodes”. Funding source: IBM and KAUST. Grant Amount **US$200,000** (my portion was $110,000). Start Date: March 2012 and End Date: March 2013. (Co-PI: Frances Ross at IBM).

- Principal Investigator, “1st International Conference on Energy Storage at KAUST”, Funding Source: KAUST. Grant Amount: **US$88,000**. September 21-23, 2013.

- Principal Investigator, “Graphene-Based Electrodes for Enhanced Supercapacitor Performance”. Funded by Saudi National Science Funding Agency (KACST). Grant amount: **US$172,000**. Start Date: July 2012 and End Date: July 2014.

- Principal Investigator, “Energy Harvesting and Waste Heat Recovery Using Oxide Thermoelectrics”. Funded by KAUST Competitive Research Grant (CRG) Program. Grant Amount: US$1.5million (my portion was **US$893,000**). Start Date: March 2011 and End Date: March 2014. (Co-PI: Terry Tritt at Clemson University, USA).

- Principal Investigator, “Polymer-Based Flexible Electronics”. Funded by Saudi Basic Industries Corporation (SABIC). Grant Amount **US$422,000**. Start Date: March 2011 and End Date: March 2014.

- Principal Investigator, “Rectenna Device for Energy Harvesting”. Collaborative Research Project with Imperial College, England. Funded by KAUST-Imperial Academic Excellence Alliance Fund. Grant amount: US$660,000 (my portion was **US$160,000** over two years). Start Date: March 2011 and End Date: March 2013. (Co-PI Martyn Mclaughlin at Imperial College).

- Principal Investigator, “Functional Nanomaterials for Energy and Electronics”. KAUST Start-up Fund. Grant amount; **US$3,000,000** for five years (My portion is $3,000,000). Start July 2009- and End July 2014.

United States Funding Sources

- Co-Principal Investigator, “High-Density Piezoelectrics for Energy Harvesting from Vibration”. Funded by the US National Science Foundation, NSF, STTR Program. Grant amount: **US$130,000** Start Date: September 2008 and End Date: September 2011. (PI: Pradip Shah, Texas Micropower, Inc., USA)

- Principal Investigator, “Metal Electrodes for Nanoscale Electronic Devices”. Funded by Texas Instruments, Inc. Grant amount: **US$142,000**. Start Date: January 2008 and End Date: January 2009. (Co-PI: Robert Wallace and MA Quevedo-Lopez at UT Dallas, USA).

- Principal Investigator, “Contacts for Thermoelectrics Devices”. Funded by the II-VI Corporation. Grant Amount: **US$110,000**. Start Date: August 2008 to End Date: August 2009. (Co-PI: Bruce Gnade at UT Dallas, USA).

- Co-Principal Investigator, “Flexible Schottky Diode Arrays for Fingerprint Detector”. Funded by e-Smart Technologies. Grant Amount: **US$140,000**. Start Date: August 2008 and End Date: September 2010. (PI: MA Quevedo-Lopez at UT Dallas, USA).

- Co-Principal Investigator, “Flexible and Woven Electronics”. A subcontract from Tyler University to UT Dallas. Grant Amount: **US$800**,000. Start Date: October 2007 and End Date: October 2009. (PI: Bruce Gnade at UT Dallas, USA).

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Characterization of Ion Beam Sputter-Deposited PZT Thin Films", Ceramic Transactions 25, 97(1991).

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677. M.S. Ameen , T.M. Graettinger, S.H. Rou, **H.N. Alshareef**, K.D.Gifford, O. Auciello, and A. I. Kingon, "Processing and Structural Characterization of Ferroelectric Thin Films Deposited by Ion Beam Sputtering", MRS Symposium Proceedings **200**, 65(1991).

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BOOK CHAPTERS

1. Xiangming Xu and **H.N. Alshareef**, 'MXenes for Electronic & Communication Devices', (in preparation)

2. M.A. Quevedo and **H. N. Alshareef**, "Functional Thin Films for Silicon-Based Technology", edited by F. J. Espinoza-Beltrán, Research Signpost Publishers (2010). (ISBN978-81-308-0354-8).

3. D. Dimos, W. L. Warren, and **H.N**. **Alshareef**, "Thin Film Ferroelectric Materials and Devices", edited by R. Ramesh, Kluwer Academic Publishers (Boston, 1997). ISBN 0-7923-9993-5.

4. **H.N. Alshareef** and A. I. Kingon, "Ferroelectric Thin Films: Synthesis and Basic Properties", Vol 10, edited by J.F. Scott, C.A. Paz de Araujo, and G. W. Taylor, Gordon and Breach Science Publishers, New York (1996). ISBN 2-88449-189-9.

LIST OF INVITED PRESENTATIONS

1. **H.N. Alshareef**, "MXenes for Energy Harvesting Applications", Presented at the Materials Today Conference (June 24, 2025, Sitges, Spain).

2. **H.N. Alshareef**, "MXenes for Energy Harvesting Applications", Presented at the Gordon Conference" (February 23, 2025, Ventura, CA, USA).

3. **H.N. Alshareef**, "NH_4^+ Battery for Sustainable Energy Storage", Presented at Materials for Sustainability Conference, Seville, Spain, March 25, 2025).

4. **H.N. Alshareef**, "Batteries in Transport: Powering the Future", Presented at the E1 Electric Boat Race in Jeddah Saudi Arabia" (Jeddah, Saudi Arabia, January 24, 2025,).

5. **H.N. Alshareef**, "Integrated Electronics and Sensors Using MXenes", Presented at the 2nd International Conference on Emerging Materials for Sustainable Energy and Environment, (Sunway University, Malaysia, October 23, 2024).

6. **H.N. Alshareef**, "MXenes for Wafer-scale Electronic Devices", Presented at the EuroMXene Conference Polytechnic University of Valencia, Sapin, June 27, 2024).

7. **H.N. Alshareef**, "MXenes for Salinity Gradient Energy Harvesting", Presented at the Materials Research Society (November 29, 2023, Boston, MA, USA).

8. **H.N. Alshareef**, "MXetronics: MXenes for Integrated Electronics", Presented at the Materials Research Society (November 30, 2023, Boston, MA, USA).

9. **H.N. Alshareef**, “MXenes for Sensing Applications”, Presented at the Materials for Sustainability (MATSUS) Conference, (Torremolinos, Spain , October 16-20, 2023).

10. **H.N. Alshareef, “**Integrated Electrochemical Microcapacitors”, Presented at the eScience International Summit, August 21-23, 2023. Tianjin, China.

11. **HN. Alshareef**, “MXenes for Electronic Applications”, MRS Bulletin Special Issue Virtaul Talk”, Online presentation, March 22, 2023.

12. **H.N. Alshareef**, “Rechargeable Zinc Ion batteries”, Presented at the Materials for Sustainability (MATSUS) Conference, (Valencia, Spain , March 4-11, 2023).

13. **Jehad El-Demellawi & H.N. Alshareef**, “Workfunction Tuning of Mxenes without Changing Their Other Properties”, MXene Symposium, MRS, Fall (December 1, 2022).

14. **H.N. Alshareef**, “MXene Hydrogel & Their Applications”, MXene Symposium, MRS, Fall (December 1, 2022).

15. **H.N. Alshareef**, “MXenes: a New Class of 2D Materials for Device Applications”, the University of Texas at Dallas, December 7, 2021.

16. **H.N. Alshareef,** "Electrode & Electrolyte Engineering Toward More Stable Zinc Metal Batteries", Stony Brook University, NY. (November 10, 2021).

17. **H.N. Alshareef**, Invited by Advanced to Materials: “MXenes: Looking Ahead to the Next Ten Years” Online Webinar Organized by Wiley (October 18, 2021).

18. **H.N. Alshareef**, “MXenes for Electronics & Sensing”, IEEE International Conference on Sensors & Nanotechnology, Malaysia (September 22, 2021).

19. **H.N. Alshareef**, “MXene-based Devices”, Plenary Talk at the 10th Anniversary of MXene Workshop (Drexel University, August 2021).

20. **H.N. Alshareef,** ‘MXenes Hydrogels’, MRS Virtual Fall Meeting (2020).

21. **H.N. Alshareef,** ‘Integrated Electrochemical Microsupercapacitors**’,** International Conference on Materials for Humanity, Singapore (6 to 9 July 2021).

22. **H.N. Alshareef**, “MXene-Based Devices”, Mexico Vacuum Society Meeting 2020, October 21, 2020.

23. **H.N. Alshareef**, “Transparent Conducting Oxide Conference”, Virtual Conference (Crete, Greece, October 2020).

24. **H.N. Alshareef**, “Electrochemical Microsupercapacitors for Nanosystem Applications”, Presented at the 4th International Conference on Nano Energy and Nanosystems, Beijing, China (June 15, 2019).

25. **H.N. Alshareef**, “Integration of Thin Film Electronics and Electrochemical Microsupercapacitors”, Presented at International Symposium on Enhanced Electrochemical Supercapacitors (ISEECap), Nantes, France, May 8, 2019.

26. Yizhou Zhang and **H.N. Alshareef**, “Hydrogels Stretch and Heal Better with MXene”, MRS April 2019 Pheonix, AZ, USA.

27. Dhinesh Velusamy, Jehad El-demelawy, Husam N. Alshareef, “*Plasmonic MXene Thin Films for Flexible Visible-Light Photodetectors*”, presented at the Materials Research Society (MRS) April 23, 2019, Pheonix, Arizona, USA.

28. **H.N. Alshareef**, “On-Chip Electrochemical Energy Storage”, University of Texas at Dallas, Dallas, Texas, December 13, 2018.

29. **H.N. Alshareef**, “IEEE Distinguished Lecture in Nanotechnology”, University of Texas Houston, Houston, Texas, December 7, 2018.

30. **H.N. Alshareef**, 2018 Kuwait Prize Award Lecture, “Electrode Material Design Strategies for Capacitiive Energy Storage”, Kuwait Institute for Scientific Research (KIST). December 2, 2018.

31. **H.N. Alshareef**, “Two-Dimensional Materials for Energy Harvesting and Storage”, Harvard University, November 26, 2018.

32. **H.N. Alshareef**, “Rational Design of Nanostructured Electrodes for Capacitive Energy Storage”, Materials Research Society, November 26, 2018.

33. **H.N. Alshareef**, “Layered Oxide Cathodes for Zinc Ion Batteries”, 2nd International Conference on Energy Storage Materials, Tsinghua University, Shenzhen, China, November 8-11, China.

34. **H.N. Alshareef**, “Transparent Electronics using Oxide Semiconductors and 2D Materials”, 7th International Conference on Transparent Conducting Materials, October 14-18, 2018. Crete, Greece.

35. **H.N. Alshareef**, “Electrode Material Design Stratgies for Efiicient Energy Storage”, Georgia Institute of Technology, Atlanta, GA (July, 7 2018).

36. Jehad El-Demellawi, Sergei Lopatin, Omar Mohammed, **H.N. Alshareef**, “Spatial Mapping of Multipolar Surface Plasmons in $Ti_3C_2T_x$ MXenes”, Presented at Materials Research Society (MRS) Meeting, November 27, 2018. Boston, USA.

37. F. Ming, H. Liang, Y. Lei, W. Zhang, **H.N. Alshareef**, “Solution Synthesis of VSe_2 Nanosheets and their Alkali Metal Ion Storage”, Presented at Materials Research Society (MRS) Meeting, November 27, 2018. Boston, USA.

38. F. Zhang, Eman Alhajji, Yongjiu Lei, Narendra Kurra, **H.N. Alshareef**, “Highly Doped 3D Graphene Na-ion Battery Anode by Laser Scribing Polyimide Films in Nitrogen Ambient”, Presented at the Materials Research Society (MRS) Meeting, November 27, 2018. Boston, USA.

39. Qiu Jiang, C. Wu, Z. Wang, J.H. He, ZL Wang, and **H.N. Alshareef**, “Integrating MXene Electrochemical Microsupercapacitor with Triboelectric Nanogenerator as Self-charging Power Unit”, Presented at Materials Research Society (MRS) Meeting, November 26, 2018. Boston, USA.

40. **H.N. Alshareef** and Chuan Xia**,** “Large Intercalation Capacitance in VO_2(B) Layered Oxides” Presented at the Materials Research Society (MRS) Spring Meeting, April 2-6, 2018 (Phoenix, USA).

41. **H.N. Alshareef** and Qiu Jiang “Asymmetric MXene-RuO_2 Supercapacitor with Wide Voltage Window” Presented at the Materials Research Society (MRS) Spring Meeting, April 2-6, 2018 (Phoenix, USA).

42. Zhenwei Wang and **H.N. Alshareef**, “Large-Area Chemical Vapor Deposited MoS_2 with Transparent Conducting Oxide Contacts toward Fully Transparent 2D Electronics” presented at the Materials Research Society (MRS) Fall Meeting, Nov 29, 2017. (Boston, USA)

43. Z. Wang and **H.N. Alshareef,** “Hybrid van der Waals p–n Heterojunctions based on SnO and 2D MoS_2” Presented at the Materials Research Society (MRS) Fall Meeting, Nov 29, 2017. (Boston, MA, USA)

44. Fan Zhang and **H.N. Alshareef,** “Effect of the Number of Atomic Layers in 2D SnO on Na Ion Battery Performance, Presented at the Materials Research Society (MRS) Fall Meeting, Nov 27, 2017. (Boston, MA, USA)

45. Hanfeng Liang and **H.N. Alshareeef,** "Low Temperature Synthesis of Ternary Metal Phosphides by Plasma for Asymmetric Supercapacitors", Presented at Materials Research Society (MRS) Fall Meeting, Nov 27, 2017

46. C. Xia and **H.N. Alshareef**, "Anamolous Li Ion Storage in Non-layered 2D MoO_2", Presented at the Materials Research Society (MRS) Fall Meeting, Nov 27, 2017. (Boston, USA)

47. **H.N. Alshareef**, "Nanomaterial Design Strategies for Capacitive Energy Storage", Presented at The Nantech Institute and Department of Chemistry, University of Texas at Dallas, December 7, 2017.

48. **H.N. Alshareef**, "2D Materials for Energy Storage Applications", Presented at Energy Materials 2017, Dallas, Texas, December 6, 2017.

49. **H.N. Alshareef**, "Fully Transparent Indium-Free Oxide Electronics Entirely Deposited by Atomic Layer Deposition", Presented at IEEE Nanotechnology Materials and Devices Conference (NMDC) 2017 Singapore October 4-7,2017.

50. Narendra Kurra and **HN Alshareef,** "MXene-on-paper Microsupercapacitors", presented the European Materials Research Society Meeting, Strasbourg, France, 2017.

51. **H.N. Alshareef,** "Indium-free Fully Transparent Oxide Electronics Entirely Deposited by Atomic Layer Deposition"**,** Presented at the International on Materials for Advanced Technologies (ICMAT) Singapore (June, 2017).

52. **H.N. Alshareef,** "Microsupercapacitor Materials & Devices", Presented at the International on Materials for Adanced Technologies (ICMAT) Singapore (June 2017).

53. **H.N. Alshareef,** "Transparent Electronics: Materials and Devices", presented at the "CMOS Emerging Technologies Conference", Poland (May, 2017).

54. **H.N. Alshareef**, "Asymmetric Microsupercapacitors with Vertically Scaled 3D Current Collectors", presented at the Materials Research Society (MRS) Spring Meeting (April 20, 2017). Phoenix, USA

55. **H.N. Alshareef**, "2D Material-Oxide Heterojunctions for Electronic & Sensing Applications", presented at Frontiers in Theoretical and Applied Physics Conference (American University of Sharja, February 22, 2017)

56. Fan Zhang and **H.N. Alshareef**, "2D $SnSe_2$ Anodes for Advanced Na Ion Batteries", presented at the Materials Research Society (MRS) Fall Meeting in Boston, USA, November 27-December 2, 2016.

57. Narendra Kurra, **H.N. Alshareef**, Yury Gogotsi, "MXene-polymer Composites for Na Ion Batteries", presented at the Materials Research Society (MRS) Fall Meeting in Boston, USA, November 27-December 2, 2016.

58. Fwzah Alshamri, Jihoon Park, **H.N. Alshareef**, "Precise Control of Threshold Voltage of Thin Film Transistors Using Multilayer Channels", presented at the Materials Research Society (MRS) Fall Meeting in Boston, USA, November 27-December 2, 2016.

59. **H.N. Alshareef,** "Nanomaterial Design Strategies for Capacitive Energy Storage", presented at the 4th Saudi International Nanotechnology Conference", King Fahad University for Petroleum & Minerals (KFUPM), Dhahran (October 26, 2016).

60. Narendra Kurra, Q. Jiang, and **H.N. Alshareef**, "Marker Pen lithography for flexible and curvilinear on-chip energy storage"–Oral presentation at 229th ECS meeting@ San Diego, CA, USA. (San Diego, CA, 30 May 2016).

61. **H.N. Alshareef,** "Oxide Semiconductors for Energy & Electronics", presented at the 6th Annual Meeting on Transparent Conducting Materials", Chania, Crete, Greece (October 12, 2016).

62. Zhenwei Wang & **H.N. Alshareef**, “Indium-Free Fully Transparent Devices Deposited Entirely by ALD”, presented at the 6th Annual Meeting on Transparent Conducting Materials”, Chania, Crete, Greece (October 13, 2016).

63. Zhenwei Wang & **H.N. Alshareef**, “Two-Dimensional van der Waals Heterojunctions based on SnO/WS_2”, presented at the 6th Annual Meeting on Transparent Conducting Materials”, Chania, Crete, Greece (October 12, 2016).

64. Mrinal Hota & **H.N. Alshareef**, “Resistively Switched Memory based on Binary HfZnOx”, presented at the 6th Annual Meeting on Transparent Conducting Materials, Chania, Crete, Greece (October 12, 2016).

65. Mrinal Hota & **H.N. Alshareef**, “SnO based Nanoscale Resistive RAM”, presented at the 6th Annual Meeting on Transparent Conducting Materials”, Chania, Crete, Greece (October 12, 2016).

66. **H.N. Alshareef** “Indium-Free Fully Transparent Devices & Circuits Deposited Entirely by ALD”, presented at the International Materials Research Congress”, Cancun, Mexico (August 16, 2016).

67. **H.N. Alshareef**, “Nanomaterial Design and Fabrication Strategies for Micro supercapacitors”, PACRIM (American Ceramic Society), Clear Water, FL (April 14, 2016).

68. **H.N. Alshareef**, “Micro capacitors for On-Chip Energy Storage” presented at the 144th Annual Meeting & Exhibition of TMS (The Materials, Metals, and Minerals Society) Society, MARCH 15-19, 2015 • Orlando, FL, USA.

69. **H.N. Alshareef**, “Nanostructured Semiconductors for Energy Storage Applications”, Seminar at Regensburg University Department of Chemistry, Regensburg, Germany (December 14, 2015).

70. **H.N. Alshareef**, “Semiconductor Oxide Thermoelectric Superlattices for Waste Heat Recovery”, Seminar at California Lutheran University, Los Angeles, CA, USA (November, 2015).

71. **H.N. Alshareef** and Sarath Kumar, “Thermoelectric Superlattices for Waste Heat Recovery” Materials Research Society Meeting in Cancun, Mexico (August 16-18, 2015).

72. **H.N. Alshareef**, “Materials & Devices for Transparent Electronic Applications”, presented at the Electrical Engineering Department at Khalifa University, Abu Dhabi, UAE (April 15, 2015).

73. **H.N. Alshareef, “**Nanomaterial Design Strategies for Supercapacitor Applications**”,** presented at 3rd Saudi International Conference on Advanced Materials Technology, held on May 18 - 19, 2015 at King Abdulaziz City for Science and Technology (KACST) in Riyadh, Saudi Arabia.

74. Narendra Kurra, Bilal Ahmed, and **H.N. Alshareef**, “HfO_2-coated MoS_2 Nanosheets as High Capacity Anode for Sodium Ion Batteries: Mechanistic Insight into Capacity Retention”, Material Research Society (MRS) Spring 2015 Meeting, April 8, 2015, Boston, MA, USA.

75. Narendra Kurra, Nagaraju Doddahali, and **H.N. Alshareef**, “V_2O_5 Nanostructures and Reduced Graphene Oxide as Electrodes for High Energy Density Asymmetric Supercapacitors”, Material Research Society (MRS) Spring 2015 Meeting, April 9, 2015, Boston, MA, USA.

76. Zhenwei Wang and **H.N. Alshareef**, “Gate-bias stress stability improvement of TFTs using ZnO/HfO_2 multilayer channel structure”, International Materials Research Congress (IMRC) 2015, Cancun, Mexico 18 Aug 2015,

77. Zhenwei Wang and **H.N. Alshareef**, “Low temperature processed complementary metal oxide semiconductor (CMOS) device by oxidation effect from capping layer”, International Materials Research Congress (IMRC) 2015, Cancun, Mexico, 19 Aug 2015.

78. Chuan Xia and **H.N. Alshareef**, "Polyaniline-RuO_2 Core-Shell Nanostructured Arrays for Very Stable and High Performance Pseudocapacitors", 66th Annual Meeting of the International Society of Electrochemistry in Taipei; 4-9 October 2015. Date of the talk: 6 Oct, 2015.

79. Qiu Jiang and **H.N. Alshareef**, "A general strategy for the fabrication of high performance microsupercapacitors", 66th Annual Meeting of the International Society of Electrochemistry", Taipei,Taiwan (October 4th 2015).

80. Zhenwei Wang and **H.N. Alshareef**, "Transparent all tin oxides based p-n diode thermometer", International Materials Research Congress (IMRC) 2015, Cancun, Mexico, 19 Aug 2015.

81. Mrinal Hota, **H.N. Alshareef**, "Synaptic Memory Observed in bi-layer SnO Memristors" presented at International Material Research Congress (IMRC) 2015, Cancun, Mexico (16 - 20 August, 2015).

82. Nuha Alhebshi and **H.N. Alshareef**, "Microfabricated Pseudocapacitors Using Ni(OH)2 for on-Chip Energy Storage Applications", The 2nd Edition of Nanotechnology Dubai International Conference and Exhibition (Nanotech Dubai, March 16 -18, 2015).

83. Nuha Alhebshi and **H.N. Alshareef**, "Flexible and Low-Cost Supercapacitors Based on Ni-Co-OH Nanoflakes and Graphene-Carbon Nanofibers, The Saudi Arabia Conference on Smart Grids and Sustainable Energy", Jeddah, Saudi Arabia, December 7–9, 2015.

84. **H.N. Alshareef**, "Materials & Devices for Flexible and Transparent Electronic Platforms", International Conference on Electronic Materials and Nanotechnology for Green Environment 2014, (November 20-22, 2014). Jeju, **KOREA.**

85. **H.N. Alshareef**,J.A. Carveo, M. A. Khan, "Flexible Memory Devices Based on Functional Polymers", Smart Materials and Surfaces (SMS) Conference, Bangkok, **Thailand** (August 26-28, 2014).

86. **H.N. Alshareef**, "Thin Film and Nanowire Devices Based on p-Type Transparent Oxide Semiconductors", International Conference on Nanomaterials & Technology (ICN+T), AVS sponsored meeting (July 21-25, 2014). Vail, Colorado, **USA**.

87. **H.N. Alshareef**, "Nanomaterial Designed Strategies for Capacitive Energy Storage Applications", International Colloquium on Photovoltaic & Flexible Electronics (KAUST, November 2013). **Saudi Arabia.**

88. **H.N. Alshareef**, "Materials & Devices for Transparent Electronics", CMOS Emerging Technologies Workshop, Grenoble, **FRANCE** (July 6-9, 2014).

89. **H.N. Alshareef** and J.A. Caraveo-Frescas, "SnO Based Thin Film and Nanowire Devices", 10th International Thin-Film Transistor Conference (January 23-24, 2014). Delft, **Netherlands**.

90. **H.N. Alshareef**, "Nanomaterial for Energy Storage Applications", TMS Annual Meeting, (February 16, 2014). San Diego, **USA**.

91. S.R. Sarath Kumar and **H.N. Alshareef**, "Nanostructured Oxide Thin Films & Superlattice Thermoelectrics", IUMRS, (December 2013). Chennai, **India**.

92. **H.N. Alshareef**, "High Performance Thin Film and Nanowire Devices Based on p-type Oxide Semiconductors", Materials Research Society 2013 Fall Meeting (December 2, 2013). Boston, **USA**.

93. **H.N. Alshareef**, "Strategies for Improving the Performance of Thermoelectric Oxide Thin Films and Superlattices", 2013 Pacific Rim (PACRIM) Conference (June 2-7, 2013). San Diego, **USA.**

94. A.I.Abu-Taha, Sarath Kumar, and **H.N. Alshareef**, "Crystal orientation dependent thermoelectric properties of Al-doped ZnO films", presented at the 32nd International Conference on Thermoelectrics, June 30 - July 4, 2013.

Kobe, **Japan**.

95. **H.N. Alshareef**, “Future Directions in Materials Research”, SABIC Annual Technology Workshop, May 21, 2013. (Riyadh, **Saudi Arabia**).

96. **H.N. Alshareef**, “Nanostructured Electrodes for Efficient Supercapacitors”, American Chemical Society Meeting (April 8, 2013). New Orleans, **USA**.

97. U. Bhansali and **H.N. Alshareef**, “All-Polymer, Flexible PEDOT-Based Single Polymer Resistive Memory Device”, Presented at the Materials Research Society Spring Meeting (April 2, 2013)

98. H. Al-Jawhari, J.A. Caraveo-Frescas, and **H.N. Alshareef**, “Deposition and Characterization of P-type Cu_2O Thin Films & Devices”, Fourth International Conference on Transparent Conductive Materials, October 17-23, 2012. **Greece**.

99. A.J. Alfonso-Frescas and **H.N. Alshareef**, “Fabrication of flexible p-type SnO thin film transistor”, Fourth International Conference on Transparent Conductive Materials, October 17-23, 2012. **Greece**.

100. **H.N. Alshareef**, “All-Polymer Electronic Memory on Banknotes”, High Security Printing Conference, **Dubai** September 26, 2012.

101. S. Sarath Kumar and **H.N. Alshareef**, “Thermoelectric Superlattices using NbO Interlayers”, Materials Research Society 2012 Fall Meeting (November 25-December 2, 2012). Boston, **USA**.

102. Barasheed S.R. Sarath Kumar, and **H.N. Alshareef**, “Temperature-dependent thermoelectric properties of zinc oxide and gallium doped zinc oxide thin films prepared by Sol-Gel processing”, Materials Research Society 2012 Fall Meeting (November 25-December 2, 2012). Boston**, USA**.

103. Arash Mehdizadeh, Sriparna Bhattacharya, **H.N. Alshareef**, and T. Tritt, “Large Thermoelectric Power Factor in Pr-doped $SrTiO_3$ Ceramics”, Materials Research Society 2012 Fall Meeting (November 25-December 2, 2012). Boston, **USA**.

104. **H.N. Alshareef** and Pradipta Nayak, “Effect of Plasma Treatment on the Performance of Ga-doped ZnO (GIZO) Thin-Film Transistors”, Materials Research Society (MRS-IMRC) Meeting August 13-13 (2012) in Cancun, **Mexico**.

105. **H.N. Alshareef**, A. Khan, and U. Bhansali, “Polymer Electronics on Banknotes”, Materials Research Society (MRS-IMRC) Meeting in Cancun, **Mexico** August 13-13 (2012)

106. A.J. Caraveo-Frescas and **H.N. Alshareef, “**High Mobility p-type SnO on Flexible Substrates”, Materials Research Society (MRS-IMRC) Meeting in Cancun, **Mexico** August 13-13 (2012)

107. A.J. Caraveo-Frescas and **H.N. Alshareef**, “Experimental and Theoretical Investigation of the Effect of SiO2 Content in Gate Dielectrics on Flat-Band Voltage Shifts”, presented at Materials Research Society (MRS-IMRC) Meeting in Cancun, **Mexico** August 13-13 (2012)

108. **H.N. Alshareef**, “High-Performance Supercapacitors Using Nanostructured Oxides” International Meeting on Integrated Functionalities (ISIF)”, June18-21, 2012, **Hong Kong**.

109. **H.N. Alshareef**, “Chemically Derived Nanostructured Oxides for Energy Storage Applications”, International Meeting on Applications of Ferroelectricity”, scheduled for July 18-21, 2012, Aviero, **Portugal**.

110. Caraveo-Frescas and **H.N. Alshareef**, “Optimization of the sputter deposition conditions of Tin Monoxide”, presented at the European Materials Research Society (E-MRS) Meeting, May 14-18 (2012), in Strasbourg, **France**.

111. **H.N. Alshareef**, “Functional Oxides for Sustainable and Smart Living”, International Symposium on Micro and Nanotechnology, Sonora University, Hermosillo, **Mexico** (Feb 2, 2012).

112. W. Chen, R.B. Rakhi, and **H.N. Alshareef**, “Supercapacitors on Macroporous Sponge Electrodes”, Materials Research Society Spring Meeting San Francisco, April 9-15, (2012).

113. W. Chen, R.B. Rakhi, and **H.N. Alshareef**, “Graphene-Oxide Nanocomposite Electrodes for Energy Storage Applications”, Materials Research Society Spring Meeting, San Francisco, **USA**, April 9-15, (2012).

114. R.B. Rakhi, W. Chen, and **H.N. Alshareef**, “Conducting polymer/carbon Nanocoil composite electrodes for efficient supercapacitors”, oral presentation at the Materials Research Society Spring Meeting, San Francisco, **USA**, April 9-15, (2012).

115. R.B. Rakhi and **H.N. Alshareef**, “Ternary Graphene-CNT-MnO_2 Electrodes with Remarkable Pseudocapacitance ”, oral presentation at the Materials Research Society Spring Meeting, San Francisco, **USA**, April 9-15, (2012).

116. Unnat S. Bhansali, M.A. Khan, and **H.N. Alshareef**, “Inkjet Electrodes for Polymer Ferroelectric Memories on Flexible Substrates”, presented and the Flexible Electronics and Displays Conference”, Pheonix**, USA**, February 6-9(2012).

117. M. Dehkord, S. Bhattacharya, T. Tritt, and **H.N. Alshareef**, “Transport Properties of La-doped $SrTiO_3$ Thermoelectrics Prepared Using Spark Plasma Sintering”, presented at the American Physical Society Meeting, Boston, **USA**, February 27- March 2, 2012.

118. **H.N. Alshareef**, “Nanomaterials for Energy Storage Applications”, SABIC Energy Summit, Thuwal, **Saudi Arabia** (Jan. 22, 2011).

119. **H.N. Alshareef**, “Nanostructured Electrodes for High Performance Supercapacitor Applications”, invited Seminar at the KFUPM (Nov 15, 2011). **Saudi Arabia**.

120. **H.N. Alshareef**, “Ternary Electrode Composites for Electrochemical Energy Storage”, invited Seminar at UT Dallas, **USA**, (October 5, 2011).

121. **H.N. Alshareef**, “Ternary Electrode Composites for Electrochemical Energy Storage”, invited Seminar at the University of Northern Texas, Denton, **USA** (October 5, 2011).

122. **H.N. Alshareef**, “Nanostructured Electrodes for High Performance Supercapacitor Applications”, Nanomaterials for Energy Conference, University of Toronto (September 29, 2011), Toronto, **Canada**.

123. Caraveo-Frescas and **H.N. Alshareef**, “Oriented p-type SnO Thin Films Deposited by Reactive Sputter-Deposition”, presented at the Materials Research Society (MRS-IMRC) Meeting in Cancun, **Mexico** August 12 (2011).

124. Caraveo-Frescas and **H.N. Alshareef**, “Composition Dependent V_{FB} Tuning Using Rare Earth Oxide Capping Layers”, presented at the Materials Research Society (MRS-IMRC) Meeting in Cancun, **Mexico** August 13 (2011).

125. S. Kumar and **H.N. Alshareef**, “Thermoelectric Properties of Nb-Doped Thin Films”, presented at the 30th International Meeting on Thermoelectricity (ICT 2011) in Traverse City, Michigan, **USA** July 17-21 (2011).

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LIST OF PATENTS

US Patent #	Issued Patent Title	Topic	Google Citations
8,878,341	Graphene-based composite materials, method of manufacture and applications thereof	KAUST	38
8,994,014	Ferroelectric devices, interconnects, and methods of manufacture thereof	KAUST	2
9,305,706	Fractional order capacitor	KAUST	8
9,976,913	Thermal History Devices, Systems and Methods for Thermal History Detection, US Patent	KAUST	6
10,068,630	Non-volatile ferroelectric memory cells with multilevel operation	KAUST	0
10,096,352	Ferroelectric capacitor with improved fatigue and breakdown properties	KAUST	0
10,903,019	Compositions and methods of making metal-organic frameworks with redox-active centers	KAUST	0
10,964,822	Single material electronic device and method of producing such an electronic device	KAUST	0
11,031,620	Osmotic energy conversion with MXene lamellar membrane-based system and method	KAUST	0
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7,332,433	Methods of modulating the work functions of film layers	TI- Metal Gate	22
7,582,521	Dual metal gates for mugfet device	TI- Metal Gate	9
7,799,669	Method of forming a high-k gate dielectric layer	TI- Metal Gate	6
7,807,522	Lanthanide series metal implant to control work function of metal gate electrodes	TI- Metal Gate	14
7,858,459	Work function adjustment with the implant of lanthanides	TI- Metal Gate	18
8,304,333	Method of forming a high-k gate dielectric layer	TI- Metal Gate	2
8,802,519	Work function adjustment with the implant of lanthanides	TI- Metal Gate	1
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6,921,703	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	10
7,906,441	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	59
9,177,806	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	8
9,337,046	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	0
9,337,044	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	0
9,368,355	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	0
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9,576,804	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	0
9,892,927	System and method for mitigating oxide growth in a gate dielectric	TI- Nitridation	0
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6,924,239	Method for removal of hydrocarbon contamination on gate oxide prior to non-thermal nitridation using "spike" radi	TI- Nitridation	19
7,018,925	Post high voltage gate oxide pattern high-vacuum outgas surface treatment	TI- Nitridation	6
7,049,242	Post high voltage gate dielectric pattern plasma surface treatment	TI- Nitridation	4
7,087,440	Monitoring of nitrided oxide gate dielectrics by determination of a wet etch	TI- Nitridation	19
7,226,826	Semiconductor device having multiple work functions and method of manufacture therefor	TI- Nitridation	22
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7,339,240	Dual-gate integrated circuit semiconductor device	TI- Nitridation	1
7,345,001	Gate dielectric having a flat nitrogen profile and method of manufacture therefor	TI- Nitridation	2
7,402,524	Post high voltage gate oxide pattern high-vacuum outgas surface treatment	TI- Nitridation	0
7,514,308	CMOS device having different amounts of nitrogen in the NMOS and PMOS gate dielectric layers	TI- Nitridation	6
7,682,988	Thermal treatment of nitrided oxide to improve negative bias thermal instability	TI- Nitridation	5
7,799,669	Method of forming a high-k gate dielectric layer	TI- Nitridation	3
8,008,216	Nitrogen profile in high-K dielectrics using ultrathin disposable capping layers	TI- Nitridation	1
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6,162,744	Method of forming capacitors having high-K oxygen containing capacitor dielectric layers,	Micron- High-k	51
6,191,443	Capacitors, methods of forming capacitors, and DRAM memory cells	Micron- High-k	37
6,239,459	Capacitors, methods of forming capacitors and integrated circuitry	Micron- High-k	6
6,255,186	Methods of forming integrated circuitry and capacitors having a capacitor electrode	Micron- High-k	19
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6,281,543	Double layer electrode and barrier system on hemispherical grain silicon for use with high	Micron- High-k	30
6,291,364	Method and apparatus for stabilizing high pressure oxidation of a semiconductor device	Micron- High-k	14
6,316,800	Boride electrodes and barriers for cell dielectrics	Micron- High-k	13
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6,518,121	Boride electrodes and barriers for cell dielectrics	Micron- High-k	11
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6,614,082	Fabrication of semiconductor devices with transition metal boride films as diffusion barriers	Micron- High-k	6
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6,673,689	Double layer electrode and barrier system on hemispherical grain silicon	Micron- High-k	11
6,720,607	Method for improving the resistance degradation of thin film capacitors	Micron- High-k	3
6,737,696	DRAM capacitor formulation using a double-sided electrode	Micron- High-k	9
6,773,981	Methods of forming capacitors	Micron- High-k	10
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6,872,639	Fabrication of semiconductor devices with transition metal boride films as diffusion barriers	Micron- High-k	40
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7,038,265	Capacitor having tantalum oxynitride film and method for making same	Micron- High-k	8
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7,282,457	Apparatus for stabilizing high pressure oxidation of a semiconductor device	Micron- High-k	0
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5,555,486	Hybrid metal/metal oxide electrodes for ferroelectric capacitors	NC State	162
6,096,127	Tuneable dielectric films having low electrical losses	Sandia	140
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