

Husam N. Alshareef

King Abdullah University of Science & Technology (KAUST)

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Other Names Used ([Husam N. Al-Shareef](#), [H.N. Alshareef](#), [H.N. Al-Shareef](#).)

Google Scholar: https://scholar.google.com/citations?hl=en&user=shnVzdcAAAAJ&view_op=list_works

Publons Public Profile: <https://publons.com/researcher/2449998/husam-n-alshareef/>

Web of Science Researcher ID: [A-2000-2015](#)

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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

- | | |
|--|----------------------|
| • Acting Faculty Chair
Chair of New Faculty Comprising Materials Science & Applied Physics | 2018 –2020 |
| • Program Chair
Materials Science & Engineering
KAUST, Saudi Arabia | 2012-2016 |
| • Professor
Materials Science & Engineering
Electrical Engineering | 2013-Now
2020-Now |
| • Associate Professor , Materials Science & Engineering
KAUST, Saudi Arabia | 2009-2013 |
| • Adjunct Professor , Materials Science & Engineering
University of Texas at Dallas | 2009-Now |
| • Research Professor , Materials Science & Engineering
University of Texas at Dallas, USA | 2007- 2009 |
| • Member of Technical Staff
Texas Instruments, Inc., Dallas, USA | 2001-2007 |
| • Sr. Staff Engineer
Conexant System, Newport Beach, USA | 1999-2001 |
| • Member of Technical Staff
Micron Technology, Inc., Boise, USA | 1996-1999 |

RESEARCH INTERESTS

Professor Alshareef's research interests are the development of **Nanomaterials for and Electronics and Energy Applications**.

SCHOLARLY ACTIVITY

- **510** publications, mostly in peer-reviewed journals; **34** Highly Cited
- **> 80** issued and pending patents, several of which entered volume production
- **32, 450** citations with an H-index of **95** (Google Scholar), **82** (Web of Science)
- **\$15M** of Competitive Research Funds Raised
- **200** invited/contributed presentations and tutorials
- **27** Ph.D., **6** MS students, **25** post-doctoral researchers supervised (including current ones)

HONORS/AWARDS

- Web of Science/Clarivate Analytics Highly Cited Researcher in Materials Science 2021
- Web of Science/Clarivate Analytics Highly Cited Researcher in Materials Science 2020
- Web of Science/Clarivate Analytics Highly Cited Researcher in Materials Science 2019
- Fellow, American Physical Society (2019)
- Fellow, Royal Society of Chemistry (2018)
- Fellow of the Institute of Materials, Minerals, & Mining (2021)
- Kuwait Prize in Clean and Sustainable Energy Technologies (2018)
- KAUST Distinguished Teaching Award (Inaugural Award, 2018)
- Seed Fund Award “MXene-Based Salinity Gradient Energy Harvester” (2020)
- IEEE Distinguished Lecturer in Nanotechnology (2017-2018)
- A.H. Shoman Prize for Excellence in Energy Research (2016)
- DOW Sustainability Competition Award (2015) (with my student Dr. Anas Abu-Taha)
- Co-Chair of the Materials Research Society (**MRS**) Fall Meeting (2014). Meeting 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)
- Elected 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)
- UN Outstanding Undergraduate Student Fellowship (1986 - 1990)

AWARDS FOR MY STUDENTS & POST-DOCS

- “Best Poster Award” at the Material Research Society (MRS) , Spring 2021 Meeting for my student Eman Alhajji
- Eman Alhajji was selected as “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 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 will 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 is 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.

PROFESSIONAL SOCIETIES AND SERVICES

- Professional Memberships:
 - American Physical Society, Fellow Member
 - Royal Society of Chemistry, Fellow Member
 - Institute of Electrical and Electronics Engineers (IEEE), Senior Member
 - Materials Research Society (MRS), Member
 - Electrochemical Society, Member
 - Institute of Materials, Minerals, and Mining, Fellow Member
 - American Ceramic Society, Member
- Professional Services:

- 2021 Guest Editor, “Energy Storage Materials” Special issue on Zinc Ion Batteries
- 2017-now, Member Editorial Board of Wiley’s journal “Small Methods”, IF = 14
- 2021-now, Member of Editorial Board of the journal “Materials Today Energy”, IF = 7
- 2017-now, Member Editorial Board of Wiley’s journal “Small Structures”, IF = TBD
- 2019-now, Chair, IEEE Nanotechnology Council (Western Saudi Arabia Section)
- 2018-now, Member of Editorial Board of Elsevier’s journal “EnergyChem”, IF = TBD
- 2017-2018, IEEE Distinguished Lecturer in Nanotechnology
- 2015-2017, Member of Editorial Board, *ACS Applied Materials & Interfaces*
- 2016-2019, Chair, MRS University Chapter Subcommittee
- 2014, Co-Chair of the Materials Research Society (MRS) Fall Meeting (2014). 6500 attendees
- 2013-2018, MRS New Meetings Subcommittee Member
- 2013-2019, Associate Editor, J. Electronic Materials
- 2012, Founding Faculty Advisor of the MRS Student Chapter at KAUST (1st MRS Student Chapter ever established outside USA)
- 2011, Guest Editor, MRS Bulletin, Materials Research Society (February, 2011)
- Ongoing, Proposal Reviewer for Asia, EU, and USA Funding agencies
- Ongoing, Promotion File Reviewer for Asia, EU, and USA Universities
- 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.
- 2013, Lead Organizer, “1st International Workshop on Energy Storage at KAUST”, which was held at KAUST 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. Yunpei Zhu	KAUST	2021-now
Dr. Mrinal Hota	KAUST	2019-now

Post-Doctoral Fellow Advising

Post-doc Name	University	Appointment Period
Dr. Yunpei Zhu	KAUST	2017-2020
Dr. Sarath Bhatman	KAUST	2021-
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 Ynag	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
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 Mo₂C by Epitaxial Phase Conversion		
Tianchao Guo	KAUST	Ph.D.	6/2023
Thesis title	P-type Te Nanostructures for Device Applications		
Kaddjija Bibi	KAUST	Ph.D.	6/2024
Thesis title:	MXens-based Iontronic Devices		
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 Framwework 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 Electrochemical 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 & Energy Efficient 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 and Devices with Multilayer Channel and Dielectrics		
Wei Chen	KAUST	Ph.D.	2013
Thesis Title:	Nanostructured MnO ₂ Electrodes for Supercapacitor Applications		
Anas Abu Taha	KAUST	Ph.D.	2015
Thesis Title:	Nanostructured Thermoelectric Oxides for Energy Harvesting Applications		
Nuha Al-Hebshi	KAUST	Ph.D.	2015
Thesis Title:	Ni-Based Electrodes for Energy Storage 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 Bi ₂ Te ₃ Thermoelectrics		
Wardia Debray	UT Dallas	MS	2010
Thesis Title:	Solution-Derived Piezoelectric Thin Films for Energy Harvesting Applications		

Ph.D. Student Committee Membership

Danilo Granato (MS, 2012; c/o Udo); Safdar Nazir (Ph.D., 2012); Deborah Marques (Ph.D., 2013); Hao Wang (2013); Yasir Said (Ph.D., 2012); Sergiy Grytsiuk (Ph.D., 2016); Kaloni Thaneshwor (Ph.D., 2013); Rami Afandy (Ph.D., 2016); Garret Mckerricher (Ph.D., 2015). Mohammad Alnasser (Ph.D., 2015); Muhammed Z. Khan (Ph.D., 2015); Eyad Arabi (Ph.D., 2015); Yang Yang (Ph.D., 2016); Akosa Collins (Ph.D., 2016); Mahmoud Ouda (2016); Maged Abdelsamie (Ph.D., 2016); Salma Alrasheed (Ph.D., 2017); Ahmed Mansour (Ph.D., 2016); Hanlin Hu (Ph.D., 2017); Noktan Alyami (Ph.D., 2017); Shahid Sattar (Ph.D., 2018); Ru-Ze Liang (2018); Muhammad Rizwan Khan (Ph.D., 2018); Valeriya Chernikova (Ph.D., 2017); Basamat Shahin (Ph.D. 2019). Aditya Prabaswara (Ph.D., 2019); Ibrahim Dursun (Ph.D., 2019); Azimul Mohamed (2019); Abdullah Alsalloum (MS, 2019); Davide Priante (Ph.D., 2019). Jasmin Smajić (Ph.D., 2019); Sreekiran Pillai (Ph.D., 2019). Vasudeo Babar (2019, Udo); Steven Zhang (Georgia Tech

2019); Saravanan Yuvaraja (Ph.D. 2020, c/o Salama); Ayan Zhumeckenov (Ph.D. 2020, c/o Salama),Jawaher Almutlaq (2020, c/o Osman Bakr), Jiakai Liu (2020, co/Osman Bakr); Jasmin Smajic (11, 2021)

TEACHING EXPERIENCE

Class	University	Level	Frequency
Electronic Properties of Materials	KAUST	Graduate	4 semesters
Thermodynamics of Materials	KAUST	Graduate	5 semesters
Energy Storage Materials & Devices	KAUST	Graduate	4 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 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, “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. Pending.
- 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. Pending.
- 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. September 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\$1,037,8000 (my portion is \$662,000 over three years). Funding Source: KAUST Internal Competitive Research Grant program. Co-PI: Professor Noredine 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: \$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: \$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: \$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: \$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 \$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 \$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: \$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: \$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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502. 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. Xiangmin Xu and **Husam N. Alshareef**, 'MXetronics: the Electronic & Photonic Applications of MXenes', (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 PRESENTATIONS

1. **H.N. Alshareef**, "Mxenes: a new class of 2D Materials for Device Applications", the University of Texas at Dallas, December 7, 2021. **Keynote Speaker**.
2. **H.N. Alshareef**, "MXenes for Electronics & Sensing", IEEE International Conference on Sensors & Nanotechnology, Malaysia (September 22, 2021). **Keynote Speaker**.
3. **H.N. Alshareef**, "MXene-based Devices", Plenary Talk at the 10th Anniversary of MXene Workshop (Drexel University, August 2021). **Plenary**.
4. **H.N. Alshareef**, 'MXenes Hydrogels', MRS Virtual Fall Meeting (2020). **Invited**.
5. **H.N. Alshareef**, "Transparent Conducting Oxide Conference", Virtual Conference (Crete, Greece, October 2020). **Invited**.

6. **H.N. Alshareef**, 'Integrated Electrochemical Microsupercapacitors', International Conference on Materials for Humanity, Singapore (6 to 9 July 2021). **Invited.**
7. **H.N. Alshareef**, "MXene-Based Devices", Mexico Vacuum Society Meeting 2020, October 21, 2020. **Plenary.**
8. **H.N. Alshareef**, "Electrochemical Microsupercapacitors for Nanosystem Applications", Presented at the 4th International Conference on Nano Energy and Nanosystems, Beijing, China (June 15, 2019). **Plenary.**
9. **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. **Invited.**
10. Yizhou Zhang and **H.N. Alshareef**, "Hydrogels Stretch and Heal Better with MXene", MRS April 2019 Phoenix, AZ, USA.
11. 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, Phoenix, Arizona, USA.
12. **H.N. Alshareef**, "On-Chip Electrochemical Energy Storage", University of Texas at Dallas, Dallas, Texas, December 13, 2018. **Invited.**
13. **H.N. Alshareef**, "IEEE Distinguished Lecture in Nanotechnology", University of Texas Houston, Houston, Texas, December 7, 2018. **Invited.**
14. **H.N. Alshareef**, 2018 Kuwait Prize Award Lecture, "Electrode Material Design Strategies for Capacitive Energy Storage", Kuwait Institute for Scientific Research (KIST). December 2, 2018, **Invited.**
15. **H.N. Alshareef**, "Two Dimensional Materials for Energy Harvesting and Storage", Harvard University, November 26, 2018. **Invited.**
16. **H.N. Alshareef**, "Rational Design of Nanostructured Electrodes for Capacitive Energy Storage", Materials Research Society, November 26, 2018, . **Invited.**
17. **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. **Invited.**
18. **H.N. Alshareef**, "Transparent Electronics using Oxide Semiconductors and 2D Materials", 7th International Conference on Transparent Conducting Materials, October 14-18, 2018. Crete, Greece. **Invited.**
19. **H.N. Alshareef**, "Electrode Material Design Strategies for Efficient Energy Storage", Georgia Institute of Technology, Atlanta, GA (July, 7 2018). **Invited.**
20. Jehad El-Demellawi, Sergei Lopatin, Omar Mohammed, **H.N. Alshareef**, "Spatial Mapping of Multipolar Surface Plasmons in $\text{Ti}_3\text{C}_2\text{T}_x$ MXenes", Presented at Materials Research Society (MRS) Meeting, November 27, 2018. Boston, USA.
21. 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.
22. F. Zhang, Eman Alhajji, Yongjiu Lei, Narendra Kurra, **H.N. Alshareef**, "Highly Doped 3D Graphene Nanion Battery Anode by Laser Scribing Polyimide Films in Nitrogen Ambient", Presented at the Materials

Research Society (MRS) Meeting, November 27, 2018. Boston, USA.

23. 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.
24. **H.N. Alshareef** and Chuan Xia, "Large Intercalation Capacitance in VO₂(B) Layered Oxides" Presented at the Materials Research Society (MRS) Spring Meeting, April 2-6, 2018 (Phoenix, USA).
25. **H.N. Alshareef** and Qiu Jiang "Asymmetric MXene-RuO₂ Supercapacitor with Wide Voltage Window" Presented at the Materials Research Society (MRS) Spring Meeting, April 2-6, 2018 (Phoenix, USA).
26. Zhenwei Wang and **H.N. Alshareef**, "Large-Area Chemical Vapor Deposited MoS₂ with Transparent Conducting Oxide Contacts toward Fully Transparent 2D Electronics", Presented at the Materials Research Society (MRS) Fall Meeting, Nov 29, 2017. (Boston, USA)
27. Z. Wang and **H.N. Alshareef**, "Hybrid van der Waals p-n Heterojunctions based on SnO and 2D MoS₂" Presented at the Materials Research Society (MRS) Fall Meeting, Nov 29, 2017. (Boston, MA, USA)
28. 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)
29. Hanfeng Liang and **H.N. Alshareef**, "Low Temperature Synthesis of Ternary Metal Phosphides by Plasma for Asymmetric Supercapacitors", Presented at Materials Research Society (MRS) Fall Meeting, Nov 27, 2017
30. C. Xia and **H.N. Alshareef**, "Anomalous Li Ion Storage in Non-layered 2D MoO₃", Presented at the Materials Research Society (MRS) Fall Meeting, Nov 27, 2017. (Boston, USA)
31. **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. **Invited.**
32. **H.N. Alshareef**, "2D Materials for Energy Storage Applications", Presented at Energy Materials 2017, Dallas, Texas, December 6, 2017. **Invited.**
33. **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. **Invited.**
34. Narendra Kurra and **HN Alshareef**, "MXene-on-paper Microsupercapacitors", presented the European Materials Research Society Meeting, Strasbourg, France, 2017.
35. **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). **Invited.**
36. **H.N. Alshareef**, "Microsupercapacitor Materials & Devices", Presented at the International on Materials for Advanced Technologies (ICMAT) Singapore (June 2017). **Invited.**
37. **H.N. Alshareef**, "Transparent Electronics: Materials and Devices", presented at the "CMOS Emerging Technologies Conference", Poland (May, 2017).
38. **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

39. **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)
40. Fan Zhang and **H.N. Alshareef**, “2D SnSe₂ Anodes for Advanced Na Ion Batteries”, presented at the Materials Research Society (MRS) Fall Meeting in Boston, USA, November 27-December 2, 2016.
41. 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.
42. 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.
43. **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). **Invited.**
44. 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).
45. **H.N. Alshareef** “Oxide Semiconductors for Energy & Electronics”, presented at the 6th Annual Meeting on Transparent Conducting Materials, Chania, Crete, Greece (October 12, 2016). **Invited.**
46. 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).
47. Zhenwei Wang & **H.N. Alshareef**, “Two Dimensional van der Waals Heterojunctions based on SnO/WS₂”, presented at the 6th Annual Meeting on Transparent Conducting Materials”, Chania, Crete, Greece (October 12, 2016).
48. 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).
49. 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).
50. **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). **Invited.**
51. **H.N. Alshareef**, “Nanomaterial Design and Fabrication Strategies for Micro supercapacitors”, PACRIM (American Ceramic Society), Clear Water, FL (April 14, 2016). **Invited.**
52. **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. **Invited.**
53. **H.N. Alshareef**, “Nanostructured Semiconductors for Energy Storage Applications”, Seminar at Regensburg University Department of Chemistry, Regensburg, Germany (December 14, 2015). **Invited.**

54. **H.N. Alshareef**, "Semiconductor Oxide Thermoelectric Superlattices for Waste Heat Recovery", Seminar at California Lutheran University, Los Angeles, CA, USA (November, 2015). **Invited.**
55. **H.N. Alshareef** and Sarath Kumar, "Thermoelectric Superlattices for Waste Heat Recovery" Materials Research Society Meeting in Cancun, Mexico (August 16-18, 2015). **Invited.**
56. **H.N. Alshareef**, "Materials & Devices for Transparent Electronic Applications", presented at the Electrical Engineering Department at Khalifa University, Abu Dhabi, UAE (April 15, 2015). **Invited.**
57. **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. **Invited.**
58. Narendra Kurra, Bilal Ahmed, and **H.N. Alshareef**, "HfO₂ coated MoS₂ 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.
59. Narendra Kurra, Nagaraju Doddahali, and **H.N. Alshareef**, "V₂O₅ 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.
60. Zhenwei Wang and **H.N. Alshareef**, "Gate-bias stress stability improvement of TFTs using ZnO/HfO₂ multilayer channel structure", International Materials Research Congress (IMRC) 2015, Cancun, Mexico 18 Aug 2015,
61. 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.
62. Chuan Xia and **H.N. Alshareef**, "Polyaniline-RuO₂ 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.
63. 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).
64. 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.
65. 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).
66. 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).
67. 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.
68. **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. Invited.**
69. **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). **Invited.**
70. **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**. **Invited.**
 71. **H.N. Alshareef**, "Nanomaterial Designed Strategies for Capacitive Energy Storage Applications", International Colloquium on Photovoltaic & Flexible Electronics (KAUST, November 2013). **Saudi Arabia**. **Invited.**
 72. **H.N. Alshareef**, "Materials & Devices for Transparent Electronics", CMOS Emerging Technologies Workshop, Grenoble, **FRANCE** (July 6-9, 2014). **Invited.**
 73. **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**. **Invited.**
 74. **H.N. Alshareef**, "Nanomaterial for Energy Storage Applications", TMS Annual Meeting, (February 16, 2014). San Diego, **USA**. **Invited.**
 75. S.R. Sarath Kumar and **H.N. Alshareef**, "Nanostructured Oxide Thin Films & Superlattice Thermoelectrics", IUMRS, (December, 2013). Chennai, **India**. **Invited.**
 76. **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**. **Invited.**
 77. **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**. **Invited.**
 78. 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**. **Invited.**
 79. **H.N. Alshareef**, "Future Directions in Materials Research", SABIC Annual Technology Workshop, May 21, 2013. (Riyadh, **Saudi Arabia**). **Plenary.**
 80. **H.N. Alshareef**, "Nanostructured Electrodes for Efficient Supercapacitors", American Chemical Society Meeting (April 8, 2013). New Orleans, **USA**. **Invited.**
 81. 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)
 82. H. Al-Jawhari, J.A. Caraveo-Frescas, and **H.N. Alshareef**, "Deposition and Characterization of P-type Cu₂O Thin Films & Devices", Fourth International Conference on Transparent Conductive Materials, October 17-23, 2012. **Greece**.
 83. 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**.
 84. **H.N. Alshareef**, "All-Polymer Electronic Memory on Banknotes", High Security Printing Conference, **Dubai** September 26, 2012. **Invited.**
 85. 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**.
 86. 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**.
87. Arash Mehdizadeh, Sriparna Bhattacharya, **H.N. Alshareef**, and T. Tritt, “Large Thermoelectric Power Factor in Pr-doped SrTiO₃ Ceramics”, Materials Research Society 2012 Fall Meeting (November 25-December 2, 2012). Boston, **USA**.
 88. **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**.
 89. **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)
 90. 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)
 91. 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)
 92. **H.N. Alshareef**, “High-Performance Supercapacitors Using Nanostructured Oxides” International Meeting on Integrated Functionalities (ISIF), June18-21, 2012, **Hong Kong**. **Invited**.
 93. **H.N. Alshareef**, “Chemically Derived Nanostructured Oxides for Energy Storage Applications”, International Meeting on Applications of Ferroelectricity, scheduled for July18-21, 2012, Aviero, **Portugal**. **Invited**.
 94. 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**.
 95. **H.N. Alshareef**, “Functional Oxides for Sustainable and Smart Living”, International Symposium on Micro and Nanotechnology, Sonora University, Hermosillo, **Mexico** (Feb 2, 2012). **Invited**.
 96. 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).
 97. 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).
 98. 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).
 99. R.B. Rakhi and **H.N. Alshareef**, “Ternary Graphene-CNT-MnO₂ Electrodes with Remarkable Pseudocapacitance”, oral presentation at the Materials Research Society Spring Meeting, San Francisco, **USA**, April 9-15, (2012).
 100. 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).
 101. M. Dehkord, S. Bhattacharya, T. Tritt, and **H.N. Alshareef**, “Transport Properties of La-doped SrTiO₃ Thermoelectrics Prepared Using Spark Plasma Sintering”, presented at the American Physical

Society Meeting, Boston, **USA**, February 27- March 2, 2012.

102. **H.N. Alshareef**, "Nanomaterials for Energy Storage Applications", SABIC Energy Summit, Thuwal, **Saudi Arabia** (Jan. 22, 2011). **Invited.**
103. **H.N. Alshareef**, "Nanostructured Electrodes for High Performance Supercapacitor Applications", invited Seminar at the KFUPM (Nov 15, 2011). **Saudi Arabia. Invited.**
104. **H.N. Alshareef**, "Ternary Electrode Composites for Electrochemical Energy Storage", invited Seminar at UT Dallas, **USA**, (October 5, 2011). **Invited.**
105. **H.N. Alshareef**, "Ternary Electrode Composites for Electrochemical Energy Storage", invited Seminar at the University of Northern Texas, Denton, **USA** (October 5, 2011). **Invited.**
106. **H.N. Alshareef**, "Nanostructured Electrodes for High Performance Supercapacitor Applications", Nanomaterials for Energy Conference, University of Toronto (September 29, 2011), Toronto, **Canada. Invited.**
107. 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).
108. 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).
109. 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).
110. S. Kumar, and **H.N. Alshareef**, "Thermoelectric properties of single-phase $In_{0.2}Yb_{0.2}Co_4Sb_{12}$ thin films", presented at the 30th International Meeting on Thermoelectricity (ICT 2011) in Traverse City, Michigan, **USA**, July 17-21 (2011).
111. **H.N. Alshareef**, S. Kumar, A. Alyamani, and T. Tritt, "Thin Film Skutterudite Nanocomposites", presented at the Materials Research Society (MRS) 2010 Fall Meeting in Boston, **USA**, (November 28 -December 3, 2010).
112. **H.N. Alshareef**, "Polymeric Ferroelectric Memory Materials & Devices", presented at the IMRC-MRS 2010 Meeting in Cancun, Mexico (August, 16, 2010).
113. **H. N. Alshareef** and M. Alahmad, "Parametric Model for the Optimization of Energy Output of Piezoelectric Cantilevers", presented at ISIF 2010, San Juan, **Puerto Rico**, June 13-17, 2010.
114. 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).
115. 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).
116. 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).

117. S. Kumar, and **H.N. Alshareef**, "Thermoelectric properties of single-phase $\text{In}_{0.2}\text{Yb}_{0.2}\text{Co}_4\text{Sb}_{12}$ thin films", presented at the 30th International Meeting on Thermoelectricity (ICT 2011) in Traverse City, Michigan, **USA**, July 17-21 (2011).
118. **H.N. Alshareef**, "Functional Oxides in Emerging Electronics", CMOS Emerging Technologies Conference, Whistler, BC, **Canada** (June 14-17, 2011). **Invited.**
119. **H.N. Alshareef**, S. Kumar, A. Alyamani, and T. Tritt, "Thin Film Skutterudite Nanocomposites", presented at the Materials Research Society (MRS) 2010 Fall Meeting in Boston, **USA** (November 28 -December 3, 2010).
120. **H.N. Alshareef**, "Micro-power Generation Using Unconventional Sources", The presented at Chemindix, The Applications of Nanotechnology in Energy Conference . Bahrain, October 18-22 (2010). **Invited.**
121. **H.N. Alshareef**, "Emerging Electronics & Energy Harvesting", presented at SAUDI ARAMCO (October, 2009). Dahrn, **Saudi Arabia**. **Invited.**
122. Hinkle, J. Chambers, **H.N. Alshareef** et al., "Metal gate work function tuning by interface engineering", VLSI Technology Symposium 2010, Hawaii (June 2010).
123. **H. N. Alshareef**, "Polymeric Ferroelectric Memory Materials & Devices", presented at the IMRC-MRS 2010 Meeting in Cancun, **Mexico** (August, 16, 2010).
124. **H. N. Alshareef** and M. Alahmad, "Parametric Model for the Optimization of Energy Output of Piezoelectric Cantilevers", presented at ISIF 2010, San Juan **Puerto Rico**, June 13-17, 2010.
125. **H. N. Alshareef**, "Energy Harvesting from Vibrations", IEEE Local Chapter Meeting, Austin, Texas, **USA** (April 23, 2009). **Invited.**
126. M. Quevedo, A. Avendano, **H.N. Alshareef**, B. Gnade, Sameer Vengopal, and David Allee, presented at the Materials Research Society Meeting, San Francisco, **USA** (April, 13, 2009). **Invited.**
127. **H. N. Alshareef**, "Integrated Hybrid Flexible CMOS Devices and Circuits", presented at Stanford University, **USA**, April 11, 2009. **Invited.**
128. **H. N. Alshareef**, "Applications of Functional Oxides in Electronic and Energy Harvesting Devices", presented at Imperial College, **England**, August, 14, 2009. **Invited.**
129. **H.N. Alshareef** and B.E. Gnade, Fourth Annual Workshop on Energy Harvesting, Virginia Tech, Virginia, **USA**, January 28-29 (2009). **Invited.**
130. D.R. Allee, M.A. Quevedo-Lopez, S. Gowrisanker, A. E. Avendano-Bolivar, **H.N. Alshareef**, B. Gnade S. Venugopal, R. Krishna, K. Kaftanoglu "Flexible CMOS and Electrophoretic Displays" Invited Presentation, Society of Information Display International Symposium (2009). Pheonix, **USA**. **Invited.**
131. M. Quevedo, **H. N. Alshareef**, D. Allee, and B. Gnade, Electrochemical Society Meeting CS (October, 2009), Vienna, **Austria**. **Invited.**
132. A. Hande, Pradeep Shah, **H. N. Alshareef**, Bruce Gnade, "Integrated Energy Harvesting with Multisource, Adaptive Circuits & Interfaces", Fourth Annual Workshop on Energy Harvesting, Virginia tech, USA ,Jan 28-29 (2009). **Invited.**
133. S. Gowrisanker, M.A. Quevedo-Lopez, **H. N. Alshareef**, B. Gnade. S. Venugopal, R. Krishna, K. Kaftanoglu, D. Allee "Low Temperature Integration of Hybrid CMOS Devices on Plastic Substrates"

Proceedings of the 2009 Flexible Electronics and Displays. (presented January, 2009 in Phoenix, **USA**.

134. **H.N. Alshareef**, "Energy Harvesting Through the Piezoelectric and Thermoelectric Effects", 2nd International Conference on Advanced materials, Monclova, **Mexico** (October, 2008). **Invited.**
135. **H.N. Alshareef**, "Energy Harvesting From Vibration" Invited talk at Sematech, Austin, Texas, **USA** (September, 2008). **Invited.**
136. **H.N. Alshareef**, "Metal Gate Electrode Options for Nano Scale Transistors" Invited talk at Applied Materials Santa Clara, CA, **USA** (April, 2008). **Invited.**
137. **H.N. Alshareef**, M. Alahmad, E. Fuentes, L. Baldenegro, M. Quevedo, B. E. Gnade, and "Estimation of The Piezoelectric Constant of Pb(Zr,Ti)O₃ Thin Films Using a Simple Capacitive Technique", presented at the Materials Research Society Meeting, Boston, **USA** (December 3, 2008).
138. L. Baldenegro, E. Fuentes, M. Quevedo, W. Debray, B. E. Gnade, and **H.N. Alshareef**, "Characterization of PZT Thin Films on Non-Conducting Surfaces for Energy Harvesting Applications", presented at the Materials Research Society Meeting, Boston, **USA** (December 1, 2008).
139. **H.N. Alshareef**, "Energy Harvesting through the Piezoelectric Effect", presented at the University of Texas at Dallas, Dallas, Texas, **USA**, (April 18, 2008).
140. M.A. Quevedo, **H.N. Alshareef**, and B. Gnade, "Sensor Materials and Devices", presented at the Signal Analysis Conference 2008, Pheonix, AZ, **USA** (March 13, 2008). **Invited.**
141. G. Srinivas, Y. Ai, M. A. Quevedo, **H.N. Alshareef**, E.Vogel, and B.E. Gnade, "Thickness Effects in Pentacene Organic Thin Film Transistors", presented at US Display Conference (USDC), Tucson, AZ, **USA** (Jan. 2008).
142. G. Srinivas, Y. Ai, M. A. Quevedo, **H.N. Alshareef**, and B.E. Gnade, "Time Dependent Dielectric Breakdown in Parylene Thin Films", presented at MRS Spring Meeting, March 23-28, 2008 (San Francisco, CA, **USA**).
143. **H.N. Alshareef**, "Flexible Electronics: Materials and Devices", presented at the International Conference on Advanced Materials, Monclova, **Mexico** (September 27, 2007). **Invited.**
144. H.C. Wen, S.C. Song, C.S. Park, C. Burham, G. Burseker, M. Quevedo, K. Chio, and **H.N. Alshareef**, "Metal-Al-Nitride Gate Electrodes for 32 nm CMOS Applications", presented at the 2007 VLSI Technology Symposium, 160 (2007).
145. **H.N. Alshareef**, "Metal Gates for CMOS Applications", presented at the University of Texas at Dallas, Dallas, **USA** (April, 2006). **Invited.**
146. **H.N. Alshareef**, H.R. Harlan, H.C. Wen, P. Majhi, H.F. Luan, K. Choi, B.H. Lee, R. Jammy, "Thermally Stable N-Metal Gate MOSFETs Using La-Incorporated HfSiO Dielectric" presented at the VLSI Technology Symposium, Honolulu, **Hawaii**, (June 10, 2006).
147. H. R.Harris, **H. N. Alshareef**, H.C. Wen, S. Krishnan, K. Choi, H. Luan, D. Heh, C.S. Park, H.B. Park, M. Hussain, B.S. Ju, P.D. Kirsch, S.C. Song, P. Majhi, B.H. Lee, R. Jammy "Simplified Manufacturable Band Edge Metal Gate Solution for NMOS Without a Capping Layer", presented at the International Electron Device Meeting, **Washington, DC** (December, 2006).
148. H. Harris, S. Krishnan, H. C. Wen, **H. N. Alshareef**, A. Rao, L. Solis, P. Majhi, R. Choi, B. H. Lee, G. Bersuker, and G. A. Brown, "Reliability Characteristics of Metal/High-? PMOS with Top Interface Engineered Band Offset Dielectric (BOD)," presented at the IEEE International Reliability Physics

Symposium, Florida, **USA** (2006).

149. M. El Bouanani, V. Ukirde and **H. N. Alshareef**, "Cu diffusion in CH₄ plasma irradiated Tantalum nitride", presented at CAARI 2006:19th International Conference on the Application of Accelerators in Research and Industry, Ft Worth TX, **USA** (August 21-25) 2006.
150. P. Kirsch, M. A. Quevedo-Lopez, S. A. Krishnan, C. Krug, **H. Alshareef**, C. S. Park, R. Harris, N. Moumen, A. Neugroschel, G. Bersuker, B. H. Lee, J. G. Wang, G. Pant1, B. E. Gnade, M. J. Kim, R. M. Wallace, J. S. Jur, D. J. Lichtenwalner, A. I. Kingon, and R. Jammy. "Band Edge n-MOSFETs with High-k/Metal Gate Stacks Scaled to EOT=0.9nm with Excellent Carrier Mobility and High Temperature Stability", presented at the International Electron Device Meeting, Washington, DC, **USA** (December, 2006).
151. H.C. Wen, K. Choi, C. S. Park, H. Luan, **H. N. Alshareef**, H. R. Harris H.B. Park, G. Bersuker, P. Lysaght, P. Majhi, S.C. Song and B.H. Lee, "Fermi-level pinning and threshold voltage roll-off phenomena at low effective oxide thicknesses for p-MOS work function metal gates" presented at the 3rd International Symposium on Advanced Gate Stack Technology, Austin, Texas, **USA** (September 27-29, 2006).
152. M. M. Hussain, S. -. Song, C. Y. Kang, M. A. Quevedo-Lopez, **H. N. Alshareef**, B. Sassman, R. Choi and B. H. Lee, "Compatibility of ALD Hafnium Silicate with Dual Metal Gate CMOS Integration", presented at the 2006 Solid State Device Meeting in Yokohama, **Japan** (2006).
153. M. A. Quevedo-Lopez, P.D. Kirsch, S. Krishnan, **H. N. Alshareef**, J. Barnett, H. R. Harris, A. Neugroschel, F.S. Aguirre-Tostado, B. E. Gnade, M. J. Kim, R. M. Wallace, and B.H. Lee, "Systematic Gate Stack Optimization to Maximize Mobility with HfSiON EOT Scaling", presented at the 36th European Solid-State Device research Conference, Montreaux, **Switzerland**, September 18-22, 2006.
154. **H. N. Alshareef**, K. Choi, H. C. Wen, H. Harris, H. Luan, P. Lysaght, P. Majhi, and B. H. Lee, "Gate Work Function Modification Using Ultra-Thin Metal Interlayers", presented at the 207th Electrochemical Society Meeting, Quebec, **Canada** (September, 2005).
155. K. Choi, Y. Senzaki, H. Luan, **H. N. Alshareef**, H. Harris, H. Wen, C. Park, P. Majhi, and B. H. Lee, "N-type band edge work function demonstration employing plasma-enhanced ALD HfSiN gate electrodes on high-k dielectrics," presented at AVS 5th International Conference on Atomic Layer Deposition, San Jose, California, **USA**, 2005.
156. **H.N. Alshareef**, "IC Fabrication Tutorial", presented at the 2nd International Conference on Novel Materials and Devices, Saltillo Institute of Technology, Saltillo, **Mexico** (April, 2005). **Invited.**
157. **H.N. Alshareef**, "Composition and Temperature Dependence of the TaAlN Metal Gate Work Function", presented at the Semiconductor Interface Specialist Conference (SISC), Washington, DC, **USA** (December, 2005).
158. **H.N. Alshareef**, "Work Function Extraction Using a Terraced Oxide Technique", presented at 2nd International Workshop on Advanced Gate Stack Technology, in Austin, TX, **USA** (September 28-30, 2005). **Invited.**
159. **H.N. Alshareef**, "Status of Metal Gate Material Development for CMOS Applications", presented at Philips Research, Grenoble, **France**, (September, 2005). **Invited.**
160. **H.N. Alshareef**, "Status of Metal Gate Material Development for CMOS Applications", presented at Infineon technology, Dressden, **Germany** (September, 2005). **Invited.**
161. **H.N. Alshareef** and P. Majhi, "Atomic Layer Deposition of TaN Metal Gate Electrodes", presented at

the 2005 International Conference on Atomic Layer Deposition, Helsinki, Finland (July, 2005)

162. Y. Senzaki, J. Gutt, G. A. Brown, P. Kirsch, **H. N. Alshareef**, K. Choi, C. Huffman, H. Wen, P. Majhi, B. H. Lee, H. Chatham, S. Park, and S. Lane, "ALD of Advanced High-k and Metal Gate Stacks for MOS Devices," presented at 207th ECS Meeting, Quebec, Canada, 2005.
163. D. Rogers, T. Laaksonen, A. Varghese, C. Otten, M. Kasner, **H. N. Alshareef**, M. Bevan, "In-Line Control and Rapid Process Development of Nitrided Gate Oxides" , presented at the CHARACTERIZATION AND METROLOGY FOR ULSI TECHNOLOGY 2005, Dallas, Texas (2005).
164. S. C. Song, B. Lee, Z. Zhang, K. Choi, S. H. Bae, **H.N. Alshareef**, P. Majhi, H. Wen, J. Bennett, B. Sassman, and P. Zeitzoff, "Comparision of MOSFET Characteristics Between ALD and MOCVD TiN Metal Gate on Hf Silicate," presented at the 207th Meeting of the Electrochemical Society, Quebec, Canada (September, 2005).
165. H. R. Harris, H. C. Wen, K. Choi, **H.N. Alshareef**, H. Luan, Y. Senzaki, C. D. Young, S. C. Song, Z. Zhang, G. Bersuker, P. Majhi, and B. H. Lee, "Demonstration of high performance transistors with PVD metal gate," presented at the European Solid-State Device Research Conference, Switzerland, 2005.
166. K. Choi, Y. Senzaki, H. Luan, **H. N. Alshareef**, H. Harris, H. Wen, C. Park, P. Majhi, and B. H. Lee, "N-type band edge work function demonstration employing plasma-enhanced ALD HfSiN gate electrodes on high-k dielectrics," presented at AVS 5th International Conference on Atomic Layer Deposition, San Jose, California, 2005.
167. H. C. Wen, K. Choi, P. Lysaght, P. Majhi, **H. N. Alshareef**, C. Huffman, R. Harris, H. Luan, B. H. Lee, N. Yamada, and S. Wickramanayaka, "Work function engineering of RuHf alloys as gate electrodes for future generation dual metal CMOS," presented at the Taiwan VLSI Technology Symposium, Taipei, Taiwan (2005).
168. K. Choi, Y. Senzaki, H. Luan, **H. N. Alshareef**, H. Harris, H. Wen, C. Park, P. Majhi, and B. H. Lee, "N-type band edge work function demonstration employing plasma-enhanced ALD HfSiN gate electrodes on high-k dielectrics," presented at AVS 5th International Conference on Atomic Layer Deposition, San Jose, California, (2005).
169. H. C. Wen, K. Choi, P. Lysaght, P. Majhi, **H. N. Alshareef**, C. Huffman, R. Harris, H. Luan, B. H. Lee, N. Yamada, and S. Wickramanayaka, "Work function engineering of RuHf alloys as gate electrodes for future generation dual metal CMOS," presented at the Taiwan VLSI Technology Symposium, Taipei, Taiwan (2005).
170. Z. Zhang, S.C. Song, C. Huffman, J. Barnett, N. Moumen, **H.N. Alshareef**, P. Majhi, M. Hussain, M. Akbar, J. Sim, S. Bae, B. Sassman, and B.H. Lee, "Integration of Dual Metal gate CMOS Using TaSiN and Ru Metal Gates", presented at the 2005 VLSI Technology Symposium, Japan (2005).
171. P. S. Lysaght, H.-C. Wen, **H. N. Alshareef**, K. Choi, R. Harris, H. Luan, Y. Senzaki, G. Lian, M. Campin, M. Clark, B. Foran, P. Majhi, and B.-H. Lee, "Physical Characterization of Novel Metal Electrodes for Hf-based Transistors," presented at the CHARACTERIZATION AND METROLOGY FOR ULSI TECHNOLOGY 2005 Conference, Dallas, TX (September 9, 2005).
172. P. Majhi, H. C. Wen, **H. N. Alshareef**, K. Choi, R. Harris, P. Lysaght, H. Luan, Y. Senzaki, S. C. Song, B. H. Lee, and C. Ramiller, "Evaluation and integration of metal gate electrodes for future generation dual metal CMOS," presented at the IEEE International Conference on Integrated Circuit Technology, Shanghai, China (2005).
173. K. Choi, H.-C. Wen, **H. N. Alshareef**, R. Harris, P. Lysaght, H. Luan, P. Majhi, and B. H. Lee, "The effect of metal thickness, overlayer and high-k surface treatment on the effective work function of metal electrode," presented at the European Solid-State Device Research Conference, (2005).

174. K. Choi, P. Lysaght, H.-C. Wen, K. Matthews, **H. N. Alshareef**, C. Huffman, R. Harris, H. Luan, P. Majhi, and B. H. Lee, "Growth mechanism of ALD-TiN and the thickness dependence of work function," presented at the Taiwan VLSI Technology Symposium, Taipei, Taiwan (2005).
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LIST of PATENTS

Patents in Industry

Related to High-k Dielectric for DRAM

At Micron, Prof. Alshareef received **20 issued patents** covering the various aspects of high-k deployment in DRAM. Below is a list of the most relevant patents.

US Patent 6,162,744	Method of forming capacitors having high-K oxygen-containing capacitor dielectric layers HN Alshareef, SJ DeBoer, RPS Thakur Cited 51 times
US Patent 6,191,443	Capacitors, methods of forming capacitors, and DRAM memory cells HN Alshareef, SJ DeBoer, FD Gealy, RPS Thakur Cited 37 times
US Patent 6,351,005	Integrated capacitor incorporating high-K dielectric HN Alshareef, EX Ping Cited 17 times
US Patent 6,458,645	Capacitor having tantalum oxynitride film and method for making same SJ DeBoer, HN Alshareef, RPS Thakur, D Gealy Cited 45 times

US Patent 6,281,543	Double-layer electrode and barrier system on hemispherical grain silicon for use with high dielectric constant materials and methods for fabricating the same HN Alshareef, S DeBoer, R Thakur Cited 30 times
US Patent 6,124,164	Method of making integrated capacitor incorporating high K dielectric HN Alshareef, EX Ping Cited 27 times
US Patent 6,239,459	Capacitors, methods of forming capacitors and integrated circuitry HN Alshareef, SJ DeBoer, RPS Thakur Cited 6 times
US Patent 6,943,392	Capacitors having a capacitor dielectric layer comprising a metal oxide VK Agarwal, HN Alshareef Cited 12 times
US Patent 6,773,981	Methods of forming capacitors HN Alshareef, SJ DeBoer, FD Gealy, RPS Thakur Cited 10 times
US Patent 7,206,215	Antifuse having tantalum oxynitride film and method for making same SJ DeBoer, HN Al-Shareef, RPS Thakur, D Gealy Cited 27 times
US Patent 6,737,696	DRAM capacitor formulation using a double-sided electrode SJ Deboer, H Al-Shareef, R Thakur Cited 9 times
US Patent 6,720,607	Method for improving the resistance degradation of thin-film capacitors Cem Basceri, HN Alshareef Cited 3 times
US Patent 6,518,121	Boride electrodes and barriers for cell dielectrics HN Alshareef, SJ Deboer, D Gealy, RPS Thakur Cited 11 times
US Patent 6,451,661	DRAM capacitor formulation using a double-sided electrode SJ Deboer, H Alshareef, R Thakur Cited 25 times
US Patent 6,400,552	Capacitor with conductively-doped Si-Ge alloy electrode HN Alshareef, SJ DeBoer, FD Gealy, RPS Thakur Cited 12 times
US Patent 6,255,186	Methods of forming integrated circuitry and capacitors having a capacitor electrode HN Alshareef, SJ DeBoer, RPS Thakur Cited 19 times

Plasma-nitrided Dielectric for Logic Circuits

At Texas Instruments, Husam also was unable to publish papers, but obtained over **20 patents** related to plasma nitridation of SiO₂ gate dielectric. Below is a list of the most relevant patents.

US Patent 7,226,826	Semiconductor device having multiple work functions and method of manufacture therefor HN Alshareef, MR Visokay, ALP Rotondaro, L Colombo Cited 22 times
US Patent 7,906,441	System and method for mitigating oxide growth in a gate dielectric MJ Bevan, H Bu, H Niimi, HN Alshareef Cited 57 times (Key Patent for cluster tool). Re-issued ever year for 15 years.
US Patent 8,008,216	Nitrogen profile in high-K dielectrics using ultrathin disposable capping layers HN Alshareef, MA Quevedo-Lopez Cited 2 times
US Patent 6,730,566	Method for non-thermally nitrided gate formation for high voltage devices H Niimi, R Khamankar, HN Alshareef Cited 70 times
US Patent 7,682,988	Thermal treatment of nitrided oxide to improve negative bias thermal instability HN Alshareef, R Khamankar, A Varghese, CA Chancellor, A Krishnan, ... Cited 4 times
US Patent 6,924,239	Method for removal of hydrocarbon contamination on gate oxide prior to non-thermal nitridation using “spike” radical oxidation H Niimi, HN Alshareef, A Varghese Cited 19 times
US Patent 7,345,001	Gate dielectric having a flat nitrogen profile and method of manufacture therefor H Niimi, HN Alshareef, R Khamankar, T Tran Cited 2 times
US Patent 7,227,201	CMOS device having different amounts of nitrogen in NMOS and PMOS gate dielectric layers A Varghese, HN Alshareef, R Khamankar Cited 19

Metal gate/High-k Patents

Professor Alshareef also filed several patents for processes and fabrication strategies for integration of metal gates in CMOS flow. Here is a list of the most relevant patents.

US Patent 7,226,826	Semiconductor device having multiple work functions and method of manufacture therefor HN Alshareef, MR Visokay, ALP Rotondaro, L Colombo Cited 22 times
US Patent 7,807,522	Lanthanide series metal implant to control work function of metal gate electrodes HN Alshareef, M Ramin, MF Pas

Cited 14 times

US Patent 7,858,459 Work function adjustment with the implant of lanthanides
M Ramin, MF Pas, H Alshareef
Cited 18 times

US Patent 8,802,519 Work function adjustment with the implant of lanthanides
M Ramin, MF Pas, HN Alshareef
Cited 1 time

US Patent 8,304,333 Method of forming a high-k gate dielectric layer
M Ramin, MF Pas, H Alshareef

US Patent 7,799,669 Method of forming a high-k gate dielectric layer
M Ramin, MF Pas, H Alshareef
Cited six times

US Patent 7,582,521 Dual metal gates for mugfet device
HN Alshareef, W Xiong
Cited 9 times

US Patent 7,332,433 Methods of modulating the work functions of film layers
K Choi, H Alshareef, P Majhi
Cited 22 times

Patents In Academia

US Patent 5,555,486 Hybrid metal/metal oxide electrodes for ferroelectric capacitors
A Kingon, HN Alshareef, O. Auciello, O. Gifford, D. Lichtenwalner, D. Dat
Cited 162 times

US Patent 8,878,341 Graphene-based composite materials, method of manufacture and applications thereof
MN Almadhoun, HN Alshareef, US Bhansali, P Xavier, IN Odeh
Cited 40 times

US Patent 9,305,706 Fractional order capacitor
MN Almadhoun, A Elshurafa, K Salama, HN Alshareef
Cited 8 times

US Patent 10,964,822 Single material electronic device and method of producing such an electronic device
FH Alshammari, HN Alshareef

US Patent 11,031,620 Osmotic energy conversion with MXene lamellar membrane-based system and method
H Seunghyun, P Wang, HN Alshareef

US Patent 10,903,019 Compositions and methods of making metal-organic frameworks with redox-active centers
A Mallick, B Ahmed, O Shekhah, HN Alshareef, M Eddaoudi

US Patent 10,068,630 Non-volatile ferroelectric memory cells with multilevel operation
JH Park, HN Alshareef, IN Odeh

	Cited 4 times
US Patent 8,994,014	Ferroelectric devices, interconnects, and methods of manufacture thereof US Bhansali, MA Khan, HN Alshareef, MM Saleh, IN Odeh Cited 3 times
US Patent 9,976,913	Thermal history devices, systems for thermal history detection, and methods for thermal history detection JA Caraveo-Frescas, HN Alshareef
US 20210247692A1	Lignin based laser lithography process for fabricating 3d graphene electrode & method Wenli Zhang, Yongjiu Lei, Husam Niman Alshareef
US20210219939A1	Multimodal strain sensor and method HN Alshareef, KH Lee, Y Zhang
US20210096096A1	Sensor electrode, sensor, and method of production LEI Yongjiu, HN Alshareef
PCT/US2015/033547	Use of ambient-robust solution processing for preparing nanoscale organic ferroelectric films JH Park, HN Alshareef, IN Odeh
PCT/IB2018/059959	Large-scale synthesis of 2D semiconductors by epitaxial phase conversion X Xu, HN Alshareef
TBD	MXene Ultrasound Generator Kanghyuck Lee and HN Alshareef

Full list of Issued Patents

No.	US Patent #	Issued Patent Title
1	9,976,913	Thermal History Devices, Systems and Methods for Thermal History Detection, US Patent
2	9,305,706	Fractional order capacitor
3	8,994,014	Ferroelectric devices, interconnects, and methods of manufacture thereof
4	8,878,341	Graphene-based composite materials, method of manufacture and applications thereof
5	8,802,519	Work function adjustment with the implant of lanthanides
6	8,304,333	Method of forming a high-k gate dielectric layer
7	8,008,216	Nitrogen profile in high-K dielectrics using ultrathin disposable capping layers
8	7,906,441	System and method for mitigating oxide growth in a gate dielectric
9	7,858,459	Work function adjustment with the implant of lanthanides
10	7,807,522	Lanthanide series metal implant to control work function of metal gate electrodes
11	7,799,669	Method of forming a high-k gate dielectric layer
12	7,682,988	Thermal treatment of nitrided oxide to improve negative bias thermal instability
13	7,582,521	Dual metal gates for mugfet device
14	7,514,308	CMOS device having different amounts of nitrogen in the NMOS gate dielectric layers and PMOS gate dielectric layers
15	7,410,911	Method for stabilizing high pressure oxidation of a semiconductor device
16	7,402,524	Post high voltage gate oxide pattern high-vacuum outgas surface treatment
17	7,345,001	Gate dielectric having a flat nitrogen profile and method of manufacture therefor
18	7,339,240	Dual-gate integrated circuit semiconductor device
19	7,332,433	Methods of modulating the work functions of film layers
20	7,282,457	Apparatus for stabilizing high pressure oxidation of a semiconductor device
21	7,226,826	Semiconductor device having multiple work functions and method of manufacture thereof
22	7,206,215	Antifuse having tantalum oxynitride film and method for making same
23	7,176,079	Method of fabricating a semiconductor device with a wet oxidation with steam process
24	7,087,440	Monitoring of nitrided oxide gate dielectrics by determination of a wet etch
25	7,064,052	Method of processing a transistor gate dielectric film with stem
26	7,049,242	Post high voltage gate dielectric pattern plasma surface treatment
27	7,038,265	Capacitor having tantalum oxynitride film and method for making same
28	7,022,623	Method of fabricating a semiconductor device with a dielectric film using a wet oxidation with steam process
29	7,018,925	Post high voltage gate oxide pattern high-vacuum outgas surface treatment
30	6,955,996	Method for stabilizing high pressure oxidation of a semiconductor device
31	6,949,477	Method of fabricating a capacitive element for a semiconductor device
32	6,943,392	Capacitors having a capacitor dielectric layer comprising a metal oxide having multiple different metals bonded with oxygen
33	6,924,239	Method for removal of hydrocarbon contamination on gate oxide prior to non-thermal nitridation using "spike" radical oxidation
34	6,921,703	System and method for mitigating oxide growth in a gate dielectric
35	6,872,639	Fabrication of semiconductor devices with transition metal boride films as diffusion barriers
36	6,864,527	Capacitor having tantalum oxynitride film and method for making same
37	6,773,981	Methods of forming capacitors
38	6,737,696	DRAM capacitor formulation using a double-sided electrode
39	6,730,566	Method for non-thermally nitrided gate formation for high voltage devices
40	6,720,607	Method for improving the resistance degradation of thin film capacitors
41	6,673,689	Double layer electrode and barrier system on hemispherical grain silicon
42	6,614,082	Fabrication of semiconductor devices with transition metal boride films as diffusion barriers
43	6,613,654	Fabrication of semiconductor devices with transition metal boride films as diffusion barriers
44	6,610,211	Method of processing internal surfaces of a chemical vapor deposition reactor
45	6,596,651	Method for stabilizing high pressure oxidation of a semiconductor device
46	6,518,121	Boride electrodes and barriers for cell dielectrics
47	6,458,645	Capacitor having tantalum oxynitride film and method for making same
48	6,451,661	DRAM capacitor formulation using a double-sided electrode
49	6,423,649	Method and apparatus for stabilizing high pressure oxidation of a semiconductor device
50	6,400,552	Capacitor with conductively doped Si-Ge alloy electrode
51	6,399,459	Double layer electrode and barrier system on hemispherical grain silicon for use with high dielectric constant materials
52	6,351,005	Integrated capacitor incorporating high K dielectric
53	6,316,800	Boride electrodes and barriers for cell dielectrics
54	6,291,364	Method and apparatus for stabilizing high pressure oxidation of a semiconductor device
55	6,258,655	Method for improving the resistance degradation of thin film capacitors
56	6,255,186	Methods of forming integrated circuitry and capacitors having a capacitor electrode
57	6,239,459	Capacitors, methods of forming capacitors and integrated circuitry
58	6,191,443	Capacitors, methods of forming capacitors, and DRAM memory cells
59	6,162,744	Method of forming capacitors having high-K oxygen containing capacitor dielectric layers,
60	6,124,164	Method of making integrated capacitor incorporating high K dielectric
61	6,111,285	Boride electrodes and barriers for cell dielectrics
62	6,096,127	Tuneable dielectric films having low electrical losses
63	6,082,375	Method of processing internal surfaces of a chemical vapor deposition reactor
64	5,555,486	Hybrid metal/metal oxide electrodes for ferroelectric capacitors