جامعة قطر
QATAR UNIVERSITY

CAM
مركز المواد المتقدمة
Center for Advanced Materials

Center for Advanced Materials
NEWSLETTER Issue 3

December 2022

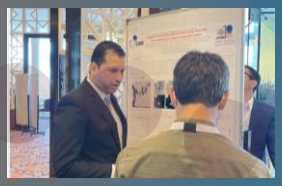
Inside this issue

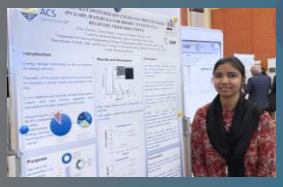
CAM Activities

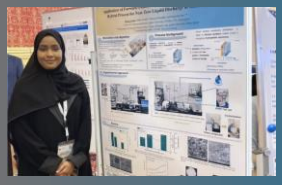
End of Academic Year Ceremony 2021/2022

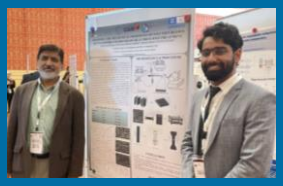
CAM Director, Dr. Mohammad Irshidat, spoke about the recent achievements of the Center at the End of Academic Year Ceremony organized by Research and Graduate Studies, Qatar University.

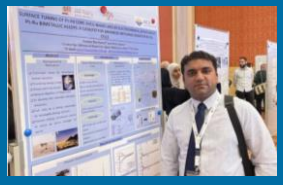
ACS Conference attendance



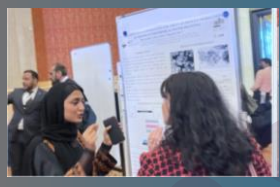


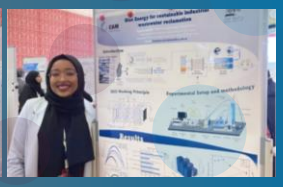


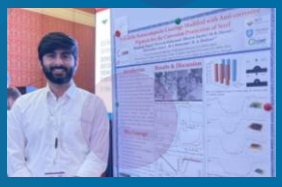


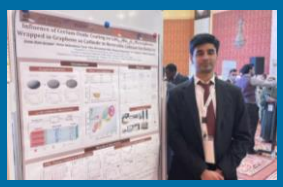


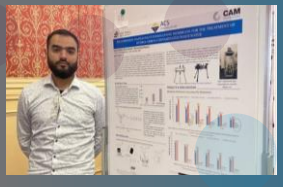
Researchers at CAM showcased an array of the latest research activities at the recently concluded "ACS Research Conference: Chemistry and Chemical Engineering in MENA" in Doha, Qatar.

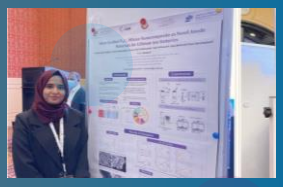


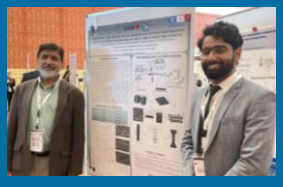




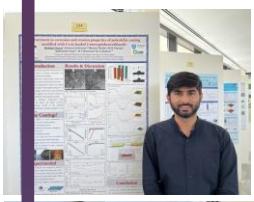
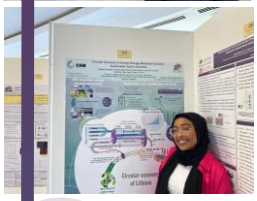
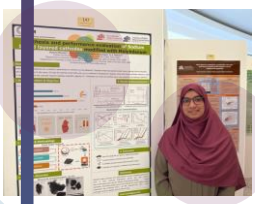
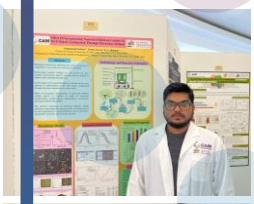
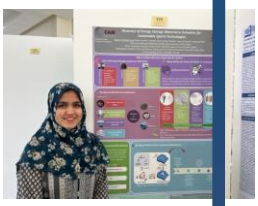
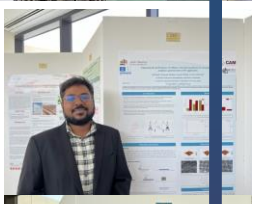


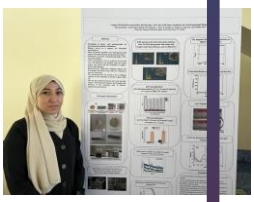






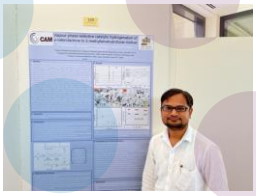
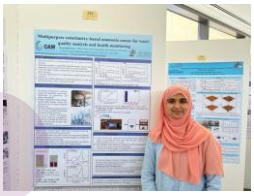
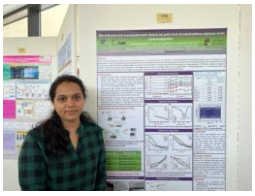
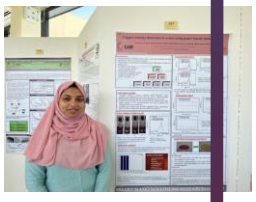
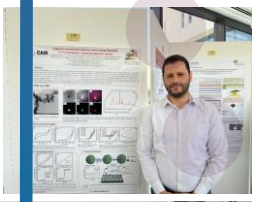
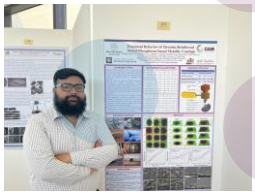
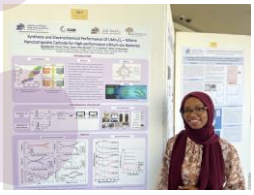
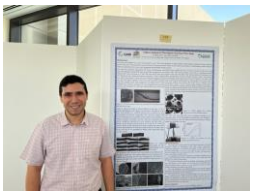
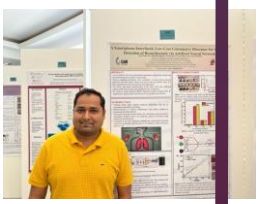
CAM Activities

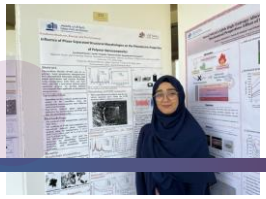
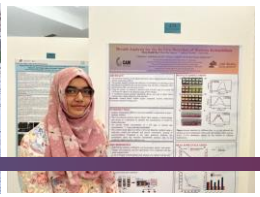
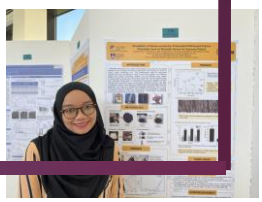









CAM research teams display various ongoing research at the poster session of the

Qatar University Annual Research Forum and Exhibition 2022.

Summer Internship



"N-oxide Based Gels"
"High-voltage Lithium-ion Batteries: Manufacturing and Testing"

CAM Activities

CAM Exhibition stand at Qatar University Annual Research Forum and Exhibition 2022

CAM Faculty members (Dr. Abdul Shakoor's group and Dr. Dong Suk Han's group) presented their project topics to the Secondary School's students in the event "I am a Researcher 22nd Cycle", hosted by Qatar University Young Scientists Center (QUYSC).

The Health & Safety Section at Qatar University conducted Fire Safety Training for CAM staff and students. The training included theory & practical mock sessions covering several aspects of preventive measures and immediate response in case of an emergency.

Achievements

Awarded Grants

Project: QNRF-grants

MME Food Security Call

LPI	Title
Dr. Kishor Kumar Sadasivuni	Developing highly productive nutrition framework for poultry via smart health monitoring and machine learning approach

UREP Cycle 29

LPI	Title
Dr. Noora Al-Qahtani	Smart super hydrophobic antifouling coatings for seawater systems
Dr. Dong Suk Han	Fabrication of 2D-printed Thin Film Composite Forward Osmosis (FO) Membrane for Applications in Sustainable Agricultural Irrigation

Project: QU-Internal Grant

Visiting fellow, Scholar & Researcher Program (VFS & RP)

	Title
Referent Faculty: Dr. Peter Kasak **Visiting Scholar:** Dr. Andrey L. Rogach	Fabrication and application of citric acid-based fluorophores

Post-Doc Initiative (PDOC) Program

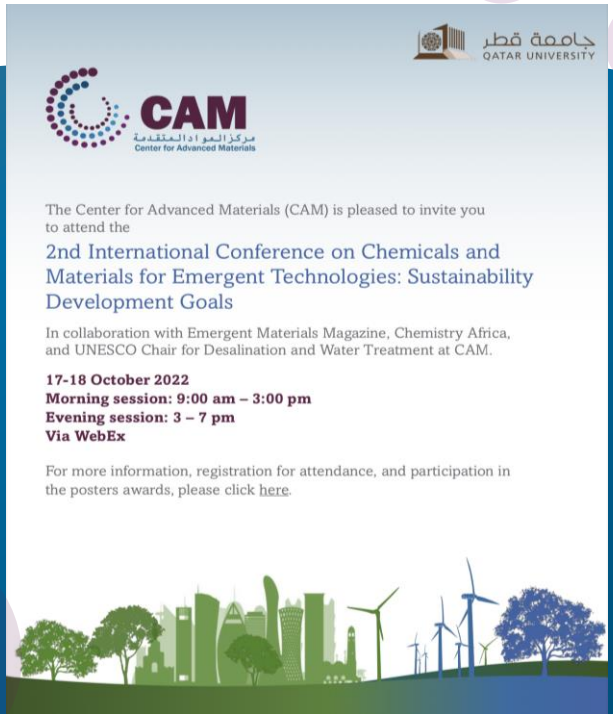
LPI	Title
Dr. Dong Suk Han	Solar-thermal-assisted Green Hydrogen (H_2) Production using Downstream water of Qatar's Industrial Wastewater Treatment Plant

E-Conference

The Center for Advanced Materials hosted the "2nd International Conference on Chemicals and Materials for Emergent Technologies: Sustainability Development Goals."

Press and media coverage:

- Al Arab newspaper, Click here.
- The Peninsula newspaper, Click here.
- QU website, Click here.



Achievements

Awards

1. CAM researcher (Ms. Sehrish Habib supervised by Dr. Abdul Shakoor) project on "Smart Self Healing Nanocomposite" won Second Place in the Postgraduate Category at the GPCA__research and innovation Conference in Dubai.

2. Saqr Al-Rumaihi and Issa Al-Mohannadi from Jassim Bin Hamed Secondary School for Boys ("Khalifa Stadium“ group) won first place in the National Program for the Promotion of Scientific Research. Project title: "Silver-supported nanocomposites as new anode materials for lithium batteries"

3. CAM student researcher Khadija Muhammad Abdul Quddus won the best poster presentation award in the undergraduate students' category, in addition to QR10,000 for participating in one of the international conferences.

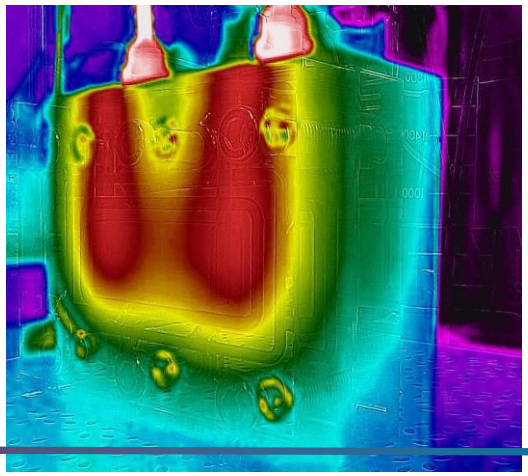
4. Dr. Dong Suk Han's research group (Tasneem Elmakki (1st Place) and Mona Gulied (3rd Place)) won the poster presentation award at the 3rd International Sustainability Conference on Food Security (ISC 2022).

Achievements

5

Dr. Dong Suk Han, Dr. Leena Al-Sulaiti, Dr. Zubair Ahmad and Eng. Mona Gulied won the First Position in the Visualization Challenge Award in the Photography category at Qatar University Annual Research Forum & Exhibition 2022

Concentrating Lithium Ion in Seawater using Thermal Membrane Distillation (NPRP 12S-0227-190166)



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Dr. Mohammad R. Irshidat (Director, CAM) receives ISO 17025 Accreditation Certificate for CAM in QUARFE2022.

Dr. Dong Suk Han has been selected as an Editorial Board Member of Desalination, Elsevier. This journal (Impact Factor 11.211, Q1) ranked top 1% in desalination materials, processes, water purification, membrane technology, etc.

Honor

PEOPLE

Promotion & New Appointment

Dr. Khalid Qasem Mo Bani Melhem

Research Associate Professor

Dr. Khalid Bani-Melhem graduated from Jordan University of Science and Technology (JUST) with a BEng (Chemical Eng.) and an MEng (Chemical Eng.) in 1995 and 1998, respectively. His MEng research topic was on water desalination using membrane distillation technology. Dr. Bani-Melhem received his Ph.D. (Civil and Environmental Eng.) from Concordia University, Montreal-Canada, in 2008. In August 2022, Dr. Bani-Melhem has joined the center for advanced materials (CAM) at Qatar University as a research associate professor. Prior to joining Qatar University, Dr. Bani-Melhem worked at Hashemite University in the department of Water Management and Environment from 2012 to 2018 as an assistant professor and from 2018 to 2022 as an associate professor. Between September 2016 and September 2019, Dr. Bani-Melhem served as the chairman of the Water Management and Environment Department at Hashemite University. Prior to joining Hashemite University in 2012, he has worked at American University in Cairo (AUC) from Feb. 2010 to August 2012 as a Postdoctoral Researcher on a big project funded from King Abdullah University of Science and Technology (KAUST). Upon finalizing his PhD degree, Dr. Bani-Melhem also engaged in a post-doctoral fellow at Concordia University from 2008 to 2010, where he completed his research on his PhD project which was funded by more than 650,000 Canadian dollars from the Natural Sciences and Engineering Research Council of Canada (NSERC). His work from Ph.D. was registered as a patent in 2010 in USA.

Dr. Bani-Melhem's research interests are in the general area of physical, chemical and biological processes for water and wastewater treatments, specifically he focuses on membrane processes for water quality control and water reuse. Dr. Bani-Melhem published more than 50 papers in international refereed international journals and conferences. On the industrial scale, Dr. Bani-Melhem has a long and an excellent experience in the chemical and environmental engineering fields. He worked as a process engineer and a quality supervisor at Arab Potash Company (APC) for over 7 years. During his work at APC, he supervised on the quality systems (ISO 14000 and ISO 9000) in the company. He was the coordinator for building up these two systems at the company. For Building up ISO 14000, He participated in identifying all the environmental aspects and their impact assessment on the environment.

Highlighting CAM Researchers

Dr. Anton Popelka
Research Associate

Dr. Anton Popelka has been a Research Associate at the Center for Advanced Materials of QU since 2013. He obtained his Ph.D. in 2012 from the Polymer Technology program of the Polymer Institute, Slovak Academy of Sciences in Slovakia. His present research mainly focuses on surface modification of different polymeric materials by atmospheric and low-temperature pressure plasma techniques, especially applicable in packaging, membranes, and biomedical applications. To date, Dr. Popelka has authored/coauthored 1 U.S. patent, 3 book chapters, and over 90 peer-reviewed publications with more than 1000 citations. Moreover, Dr. Popelka has also participated in many international conferences and symposiums (about 30). He has also attended and led several projects awarded by the QNRF, QU, and industry; many of these projects have focused on modifying polymeric surfaces with plasma technology.

The biomaterials research of Dr. Anton Popelka at CAM focuses on the fabrication and modification of polymeric materials intended to come into contact with living tissue, which is applicable in tissue engineering, regenerative medicine, or medical products. These materials include polymer-based scaffolds and antibacterial-modified polymers. Dr. Anton Popelka's expertise includes polymer-based scaffold preparation, surface treatment using low-temperature plasma technology (radio-frequency vacuum plasma, atmospheric corona plasma), and antibacterial modification of medical-grade polymers (plasma-assisted radical-graft polymerization, slippery liquid-infused porous surfaces fabrication). His research is mainly oriented on applied interdisciplinary research in material and biomedical sciences, such as the development of novel and simple preparation of medical scaffolds with enhanced infection resistance. This innovative concept can be easily implemented into industrial-scale production because all the required technologies and materials are available in the market with a long establishment in the manufacturing industry. By the suitable combination of electrospinning, plasma treatment, or antimicrobial agent grafting, the preparation of new medical scaffolds with infection resistance was investigated, and innovative methods regarding biomaterials research were established at CAM.

Research areas

- Surface treatment using plasma techniques
  - Radio-frequency plasma (Capacitively coupled, Inductively coupled)
  - Corona plasma
  - Diffuse coplanar surface barrier plasma
- Antibacterial modification
  - Plasma-assisted radical graft polymerization
  - Biomedical materials
  - Scaffolds for regenerative medicine
- Adhesion improvement
  - Packaging
  - Building
- Water harvesting & treatment
  - Water collecting (air)
  - Gravity-driven filtration
  - Tertiary filtration
  - Desalination (Reverse osmosis)

Workshops

Climate Change and Sustainable Development

Qatar University's (QU's) Center for Advanced Materials (CAM) conducted a workshop entitled: 'Climate Change and Sustainable Development' at QU's Research Complex (H10). CAM-Qatar University and Korean Embassy co-hosted the event.

The event aimed to discuss climate change and climate action in Qatar. Highlighting world's first carbon-neutral (zero-carbon) FIFA World Cup to be hosted by Qatar. The event was attended by Professor Mariam Al-Ali Al-Maadeed, Vice President for Research and Graduate Studies at QU, HE Joon-ho Lee, Ambassador of the Republic of Korea, Dr. Soud AlThani, Earthna, Qatar Foundation, Mr. Ashraf Kinawi, Earthna, Qatar Foundation, Dr. Pranab Baruah, Head of Doha Mission, Global Green Growth Institute (GGGI), Prof. Aboubakr M Abdullah, Innovation Manager, Qatar University, Dr. Dong Suk Han, Res. Associate Professor at Center for Advanced Materials (CAM) Qatar University, Prof. Seungkwan Hong, Dean of KU-KIST Graduate School of Energy and Environment (Green School), Korea University and Dr. Donghyun Kim, Assistant Professor at Department Chemical Engineering at Qatar University.

The event started with the welcoming speech by Prof. Mariam Al-Maadeed, in which she stated that "Climate change is one of the most important topics, Qatar has kept climate change and sustainable development on top of their priorities. Qatar National Vision 2030 has named environment and development as one of its four main research pillars. Prominent example is FIFA World Cup 2022, as it is organized as an environmentally friendly event. It will be the world's first carbon-neutral FIFA World Cup. Qatar University considers environmental studies among its research priorities." During his opening remarks, H.E. Joon-ho Lee, Ambassador of the Republic of Korea said, "Climate change is not a distant matter. It is our reality, now we see more and more unprecedented floods, heat waves and drought. Many experts warn that these extreme weather conditions will grow in the future and the trend is inevitable and irreversible. To overcome this crisis, we need more international cooperation and advanced green technology." "Qatar and Korea have shared common views on climate change. Qatar unveiled the National Climate Change Action Plan 2030, one of the most ambitious plans in the region. Korea pledged to reduce its national carbon emissions by 40% from 2018 level till 2030 and reach the carbon neutrality by 2050," he added. Lee, added "one of the main focus areas of this seminar is green technology which is the key to fight climate change and guarantee sustainable development in the future. I believe more exchanges of experts and joint research between universities and institutions of Qatar and Korea will greatly contribute to the development of more efficient and greener technology."

The event consisted of two sessions. The first session was based on technical presentations by - Dr. Pranab Baruah, Mr. Ashraf Kinawi, Prof. Dong Suk Han, "CO2 Utilization Approach in the Qatar Environment" and Prof. Seungkwan Hong, "The Future Water Infrastructure in Response to Climate Change".

The second session was based on panel discussion between Dr. Pranab Baruah, Mr. Ashraf Kinawi, Prof. Aboubakr M. Abdullah, Prof. Seungkwan Hong and Dr. Donghyun Kim (as moderator). The panel discussion concluded with Q&A session with the audience.

Closing Remarks were delivered by Dr. Mohammad Irshidat, Director of CAM. The event concluded with Business Lunch and networking.

Workshops

Short course: Membrane-Based Water Treatment

The Center for Advanced Materials (CAM) at Qatar University organized a two-day short training course entitled "Workshop on Membrane-Based Water Treatment". Several local engineers working in water technology at Qatar Electricity and Water Company & Kahramaa attended the workshop.

Applications of Advanced Sustainable Materials

Title: Journey of Electric Vehicle Batteries: From Cell Chemistry to End of Life (EOL) Recycling.
Speaker-1: Dr. Shahid Rasul, Northumbria University, UK.

Title: Electrochemical sensors and biosensors: Graphene to Mxene.
Speaker-1: Dr. Pramod Kalambate, Department of Clinical Chemistry, Chulalongkorn University, Thailand.

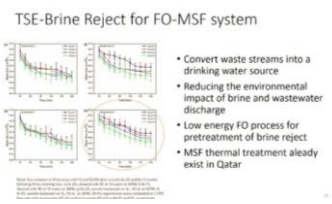
Title: Prospects of Polymer-based nanofiber membranes in developing sustainable clean water technologies.
Speaker-1: Dr. Fazik Ejaz, Department of Mechanical Engineering, King Saud University, Saudi Arabia

Seminars

7 June 2022

Title: "Membrane Technologies for Desalination and Power Generation "

Speakers: Prof. Ali Altaee (University of Technology Sydney, Australia



22 August 2022

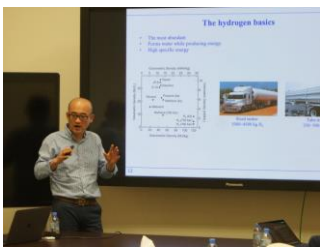
Title: Examples of Smart Materials and Smart Construction in Civil Engineering“

Speaker: Prof. Daichao Sheng, Head of the School of Civil and Environmental Engineering, University of Technology Sydney (UTS)

13 September 2022

Title: "Creating Multifunctional Materials Platforms: From Superhydrophobic Surfaces to Enhanced Food Security and Gas/Oil Sorption"

Speaker: Prof. Saad Khan, Department of Chemical & Biomolecular Engineering at North Carolina State University



26 September 2022

Title: Hydrogen Energy
Speaker-1: Prof. Zhenguo Huang, University of Technology Sydney (UTS)

Title: Hydrogen Production
Speaker-2: Dr. Dong Suk Han, CAM, Qatar University

27 October 2022

Title: Machine Learning for Understanding Variables in Catalytic Reactions

Speaker: Dr. Doniyorbek Ahmadaliev, Director of Presidential School in Andijan city, Uzbekistan

Special talk 16 August 2022

Dr. Dong Suk Han (Research Associate Professor, CAM at Qatar University was invited by the QEERI-HBKU Energy Research team (Dr. Fadwa El Mellouhi) to present the seminar. Dr. Han gave a talk on the topic of “Waste-to-Value Approach in Qatar Environment"

CAM Booklet published

To learn more about the Center for Advanced Materials (CAM) at Qatar University and our research priorities, please read the booklet at the link, here.

Published by:
CAM Newsletter & Press Committee

Design by:
Tasneem Elmakki

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