PHYSICAL SCIENCES AND ENGINEERING DIVISION FACULTY

Tala'at Al-Kassab, *Associate Professor, Materials Science and Engineering*
Research interests: alloys and nanos; materials modeling; spectro- and microscopic characterization. (PhD, University of Göttingen, Germany)

Tariq A. Al-Khalifah, *Professor, Earth Science and Engineering*
Research interests: seismic imaging; seismic inversion; anisotropy. (PhD, Colorado School of Mines)

Husam Alshareef, *Associate Professor, Materials Science and Engineering*
Research interests: nanomaterials; energy harvesting and storage; emerging electronics. (PhD, North Carolina State University)

Aram Amassian, *Assistant Professor, Materials Science and Engineering*
Research interests: organic solar cells; organic electronics; colloidal quantum dot solar cells; solution processing. (PhD, École Polytechnique de Montréal, Canada)

Osman Bakr, *Assistant Professor, Materials Science and Engineering*
Research interests: nanomaterials synthesis; self-assembly; plasmonics. (PhD, Harvard University)

Jean Marie Basset, *Director, Catalysis Research Center,* *Named Professor, Chemical Science*
Research interests: comparison between homogeneous and heterogeneous catalysis. (PhD, University of Lyon, France)

Pierre Beaujuge, *Assistant Professor, Chemical Science*
Research interests: organic electronics for solar cells, circuit logics; energy storage and delivery. (PhD, University of Florida)

Fabrizio Bisetti, *Assistant Professor, Mechanical Engineering*
Research interests: computational fluid mechanics; turbulence; aerosols; combustion; numerical methods. (PhD, University of California, Berkeley, US)

Victor Manuel Calo, *Assistant Professor, Earth Science and Engineering*
Research interests: multiscale and multiphysics modeling of geodynamics; porous media and turbulence. (PhD, Stanford University, US)

Luigi Cavallo, *Associate Professor, Chemical Science*
Research interests: catalysis; reactivity; computer modeling. (PhD, University of Napoli, Italy)

Sahraoui Chaieb, *Associate Professor, Mechanical Engineering*
Research interests: condensed matter physics; photonics; nanomaterials; mechanics of materials. (PhD, École Normale Supérieure of Paris, France)

Suk Ho Chung, *Director, Clean Combustion Research Center,* *Named Professor, Mechanical Engineering*
Research interests: fundamental combustion; fuels; energy & environment. (PhD, Northwestern University, US)

Mohamed Eddaoudi, *Associate Director, Advanced Membranes and Porous Materials Research Center,* *Professor, Chemical Science*
Research interests: functional porous solid-state materials; gas separation and storage. (PhD, Denis Diderot University, France)

Tamer El Sayed, *Assistant Professor, Mechanical Engineering*
Research interests: multiscale modeling of materials; multiphysics; brain modeling. (PhD, California Institute of Technology, US)

Jörg Eppinger, *Assistant Professor, Chemical Science*
Research interests: metal- and bio-catalysis; green chemistry; metalloenzymes, molecular biology. (PhD, Technical University of Munich, Germany)

Aamir Farooq, *Assistant Professor, Mechanical Engineering*
Research interests: chemical kinetics; spectroscopy; laser diagnostics. (PhD, Stanford University, US)

Jean Fréchet, *Vice President for Research; Named Professor, Chemical Science*
Research interests: organic and polymer chemistry, nanoscience, nanotechnology, macromolecules. (PhD, Syracuse University and State University of New York College of Environmental Science and Forestry, US)

Yves Gnanou, *Dean, Physical Sciences and Engineering Division Professor, Chemical Science*
Research interests: poly(ethylene oxide) dendrimers, 'green' catalysts, functional architectures based on natural polymers (DSc, University of Louis Pasteur, France)

Nikolaos Hadjichristidis , *Professor, Chemical Science*
Research interests: complex macromolecular architectures; hybrids, self-assembly, applications. (PhD, University of Liège, Belgium)

Yu Han , *Associate Professor, Chemical Science*
Research interests: porous materials; electron microscopy; catalysis. (PhD, Jilin University, China)

Ibrahim Hoteit, *Assistant Professor, Earth Science and Engineering*
Research interests: data assimilation; inverse problems; ocean modeling; Red Sea circulation. (PhD, Université Joseph Fourier, France)

Kuo-Wei Huang, *Assistant Professor, Chemical Science*
Research interests: catalysis; organometallics; mechanistic study. (PhD, Stanford University, US)

Hong Im, *Named Professor, Mechanical Engineering*
Research interests: ignition/extinction, unsteady flame phenomena, DNS/LES of turbulent reacting flows, nonpremixed edge-flame dynamics, modeling of homogeneous charge compression ignition engines, modeling of sooting flames, and micro-scale power generation. (PhD, Princeton University, US)

Sigurjón Jónsson, *Associate Professor, Earth Science and Engineering*
Research interests: earthquakes and volcanoes; crustal deformation; radar interferometry. (PhD, Stanford University, US)

Niveen M. Khashab, *Assistant Professor, Chemical Science*
Research interests: design, synthesis of nanomaterials for drug delivery and environmental applications. (PhD, University of Florida, US)

Zhiping Lai, *Assistant Professor, Chemical and Biological Engineering*
Research interests: membranes: inorganic, ceramic, zeolite, MOF; carbon nanotubes; gas separations. (PhD, University of Massachusetts, US)

Gilles Lubineau, *Associate Professor, Mechanical Engineering*
Research interests: integrity and durability of composite materials and structures; multiscale coupling techniques; inverse problems. (PhD, École Normale Supérieure de Cachan, France)

Aurélien Manchon, *Assistant Professor, Materials Science and Engineering*
Research interests: spin-dependent electronic transport and magnetization dynamics. (PhD, Joseph Fourier University, France)

Martin Mai, *Professor, Earth Science and Engineering*
Research interests: earthquake dynamics; imaging earthquake sources; seismic hazard. (PhD, Stanford University, US)

Klaus-Victor Peinemann, *Professor, Chemical and Biological Engineering*
Research interests: multicomponent membranes; polymer self-assembly; hybrid materials. (PhD, Christian Albrechts University, Germany)

Ingo Pinnau, *Director, Advanced Membranes and Porous Materials Research Center Named Professor, Chemical and Biological Engineering*
Research interests: membranes; gas and liquid separations; transport phenomena. (PhD, University of Texas at Austin, US)

Vivek Polshettiwar, *Assistant Professor, Chemical Science*
Research interests: nanocatalysis; green chemistry. (PhD, DRDE and Jiwaji University, India)

William Roberts, *Professor, Mechanical Engineering*
Research interests: high-pressure combustion; soot and pollutants; diagnostics; biofuels. (PhD, University of Michigan, US)

Valentin Rodionov, *Assistant Professor, Chemical Science*
Research interests: catalysis with soft materials; polymer chemistry and self-assembly. (PhD, The Scripps Research Institute, US)

Iman S. Roqan, *Assistant Professor, Materials Science and Engineering*
Research interests: material spectroscopy; semiconductors; optoelectronic devices; diluted magnetic semiconductors. (PhD, Engineering University of Strathclyde, Scotland)

Alexander Rothenberger, *Associate Professor, Chemical Science*
Research interests: inorganic chemistry; gas/water purification; solar energy. (PhD, Gonville and Caius College, University of Cambridge)

Ravi Samtaney, *Associate Professor, Mechanical Engineering*
Research interests: alternative energy; computational fluid & plasma dynamics; magnetohydrodynamics. (PhD, Rutgers University, US)

Mani Sarathy, *Assistant Professor, Chemical and Biological Engineering*
Research interests: combustion chemistry and reaction engineering; sustainable energy and fuels. (PhD, University of Toronto, Canada)

Gerard Schuster, *Professor, Earth Science and Engineering*
Research interests: seismic methods applied to exploration, earthquake, and engineering studies. (PhD, Columbia University, US)

Udo Schwingenschlögl, *Associate Professor, Materials Science and Engineering*
Research interests: first-principles calculations for nanostructured systems. (PhD, Universität Augsburg, Germany)

Georgiy Stenchikov, *Professor, Earth Science and Engineering*
Research interests: climate modeling; numerical fluid dynamics; atmospheric physics. (PhD, Moscow Physical Technical Institute, Russia)

Shuyu Sun, *Associate Professor, Earth Science and Engineering*
Research interests: finite element methods; reservoir simulations; computational transport phenomena; molecular simulations. (PhD, University of Texas at Austin, US)

Kazuhiro Takanabe, *Assistant Professor, Chemical Science*
Research interests: energy conversion; heterogeneous (photo)catalysis; electrocatalysis. (PhD, Tokyo Institute of Technology, Japan)

Sigurdur Thoroddsen, *Professor, Mechanical Engineering*
Research interests: experimental fluid mechanics; high-speed imaging. (PhD, University of California, San Diego, US)

Tao Wu, *Associate Professor, Materials Sciences and Engineering*
Research interests: Emerging functionalities and novel devices of a wide range of oxide thin films and nanomaterials, aiming at applications in areas of spintronics, nonvolatile memory, energy harvesting, and sensors. (PhD, University of Maryland, US)

Mohammad Younis, *Associate Professor, Mechanical Engineering*
Research interests: Novel MEMS sensors and switches design. (PhD, Virginia Polytechnique Institute and State University, US)

http://pse.kaust.edu.sa

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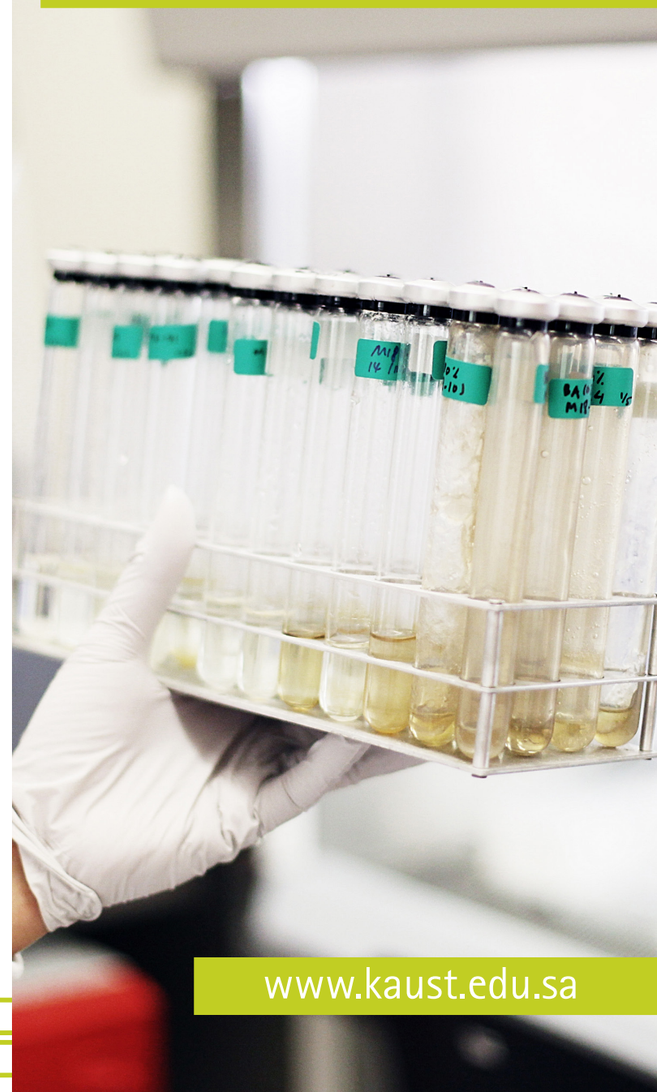
جامعة الملك عبدالله للعلوم والتقنية
King Abdullah University of Science and Technology

PHYSICAL SCIENCES AND ENGINEERING DIVISION



www.kaust.edu.sa

KAUST – *Through inspiration, discovery*

King Abdullah University of Science and Technology (KAUST) attracts top international faculty, scientists, engineers, and postgraduate students to conduct fundamental and goal-oriented research to address the world's pressing scientific and technological problems. The University is committed to cutting-edge research in the areas of water, food, energy, and the environment (including the Red Sea) with a strong emphasis on computational science.

The University engages students, researchers, and faculty in advancing science and technology through collaborative inquiry of regional and global significance. The University's unique matrix structure supports both basic and goal-oriented research to benefit Saudi Arabia and beyond.

KAUST offers its students rich opportunities for learning, discovery, and research. With a student body representing over 70 nations, the University is committed to attracting and educating the world's most gifted and inspired scholars. Students, faculty, and researchers cultivate a dynamic and collaborative environment of bold scientific research and innovation. KAUST is where adventurous and imaginative individuals engage in a journey of intellectual and cultural discovery.

WHY CHOOSE KAUST?

KAUST is a graduate-level research university located on the shores of the Red Sea in Saudi Arabia. The University offers master's (MS) and doctoral (PhD) degrees in three academic divisions: Biological and Environmental Sciences and Engineering; Computer, Electrical, and Mathematical Sciences and Engineering; and Physical Sciences and Engineering. The University's new facilities with state-of-the-art technology offer an ideal setting to study and to conduct high-impact research.

- World-class faculty directs the University's talented postgraduate students, researchers, and postdocs
- Research Centers provide an environment that promotes targeted goal-oriented research
- Guaranteed funding ensures continuity and the highest quality research in water, food, energy, and the environment
- Core facilities include Advanced Nanofabrication, Imaging, and Characterization (microscopy, NMR, thin films); Bioscience (genomics, proteomics, bioinformatics); Supercomputing (Shaheen-IBM Blue Gene); and Visualization (3D display environment, virtual reality)
- Extensive collaboration with industrial partners encourages internships that lead to job opportunities for graduates
- Attractive residential campus enhances research and quality of life

KAUST FELLOWSHIP

All students receive the benefits of the KAUST Fellowship (the University's scholarship program):

- Full tuition support
- Competitive monthly living allowance
- Housing
- Private medical and dental coverage
- Relocation support

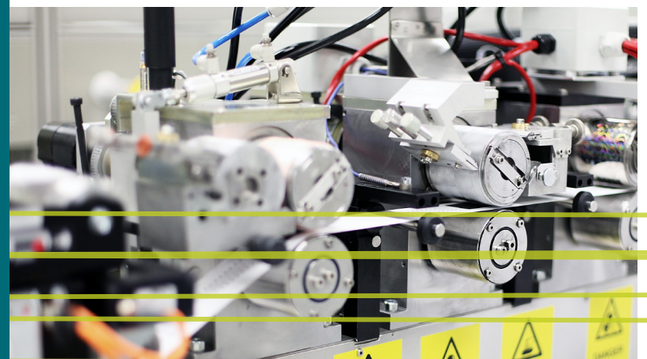
PHYSICAL SCIENCES AND ENGINEERING DIVISION

The Physical Sciences and Engineering Division (PSE) offers five graduate programs corresponding to five core disciplines: Chemical and Biological Engineering; Chemical Science; Earth Science and Engineering; Materials Science and Engineering; and Mechanical Engineering. Some of these programs have specific academic tracks, and a student may choose the track that best suits his/her goals. Students will be offered modules consisting of lectures, seminars, and laboratory classes and will conduct independent research.

The science conducted in PSE is about understanding, modeling, and manipulating matter at all scales: nano, meso and macroscopic levels; in all forms: bulk, thin films, divided colloids, fluid flows, earth as system etc.; and in interaction with external stimuli: light, heat, fluids, etc.; or stresses. The knowledge created serves to design and engineer materials, technologies, and systems that will address issues related to KAUST's four thrusts: water, food, energy, and the environment.

PSE boasts superb facilities and resources:

- Students of the Chemical Science (ChemS) program benefit from state-of-the-art instrumentation and advanced analytical, characterization, and imaging facilities of KAUST Research Centers (Catalysis, Advanced Membranes & Porous Materials, and Solar & Renewable Energy) and of Core Laboratories. Research addresses current challenges in catalysis and molecular and materials design. ChemS faculty has made significant contributions to "catalysis by design", Surface Organometallic Chemistry, development of metal-organic frameworks (MOFs), well-defined macromolecular architectures, photocatalytic water splitting, mechanistic understanding of small molecule activation, Green Chemistry applications, and metallo-enzyme functions.
- State-of-the-art equipment of four world-class research centers in the areas of Advanced Membranes and Porous Materials, Water Desalination and Reuse, Catalysis, and Clean Combustion await students of the Chemical and Biological Engineering Program. Students can also take full advantage of interdisciplinary research opportunities that arise from collaborations with other PSE programs, KAUST divisions, and industrial partners.
- The facilities of the Materials Science program include a 2,000m^2 Class 1000 clean room and multiple bays at Class 100, enabling state-of-the-art thin-film deposition techniques and generally all techniques related to the fabrication, visualization, and testing of advanced materials.
- Laboratories in Mechanical Engineering include an integrated environment dedicated to modeling, simulation, and inverse approaches for composite materials; state-of-the-art instrumentation for experiments in fluid mechanics; advanced equipment and facilities for combustion diagnostics; computational capabilities for reactive flow modeling; and total internal reflection fluorescence microscopy.
- A state-of-the-art seismic field laboratory is available to students in the Earth Science and Engineering program. In particular, students have access to the latest supercomputing and visualization facilities.



The Printing and Roll-to-Roll Laboratory is part of the advanced facilities in the Solar and Photovoltaic Engineering Research Center.

AFFILIATED RESEARCH CENTERS:

Advanced Membranes and Porous Materials Center
http://ampm.kaust.edu.sa

KAUST Catalysis Center
http://kcc.kaust.edu.sa

Clean Combustion Research Center
http://ccrc.kaust.edu.sa

Solar and Photovoltaics Engineering Research Center
http://sperc.kaust.edu.sa

DEGREE PROGRAMS

CHEMICAL AND BIOLOGICAL ENGINEERING (CBE)

CBE covers a broad range of advanced chemical and biological engineering topics related to water, food, energy, and the environment. Students are offered opportunities to develop real-world solutions to global challenges by leveraging basic discoveries in chemical and biological engineering and sciences. These include the development of new processes for gas and liquid separations, water desalination, process design and optimization, catalysis, as well as the development of new materials for carbon capture and sustainable and renewable energy.

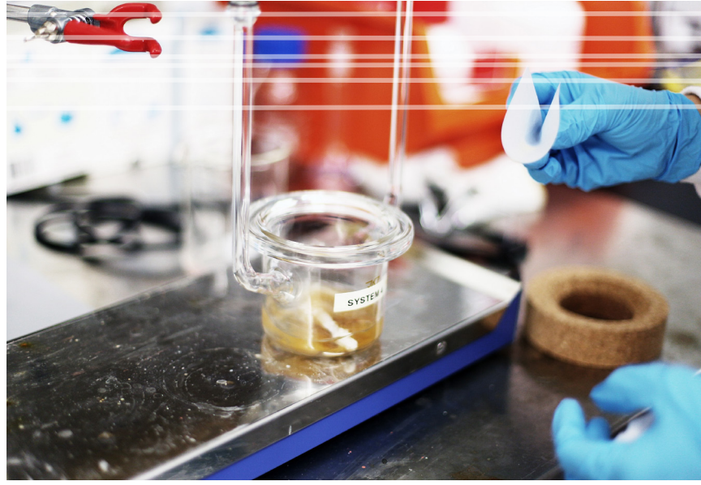
CHEMICAL SCIENCE (ChemS)

The ChemS program provides a modern research-oriented education in Chemistry. From the first day, Students work on research projects in close contact with faculty and benefit from the expertise of the three Research Centers: Catalysis, Advanced Membranes & Porous Materials, and Solar & Photovoltaic Engineering.

Interdisciplinary research opportunities also arise from collaborations with other PSE programs and KAUST divisions. State-of-the-art equipment and strong links to industrial partners prepare our graduates to meet the challenges of a globalized job market.

EARTH SCIENCE AND ENGINEERING (ErSE)

The Earth Science and Engineering (ErSE) program focuses on applications of modern computational methods to study geophysical problems associated with the atmosphere and/or ocean circulation, earthquakes, oil exploration, reservoir modeling, and subsurface phenomena. Students receive broad training in numerical methods, mathematical modeling, and geophysics, with an option for MS students to participate in scientific research activities that include computational modeling and field-study projects. PhD candidates conduct original research on a topic related to earth science and engineering. The program is divided into two tracks that focus on computational analysis of Fluid Earth Systems and Solid Earth Systems. ErSE students must specify one of the two tracks as their major. Students in the Fluid Earth Systems track study flow and transport processes both beneath and above the earth's surface, including subsurface, surface, and atmospheric flows. Students in the Solid Earth Systems track focus on seismology, geophysics, geodynamics, and geomechanics.



The Catalysis Research Center offers a breadth of scientific expertise and state-of-the-art laboratories under one roof.

MATERIALS SCIENCE AND ENGINEERING (MSE)

The Materials Science and Engineering program is devoted to preparing students to address the major challenges facing the world in terms of sustainability and alternative energy. The program aims to equip students with fundamental and applied knowledge of nanomaterials and devices; energy conversion materials and devices; biomaterials; and advanced characterization techniques.

The MSE program offers a broad range of faculty expertise in advanced fabrication, design, and analysis of physical properties of materials, with a special focus on energy efficient devices and applications. Our long-term goal is to train our students to develop viable technology-based solutions that are sustainable and promote renewable energy.

MECHANICAL ENGINEERING (ME)

The Mechanical Engineering program focuses on research in the broad areas of Mechanics of Structures and Solids, Fluid Mechanics, Combustion, Control & Dynamics, and Energy. Individual faculty-directed laboratories are complemented by the KAUST Core Labs, which include powerful supercomputing facilities, to give talented and motivated students unique cross-disciplinary research opportunities. Facilities include ultra-high-speed imaging, x-ray tomography, microfluidics, MEMS, and laser diagnostics in combustion.

ENGLISH LANGUAGE REQUIREMENT

All courses are taught in English and students must meet the minimum language requirement: 79 on the TOEFL iBT (internet based test) or 6.0 on the IELTS test.

FOR APPLICATIONS OR INQUIRIES OFFICE OF ADMISSIONS

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