

## Iran launches the Mustafa Prize for Sciences

The Mustafa Prize is an award granted by Iran to recognize leading researchers and scientists from the Organization of Islamic Cooperation (OIC), as well as Muslim researchers from around the world. Presented biennially by the Iranian Government, the Prize aims to encourage education and research by playing a pioneering role in developing regional relations between science and technology institutions working in the OIC member countries. OIC is the second largest intergovernmental organization after the United Nations, with 57 member countries. The fields and categories covered by the Prize are: (a) life and medical science; (b) information and communication technology; (c) nano science and technology, and (d) top scientific achievement in other fields. The laureates in each section will be awarded US\$ 500,000 as well as a special medal and certificate<sup>1</sup>.

Iran recently announced the recipients of the inaugural Mustafa Prize in the field of nano-biotechnology – Jackie Yi-Ru Ying from Singapore and Omar Mwannes Yaghi from Jordan. Ying was born in Taipei in 1966. She first moved to Singapore with her family in 1973 and then to New York at the age of 15. She obtained her Ph D in chemical engineering from Princeton University, USA in 1991, and spent one year as a Humboldt Fellow at the Institute for New Materials in Saarbrücken, Germany, working on nanocrystalline materials. She served as a professor of chemical engineering at the Massachusetts Institute of Technology (MIT), USA before returning to Singapore in 2003. She is currently the Executive Director of the Institute of Bioengineering and Nanotechnology, Singapore, and an Adjunct Professor of Chemical Engineering at MIT. Ying's research is interdisciplinary in nature, with a focus on synthesis of advanced nanostructured materials for catalytic and biomaterial applications. Her laboratory has been responsible for several novel wet-chemical and physical vapour synthesis approaches for developing nanocomposites, nanoporous materials and nanodevices with unique size-dependent characteristics. These new systems are designed for applications in fine chemicals and pharmaceuticals, the efficient

use of energy and resources, control and prevention of environmental pollution, targeted delivery of drugs, proteins and genes, and generation of biomimetic implants and tissue scaffolds<sup>2,3</sup>. For her work on nanostructured materials, Ying has been recognized with the Ross C. Purdy Award of the American Ceramic Society (1993), and the David and Lucile Packard Fellowship. She is serving on several editorial boards and advisory councils. According to Hossein Zohour, Chairman of the Scientific Committee of the Mustafa Prize, 'Amongst the many novel outcomes of her work, Prof. Ying's contribution to the development of stimuli-responsive polymeric nanoparticles that deliver insulin to diabetic patients only when their blood glucose levels are high, without the need for external blood glucose monitoring, is considered an outstanding scientific approach of great promise for improving the quality of life of mankind in the near future'.

Yaghi was born in 1965 in Jordan and moved to USA at the age of 15. Now, he is a Professor of Chemistry and Biochemistry at the University of California, Berkeley, USA. The Prize Committee stated that 'Omar Yaghi has made seminal contributions in the field of metal organic frameworks (MOFs). Potential application of MOFs include materials for gas storage, gas/vapour separation, catalysis, luminescence, and drug delivery. In the last two decades, he developed MOFs through innovative approaches to construct novel materials and explored their applications in various fields, including encapsulation of biomolecules, and capturing of gases such as carbon dioxide and hydrogen'. MOFs are extended porous structures composed of transition metal ions (or clusters) that are linked by organic bridges. They are prepared as crystalline solids by solution reactions of metal ion salts with organic linkers. MOFs represent a new class of network solids that have great potential in specific applications such as separation, storage, heterogeneous catalysis and controlled drug delivery. Extensive research has been performed on MOFs as these materials are excellent for storing hydrogen and carbon dioxide<sup>4,5</sup>. Yaghi's work was recognized by numerous

awards, including the US Department of Energy Hydrogen Program Award for outstanding contributions to hydrogen storage (2007). He also received the 2015 King Faisal International Prize (KFIP) for his contributions in the field of MOFs<sup>6</sup>.

In the inaugural round, only two of the four categories were judged to have outstanding nominations. The nominees must be citizens of one of the 57 OIC member countries, while in the last category the nominee must be a Muslim, although not necessarily a citizen of an OIC country. The Mustafa Prize Committee has emphasized that the award shall serve as a beacon to other Islamic researchers to perform high-quality, high-impact research. The Committee further stated that, 'OIC and other developing countries have to create a paradigm shift to again become a community that values knowledge and become proficient in utilizing and advancing Science & Technology to enhance their socio-economic wellbeing as well as humanity's'. The other major science prizes instituted by the Muslim world are the KFIP and the UNESCO Sultan Qaboos Prize for Environmental Preservation<sup>7</sup>. Both of them do not have any restrictions on the recipients<sup>6,7</sup>. To date, there are 17 KFIP laureates who also received Nobel Prizes (mostly after the KFIP). Some of the KFIP laureates are also recipients of other prestigious awards, including the Fields Medal and the Dirac Medal<sup>6</sup>.

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