College of Chemistry (/)

Home (/home) » Omar Yaghi awarded the inaugural VinFuture Special Prize

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VinFuture Prize Press Release *January 24, 2022*

The first Special Prize, dedicated to "Innovators with Outstanding Achievements in Emerging Fields", is awarded to Professor Omar Yaghi (USA) for his work on discovering metal-organic frameworks. — Photo courtsey VinFuture Prize

The first VinFuture Special Prize for Innovators with Outstanding Achievements for Emerging Fields was awarded to Professor Omar M. Yaghi for the discovery of metal-organic frameworks (MOFs).

Professor Yaghi has been awarded this prize for scientific advancement with his pioneering work on the discovery and development of metal-organic framework and covalent organic framework materials which have the potential to improve the everyday lives of millions of people.

In 1995, Prof. Yaghi reported the successful preparation and crystallization of the first strongly-bonded porous framework, which has become an extensive class of porous materials named metal–organic frameworks (MOFs). His strong bond approach, where metal ions are joined by

charged organic linkers exemplified by carboxylates, followed by proof of the MOF permanent porosity in 1998 and discovery of their ultrahigh porosity in 1999, set off a worldwide chain reaction leading to the development of the field reticular chemistry and properties. In 2005 he extended his approach to design and crystallization of the first 2D covalent organic frameworks (COFs) and in 2007 3D COFs. MOF and COF chemistry is now being practiced worldwide.

Prof. Yaghi's invention of MOFs and COFs is helping to achieve cleaner air, cleaner energy, and cleaner water. Prof. Yaghi's MOF water harvester has the demonstrated potential of providing clean water anywhere at any time of the year and ultimately give people water independence. His pioneering work on carbon dioxide capture and hydrogen storage with MOFs and COFs opened the door for achieving "net zero emissions" in the future.

These nanoporous structures can be used for the capture, storage, separation, and controlled chemistry of a wide range of gases and molecules. They have a wide range of potential applications in support of the transition to zero net carbon, purification, catalysis, and sensing.

The event, held on January 20th, was attended by Prime Minister Pham Minh Chinh, Vingroup President Pham Nhat Vuong, world scientists and other high-ranking officials.

Speaking at the opening ceremony, the Prime Minister emphasized the importance of science for development. "In the development history of mankind, scientists have changed the world", the PM said.

"Today we honor the winning works, honor sciences contribution to mankind and honour scientists who spend their lives on research with exceptional minds, passion and great service. In Vietnam, sci-tech development is a priority, a breakthrough strategy to develop economy and society," PM Chinh said.

"The VinFuture Prize 2021 recognizes truly outstanding scientific work that has made, and will make, a positive impact on the lives of millions, or even billions, of people around the world. The winners have brought new solutions for some of the most significant challenges that humanity is facing, such as infectious diseases and meeting the urgent need for zero-carbon energy," Professor Sir Richard Friend, VinFuture Prize Council Chair, said at the event.

For its first award round, the organizing board received over 1,200 entries from 654 leading universities, 51 well-known research institutes and 42 national science academies globally. Among the 599 innovations in the competition, about 100 are made by the top 2 per cent of the most-cited scientists in the world. Female scientists in the event accounted for 34.3 per cent of the total, many of them winners of Nobel, Breakthrough, Tang and Japan prizes.

The competition drew participants from 60 countries globally; 52.6 per cent of the projects are from North America and the European Union. Vietnam also joined with 17 projects. The result far exceeded expectations for a brand new prize like VinFuture.

About Professor Omar Yaghi

Omar M. Yaghi (http://yaghi.berkeley.edu/) received his B.S. from State University of New York at Albany (1985) and Ph.D. in Inorganic Chemistry from University of Illinois at Urbana-Champaign (1990). He was an NSF Postdoctoral Fellow at Harvard University (1990-92).

He started his independent career as an assistant professor in 1992 at Arizona State University, moved to University of Michigan at Ann Arbor as Robert W. Parry Professor of Chemistry in 1999, and then UCLA in 2006 as Christopher S. Foote Professor of Chemistry and Irving and Jean Stone Chair Professor in Physical Sciences.

Since 2012 he has been the James and Neeltje Tretter Chair Professor of Chemistry at University of California, Berkeley. He is the Founding Director of the Berkeley Global Science Institute, and the Co-Director of the Kavli Energy NanoSciences Institute, and the California Research Alliance by BASF.

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The VinFuture Prize rewards breakthrough scientific research and technological innovations with humanitarian outcomes

- The VinFuture Prize is aligned with one or more of the UN's Sustainable Development Goals (SDGs) and is grounded in recognising proven, real-life impact
- Winners demonstrated breakthrough innovations in science and technology focused on driving meaningful and scalable change through improvements in health, prosperity, productivity, equity, and sustainability
- Recipients were selected from nearly 600 nominations across 60 countries

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Hanoi, January 20, 2022 – The inaugural VinFuture Award Ceremony honors inventors of core mRNA vaccine technology; metal-organic frameworks (MOFs); flexible semiconductors with the sensing properties of human skin; and tenofovir gel for the prevention of HIV. These projects are exceptional scientific accomplishments that will positively impact the lives of billions of people on Earth in the present and future.

Honouring exceptional minds whose research and technological innovations will improve quality of life and ensure sustainable living for future generations, The VinFuture Prize was launched on International Solidarity Day 2020 and is uniquely aligned with one or more of the UN Sustainable Development Goals (SDGs).

The award programme is part of the VinFuture Foundation, an independent, not-for-profit set up by Mr. Phạm Nhật Vượng, the first Vietnamese billionaire and Founder and Chairman of the largest Vietnamese conglomerate, Vingroup Corporate, together with his wife, Mrs. Phạm Thu Hương, to create meaningful change in the everyday lives of millions by recognising and rewarding transformative innovation in sci-tech.

Attracting almost 600 nominations across 60 countries in its inaugural year, the Prize represents the best in science and technological breakthroughs in these fields. Of these nominations, nearly 100 came from the world’s top 2% most-cited scientists, many of whom are themselves laureates of distinguished awards, such as the Nobel Prize, Breakthrough Prize and Tang Prize, among others.

The Grand Prize, valued at US$3 million, is awarded to three scientists: Katalin Kariko (USA), Drew Weissman (USA) and Pieter Cullis (Canada) for their work on mRNA technology, which paved the way for effective COVID-19 vaccines. In their research, they were able to modify mRNA and encapsulate it in lipid nanoparticles, preventing the immune s ystem from reacting to foreign mRNA entering the body and avoiding cytokine induction, toxicity, and off-target effects. Based on Kariko and Weissman’s discovery, and Cullis’s development of lipid nanoparticles, pharmaceutical companies like Pfizer-BioNTech and Moderna were able to produce effective COVID-19 vaccines in record time.

Professor Katalin Kariko (third from right), Professor Pieter Cullis and Professor Drew Weissman (first and second from left) win VinFuture Grand Prize

Besides serving as a global line of defense against the increasing infections and deaths caused by the pandemic, mRNA technology also has the potential to generate vaccines against HIV, cancer, autoimmune diseases and genetic diseases, potentially saving the lives of billions of people in the future.

In addition to the Grand Prize, three Special Prizes, each valued at US$500,000, have been dedicated specifically for female innovators and to recognize innovations in emerging fields and in developing countries.

The first Special Prize, dedicated to "Innovators with Outstanding Achievements in Emerging Fields", is awarded to Professor Omar Yaghi (USA) for his work on discovering metal-organic frameworks (MOFs). MOFs are a new class of materials formed as networks of charged molecules linked to metal ions, with permanent porosity with high surface area and impressive stability. With tuneable pore sizes that enable the absorption and storage of gas and water molecules, MOFs provide solutions for the capture, storage, separation, and chemical manipulation of different types of gases and particles, and have the potential to create a cleaner environment and cleaner air, energy, and water sources.

Professor Omar Yaghi win the VinFuture Special Prize for Innovators with Outstanding Achievements in Emerging Fields

In particular, Professor Yaghi's MOF water harvester has been proven to have the potential to generate clean water at any time, in any place. If successfully implemented, MOFs can improve the lives of millions of people in regions that lack access to clean water, helping increase water independence and increase quality of life.

The second Special Prize, dedicated to "Female Innovators", is awarded to Professor Zhenan Bao (USA) for her work on developing flexible electronics with the sensing properties of human skin. The electronics are made from a type of flexible molecular semiconductor material that has self-healing and biodegradable properties, allowing electronics to be integrated seamlessly into the human body. They have great potential in medical diagnosis and smart healthcare and can also be applied to wearable and implantable electronic devices, enhancing the quality of life of millions of people with disability and sparking future medical breakthroughs.

Professor Zhenan Bao win the VinFuture Special Prize for Female Innovators

The Special Prize, for "Innovators from Developing Countries", is awarded to Professors Salim Abdool Karim and Professor Quarraisha Abdool Karim from South Africa for their research on effective HIV prevention. With extensive experience in the field of epidemiology, the two scientists developed a tenofovir-based gel that prevents sexual transmission of HIV, laying the foundation for the pre-exposure prophylaxis (PrEP) method of preventing HIV. Salim Abdool Karim and Quarraisha Abdool Karim also created an oral medicine to create an HIV prevention strategy across the world, including for women and infants.

The Karims' research was recognized by UNAIDS and WHO as a pivotal scientific breakthrough, with significant impact on the prevention of an epidemic in the African continent and the world.

Professors Salim Abdool Karim and Professor Quarraisha Abdool Karim win the VinFuture Special Prize for Innovators from Developing Countries

Speaking about the results of the inaugural season of the VinFuture Prize, **Professor Sir Richard Friend, VinFuture Prize Council Chair**, stated: *“The VinFuture Prize 2021 recognizes truly outstanding scientific work that has made and will make, a positive impact on the lives of millions, or even billions, of people around the world. The winners have brought new solutions for some of the most significant challenges that humanity is facing, such as infectious diseases and meeting the urgent need for zero carbon energy. The VinFuture Prize celebrates the power of science and technology to solve global problems.”*

Members of the VinFuture Prize Council and the Pre-screening Committee attending the Award Ceremony

On behalf of the Prize Laureates, **Professor Katalin Kariko** shared: *"It is an incredible honor to learn that the Prize council selected me, together with my fellow scientists Drew Weissman and Pieter Cullis, to receive the inaugural VinFuture Grand Prize. We, as scientists, work at the bench in the laboratory, performing experiments day-after-day and hope that one day – maybe in our lifetime – we can witness that the advancements we made will be beneficial for the common good. We are all relieved and thrilled that our scientific discoveries laid the foundation for the development of the mRNA vaccines. It is also important to note that the vaccines were developed based on a century of scientific and technological progress and recent discoveries by hundreds of thousands of scientists, doctors, engineers and experts who advanced the knowledge of their respected fields, and the combination of that work led to the creation of these very effective and safe mRNA vaccines. We hope that our scientific adventure will also inspire the next generation of researchers and doctors, and that their contributions will advance our scientific knowledge on a higher level leading to the treatment of patients with unmet medical needs."*

The first VinFuture Award Ceremony was broadcasted live on major communication channels across the world, with the appearance of Mr. Pham Minh Chinh, Prime Minister of Vietnam, leaders of domestic ministries and agencies, global ambassadors, industry leaders, and in particular, eminent international scientists.

Vietnamese Prime Minister Pham Minh Chinh delivered *his remarks at the Inaugural VinFuture Award Ceremony*

The Award Ceremony signals the end of the first season of the VinFuture Prize, with results far exceeding the expectations of the Prize Council in terms of both quantity, quality, and practical application potential of the nominations. The early success of the Prize lays the foundation for broadening the Prize's impact in coming years, recognising scientists who seek and deliver solutions to humanity's problems, contributing to creating a better life for everyone, and building a sustainable environment for future generations.

Officially starting the second season of the VinFuture Prize

The second cycle of the VinFuture Prize has now started, immediately following the conclusion of the inaugural VinFuture Award Ceremony. The VinFuture Foundation will open the nomination portal from February 15 running until June 3, 2022.

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