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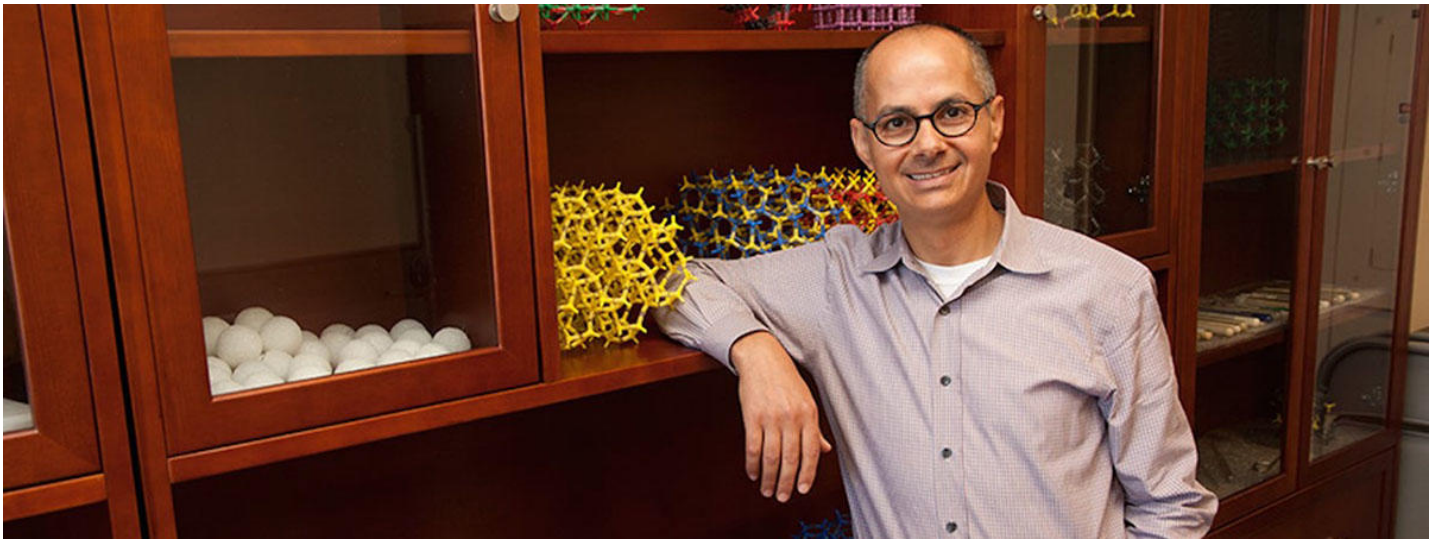

The Wolf Prize in Chemistry (http://www.wolffund.org.il/index.php?dir=site&page=news&id=3064) has been awarded to The James and Neeltje Tretter Professor of Chemistry Omar M. Yaghi (https://chemistry.berkeley.edu/faculty/chem/yaghi), University of California, Berkeley, for "pioneering reticular chemistry via metal-organic frameworks (MOFs) and covalent organic frameworks (COFs)." Professor Yaghi shares this year's prize with Professor Makoto Fujita from the University of Tokyo who was cited for his work in metal-directed assembly of large molecules.

"I am deeply honored to be selected for this prestigious international prize. Being informed on my birthday made it a doubly special occasion. I am grateful to the Wolf Prize selection committee members and the international jurors, as well as the confidence of those who nominated me, my colleagues here at Berkeley for their continued support and collegiality, my fellow reticular chemists around the world, and all those who have helped me over the years, most especially my former and current research group members," stated Professor Yaghi.

"We are extremely proud of Omar, who joins a very esteemed group of previous Wolf Prize winners from the College of Chemistry. His pioneering work with MOFs is a rare example of a breakthrough that has truly launched a new field at the interface of chemistry and materials science," remarked Douglas S. Clark, Dean, and G.N. Lewis Professor.

The 2018 Wolf Prize laureates were announced on Monday, February 12, 2018, at a special event hosted by the President of Israel, Mr. Reuven Rivlin, at his residence in Jerusalem.

Rivlin commented, "The day the winners of the Wolf Prize are announced is a day of celebration, not only for the award winners, but for scientists, researchers, artists, creators, culture lovers, the State of Israel and the entire world." He added, "Israel is proud to encourage science and development, art and creativity, and from here, from Jerusalem, the capital of Israel, we are excited to congratulate the winners."

Announcing the awards on behalf of the Wolf Foundation, Nobel laureate Professor Dan Shechtman commented, "The prize winners' exceptional achievements are the fruits of a never-ending journey. A courageous journey. A journey whereby one who travels, also navigates. Endless curiosity and a lack of fear of norms and prejudice inspire and drive this journey."

Awarded each year since 1978 by the Wolf Foundation in the fields of agriculture, chemistry, mathematics, medicine, physics, and rotating disciplines in the arts, recipients are considered outstanding in their fields. Laureates receive their awards from the President of the State of Israel, at a special ceremony held in the parliamentary Knesset building in Jerusalem.

Yaghi earned his PhD at the University of Illinois-Urbana in 1990. He is currently the James and Neeltje Tretter Chair Professor of Chemistry at UC Berkeley, and a Senior Faculty Scientist at Lawrence Berkeley National Laboratory. He is the Founding Director of the Berkeley Global Science Institute. He is also the Co-Director of the Kavli Energy NanoScience Institute, and the California Research Alliance by BASF.

His work encompasses the synthesis, structure and properties of inorganic and organic compounds and the design and construction of new crystalline materials. He is widely known for inventing several extensive classes of new materials termed metal-organic frameworks (MOFs), covalent organic frameworks (COFs), and zeolitic imidazolate frameworks (ZIFs). These materials have the highest surface areas known to date, making them useful in clean energy storage and generation. Specifically, applications of his materials are found in the storage and separation of hydrogen, methane, and carbon dioxide, and in clean water production and delivery, supercapacitor devices, proton and electron conductive systems.

MOFs,COFs, and ZIFs can be thought of as crystalline sponges on a molecular scale: highly porous materials whose pores or cells, of pre-programmable size, form an organized structure. These frameworks unite many of the properties most prized by chemists, among them a considerable capacity to adsorb other compounds, which lodge within their pores, and exceptional versatility and selectivity, with the size of the pore tailored to the target or "guest" compound. In this sense, they operate like purpose-built "molecular sieves." As Yaghi explains it, "If one gram of a MOF material was unfolded into a single atomic-scale sheet, it would extend across the equivalent of sixty tennis courts."

MOFs are composed of metal-oxide anchors linked by organic struts to form extended frameworks. COFs are purely organic crystalline porous structures, which extend organic chemistry beyond molecules (0D) and polymers (1D) to infinite layered (2D) and network (3D) forms. They are composed of light elements linked by covalent bonds and represent the least dense materials known to date. COFs are being studied for their applications in 2D electronics and catalysis, while ZIFs are the metal-organic analogues of well-known zeolite minerals and represent a long sought after class of materials.

Yaghi's research into MOFs, COFs, and ZIFs is the seed that has produced a new chemistry now sweeping the world, with hundreds of laboratories pursuing fresh applications for these porous materials. The new Wolf laureate has to date, he says, counted "more than 70,000" varieties of developed crystalline materials based on reticular chemistry, which he defines as stitching molecules together by strong bonds into open frameworks.

Yaghi will join other laureates, including singer/song writer, and former Beatles member, Sir Paul McCartney, at an induction ceremony later this spring in Israel.

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Web Date: February 19, 2018

Makoto Fujita and Omar Yaghi win Wolf Prize in Chemistry

Israel-based foundation honors research on metal-organic frameworks and porous polymers

*By **Linda Wang***

Makoto Fujita
Credit: Courtesy of Makoto Fujita

For their pioneering work on metal-organic frameworks and porous polymers, **Makoto Fujita <http://fujitalab.t.u-tokyo.ac.jp/about_e/>** of the University of Tokyo and **Omar Yaghi <http://yaghi.berkeley.edu/>** of the University of California, Berkeley, have been awarded the 2018 Wolf Prize in Chemistry. The $100,000 prize is awarded annually by the Israel-based **Wolf Foundation <http://www.wolffund.org.il/index.php?language=eng>** for outstanding work in the fields of agriculture, chemistry, mathematics, medicine, physics, and rotating disciplines in the arts.

Omar Yaghi
Credit: Courtesy of Omar Yaghi

Fujita, a professor of applied chemistry at the University of Tokyo, is being honored for his work on metal-directed self-assembly, which has yielded large, highly porous complexes used in applications such as structure determination in X-ray crystallography.

“Winning this prize is a great appreciation not only for me but also for all my former and current coworkers,” Fujita says. “It was wonderful that the committee stated the reason for my winning as ‘conceiving metal-directed assembly principle,’ which means I am one of the pioneers in this very exciting new field. For the future, we envision that our self-assembly chemistry will overlap more with biology.”

Yaghi, James and Neeltje Tretter Chair Professor of Chemistry at the University of California, Berkeley, is being honored for his work on metal-organic frameworks (MOFs) and covalent organic frameworks (COFs), and pioneering the field of reticular chemistry, which is the chemistry of linking molecular building blocks by strong bonds to make crystalline open frameworks. Applications of his research include the development of materials for clean energy storage and generation.

“I am thrilled and honored to be selected by the Wolf Foundation and for its support and understanding of the transformational nature of basic science and its unlimited impact on human progress, and most especially on the freedom of the human spirit,” Yaghi says. “I value and appreciate my wonderful colleagues here and abroad who have supported me, and my research group members both former and present for their patience and commitment.”

“Reticular chemistry will continue to grow beyond MOFs and COFs to include the science of building chemical structures where by virtue of the spatial arrangement of their components can function in a pre-coded fashion,” Yaghi adds. “Such a concept will lead to sequence-dependent materials, highly selective reactions, and atomically-defined chemical environments for dynamics to occur within robust frameworks.”

Yaghi and Fujita, along with seven other Wolf laureates in the sciences and arts, will receive their awards from the President of Israel during a ceremony later in the spring.

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The 2018 Wolf Prize laureates have been announced

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Date: 12/02/2018

The laureates of the 2018 Wolf Prize were announced today (Monday, 12 February 2018), at a special event hosted for the first time by the President of Israel, Mr. Reuven Rivlin, at his residence in Jerusalem

The Wolf Prize for Agriculture will be granted to **Prof. Gene Robinson** from University of Illinois, Urbana-Champagne, for leading the genomics revolution in organismal and population biology of the honeybee

The Wolf Prize for Music will be shared by two laureates: **Sir Paul McCartney,** for his seminal contribution to music in the modern era; and to **Adam Fischer**, an inspirational conductor and eloquent defender of human rights

The Wolf Prize for Chemistry will be shared by two laureates: **Prof. Omar Yaghi**, University of California, Berkeley, for pioneering reticular chemistry via metal-organic frameworks and covalent organic framework; and **Prof. Makoto Fujita** from University of Tokyo, for conceiving metal-directed assembly principles leading to large highly porous complexes

The Wolf Prize for Physics will be shared by two laureates: **Dr. Charles H. Bennett** from IBM Research Center, Yorktown Heights, NY, USA, and **Prof. Gilles Brassard** from University of Montréal, Canada, for founding and advancing the fields of Quantum Cryptography and Quantum Teleportation

The Wolf Prize for Mathematics will be shared by two laureates: **Prof. Alexander Beilinson** and **Prof. Vladimir Drinfeld**, both from the University of Chicago, for their groundbreaking work in algebraic geometry, representation theory, and mathematical physics

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of Israel, Mr. Reuven Rivlin, at his residence in Jerusalem

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