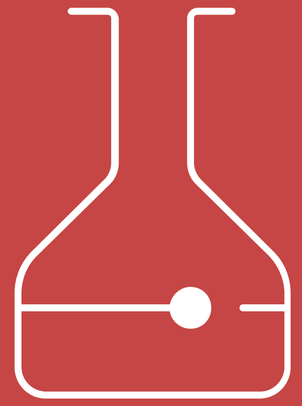
THE NOBEL PRIZE

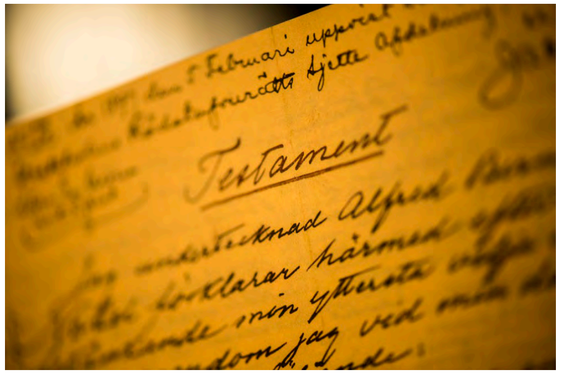
CHEMISTRY PRIZE 2025

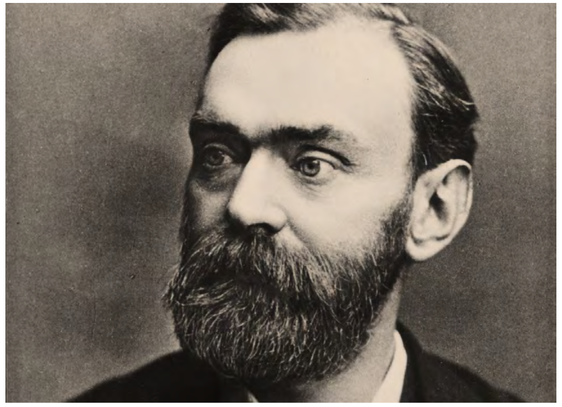


Nobel Prize lessons

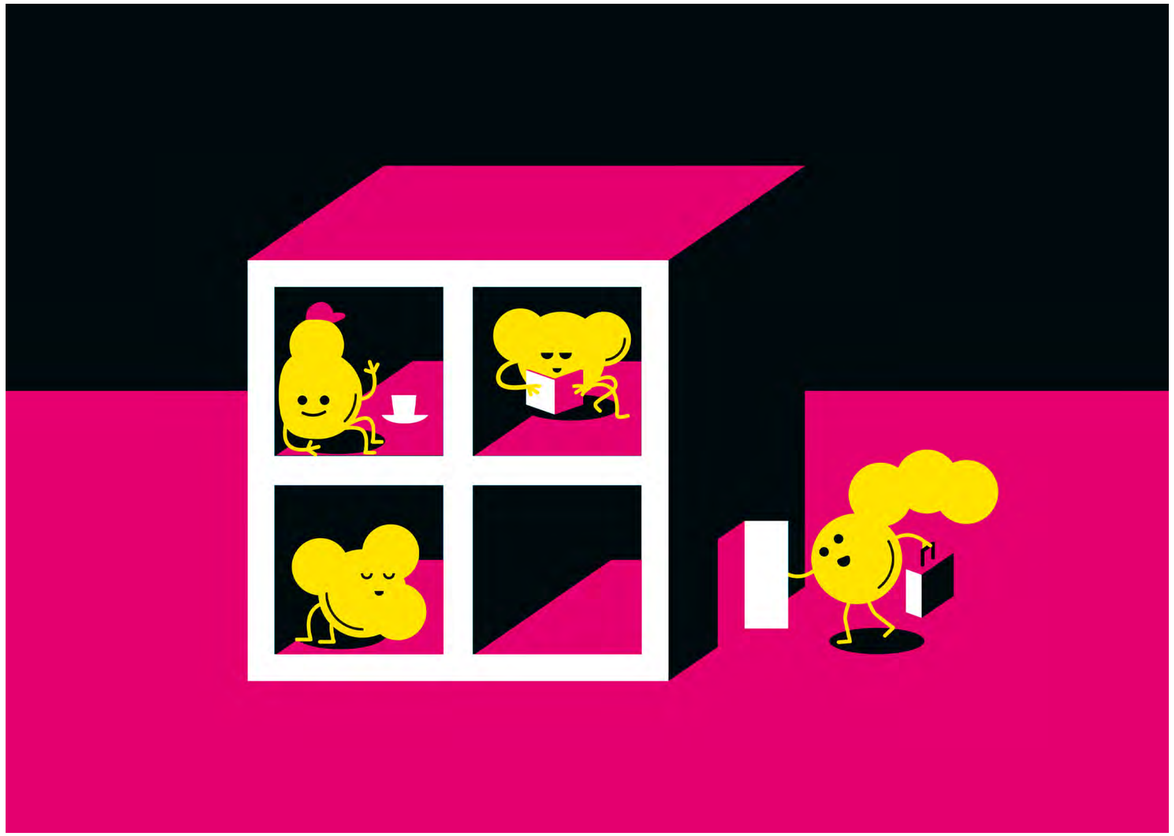
The Nobel Prize in Chemistry

"to the person who made the most important chemical discovery or improvement"
Alfred Nobel (1833–1896)





The 2025 chemistry prize
MOFs – molecular structures

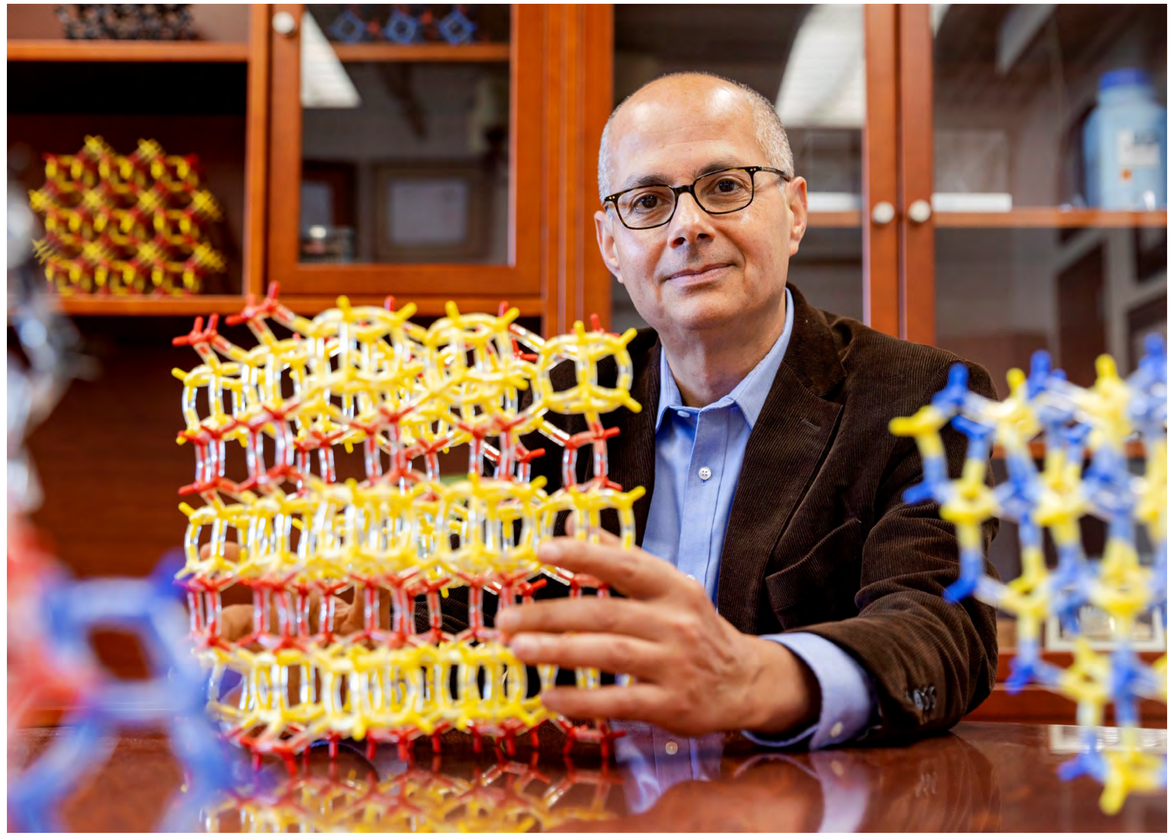


The chemistry laureates have created molecular structures called metal-organic frameworks. Molecules are able to move in and out of these structures.

What is an organic molecule?
What is metal?

Metal ions + organic molecules → MOF

- A metal is an element with a metallic sheen that also conducts electrical currents.
- Organic molecules are found in all living things. They are chemical compounds that contain carbon.



HOTO BRITTANY HOSEA-SMALL, UC BERKELEY

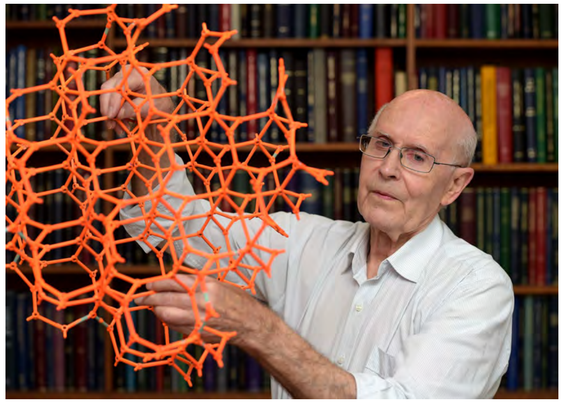


PHOTO: UNIVERSITY OF MELBOURNE

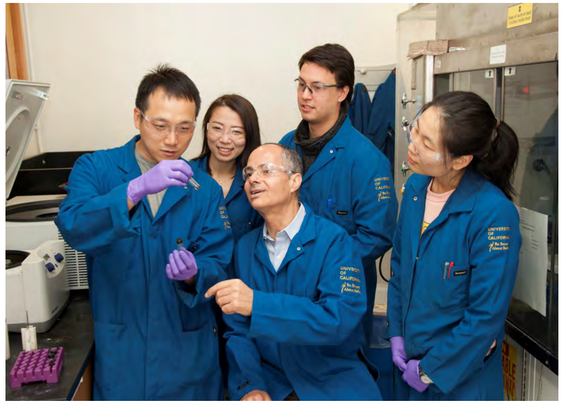
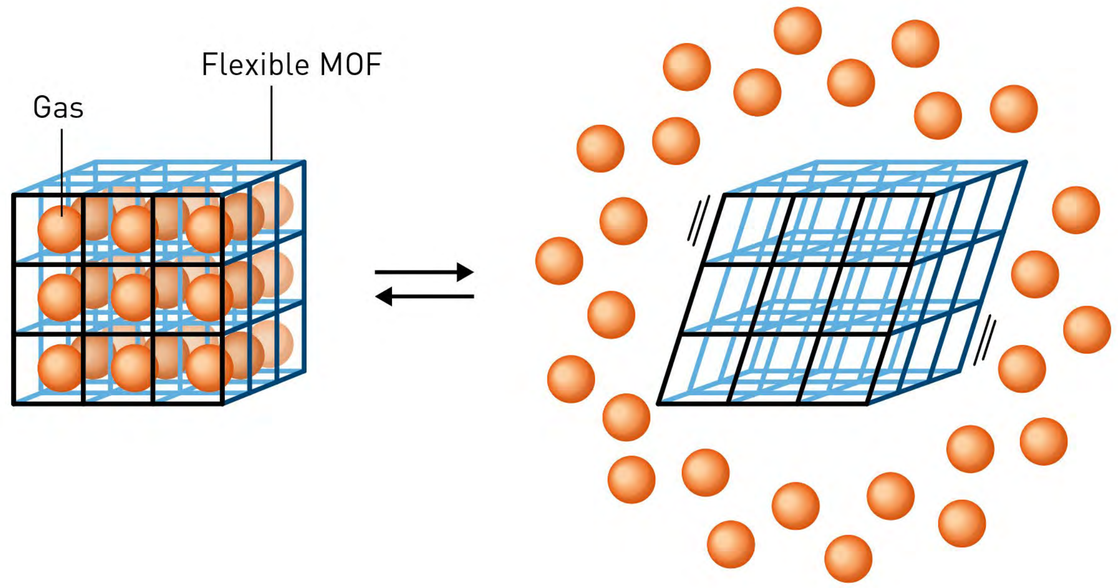


PHOTO: BRITTANY HOSEA-SMALL, UC BERKELEY

From idea to stable structures



The first molecular structures were unstable. Over time, however, stable MOFs were developed that are able to capture and release gases.

MOFs that hide huge surfaces in their cavities

Yet another new type of MOF was developed. It is no larger than a sugar cube, but the surface in the material's cavity is as big as a football pitch.

PHOTO: SHUTTERSTOCK

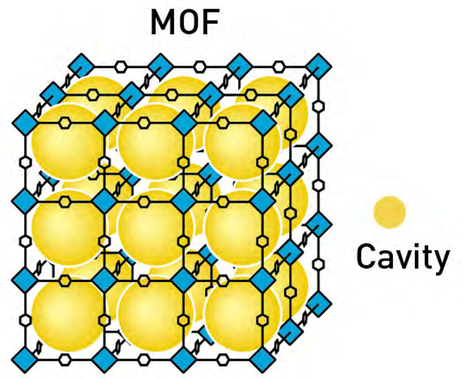


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PHOTO: SHUTTERSTOCK

The 2025 Nobel Prize laureates in chemistry

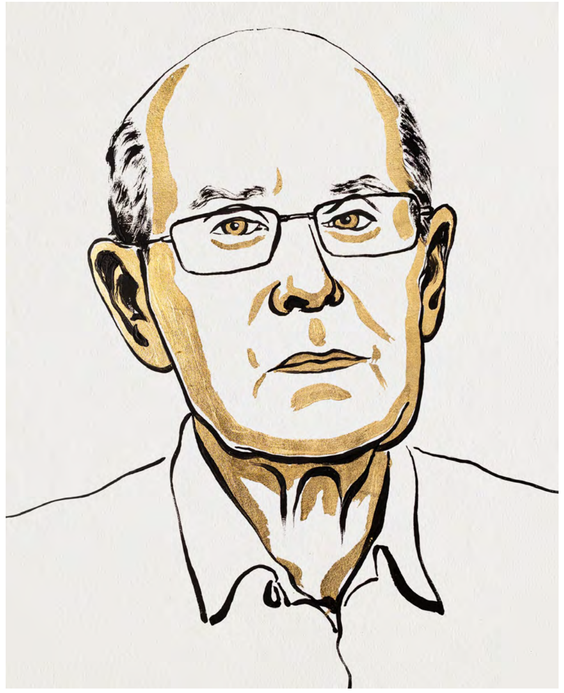
"for the development of metal–organic frameworks"

Omar Yaghi talks about his background with a mother who could neither read nor write:

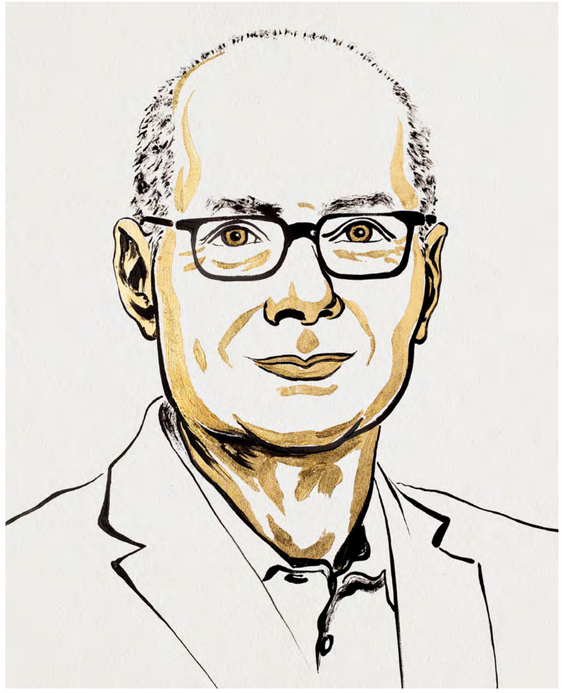
"It's quite a journey. Science allows you to do it. Science is the greatest equalising force in the world. Smart people, talented people, skilled people exist everywhere. That's why we really should focus on unleashing their potential through providing them with opportunity."

Omar Yaghi

Susumu Kitagawa
Born: 1951, Japan



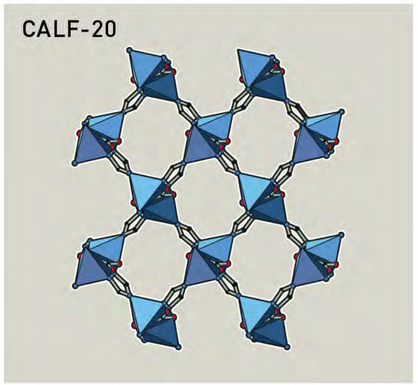
Richard Robson
Born: 1937, United Kingdom



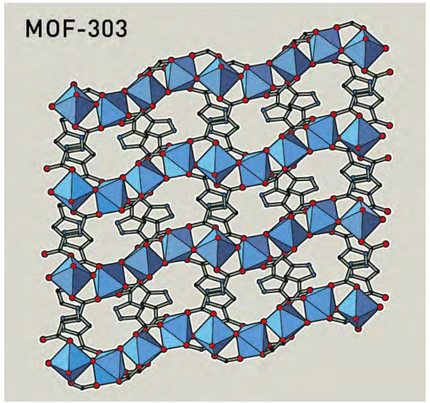
Omar Yaghi
Born: 1965, Jordan

For the greatest benefit to humankind

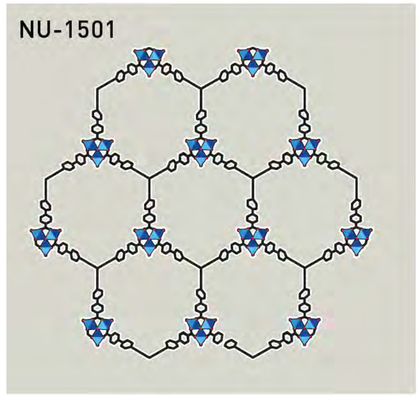
MOFs allow us to create materials with new features.



CALF-20 is very good at capturing carbon dioxide.



MOF-303 can capture water vapor from the desert air at night. When the sun heats up the material in the morning, potable water is released.



NU-1501 can store and release hydrogen at normal pressure.

THE
NOBEL
PRIZE

FOR THE GREATEST BENEFIT TO HUMANKIND

Nobel Prize lessons