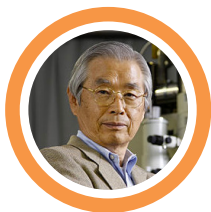


# CHEMISTRY ADVENT 2018

22

1990



**SUMIO IIJIMA**

● 1939-PRESENT



In 1991, Iijima published a paper announcing the discovery of carbon nanotubes, an allotrope of carbon with a thickness of a few nanometres.



In the 1970s, developed an electron microscope and used it to produce the first images of individual metal atoms in metal oxide crystals



Carbon nanotubes have applications in batteries, composite materials and more

1992



**FRANCES ARNOLD**

🇺🇸 1956-PRESENT



Pioneered directed evolution of enzymes, by creating random changes in an enzyme's DNA and then selecting the most effective variant



Custom enzymes produced by directed evolution can be used in the production of biofuels and medicines



Arnold shared the 2018 Nobel Prize in Chemistry, becoming the first American woman to win the chemistry prize

1996



**JACQUELINE BARTON**

🇺🇸 1952-PRESENT



Provided the first evidence for electron transport in DNA



Suggested that DNA can conduct electricity like a molecular wire, and that DNA repair proteins use this to identify DNA damage so it can be repaired



Barton's work may lead to new ways to diagnose and treat diseases where DNA damage is involved

1998

