

WORLD
world

Battery pioneers win Nobel Chemistry Prize

Through their work, this year's Chemistry Laureates have laid the foundation of a wireless, fossil fuel-free society



CHEMISTRY
2019 Development of lithium-ion batteries

John Goodenough (US)
Stanley Whittingham (Britain)
Akira Yoshino (Japan)

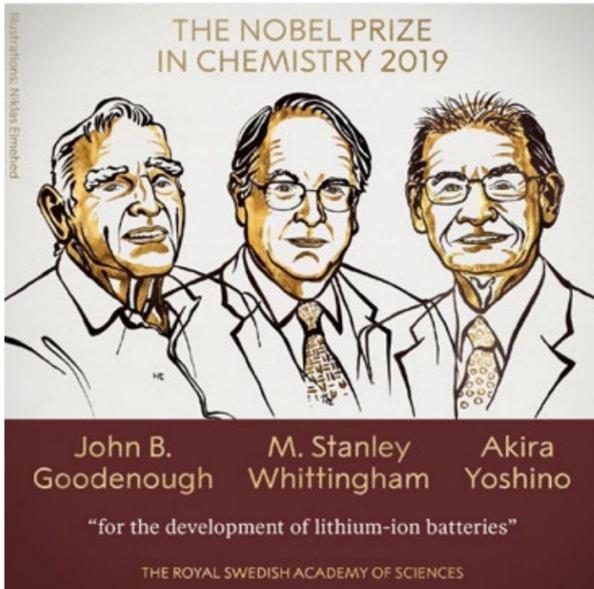
2018 Evolution of enzymes and antibodies
F. H. Arnold (US)
G. P. Smith (US)
G. P. Winter (Britain)

2017 Cryo-electron microscopy
J. Dubochet (Switzerland)
J. Frank (US)
R. Henderson (Britain)

2016 Molecular machines
J.-P. Sauvage (France)
F. Stoddart (Britain)
B. Feringa (Netherlands)

2015 DNA repair
T. Lindahl (Sweden)
P. Modrich (US)
A. Sancar (Turkey-US)

2014 High resolution fluorescence microscopy
E. Betzig (US)
W. Moerner (US)
S. Hell (Germany)



-- Britain's Stanley Whittingham, and Japan's Akira Yoshino will share the nine million Swedish kronor (about \$914,000 or 833,000 euros) prize equally, the Royal Swedish Academy of Sciences said.

"This lightweight, rechargeable and powerful battery is now used in everything from mobile phones to laptops and electric vehicles... (and) can also store significant amounts of energy from solar and wind power, making possible a fossil fuel-free society," the jury said.

"Lithium batteries have revolutionised our lives since they first entered the market in 1991," and were "of the greatest benefit to humankind".

Seeking an alternative source

of power during the oil crisis of the 1970s, Whittingham discovered a way to harness the potential energy in lithium, a metal so light it floats on water.

He constructed a battery partly made of lithium that utilised the element's natural tendency to shed electrons, thereby transferring energy.

However the battery was too

unstable to be used.

Goodenough built on Whittingham's prototype, substituting a different metal compound and doubling the potential energy of the battery to four volts.

This paved the way for far more powerful and durable batteries in the future.

In 1985, Yoshino instead used a carbon-based material that stores lithium ions, finally rendering the battery commercially viable.

The culmination of the trio's research resulted in the most powerful, lightweight and rechargeable battery ever seen.

Good scientists 'stay persistent'

"This is such a wonderful thing, and I am very surprised," Yoshino told reporters in Tokyo after winning the prize.

He said he had only gotten a cell phone in recent years.

"I have long felt a bit of rejection towards mobile phones, so I have never had one until recently.

"I know the lithium ion battery really benefited mobile phones", he said, adding he did "not really" feel that he had helped make a product that benefited his life.

For Yoshino, a good scientist

needed two qualities.

"One thing is that you have to have a flexible brain. Flexibility. The other is tenacity. You stay persistent and never give up."

Whittingham, 77, said he was "overcome with gratitude at receiving this award".

His research "has helped advance how we store and use energy at a foundational level, and it is my hope that this recognition will help to shine a much-needed light on the (US) nation's energy future," he said on the website of Binghamton University in New York where he is a professor.

Yoshino, 71, works at the Asahi Kasei Corporation in Tokyo and is a professor at Meijo University in Nagoya, Japan, while Goodenough holds the Cockrell Chair in Engineering at the University of Texas at Austin.

The trio will receive the prize from King Carl XVI Gustaf at a formal ceremony in Stockholm on December 10, the anniversary of the 1896 death of scientist Alfred Nobel who created the prizes in his last will and testament.

Last year, the honour went to US scientists Frances Arnold and George Smith and British researcher Gregory Winter for developing enzymes used for

greener and safer chemistry and antibody drugs with fewer side effects.

Arnold was just the fifth woman to clinch chemistry's most prestigious honour since Marie Curie in 1911.

This year's Nobel season kicked off on Monday with the Medicine Prize, followed by the Physics Prize on Tuesday.

Peace Prize on Friday

The Literature Prize will follow on Thursday, with two laureates to be crowned after a sexual harassment scandal forced the Swedish Academy to postpone the 2018 award, for the first time in 70 years.

Names creating a buzz ahead of this year's literature prize include Canadian poet Anne Carson, Kenyan writer Ngugi Wa Thiong'o, Romanian poet and novelist Mircea Cartarescu and Polish writer and activist Olga Tokarczuk.

On Friday the action moves to Norway where the Peace Prize is awarded, with bookies predicting a win for Swedish teen climate activist Greta Thunberg.

The Economics Prize will wrap up the Nobel prize season on Monday, October 14.

Stockholm

Three researchers won the Nobel Chemistry Prize on Wednesday for the development of lithium-ion batteries, paving the way for smartphones and a fossil fuel-free society.

John Goodenough of the United States -- at 97 the oldest person to be awarded a Nobel prize



In the early 1970s, Stanley Whittingham, awarded this year's Chemistry Prize, used lithium's enormous drive to release its outer electron when he developed the first functional lithium battery.



Akira Yoshino succeeded in eliminating pure lithium from the battery, instead basing it wholly on lithium ions, which are safer than pure lithium. This made the battery workable in practice.



2019 Chemistry Laureate John Goodenough doubled the lithium battery's potential, creating the right conditions for a vastly more powerful and useful battery.



US curbs China officials' visas

AFP | Washington

The United States said Tuesday it would curb visas for Chinese officials until Beijing ends its "repression" of Uighurs and other Muslims in the western region of Xinjiang, a day after imposing commercial restrictions.

The one-two punch by President Donald Trump's administration marks the most forceful attempt by a foreign power to address what some rights groups call a historic crisis in Xinjiang, and comes amid a range of feuds between the United States and China.

"China has forcibly detained over one million Muslims in a brutal, systematic campaign to erase religion and culture in Xinjiang," Secretary of State Mike Pompeo wrote on Twitter.

"China must end its draconian surveillance and repression, release all those arbitrarily detained and cease its coercion of Chinese Muslims abroad," he said. In an accompanying statement, Pompeo said that the State Department would restrict visas granted to government and ruling Communist Party

China retaliates

Reuters | Singapore

China is planning tighter visa restrictions for US nationals with ties to anti-China groups, people with knowledge of the proposed curbs said.

China's Ministry of Public Security has for months been working on rules to limit the ability of anyone employed, or sponsored, by US intelligence services and human rights groups to travel to China.

The proposed changes follow the introduction by the United States of tighter rules for visas for Chinese scholars in May.



Xinjiang Communist Party chief Chen Quanguo

officials involved in "detention or abuse" of Uighurs, Kazakhs or members of other predominantly Muslim ethnic groups in Xinjiang.



Donald Trump, the US President and Xi Jinping, Chinese President (file)

The Chinese rules would mandate the drafting of a list of US military and CIA-linked institutions and rights groups, and the addition of their employees to a visa blacklist, according to the sources, who declined to be identified.

"The plan has been widely discussed by senior police officers over recent months, but made more likely to be implemented after the Hong Kong protests and the US visa ban on Chinese officials," the source said.

who would be affected.

Beijing voiced its "strong dissatisfaction and resolute opposition" over the move and denied any human rights abuses in the restive region. "These accusations are nothing more than an excuse for the United States to deliberately interfere in China's internal affairs," foreign ministry spokesman Geng Shuang said in Beijing.



US Secretary of State Mike Pompeo

The order will also affect their family members, including children who may be seeking to study in the United States.

The State Department did not specify the names of officials

Modi to host Xi at summit

Agencies | New Delhi

Prime Minister Narendra Modi will welcome Chinese President Xi Jinping at an informal summit this week, the Indian foreign ministry said yesterday.

The meeting in Chennai on Oct. 11-12 is aimed at enhancing the rapport the leaders built when they met in the Chinese city of Wuhan last year to help stabilise ties after a standoff in another contested section of their long border, far removed from Kashmir.

"The forthcoming Chennai Informal Summit will provide an opportunity for the two leaders to continue their discussions on overarching issues of bilateral, regional and global importance and to exchange views on deepening India-China Closer Development Partnership," the Indian ministry said in a statement.

Srikanth Kondapalli, professor of Chinese studies at New Delhi's Jawaharlal Nehru University, said it was important for the nuclear-armed neighbours to stabilise relations as both dealt with domestic and regional issues.

"The second informal meet-



Prime Minister Narendra Modi will welcome Chinese President Xi Jinping (file)

ing as such is significant given these ominous signals at bilateral, regional and global levels," he said.

Xi will also make a state visit to Nepal at the end of his India visit, the first by a Chinese president in 22 years, the Nepali foreign ministry said.

During Xi's visit, Modi is expected to raise economic issues, including India's \$53 billion trade deficit with China in 2018/19, and the smaller presence of Indian companies in China compared with that of other major economies.

China is expected to urge India to take an independent decision on telecom equipment maker Huawei's bid for India's proposed 3G network and not be swayed by US pressure.