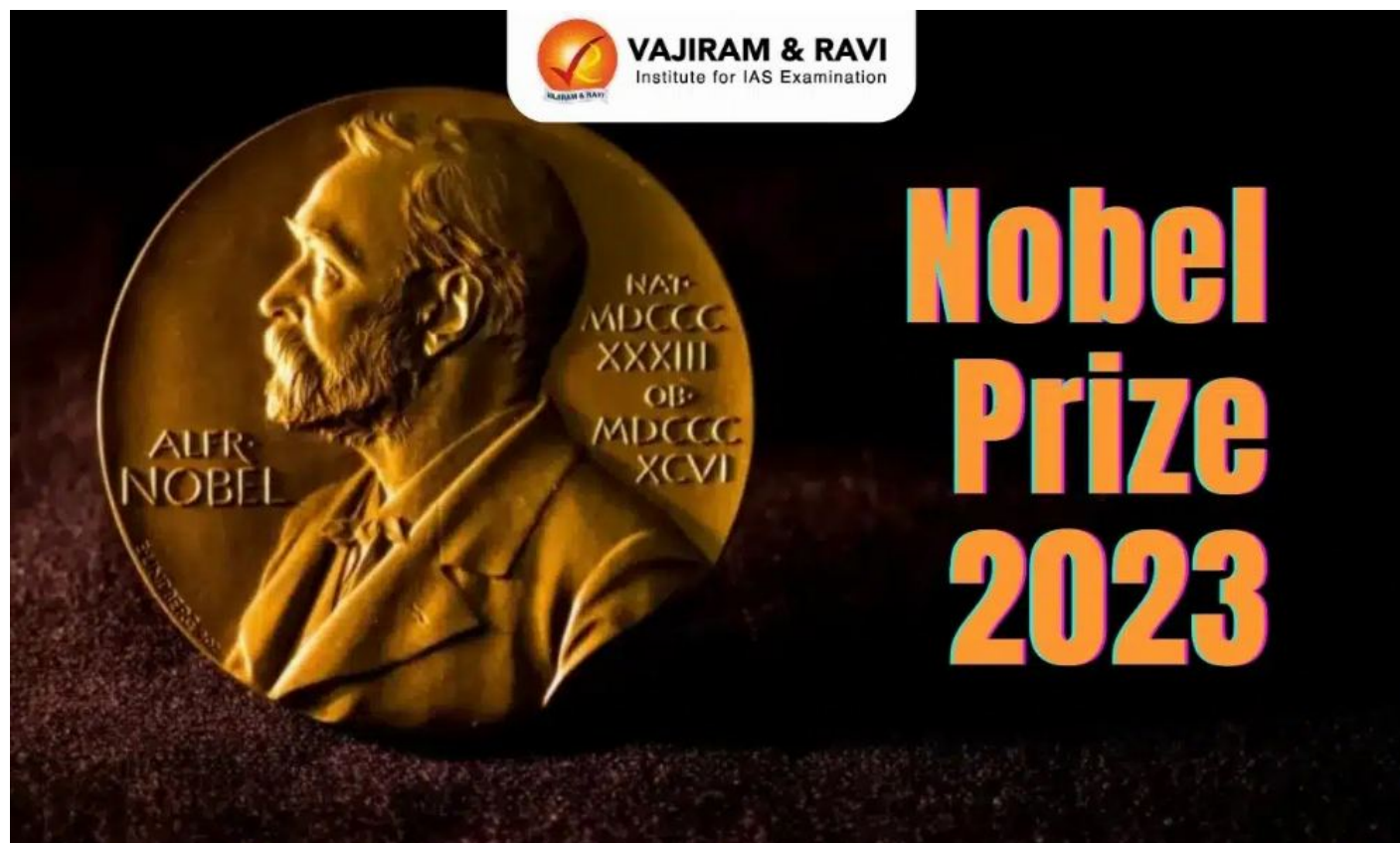


Nobel Prize 2023 Winners List, Categories, Names, Fields

July 10, 2026 • vajiramandravi.com



The Nobel Prizes 2023 have recently been announced. The Swedish Academy has given the prize for literature, the Karolinska Institute for physiology or medicine, and the Royal Swedish Academy of Sciences has given the prizes for physics, chemistry, and economics. The Nobel Peace Prize has been given out by the Oslo-based Norwegian Nobel Committee. The prize money for the awards comes from a will made by Alfred Nobel, a Swedish scientist who founded the award.

Nobel Prize 2023 Winners List

These prestigious Nobel prizes are given out annually to honour individuals and organisations who have excelled in the disciplines, including **physics, chemistry, medicine, literature, peace, and economics**. This year these six awards have been given to **eleven** deserving personalities.

Field	Nobel Prize Winners	Awarded For
Physiology/Medicine	Katalin Kariko and Drew Weissman	mRNA Vaccines

Physics	Pierre Agostini, Ferenc Krausz and Anne L'Huillier	Electron dynamics in matter
Chemistry	Moungi Bawendi, Louis Brus and Alexei Ekimov	Discovery and synthesis of quantum dots
Literature	Jon Fosse	For his innovative plays and prose which give voice to the unsayable".
Peace	Narges Mohammadi	Fight against women's oppression in Iran
Economic Sciences	Claudia Goldin	Gender Gap in labour market

Nobel Prize in Physiology or Medicine 2023

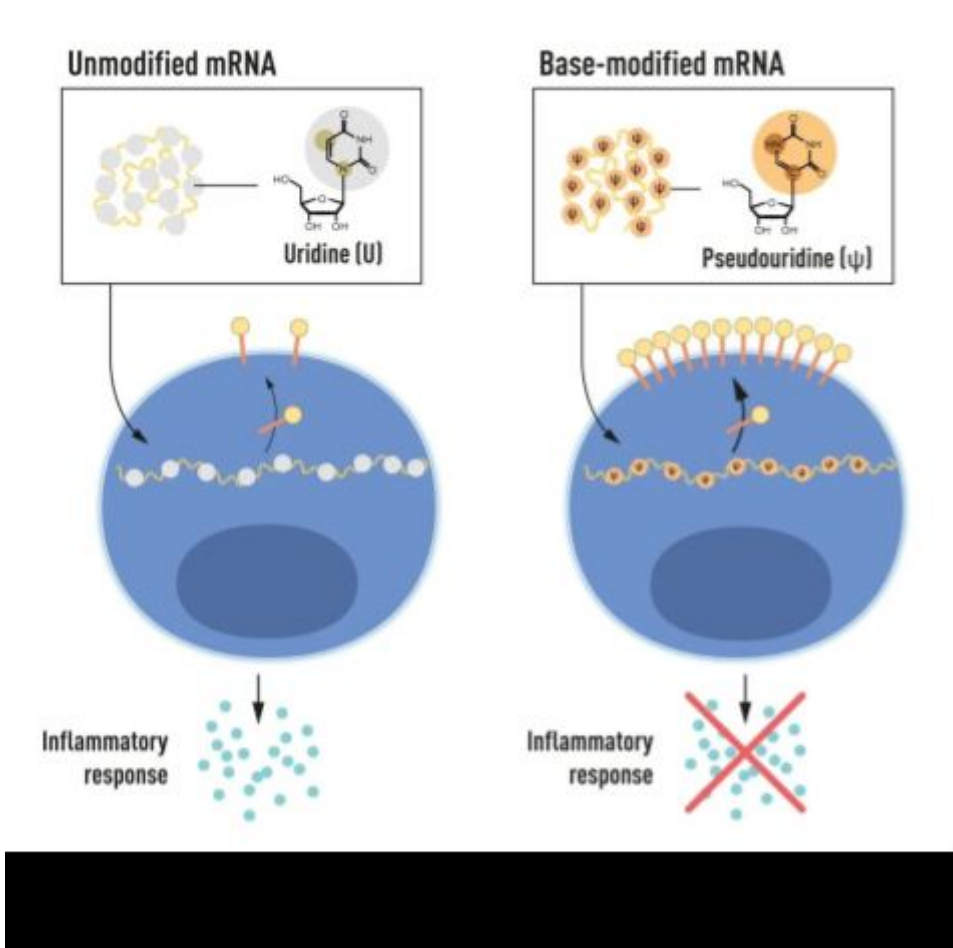
Katalin Kariko (left) and **Drew Weissman (right)** have shared the Nobel Prize in Physiology or Medicine, 2023 for their "discoveries regarding nucleoside base modification that enabled the development of effective mRNA vaccines against COVID-19."



The Nobel Laureates

- **Katalin Kariko (Hungary):** University of Pennsylvania, USA
- **Drew Weissman (USA):** University of Pennsylvania, USA

Research

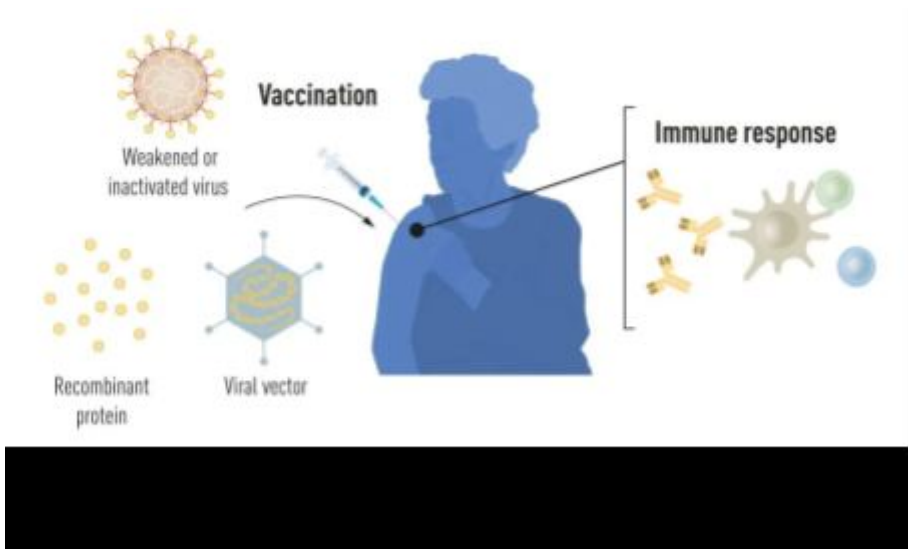


- At the University of Pennsylvania, both Weissman and Kariko studied mRNA modification. The investigation into this began in the late 1990s, and a significant discovery was published in 2005.
- Karikó and Weissman worked on the effect of the **base modification** of mRNA on cytokine response by dendritic cells. They proved that the eukaryotic mRNA (abundant base modifications) did not stimulate any immune response while in vitro-transcribed and prokaryotic mRNA did. This is the basis of the m-RNA vaccine development.
- The Karolinska Institute, the organisation that gave the award, claims that this research made it possible for Pfizer and Moderna to develop COVID-19 vaccines, one of the greatest threats to human health in modern times.

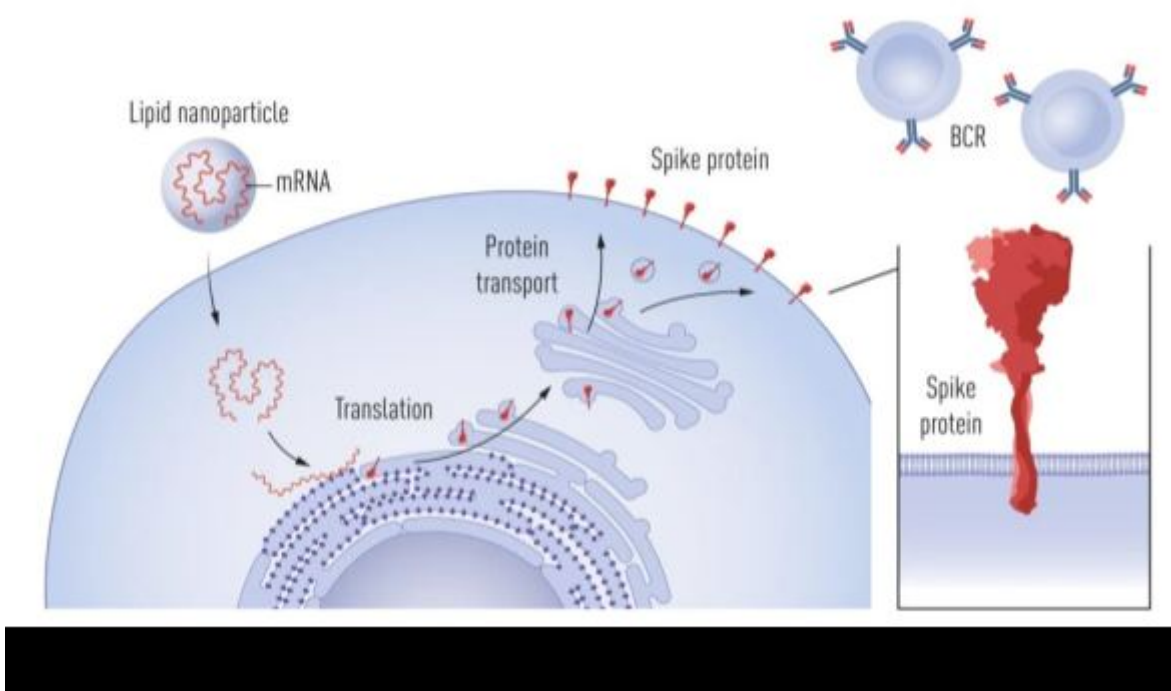
mRNA COVID Vaccine

Vaccines before the pandemic

- Producing protein-, vector-, or whole virus- was time consuming as they require large-scale cell culture.



Vaccines after the COVID-19 pandemic: mRNA vaccines



- The basis for these vaccines is messenger RNA, or mRNA. The messenger RNA molecules that instruct the body's cells to produce certain proteins are used in mRNA vaccines.
- In this instance, the mRNA is coded to instruct the cells to produce the **spike protein** of the SARS-CoV-2 coronavirus, which causes Covid-19 because it enables the virus to enter cells, where it then begins to replicate.
 - The immune system is subsequently expected to respond by producing antibodies to combat it.
 - These antibodies will remain in the blood and fight the real virus if and when it infects the human body.

Nobel Prize 2023 in Physics

The Nobel Prize 2023 in Physics has been jointly awarded to **Pierre Agostini (left), Ferenc Krausz (middle), and Anne L'Huillier (right)** “for experimental methods that generate attosecond pulses of light for the study of

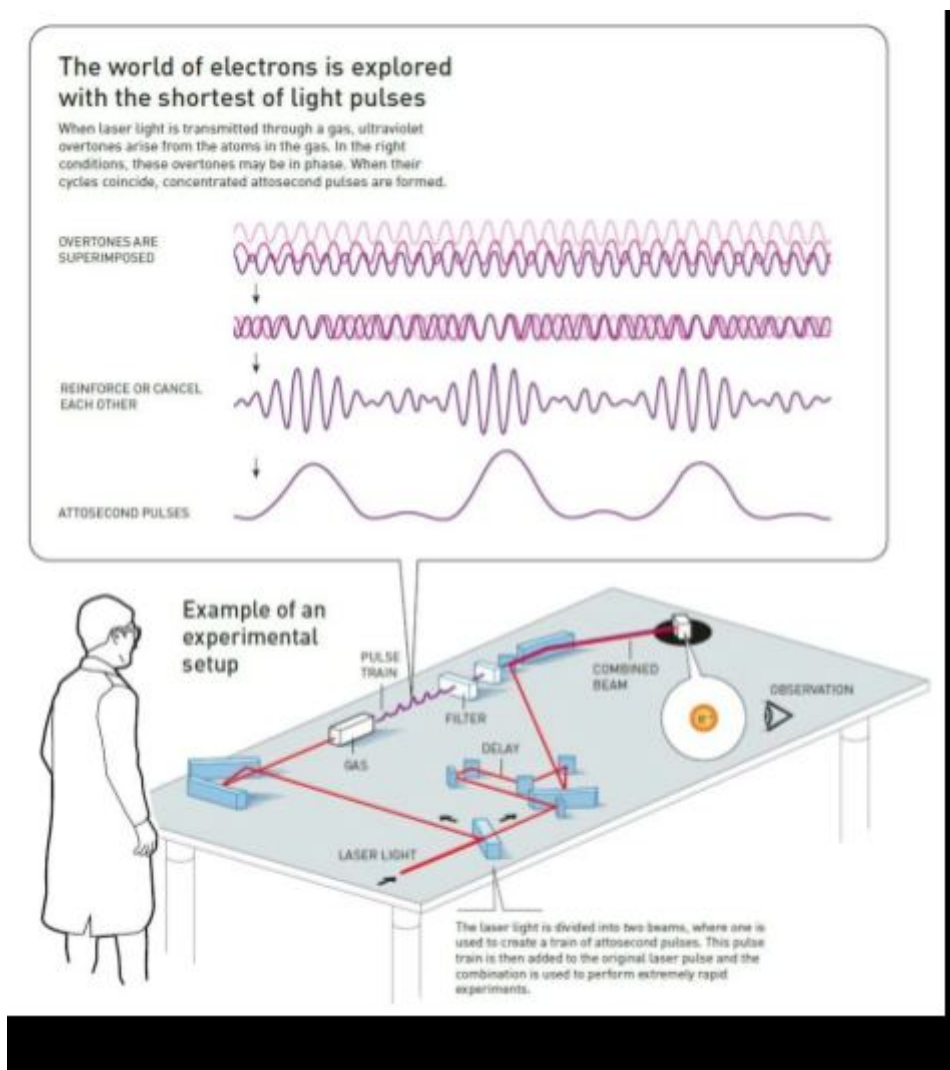
electron dynamics in matter.”



The Nobel Laureates

- **Pierre Agostini (France):** Professor, Ohio State University, USA
- **Ferenc Krausz (Hungary):** Professor, Ludwig-Maximilians-Universität, Germany
- **Anne L'Huillier (France):** Professor, Lund University, Sweden

Experimental Description



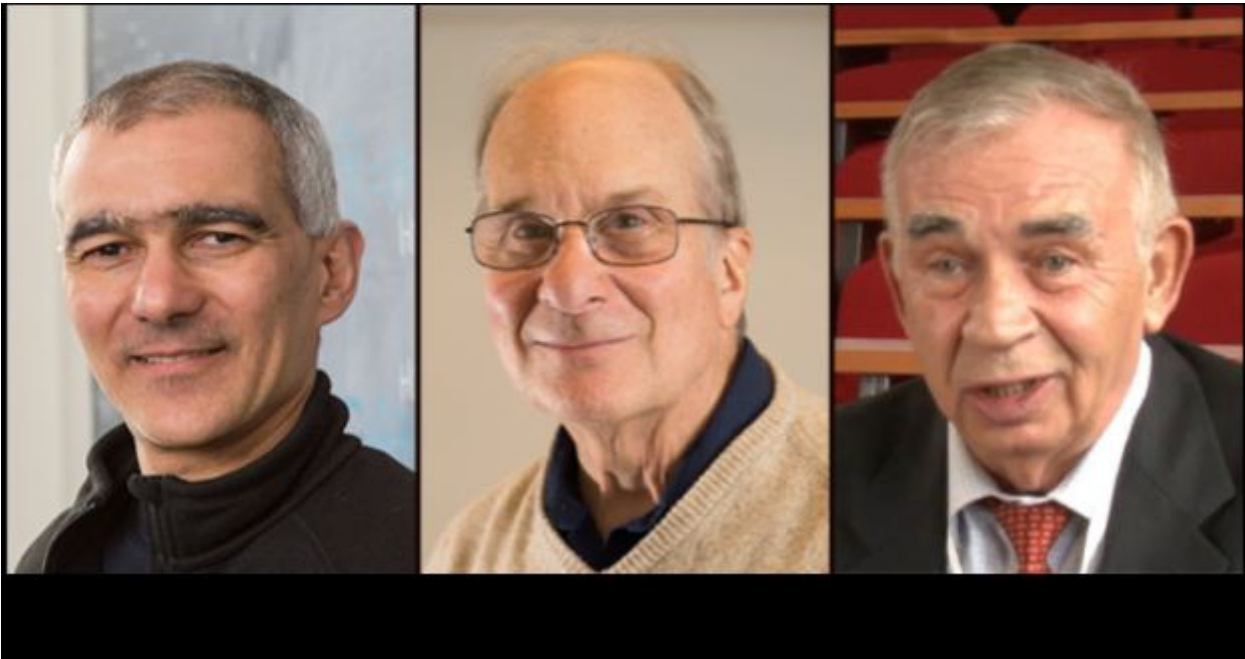
The three recipients of the 2023 Nobel Prize in Physics have provided mankind new resources for examining the world of electrons inside atoms and molecules.

- They demonstrated a way to create extremely short pulses (lasting in a few attoseconds) of light that can be used to measure the rapid processes in which electrons move or change energy.
- Images of the activities that take place inside atoms and molecules can be obtained using these brief light pulses.
- The researchers were able to study processes that were moving so quickly that it was previously impossible to keep up with them. In order to comprehend and regulate how electrons behave in a material, it is crucial to use this new technology.
- **Applications:**
 - These short pulses can be applied to test the internal processes and **events of matter**.
 - The pulses can be utilised to push molecules that can be used in medical diagnostics such as the early detection of diseases like **lung cancer**.

Nobel Prize 2023 in Chemistry

For the discovery and synthesis of quantum dots, **Moungi G. Bawendi (left)**, **Louis E. Brus (middle)**, and **Alexei I. Ekimov (right)** have been given the **Nobel Prize in Chemistry 2023**. These nanoparticles have numerous uses in

industries like electronics, cutting-edge surgery, and quantum computing.



The Nobel Laureates

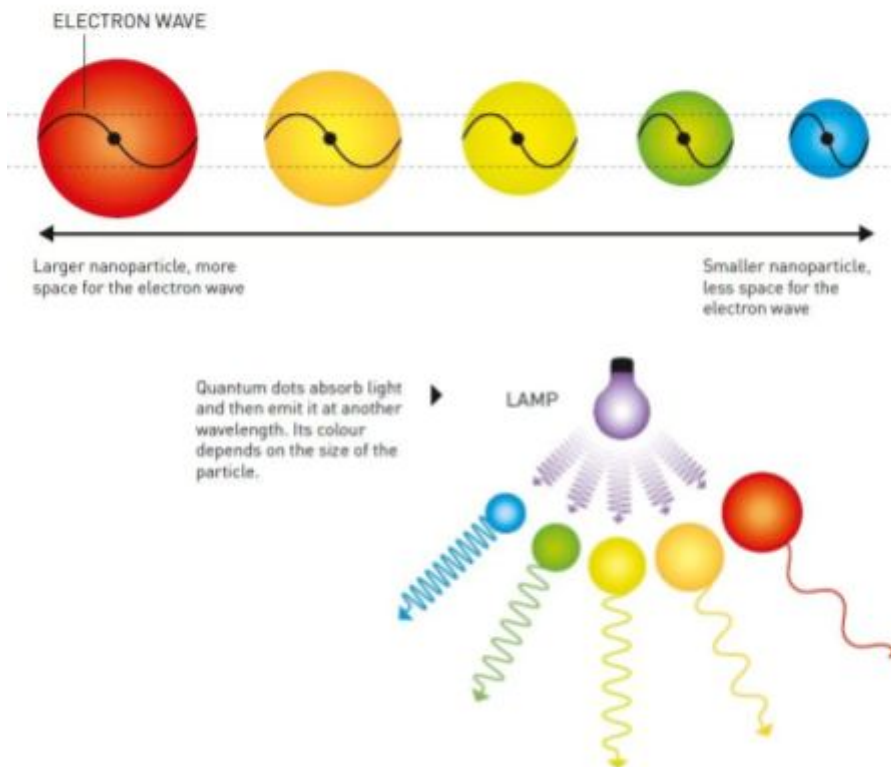
- **Mounji G. Bawendi (France):** Professor at MIT, USA.
- **Louis E. Brus (USA):** Professor at Columbia University, New York, USA.
- **Alexei I. Ekimov (Russia):** Formerly Chief Scientist in New York, USA.

Quantum Dots

- Quantum dots are **tiny particles**, in the range of a few nanometers.
- Because of their small size, they have distinctive optical characteristics. Their structure and atomic composition are the same as bulk materials, but the properties of quantum dots depend on the size.
- Altering the size of quantum dots can change their characteristics, they have different colours according to their size.
- Due to the dominance of quantum physical forces at the nanoscale, materials and particles are capable of exhibiting novel, size-dependent properties. On the other hand, gravity and classical physics' laws rule at the macroscopic scale, just as they do in our daily lives.
- Quantum dots are thus bringing the greatest benefit to humankind. Researchers believe that in the future they could contribute to **flexible electronics, tiny sensors, thinner solar cells and encrypted quantum communication** – so we have just started exploring the potential of these tiny particles.

Quantum effects arise when particles shrink

When particles are just a few nanometres in diameter, the space available to electrons shrinks. This affects the particle's optical properties.



• Modern-day applications of quantum dots:

- To **light computer monitors, television screens, LEDs**. More colours and brightness result from combining the colours.
- Biochemists can **map biological tissues** using nanoscale-sized quantum dots.
- To increase the efficiency and absorption of converting solar energy into electricity, quantum dots are also used in **photovoltaic cells**.
- Some cancer treatments use Quantum dots for targeted drug delivery and other therapeutic procedures. In the area of **nanomedicine**, this has additional uses.
- Quantum dots can be used as security markers on money and documents.
- They can be used to tag and track objects in general as **fluorescent** markers.

Nobel Prize in Literature 2023

The 2023 Nobel Prize in literature was awarded to the Norwegian author and dramatist **Jon Fosse** for his “innovative plays and prose which give voice to the unsayable.”

Jon Fosse



- Jon Fosse is an author of about 40 plays, as well as books for children, novels, short stories, poetry, and essays. About 50 different languages have versions of his writing.
- He is also recognised for his prose.

Nobel Prize in Peace 2023

The Nobel Committee has recently decided to award the Nobel Peace Prize, 2023 to **'Narges Mohammadi'** for the **fight against the discriminatory policy of the theocratic Iran's regime towards women**. The Prize also has recognised the last year demonstrations of hundreds of thousands of brave people of Iran that were against the oppression targeting women.

Narges Mohammadi and "Woman - Life - Freedom"



- Mohammadi, who has spent the last 20 years serving a number of prison terms, is best known for her fight for freedom and against the mistreatment of Iranian women.
- Narges Mohammadi is a human rights advocating Iranian woman, as well as a freedom fighter.
- Her struggle for freedom and dignity has not come without tremendous costs.
- She has been arrested 13 times, convicted five times, and sentenced for 31 years in total, as well as 154 lashes. Mohammadi is still in jail.
- The motto of the demonstrators called – “**Woman - Life - Freedom**”, was composed by Narges Mohammadi.

Nobel Prize in Economic Sciences 2023

The “Royal Swedish Academy of Sciences” has recently decided to give the Nobel Prize in Economy 2023 (Sveriges Riksbank Prize in Economic Sciences) to **Claudia Goldin**, a Harvard University labour economist and economic historian, for working on the “**women’s labour market outcomes.**”

Claudia Goldin and her Research



- Claudia Goldin provided for the first time a comprehensive account of women's earnings and their labour market participation since the centuries.
- She revealed the key drivers of the gender gap in labour market and employment.
- She presented new and surprising facts that women's choices have been limited by marriage and domestic responsibility, family, etc.
- Although she accumulated the data from the United States, her insights and model reached across the world due to the findings of similar patterns in many countries.
- She showed that the female labour participation forms a **U-shaped curve** in the entire period (of 200 years).
 - The participation of married ones has decreased with the transition from agrarian to industrial society due to the Industrial revolution in the 19th century, but increased due to the growth of the service sector in the early 20th century.
 - The gap in the labour participation has increased after the birth of the first child.

Source: <https://vajiramandravi.com/upsc-exam/nobel-prize-2023/>

© Vajiram & Ravi. For personal use only.