

The Nobel Prize 2020: A Brief Look at This Year's Winners

Duygu Bayram

They say

there is a rift in the human soul

which was not constructed to belong

entirely to life. - Louise Glück, 1943

In 1895, Alfred Nobel decided to leave his fortune of SEK 31 million (1,702 million in today's value) to pioneering scientists in the fields of Physics, Chemistry, Physiology/Medicine, Literature, and Peace. His will stated that he wanted his income to be "distributed annually in the form of prizes to those who during the preceding year have conferred the greatest benefit to mankind." In 1968, Sweden's central bank established *The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel*. The winners of the prizes were named *Laureates*, inspired by the Ancient Greek tradition of awarding a laurel wreath as a sign of honor to the winners of athletic and poetic competitions as the Greek God Apollo is depicted to wear a laurel wreath on his head. The Nobel Prize amount for 2020 was determined to be SEK 10 million per full Nobel Prize. (1)

Harvey J. Alter, Michael Houghton, and Charles M. Rice won the Nobel Prize in Physiology or Medicine this year for their discovery of the Hepatitis C virus. Until recently, we were aware of two types of infectious hepatitis, Hepatitis A and B. While Hepatitis A can be caught from water or food that may be unsafe to consume, it is generally safe and has a little long-term impact on health. On the other hand, Hepatitis B is caught through blood and bodily fluids and is a major health threat due to the way it can progress in shadows for years before it is noticed, lead to chronic illnesses such as cirrhosis and liver cancer, and is responsible for over a million deaths per year. Harvey J. Alter noticed that a significant number of transfusion-related hepatitis cases remained despite the techniques developed for preventing it over the years. Further studies showed them that an unknown agent was at play and could also infect chimpanzees. Harvey J. Alter, Michael Houghton, and Charles M. Rice continued to work on the cases and discovered the Hepatitis C virus, allowing for new tests to be made and thus reducing the number of transfusion-related infections. (2)

The Nobel Prize in Physics was awarded to three scientists this year for two discoveries. Roger Penrose demonstrated that "the general theory of relativity leads to the formation of black holes", and Reinhard Genzel and Andrea Ghez found that "an invisible and extremely heavy object governs the orbits of stars at the center of our galaxy". Currently, this object is thought to be a supermassive black hole. In 1965, Roger Penrose mathematically proved that Einstein's general theory of relativity directly leads to the formation of black holes despite not even Einstein himself believing that it was possible. Reinhard

Genzel and Andrea Ghez have studied the center of our galaxy, named Sagittarius A*. They mapped the orbits of the brightest stars closer to the center and found that something heavy and invisible was pulling them in, causing them to move at high speeds. Genzel and Ghez were awarded the prize because of their ingenious use of technology to provide the most compelling evidence for a black hole at the center of our galaxy. (3)

Emmanuelle Charpentier and Jennifer A. Doudna earned the 2020 Nobel Prize in Chemistry for their discovery of CRISPR/Cas9 genetic scissors, a genome editing method. The method will allow researchers to change the DNA of animals, plants, and microorganisms with high precision. The method has had a significant impact on life sciences and cancer research and may lead to the cure of inheritable diseases. CRISPR/Cas9 genetic scissors sped up the process of gene modification remarkably, reducing the time to a couple of weeks. About the discovery, the chair of the Nobel Committee for Chemistry said “There is enormous power in this genetic tool, which affects us all. It has not only revolutionized basic science but also resulted in innovative crops and will lead to ground-breaking new medical treatment.” (4)

The Nobel Prize in Literature went to the American poet Louise Glück “for her unmistakable poetic voice that with austere beauty makes individual existence universal.” She has won many other awards including the Pulitzer Prize, National Humanities Medal, National Book Award, National Book Critics Circle Award, and Bollingen Prize. Unfortunately, the press release on her Nobel Prize is lacking, therefore I have provided an excerpt from one of her poems as an intro to honor her achievement. Her work is often acknowledged for its emotional depth as well as mythological and natural references to support themes of isolation and sadness. (5) (6)

The Nobel Peace Prize was awarded to the World Food Programme (WFP) this year for their extensive efforts to fight hunger and the use of hunger as weapons, as well as their contributions to peace in regions riddled with conflict. In 2015, the UN established eradicating hunger as one of the Sustainable Development Goals and WFP has been the UN’s main organization to meet this goal. In 2019, WFP helped approximately 100 million people in 88 countries in efforts to decrease hunger. Unfortunately, in the same year, the highest number of people suffering from acute hunger was reached due to war. 2020’s coronavirus has made the situation worse, and WFP increased its efforts in an impressive manner to keep combatting hunger. WFP acknowledges the close relationship between hunger and war and was a participant in the UN Security Council’s unanimous adoption of Resolution 2417 in 2018. It is implied that the choice to award the prize to WFP this year was an attempt to draw more attention to these issues. (7)

Paul Milgrom and Robert Wilson were chosen for this year’s Prize in Economic Sciences for their work on auctions. They designed new auction formats to sell products that are not easily sold with traditional methods. People always sell things at the highest possible value and buy them for the cheapest possible value. Auctions are difficult to analyze for this reason and for the reason that the buyers tend to also consider the behaviors of other potential buyers rather than just themselves. Robert Wilson established “the common value” for objects sold at auctions, a value that is unclear at first but is the same for

everyone at the end. Wilson also showed why people bid below their estimates of the common value because they are afraid of paying too much or losing out. Paul Milgrom added to this theory by introducing private values, which differ from bidder to bidder. He found that when bidders know each other's estimated values, the seller will receive higher revenue. Their findings were used widely. (8)

To summarize, the Nobel Prize went to many impactful works this year. For the Physiology or Medicine category, the discovery of Hepatitis C was honored. For Physics, research on black holes continues to produce the most influential findings. The Chemistry category awarded a revolutionary method of genome editing, leading to many more impactful studies due to the advantages it provided. Humanities were not forgotten, the Literature Prize was given to Louise Glück for her wonderful poems. WFP's efforts to reduce hunger and hunger-caused conflict were honored and rewarded to spread awareness. Last but not least, the Economic Sciences Prize was given to two scientists who studied auctions and designed formats that were used all around the world.