



KNOWBEL

ENLIGHTENING THE NOBLES!



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WELCOME !

To the 12th issue of KNOWBEL.

Here comes the latest edition of your favourite magazine, KNOWBEL. Dive into the world of fascinating articles, inspiring personalities, mind-blowing quizzes, adorable comics and a lot more. All it takes is the flip of a page.

We firmly believe that everyone must have access to information and hence, strive to include the choicest of material for you to dwell upon. Besides, we provide a wonderful platform for you to showcase your amazing talent. You can send us your creative work at knowbel.science@gmail.com.

Moreover, don't forget to participate in the quizzes and contests we host because who knows, you may be the next star to win some exciting prizes and a feature in our next issue. Do share this with your friends and family. A candle loses nothing by lighting up another one.
Happy reading!

Stay home & Stay safe !

SPECIAL THANKS TO

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&

HAPPY NEW YEAR!

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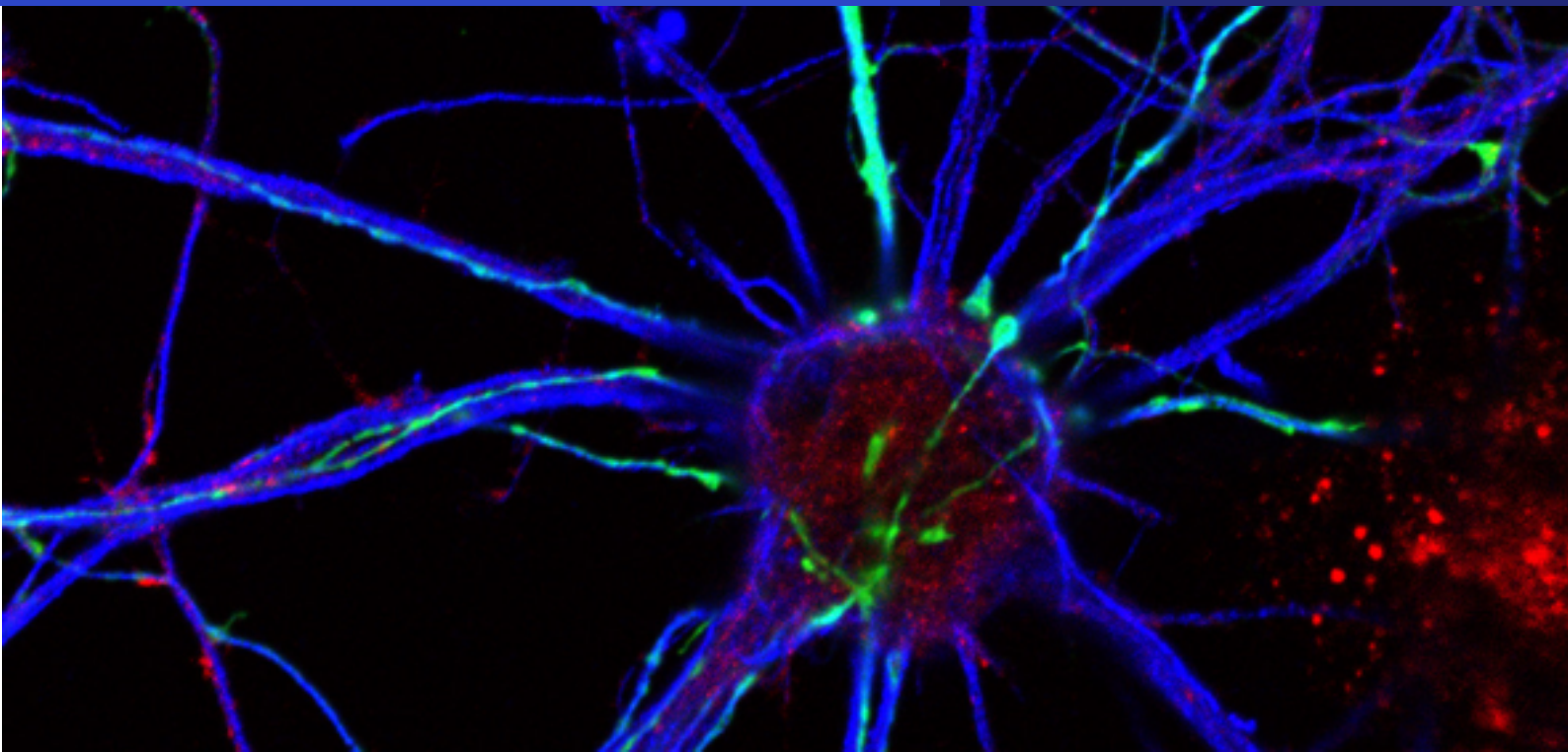
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Inspiron

WONDERELLA



Never Stop Questioning !



Bigscience1999, CC BY-SA 4.0, via Wikimedia Commons

01 - THE MOST REMEMBERED BRAIN IN NEUROSCIENCE THAT COULDN'T REMEMBER

This is the story of one of the most famous patients of all time that helped mankind understanding about memories, learning and motivation. In 1953, a neurosurgeon named William Scoville cut out two slivers from a patient's brain.

This patient named Henry Molaison (famously known as HM) was an epileptic patient, and this surgery was the only option suggested to save him from the seizures.

Interestingly, the surgery helped the patient's epilepsy, but left him unable to form any new memories!

Initially, it was thought to be an effect of surgery in which a significant region of his hippocampus (limbic system) was removed. However, two years later, when Brenda Milner (BM) examined him, she found that his brain had undergone permanent damage as a result of which he had lost the ability to form new memories. He could recollect the things for at most 15 minutes without any distractions. Surprisingly he could not even remember about having had lunch a little while ago and would often keep solving the same puzzle, again and again, a hundred times!

The most astonishing part was his up-gradation in IQ quotient. It was believed that the patient's IQ had improved after the operation! Another surprising fact was that his motor skills such as drawing would improve with time in spite of the fact that he would feel it as if he were doing it for the first that.

Such a miraculous life story has been a motivation for movies like Memento and Ghajini and has also helped us understand the role of hypothalamus.

RIVETING READS IN THIS ISSUE:

02 - NOBEL PRIZE IN PHYSICS

03 - NANOSENSORS

04 - CORONA - HITS AND MISSES

02 - NOBEL PRIZE IN PHYSICS

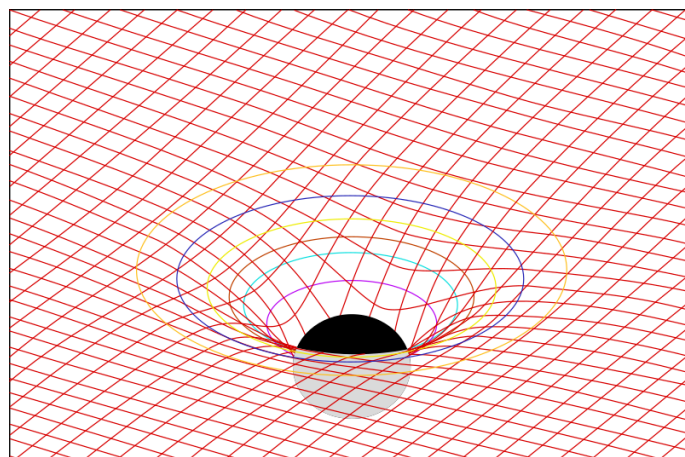
“Cooper: Well, this little manoeuvre’s gonna cost us 51 years! Brand: You don’t sound so bad for a man pushing 120!” This famous dialogue from the film *Interstellar* (2014) is talking about time dilation, one of the outcomes of Einstein’s theory of relativity as the characters of the story attempt to navigate into Gargantua, a supermassive black hole. Black holes are exotic objects in the universe that have strongly pulled and “spaghettified” minds of numerous Earthlings.

Einstein’s general theory of relativity stated that our universe is a four-dimensional fabric of space-time. He dismissed the idea that gravity was a force (as described by Newton), and instead said it was the consequence of the curvature arising from the presence of matter and energy in the space-time fabric. This led to the theory of an object that, if heavy enough, could infinitely curve the fabric of the universe, such that nothing, not even light, can escape falling into it once it is close enough. This object is nothing but the black hole. This year’s Nobel prize has been awarded to three scientists who have researched on black holes.

Sir Roger Penrose is a mathematician by training and was brought into astrophysics by Prof Dennis Sciama. After being fascinated by the concept of black holes, he published many papers related to black holes and cosmology. In his paper “Gravitational Collapse and Space-Time Singularities”, he proved that if a massive dying star implodes beyond a certain point, nothing can stop it from collapsing into a black hole.

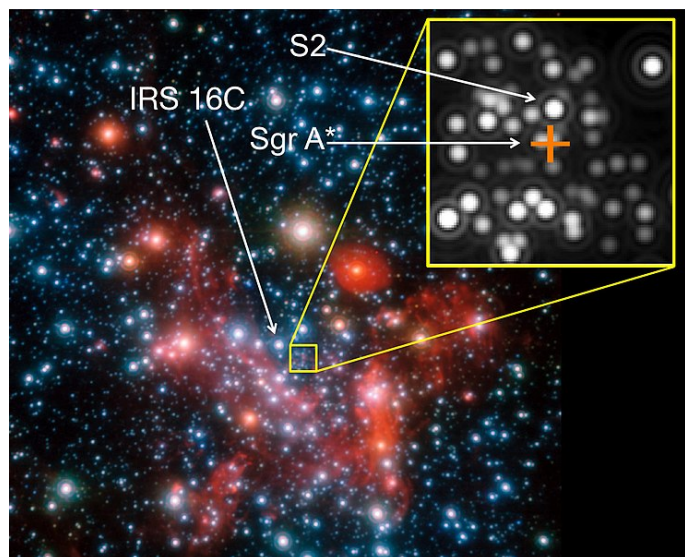
Infinities in Einstein’s equations have been found since Karl Schwarzschild solved them. The Schwarzschild radius, also known as the event horizon, was described to be the point of no return. As more work on singularity progressed, scientists described the physics of gravitational collapse using a symmetrical collapsing body. Penrose wanted to analyse the equations without assuming this symmetry. To explain this, he came up with the concept of the “trapped surface”. A spherical body will become a trapped surface when its radius reaches its Schwarzschild radius. Here, the time and space switch roles and flow of time will inevitably take you to the centre of the formed black hole when the time ends. Okay! That’s mindboggling!

The takeaway is that, once this trapped surface has formed, nothing can stop the body from collapsing into a black hole. Trapped surfaces do not require extreme densities to form. So black holes are not only possible but also probable to exist in the real, physical universe. Black holes were no more mathematical fantasies.



Maschen (this SVG file), CCO, via Wikimedia Commons

SPACE TIME CURVATURE



ESO/MPE/S. Gillessen et al., CC BY 4.0, via Wikimedia Commons

GALACTIC CENTRE

02 - NOBEL PRIZE IN PHYSICS (CONTINUED)

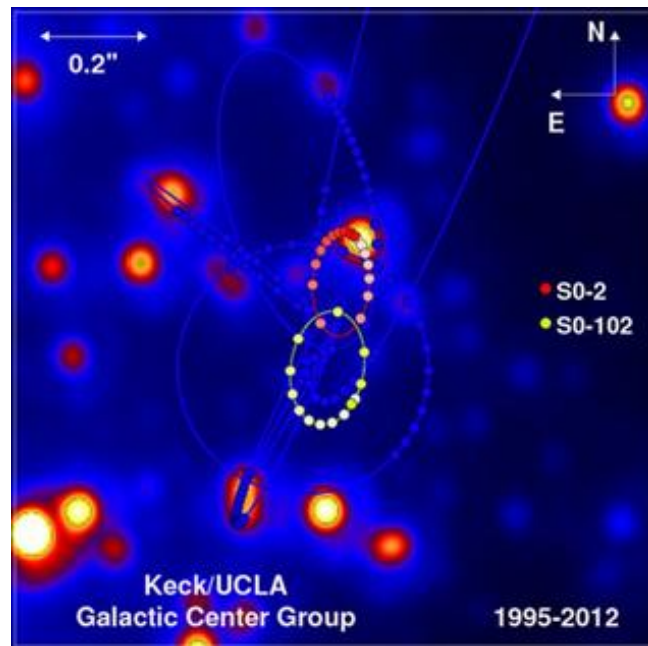
As astronomers figured out that almost all “active” galaxies might host a supermassive black hole, search for one in our docile galaxy began. And this is where the other two awardees come in. Prof Andrea Ghez and Prof Reinhard Genzel looked at “swarm” of stars in the womb of our galaxy in attempts to find a supermassive black hole among all the gas and dust.

For decades, they observed the stars in the galactic centre. They tracked their positions and velocities, using infrared telescopes to see through the opaque curtain of interstellar dust (interstellar dust is opaque to visible wavelengths). They used advanced technology like adaptive optics to fight the turbulent atmosphere of the Earth and get a more resolved image. Adaptive optics uses a “fake guide star” created by lasers by exciting sodium atoms in the atmosphere to get real-time distortions in the atmosphere. Then, special mirrors in the telescope can deform in the right way, using the information from the fake star, as to reverse the distortion of the wavefront from the astronomical object of interest.

Independently, the two groups concluded that the stars orbited an object a couple of millions of solar masses heavy confined in a space smaller than the dimensions of our solar system. Astronomers already had discovered Sagittarius A* (which we now know is a black hole) as a strong radio source from the centre of the galaxy. The study by Genzel and team suggested that the massive central body is very close to the radio source. Sagittarius A* had to be a black hole!

The team did mindblowing observations as a star named S2 completed its orbit around its invisible companion since the start of the observations. As the star approached the orbital pericenter in 2018, scientists could observe the effects of general and special relativity theories for the first time. The gravitational redshift (from GR) and relativistic Doppler shift (from SR) measured upheld relativity even near the extreme gravitational regime around the black hole. Hundred years and counting, Einstein’s theory of gravity has stood the test of time, fascinating and inspiring curious minds all over the world.

This year’s Nobel prize also displays the subtle connection between theory and observations in the field of research. Progress in both is essential for a better understanding of the beautiful cosmos we live in!



Andrea Ghez | <https://arstechnica.com/science/2012/10/fast-moving-star-is-the-closest-yet-to-the-milky-ways-black-hole/>

THE ORBITS OF THE TWO STARS S0-2 AND S0-102 AROUND THE SUPERMASSIVE BLACK HOLE LOCATED AT THE CENTER OF THE MILKY WAY GALAXY.



References -

- Wikipedia: Roger Penrose
- Wikipedia: Sagittarius A*
- Nobel prize “scientific background” PDF

03 - NANOSENSORS

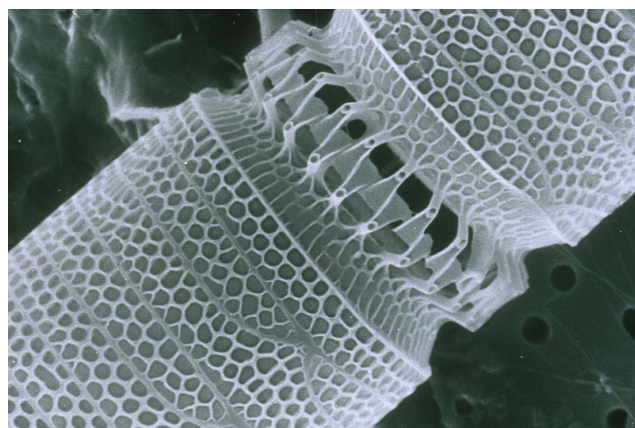
Nanotechnology is the fast-moving and emerging field of science and technology which is concerned with designing things at a nanoscale (10⁻⁹ meter). The size of one nanometer is about 1000 times smaller than the width of a human hair and designing new things at a diminutive scale is known as nanotechnology. Nanotechnology is the visionary field of research and moving towards the fabrication of nanosensors that are flexible, specific, versatile, and sensitive. The objective of nanosensors is to monitor activity at the nanoscale by measuring chemical, mechanical, and physical changes and convert them to signals that can be analyzed.

Exponential market demand captivated the researcher's attention to design potential nanosensors. Three basic methods of designing nanosensors are top-down lithography, bottom-up fabrication, and self-assembly method. In the top-down method, patterns are generated at a large section of material such as an electronic circuit board and then reduced to the nanoscale. Whereas the bottom-up approach involves the assembling atoms and molecules in a specific pattern which has been achieved in laboratory tests through the use of atomic force microscopy. In the case of self-assembly method, atoms, molecules or nanoscale building blocks simultaneously arrange themselves in the specific pattern, without any human intervention.

In 1999 the first synthetic nanosensor was designed by researchers at the Georgia Institute of Technology. This nanosensor detects the discrepancy between the two vibrational frequencies of the nanotube with or without the particle which is attached at the end of the carbon nanotube. And, this change in frequency allows researchers to measure the mass of the attached particle.

Ground-breaking technology of nanosensors is changing the modern world constructively. Nanosensors have immense potential and wide-spread applications in the field of medicine, precision agriculture, urban farming, plant nano bionics, prognostics and diagnostics, SERS based sensors, and many industrial applications. Additionally, nanosensors are radically used in the military and defense for the detection of explosives or toxic gases. Due to their sensitivity, tunability, and selectivity, nanosensors have greatly improved various sub-areas within the food and environment sectors including food processing, air, and water quality monitoring. Nanosensors aid in developing smart health care and little more efforts are required for their advancement in the health sector.

The introduction of nanosensors in our hectic schedule has extensively transformed the lifestyle by making it more quicker, more scientific, more efficient, more precise, more enjoyable, and simple to implement which is why this technology has gained tremendous significance. Engineers, researchers, and scientists need to pay more attention to make breakthroughs in nanosensors—there are a lot of extraordinary fruitful opportunities available to explore nanotechnology in its true essence, yet more to discover than most can imagine.



CSIRO, CC BY 3.0, via Wikimedia Commons

**A SCANNING ELECTRON MICROSCOPE IMAGE
OF A MARINE DIATOM, DETONULA PUMILA.**



References -

- [Nanosensors](#)
- [Nanosensors – what they are; what they do?](#)
- [Nanotechnology](#)

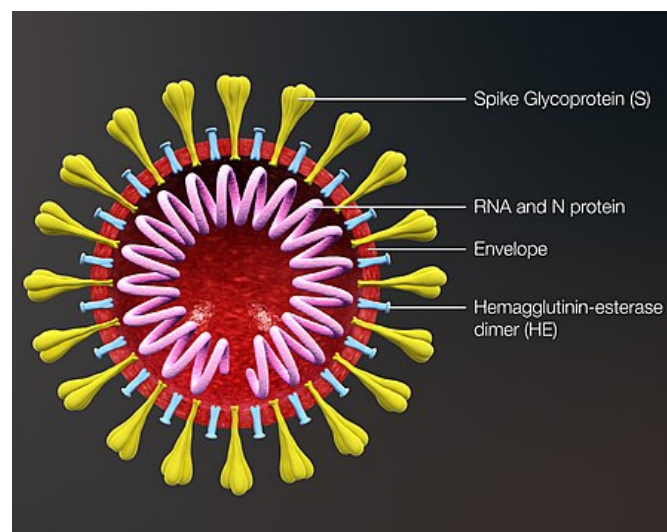
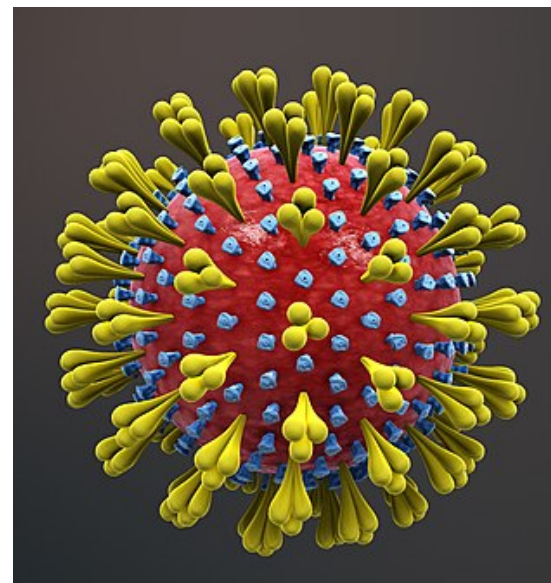
04 - CORONA - HITS AND MISSES

Different parts of our world have seen the pandemic in all its varying degrees of its severity. Researchers have struggled to figure out whether the COVID-19 death rates are indeed dropping. The calculations can be complicated. Case-fatality rates depend on testing. For instance, a country that tests only people with severe symptoms will have an outsized case-fatality rate compared to one in which asymptomatic testing is widespread. Fatality rates in intensive-care units could be misleading if the demographics of the people admitted change over time. The detailed data that is needed to parse these differences have been hard to obtain in many countries. As a result, it has taken scientists some time to determine whether the number of deaths per SARS-CoV-2 infection is falling.

Intensive-care physicians say that the treatment for the disease has improved, but not always in ways that are easy to pinpoint. The sensation around hydroxychloroquine, a malaria drug that some initial studies suggested might help to treat COVID-19. The prospectives set off a run for tests on the drug, with some physicians and politicians advocating its use without firm evidence for its effectiveness. In June, a study in the UK showed that the medication did not alleviate symptoms in people hospitalized with COVID-19. In fact, some studies even suggested that hydroxychloroquine could be harming some patients, especially by causing heart damage, and particularly, when combined with the antibiotic azithromycin. Numerous hydroxychloroquine clinical trials were launched, squandering resources and effort that could have been directed elsewhere.

There were instances where the increased production of proteins, called cytokines, could rev up immune responses in people with severe COVID-19. This 'cytokine storm' stimulated interest in developing targeted therapies to dampen such immune responses. This prompted some physicians in India to use tocilizumab, an antibody that blocks the activity of the cytokine interleukin-6 (IL-6), as an anti-covid drug. But the treatment is thought to have rendered patients more susceptible to other infections, particularly bacterial ones.

Supplemental studies have shown that, although IL-6 levels are raised in some people with severe COVID-19 as compared to healthy individuals or individuals with mild infections, they are not elevated when compared with others with acute respiratory distress4.



<https://www.scientificanimations.com>, CC BY-SA 4.0,
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**IMAGES COMBINED FROM A 3D MEDICAL ANIMATION,
DEPICTING THE SHAPE OF CORONAVIRUS AS WELL AS THE
CROSS-SECTIONAL VIEW. IMAGE SHOWS THE MAJOR
ELEMENTS INCLUDING THE SPIKE S PROTEIN, HE PROTEIN,
VIRAL ENVELOPE, AND HELICAL RNA**

04 - CORONA - HITS AND MISSES (CONTINUED)

Another test on an IL-6-blocking antibody called sarilumab in the United States was stopped because it showed no benefit. In contrast, the blanket suppression of the immune system using steroids has been shown to bring down death rates. On June 16, the UK RECOVERY trial found that a common steroid called dexamethasone could reduce COVID-19 fatalities by almost one-third when administered to patients who require supplemental oxygen or are on ventilators. In reality, some intensive-care physicians were already giving low doses of dexamethasone to critically ill patients as a part of their standard treatment for acute respiratory distress. Still, the safety of that approach was debated. So far, steroids are the only medicines that have shown to have a dramatic effect on COVID-19 mortality.

Remdesivir, the antiviral drug developed by the biopharmaceutical company Gilead Sciences in Foster City, California, was shown to shorten hospital stays. A subsequent trial coordinated by the WHO found that the drug had little effect on mortality. In spite of this, the US Food and Drug Administration approved it for treating COVID-19 on October 22.

Innumerable other therapies are being tested against COVID-19, but many of the ongoing trials are too small to yield significant and convincing results. Studies of antibodies, either purified antibodies administered individually or in cocktails or antibody-rich blood plasma taken from people recovering from the disease, have been the most notable.

Convalescent plasma studies have been obstructed in the US by the availability of the treatment outside clinical trials. Still, the UK RECOVERY trial hopes to have significant data on this approach from a large, randomized, controlled trial this year. However, a 464-person, open-label study in India found that convalescent plasma did not prevent moderate COVID-19 from progressing to severe disease.

Blood clots were discovered to be an unexpected hallmark of COVID-19. Researchers are looking to find out whether drugs that prevent blood clots could be given at higher doses or earlier during infection.

Some researchers are doubtful of the chances that highly effective medicine will be found. They cite decades of failed attempts to find a 'magic bullet' for acute respiratory distress.

Reducing the death rate by 10–20% due to COVID-19 would feel like an incredible win in an intensive-care ward. But that would still leave the number of deaths relatively high, especially among older people. Experts concur saying that suppressing the transmission is the best way to reduce COVID-19 deaths at present.



Image by Gerd Altmann from Pixabay

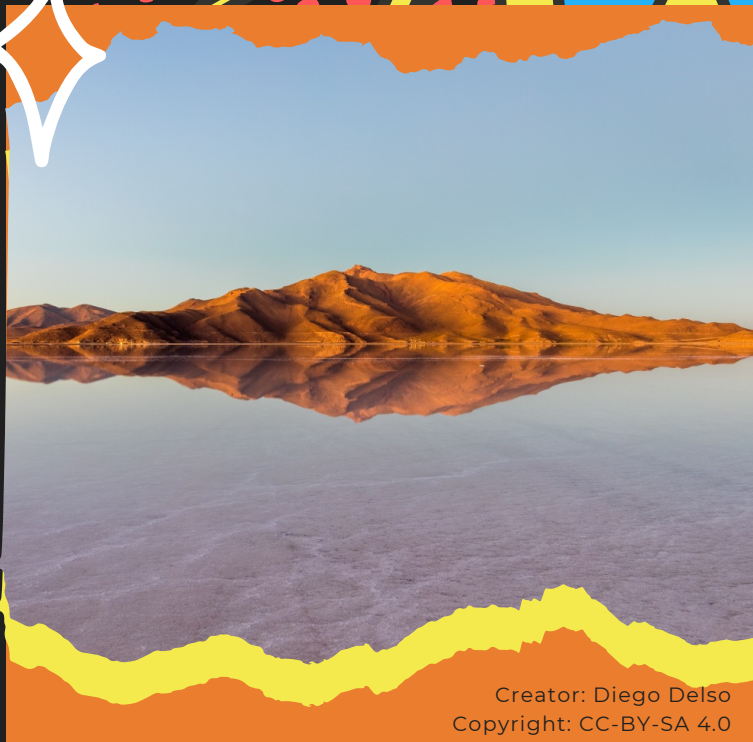


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- www.nature.com

FACTASTIC!

*Get ready to guzzle down
these interesting facts...*



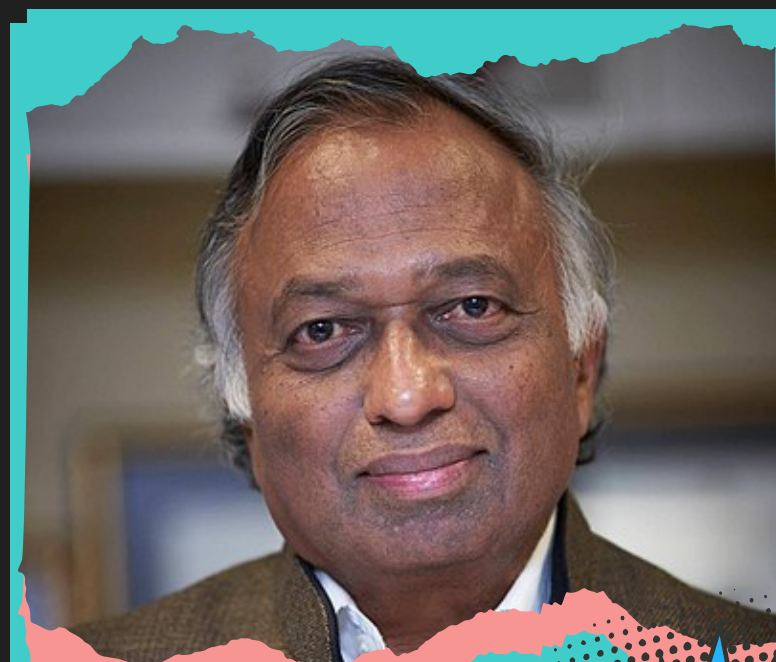
Creator: Diego Delso
Copyright: CC-BY-SA 4.0

WORLD'S LARGEST MIRROR

Salar de Uyuni is the world's largest salt flat located in Bolivia. During rainy season, the water accumulated here turns the flat into world's largest mirror. It's been called "The Border Between Heaven and Earth."

SUPER SCIENTIST

Dr Vijay Panduranga Bhatkar is the architect of super-computing in India. He rolled out India's first indigenous supercomputer: PARAM8000. It was the second-fastest supercomputer in the world. In 2015, he was honoured with Padma Bhushan for his invaluable contribution.



Nachiketas, CC BY-SA 4.0, via
Wikimedia Commons

KOALA SUS?

The fingerprints of a koala are so indistinguishable from humans that they have on occasion been confused at a crime scene. In 1996, a different type of mammal came under police suspicions: a koala! While it makes sense that orangutans and chimpanzees would have fingerprints like us, being some of our closest relatives, koalas are evolutionarily distant from humans. It turns out that fingerprints are an excellent example of convergent evolution, or different species developing similar traits independently from each other.

Erik Veland, CC BY-SA 3.0, via Wikimedia Commons

HIV-AIDS - ORIGINS

The Human immunodeficiency virus (HIV) originated with simian immunodeficiency viruses (SIVs) – viruses in chimpanzees and monkeys. But how did the virus jump species? It's thought human hunters were the bridge. By eating the meat or coming into contact with the blood of monkeys and apes, hunters provided opportunities for SIV to enter the human body and mutate into a form that infects humans: HIV.



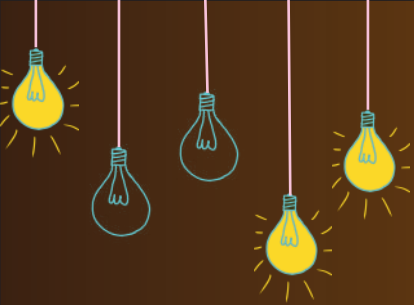
Image by Gerd Altmann from Pixabay

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- www.avert.org
- www.mcgill.ca
- www.thedodo.com

Fact Finder

MRUNAL



The Quizopedia

-ARE YOU READY FOR THE CHALLENGE?

Is your mind slowly going stale? Did you pride yourself on being the 'Know-it-all' in your class? Well, here's a chance to flex your grey cells and bring them back to tip-top shape. KNOWBEL presents to you 'Quizopedia'. I, Aditya, the quizmaster, have selected 13 of the most sizzling questions for you to crack. All of the questions are related to the theme of this month's issue.

Check out the instructions below:

The QR code below will take you to a Google Form, which contains a quiz consisting of 13 questions. You must answer all the questions and try to get them correct. All of them are without options. You are free to make wild guesses as there is no negative marking! The names of the winners would be published in the upcoming issue, and the winner of the contest will receive prizes worth Rs. 250. Answers shall be officially released via mail on December 25, 2020.

The winners would be chosen based upon:

1. Number of Correct Answers
2. Time of Submission

Competition begins on: December 2, 2020, at midnight
Last Date for Submission: December 20, 2020

What are you waiting for? Let's get quizzing!

Scan or click on the QR code below:

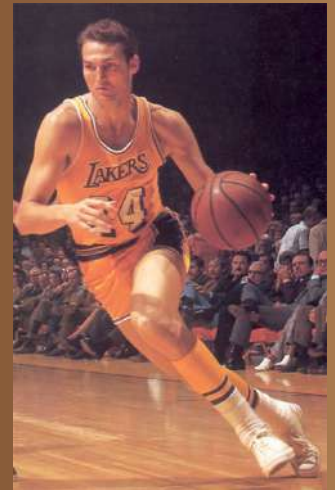


10th Quizzo winner

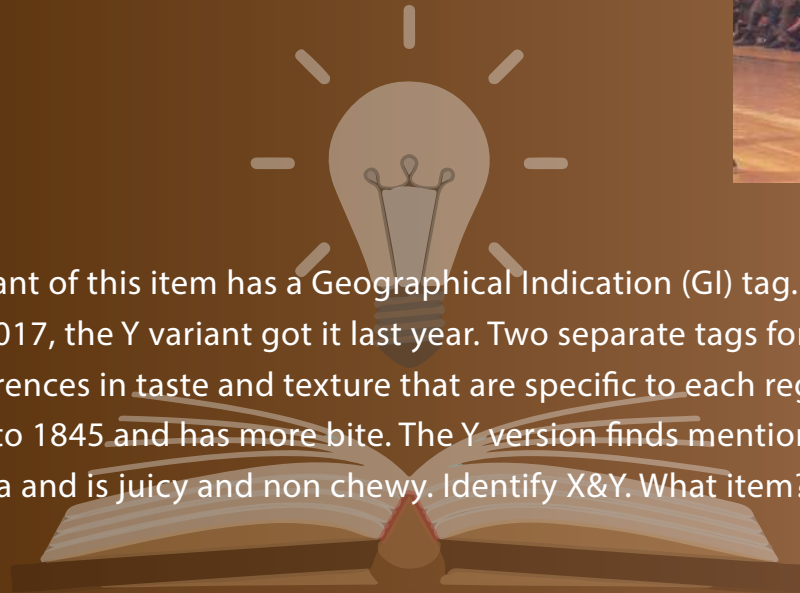
Ashwini Dhone

1. The term X is derived from the Italian words meaning broken bench. Businessmen in Northern Italy would break the bench that they worked on to signify that they were no longer in business. Identify the phrase X which is used commonly in the world of money.

2. Jerome Alan West, popularly known as Jerry West, is an American basketball executive and former player. During his active career West played professionally for the Los Angeles Lakers of the National Basketball Association. His nicknames included Mr. Clutch, for his ability to make a big play in a clutch situation, such as his famous buzzer-beating 60-foot shot. He retired from professional basketball in 1974. He has been immortalized in the world of basketball in a very special way. What is it?



3. Both the X and Y variant of this item has a Geographical Indication (GI) tag. While the X variant got its tag in 2017, the Y variant got it last year. Two separate tags for the same item recognize the differences in taste and texture that are specific to each region. The X version traces its origin to 1845 and has more bite. The Y version finds mention in the 15th century Dandi Ramayana and is juicy and non chewy. Identify X&Y. What item?



4. What event is this Amul advertisement from 2019 about?



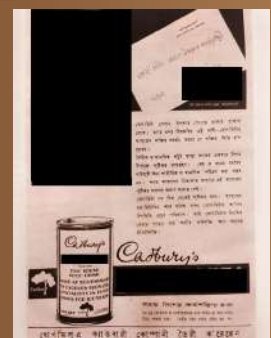
5. The logo of brand X was carefully chosen. Elephant signifies strength and steadiness. Moreover to many, the elephant has an auspicious significance. Keeping these values in mind, the elephant was chosen as X's logo, hoping that it would bestow luck and spell success. The logo caught on. In the rural heartland of India, X is still known as the "hathiwala cream". Identify X.

6. In December 2019, US officials removed _____ from the list of free trade partners of the US. This country had been listed on the drop-down menu for the agriculture department's foreign agricultural service tariff tracker along with Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Panama, and Peru. Amongst the commodities listed were "live asses", "mules and hinnies" and several other farm animals. Potatoes and chestnuts were also reportedly listed. However, the country's most famous product, a "mineral" was left out. FITB.

	A	B	C	D	E	F	G
	TL	6 digit	HS 2	Subdivision	Partner	Reporter	HS - 8 Description
2	01012100	010121	01			United States	Live purebred breeding horses
3	01012900	010129	01			United States	Live horses other than purebred breeding h-
4	01013000	010130	01			United States	Live asses
5	01019030	010190	01			United States	Mules and hinnies imported for immediate
6	01019040	010190	01			United States	Mules and hinnies not imported for immedi-
7	01022100	010221	01			United States	Live purebred breeding cattle
8	01022920	010229	01			United States	Cows imported specially for dairy purposes
9	01022940	010229	01			United States	Live cattle other than purebred or those imm-
10	01023100	010231	01			United States	Live purebred breeding buffalo
11	01023900	010239	01			United States	Live buffalo, other than purebred breeding
12	01029000	010290	01			United States	Live bovine animals, other than cattle and b-
13	01031000	010310	01			United States	Live purebred breeding swine
14	01039100	010391	01			United States	Live swine, other than purebred breeding
15	01039200	010392	01			United States	Live swine, other than purebred breeding
16	01041000	010410	01			United States	Live sheep
17	01042000	010420	01			United States	Live goats
18	01051200	010511	01			United States	Live chickens weighing not over 185 g each
19	01051200	010512	01			United States	Live turkeys weighing not more than over 3-
20	01051300	010513	01			United States	Live ducks, weighing not more than 185 g
21	01051400	010514	01			United States	Live geese, weighing not more than 185 g
22	01051500	010515	01			United States	Live guinea fowls, weighing not more than
23	01059400	010594	01			United States	Live Poultry, Chickens
24	01059900	010599	01			United States	Live ducks, geese, turkeys and guineas, we-

7. Previously known as Kapashi, Paytaan, Kachkadi, Bakkalnali, and Pukari, the names indicating the villages where they were made, the origin of X can be traced back to the 12th century. According to historical records, they were first worn in the thirteenth century. In the seventies, with the Hippie movement X became very popular in the United States. The success faded out and recently came back influencing new models with minimalist designs, in contrast to the original intricate ethnic pattern characterizing it. Identify X.

8. The following slide contains one of the most iconic advertising campaigns of this particular product from Cadbury, from the year 1937. Identify the product and why this particular ad is unique.

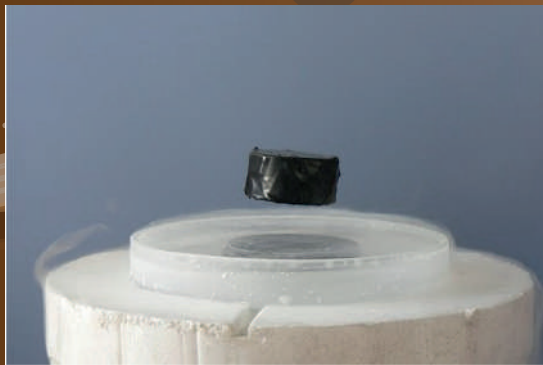


9. X is a popular type of biscuit. The origin of the name X is unknown, but there are many hypotheses, including derivations from the French word 'or', meaning gold, or from an Ancient Greek root meaning mountain. Others believe that it was named X simply because the name was short and easy to pronounce. Another theory, proposed by writer Stella Parks, is that the name derives from the Latin word for a genus of the laurel family. She observes that the original design of X includes a laurel wreath. Identify X.

10. X was acquired in 2005 by Indian businessman Sanjiv Mehta, who has turned it into a consumer brand focused on luxury foodstuffs. He has relaunched X in London 135 years after it was dissolved. Mr. Mehta's shop in London is stocked with 350 luxury products, including 100 varieties of tea, chocolates, spices, and mustards developed by the company from across the world. X's early business activities focused on cotton, silk, and tea. Identify X.

11. The Golden Arches Theory of Conflict Prevention was put forward by Thomas L. Friedman in his book *The Lexus and the Olive Tree: Understanding Globalization*. It states that no two countries that both have X have never fought a war against each other. He supported that observation, as a theory, by stating that when a country has reached an economic development where it has a middle class strong enough to support an X network, it would become an "X country", and will not be interested in fighting wars anymore.

12. Which particular physical phenomenon is also referred to as the 'Holy Grail of Energy Efficiency'?



13. If the cold water is poured into a person's ear, their eyes showed an involuntary movement called X, which moves the eye in the direction of the opposite ear. However, if the warm water is poured into their ear, their eyes will move towards that ear. This is used to test for damage to the brain stem. Identify X.

< D/CODE >

THERE IS ONLY ONE TRUTH !
BRING OUT THE SHERLOCK IN YOU.

Are you rooting to challenge your brain in this seemingly endless lockdown? Well, we have just the right thing for you. KNOWBEL presents a revamped version of your favourite D-code. Gear up to send your neurons on a marathon.

To begin, click on the start button below. There are 5 documents, one leading to another with a clue to open it. You have to submit the final answer, a code given in the final document, at the submission link. Remember, don't give up midway because the solution is staring at you in the face.

Conquistadors will be **honoured** with fantastic **prizes** worth **Rs.250** and **certificates**. Besides, you will get a chance to be featured in our next issue.

The answers will be sent to you by **25/12/2020**. The enthralling **competition begins** on **02/12/2020**. **Hints** would be given out after **5 days** from the **start** of the competition on the official **KNOWBEL website**

here : **HINTS**

The final winners will be chosen on the following basis:

- 1) Your answers (obviously!)
- 2) Logic
- 3) Preference for early-bird submissions

The Deadline for entering your answers is 25/12/2020.

Now, are you ready to EODCD? 😜

Click on **START** to begin.



START

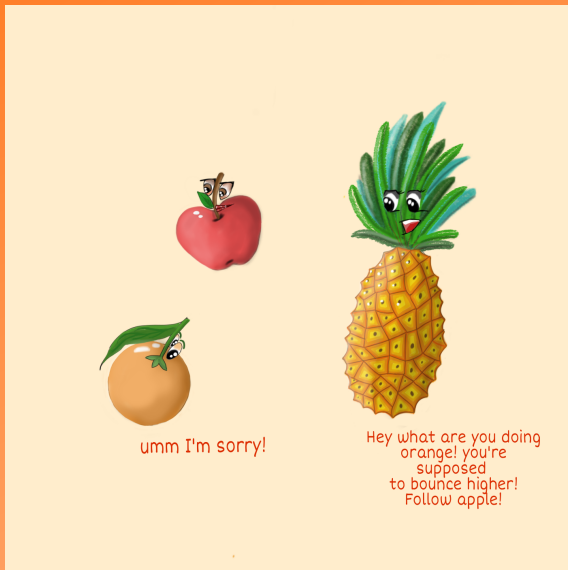
For clarification, please contact: knowbel.decode@gmail.com

<D/code> - 10 Winner:

1. **Kartikeya Raghu**



PLOT-TWIST



— By Aishwarya Juneja



Enlightening the nobles !

INSPIRON



LUDWIG VAN BEETHOVEN
(1770-1827)

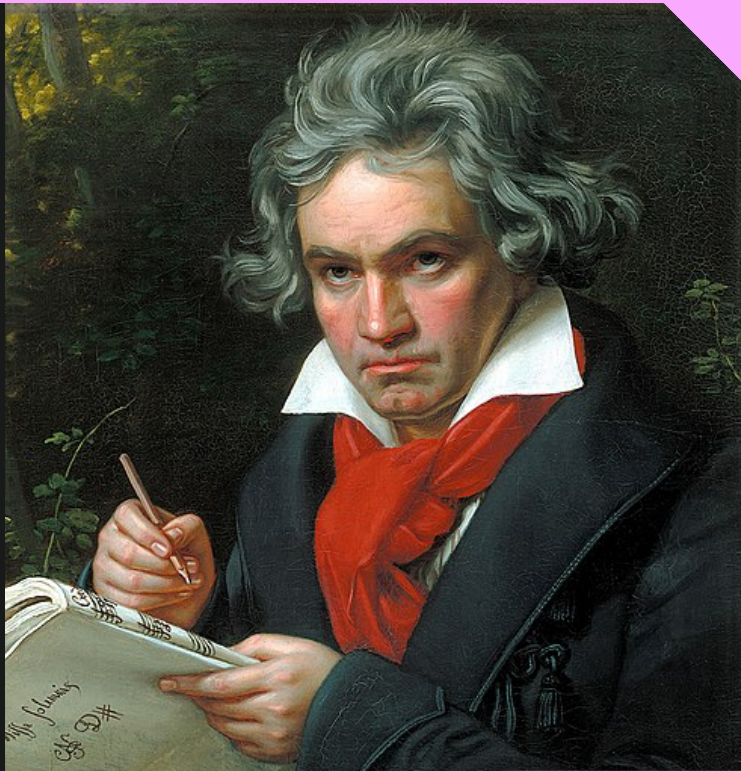


THE GREATEST OF
ALL TIME



*Plaudite, amici, comedia
finita est. (Applaud, my
friends, the comedy is over.)*

- Ludwig van Beethoven



Joseph Karl Stieler, Public domain, via Wikimedia Commons



Before continuing reading this article, I am obliged to warn the reader that this month's Inspiron will be a little different. This time, we celebrate a person who lived in a place and time very different from our current one. December 16, 2020, would mark the 250th birth anniversary of German composer Ludwig van Beethoven. Two hundred fifty years ago, humanity was yet to invent the steam engine and discover Antarctica. George Washington had not become the first President of the United States. As for India, our country was still under the rule of the Mughal Empire. Well, this begs for the question, 'Why explore a person who lived in an era so starkly different from ours?' We wish to answer this very question through this article while trying to convince you of this man's genius and relevance in the 21st century.

01. EARLY YEARS (1770-1792)

Ludwig van Beethoven was born on December 16, 1770, in Bonn, a small town in modern-day Germany. He was the eldest of three brothers. His father, Johann van Beethoven, a court musician in Bonn, noticed five-year-old Ludwig's musical talent and thus started giving him piano and violin lessons. Johann wished to promote and monetize Ludwig's prodigious talent all across Europe. However, his lessons were harsh and intense with a fair dosage of beating and cursing, often reducing young Ludwig to tears. Their relationship deteriorated further after the death of Ludwig's mother, Maria, in 1787. Johann succumbed to chronic alcoholism resulting in Ludwig becoming the sole earner for the family. Bearing the family's responsibilities prevented him from following his ambitions, namely moving to Vienna, Austria's capital city, and studying with the great composers Wolfgang Amadeus Mozart and Franz Joseph Haydn.

02. THE EARLY VIENNA PERIOD (1792-1802)

After his father died in 1792, Ludwig van Beethoven finally had the opportunity to travel to Vienna. Mozart had already passed away in 1791. However, Haydn was willing to take in the 22-year-old Beethoven as his pupil.

WITHIN THESE PAGES:

- 01** *EARLY YEARS
(1770-1792)*
- 02** *THE EARLY
VIENNA PERIOD
(1792-1802)*
- 03** *THE MIDDLE
(HEROIC)
VIENNA PERIOD
(1802-1814)*
- 04** *THE LATE
VIENNA PERIOD
(1814-1827)*
- 05** *RELEVANCE IN
CONTEMPORARY
TIMES*



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Music should strike fire from the heart of man, and bring tears from the eyes of woman.

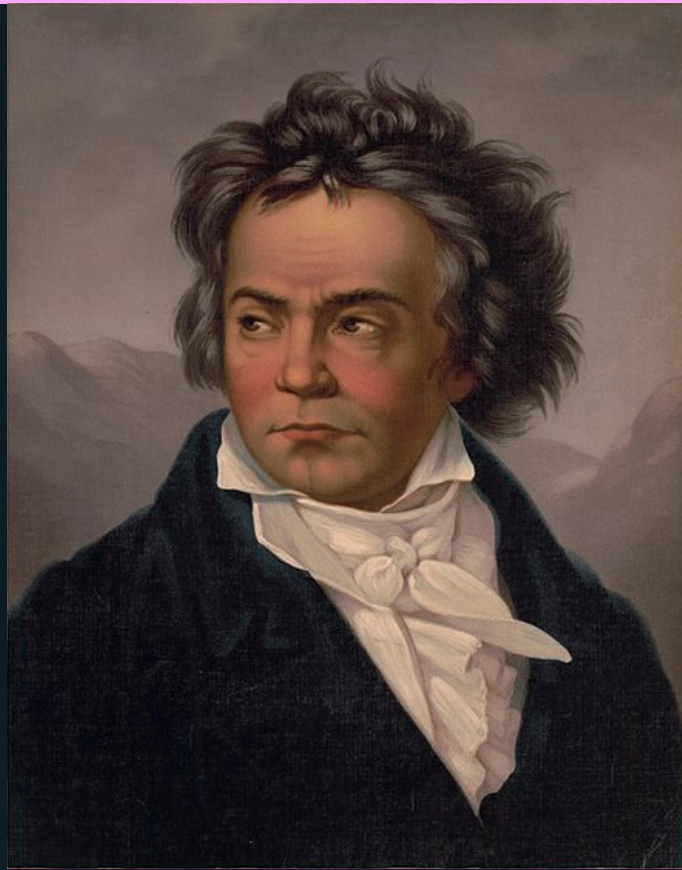
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Beethoven gained a reputation among the Viennese elite as a virtuoso pianist and budding composer over the next ten years. His growing successes both as a performer and a composer earned him patrons among the Viennese nobility. His first major orchestral work, the 'First Symphony', appeared in 1800. He also composed several pieces for solo piano (called piano sonatas), piano and violin (violin sonatas), and other instruments.

03. THE MIDDLE (HEROIC) VIENNA PERIOD (1802-1814)

Beethoven first started suffering from hearing loss in 1798. By 1801, the hearing loss had become significant enough to cause problems in social gatherings and performances. On his doctor's advice, Beethoven moved to the small Austrian town of Heiligenstadt, just outside Vienna, from April to October 1802 to come to terms with his condition. There he wrote the document known today as the 'Heiligenstadt Testament', a heart-wrenching letter to his brothers which records his thoughts of suicide due to his growing deafness and records his resolution to continue living for and through his art. The message was never sent and was discovered in his papers after his death.

Over the next ten years, even though his deafness deteriorated, leading to a steady decline in performance and social life, Beethoven's composing career bloomed with nearly every composition recognized today as a masterpiece. Even if he couldn't hear the actual musical notes, such was his genius that he could imagine how it would sound in his brain! Also, a dramatic change in his compositions became apparent. Unlike in his early compositions, which were small and cute, the new pieces starting with the 'Third Symphony' (1804) were gigantic in length and scope.



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Beethoven started using his compositions as a medium to express his most profound emotions, be it tragic (hearing loss or alienation from society) or triumphant (heroically beating one's struggles no matter what the odds). Beethoven was also a staunch follower of the French Revolution and its ideals of equality and overthrowing the status quo. Along with emotional extremism, those ideas charged these new pieces with an intensity never heard in music before. The most notable of them is the 'Fifth Symphony' (the one with the iconic BA..BA..BA..BAAAAA opening). Try listening to it once (there are multiple recordings on Youtube).

04. THE LATE VIENNA PERIOD (1814-1827)

By 1814, Beethoven was almost completely deaf. Over the last 20 years, his efforts in finding the 'woman of his dreams' and building a family had also failed, despite temporary relations with several Viennese noblewomen. Beethoven's younger brother, Kaspar, died of tuberculosis in 1815. In the hope of having some semblance of a family, Beethoven immediately tried gaining custody of Kaspar's son Karl from his mother, Joanna, which resulted in bitter legal trials that lasted for over five years. Beethoven finally did win Karl's custody and subsequently spent the next five years trying to raise Karl, which led to a drop in composing.

1820 saw the start of Beethoven's final period of composing, which continued until his death. This late period brought forth pieces like the 'Ninth Symphony' and the 'Missa Solemnis', pieces of such grandeur and monumentality that Western music is yet to come out of their shadow. .

“

*Music is the
mediator
between the
spiritual and
the sensual
life.*

”



“

*Music is a
higher
revelation than
philosophy.*

”



Joseph Willibrord Mähler, Public domain,
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The 'Ninth Symphony' is notable for being the first Symphony to include choruses. The chorus sings the iconic 'Ode to Joy' which has subsequently become an anthem for promoting worldwide unity and harmony.

By the premiere of the 'Ninth Symphony' in 1824, Beethoven was completely deaf. He was on the podium conducting the orchestra; however, he couldn't hear a single note that they played. When the performance ended, Beethoven didn't realize that the orchestra stopped playing. Only when the musicians turned him around did he see a hall full of people giving him a standing ovation. The ovation lasted for nearly 20 minutes. The response incredibly moved Beethoven.

The premiere of the 'Ninth Symphony' was also Beethoven's final public appearance. Beethoven's health steadily deteriorated over the next three years. He finally passed away aged 56 on March 24, 1827. Subsequently, people from all over Vienna came and plucked out locks of his hair as a memento for posterity. His funeral was attended by nearly 1/10th of the entire city's population.

05. RELEVANCE IN CONTEMPORARY TIMES

As we saw, Beethoven's life was one of eternal misery. He had abusive parents, lost hearing when he started becoming successful as a musician, could not find love, and couldn't even have a happy family. While all that hardship did turn him into a bitter pessimistic man, his music was exactly the opposite. His music speaks of optimism, the human spirit's strength to combat all odds, of universal joy and brotherhood. In times of such uncertainty, ideas like these need to be inculcated among us so that we human beings keep moving forward in the hope of a better future. Hence, we believe that even after 250 years, this man and his music are as relevant as they have ever been.

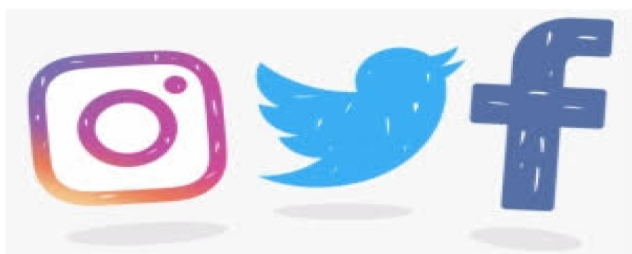
Beethoven's shadow looms large over Western Music to this day, a testament to his genius. From Brahms to the Beatles, all have studied and drawn inspiration from Beethoven. To celebrate his 250th birth anniversary, orchestras all over Europe and the Americas had planned concerts performing Beethoven's music before the pandemic stopped everything. Unfortunately, Beethoven's music is still relatively unknown in our country. Hopefully, after reading this article, you will make an effort to try out some of his music. Believe us. It is far more than catchy elevator jingles!



To appreciate the beauty of snowflakes, it is
necessary to stand out in the cold.
-Aristotle

click by Denys Nevozhai

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in the magazine as well*



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