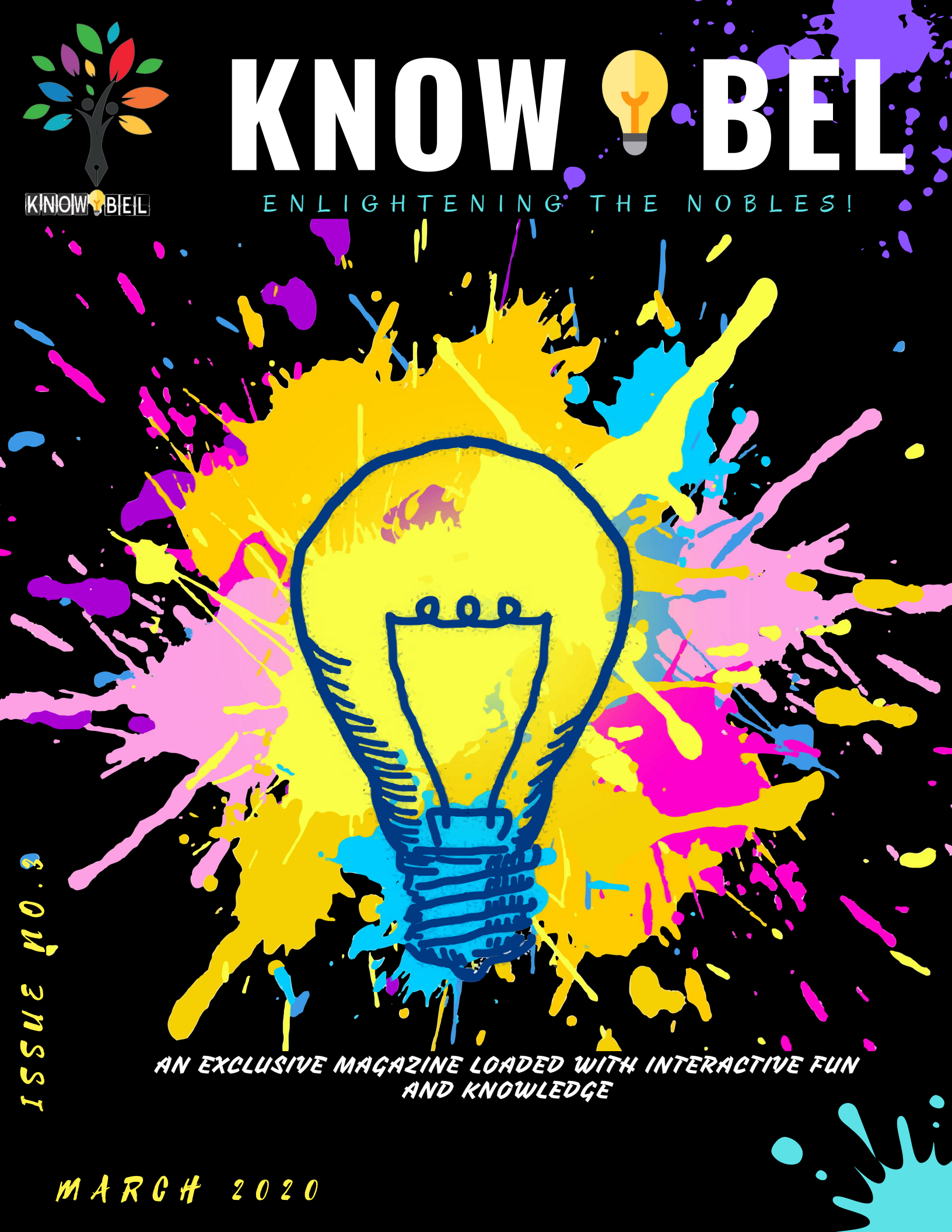
KNOWBEL

ENLIGHTENING THE NOBLES!



AN EXCLUSIVE MAGAZINE LOADED WITH INTERACTIVE FUN AND KNOWLEDGE

ISSUE NO.3

MARCH 2020

KNOWBEL

Enlightening the nobles !

WELCOME !

To the third issue of KNOWBEL monthly.

Proudly presenting the third issue of
our magazine with more fun and knowledge.
We have introduced Holi
special theme of colours in this issue to boost up your enthusiasm.
May you explore and enjoy all the shades of it.

Let's go exploring !

SPECIAL THANKS TO

DR. APARNA DESHPANDE
Faculty Advisor

CONTACT US

KNOWBEL

Email:-
knowbel.science@gmail.com

PEOPLE WHO MADE THIS PROJECT A REALITY

AVADHOOT JADHAV
Editor-In-Chief

PRADEEP TRIMBAKE
Design editor

PRAJWAL JADHAV
Outreach Head

RITESH CHAWARE
Technical Editor

SUYOG SANKHE
Resource Editor

VALUABLE TEAM MEMBERS :

Design team:
Pradeep Trimbake, Prajwal Jadhav, Ritu Dhaulakhandi, Suyog Sankhe

Resource team:
Suyog Sankhe, Avadhoot Jadhav, Aditya Bhattacharyya, Kushan Panchal, Darshini Poola, Mrunal Pazare

Technical team:
Ritesh Chaware

Outreach team:
Prajwal Jadhav, Gunwant Patil

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WONDERELLA

PHOTO BY NIKHITA SINGHAL ON UNSPLASH

IS THERE A FIFTH FORCE OF NATURE?

We all know the 4 fundamental forces of nature: gravity, the electromagnetic force, the strong and the weak nuclear forces. However , in 2016, a group of hungarian researchers claimed to have isolated a new type of subatomic particle which could indicate a new fundamental force of nature. Dubbed as the “X17” particle, they suggest , that the particle is a new kind of boson. Bosons are particles which act like the carriers of various forces(for eg, the photon, is the carrier of the electromagnetic force) . The mass of the particle is calculated to be about 17 MeV. Originally the team of scientists aimed to look for “dark photons” which are believed to carry dark matter(about which we know nothing except that it only interacts with normal matter through gravity). Around 85 percent of matter in the universe is dark, but we still have no theory about the kind of particles that it consists of. Scientists used a particle accelerator to propel particles at high energies in a vacuum tube, and observe how isotopes decay when they have such high energies. They observed the decay of Beryllium-8 and saw some light emissions . Electrons and positrons were originating from the isotope at an angle of 140 degrees which was not expected as it seems to violate the law of conservation of energy.

INSPIRING READS IN THIS ISSUE:

MORE INFORMATION:
HTTPS://ARXIV.ORG/PDF/1504.01527.PDF (PAPER FOR THE OBSERVATION)
OR SCAN THE FOLLOWING QR CODE -

02 - OSCAR NOMINEE FOR THE BEST SCIENTIFIC VIDEO EVER!

Scientists from the University of Nottingham,UK have recorded the first ever footage of a chemical bond forming between two atoms. As we all know, atoms form a molecule through chemical bonding by sharing/donating/receiving electrons. Researchers from Nottingham University, trapped two rhenium atoms in a carbon nanotube. The diameter of a carbon nanotube at max is about a few nanometers. An individual Rhenium atom (Atomic No. 75) is about 0.205 nanometers and hence, by a stroke of luck, two rhenium atoms snuck inside the carbon nanotube prepared by the scientists and were seen forming a bond, as two dark circles merged , and then showed vibrations and distortions before the chemical bond broke and formed again. To drive the atoms inside the tube, scientists used a technique called TEM (Transmission Electron Microscopy) which involves passing a beam of electrons through a thin slice of any sample. The electrons imparted enough kinetic energy to the two Rhenium atoms so that they come close enough to bond. All ligands and other foreign atoms were removed from the sample so that pure metallic bonding between the atoms could be observed. Carbon nanotubes are ideal as other compounds/materials might have considerably distorted the bond formed, changing its length, breaking it before it forms, etc. " We show that the simultaneous function of the electron beam as a source of energy and an imaging tool allows advancements in the understanding of metallic bonding" the researchers wrote.

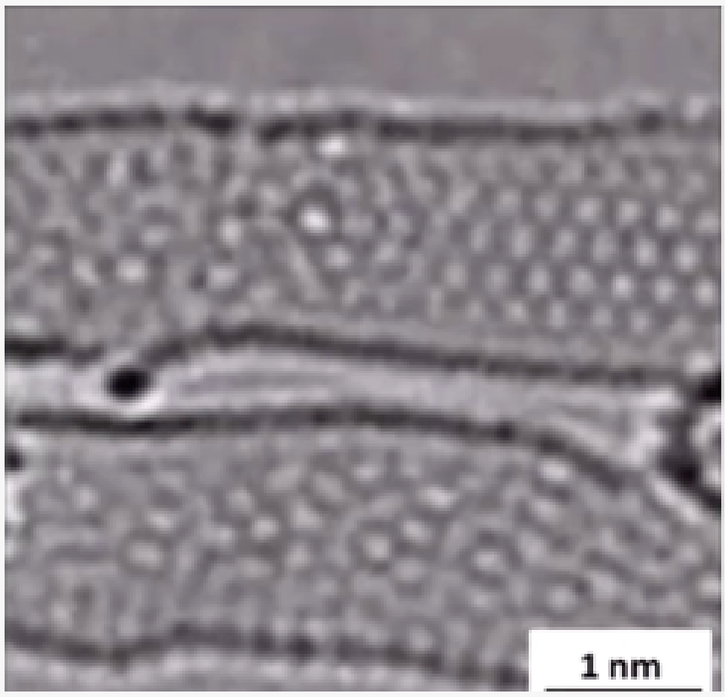


IMAGE SOURCE: SCINEWS UNIVERSITY OF NOTTINGHAM

MORE INFORMATION:
HTTPS://WWW.POPULARMECHANICS.COM/SCIENCE/A30616427/ATOMS-BONDING-VIDEO/
OR SCAN THE FOLLOWING QR CODE -

03 - BUMBLEBEES MIGHT GO EXTINCT DUE TO CLIMATE CHANGE

Bumblebees are becoming less and less common over the years as now its is 50 percent less likely to see a bumblebee in North America as it was in 1974. Some species have already gone extinct in several areas, like the rusty patched bumblebee which is no longer to be found in all of Canada! Bumblebees are amongst the most important pollinators of this planet , as they help in pollinating tomatoes, berries, cucumber, melon and many other important crops. Global rise in temperatures could lead to an intolerable environment for these insects as they need a specific range of temperatures to grow or lay eggs. They tend to prefer cool and slightly humid habitats and the rise in temperature had led to drying up of many such places. Their rate of colonisation (where a species explores a new area and starts breeding and growing there) is far lower than the rate of local extinctions.
As a result, their populations gave decreased by 46 % in North America and 17 % in Europe . However, there are many conservation techniques which might help in saving bumblebees which include: lesser use of pesticides, planting a variety of flowers to reduce habitat loss, and providing them with shelter from the sun during extreme weather changes which are now more common due to global warming. They can be protected from excessive sunlight and rain by planting shrubs along with flowers and building shelters with roofs made of materials like wood. “ We are not saying that what we all need to do is immediately start living in a hut in the woods to recover the situation. It points to a hopeful direction if we choose to intervene” said Dr. Jeremy Kerr, a biology professor at University of Ottawa.

PHOTO BY SANDY MILLAR ON UNSPLASH

MORE INFORMATION:
1)HTTPS://WWW.NATIONALGEOGRAPHIC.COM/ANIMALS/2020/02/BUMBLEBEES-GOING-EXTINCT-CLIMATE-CHANGE-PESTICIDES/

2) HTTPS://EDITION.CNN.COM/2020/02/06/US/BUMBLE-BEE-CLIMATE-CHANGE-EXTINCTION-STUDY-SCN/INDEX.HTML
OR SCAN THE FOLLOWING QR CODE -

04 - ALL YOU NEED TO KNOW ABOUT CORONAVIRUS

Coronaviruses are a large family of viruses which infect both humans and animals. They are not necessarily fatal and most are known to cause mild symptoms such as a runny nose, cough and fever. Rarely, these viruses can be fatal and can cause pneumonia and breathing difficulties. Older people with existing medical conditions are more prone to be severely affected by the virus. The animal source for the virus has not been identified, but this doesn't mean that one can catch it from dogs or cats which we find everyday around our homes. One should avoid eating raw or uncooked meat in order to be safe, and raw milk, animal organs etc. must be handled with care . The 2019 nCoV(which is the epidemic strain and can be fatal) can be spread from person to person in households, workplaces or healthcare centres. It spreads through sneezes, coughs, saliva or mucous discharge from the nose. Antibiotics aren't effective as they work only on bacterial infections and not viral ones. There is no specific medicine available for 2019 -nCoV . The WHO is helping to coordinate efforts to develop a cure for the disease. Note that it is safe to receive products or packages from China, as the virus isn't known to survive long on objects such as letters or packages. The deaths resulting from 2019-nCoV has reached about 800 which is more than the SARS epidemic (which killed about 774 people worldwide) and has infected about 37,198 people as confirmed by China's National Health Commission.

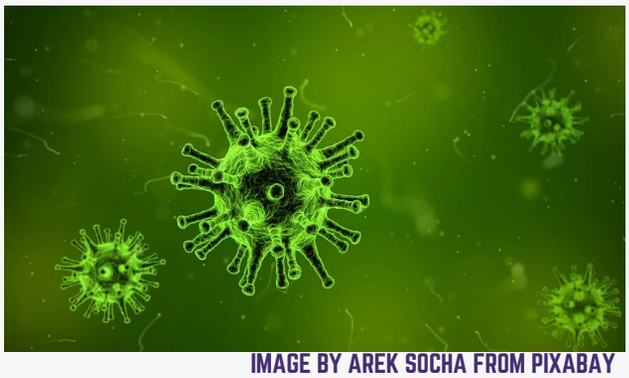
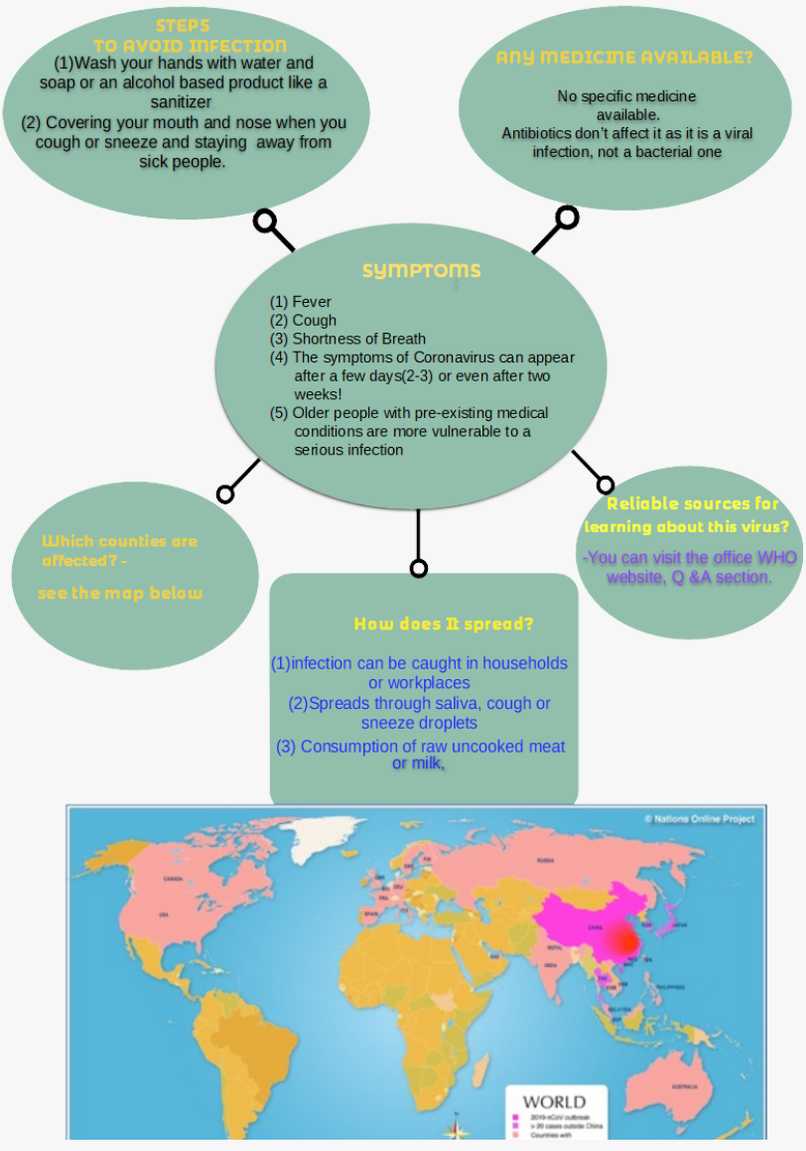


IMAGE BY AREK SOCHA FROM PIXABAY



MORE INFORMATION :
HTTPS://WWW.WHO.INT/EMERGENCIES/DISEASES/NOVEL-CORONAVIRUS-2019
OR SCAN THE FOLLOWING QR CODE -

05 - DOGS CAPABLE OF DOING MATH?

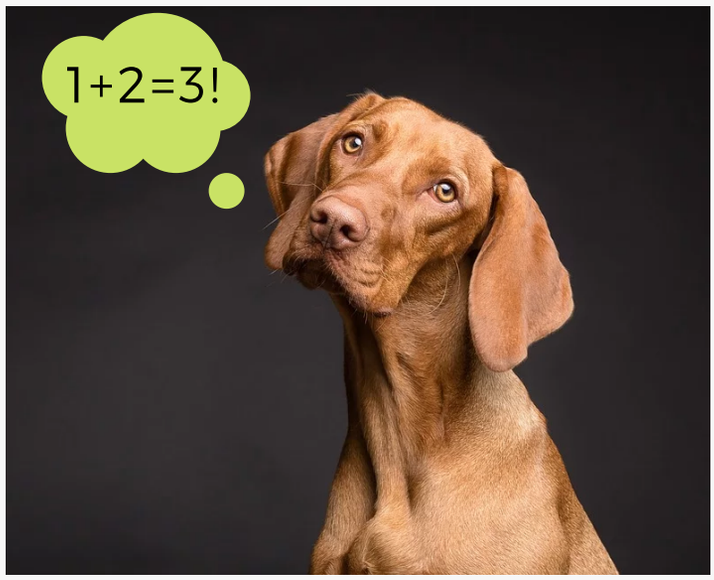


IMAGE BY PÉTER GÖBLYÖS FROM PIXABAY

A recent study has suggested that dogs use a component/part of their brain to process numerical quantities which is similar to the part of the brain that humans use, meaning even after a gap of many millions of years of evolution between mankind and “dog kind”, the neural network and mechanism for math processing is conserved (i.e. doesn't show considerable difference across species). A study at Emory University used functional magnetic resonance imaging (fMRI) to scan the brains of dogs as they a variable number of dots on a screen. They observed that the dogs’ parietotemporal cortex, respond to the change in the number of the dots. To confirm that the response was to the changing number, they showed dots of a fixed size and shape, and so, the only parameter that can create a response was the number of dots! All animals seem to have a sense or a basic understanding of numbers, (dogs have this understanding which helps them in determining the number of predators around them or the amount of food they need to collect, human babies too have a sense of “numerosity” which is linked to the parietal lobe of the brain during infancy) but humans are able to formulate abstract mathematics such as algebra and calculus(which involves more activity in the prefrontal cortex). This remains an unsolved mystery as to how this jump of mathematical ability happens between infancy and adulthood. "Our work not only shows that dogs use a similar part of their brain to process numbers of objects as humans do -- it shows that they don't need to be trained to do it," says Gregory Berns, Emory professor of psychology Hence, one might think whether the amount of “training” we get, helps us get an edge in higher mathematics. 1+2=3 !

MORE INFORMATION :
HTTPS://WWW.SCIENCEDAILY.COM/RELEASES/2019/12/191218153339.HTM
OR SCAN THE FOLLOWING QR CODE -

GOBBLE THE FACTS !

Get ready to guzzle down these interesting facts...

Photo by American Public Power Association on Unsplash

WORLDS LARGEST DAM !

Three Gorges Dam in China is the World's Largest Dam. At it's full capacity, it decreases speed of Rotation of Earth by 0.06 microseconds which lead to slightly longer Days.

GLUTTONY BRAIN !

Even though your brain is only about 2% of your body's weight, about 3 pounds, it uses 20-30% of the calories you consume.

Image by Colin Behrens from Pixabay

Image by StockSnap from Pixabay

BIOLUMINESCENT TREES !

A group of developers are taking the glow in the dark enzyme found in certain jellyfish and fireflies and creating bioluminescent trees. These trees could possibly light up public streets while being energy-neutral.

Image by Colin Behrens from Pixabay

WHAT'S YOUR AGE ?

Your body is only 11 months old. Almost every cell in your body is replaced every 11 months. Except for brain cells, which are replaced after 7 years.

DÉJÀ VU !

Believers in this theory claim that the human experience of deja vu can be explained by considering the unsettling feeling of having lived a moment before as a "crossover' with a parallel universe. This would mean that whatever you're doing while experiencing the deja vu, a parallel version of you is doing it in a different universe simultaneously, therefore creating an alignment between the two universes!

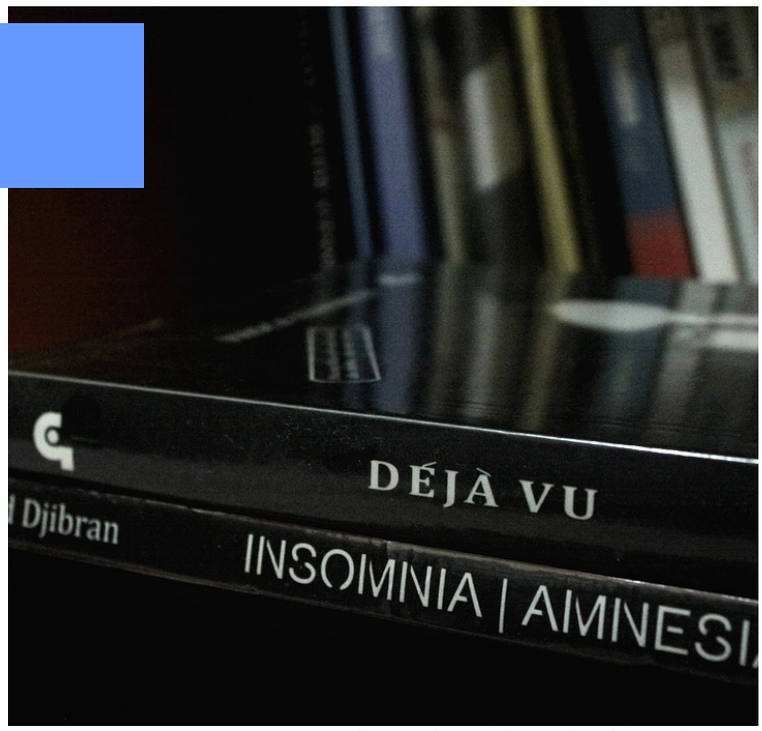


Image by marlon Nainggolan from Pixabay

SPARKLING MINDS !

The human brain (when awake) produces enough electricity to power a 40 watt light-bulb for 24 hours.

Facts finder: Mrunal

MARCH 2020 | ISSUE NO. 3

THE QUIZOPEDIA

Are you ready to get your brain busted !

Photo by Siora Photography on Unsplash

The Quizopedia

A brain-storming contest and a chance for the readers to become famous.

But hold your horses right there! Check out the instructions below before you begin :
The QR code below will take you to a Google form which is a quiz consisting of 10 questions. You must answer all the questions and try to get most of them correct. There will be no negative marking. The names of the winners would be published in the upcoming issue and winner of the contest will get exciting prizes at the end of the contest. Answers would be officially released via mail on 25/03/2020.
(Competition begins on 02/03/2020 at 12 pm)
The winners would be chosen based upon
1. No. of correct answers
2.Time of submission
Deadline : 20/3/2020

So let's begin....
Scan below or click on the QR code.

Quizopedia winners:

Siddhartha Naik

Answers to the previous quiz have been mailed to the participants.

Quiz master: Aditya

D-CODE

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

IMAGE BY COMFREAK FROM PIXABAY

D-CODE

Here is a brainy puzzle for you. Use anything and everything that you can and decipher it. The answer can a word or couple of words. Scan the QR code below and send us the right answer in shortest amount of time to get that glory. The winner and next 2 runner-ups will have their names printed in the upcoming issue. Top the leader-board and win exiting prizes and the end of the contest. Competition starts on 02/03/2020, 12pm.

Here comes the question:

1. The World, right On Time.
2. That's all Folks!

Images related to above questions are on the right side of the page.

D-code Winner:

Gangasagar Ransarje
School-K.C Thackeray Vidya Niketan School

Deadline: 20/3/2020

1.

2.

- QR code for hints : (Remember hints would be released 48 hours after the start of the contest)

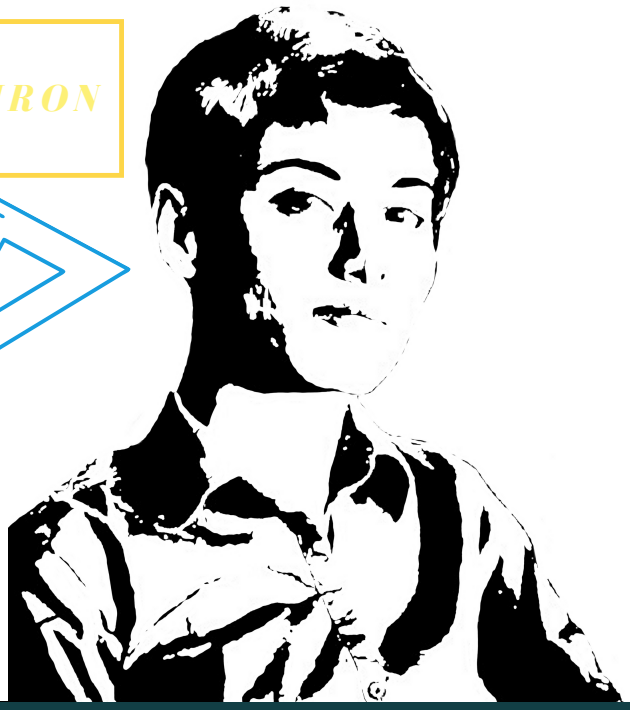
- To submit your answer scan the following QR code :

ISSUE NO.3 | MARCH 2020

INSPIRON

AN EPITOME OF MATCHLESS BRILLIANCE

MARYAM MIRZAKHANI



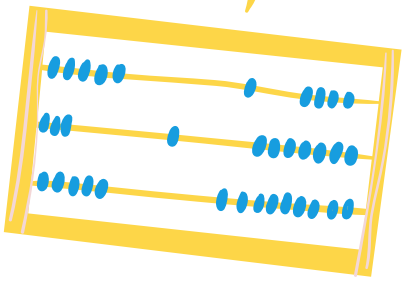


ILLUSTRATION BY RITU

01. Women in Mathematics

Not until recent years, it has often been socially unacceptable, or even impossible, for women to study mathematics at the highest levels. It is indeed unfortunate to find only a meagre number of female mathematicians even today, though the numbers have risen significantly with the onset of modern times, It requires effort and active engagement to change the culture. Progress is being made, albeit slowly. The “leaky pipeline” of academia (which sees women drop out at every level) means that even though gender diversity is improving amongst mathematics undergraduates, the balance is not great among postdocs and worse still among professors. Recent data from the London Mathematical Society showed that from 2014 to 2015 around 40% of UK mathematics undergraduates were female, but only 9% of UK mathematics professors were female. It is not surprising that the same phenomenon occurs in many walks of life, not just academia. Lots is being done to try to understand why this is the case in mathematics. Recruitment practices are being improved, and academics are being trained in unconscious bias. Perhaps a problem that is distinctive to mathematics (and closely related subjects) is cultural. There is sometimes an unhelpful perception that one has to be some sort of genius to succeed in mathematics, and this can be off-putting. Here is the story of one such mathematician who raised the ceiling in the world of mathematics by her astounding genius.

WITHIN THESE PAGES:

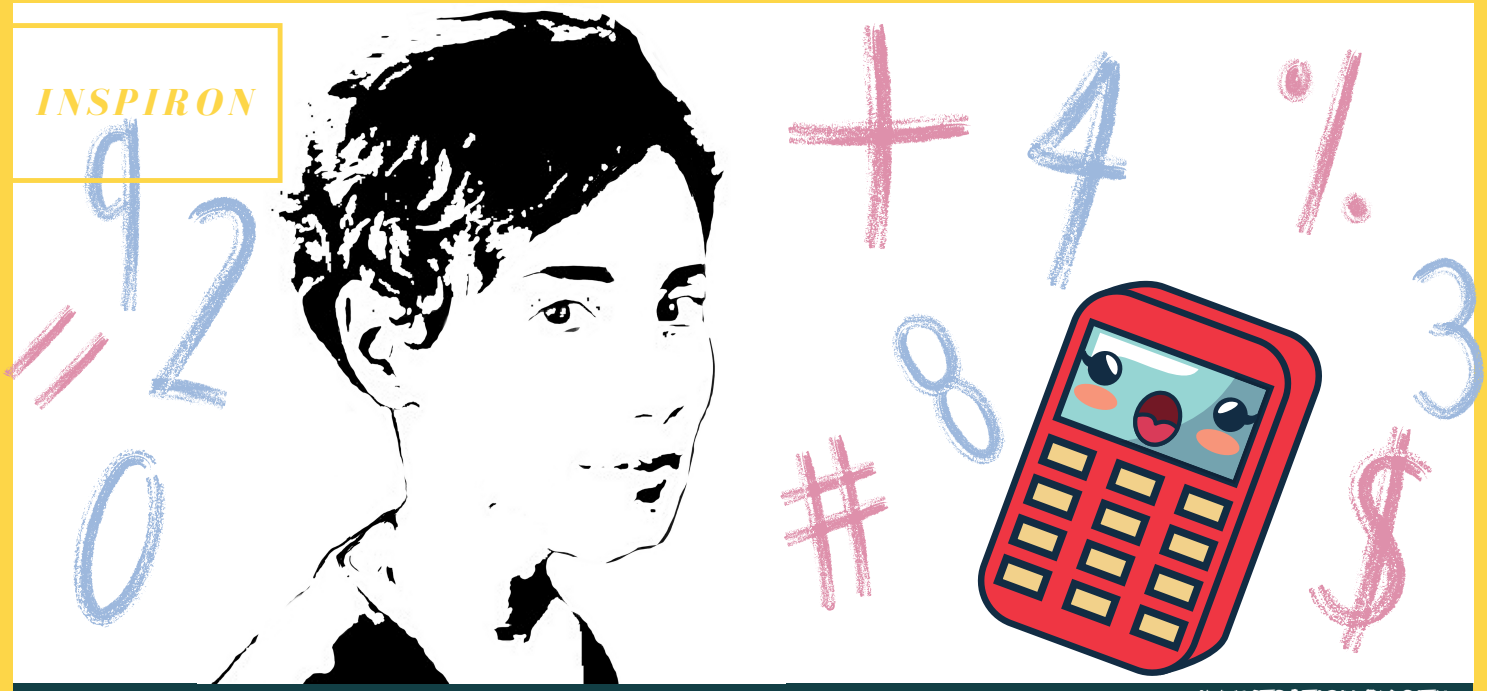


ILLUSTRATION BY RITU

02. Maryam Mirzakhani - An epitome of matchless brilliance

It is not every day that you come across the name Maryam Mirzakhani. This amazing personality was, and in fact still is, a gem in the mystifying world of mathematics. Born on 12th May 1977, Mirzakhani was an Iranian mathematician and a professor of mathematics at Stanford University. Her research mainly encompassed the areas of Teichmüller theory, hyperbolic geometry, ergodic theory, and symplectic geometry. In spite of being reserved and private as a person, Mirzakhani was dynamic and unbeatable when it came to the blackboard. In 2005, as a result of her research, she was honoured in Popular Science's fourth annual "Brilliant 10' in which she was acknowledged as one of the top 10 young minds to have propelled their fields towards groundbreaking discoveries. When Mirzakhani was in sixth grade, in Tehran, a teacher discouraged her interest in mathematics, erroneously regarding her as incapable merely because she wasn't among the 'top' students of her class. Little did the world know that a quarter-century later, in 2014, she would become the first woman (and the first Iranian) to win the Fields Medal, math's highest honour. The award committee cited her work in "the dynamics and geometry of Riemann surfaces and their moduli spaces". Mirzakhani's list of achievements is endless. In 1994, Mirzakhani achieved the gold medal level in the International Mathematical Olympiad in Hong Kong, scoring 41 out of 42 points, becoming the first female Iranian student to do so. The following year, in 1995, she achieved a perfect score to win two gold medals in the International Mathematical Olympiad held in Toronto.

> *The beauty of mathematics only shows itself to more patient followers.*

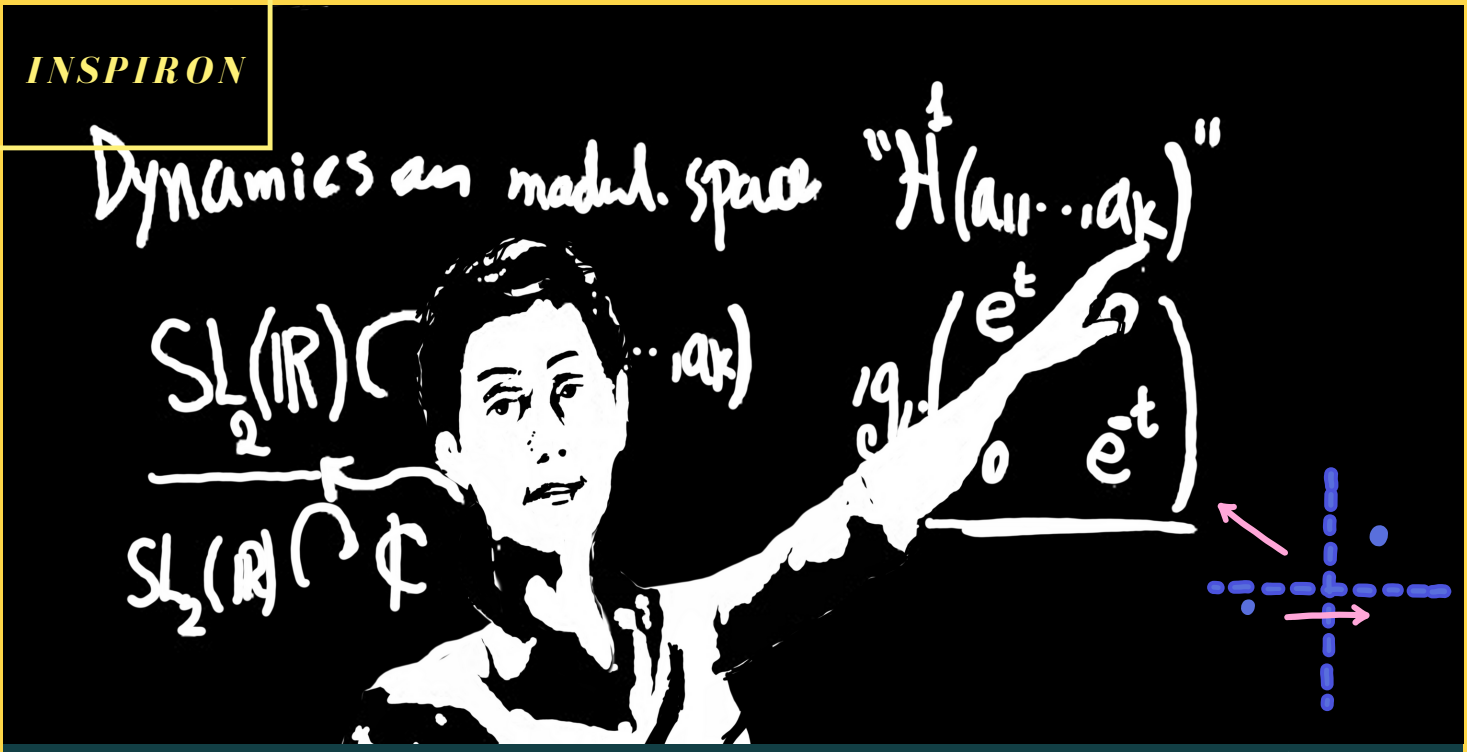


ILLUSTRATION BY RITU

Later in her life, she collaborated with friend, colleague, and Olympiad silver medalist, Roya Beheshti Zavareh, on their book Elementary Number Theory, Challenging Problems which was published in 1999. Regardless of the numerous accolades attached to her name, Mirzakhani always remained down to earth because though she took pride in them, they were never her true concern.

03. DETERMINATION IS THE KEY

In 1999, she obtained a Bachelor of Science in mathematics from the Sharif University of Technology. During her time there, she received recognition from the American Mathematical Society for her work in developing a simple proof for a theorem of Schur. She then went to the United States for graduate work, earning a PhD in 2004 from Harvard University, where she worked under the supervision of the Fields Medalist Curtis T. McMullen. At Harvard, she is said to have been "distinguished by determination and relentless questioning", despite not being a native English-speaker. She used to take her class notes in Persian.

The Princeton mathematician Manjul Bhargava, who also won a Fields in2014, said that Mirzakhani “was a master of curved spaces.” As heexplained in an e-mail, “Everyone knows that the shortest distance between two points on a flat surface is a straight line. But if the surface is curved—for example, the surface of a ball or a doughnut—then the shortest distance will also be along a curved path, and can thus be more complicated. Maryam proved many amazing theorems about such shortest paths—called ‘geodesics’—on curved surfaces, among many other remarkable results in geometry and beyond.”

> *“I don’t think that everyone should become a mathematician, but I do believe that many students don’t give mathematics a real chance.”*

CREDIT: COURTESY OF MARYAM MIRZAKHANI

More info :
http://www.ams.org/profession/mirzakhani

Or scan the following QR code:

04. The Fields Medal Puzzle

At the I.C.M. meeting in Seoul, where Mirzakhani was awarded the Fields medal along with Manjul Bhargava, Artur Avila and Martin Hairer, the presenters apparently hadn't realized that the medals were engraved with the recipients' names, and they incorrectly distributed them. "I received Martin's, who received Maryam's, who received Artur's, who received mine," Bhargava said. "An unlikely scenario, even if the medals were distributed randomly." The mathematicians had a real-life combinatorial problem in their hands. Talk about mathematics being just an abstract pile of figures! As a matter of fact, Mirzakhani had been undergoing chemotherapy for breast cancer at that time and still made it to the event despite her failing health.

05. Etched forever in our memories - A significant loss to the mathematical community

Unfortunately, the world lost this math virtuoso on 14th July 2017 when she was merely 40 years old. Mirzakhani described herself as a "slow' mathematician, saying that "you have to spend some energy and effort to see the beauty of math.' To solve problems, Mirzakhani would draw doodles on sheets of paper and write mathematical formulas around the drawings. Her daughter, Anahita, described her mother's work as "painting'. Mirzakhani once declared:
I don't have any particular recipe [for developing new proofs]. It is like being lost in a jungle and trying to use all the knowledge that you can gather to come up with some new tricks, and with some luck, you might find a way out.

IF–

by - Rudyard Kipling

If you can keep your head when all about you
Are losing theirs and blaming it on you,
If you can trust yourself when all men doubt you,
But make allowance for their doubting too;
If you can wait and not be tired by waiting,
Or being lied about, don't deal in lies,
Or being hated, don't give way to hating,
And yet don't look too good, nor talk too wise:

If you can dream—and not make dreams your master;
If you can think—and not make thoughts your aim;
If you can meet with Triumph and Disaster
And treat those two impostors just the same;
If you can bear to hear the truth you've spoken
Twisted by knaves to make a trap for fools,
Or watch the things you gave your life to, broken,
And stoop and build 'em up with worn-out tools:

If you can make one heap of all your winnings
And risk it on one turn of pitch-and-toss,
And lose, and start again at your beginnings
And never breathe a word about your loss;
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: 'Hold on!'

If you can talk with crowds and keep your virtue,
Or walk with Kings—nor lose the common touch,
If neither foes nor loving friends can hurt you,
If all men count with you, but none too much;
If you can fill the unforgiving minute
With sixty seconds' worth of distance run,
Yours is the Earth and everything that's in it,
And—which is more—you'll be a Man, my son!

Image by: Elliott & Fry / Public domain

Rudyard Kipling (1865- 1936) was an English journalist, short-story writer, poet, and novelist. Most of his works are based on India, where he was born and spent some of his adult life. He is most well known as the writer of 'The Jungle Book.' His significant works in the poetry genre include 'If..' and 'Mandalay.' He won the Nobel Prize in Literature in 1907 at the age of 41, being the youngest to win to this date.

More Info:
https://www.poetryfoundation.org/poems/46473/if--
Or scan the following QR code -

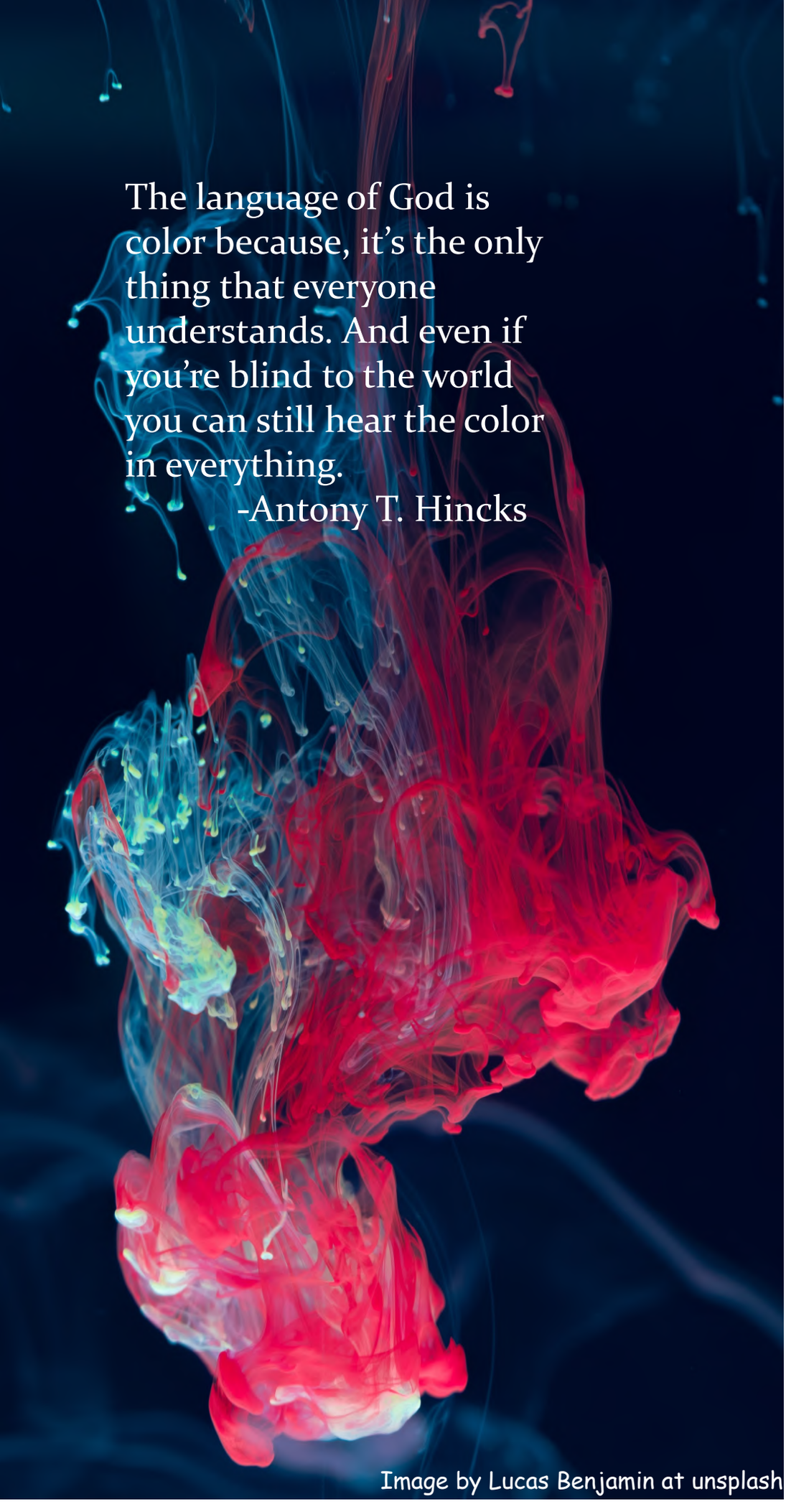


Image by Lucas Benjamin at unsplash

HAPPY HOLI

Mail us your articles, querries, poems, views, etc. through the following contact ways. We will be happy to publish it in next issue.

GREETINGS FOR 03.14.2020

Thank you for reading our third issue.Do let us know your reviews about knowbel and keep us motivated through the following link or by just scanning the QR code: https://-forms.gle/a7whZUs-nDE5g9bQPA

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