

The good thing about science is that it's true whether or not you believe in it.” “Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.

Marie Curie

## Visionary Physicist

### MEET INDIA’S ROCKET WOMAN: MOUMITA DUTTA



A physicist at the Indian Space Research Organisation’s Space Applications Centre, Moumita Dutta was part of the team that put a probe into Mars orbit in 2014. The instruments they designed for the Mangalyaan are still beaming back data. Dutta ended up doing a master’s in applied physics, specializing in optics. She said, “one morning in 2004 I read in the local newspaper that India was preparing for its first lunar mission, and I thought ‘What a phenomenal thing’. From that moment on I wanted to join the ISRO.” A year and a half later, she worked on two sensors that flew on the Chandrayaan-1 project. Dutta was raised in Kolkata and obtained her M Tech degree in Applied Physics from the University of Kolkata.

She joined the Space Applications Centre, Ahmedabad in 2006. Since then she has been involved in many prestigious projects like Oceansat, Resourcesat, HySAT, Chandrayan I and Mars Orbiter Mission. Moumita left the offer of a PhD abroad and moved halfway across the country to join ISRO in its mission to the Moon. She was chosen to work as Project Manager for the Methane Sensor for Mars and was given the responsibility for the development of the complete optical system, optimization and characterization and calibration of the sensor. Moumita and her colleagues concluded that their best shot at recording those fine measurements lay in a choice of an optical filter that had never been flown in interplanetary missions: etalon. It was untested, but sensitive enough to detect the smallest amounts of methane and it would bring down the weight of the sensor to under 3kg or 6.5lb. Moumita conceptualized, developed, and executed tests for the etalon. It was so critical to nail this experiment, the chairman and directors of ISRO were present for the tests. In an interview Moumita says, “Actually in our work on the Methane Sensor for Mars, we were five ladies. Now you know what happens when more than two ladies come together. And with five members, specialists in different subjects, you won’t believe, how these five went hand in hand. Finally it is the potential that matters. ” Presently she is also leading a team in the indigenous development of optical instruments (i.e. imaging spectrometers) and working towards the realization of the ‘Make in India’ concept. Her research area includes miniaturization of gas sensors which involves state-of-the-art technologies in the field of optics. She is a recipient of the ISRO Team of Excellence Award for the Mangalyaan. As far as space science is concerned, she was always thrilled with some of the keywords like ‘space’, ‘UFO’, and ‘aliens’ and the term ‘space communication’ meant to her was communication with the aliens. Besides being a space scientist, she is interested in literature, creative writing, recitation and music. Women scientists in India tend to be less visible than their male counterparts, and public awareness of Indian women scientists is low’. ISRO’s women scientists, particularly those that worked on MOM (or Mangalyaan), slowly changing this paradigm through their performances, perspectives and plaudits.

## Science News Section

### HOW DO HUMAN HEART CELLS REACT TO MICROGRAVITY?

Human heart cells exposed to microgravity show surprisingly quick changes in function and gene expression, but largely return to normal when back on Earth, say researchers in the US. The team compared the RNA, morphology and behavior of two sets of cardiac muscle cells in vitro, one of which spent more than five weeks onboard the International Space Station (ISS). During the samples’ 5.5 weeks on the ISS, astronaut and co-author Kathleen Rubins, of NASA Johnson Space Center, observed the cells’ contraction dynamics using video microscopy. After the cells were returned to Earth, the researchers used phase-contrast microscopy and immunofluorescence microscopy to measure the cell morphology. Equivalent observations on the ground-based cells revealed no significant differences in shape and structure between the two sets of cultures. However, those in orbit beat less regularly and contracted and relaxed more slowly, which the researchers attribute to changes in the way calcium was cycled within the cells.

### QUANTUM DOT LEDS GO CADMIUM-FREE

Light-emitting diodes (LEDs) containing semiconducting nanocrystals called quantum dots are ideal for applications such as large-panel displays and solar cells thanks to their high efficiency and colour purity. To date, the chief drawback of these quantum-dot LEDs has been their toxicity, since most contain cadmium or other heavy metals. Now, however, a team of researchers at Samsung in South Korea has engineered cadmium-free light emitters with an efficiency, brightness and lifetime comparable to those of their environmentally unfriendly predecessors. Quantum dots (QDs) emit light via a process known as radiative recombination. When an electron in the valence energy band within the QD absorbs a photon and moves to the conduction band, it leaves behind an electron vacancy, or hole. The excited electron and hole then recombine, releasing a photon. Indium phosphide (InP)-based QDs are promising alternatives because their photoluminescence quantum yield – the number of photons emitted by the QD, divided by the number absorbed – is high, at 93%. Even so, the light-emitting performance of (InP)-based LEDs has lagged those of their Cd-containing cousins for reasons that are thought to derive from structural defects in the material. These defects reduce the external quantum efficiency of InP devices to just 12.2%.

### CRACKING 60-YEAR-OLD MYSTERY OF SUN'S MAGNETIC WAVES

The closest ever mission to the Sun has discovered dynamic structures in the solar wind that will help explain how this flux of charged particles is created and evolves as it travels out into space. The results are highly relevant here on Earth because the solar wind generates space weather including solar storms, which can damage power grids, communication networks and satellites. NASA’s Parker Solar Probe launched in 2018 and has made measurements of the Sun from a distance of just 24 million km. This is less than half the distance between Mercury and the Sun. The first results from the mission show bizarre S-shaped bends in the solar wind, which is a stream of energetic charged particles riding through the Solar System on magnetic field lines emanating from the Sun. There are two main components to the solar wind: the fast wind that appears to emanate from magnetic gaps in the Sun’s corona; and the slow wind, which is more of a puzzle. “We have theories, but we don’t know for certain” what produces them, Christian tells Physics World. What the bends highlight is that the structure within the solar wind is imprinted upon it close to the Sun, where the solar wind is far more turbulent than it is as it passes Earth. The new results show that, alongside the solar wind’s radial velocity, there’s also a rotational component that moves at between 35–50 km/s. As the Sun rotates, it creates magnetic tension in the corona and as magnetic fields twist up, plasma ends up being flung out into space. This had been expected, but its rotational velocity far exceeds the predictions.

Prove that PAPA = MAMA

How many theoretical physicists specializing in general relativity does it take to change a light bulb?

Answer: Two. One to hold the bulb and one to rotate the universe.



PHYSICS STUDENT:  
Force(F) = Mass(M) \* Acceleration(A)  
Force(F)= Pressure(P) \* Area(A)  
This implies,  
PA = MA  
Squaring both side  
PAPA = MAMA  
Hence proved.

### MEET INDIA’S ROCKET MAN : DR. KAILASAVADIVOO SIVAN



A humble son of a farmer who studied in local government schools in Tamil medium at Kanyakumari district of Tamil Nadu is now heading India's premier Space agency ISRO. A space scientist from Tamil Nadu, Sivan is now the 9th chairman of ISRO after he took over from AS Kiran Kumar. K Sivan, Director of Vikram Sarabhai Space Centre, who is the Secretary of Space Department and Chairman of Space Commission and the Indian Space Research Organization (ISRO), is a native of Tarakkanvilai in Kanyakumari district."Sivan hails from a very ordinary family. His father was a farmer. He is the first graduate in the family", his uncle A Shunmugavel said.

He joined ISRO in 1982 in Polar Satellite Launch Vehicle (PSLV) project and contributed immensely towards end to end mission planning, mission design, mission integration and analysis. Sivan studied in a Tamil medium Government school in Mela Sarakkalvilai Village and later in Vallankumaranvilai in Kanyakumari district. He graduated from Madras Institute of Technology in Aeronautical engineering in 1980. He took his ME in Aerospace engineering from IISc, Bangalore in 1982. Subsequently, he completed his PhD in Aerospace engineering from IIT, Bombay in 2006. For his contribution to space research, the rocket scientist has received many awards, including the Shri Hari Om Ashram Prerit Dr Vikram Sarabhai Research Award in 1999, ISRO Merit Award in 2007, and Dr. Biren Roy Space Science Award in 2011. Indian Systems Society for Science and Engineering, Aeronautical Society of India, and Systems Society of India. With his expertise in all areas pertaining to launching vehicles, he published a book titled Integrated Design for Space Transportation System in the year 2015. He is also a Fellow of the Indian National Academy of Engineering, the Aeronautical Society of India and the Systems Society of India. He is the chief architect of 6D trajectory simulation software, SITARA which is the back-bone of the real-time and non-real-time trajectory simulations of all ISRO launch vehicles. He commissioned world class simulation facility in ISRO for mission synthesis and analysis which is used for mission design, sub-system level validation and integrated validation of avionics systems in all ISRO launch vehicles. He developed and implemented an innovative day-of launch wind biasing strategy which has made possible rocket launch on any day of the year at any weather and wind conditions. He has contributed significantly in establishing a Parallel computing facility and Hypersonic wind tunnel facility, which has opened new avenues in the area of computational fluid dynamics, and self-reliance in wind-tunnel testing. He evolved novel cost effective strategies for launching India's MARS mission endeavor through PSLV, ISRO's work horse. He also led the RLV-TD development program and spearheaded its design, qualification, aerodynamic characterization and hardware development. He is the chief mission architect for 104 satellites launched in a single mission of PSLV (PSLV C37). Successful accomplishment of first development flight of GSLV Mk-III which launched heaviest satellite from Indian soil was under his leadership. He is the Chief architect of ISRO's Space Transportation and technology roadmap for meeting the future requirements as well as augmenting the existing capabilities in a phased manner. Dr K Sivan, Chairman, ISRO was awarded Dr A P J Abdul Kalam Award by Tamil Nadu government for the year 2019. The award was announced in recognition of Dr Sivan’s stellar work in the promotion of science and technology. He is also known at ISRO for his tireless work and is regarded as a workaholic, earning his nickname, “sleepless scientist”.

### NOVEL MATERIAL SWITCHES BETWEEN ELECTRICALLY CONDUCTING AND INSULATING STATES

Northwestern Engineering researchers have developed a novel design strategy to identify new materials exhibiting a metal-insulator transition (MIT), a rare class of materials categorized by their ability to reversibly switch between electrically conducting and insulating states. The new method could jumpstart future design and delivery of faster microelectronics with more storage capabilities, as well as quantum materials platforms for future electronics. Using quantum-mechanical computer simulations at Northwestern's Quest High Performance Computing Cluster, Rondinelli and researchers designed the picoscale crystalline structure of the new material, called molybdenum oxynitride (MoON), to host the phase transition. The researchers found the MIT occurred near 600 degrees Celsius. The group noted multiple design parameters influenced MoON's phase transition. The inclusion of multiple anions in the material -- in this case, negatively charged oxygen and nitrogen ions -- activated the phase transition due to specific electron configurations related to the spatial orientation of electronic orbitals, supporting previous findings in other binary MIT materials. In addition, MoON's flexible rutile crystal structure lent reversibility between electrically conducting and insulating states.

### A MOMENTOUS VIEW ON THE BIRTH OF PHOTOELECTRONS

The creation of photoelectrons through ionisation is one of the most fundamental processes in the interaction between light and matter. Yet, deep questions remain about just how photons transfer their linear momentum to electrons. With the first sub-femtosecond study of the linear photon momentum transfer during an ionisation process, physicists now provide unprecedented insight into the birth of photoelectrons. The interaction between light and matter is the basis of both many fundamental phenomena and various practical technologies. Most famously, in the photoelectric effect, electrons are emitted from a material that is exposed to light of suitable energy. In some important cases, the key principle is the transfer not of energy but of linear momentum -or, impulse - from photons to electrons. This is the case, for instance, when laser light is used to cool microscopic and macroscopic objects, or to understand the phenomenon of radiation pressure. Despite the fundamental importance of momentum transfer, the precise details of how light passes its impulse on to matter are still not fully understood. One reason is that the transferred impulse changes during an optical cycle on extremely fast, sub-femtosecond timescales. This gap has now been filled by the group of Ursula Keller at the Institute for Quantum Electronics, they looked at the case of high laser intensities, where multiple photons are involved in the ionisation process, and investigated how much momentum is transferred in the direction of laser propagation. To achieve sufficient time resolution, they employed the so-called attoclock technique, which has been developed and refined in the Keller lab over the past decade. Instead, information about the rotating laser-field vector in close to circular polarised light is used to measure time relative to the ionisation event with attosecond precision. With this versatile tool at hand, the ETH physicists were able to determine how much linear momentum electrons gained depending on when the photoelectrons were 'born'.



## 15 days industrial visit at Gujarat Borosil Ltd., Bharuch Gujarat

Four students went on 15 days industrial visit at Gujarat Borosil Ltd., Bharuch, Gujarat from 25th June 2019 to 9th July 2019. Gujarat Borosil Ltd. manufactures finest quality sheet glass in the country and has been the largest exporter in this segment. Students learnt about preparation and applications of toxicity free glasses. Toxin free glasses manufactured by GBL are devoid of arsenic and antimony. New concept about production and installation of solar panels were learnt by students. Further students acquired knowledge about tempered glasses. This exposure will go in long way in developing scientific and research temper in them.



## Star Students Award under DBT Star College Status

40 students were appreciated for their best performance under DBT Star College status. Students were awarded for their excellent presentations, demonstrations of physics experiments, research work etc. To acknowledge the contribution of students, department distributed physics text books among students. Principal Madam congratulated all the students and appreciated physics department for such an encouragement given to the students. Such efforts will enhance the scientific temperament among them.

## An essay writing competition on Guru Nanak Dev Ji – as science teacher, was organized

An event of essay writing competition on Guru Nanak Dev Ji-as Science Teacher is organized on 1<sup>st</sup> August 2019 by the students of M. Sc. (Physics) Sem III. Twenty students of B.Sc and M.Sc. participated in this event. Amanjot Kaur of B.Sc Sem III bagged the first position, Tanvi Sharma of Sem I won Second position, Monika of M.Sc (Physics) Sem I succeeded to earn the third position. The consolation prize was given to Lovleen Saini of B.Sc Sem I.



## 5-DAY INSPIRE CAMP was Organized from 3rd to 7th September



Fourth day of the camp was organized by P.G. Department of Physics. Three eminent personalities Prof. (Dr.) Ravi Kumar, NIT Hamirpur, Dr. Arvind Dhillon, IISER, Mohali, Dr. Awadhesh Pandey, Adarsh Hospital, Amritsar graced the occasion. Prof. (Dr.) Ravi Kumar inspired students to take physics as a carrier. He said “It is not important to know what you know, but it is more important to know what you don’t know”. Dr. Awadhesh Pandey informed the students about Nuclear medicine and radiotracers that are typically injected into the bloodstream, inhaled or swallowed. Dr. Arvind Dhillon is theoretical physicist working in the area of quantum information theory. He explained about basic concepts of quantum mechanics. Dr. Neetu Chopra, KMV Jalandhar organized a workshop in which she demonstrated different experiments. Dr. Sonik Bhattia conducted quiz named “Kaun Banega Einstein” for students.

## Students attended “An interaction with Prof. HC Verma” at LPU



Seven Students of M.Sc. (Physics) sem-II accompanying two teachers attended an interaction with HC Verma on 18<sup>th</sup> October at LPU. The students enjoyed the lecture delivered by Dr. Verma. The students also got the chance to interact with Dr. Verma and ask their queries regarding the concepts of Physics.

## Online course on “Basics of Quantum Mechanics” by Prof. HC Verma

17 students of M.Sc Physics, 3 student of B.Sc. And three faculty members of department enrolled for online course on the topic “Basics of Quantum Mechanics” conducted by Prof. HC Verma of IIT, Kanpur. These students and teachers have been provided certificates by CDTE, IIT Kanpur. This course includes the phenomena leading to the development of quantum mechanics, photoelectric effect, Compton effect, wave particle duality, de-Broglie matter waves, operators corresponding to measurable quantities and their expectation values, etc. the course run from 15<sup>th</sup> August to 18<sup>th</sup> November, which includes lectures and assignments. The certificate was also provided to the students who have visited at least 90% of the videos.

Thus the students get double benefits by watching the lectures: 1 They understand the concepts of quantum mechanics that will surely help them to crack CSIR-NET examination. The other is they got certified.

## Extension Lecture on “Intellectual Property Rights”

An extension lecture on “Intellectual Property Rights” was organized on 9<sup>th</sup> December under DBT star college scheme. The resource person of the day was Dr. K.S. Nagla, Associate Professor and Head, Instrumentation and Control Engineering, NIT Jalandhar. During his talk, he focused on Introduction of IPR, Patents, Copyrights and Design. He defined intellectual property rights (IPR) as ideas, inventions, and creative expressions based on which there is a public willingness to bestow the status of property. He added that IPR provide certain exclusive rights to the inventors or creators of that property, in order to enable them to reap commercial benefits from their creative efforts or reputation. He also told that patent can be filed for very simple designs or mechanisms which need not to be very technical. But condition is that it must be unique, useful for society and can be commercialized. He boosted the audience to get their unique as well as innovative ideas patent.



## Faculty Development Program on “Capacity Building and Enhancement in Higher Education”

One week Faculty Development Program on ‘Capacity Building and Enhancement in Higher Education’ was organized from December 16 to 21, 2019. This FDP has provided an opportunity to 125 participants to listen to academicians and scientists who are an authority in their fields of specializations. Each resource person touched a different topic which were relevant to the theme of the FDP. This has provided an opportunity to gain knowledge on various aspects of capacity building which included Role and responsibility of faculty in Higher Education, Course preparation, Designing, Delivering and Assessment, Soft Skills for teachers, Use of ICT in Teaching Learning Process, Research Methodology and Work life Balance.



## National Anveshika Experimental Skill Screening Test 2019 was conducted



National Anveshika Skill Test 2019 was conducted on 10<sup>th</sup> August 2019 in collaboration with Indian Association of Physics Teachers (IAPT). Anveshika is an IAPT initiative to create centers across India in schools and Colleges where students and teachers can learn experiment-based physics and try out their own ideas. In screening test short experimental videos were played and questions based on videos were asked. Selected students from different institutes appeared in preliminary examination on 17<sup>th</sup> August and performed various experiments based on Physics fundamentals. The Best experiment performer from school and college was shortlisted and got the opportunity to compete in semi final and final round held in IIT, Kanpur. Ms. Anureet of M.Sc. (Physics) Sem-II also got the chance to compete for semi finals.

## Tribute to Dr. Vikram Sarabhai was given on his 100<sup>th</sup> Birthday



Dr. Vikram Ambalal Sarabhai was an Indian scientist and innovator widely regarded as the father of India's space programme. The lander on India's moon mission Chandrayaan II is named Vikram in his honor. To commemorate and celebrate his 100th birthday “A tribute to Vikram Sarabhai” was organized. 150 Students participated with enthusiasm and presented his biography and recent inventions of Chandrayaan II. Kanya Maha Vidyalaya, Jalandhar has registered Vikram Sarabhai Science society under Vigyan Prasara and has been awarded silver level by Vigyan Prasara, Department of science and technology, Govt. of India. Objective of Vikram Sarabhai Science society at KMV is to provide a holistic approach toward problems through awareness, concern, involvement, and application of the scientific methodology for their resolution.

## “ANUBHOOTI”- student–student mentoring workshop planned

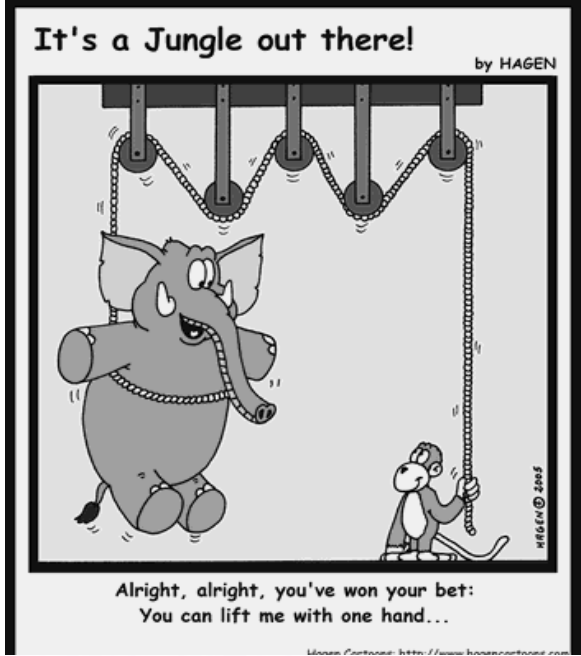
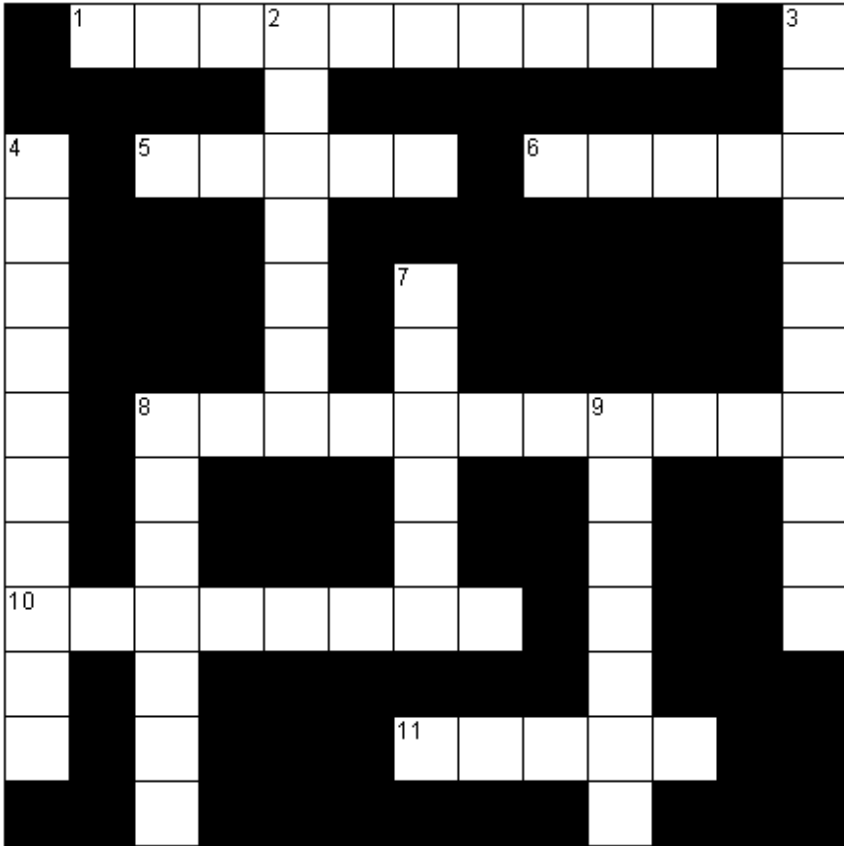


An innovative program “ANUBHOOTI” was organized on 28th August, in which a platform was provided to the students to present their concept based innovative experiments and projects that they have designed under DBT star college scheme. The objective of the event was to encourage the students to work on creative scientific ideas. During this event senior students interacted with juniors and explained them the basic concepts behind their projects like air cooler, Laser show, matchbox microphone, Rocket water bottle and many more.



# Science Crossword Puzzles

# Fun Times with Physics



## Notice

A Seminar on Time Travel will be held two weeks ago.

### Across

- 1. A shaking or trembling of the earth that is volcanic or tectonic in origin
- 5. Outermost layer of the earth
- 6. Fracture where blocks of crust on either side move
- 8. An instrument that records the earth's vibrations
- 10. A sudden event bringing great destruction
- 11. Energy that travels through the earth

### Down

- 2. Large ocean wave caused by an underwater earthquake or volcanic eruption
- 3. An earthquake that happens after the main earthquake
- 4. Location of 1994 earthquake that measured 6.7 on the Richter scale and killed 57 people
- 7. Harm resulting from injury to person or property
- 8. Concerning an earthquake or earth vibration
- 9. Scale used to measure the magnitude of an earthquake

# Story time

## Revelations

No one knew why they came, and in the end, it didn't matter. They came, and that bald fact alone was all the human race needed to know.

We could deduce certain things about them. They were bold, they were advanced, and they were not given to subtlety. They had a single, obvious message for us, and they hit us over the head with it. They must have been monitoring us for many years because when the day came all they had to do was show themselves and leave everything else up to us.

I was driving an air cab on the run between Coogee and Circular Quay when they arrived. They were a bit hard to miss. First the city air traffic net lit up like Christmas, then people started screaming, and everything in the air was ordered down. I saw Police aircars with their spinners flickering herding drivers out of the air, and I put my cab down on the skypad of the Zhen Yun Hotel tower, overlooking Sydney harbor, half a kay back from The Rocks, by the bridge, and copped one of the best views imaginable. Or worst, if you felt that way.

My fare was a young lass on her way to an event at the Opera House and she was as dumbstruck as me; we sat under the long clear canopy of my cab and stared at the sky, gaping like goldfish, as the alien vessel made its appearance. It seemed to fill the sky from horizon to horizon, the clouds swirling and parting before it, sharp cracks of lightning around it as its motion created vast static potential. It was intricately detailed with mechanisms unguessable, its design seemed to follow no logic the human mind could comprehend, at least as abstract or aesthetic as functional; and it was black as hell, or just blocked out the daylight of a cloudy afternoon and hung over us like the stroke of doom.

My fare climbed over from the back into the seat beside me for a better view and at last offered her hand without taking her eyes from the thing. "Jody," she whispered.

"Craig," I returned, as softly. People sat in their craft all around us, the pad was now packed and others were turned away, sent racing for other landfalls or just out of the city as fast as they could move. From the corner of my eye I saw Jody take out her mobile and start imaging the alien, and realized people had their phones raised to the sky in most vehicles around us.

We waited for the streams of light to fall, for the fires and chaos, the devastation--it was obvious we were helpless before them. For a good twenty minutes we expected to die. I saw a guy in the next car praying, a rosary at his lips, and knew others throughout the city would be doing the same--prayer mats and shawls, sidewalk services, Muslims facing Mecca. But after half an hour we were getting bored, and many began to leave their vehicles, walk to the safety rails at the edge of the roof for a better view, and chat.

What can I say? The alien ship must have been over a dozen kilometers long, it was up there, and it didn't do a damned thing. Not an overt act, not a blinking light pattern, nor a voice of thunder from the heavens. It just hung there, as if it was saying, you think you're so smart? What do you make of this? Take your time, kiddies, you've got plenty of it.

And that was probably the point, the whole point, and nothing but the point. Because in the moment of paradigm shift, the human species seemed to lose its grip on reality. Oh, the better minds among us inferred a lot--these aliens did not give a rat's ass for human notions of pecking order, they revealed themselves in Australia, not America. Nor over London, nor Moscow, nor Tokyo. They were in no rush, and were, undoubtedly, watching us cockroaches running frantically in the maze when provided the stimulus.

Well, we sure put on a show. Besides the praying, there were those running in terror, those demanding the aliens be attacked, those trying to communicate--with everything from radio waves to human bodies spelling out welcome on Bondi Beach, and other such banalities as an hour became two. And plenty of folks who assumed it was judgment day and waited to be raptured. Many more lost their grip on sanity, on life itself, and rained from high places, to the disgust of those who were barbecuing in the parks--Centennial, Queen's, Hyde, Nielsen, it was over them all, and lay back on beach towels to stare up at the vessel and wait--because the ball was clearly in our visitors' court.

That was the worst part, I thought, as I leaned on the railing with Jody, and we got stiff necks from staring at the city-sized thing, growing cold in its night-dark shade, watching Police aircars cruise cautiously around it. It did nothing. It made no move, replied to no entreaty, just showed itself like a grotesque photo-op and people took freakin' selfies with it in the background. According to Facebook stats, over 400,000 such images went up in less than two hours. Was that the defining moment in first contact?

That the reality of technological alien visitation was absorbed into the human experience as a manifestation of the selfie disease? If so, it boded ill for the future, because about then the ship moved. It turned very gently, lightning following it through the clouds and striking to the ocean beyond Sydney Heads, and, little by little, it faded from our sight. One moment it filled the sky, the next it was receding, all in ghost-like silence but for the rumble of the storm following it, leaving millions of people with a sudden, aching hole in their hearts and lives. The population of a city stood and stared, and reached after it with supplicating hands, crying out for... something. Anything. Anything but the blank wall they left us.

Were we afraid? Were we too eager? Were we aggressive, or overflowing with tribal superstition? All the above, and maybe it was one big lesson--because Revelations is now a whole new book, and what we make of it will more than likely govern their attitude to us, next time. 'Cause, there'll be a next time. They've opened the door, just a crack; and we're waiting with very mixed feelings for the day they choose to step through it.

Mike Adamson

# RIDDLES FOR FUN

You're in a **cement room** with no windows or doors.

The only thing you have is a mirror and a piece of wood.

A man has to get a **fox**, a **chicken**, and a **sack** across a river. He has a rowboat, and it can only carry him and one other thing.

If the fox and the chicken are left together, the fox will eat the chicken. If the chicken and the corn are left together, the chicken will eat the corn.

There are **eight pills**. They are all the same size and color. One pill weighs slightly more and is poisonous.

You have a balanced scale and can only use it twice.

How do you get out?

How does he do it?

How can you find the poisoned pill?

# FORTHCOMING EVENT

Kanya Maha Vidyalaya, Jalandhar the heritage and autonomous institution is going to organize an exhibition on *World Vision 2050 through Science on Jan 22, 2020* which is supported by Department of Biotechnology (DBT) and ministry of Science and Technology, Govt. of India. ). Nominations are invited from schools/colleges for participating in world vision. There is **No Registration Fee. Certificate will be given to each participant. Cash Prizes worth Rs 5000/-, 3000/-, 2000/- & many more** will be distributed to the achievers.

### About KMV

Kanya Maha Vidyalaya a multifaculty post graduate pioneer institution of women education through 152 eventful years of its existence has long been recognized as a premier centre of higher learning for women. An autonomous Accredited 'A' grade by MAAC and 'The Heritage Institution' status by HRD Ministry, Govt. of India, the college strives consistently to enlighten and empower women. Education at K.M.V. is a unique amalgam of traditional learning and futuristic vision. Committed to preserving our rich cultural legacy and traditional values, the college harmoniously blends tradition and modernity to create an ambience conducive to the holistic development of an individual's potential. K.M.V. has striven ceaselessly to expand landscapes of learning. Keeping pace with the changing times, the college offers courses that help to develop individual skills, knowledge and creativity for a wide choice of career opportunities in Science. The college is running successfully courses in Physics, Chemistry, Mathematics, Zoology Botany, Electronics, Bio Informatics, Agriculture, Environment Management, Biotechnology and Food Science at under graduate level. The college is striving tirelessly to maintain its standards of excellence by fostering an environment of endless opportunities and promoting culture of life-long learning.

### WORLD VISION 2050 THROUGH SCIENCE

Science and technology is progressing at a very fast pace through innovations related with health care, communication, agriculture, environmental issues, robotics, controlling terrorism etc. Class room teaching is insufficient to address these issues. This exhibition will be a good initiative to develop creativity, visionary thinking and imagination among budding scientists. It will provide a platform to the students where they will be an inherent part of all the activities and will be able to showcase their talent and imaginations in innovative manner. All events of this mega show have been planned with the objective of not only learning , understanding and getting involved in science in a very easy way but will also provide an opportunity for expression of scientific talent and development of scientific temper among students at large . It is an effort to galvanise the hidden talents of students to build up their confidence, create awareness and enable them to face future challenges of the world. It will encourage the students to innovatively think about future, to tackle all the present issues that the world is facing and also suggest solutions through creative ideas and imagination. This exercise will increase passion for science among the masses through innovative techniques. The aim is to develop adaptable, creative and motivated individuals who can take responsibility for their own learning and also work effectively in team for the betterment of society – a world in 2050.

### Events

#### Visualize 2050 through art and working models :

- Max. 4 teams per institution and 2 students per team.

#### Institution:

Dr. Surbhi (9883359752),  
Dr. Sandeep Kaur (8146772251)

#### Flora Expo.

- Plant variety show with ornamental and medicinal plants
- Max. 3 teams per institution and 2 students per team.

#### Institution:

Ms. Shikha (9569611748),  
Ms. Deepika (978096474)

#### Edible art

- Edible art pieces of life & environment

#### Kaun Banega Scientist

Screening and Stage Show of General Science Quiz

- Max. 3 teams per institution and 2 students per team
- Max. one team per institution and 3 students per team

#### Institution:

Dr. Harleen Singh (7889133510),  
Dr. Sandeep Singh (9478761601)

#### Wings to Imagination through cartoon

- Max. 3 teams per institution and 2 students per team.
- Pre-prepared poster of size 28"X22 inches.

#### Institution:

Dr. Archana Saini (882644840),  
Dr. Narinderjit Kaur (946488105)

#### Poster of world of Science

- Max. 1 team per institution and 8-10 students per team.
- 5-6 mins will be given to each team

#### Edible art competition

- Max. 5 teams per institution and 2 students per team.
- One 812 inches photograph per entry depicting environmental contribution/ protection initiative

#### Institution:

Ms. Gurpreet (9463453495),  
Ms. Sufalica (8988077162)

#### Advertisement (Cartoonish)

- Max. 1 team per institution and 8-10 students per team.
- 5-6 mins will be given to each team

#### Institution:

Dr. Archana Saini (882644840),  
Dr. Narinderjit Kaur (946488105)

**One student can participate only in one event**

- Level 1 Participants – 9th to 12th class
- Level 2 Participants – Undergraduate science students
- Requisite material to bought by the participant

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### Contact :

Dr. Updesh Kaur (9417490490) / Dr. Neehu Chopra (9463001901)  
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# ACCIDENTAL DISCOVERIES IN PHYSICS

In 1941, Swiss engineer George de Mestral went for a hike in the Alps with his dog. Upon returning home, he took a look at the small burdock burrs that stuck to his clothes, and noticed that the little seeds were covered in small hooks, which is how they became attached to fabric and fur. He hadn't set out to create a fastening system, but after noting how firmly those little burrs attached to fabric, he decided to create the material that we now know by the brand name Velcro. It became popular after it was later adopted by NASA, and became commonly used on sneakers, jackets, and so much more.

## Science Crossword Puzzles

### Across

- 1.First 4. Liquid 5. Density 9. Atmospheric 13. Watervapor 11. Centripetal
- 15.Pressure 17. AbsoluteHumidity 19. Third 21. Pressure 23. Gas 24.Conduction
- 26. Relative 27. Raised

### Down

- 1. Fulcrum 2. Kinetic 6. Aspectratio 7. Convection 8. Matter 10. Pressure 11.Dewpoint
- 12. Mass 14. Centrifugal 16. Solid 18. Temperature 20. Potential
- 22. Power 25. Work