Estd. 1981

Karnataka Association for the Advancement of Science (R.)

Reg. No. 1961 (No.122/81-82/13-7-1981)

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Contents

President's Note

Dr. K. Siddappa

Illustrious alumni of the central college serving in their alma mater founded the KAAS in 1981 with the objective and aims of promoting science including its application to problems of national importance, disseminating the knowledge of pure and applied science using lectures, publications, demonstrations, exhibitions, etc. It is gratifying to know that the KAAS has, all along been carrying out appropriate activities to realise the dream of the founders.

These activities were carried out in Bangalore and Institutions around Bangalore. The founders right at the time of founding KAAS had visualised, and made provisions to organise branches at other regional centres for the motion of the above objectives and aims. Accordingly, the KAAS Executive Committee decided to open and establish. Two years back a branch was established at Davangere, the central region of Karnataka, which has grown as a knowledge city with a hub of Educational Institutes covering all disciplines of Science and Technology including Davangere University.

Due to the support and involvement of the proactive vice chancellor of Davangere University and authorities of major educational institutions, several activities have been conducted in Davangere in addition to Bangalore to realise the objective of KAAS. These activities are: 1. Noble Lectures of Science awarded in 2023 Davangere University and Bapuji Institute of Engineering and Technology (BIET); 2. A three-day faculty development workshop at Davangere University for improved and more effective performance of teaching and non-teaching staff; 3. A two-day workshop on research methodology at Davangere University and one at BIET; 4. A one-day brainstorming session on collaborative research in biotechnology at TIGS (Tata Institute of Genetic and Society) held at PES University in which researchers of Davanagere University and BIET participated: 5. workshop on biotechnology collaborative research presentation and discussion of proposals held at BIET.

"You cannot teach a man anything, you can only help him discover it in himself," said Galileo. In tune with this saying we employed a novel method, in conducting the above first four programs by using specially designed modules that facilitate interactive mode and experiential learning. Facilitators and senior scientists (all being members of Kaas) conducted these programs. The last two programs invited senior professors of bio-technology and related fields from the universities of Mysore Karnataka and University and senior scientists guided the discussion and Presentations, and offered valuable suggestions. All the programs were successful in bringing total satisfaction, The fine-tuned proposals will be presented in the workshop scheduled to be after six weeks.

KAAS has also undertaken a project to develop 20 selected government high schools as model schools in Davangere District, in collaboration with the District Panchayat Administration. Davangere University and BIET will also participate in implementing this project. Encouraged by these positive developments, KAAS is planning to extend similar activities to other regions of the state. I look forward to sharing more about this plan with you in the next issue of *Vaisheshika*. I am confident that this issue of *Vaisheshika* will reach you soon with engaging articles, including some unsung stories you would appreciate.

My hearty seasonal greetings and best wishes.

Editor's Note

Muktha B. Kagali

Welcome to the second issue of *Vaisheshika*, where we continue our journey of exploring science in ways that inspire curiosity and understanding. This month's edition arrives during Nobel Prize season—a time when the world celebrates groundbreaking achievements in science that push boundaries, solve complex problems, and remind us of the limitless potential of human inquiry. Here at *Vaisheshika*, we strive to make that same spirit accessible, relevant, and inspiring for everyone.

This issue explores topics that connect science, society, and history. *Wings of Wonder: Understanding the Physics of Flight* unravels the principles behind human flight, transforming a modern marvel into an accessible exploration of physics. *The Peril of Water Scarcity* reminds us of our shared responsibility to preserve water, a resource essential to all life. Journeying through deep time, *The Epic History of Life on Earth* captures the incredible story of life's evolution on our planet. *Making of a Swadeshi Suit* takes us back to the spirit of self-reliance, linking a national movement to personal and societal resilience.

ಹಸಿದು ಮೌಲ್ಯ highlights our association's ongoing efforts to promote science for the greater good, underlining the collective power of community and education. A special highlight, *The Unseen Partner: Lokasundari Ammal and Her Impact on C.V. Raman*, offers a heartfelt look at the often-overlooked contributions of women in science, focusing on Lokasundari Ammal's influence on Nobel laureate Sir C.V. Raman. Following this, *The Double-Edged Sword of Salt: Essential but Dangerous* adds another layer, examining the crucial yet complex role of salt in both human health and industry. *KAAS in Action: Engaging in Meaningful Activities for Science and Society* showcases our collective commitment to science and community.

Each article in this issue reminds us that science and society are deeply interconnected. As we turn these pages, may we be inspired not only by discoveries and innovations but also by enduring values of knowledge, resilience, and shared purpose?

We extend our heartfelt thanks to all the contributors whose articles have enriched this issue. Your passion and expertise continue to inspire and educate our readers. A special note of gratitude goes to our esteemed President, whose vision and guidance remain the cornerstone of this periodical's success.

Looking ahead, we invite you all to participate by sharing feedback, suggestions, and article contributions. Together, let us brighten the flame of scientific curiosity and work toward making science accessible and engaging for all.

Thank you for your continued support. We hope this issue provides valuable insights and sparks further interest in the fascinating world of science.

Warm regards

Nobel Prize Winners 2024: Groundbreaking Contributions to Science, Literature, and Peace

Muktha B. Kagali

The 2024 Nobel Prizes were awarded to exceptional individuals whose research and work have made significant impacts on humanity in diverse fields such as science, literature, and peace. This year's laureates continue the prestigious tradition of recognizing achievements that enhance human understanding and global well-being. Here's a closer look at each of the winners and their pioneering contributions:

1. Nobel Prize in Physics 2024: John J. Hopfield & Geoffrey Hinton

Awarded for: Foundational discoveries and inventions that enable machine learning with artificial neural networks.

The field of artificial intelligence (AI) has made enormous strides over the past few decades, with John J. Hopfield and Geoffrey Hinton playing key roles in this revolution. Their work on artificial neural networks, which mimics the way the human brain processes information, has enabled breakthroughs in machine learning. Hopfield's contributions in the 1980s laid the groundwork for modern AI, while Hinton's work on deep learning has led to many of today's AI innovations, including natural language processing and computer vision

2. Nobel Prize in Chemistry 2024: David Baker, Demis Hassabis & John Jumper

Awarded for: Advances in protein design and structure prediction.

In the realm of biochemistry, David Baker revolutionized the way scientists design proteins. By using computational methods, he has enabled the creation of novel proteins with practical applications, from healthcare to environmental sustainability. On the other hand, Demis Hassabis and John Jumper were recognized for their work on AlphaFold, a groundbreaking system that accurately predicts protein structures. This achievement holds immense potential for drug development, understanding diseases, and creating more efficient biomaterials

3. Nobel Prize in Physiology or Medicine 2024: Victor Ambros & Gary Ruvkun

Gary Ruvkun
American molecular biologist and geneticist

Victor R Ambros
American developmental biologist

Awarded for: Discovering microRNA and its role in gene regulation.

Victor Ambros and Gary Ruvkun were honored for their discovery of microRNAs, small molecules that play a crucial role in post-transcriptional gene regulation. This discovery has opened up new areas of research in genetics and molecular biology, offering potential solutions for treating genetic disorders and diseases such as cancer and cardiovascular conditions. Their work has had far-reaching implications for both basic science and medical applications

4. Nobel Prize in Literature 2024: Han Kang

Han Kang
South Korean author

Awarded for: Intense poetic prose that confronts historical traumas.

Han Kang, a prominent South Korean author, received the Nobel Prize in Literature for her profound literary works, which grapple with historical trauma and the fragility of human existence. Her novels, including *The Vegetarian*, challenge societal norms and delve deeply into the emotional and psychological toll of societal issues, reflecting the collective pain of her country. Kang's writing is known for its sparse, poetic style that invites readers to confront uncomfortable truths

5. Nobel Peace Prize 2024: Nihon Hidankyo

Toshiyuki Miyamaki
Japanese anti-nuclear campaigner group

Awarded for: Efforts to achieve a nuclear-free world.

The Nobel Peace Prize 2024 was awarded to Nihon Hidankyo, a Japanese organization of atomic bomb survivors. The organization's tireless advocacy for nuclear disarmament, through the personal testimonies of those who lived through the horrors of Hiroshima and Nagasaki, underscores the moral imperative of eliminating nuclear weapons. Their ongoing work is a testament to the devastating consequences of nuclear warfare and their message that nuclear weapons must never be used again

6. Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2024: Daron Acemoglu, Simon Johnson & James A. Robinson

Awarded for: Research on the formation of institutions and their impact on prosperity.

Daron Acemoglu, Simon Johnson, and James A. Robinson received the Nobel Prize in Economic Sciences for their groundbreaking work on the role of institutions in shaping national prosperity. Their research highlights how inclusive political and economic institutions are critical in fostering economic growth and stability. Their insights have been crucial for understanding how societies can build systems that encourage innovation and reduce inequality

Significance of the 2024 Nobel Prizes

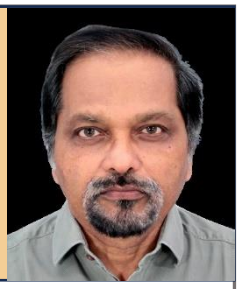
The 2024 Nobel Prize laureates have made extraordinary contributions in their respective fields, which continue to influence global developments. From advancing artificial intelligence and understanding the building blocks of life to addressing nuclear disarmament and promoting economic justice, their achievements represent the very best of human intellect and compassion. Their work not only brings solutions to pressing challenges but also inspires future generations of researchers, thinkers, and activists.

By recognizing these laureates, the Nobel Prizes continue to celebrate human ingenuity and commitment to the betterment of society. Their stories remind us that each breakthrough, whether in science or peace, has the potential to reshape the world for the better.

Source:NobelPrize.org

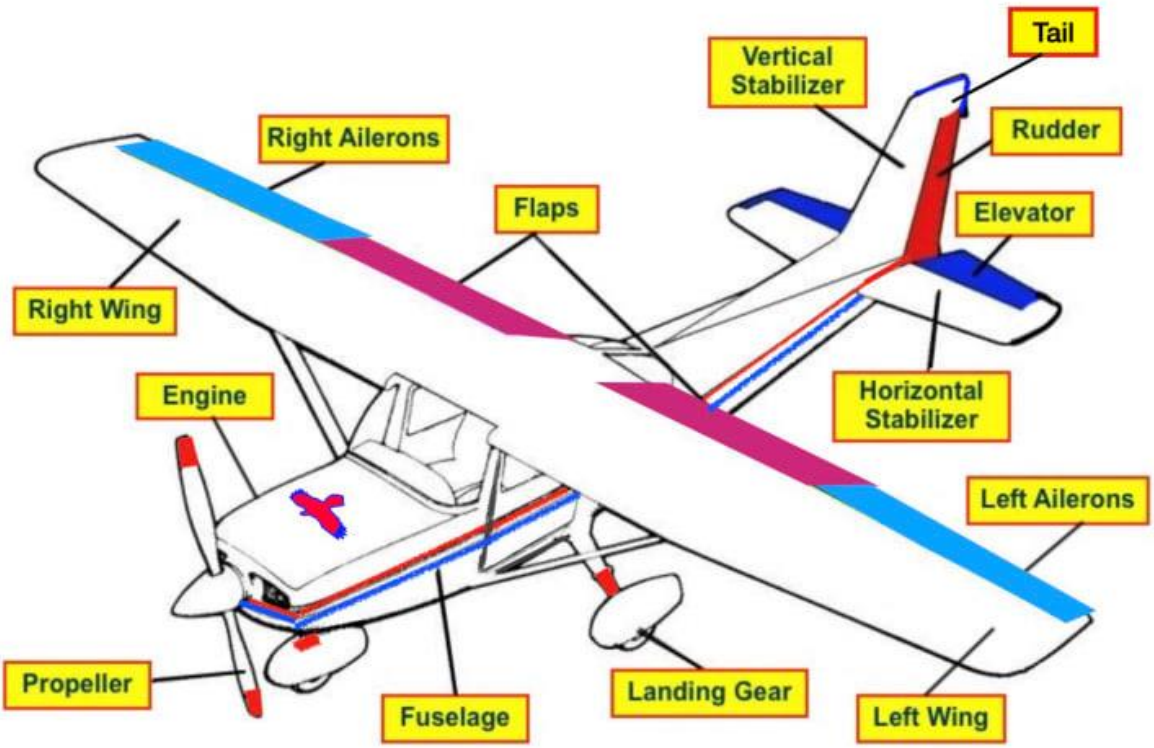
Wings of Wonder: Understanding the Physics of Flight

Dr. Basavaraj A. Kagali
Professor of Physics (retd.), Bangalore University



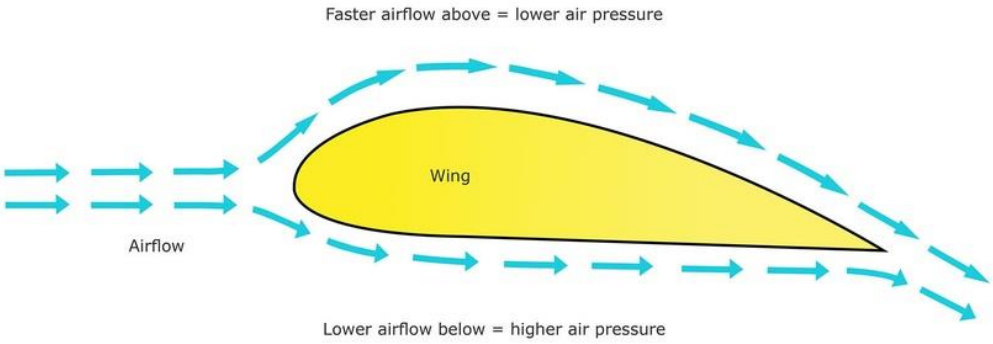
Who is not amazed at the sight of huge metallic machines called airplanes carrying so many people flying in the air like birds and travelling great distances in quick time? They are great wonders of science and technology. Airplanes began appearing on the scene after the pioneering efforts of the Wright brothers in the USA in the early 20th century. Since then, many improvements and modifications have been made to their engines and design so that airplanes have now become reliable, comfortable and safe modes of transport over long distances. In this short article, the most basic aspects of their design and operation are discussed for the benefit of students and novices.

The Main Parts of a Plane



The body of the plane is called its **fuselage** (see the figure). It is generally a long tube-shaped part. The pilots and passengers are seated in it. In a small plane, the **engine** that is placed in the front part spins specially designed blades, called **propellers,** at high speeds. While spinning the blades propel or push a large amount of airmass towards the backside of the plane. In bigger planes, the engines are attached to the wings and there will not be propeller blades. The set of wheels of a plane is called the **landing gear**. There are two main wheels on either side of the plane fuselage. For stability, there is one more wheel near the front of the plane. The landing gear can be folded into the fuselage during the flight and opened for landing in bigger planes.

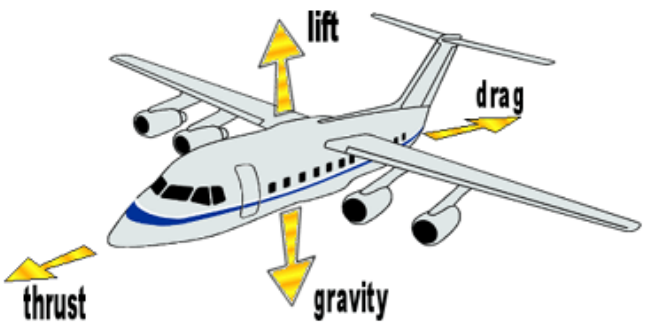
All planes have **right and left wings** attached to the fuselage - on top or to the sides of the fuselage. The wings are specially shaped with smooth surfaces. The top surfaces are slightly curved from the front or leading edge, to the back or trailing edge (as shown in the figure). The top surface is curved more than the bottom surface. High-speed air moving over the wing produces an upward lift for the aeroplane. The specially designed shape of the wings determines how fast and high a plane can fly.



There are two movable plates called **flaps** and **ailerons** on the two wings (as shown in the figure). They are connected to the backside of the wings with hinges. The flaps slide back and down to increase the surface area of the wings. They also tilt down to increase the curvature of the wing. The ailerons are hinged to the wings nearer to the edges and can be moved up and down. The left and right ailerons always move in opposite directions. They are used to tilt the wings up or down causing a motion called rolling. They are helpful in the smooth turning of a plane to its left or right. Usually, they are operated along with a movable metal plate called a **rudder** hinged to the backside of the tail (see the figure). The tail at the rear of the plane provides stability. The vertical part of the tail is called the **vertical stabilizer**. The rudder at the back of the plane can be moved left and right to control the left or right movement of the plane.

There are two hinged parts called **elevators** attached to the **horizontal stabilizer** at the rear of the plane. They can be raised or lowered to change the direction of the plane's nose (also called its **pitch**). The plane begins to move up or down depending on the direction of motion of the elevators. After landing, some plates called spoilers hinged to the wings are used like air brakes in bigger planes to reduce the speed of the plane while landing. They are not marked in the figure.

Forces on a plane



Four kinds of forces are normally acting on a flying plane (as shown in the figure). The **gravitational force** due to the earth is acting downward towards the earth. The engine that spins the propeller blades leads to a force in the forward direction as the propellers displace the air backwards with great speed. By Newton's third law, the displaced air pushes the plane in the opposite direction. Such a force is called **thrust**. Airplane wings have specially designed surfaces that make air move faster over the top surface having greater curvature. When air moves faster in a region, the pressure of the air decreases there. This is known as the Bernoulli principle. Hence the pressure on the top of the wing is less than the pressure at the bottom of the wing. The difference in pressure leads to a force on the wing called **lift** that pushes the entire

plane in the upward direction. Only when the lift is greater than the gravitational downward force (the weight), the plane can rise from the ground to fly. The air around the plane tends to slow down the forward motion of the plane via **drag** force (similar to friction). Once the plane is lifted, the thrust generated by the engine also overcomes the drag and hence, the plane can fly high in the air.

Controlling the Flight

How does a plane make different manoeuvres? A pilot of a plane has special controls within his reach that can be used to fly the plane. There are levers and buttons that the pilot can push to change three types of motion called **pitch, roll** and **yaw** of the plane.

Pitch makes a plane descend or climb. The pilot adjusts the elevators on the tail to make a plane descend or climb. Lowering of the elevators leads, according to the Bernoulli principle, to lifting of the tail and lowering of the nose from the horizontal position. Then the plane begins descending motion. Conversely, raising the elevator from the horizontal position leads to the lowering of the tail or lifting of the nose. Such a manoeuvre leads to a climbing motion of a plane.

To **roll** the plane to the right or left, the ailerons are raised on one wing and lowered on the other. The wing with the lowered aileron rises while the wing with the raised aileron drops, once again following the Bernoulli principle. To roll the plane to the left, for example, the right aileron is lowered while the left aileron is raised simultaneously. In other words, rolling is nothing but angular motions about an axis passing through the fuselage and is controlled by the ailerons.

Yaw is the turning of a plane about an axis that is passing vertically upwards through the center of the plane. When the rudder is turned to one side, say to the left, there is a net force acting towards the right on the tail (again from the Bernoulli principle). As a result, the nose of the plane turns to its left. For turning the plane rightward, the rudder is moved to its right. Hence, the aeroplane's nose is pointed in the same direction as the direction of the rudder. The rudder and the ailerons are used together to make a turn to the left or right smoothly.

The pilot controls the engine power using what is called a throttle. Pushing the throttle increases power, causing the plane to lift. If the elevators are pushed up at the same time, the nose gets lifted and the plane climbs up. While landing, the power of the engine is reduced while the elevators are pushed down from their normal position to lower the nose direction.

Hence, all three motions – pitch, roll and yaw – are affected by moving small surfaces on a plane, while high-speed air is passing over them!

The pilot uses brake pedals to reduce the speed of the landing wheels after they touch the ground from a flight. In bigger planes, there are plates, called spoilers, that are hinged to the wings. They are made to stand up vertically on the wings (offering greater resistance to air) to reduce the speed of a plane moving on the runway after touchdown.

Hence, it can be seen that the movements of a plane are cleverly controlled by small movements of attachments to its wings and its tail, effectively using the power of moving air!

The Peril of Water Scarcity

Dr. K.N. Rahika
Geologist, Bengaluru

Dr. B.C. Prabhakar
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Water scarcity is a growing global crisis, exacerbated by pollution, climate change, and population growth. The rise in water-related conflicts, with a 2.4-fold increase in incidents from 2014 to 2023, illustrates the severity of the situation. In India, 80% of the 1.25 billion population faces severe water scarcity for at least one month yearly, while 180 million experience it year-round. India's renewable freshwater resources, amounting to 1,869 km³ annually, represent only 4% of the global total. This scarcity is compounded by the erratic distribution of precipitation, which is the main water source. For instance, rainfall varies from over 10,000 mm in parts of Meghalaya to less than 100 mm in the arid regions of Rajasthan and Gujarat, most concentrated in the four-month monsoon season. Such uneven water distribution has led to conflicts between Indian states, exemplified by the long-standing Cauvery River dispute between Karnataka and Tamil Nadu and the emerging Mahadayi issue between Goa and Karnataka. Further, recently, water conservation experts have warned that Bengaluru is facing an unprecedented water crisis, potentially leading to 'zero water days' in the near future. This calls for an immediate address to this peril. Now let us know what steps have the other countries taken to combat water scarcity.

Numerous nations experiencing acute scarcity of water have exhibited the efficacy of collaborative efforts and governmental involvement. For instance, Australia adopted water-saving measures like dual-flush toilets and low-flow showerheads during the Millennium drought (1997–2009), in addition to promoting shorter showers and less outdoor water consumption. Melbourne as a result cut its per-capita water use by 50% by 2010. Similarly, the possibility of 'Day Zero' - the moment the city would run out of water-loomed large over Cape Town, South Africa, in 2017–18. Greywater reuse for non-drinking purposes and strict water rationing, which limited daily usage to 50 litres per person, prevented the disaster.

Despite having very few natural freshwater supplies, nations like Singapore and Israel have emerged as global leaders in sustainable water management. Singapore was significantly dependent on imported water, prior to implementing rainwater collection, water-saving technologies, and wastewater recycling through its NEWater initiative. With recycled wastewater providing a third of the nation's water demands, this project has lowered per capita household water consumption from 165 litres per day in 2003 to 141 litres per day by 2020. Similar to this, Israel has made significant investments in desalination and water-saving technologies, allowing it to effectively manage its limited resources. Israel is a leader in sustainable water management because of the adoption of low-flow fixtures and water-efficient appliances and a national culture of water conservation.

In India, artificial groundwater recharge has been practiced since ancient times, with many traditional water conservation structures still functional today. These include Mahamandir Jhalara in Jodhpur and Agrasen Ki Baoli in Delhi. Artificial recharge not only helps conserve rainwater but also dilutes contaminated water and reduces flood risk. In Karnataka, the temple town Melukote is also a classic example of cascade tanks, then called Kalyani, for water conversation. It is alarming to state that India's current per capita water storage capacity is much lower than in other countries.

The Central Groundwater Board (CGWB) has identified the potential for harnessing 210,815 million cubic meters of water across 795,850 square kilometers through various recharge structures like sub-surface dykes, percolation tanks, and check dams. Karnataka alone has the potential to harness 11,367 million cubic meters of water through these methods. Urban areas like Bengaluru, which face challenges such as urban flooding, over-reliance on the Cauvery River, and overexploitation of groundwater, could benefit from rooftop rainwater harvesting. According to CGWB statistics, Karnataka has the potential to harness 167.33 million cubic meters of water through rooftop harvesting, which could alleviate both water scarcity and urban flooding.

Wastewater treatment also plays a crucial role in addressing water scarcity. India's urban areas generate approximately 35,558 million litres of wastewater daily, but the installed sewage treatment capacity is only 11,553 million litres, leaving a significant gap. By 2050, wastewater generation is projected to reach 48.2 billion cubic meters, potentially meeting 4.5% of the country's total irrigation water demand. India's industrial water use productivity is among the lowest in the world, at 3.42 billion US dollars per cubic meter, compared to 30 times that in Japan and South Korea. Countries like Singapore have demonstrated the potential of wastewater recycling through its NEWater initiative, which recycles wastewater into potable water, meeting about a third of the country's water demand. By adopting similar wastewater recycling systems, India could significantly reduce the pressure on its freshwater resources.

India's water crisis is one of its biggest challenges, compounded by a growing population and shrinking water resources. Although scientific advancements have improved the country's ability to manage water resources, these efforts are threatened by unsustainable practices. It is imperative that India adopt an integrated approach to water conservation, combining public education, technological innovation, and policy reform to ensure the judicious use of water. Recycling wastewater, harnessing rainwater, and implementing scientific methods to trap and conserve water are essential strategies for addressing the country's growing water scarcity. Public awareness and engagement, along with government-led initiatives, can help secure a sustainable water future for India and beyond.

Addressing water scarcity needs immediate action towards sustainable water management and conservation efforts on an individual scale. The impacts of climate change are amplifying the water scarcity issue, making water conservation not just an environmental issue but a survival necessity. Individual actions can have a significant cumulative effect on water conservation. For instance, fixing a leaky tap can save up to 3,000 gallons of water annually. Simple changes, such as taking shorter showers and being mindful of water usage in gardening, can help reduce water consumption. These seemingly small adjustments, when adopted by millions, can make a substantial impact.

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Journey Through Time: The Epic History of Life on Earth

Dr. R. Nagendra
Former Professor of Geology, Anna University

Introduction

The history of life on Earth spans 3.5 billion years and is characterized by extraordinary diversity, adaptation and increasing complexity. From simple, single-celled organisms, life evolved into the variety of multicellular forms, including humans. This evolutionary journey highlights life's remarkable ability to adapt and change over time. This article compiles the major transitions in the history of life, from its origins to the rise of the human species.

Understanding the Birth of Living Systems

The exact process by which life arose on Earth remains an area of active scientific research. The diversity of life on our planet is astonishing: around 1.8 million species have been identified and named till date. Despite this immense diversity, all life forms can be divided into two main categories. The first group consists of organisms with simple cells in which DNA floats freely within the cell. These are *prokaryotes*, which include bacteria and other early life forms. The earliest organisms on Earth were probably *prokaryotes*, simple, single-celled creatures without a nucleus or other specialized structures. The second group is *eukaryotes*, organisms with more complex cells that contain specialized compartments, including a nucleus that houses DNA. This group includes animals, plants and fungi, most of which are multicellular and work together. In addition, *eukaryotes* also include single-celled organisms such as protozoa and chromists such as golden-brown algae.

Earth's history spans 4.5 billion years, and geologists have divided this vast time scale into eons, epochs, and periods. By dating the rock layers in which fossils were institute, and reconstruct the history of life on our planet. If we travel back to Earth's origins, we find a world that was likely inhospitable to life for much of its early history. For the first 700 million years after its formation, Earth was constantly bombarded by large meteorites, remnants from the formation of the solar system. Although plate tectonics and weathering have obliterated most impact craters on Earth, the Moon, which lacks these processes, retains its heavily cratered surface. Life likely began after the end of the intense period of meteor bombardment, about 3.8 billion years ago. However, the question of whether life originated on Earth remains open. Some scientists suggest that life may have started on Mars or elsewhere in space and later “seeded” the Earth. This theory is supported by the discovery of meteorites containing the essential building blocks of life and the possibility that dormant bacteria could survive in space for millions of years. Despite these ideas, most scientists believe that life began on Earth. Regardless of their origin, there is fossil evidence of simple prokaryotic life forms that existed 3.5 to 3.8 billion years ago. These include stromatolites, small layered domes found in ancient rocks. Similar structures found in Shark Bay (Australia), consist of sticky films of bacteria that trap mud and form the layered domes. The presence of stromatolites in the fossil record indicates that bacteria were already thriving in Earth's oceans at this time. Another fossil site in Apex Chert (Australia), contains organic filaments that may represent early bacteria, although scientists argue that these features may have a non-biological origin. Although the fossil record of early Earth is difficult to interpret, other evidence strongly suggests that simple bacteria

evolved in the oceans very early in the planet's history. Important evidence is the thick layers of iron oxide found in rocks from this period. Geologists believe that there was a lack of oxygen in Earth's early atmosphere. The first bacteria probably harnessed the energy of sunlight through photosynthesis, much like plants do today. As a byproduct of photosynthesis, these bacteria would have released oxygen into the oceans. This oxygen then reacted with iron in the seawater, causing it to rust and form iron oxide on the seafloor. These iron oxide deposits serve as indirect evidence for the existence of photosynthetic bacteria at this time.

In the first half of Earth's history, simple *prokaryotic* bacteria were the only life forms. But almost two billion years after the first bacterial cells emerged, a remarkable leap in the complexity of life occurred. About 1.9 billion years ago, fossils called acritarchs appeared, representing the first *eukaryotic* cells. These cells were far more advanced than *prokaryotes* and had specialized compartments such as mitochondria for energy production and a nucleus for storing DNA. This evolutionary breakthrough likely occurred when a prokaryotic bacterium engulfed another prokaryotic cell, but instead of digesting it, incorporated it as a functional part of the cell. *Eukaryotes* are oxygen dependent and probably evolved once enough oxygen accumulated in the oceans. The development of eukaryotic cells paved the way for the incredible diversity of complex life forms.

For the first two-thirds of Earth's history, life was limited to single-celled organisms. However, around 1.4 billion years ago there was a significant change in the development of multicellular organisms, as depicted by fossil records. One of the earliest fossils from this period is *Grypania*, a coiled tube about 2mm wide and up to 5cm long, found in rocks from North America, China and India. The large *Grypania* strongly suggests that it consisted of many cells working together. Another important milestone in the history of life is a fossil called *Bangiomorpha*, which was found in Canadian rocks over 1.2 billion years ago. This fossil is an early form of red algae, a group that includes most modern algae. In addition to being multicellular, *Bangiomorpha* appeared in two forms, male and female, showing that reproduction had evolved. This ability to reproduce allowed organisms to change their genes, accelerating the pace of evolution. Paleontologists have called this crucial development the “big bang of biology” (Fig 1a & b).

Fossils indicate that the three known kingdoms of animals, plants and fungi had evolved around 630 million years ago and probably even earlier. Fossils from rocks between 630 and 542 million years old reveal strange organisms known as the *Ediacaran* fauna. These fossils are believed to represent early marine animals, although they are quite different from present animals. The discovery of these unusual fossils was first brought to light in the 1950s by an English schoolboy who found specimens in Charnwood Forest in Leicestershire. After the animal kingdom emerged, it diversified rapidly, a phenomenon difficult to explain through typical evolutionary processes. Evolution is usually slow, but between 542 and 515 million years ago, animal life experienced an extraordinary burst of development. In < 30 million years, nearly every major group of animals appeared, from jellyfish to snails to early vertebrates. In addition to familiar forms, strange and now extinct creatures also developed, such as *Anomalocaris*, a 2-meter-long sea predator. One of the best places to study this explosion of marine life is the Burgess Shale in British Columbia, Canada, which is 515 million years old. This fossil site preserves not only the skeletons of animals but also their soft tissues, providing a glimpse into early marine ecosystems. At the time these Burgess Shale creatures were thriving, life on Earth was undergoing a major change. Until then, life was confined to the oceans, but about 500 million years ago, organisms began to invade land. The earliest evidence of this

transition comes from tracks preserved in the ancient coastal dune sands of North America, probably made by giant lobster-like creatures called *eurypterids*. While *eurypterids* lived primarily in the sea, they made temporary forays onto land, possibly for feeding and mating, similar to how horseshoe crabs behave today. However, establishing permanent land settlement took longer.

About 460 million years ago, fossil soils in the United States show intricate cave systems, probably created by worms, that marked the first arrival of animals on land. Around the same time, primitive plants such as liverworts also appear in the fossil record. Liverworts, some of the simplest plants alive today, likely formed mats over moist soils, creating habitats in which early land animals could settle. The first land animals were probably either carnivores, which fed on other living things, or detritivvores, which fed on decaying organic material. However, the fossil record shows that some animals developed a taste for plants around 420 million years ago. Fossilized fecal pellets from millipedes and related animals found at the famous Ludlow Bone Bed in Shropshire contain traces of plants. This is evidence that the first herbivorous animals, had already developed at this time.

Only a small proportion of living organisms are preserved in the fossil record, often resulting in an incomplete picture of past life. However, the Rhynie Chert offers a unique glimpse into a complete terrestrial ecosystem. This extraordinary time capsule was created when a volcanic geyser, or hot spring, erupted and flooded the area with boiling water. The hot water, rich in dissolved silica, mineralized the cells of all the organisms it encountered, preserving them in lucid form. The Rhynie Chert offers a rare snapshot of life on land 400 million years ago, showing that the tallest plants reached not more than 10cm in height. A diverse group of invertebrates thrived in this vegetation, including mites, springtails, and spiders. However, this world of ankle-high plants was not to remain unchanged, as significant evolutionary changes were underway in the plant kingdom. Fossils suggest that by 380 million years ago, some plants had developed massive trunks that formed deciduous forests over 30 meters high. During this time, plants also changed their reproductive strategies. The earliest plants, like modern ferns, reproduced using spores, but later developed seeds. This adaptation allowed germinating plants to better tolerate drought, allowing them to colonize dry land far from coastal wetlands. While plants underwent these radical changes, vertebrates also experienced significant changes. Fossil skeletons indicate that the first amphibians, the ancestors of frogs, appeared about 380 million years ago. One of the most famous early amphibian fossils is *Ichthyostega*, discovered in Greenland. This species may have evolved from lungfish, which are freshwater fish that can breathe air for limited periods of time. When lungfish live in ponds that occasionally dry out, they can bury themselves in the mud, slowing their heart rate and breathing air until the next rain fills the pond. Regardless of their exact ancestry, early amphibians underwent numerous evolutionary adaptations to life on land. These adaptations included the development of limbs instead of fins, the transition from gills to lungs, and changes to sensory organs such as eyes and ears.

A key characteristic of amphibians is their dependence on water for reproduction. Fossil skeletons found in Nova Scotia, Canada, about 315 million years ago indicate that the first reptiles evolved from amphibian ancestors. A special feature that distinguishes reptiles from amphibians is their ability to lay eggs on land. This adaptation allowed reptiles to colonize drier habitats away from rivers and ponds. Life on land flourished 300 million years ago. During this time, thick layers of coal formed across Europe and North America, consisting of the remnants of Earth's first tropical rainforests. Fossils from this period reveal a rich diversity of wildlife, including giant dragonflies

and millipedes. But about 251 million years ago, a catastrophic event threatened to wipe out life on Earth. Although the exact cause remains unknown, > 95% of all marine species disappeared and land life was on the brink of collapse. Events like these are classified as mass extinctions. There have been five major mass extinctions since the land was invaded around 500 million years ago, but this was the most devastating of all. Some scientists suggest that a series of massive volcanic eruptions occurred at this time and lasted for thousands of years, although this explanation is not widely accepted among researchers.

After the mass extinction 251 million years ago, life gradually began to recover and diversify. This period saw a significant increase in biodiversity, with dinosaurs being one of the most notable success stories. Dinosaurs evolved about 220 million years ago and dominated terrestrial ecosystems for the next 150 million years. The term "dinosaur" means "terrible lizard," but these magnificent reptiles included both giant herbivores like Diplodocus and fearsome carnivores like *Tyrannosaurus rex*. For a long time, scientists believed that dinosaurs were sluggish, cold-blooded creatures like modern reptiles. However, new evidence suggests that at least few dinosaurs were warm-blooded. This conclusion is supported by dinosaur footprints, which indicate that certain species could run up to 27 miles/hour, a feat that cold-blooded animals cannot achieve. At the same time that dinosaurs were evolving, another group was also making progress: mammals. Mammals lived in the shadow of dinosaurs for 150 million years. Based on skeletal evidence, many early mammals were small insectivores that were probably nocturnal to avoid predation by dinosaurs. This nocturnal lifestyle may have contributed to the independent evolution of warm-blooded mammals. Interestingly, few fossils from China suggest that certain dog-sized mammals even hunted young dinosaurs.

One of the most exciting recent discoveries in the history of life is that birds evolved directly from bipedal dinosaurs like the *Tyrannosaurus rex* about 155 million years ago. In fact, Paleontologists classify birds as avian dinosaurs. The similarities between birds and dinosaurs have been recognized since the 1840s, but only in recent years has fossil evidence finally confirmed this relationship. Dinosaur fossils with feathers have even been found. However, there is still much debate about the evolution of bird flight. One perspective suggests that early birds hunted from the treetops and developed wings to control their descent as they pounced on their prey from above. Another viewpoint suggests that wings evolved to aid in running on the ground.

Previously it was pointed out that there have been five mass extinction events on our planet since the land invasion about 500 million years ago. Among these, the most significant extinction occurred 251 million years ago. However, 65 million years ago, another major extinction event occurred, wiping out the dinosaurs and many other species. For years there has been heated debate about what caused the dinosaurs to die out, but scientists now largely agree that the likely culprits were volcanic eruptions and the impact of a 10-kilometer-diameter meteorite on Earth. Recently, an impact crater with a diameter of 200 kilometres was discovered in the Gulf of Mexico, which can accurately determine the location of the meteorite impact. This "crater of doom" is a stark reminder of the vulnerability of life to extraterrestrial impacts. The impact would have triggered global tsunamis and wildfires in the hours after the collision, eventually plunging the planet into a nuclear winter scenario with dust blocking sunlight. Long after the dinosaurs died out, the climate became cooler and drier. Grasses that evolved toward the end of the dinosaur age began to spread across much of the world. Mammals, previously relegated to the shadow of dinosaurs, evolved into the dominant large animals on land. A variety of grazing mammals have evolved to feed on the grasslands of this

increasingly modern landscape. Because grass contains a hard compound called silica, mammals had to develop continuously growing dentition to withstand the wear and tear of grazing.

Two million years ago, human ancestors evolved from primates, a group of mammals that also includes monkeys, and belonged to the genus *Homo*. Today there is only one human species left; *Homo sapiens*, which means "wise man". However, several other human species, such as *Homo erectus* (Upright Man) and *Homo neanderthalensis* (Neanderthal), also coexisted throughout our evolutionary history. The milestones in human evolution include the ability to walk upright, the use of fire and tools to manipulate the environment, and the development of society and culture. The famous Lascaux Cave in France, decorated with paintings of animals and human hunters that are over 10,000 years old, shows that art was created during this time. Shortly after *Homo sapiens* evolved in Africa around 130,000 years ago, modern humans began to spread across the globe. Around 15,000 years ago, the extinction of many large mammals, such as the woolly mammoth, began, and although it is difficult to prove this with certainty, it is possible that human hunting contributed to this extinction. As human societies continued to develop, forests were cut down for agriculture and the industrial revolution began, leading to increased extinction rates associated with human activities. There have been five mass extinctions in the last 500 million years, and current evidence suggests we may now be experiencing a sixth mass extinction.

The Evolution of Primates and Hominins

With the extinction of the dinosaurs there was a rapid diversification of mammals. These emerging lineages of mammals included the primates, which first appeared around 65 to 55 million years ago. Early primates were small, tree-dwelling creatures, but over time they developed several distinctive features, including grasping hands, enhanced vision, and larger brains. The human lineage, known as *hominins*, split from that of other apes about 6 to 7 million years ago in Africa. Over millions of years, ancestors have undergone significant changes:

1. Bipedalism: The ability to walk upright on two legs evolved early in *hominin* history.
2. Increased Brain Size: *Hominin* brain size increased dramatically over time.
3. Tool Use: The creation and use of tools became increasingly sophisticated.
4. Language: Complex communication systems developed, but the exact timing of this development remains controversial.

Homo sapiens emerged in Africa around 300,000 years ago. However, we were not the only *hominin* species at this time; others, such as Neanderthals and Denisovans, lived alongside early humans. By about 40,000 years ago, *Homo sapiens* had spread across much of the world and was the only surviving *hominin* species. The success of *Homo sapiens* can be attributed to several factors, including adaptability, complex social structures and the ability for abstract thinking and innovation. These characteristics allowed species to thrive in a variety of environments and develop complex cultures and technologies (Figs a &b).

Conclusion

The evolution of life on Earth demonstrates the remarkable power of natural selection and the extraordinary adaptability of living organisms. From the earliest simple cells to the complex web of life we observe today including our own species evolution has driven the diversity and complexity of life on our planet. As we delve deeper into the history of life, we not only improve our understanding of our origins, but also gain valuable insights into the mechanisms that drive

biological change. This knowledge is critical as we confront current and future challenges such as climate change and biodiversity loss, which will inevitably influence the next chapter in the ongoing story of life on Earth.

Reference: www.earth4567.com/talks/time.html

Fig.1(b) Evolution of life through time.

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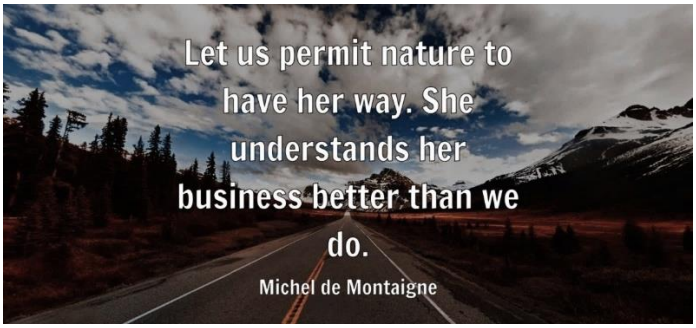

Making of a Swadeshi Suit

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ABSTRACT

Late 2019 saw the emergence of the deadly covid-19 coronavirus that shook the whole world. Several institutions across the globe took up the daunting challenge to develop suitable vaccines to combat the deadly virus. India did not lag behind in this effort and was able to develop its own vaccines such as COVAXIN. The National Aerospace Laboratories, Bengaluru which is a constituent lab of the Council of Scientific Research (CSIR) head quartered in New Delhi played an active role in a number of areas to combat the Covid pandemic. One of them relates to the successful development and certification of coveralls (Personal Protection Equipment (PPEs)) for Health care workers (Covid Warriors) and their subsequent mass production in partnership with a private industry.

INTRODUCTION

As we are all aware, the entire world went through a very challenging period between 2020 and 2022 in combating the Covid pandemic. Originating from Wuhan, China, this Novel Coronavirus spread rapidly, leading to widespread illness and deaths. The highly contagious and deadly nature of the Covid virus warranted adhering to strict protocols and government-mandated guidelines to counter the rapid transmission of the disease. This was called the lock-down period. While most shops and industries had to shut down their businesses, some of them started implementing the "work from home" concept to adapt to the situation. Travel restrictions were imposed and "social distancing" became a necessity, to curb the spread of coronavirus. Several agencies took up the daunting task that involved research, development and deployment of suitable vaccines. Demand for special purpose ventilators shot up. Doctors and primary health staff had to safeguard themselves from coronavirus, by wearing suitably designed coveralls and masks.

The Council of Scientific & Industrial Research is an autonomous body under the Ministry of Science & Technology, Government of India. It is a Pan-India Organisation that is headquartered at New Delhi and has in its ambit about 37 research laboratories and 39 outreach centres [1]. These laboratories are grouped into different clusters such as Information, Engineering, Chemical, Physical and Biological Sciences. Based on its multi – disciplinary strength, CSIR was able to gear itself in a very effective manner to combat the Covid pandemic (see Fig. 1) during the challenging period of 2020 to 2022 [2]. The COVID combat approach strategy in CSIR was classified into five verticals [3]:

a) Surveillance
b) Diagnostics
c) Drugs & Vaccines
d) Personal Protection Equipment
e) Supply Chain Management

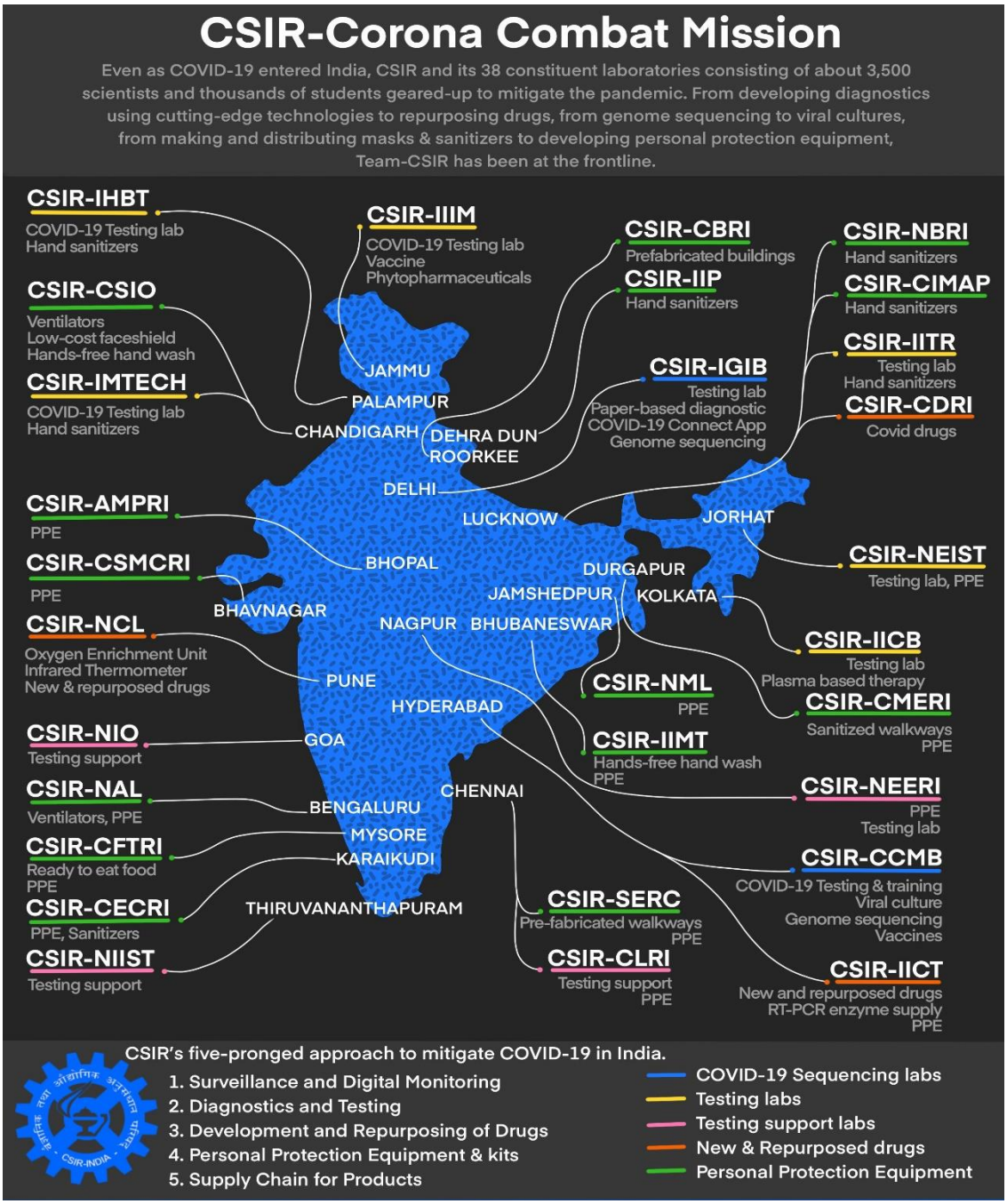


Fig. 1 The Pan India effort of CSIR in combating the COVID pandemic [2]

The objective of this paper is to bring out the efforts of CSIR-National Aerospace Laboratories in the successful development of a "Swadeshi Suit" (Coverall/ PPEs), intended mainly to provide safety to doctors and healthcare workers.

WHAT IS A COVERALL?

A "coverall" is an essential constituent of Personal Protective Equipment (PPE), see Fig 2. Other constituents of a PPE kit are Head Cover, Mask, Goggles, Face Shield, Shoe Covers and Gloves. This is primarily to provide a head-to-toe protection.

Fig. 2 Personal Protective Equipment (PPE) kit

The coveralls, used by doctors, nurses and primary healthcare staff must serve three important purposes, see Fig 3a. These are as follows. (1) Shall effectively prevent blood or other liquids in the working environment, from entering and contacting the skin of the wearer. (2) Should be fabricated from light-coloured fabric, so as to enable quick visual identification of contamination, should that occur. (3) Should be light in weight and easy to wear. It should be noted that these are "use once, then discard" kind of protective clothing and necessitated safe disposal of used coveralls.

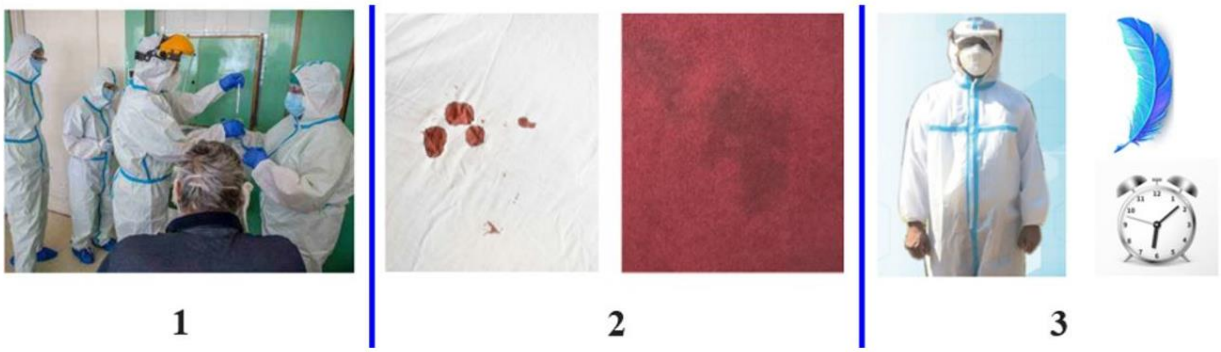


Fig.3a Essential features in a Coverall

To fabricate a coverall, five important items (Fig. 3b) required are (1) a polypropylene spun laminated multi-layered non-woven 70gsm breathable fabric. (2) polyester thread (3) woven soft thread (3) zip (5) sealing tape to seal the stitches.

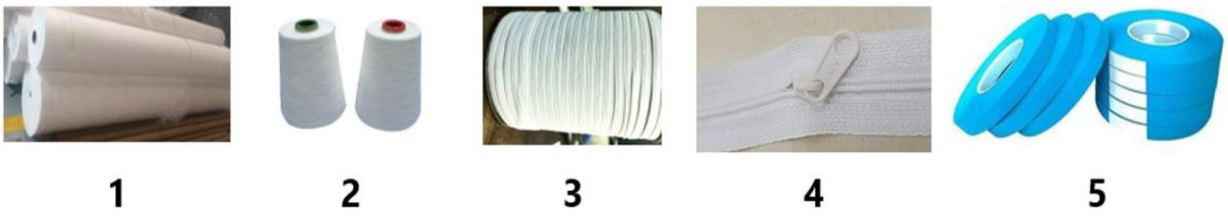


Fig. 3b Five essentials of a Coverall

STRATEGY

"Swadeshi Suit" had to be developed in the shortest possible time in order to make them available to doctors, nurses and primary health staff. CSIR-NAL quickly formed a team to address the issue, while strictly following prevalent Covid norms such as social distancing, wearing of mask and travel restrictions. Technical specifications of the suit were finalised. An important feature of protective clothing is the ability to create a barrier to eliminate or reduce exposure of the wearer to lethal contaminations in the surroundings. The coverall had to be designed to cover the complete body, including head and feet, while making it user friendly to put on and remove. This was facilitated by use of an appropriate zipper. Material used for fabrication of coveralls was a polypropylene spun laminated multi-layered non-woven 70gsm breathable fabric. Specifications of the coverall were drawn with participation from a private manufacturing agency, M/s MAF Clothing Pvt Ltd based in Bengaluru. Suitable seam sealing tape was developed and integrated with the "swadeshi suit" using heat-sealing process to ensure that no leakage happens across the fabric during its use. South India Textile Research Association (SITRA), an NABL accredited Government organisation, was identified as the certifying agency for performing final quality checks. An internal quality assurance plan was developed to ensure that the various stages of manufacturing of the coveralls progressed systematically, with stringent quality checks at each stage. Complete details are documented in [4].

EXECUTION

Various stages of manufacture of coverall is depicted by a simple flow chart shown below (Fig. 4)

These are:

(1) Procurement of raw materials from approved sources
(2) Receipt of raw materials and inspection
(3) Cutting of fabric to required shape by using standard templates

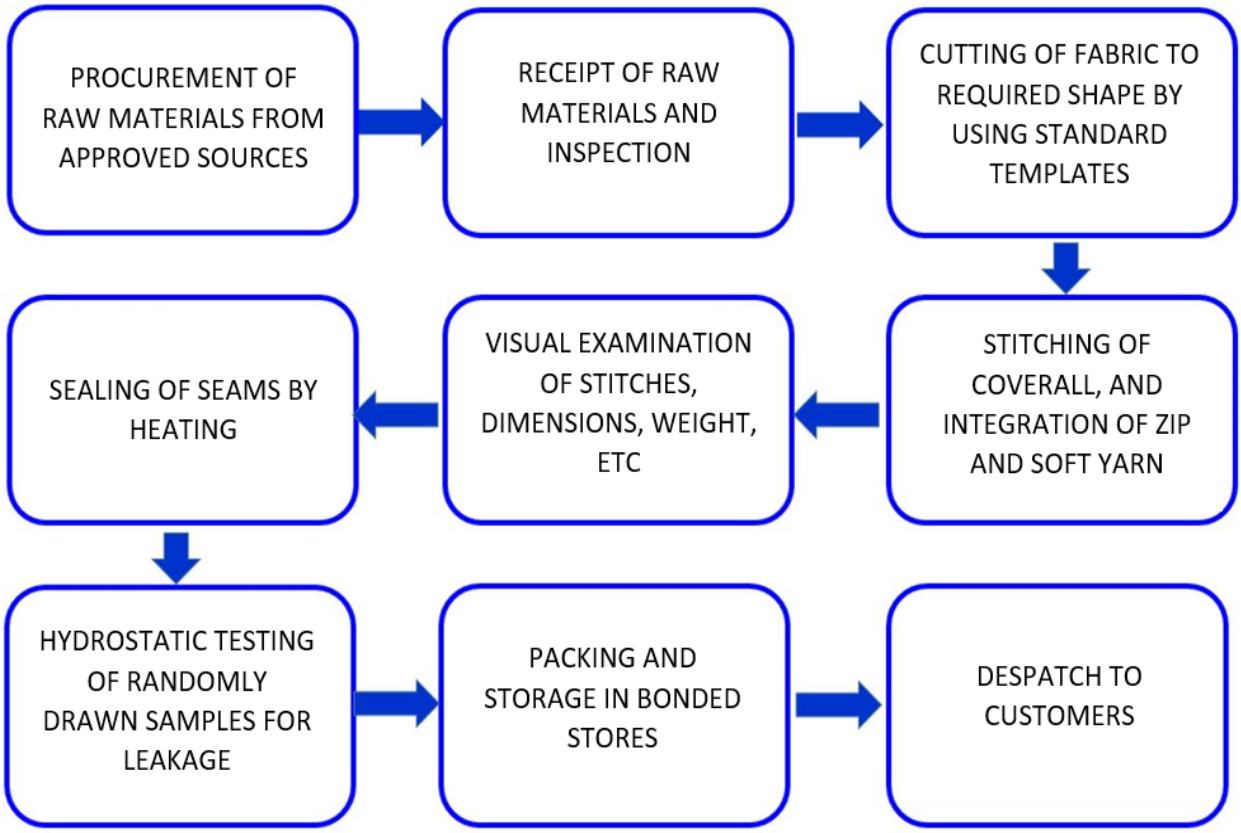


Fig. 4 Stages of manufacture of a Coverall

(4) Stitching of coverall, and integration of zip and soft yarn
(5) Visual examination of stitches, dimensions, weight etc
(6) Sealing of seams by heating
(7) Hydrostatic testing of randomly drawn samples for leakage
(8) Sanitising of finished coveralls, packing and storage in bonded stores
(9) Despatch to customers

Practical execution of these stages are shown in the form of photographs (Fig.5)

Development of a quality assurance plan and inspection at various stages

A Quality Assurance Plan was developed for ensuring quality of Coveralls manufactured at various stages, beginning from raw material procurement till despatch of finished goods to customers. Broad scope of this quality assurance plan comprised of, but not limited to, the following aspects.

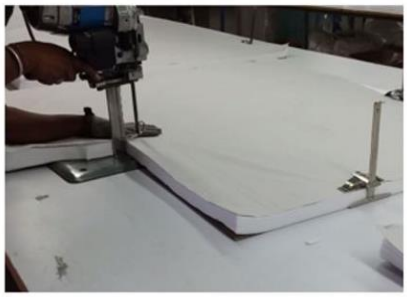
1. Raw material inward receipt and inspection
    a. Purchase order copies
    b. Approved Sources
    c. Quality of raw materials received
2. Specific training for skilled staff carrying out activities such as inspection, stitching, packing, etc.
3. Equipment under use
    a. Serviceability status of various equipment used during the fabrication and inspection process
    b. Calibration validity and periodicity of various instruments and equipment used

c. Inspection of machine settings such as stitches per inch
d. Temperature and federate setting on seam sealing equipment and their control/ monitoring during the process execution

4. Coverall and boot covers inspection

PRE-INSPECTION

BONDED STORES



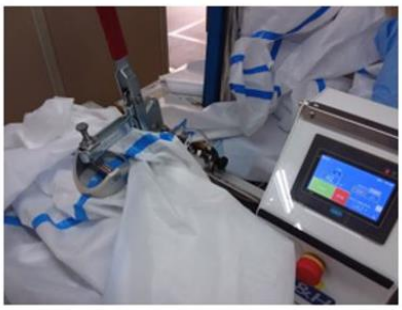
FABRIC CUTTING

STITCHING/ INTEGRATION

SEAM SEALING

IDENTIFICATION TAG

INSPECTION REPORT



HYDROSTATIC TESTING

METAL DETECTOR

PACKING

QUARANTINE STORES

BONDED STORES (OUT)

Fig. 5 Production of Coveralls

a. Overall dimensions and weight
b. Physical inspection for damages visible to naked eye, broken zipper, broken yarn, identification tag with necessary particulars such as batch number, month and year of manufacture, etc

c. Examination of seam sealing through hydrostatic testing

5. Metal detector scanning for broken sewing needles and other FOD (Foreign Object Damages).
6. Inspection of Packing
    a. box dimensions; number of coveralls per box, net weight of packing carton including coveralls.
    b. Identification tag on each coverall, weight of each coverall

Prior to commencing mass production, several coveralls were produced in different batches and subjected to preliminary testing for their adherence to design specifications and subjected to tests by the certification agency (SITRA) at their test laboratory. It is only after ascertaining that the coveralls produced met the stringent quality requirements (as outlined in ASTM F 1670M), that mass production was taken up.

REACHING OUT TO THE COMMON MAN

CSIR did raise awareness of covid-19 coronavirus by reaching out to the public through webinars/ TV live phone-in programs. For instance, a Kannada webinar on "Making of a Swadeshi Suit" (Fig. 6) for the Covid pandemic context at CSIR-NAL (one of the constituent labs of CSIR) was conducted online on July 18, 2020 [5].

A Phone-in program was organised through Doordarshan Chandana Channel (ref program flyer, Fig. 7) to bring out the contribution of CSIR-NAL, with special focus on the development and production of PPE and Swasth Vayu Bi-PAP ventilators [6]. Both these programs were very well received by the audience.

CHALLENGES

The development of coveralls did pose several challenges, both technically and due to the covid-19 environment. CSIR-NAL and the production agency (MAF Clothing Pvt Ltd) successfully overcame these to serve the needy when it was most needed.

Technical Challenges comprised of:

(1) Seam sealing; leak checks (hydrostatic testing) after seam sealing
(2) First article inspection (FAI)
(3) Rate of production (far lower than market requirement)
(4) Random sampling
(5) Possibility of rejection of the complete batch of coveralls produced
(6) Paucity of seam sealing machines; development of indigenous machines
(7) Quality of seam sealing tapes; development of indigenous tapes
(8) Certification tests as per standards, including synthetic blood penetration test.

Challenges due to covid-19 environment were:

Fig.6 Flyer for Seminar in Kannada on the making of a Swadeshi Suit

(1) Non-availability of skilled labour due to lockdown restrictions
(2) Transport restrictions, especially for certification of product outside karnataka state
(3) Non-availability of adequate quantity of raw materials in time to produce coveralls
(4) Necessity of producing the required quantity of coveralls in the given short time frame (production rate)
(5) Following the guidelines issued by department of health and family welfare:

Fig. 7 DD Chandana Phone In program (development of PPE and BI-PAP)

Wearing of mask, using sanitizer, going through frequent thermal screening procedures, wearing of gloves and other protective equipment such as facemask; maintaining social distancing (at least one meter) between workers/ staff.

CONCLUDING REMARKS

Necessity is the mother of invention. The covid-19 pandemic necessitated the development of suitable vaccines by several global organisations including India. CSIR played a key role in combating the covid-19 pandemic. CSIR-NAL successfully developed Coveralls and Bi-PAP ventilator systems and brought these items to the market when it was most needed, at an affordable price. The authors thank Director General, CSIR, New Delhi and Director, CSIR-NAL, Bangalore for their support during the pandemic in the development of coveralls.

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Poems on Covid in English & Kannada by Dr G.N. Dayananda

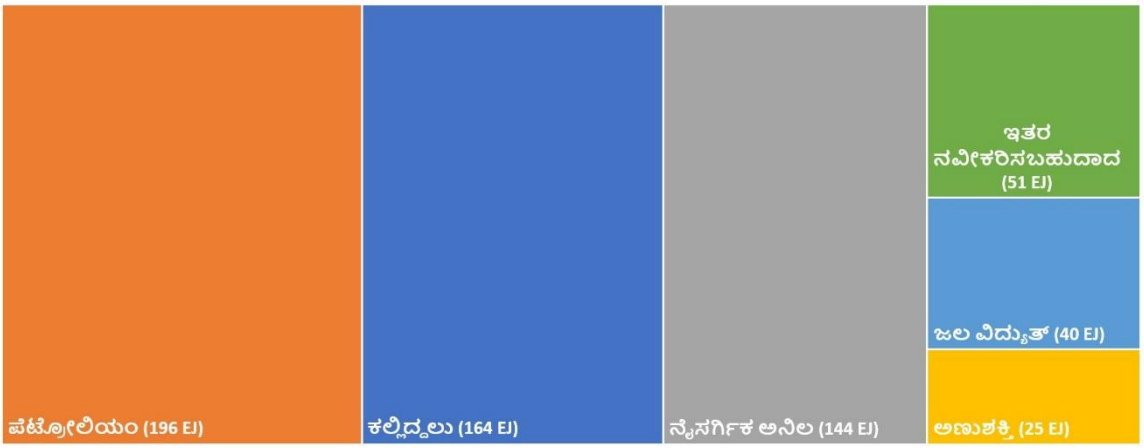
THE GRIM COVID PANDEMIC REMINDERS	ಕರಾಳ ಕೋವಿಡ್ ದಿನಗಳು ಮರಳಿ ಬಾರದಿರಲಿ
In the not-so-distant yester years of memory lane lies the gory COVID pandemic tale— a grim reminder in our wellness lane. As it ravaged the arrogant human race in those fearful days, country by country and continent too, unparalleled in misery & grief unheard – in words or verse, can never be told. Even as governments, rulers & doctors toiled and grappled, new variants wrecked the scene again. As we saw the pall of death and misery abound, the reminders of our grief-stricken brethren always evoked and begged the question, deep inside. Did science address? Or was it the Lord's round? – the gory covid pandemic tale, a grim reminder in our wellness lane! **You Tube Link available at :** **https://www.youtube.com/watch?v=bwDKaYtyeEI&list=PLj-yebCtXy8_llLaVpBMvON_frqGQ5nXg**	ಬಯಸುವ ಕ್ಷೇಮ ಬಯಕೆ ನಡುವೆ, ಮರಳಿ ಬಾರದಿರಲಿ ಆ ಕರಾಳ ಕೋವಿಡ್ ದಿನಗಳು || ತ್ವರಿತವಾಗಿ ತಾಗುವ; ವೇಗವಾಗಿ ಹರಡುವ, ಘೋರ ತಳಿಯ ಸೋಂಕು, ನುಸುಳದಿರಲಿ ಮರಳಿ || 1 || ಜನ ಸಂಖ್ಯೆಯ ಅಸಂಖ್ಯ ಜನರ ಧ್ವಂಸ ಮಾಡಿ, ದೇಶ ಕಂಡ ವಿನಾಶಕಾರಿ, ಎಸಗದಿರಲಿ ಮರಳಿ || 2 || ಸರ್ಕಾರ, ಆಡಳಿತ, ತಜ್ಞರು, ವೈದ್ಯರೂ ಒಳಗೊಂಡು ಸರ್ವರೂ ವಿಫಲಗೊಂಡರು || 3 || ಭೀಕರ ಸಾವು ನೋವಿನ, ಅಂಜಿಕೆ ಆತಂಕಗಳುಳ್ಳ ಕಷ್ಟ-ಕಾರ್ಪಣ್ಯಗಳು ತಾಗದಿರಲಿ ಮರಳಿ || 4 || ಬಯಸುವ ಕ್ಷೇಮ ಬಯಕೆ ನಡುವೆ, ಮರಳಿ ಬಾರದಿರಲಿ ಆ ಕರಾಳ ಕೋವಿಡ್ ದಿನಗಳು ||

ಹಸಿರು ಮೌಲ್ಯ

ಡಾ. ಕರಿಂಬಿ ಕೆ. ಮಹೇಶ್

ಸದ್ಯ ಬಳಕೆಯಲ್ಲಿರುವ ಹೆಚ್ಚಿನ ವಿಧದ ಇಂಧನಗಳಿಂದ ವಾಯು ಮತ್ತು ಆಹಾರದ ಮೂಲವಾಗಿರುವ ಸಸ್ಯಗಳು ದೊಡ್ಡ ಪ್ರಮಾಣದಲ್ಲಿ ಹಾನಿಗೊಳ್ಳುತ್ತಿವೆ. ಅಮೂಲ್ಯವಾದ ಹಸಿರು ಸಮೃದ್ಧಿಯನ್ನು ಉಳಿಸುವ ಸಲುವಾಗಿ ಇಂಧನ ಪರಿಷ್ಕರಣಾ ಪರ್ಯಾಯ ವಿಧಾನಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳಲು ಅಥವಾ ಪರ್ಯಾಯ ಇಂಧನಗಳನ್ನೇ ಶೋಧಿಸಲು ತಗಲುವ ಹೆಚ್ಚಿನ ವೆಚ್ಚವನ್ನು 'ಹಸಿರು ಮೌಲ್ಯ' ಎನ್ನಬಹುದು.

ಸಾರ್ವತ್ರಿಕವಾಗಿ, ಕೈಗಾರಿಕಾ ಉತ್ಪನ್ನಗಳನ್ನು ಹೆಚ್ಚು ಹೆಚ್ಚು ಬಳಸುವುದರಿಂದ ಸುಗಮ ಜೀವನ ಸಾಧ್ಯವೆನ್ನುವ ಭಾವನೆಯಿದೆ. ಈ ಉತ್ಪನ್ನಗಳ ತಯಾರಿ ಮತ್ತು ಬಳಕೆಗೆ ಬೇಕಾಗುವ ಸಂಪನ್ಮೂಲಗಳು ನಮಗೆ ಪ್ರಕೃತಿಯಿಂದಲೇ ದೊರಕಬೇಕಾಗಿದೆ. ಆದರೆ, ಈ ಭೂಮಿ ಮತ್ತು ಅದರ ಪ್ರಕೃತಿಯು ಕೇವಲ ನಿಯಮಿತ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಮಾತ್ರ ಹೊಂದಿದೆಯೆನ್ನುವುದೂ ನಮಗೆ ತಿಳಿದಿದೆ. ಹಾಗಾಗಿ ಇಂಧನ ಪರಿಷ್ಕರಣೆಯಲ್ಲಿ ಸುಧಾರಣೆ ಮತ್ತು ಪರ್ಯಾಯ ಮೂಲಗಳ ಆವಿಷ್ಕಾರ ನಿರಂತರವಾಗಿ ಸಾಗುತ್ತಿದೆ. ಈ ನಿಟ್ಟಿನಲ್ಲಿ 'green premium' ಅಥವಾ 'ಹಸಿರು ಮೌಲ್ಯ' ಎಂಬ ಪರಿಮಾಣವು ಇತ್ತೀಚೆಗೆ ಮಹತ್ವ ಪಡೆಯುತ್ತಿದೆ.



1 EJ = 10^{18} Joules

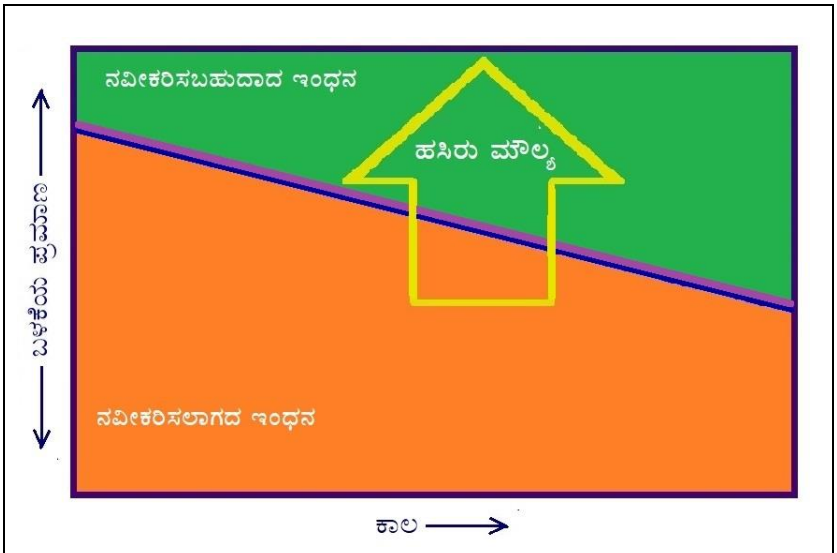
ಚಿತ್ರ 1: 2023ನೇ ವರ್ಷದ ದತ್ತಾಂಶದ ಪ್ರಕಾರ ಜಾಗತಿಕ ಮಟ್ಟದಲ್ಲಿ ಬಳಕೆಯಲ್ಲಿರುವ ಇಂಧನಗಳ ಪಾಲು.
ದತ್ತಾಂಶ – Energy Institute Statistical Review of World Energy 2024

ನಾವು ಬಳಸುವ ಇಂಧನಗಳು ಭೂಮಿಯಲ್ಲಿ ಬತ್ತಿ ಹೋಗುವ ಸಾಧ್ಯತೆಯನ್ನು ಪರಿಗಣಿಸಿ, ಎರಡು ವರ್ಗಗಳಾಗಿ ವಿಂಗಡಿಸಬಹುದು. ಅವುಗಳೆಂದರೆ, ನವೀಕರಿಸಲಾಗದ ಮತ್ತು ನವೀಕರಿಸಬಹುದಾದ ಇಂಧನಗಳು. ಪೆಟ್ರೋಲಿಯಮ್, ಕಲ್ಲಿದ್ದಲ್ಲು, ನೈಸರ್ಗಿಕ ಅನಿಲ, ಅಣುಶಕ್ತಿ ಮುಂತಾದವುಗಳು ನವೀಕರಿಸಲಾಗದ ಇಂಧನಗಳು. ಸೌರಶಕ್ತಿ, ಪವನಶಕ್ತಿ, ಸಾಗರಶಕ್ತಿ, ಜೈವಿಕ ಇಂಧನ, ಜಲವಿದ್ಯುತ್, ಜಲಜನಕ ಶಕ್ತಿ ಮುಂತಾದವುಗಳು ನವೀಕರಿಸಬಹುದಾದ ಇಂಧನಗಳು. ಹಲವಾರು ವರದಿಗಳ ಪ್ರಕಾರ, ಚಿತ್ರ 1ರಲ್ಲಿ ತೋರುವಂತೆ, ಜಾಗತಿಕ ಮಟ್ಟದಲ್ಲಿ ನವೀಕರಿಸಲಾಗದ ಇಂಧನಗಳ ಪಾಲು ಒಟ್ಟು ಬಳಕೆಯ 85%ಕ್ಕಿಂತ ಹೆಚ್ಚಿದೆ. ಈ ಇಂಧನಗಳು ಬರಿದಾಗಬಹುದು ಎಂಬ ಅಂಶ ಒಂದು ಕಡೆಯಾದರೆ, ಅವುಗಳು ಉಗುಳುವ ಹೊಗೆ ಮತ್ತು ಇನ್ನಿತರ ತ್ಯಾಜ್ಯ ಉತ್ಪನ್ನಗಳು ಪರಿಸರಕ್ಕೆ ಉಂಟುಮಾಡುವ ಹಾನಿ ಇನ್ನೂ ಭಯಾನಕವಾದುದು. ನೆಲ–ಜಲ–ವಾಯು ಮಾಲಿನ್ಯದ

ಪ್ರಮಾಣ ದಿನೇ ದಿನೇ ವೇಗವಾಗಿ ಹೆಚ್ಚುತ್ತಲಿದೆ. ಭೂಮಿಯಲ್ಲಿ ಸಸ್ಯ ಮತ್ತು ಪ್ರಾಣಿವರ್ಗಗಳ ಸಮನ್ವಯ ಬಾಳಿಗೆ ದಕ್ಕೆ ತಂದಿದೆ.

ನವೀಕರಿಸಲಾಗದ ಇಂಧನಗಳು ಉರಿದು ಶಕ್ತಿಯೊಂದಿಗೆ ಬಿಡುಗಡೆಯಾಗುವ ತ್ಯಾಜ್ಯವಸ್ತುಗಳ ಪೈಕಿ ಇಂಗಾಲದ ಉತ್ಪನ್ನಗಳ ಪ್ರಮಾಣ ಗರಿಷ್ಟ ಮಟ್ಟದಲ್ಲಿರುತ್ತದೆ. ವಾತಾವರಣದಲ್ಲಿ ಇವುಗಳ ಪ್ರಮಾಣ ಹೆಚ್ಚಿ ನಮಗೆಲ್ಲ ಶುದ್ಧ ವಾಯು ಮತ್ತು ಆಹಾರದ ಮೂಲವಾಗಿರುವ ಹಸಿರು ಸಸ್ಯಗಳು ದೊಡ್ಡ ಪ್ರಮಾಣದಲ್ಲಿ ಹಾನಿಗೊಳ್ಳುತ್ತಿವೆ. ಆದುದರಿಂದ, ವಾತಾವರಣಕ್ಕೆ ಬಿಡುಗಡೆಯಾಗುವ ಇಂಗಾಲದ ಅಂಶವನ್ನು ಕಡಿತಗೊಳಿಸುವುದು ಇಂದಿನ ಸವಾಲಾಗಿದೆ. ಈ ನಿಟ್ಟಿನಲ್ಲಿ 'ಹಸಿರು ಮೌಲ್ಯ' ಎಂದರೇನು ಎಂಬ ಬಗ್ಗೆ ತಿಳಿಯೋಣ.

ಪ್ರಸ್ತುತ, ಉಕ್ಕಿನ ಉತ್ಪಾದನೆ ಇಂಗಾಲವನ್ನು ಬಹು ಪ್ರಮಾಣದಲ್ಲಿ ಉಗುಳುವ ಬ್ಲಾಸ್ಟ್ ಫರ್ನೆಸ್‌ಗಳಲ್ಲಿ ಮಾಡಲಾಗುತ್ತಿದೆ. ಇಂಗಾಲ ಹೊರಸೂಸುವ ಪ್ರಮಾಣವನ್ನು ಕಡಿಮೆಗೊಳಿಸಲು ವಿದ್ಯುತ್ ಕಿಡಿ ಫರ್ನೆಸ್ ಅಥವಾ ಸ್ಮೆಲ್ಟರ್ ತಂತ್ರಜ್ಞಾನಗಳನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಲಾಗುತ್ತಿದೆ. ಅಂತೆಯೇ, ಅಲ್ಯುಮಿನಿಯಂ ಕ್ಷೇತ್ರದಲ್ಲಿ ಮರುಬಳಕೆಯ ವಿಧಾನದ ಹೆಚ್ಚಳ, ಸ್ಮೆಲ್ಟರ್‌ಗಳಲ್ಲಿ ನವೀಕರಿಸಬಹುದಾದ ಇಂದನಗಳ ಬಳಕೆ, ಜಡ ವಿದ್ಯುದ್ವಾರಗಳನ್ನು ಬಳಸಿ ವಿದ್ಯುದ್ವಿಶ್ಲೇಷಣೆ ಇತ್ಯಾದಿಗಳಿಂದ ಉತ್ಪಾದನೆಯನ್ನು ಪ್ರೋತ್ಸಾಹಿಸಲಾಗುತ್ತಿದೆ. ಪಾಲಿಮರ್ ವಸ್ತುಗಳ ಮರುಬಳಕೆ ಅಥವಾ ಸಂಸ್ಕರಣೆ ಸುಲಭ ಸಾಧುವಲ್ಲ. ಅದಾಗ್ಯೂ ಉತ್ತಮ ಗುಣಮಟ್ಟದ rHDPE ಮತ್ತು rPETಗಳನ್ನು ಪಡೆಯಲು ಬಹಳ ಹೆಚ್ಚಿನ ಬೆಲೆ ತೆರಬೇಕಿದೆ. ಯುರೋಪ್‌ನ ಒಂದು ವರದಿಯ ಪ್ರಕಾರ, ಇತರ ಹಲವು ಉಪಕ್ರಮಗಳೊಂದಿಗೆ, ಪೆಟ್ರೋಲ್‌ನಲ್ಲಿ ಒಕ್ಟೇನ್ ಪ್ರಮಾಣವನ್ನು ಹೆಚ್ಚಿಸುವುದರಿಂದ ಇಂಗಾಲದ ಹೆಜ್ಜೆಗುರುತನ್ನು ಕಡಿಮೆಗೊಳಿಸಬಹುದು. ಆದರೆ, ಈ ನಿಟ್ಟಿನಲ್ಲಿ ಅಧಿಕ–ಒಕ್ಟೇನ್ ಪೆಟ್ರೋಲ್‌ನ ಉತ್ತಮ ಪ್ರಯೋಜನ ಪಡೆಯಲು ವಾಹನಗಳ ಇಂಜಿನ್ ಮತ್ತು ಪೆಟ್ರೋಲಿಯಂ ರಿಫೈನರಿಗಳಲ್ಲಿ ಹಲವು ಮಾರ್ಪಾಡುಗಳನ್ನು ತರಬೇಕಾಗುತ್ತವೆ.



ಚಿತ್ರ 2: ಹಸಿರು ಮೌಲ್ಯದ ನಿರೂಪಣೆ.

ಮೇಲೆ ಉಲ್ಲೇಖಿಸಿದ ಮಾರ್ಪಾಡುಗಳ ವೆಚ್ಚವನ್ನು ತಗ್ಗಿಸಲು ಸಂಶೋಧನೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿಗೆ ಹೆಚ್ಚಿನ ಹೂಡಿಕೆ ಮಾಡಬೇಕಾಗಬಹುದು. ಇತರ ಉತ್ಪಾದನಾ ಕ್ಷೇತ್ರಗಳಾದ ಸಿಮೆಂಟು ಹಾಗೂ ವಿದ್ಯುಚ್ಛಕ್ತಿ ಘಟಕಗಳು ಅತ್ಯಂತ ಹೆಚ್ಚು ಇಂಗಾಲವನ್ನು ಹೊರಸೂಸುತ್ತಿವೆ. ಇಂಗಾಲವನ್ನು ಹೊರಸೂಸದೆ ಸಿಮೆಂಟ್ ಉತ್ಪಾದಿಸುವ ಪ್ರಕ್ರಿಯೆ ಸದ್ಯಕ್ಕಂತೂ ನಮಗೆ ತಿಳಿದಿಲ್ಲವೆಂದೇ ಹೇಳಬಹುದು. ವಿದ್ಯುಚ್ಛಕ್ತಿ ಉತ್ಪಾದನೆಗೆ ಪರ್ಯಾಯ ಮೂಲಗಳಾಗಿ ನವೀಕರಿಸಬಹುದಾದ ಸೌರ, ಪವನ, ಸಾಗರ ಮತ್ತು ಜಲಜನಕ ಶಕ್ತಿಗಳ ಬಗ್ಗೆ ನಮಗೆ ಅರಿವಿದ್ದರೂ

ಮಿತವ್ಯಯದಲ್ಲಿ ಅವುಗಳನ್ನು ಶಕ್ತಿಯಾಗಿ ಪರಿವರ್ತಿಸುವ ಸಮರ್ಥ ತಂತ್ರಜ್ಞಾನಗಳು ಇನ್ನೂ ಸಬಲಗೊಳ್ಳಬೇಕಿವೆ. ವಿದ್ಯುಚ್ಛಕ್ತಿಯನ್ನು ದೀರ್ಘಾವಧಿ ಶೇಖರಣೆ ಮಾಡಲು ದಕ್ಷ ಬ್ಯಾಟರಿಗಳ ಅವಶ್ಯಕತೆಯಿವೆ.

'ಹಸಿರು ಮೌಲ್ಯ' ಎಂಬ ಪರಿಮಾಣವನ್ನು ಸೂಕ್ತರೀತಿಯಲ್ಲಿ ಅರ್ಥೈಸುವುದು ಮಾತ್ರವಲ್ಲ, ಕಡಿತಗೊಳಿಸುವುದೂ ಸವಾಲಾಗಿದೆ. ಕೈಗೆಟಕುವ ಬೆಲೆಗೆ ಶುದ್ಧ ಇಂಧನ ದೊರೆಯಬೇಕಾದಲ್ಲಿ ಸಾಕಷ್ಟು ಸಂಶೋಧನೆಯ ಅಗತ್ಯವಿದೆ. ವಸ್ತುಗಳು ಮತ್ತು ತಂತ್ರಜ್ಞಾನಗಳ ಅಭಿವೃದ್ಧಿ ಆಗಬೇಕಿದೆ. ಇದೊಂದು ಜಾಗತಿಕ ವಿಚಾರವಾಗಿರುವುದರಿಂದ ರಾಷ್ಟ್ರೀಯ ಸರಕಾರಗಳು ಅಂತರಾಷ್ಟ್ರೀಯ ಸಂಸ್ಥೆಗಳ ಜೊತೆ ಸೇರಿ ಸೂಕ್ತ ಕೈಗಾರಿಕಾ ಮತ್ತು ಪರಿಸರ ಸಂಬಂಧಿ ನೀತಿಗಳನ್ನು ಹೆಣೆದು ಪಾಲಿಸಬೇಕಿವೆ. ಆಗಲೇ ಶುದ್ಧ ಪರಿಸರದ ಆಶಯವು ಸಾಕಾರಗೊಳ್ಳಲು ಸಾಧ್ಯ.

ಕೊನೆಯ ಮಾತು. ಭೂಮಿಯ ಮೇಲೆ ಜೀವವೈವಿಧ್ಯಗಳನ್ನು ನಿರಂತರ ಕಾಪಾಡಲು ಹಾಗೂ ಮಾನವ ಜೀವನ ಸುಕೃತಗೊಳ್ಳಲು ವಿಶ್ವಸಂಸ್ಥೆ ಕೈಗೊಂಡ 2030ರ ಕಾರ್ಯಸೂಚಿಯಂತೆ ಹಮ್ಮಿಕೊಳ್ಳಲಾದ 17 ನಿರಂತರ ಅಭಿವೃದ್ಧಿ ಗುರಿಗಳ (The Sustainable Development Goals) ಪೈಕಿ 12ಯದಾದ 'ಜವಾಬ್ದಾರಿಯುತ ಬಳಕೆ ಮತ್ತು ಉತ್ಪಾದನೆ' ಬಹಳ ಪ್ರಮುಖವಾದುದು.

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Unseen Partner: Lokasundari Ammal and Her Impact on Sir C.V. Raman

Muktha B. Kagali

Sir C.V. Raman, Lokasundari Ammal Raman, and Their Connection with Mahatma Gandhi

As we honor Sir C.V. Raman and his contributions to science this month (7th November), we must also acknowledge the profound influence of his partnership with Lokasundari Ammal and their connection with Mahatma Gandhi. Their shared values and commitments reflect a holistic vision for India—one that embraces scientific inquiry, social upliftment, and community empowerment.

Sir C.V. Raman, Lokasundari Ammal Raman

In celebrating the life and legacy of Sir C.V. Raman, it is crucial to also recognize the often-overlooked role of women like Lokasundari Ammal, whose contributions remain only in the shadows of historical narratives. The women like Lokasundari Ammal understood the men they stood beside yet had vibrant, impactful lives of their own. While the men made history, few acknowledge the profound ways in which the women helped shape that history, it is always the great man and his often-unknown wife. There is a silence surrounding women, their achievements, and their narratives. These stories always focus on the man, with the woman becoming an annexe to the imagination.

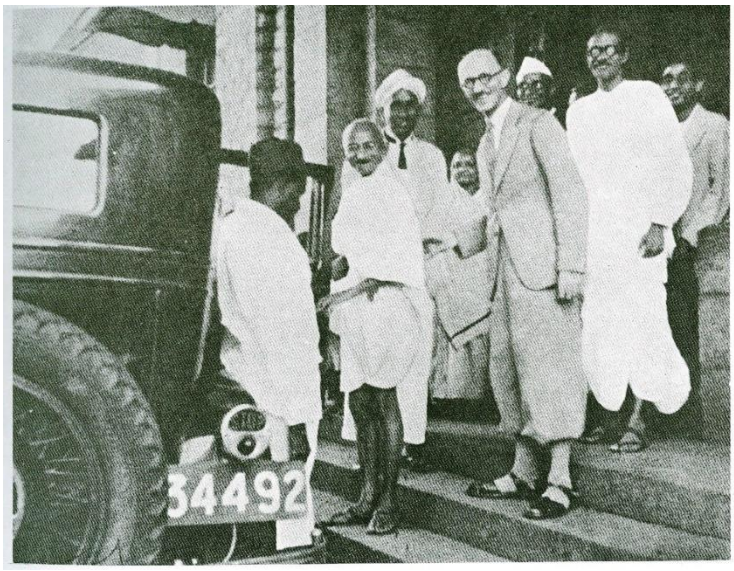
This narrative shed light on how their values and commitments intertwined during a transformative period in India's history.

A Meeting of Minds

In the early 1930s, while India was in the midst of its struggle for independence, Sir C.V. Raman and Lokasundari Ammal were drawn toward Mahatma Gandhi's principles of self-reliance and social responsibility. Raman, already celebrated for his groundbreaking work in science, was deeply conscious of the role that scientific progress could play in national development. Lokasundari, an educated and insightful woman, shared her husband's belief in the importance of social upliftment, particularly through education. These values resonated with Gandhi's vision of empowering the masses.

The Invitation to the Sabarmati Ashram

In 1935, both Raman and Lokasundari received a personal invitation from Mahatma Gandhi to visit the Sabarmati Ashram in Ahmedabad. This was a significant gesture, reflecting Gandhi's admiration for Raman's scientific contributions and his appreciation of Lokasundari's role as an intellectual partner. The visit to the ashram was a personal milestone for the couple and an enriching experience that deepened their commitment to India's progress.



During their stay, they engaged in meaningful discussions with Gandhi on topics such as science, education, and the future of the nation. Raman's scientific rigor found common ground with Gandhi's emphasis on self-reliance and the importance of community development. Lokasundari, too, found her beliefs about women's education and societal empowerment strongly echoed in Gandhi's ideals.

Gandhi's Influence on Their Values

Their interactions with Gandhi had a lasting impact on both Sir C.V. Raman and Lokasundari Ammal. Gandhi's unwavering commitment to truth, simplicity, and the importance of scientific knowledge in nation-building left an indelible mark on the couple. Lokasundari, in particular, was inspired by Gandhi's dedication to improving the lives of the rural population, aligning with her own beliefs about education and empowerment, especially for women.

A Legacy of Knowledge and Social Responsibility

The relationship between Sir C.V. Raman and Lokasundari Ammal with Mahatma Gandhi exemplifies the convergence of scientific inquiry and social activism. Inspired by their discussions with Gandhi, the couple became more involved in community educational initiatives, emphasizing the importance of scientific knowledge for societal development. They recognized that India's future lay not just in scientific progress but in uplifting the underserved segments of society.

Lokasundari Ammal, in her own right, contributed to the educational landscape by promoting science and the arts, particularly among women and the underprivileged. Her commitment to social progress resonated deeply with Gandhi's ideals, making her a key figure in the shared legacy of knowledge and responsibility that she and Raman cultivated together.

Lokasundari Ammal's Inspiring Role Behind the Brilliance of Sir C.V. Raman

Ammal was not only a supportive partner but also an integral part of Raman's success and personal growth:

1. **Supportive Partner:** Lokasundari played a crucial role in Raman's life, providing unwavering support throughout his academic and professional journey. Her belief in his abilities and encouragement were key to his groundbreaking achievements.
2. **Sharp Wit and Humor:** Lokasundari's sharp wit and humor made her a perfect match for Raman. Their relationship was built on lively conversations and intellectual debates, reflecting their deep mutual respect and intellectual connection.
3. **Handling Challenges:** In a famous incident during a flood in Calcutta, while Raman was frustrated about how to get to work, Lokasundari demonstrated her resourcefulness. She improvised a bridge using stools, ensuring Raman could cross the flooded street while she waded through the water. This episode highlighted her Ddetermination and quick thinking.**Influence on His Work:** Lokasundari was not merely a supportive spouse but also engaged actively with Raman's scientific pursuits, often providing valuable insights that helped him refine his ideas. Her intellectual contributions were pivotal to his work.
4. **Social Engagement:** Much like her husband, Lokasundari was committed to social causes, particularly education and community upliftment. She strongly advocated for women's education and shared Raman's vision for societal progress.
5. **Celebration of Achievements:** When Raman was awarded the Nobel Prize in Physics in 1930, it was a moment of pride for both of them. Raman's confidence in predicting his win by booking tickets for them in advance is legendary, and it reflects the mutual support and belief that existed between him and Lokasundari.
6. **Family Life:** Together, they raised a family, with Lokasundari skillfully balancing her role as a mother with her dedication to social causes. Her nurturing presence was pivotal in maintaining harmony in their family life while supporting Raman's career.

Nobelfru meaning Noble wife
This picture of *Lady Raman* was published in the Swedish major newspaper *Stockholms-Tidningen* around the time Sir *C.V. Raman* received the Nobel Prize in Physics in 1930.

Lokasundari Ammal's steadfast partnership with Sir C.V. Raman exemplifies the profound impact a supportive and intellectually engaged partner can have on a pioneering scientist's journey. Her resilience, intellect, and dedication left an enduring mark on Raman's success and on society, embodying a legacy of shared passion for knowledge and societal progress.***

The Double-Edged Sword of Salt: Essential but Dangerous

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Salt is an essential part of our lives, both in flavoring food and maintaining our health. A popular proverb in Kannada, “ಉಪ್ಪಿಗಿಂತ ರುಚಿ ಇಲ್ಲ; ತಾಯಿಗಿಂತ ಬಂಧುವಿಲ್ಲ" (There is no taste better than salt, no bond stronger than a mother’s"), highlights its vital role. While tea without sugar may be drinkable, food without salt is almost impossible to eat. Beyond taste, salt provides two essential electrolytes—sodium and chloride—that are critical for key bodily functions. It helps regulate fluid balance, supports nerve function, enables muscle contraction, and plays a role in controlling blood pressure*. Since the body cannot produce these electrolytes on its own, we need salt to meet the necessary levels, although small amounts can be found in fruits, vegetables, and other foods.

There are three common types of salt we use: iodized salt, which contains sodium, chloride, and iodine for thyroid health; refined or purified salt, which is purely sodium and chloride; and sea salt or rock salt, which also contains other beneficial electrolytes like potassium, magnesium, and calcium. Although rock salt has seen a decline in popularity, it still offers a wider range of minerals.

However, as with all good things, salt must be consumed in moderation. The saying, "Even nectar can become poison in excess" (ಅತಿಯಾದರೆ ಅಮೃತವೂ ವಿಷ), is especially relevant here. Excessive salt intake can have serious consequences. I recall a tragic story from a newspaper a few years ago: two friends made a bet, and one of them swallowed an entire packet of salt (250 grams) followed by water. Although he won the bet, he soon lost his life to salt poisoning. Despite medical intervention, he could not be saved. The lethal dose of salt is approximately 3 grams per kilogram of body weight, and consuming this amount disrupts bodily functions, leading to organ failure and death.

While most of us will not consume salt in such extreme quantities, consistently high salt intake poses significant health risks. Excessive sodium raises blood pressure, increasing the risk of heart attacks and other cardiovascular diseases. A 2007 medical journal reported that reducing salt intake can lower the chances of heart disease and stroke for people with high blood pressure. In simpler terms, too much salt causes water retention, which raises blood pressure and heightens the risk of hypertension. Salt reduction is also beneficial for those suffering from edema (fluid retention), as shown by research from Truman Memorial Veterans Hospital, Columbia.

Research also reveals that high salt intake can damage the stomach lining, increasing the risk of cancer. Excess sodium puts stress on the kidneys, leading to kidney stones and, in severe cases, kidney failure. A high-salt diet increases calcium excretion through urine, which can crystallize over time and form painful kidney stones. The rise in kidney failure and kidney stones is alarming. As per a survey, around 12% of people in India have kidney stones, which is similar to the global average. However, the number is higher in northern India, where about 15% of the population is affected. On June 1, 2023, the world's largest kidney stone was

surgically removed from a 62-year-old retired soldier in Sri Lanka, making headlines recently. I still remember reading about a similar case around 10 years ago when a 450-gram kidney stone was removed at a multi-speciality hospital in Mangalore.

Another consequence of excessive sodium is its negative impact on bone health. High sodium levels cause the body to lose calcium, weakening bones over time and increasing the risk of osteoporosis, especially in women. Excess salt can also exacerbate conditions like ulcers. A 2024 study revealed that a higher frequency of adding salt to foods is associated with an increased risk of psoriasis, potentially mediated by obesity and inflammation, providing evidence that greater salt intake may be a novel risk factor for the condition.

Given these health concerns, you might think, "I will just stop eating salt entirely." But that's not the solution either! As mentioned earlier, salt is crucial for many bodily functions, and too little salt can lead to low blood pressure, muscle cramps, dizziness, and nerve issues. The key is balance—enough salt to support health but not so much that it becomes harmful. One effective way to manage salt intake is by limiting salty snacks like pickles, chips, sauces, and processed foods, which often contain hidden sodium. According to the World Health Organization (WHO), adults should limit their daily salt intake to about 5 grams (roughly one and a half teaspoons). This is equivalent to less than 2,000 milligrams of sodium. For children aged 2–15, the WHO recommends adjusting salt intake based on their energy needs. Younger children with lower energy requirements should consume significantly less salt than adults, ensuring their intake is appropriate for their age, size, and activity level.

Interestingly, research from Finland and the University of London has linked excessive salt intake in children to obesity, which increases their risk of developing type-2 diabetes and heart disease later in life. The connection between salt, weight gain, and long-term health is something parents should be mindful of when giving their children salty snacks.

For those who can't resist salty foods, there's an easy solution: drink plenty of water. Drinking enough water helps the body flush out excess sodium through sweat and urine, reducing the risk of salt-related health issues. This idea is reflected in an old saying: "If you eat salt, you must drink water" (ಉಪ್ಪು ತಿಂದವ ನೀರು ಕುಡಿಯಲೇಬೇಕು).

Thus, it's important to recognize that salt is like a double-edged sword—essential for life but harmful when consumed in excess. The key lies in moderation. By controlling our salt intake, we can reap its benefits without risking our health. As always, balance is crucial!

The Importance of Salt in Our Body:

- Maintains Fluid Balance: Sodium helps regulate water levels in the body, keeping you hydrated and ensuring that fluids move between cells and the bloodstream properly.
- Supports Nerve Function: Sodium and potassium are key players in transmitting nerve signals, allowing communication between the brain and body.
- Enables Muscle Contraction: Sodium controls the exchange of ions that muscles, including the heart, need to contract and relax.

- Regulates Blood Pressure: Sodium helps maintain proper blood pressure by controlling fluid balance (Too much sodium can raise blood pressure, while too little can lower it).
- Aids Nutrient Absorption: Sodium helps absorb important nutrients, like glucose and amino acids, from the intestines.
- Balances pH Levels: Salt is critical for maintaining the body's acid-base balance, which supports metabolic functions.
- Restores Electrolytes: In cases of dehydration or excessive sweating, salt can help replenish lost electrolytes, preventing cramps.
- Prevents Iodine Deficiency: Iodized salt provides essential iodine, which helps prevent thyroid issues like goiter.

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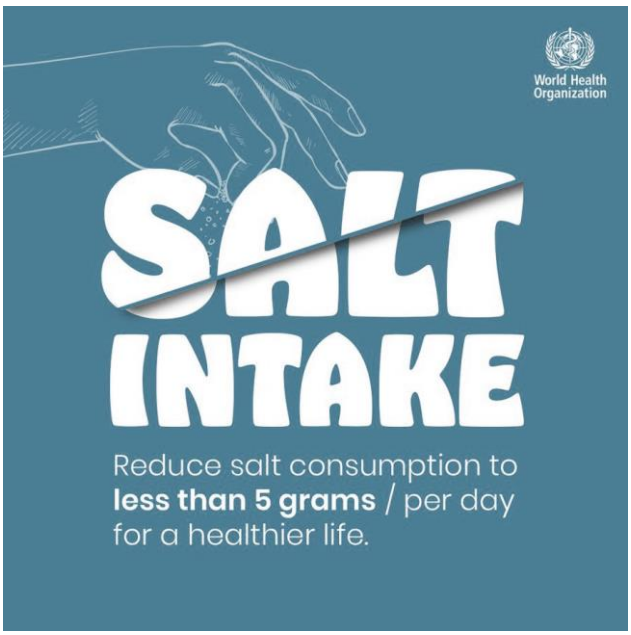

KAAS in Action: Engaging in Meaningful Activities for Science and Society

Association for the Advancement of Science (KAAS) stands at the forefront of promoting scientific inquiry and public engagement. With a commitment to bridging the gap between science and society, KAAS actively organizes and participates in a diverse range of initiatives aimed at enhancing scientific literacy, fostering collaboration, and addressing contemporary challenges. This page highlights the meaningful activities undertaken by KAAS, showcasing our dedication to empowering communities through education, outreach programs, and innovative projects. Through these efforts, we strive to inspire a new generation of thinkers and doers, ultimately contributing to a more informed and scientifically engaged society.

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ಕನ್ನಡಪ್ರಭ

ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರಕ್ಕೆ ಹೆಚ್ಚು ಆದ್ಯತೆ ನೀಡಬೇಕು: ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ

ಆತ್ರೆ, ಡಾ.ದೊರೆಸ್ವಾಮಿ, ರುದ್ರೇಗೌಡರಿಗೆ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ಪ್ರದಾನ

ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ, ಎಸ್.ರುದ್ರೇಗೌಡರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ಪ್ರದಾನ ಮಾಡಲಾಯಿತು.

• **ಕನ್ನಡಪ್ರಭ ವಾರ್ತೆ** ಬೆಂಗಳೂರು

ಭಾರತ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರಕ್ಕೆ ಹೆಚ್ಚಿನ ಆದ್ಯತೆ ನೀಡಿದರೆ 2047ರ ವೇಳೆಗೆ ಸೂಪರ್ ಪವರ್ ರಾಷ್ಟ್ರವಾಗುವಲ್ಲಿ ಯಾವುದೇ ಸಂಶಯವಿಲ್ಲ ಎಂದು ರಕ್ಷಣಾ ಸಂಶೋಧನೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿ ಸಂಸ್ಥೆಯ (ಡಿಆರ್‌ಡಿಒ) ಮಾಜಿ ಮುಖ್ಯಸ್ಥ ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ ಹೇಳಿದ್ದಾರೆ.

ಕರ್ನಾಟಕ ಅಸೋಸಿಯೇಷನ್ ಫಾರ್‌ದಿ ಅಡ್ವಾನ್ಸ್ ಮೆಂಟ್ ಆಫ್ ಸೈನ್ಸ್(ಕೆಎಎಸ್) ಮತ್ತು ಬೆಂಗಳೂರು ವಿವಿ ವಿಜ್ಞಾನ ವೇದಿಕೆ ಸಹಯೋಗದಲ್ಲಿ ಬುಧವಾರ ಜ್ಞಾನಭಾರತಿಯ ಡಾ. ವೆಂಕಟ ಗಿರಿಗೌಡ ಸಭಾಂಗಣದಲ್ಲಿ ಆಯೋಜಿಸಿದ್ದ ಸಮಾರಂಭದಲ್ಲಿ ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ, ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿನ ಸಾಧನೆಗಾಗಿ ಪದ್ಮವಿಭೂಷಣ ಡಾ.ವಿ.ಕೆ ಆತ್ರೆ, ಪಿಇಎಸ್ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ ಮತ್ತು ಉದ್ಯಮಿ ಎಸ್.ರುದ್ರೇಗೌಡ ಅವರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರದಾನ ಮಾಡಿ ಸನ್ಮಾನಿಸಲಾಯಿತು.

ಪ್ರಶಸ್ತಿ ಸ್ವೀಕರಿಸಿ ಮಾತಮಾಡಿದ ಡಾ.ಆತ್ರೆ, ಇಡೀ ವಿಶ್ವ ಭಾರತದ ನಾಯಕತ್ವವನ್ನು ಎದುರುನೋಡುತ್ತಿದೆ. ಈ ನಿಟ್ಟಿನಲ್ಲಿ ಮುಂದಿನ ಎರಡು ದಶಕಗಳು ಭಾರತಕ್ಕೆ ಅತಿ ನಿರ್ಣಾಯಕ. 2027ರ ವೇಳೆಗೆ ಅಭಿವೃದ್ಧಿ ಹೊಂದಿದ ರಾಷ್ಟ್ರವಾಗುವ ಗುರಿಯೊಂದಿಗೆ ಭಾರತ ಹೆಜ್ಜೆ ಇಡುತ್ತಿದೆ. ಇದು ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರದ ಅಭಿವೃದ್ಧಿಯಿಂದ ಮಾತ್ರ ಸಾಧ್ಯ. ಈ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರಗಳಲ್ಲಿ ಹೆಚ್ಚಿನ ಸಂಶೋಧನೆ, ಆವಿಷ್ಕಾರ, ಬೆಳವಣಿಗೆಗೆ ಭಾರತ ಹೆಚ್ಚಿನ ಆದ್ಯತೆ ನೀಡಬೇಕು. ಆಗ ಬಲಿಷ್ಠ ದೇಶ ಆಗುವುದರಲ್ಲಿ ಯಾವ ಸಂಶಯವಿಲ್ಲ ಎಂದರು.

ಪಿಇಎಸ್ ವಿವಿಯ ಕುಲಾಧಿಪತಿ ಡಾ.ಎಂ.ಆರ್. ದೊರೆಸ್ವಾಮಿ ಮಾತನಾಡಿ, ನಮಗೆ ಇಂದು ಸಿಕ್ಕ ಗೌರವ ಮತ್ತಷ್ಟು ಜವಾಬ್ದಾರಿ ಹೆಚ್ಚಿಸಿದೆ. ದಶಕಗಳಿಂದ ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿನ ಬದಲಾವಣೆಗೆ ಶ್ರಮಿಸಿರುವೆ. ಸರ್ಕಾರದ ಶಿಕ್ಷಣ ಸುಧಾರಣೆಗಳ ಸಲಹೆಗಾರನಾಗಿದ್ದಾಗ ಸಾವಿರಾರು ಸರ್ಕಾರಿ ಶಾಲೆಗಳನ್ನು ಜನಪ್ರತಿನಿಧಿಗಳು, ಉದ್ಯಮಿಗಳು, ಖಾಸಗಿ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಗಳು, ವಿವಿಗಳಿಂದ ದತ್ತು ಪಡೆದು ಅಭಿವೃದ್ಧಿಪಡಿಸಲು ಶ್ರಮಿಸಿದ್ದೇನೆ. ನಮ್ಮ ಪಿಇಎಸ್ ವಿವಿಯಿಂದಲೂ 1600 ಸರ್ಕಾರಿ ಶಾಲೆಗಳ ಮೂಲ ಸೌಕರ್ಯ ಸಂಪೂರ್ಣ ಅಭಿವೃದ್ಧಿ ಮಾಡಿದ್ದೇವೆ ಎಂದರು.

ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಗಳಲ್ಲಿ ಗುಣಮಟ್ಟದ ಶಿಕ್ಷಣದ ಜೊತೆಗೆ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಸೂಕ್ತ ಮಾರ್ಗದರ್ಶನ, ಕೌಶಲ್ಯ ತರಬೇತಿ, ವಿದ್ಯಾರ್ಥಿ-ಶಿಕ್ಷಕರ ಸಂಬಂಧ ಸುಧಾರಣೆಗಳಿಗೆ ಆದ್ಯತೆ ನೀಡಬೇಕು. ಸಮೃದ್ಧ ರಾಷ್ಟ್ರ ನಿರ್ಮಾಣಕ್ಕೆ ಶಿಕ್ಷಕರ ಪಾತ್ರ ದೊಡ್ಡದು. ಆ ಶಿಕ್ಷಕರ ಪ್ರತಿನಿಧಿಯಾಗಿ ಈ ಪ್ರಶಸ್ತಿ ಸ್ವೀಕರಿಸಿರುವುದು ಸಂತಸ ತಂದಿದೆ ಎಂದರು.

ಕುಲಪತಿ ಡಾ.ಜಯಕರ ಎಸ್ ಎಂ, ಕೆಎಎಸ್ ಅಧ್ಯಕ್ಷ ವಿಶ್ರಾಂತ ಕುಲಪತಿ ಡಾ.ಕೆ.ಸಿದ್ದಪ್ಪ, ಡಾ.ಅಶೋಕ್ ಡಿ ಹಂಜಗಿ, ಪ್ರೊ.ಬಿ.ಸಿ.ಪ್ರಭಾಕರ್, ಪ್ರೊ.ಎನ್.ನಾಗಯ್ಯ ಹಾಜರಿದ್ದರು.

ಕುಲಪತಿ ಸ್ಥಾನ ಹಣಕ್ಕೆ ಮಾರಾಟವಾಗುತ್ತಿದೆ ಎಂದು ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ ಬೇಸರ

ಮೆರಿಟ್ ಆಧಾರದಲ್ಲಿ ಕುಲಪತಿ ನೇಮಕವಾಗಲಿ

■ **ವಿಕ ಸುದ್ದಿಲೋಕ** ಬೆಂಗಳೂರು

''ವಿಶ್ವವಿದ್ಯಾಲಯಗಳ ಕುಲಪತಿ ಸ್ಥಾನವನ್ನು ಹಣಕ್ಕೆ ಮಾರಾಟ ಮಾಡುವ ಸಂಪ್ರದಾಯ ಶುರುವಾಗಿದೆ. ಇಂತಹ ಪರಿಸ್ಥಿತಿಯಲ್ಲಿ ಗುಣಮಟ್ಟದ ಶಿಕ್ಷಣ ಮತ್ತು ಸಂಶೋಧನೆ ಹೇಗೆ ಸಾಧ್ಯವಾಗಲಿದೆ,'''' ಎಂದು ಪಿಇಎಸ್ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿಯಾದ ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ ಅಸಮಾಧಾನ ವ್ಯಕ್ತಪಡಿಸಿದರು.

ಕರ್ನಾಟಕ ಅಸೋಸಿಯೇಷನ್ ಫಾರ್ ದಿ ಅಡ್ವಾನ್ಸ್‌ಮೆಂಟ್ ಆಫ್ ಸೈನ್ಸ್ (ಕಾಸ್) ಮತ್ತು ಬೆಂಗಳೂರು ವಿವಿಯ ವಿಜ್ಞಾನ ವೇದಿಕೆ ವತಿಯಿಂದ ಬುಧವಾರ ವೆಂಕಟ ಗಿರಿಗೌಡ ಸಭಾಂಗಣದಲ್ಲಿ ಆಯೋಜಿಸಿದ್ದ 'ಕಾಸ್ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ' ಪ್ರದಾನ ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಪ್ರಶಸ್ತಿ ಸ್ವೀಕರಿಸಿ ಅವರು ಮಾತನಾಡಿದರು.

''ವಿಶ್ವವಿದ್ಯಾಲಯಗಳು ಸದೃಢವಾಗಬೇಕಾದರೆ ಅಲ್ಲಿ ಗುಣಮಟ್ಟದ ಶಿಕ್ಷಣ, ಸಂಶೋಧನೆಗಳು ಸಾಧ್ಯವಾಗಬೇಕಾದರೆ

ಡಾ.ಎಂ.ಆರ್. ದೊರೆಸ್ವಾಮಿ, ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ಎಸ್.ರುದ್ರೇಗೌಡ ಅವರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ನೀಡಿ ಗೌರವಿಸಲಾಯಿತು.

ವಿವಿಗಳ ಕುಲಪತಿ ಸ್ಥಾನಕ್ಕೆ ಆಯ್ಕೆ ಮಾಡುವಾಗ ಮೆರಿಟ್ ಪರಿಗಣಿಸಬೇಕೇ ಹೊರತು ಬೇರೆ ಯಾವ ಅಂಶವನ್ನೂ ಪರಿಗಣಿಸಬಾರದು,'' ಎಂದರು.

ಡಿಆರ್‌ಡಿಒ ಮಾಜಿ ಮುಖ್ಯಸ್ಥ ಪದ್ಮವಿಭೂಷಣ ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ''ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನಕ್ಕೆ ಮತ್ತಷ್ಟು ಆದ್ಯತೆ ನೀಡಿದರೆ ಭಾರತ ಸೂಪರ್ ಪವರ್

ಅನುಮಾನವಿಲ್ಲ,'' ಎಂದರು.

ಬೆಂಗಳೂರು ವಿವಿ ಕುಲಪತಿ ಡಾ.ಎಸ್. ಎಂ.ಜಯಕರ ಮಾತನಾಡಿ, ''ವಿಶ್ವವಿದ್ಯಾಲಯಗಳಲ್ಲಾಗುವ ಸಂಶೋಧನೆಗಳು ದೇಶ ಮತ್ತು ಸಮಾಜದ ಸಮಸ್ಯೆಗಳನ್ನು ನಿವಾರಿಸಲು ಅನುಕೂಲವಾಗುವಂತಿರಬೇಕು. ಈ ನಿಟ್ಟಿನಲ್ಲಿ ಹೆಚ್ಚು ಹೆಚ್ಚು ಸಂಶೋಧನೆಗಳು ನಡೆಯಬೇಕು,''

ಶಿಕ್ಷಣ, ತಂತ್ರಜ್ಞಾನ, ಕೈಗಾರಿಕೆ ಕ್ಷೇತ್ರದಲ್ಲಿ ಸಾಧನೆ ಮಾಡಿರುವ ಡಾ.ಎಂ.ಆರ್. ದೊರೆಸ್ವಾಮಿ, ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ವಿಧಾನ ಪರಿಷತ್ ಮಾಜಿ ಸದಸ್ಯ ಎಸ್.ರುದ್ರೇಗೌಡ ಅವರಿಗೆ ಕಾಸ್ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ನೀಡಿ ಗೌರವಿಸಲಾಯಿತು.

ಕಾಸ್ ಅಧ್ಯಕ್ಷ ಡಾ.ಕೆ.ಸಿದ್ದಪ್ಪ, ಡಾ.ಅಶೋಕ್ ಡಿ. ಹಂಜಗಿ,

ವಿಶ್ವವಾಣಿ

ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ, ಎಸ್.ರುದ್ರೇಗೌಡರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರದಾನ

2047ಕ್ಕೆ ಭಾರತ ಸೂಪರ್ ಪವರ್ ಆಗುವತ್ತ ದೃಢ ಹೆಜ್ಜೆ

ಬೆಂಗಳೂರು: 2047ಕ್ಕೆ ಅಭಿವೃದ್ಧಿ ಹೊಂದಿದ ರಾಷ್ಟ್ರವಾಗುವ ಗುರಿಯತ್ತ ಭಾರತ ಹೆಜ್ಜೆ ಹಾಕುತ್ತಿದ್ದು, ಗುರಿ ಸಾಧನೆಗೆ ಭಾರತ ಆರ್ಥಿಕ ಸದೃಢತೆ, ಸ್ವಾವಲಂಬಿ ರಾಷ್ಟ್ರ, ಜ್ಞಾನ ಕೇಂದ್ರವಾಗಬೇಕು ಎಂದು ಪದ್ಮವಿಭೂಷಣ ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ ಅಭಿಪ್ರಾಯಪಟ್ಟರು.

ಕರ್ನಾಟಕ ಅಸೋಸಿಯೇಷನ್ ಫಾರ್ ದಿ ಅಡ್ವಾನ್ಸ್‌ಮೆಂಟ್ ಆಫ್ ಸೈನ್ಸ್ ಮತ್ತು ಬೆಂಗಳೂರು ವಿವಿ ವಿಜ್ಞಾನ ವೇದಿಕೆ ಸಹಯೋಗದಲ್ಲಿ ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ, ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿನ ಸಾಧನೆಗಾಗಿ ಪದ್ಮವಿಭೂಷಣ ಡಾ.ವಿ.ಕೆ ಆತ್ರೆ, ಪಿಇಎಸ್ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ ಡಾ.ಎಂ.ಆರ್.ದೊರೆಸ್ವಾಮಿ ಮತ್ತು ಕೈಗಾರಿಕೋದ್ಯಮಿ ಎಸ್.ರುದ್ರೇಗೌಡರವರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ನೀಡಿ ಸನ್ಮಾನಿಸಲಾಯಿತು.

ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ಸ್ವೀಕರಿಸಿ ಮಾತನಾಡಿದ ಆತ್ರೆ, ಭಾರತ ಜ್ಞಾನದ ವಿಶ್ವಗುರುವಾಗಲು ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರದಿಂದ ಮಾತ್ರ ಸಾಧ್ಯ. ಭಾರತ ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ ಕ್ಷೇತ್ರಕ್ಕೆ ಹೆಚ್ಚಿನ ಆದ್ಯತೆ ನೀಡಿದರೆ ಸೂಪರ್ ಪವರ್ ರಾಷ್ಟ್ರವಾಗುವುದರಲ್ಲಿ ಯಾವುದೇ ಸಂಶಯವಿಲ್ಲ. ಸಾಧಾರಣ ವ್ಯಕ್ತಿಗಳು ಅಸಾಧಾರಣ ಕಾರ್ಯಗಳನ್ನು ಸಾಧಿಸಬಹುದು. ವಿಶ್ವೇಶರಯ್ಯ, ಸಿ.ವಿ.ರಾಮನ್‌ರಂತ ಅಸಾಮಾನ್ಯ ವ್ಯಕ್ತಿಗಳಿಂದ ಮಾತ್ರ ಸದೃಢ ರಾಷ್ಟ್ರ ನಿರ್ಮಾಣವಾಗುವುದಿಲ್ಲ, ಸಣ್ಣ ಕಾಲೇಜೊಂದರ ಅತಿ ಸಾಮಾನ್ಯ ವಿದ್ಯಾರ್ಥಿ ತನ್ನ ಕರ್ತವ್ಯ, ಗುರಿಗಳನ್ನು ಅರಿತು ಕಾರ್ಯ ನಿರ್ವಹಿಸಿದರೆ ಅಭಿವೃದ್ಧಿ ಸಾಧ್ಯವಾಗುತ್ತದೆ. ಸತತ ಪರಿಶ್ರಮ, ಸಮಸ್ಯೆ ಬಗೆಹರಿಸುವ ಬುದ್ಧಿವಂತಿಕೆ, ಚಾಕಚಕ್ಯತೆ, ಕೊಟ್ಟ ಕೆಲಸ ಯಶಸ್ವಿಯಾಗಿಸುವ ತಂತ್ರ, ಅರಿತು ಬಿಟ್ಟರೆ ಸಾಮಾನ್ಯರು ಅಸಮಾನ್ಯರಾಗಬಹುದು ಎಂದರು. ಭಾರತದ ಮುಂದಿನ 2 ದಶಕಗಳು ಅತಿ ನಿರ್ಣಾಯಕವಾಗಿದೆ. ಶಿಕ್ಷಣ, ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನಗಳತ್ತ ಗಮನಹರಿಸಲು ಸಾಧ್ಯವಾಗದೇ ಅನ್ನಕ್ಕಾಗಿ ನೆರೆರಾಷ್ಟ್ರಗಳತ್ತ ಅವಲಂಬಿಸುವ ಸ್ಥಿತಿ ಇತ್ತು. ಆದರೆ ಇಂದು ಭಾರತ ಬದಲಾಗಿದ್ದು, ಸಾವಿರಾರು ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಗಳು ಕಾರ್ಯ ನಿರ್ವಹಿಸುತ್ತಿದೆ. ಸಂಶೋಧನೆ ,ಆವಿಷ್ಕಾರಗಳಲ್ಲಿ ನಿರತವಾಗಿದೆ. ಭಾರತ ಚಂದ್ರನ ಅಂಗಳದಲ್ಲಿ ಕಾಲೂರಿ ಸಾಧನೆ ಮೆರೆದಿದೆ ಎಂದರು.

ಕುಲಪತಿ ಡಾ.ಜಯಕರ ಎಸ್ ಎಂ, ಕೆಎಎಸ್ ಅಧ್ಯಕ್ಷ ಡಾ.ಕೆ.ಸಿದ್ದಪ್ಪ, ಡಾ.ಅಶೋಕ್ ಡಿ ಹಂಜಗಿ, ಪ್ರೊ.ಬಿ.ಸಿ.ಪ್ರಭಾಕರ್, ಪ್ರೊ.ಎನ್.ನಾಗಯ್ಯ ಇದ್ದರು.

ವಿಜ್ಞಾನ, ತಂತ್ರಜ್ಞಾನ, ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿನ ಸಾಧನೆಗಾಗಿ ಡಾ.ವಿ.ಕೆ ಆತ್ರೆ, ಪಿಇಎಸ್ ವಿವಿ ಕುಲಾಧಿಪತಿ ಡಾ.ಎಂ. ಆರ್.ದೊರೆಸ್ವಾಮಿ ಮತ್ತು ಕೈಗಾರಿಕೋದ್ಯಮಿ ಎಸ್.ರುದ್ರೇಗೌಡರಿಗೆ ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರಶಸ್ತಿ ನೀಡಿ ಸನ್ಮಾನಿಸಲಾಯಿತು.

ಜವಾಬ್ದಾರಿ ಹೆಚ್ಚಿಸಿದೆ

ಗೌರವ ಫೆಲೋಶಿಪ್ ಸ್ವೀಕರಿಸಿದ ಪಿಇಎಸ್ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿಗಳಾದ ಡಾ.ಎಂ. ಆರ್.ದೊರೆಸ್ವಾಮಿ ಮಾತನಾಡಿ, ಈ ಗೌರವ, ಹೆಮ್ಮೆ ತಂದಿದೆ ಮತ್ತಷ್ಟು ಜವಾಬ್ದಾರಿ ಹೆಚ್ಚಿಸಿದೆ. ಅನೇಕ ದಶಕಗಳಿಂದ ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿ ತೊಡಗಿದ್ದು,ಶಿಕ್ಷಣ ಕ್ಷೇತ್ರದಲ್ಲಿನ ಬದಲಾವಣೆಗೆ ಶ್ರಮಿಸಿರುವೆ. ಪಿಇಎಸ್ ವಿವಿ ವತಿಯಿಂದ 1600 ಸರಕಾರಿ ಶಾಲೆಗಳ ಮೂಲಸೌಕರ್ಯ ಸೇರಿದಂತೆ ಸಂಪೂರ್ಣ ಅಭಿವೃದ್ಧಿ ಮಾಡಿದ್ದೇವೆ. ಕುಲಪತಿಗಳ ಹುದ್ದೆ ಮಾರಾಟಕ್ಕಲ್ಲ, ಕುಲಪತಿಗಳ ಆಯ್ಕೆ ಮೆರಿಟ್ ಆಧಾರವಾಗಿರಬೇಕು ಎಂದು ಸರಕಾರಕ್ಕೆ ಪ್ರಸ್ತಾಪ ಸಲ್ಲಿಸಿದೆ. ಕುಲಪತಿ ಸಮರ್ಪಕವಾಗಿದ್ದರೆ ವಿಶ್ವವಿದ್ಯಾಲಯ ಗಟ್ಟಿಯಾಗಿರಲಿದೆ ಎಂದು ಪ್ರತಿಪಾದಿಸಿದೆ. ಈಗಲೂ ಪಿಇಎಸ್ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆಗಳಲ್ಲಿ ಗುಣಮಟ್ಟದ ಶಿಕ್ಷಣದ ಜತೆಗೆ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಸೂಕ್ತ ಮಾರ್ಗದರ್ಶನ,ಕೌಶಲ್ಯ ತರಬೇತಿ,ವಿದ್ಯಾರ್ಥಿ-ಶಿಕ್ಷಕರ ಸಂಬಂಧ ಸುಧಾರಣೆಗಳಿಗೆ ಆದ್ಯತೆ ನೀಡಿದ್ದೇವೆ ಎಂದರು.

ಡಾ.ವಿ.ಕೆ.ಆತ್ರೆ, ಪ್ರೊ.ಎಂ.ಆರ್. ದೊರೆಸ್ವಾಮಿ, ರುದ್ರೇಗೌಡಗೆ ಸೈನ್ಸ್ ಗೌರವ ಫೆಲೋಶಿಪ್

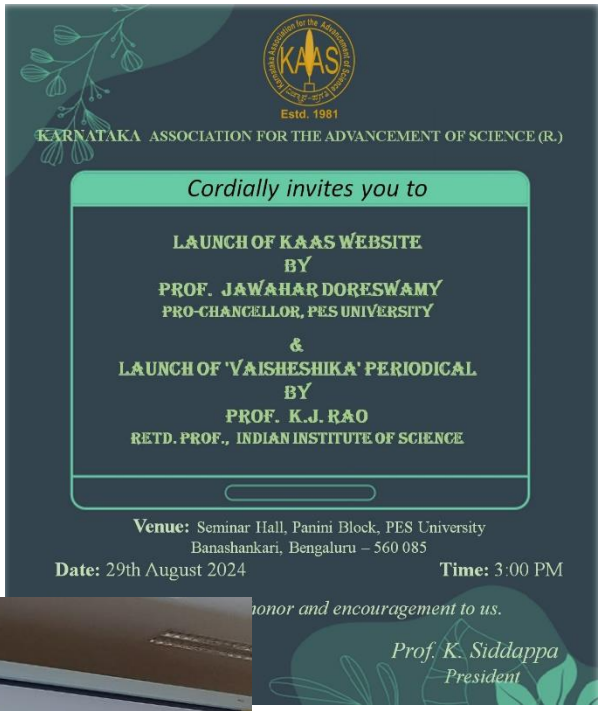
■ **ಉದಯವಾಣಿ ಸಮಾಚಾರ** UV. 09.09

ಬೆಂಗಳೂರು: 'ಕರ್ನಾಟಕ ಅಸೋಸಿಯೇಶನ್ ಫಾರ್ ದಿ ಅಡ್ವಾನ್ಸ್‌ಮೆಂಟ್ ಆಫ್ ಸೈನ್ಸ್' ಗೌರವ ಫೆಲೋಶಿಪ್ ಪ್ರದಾನ ಕಾರ್ಯಕ್ರಮ ಸೆ.11ರಂದು ಜ್ಞಾನಭಾರತಿ ಪ್ರೊ.ಎಂ.ಆರ್ .ದೊರೆಸ್ವಾಮಿ ಸಭಾಂಗಣದಲ್ಲಿ ನಡೆಯಲಿದೆ. ಗೌರವ ಫೆಲೋಶಿಪ್‌ನ್ನು ಡಿಆರ್‌ಡಿಒ ನಿವೃತ್ತ ನಿರ್ದೇಶಕ ಡಾ.ವಿ.ಕೆ. ಆತ್ರೆ, ಪಿಇಎಸ್ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಪತಿ ಪ್ರೊ.ಎಂ.ಆರ್ .ದೊರೆಸ್ವಾಮಿ, ಕೈಗಾರಿಕೋದ್ಯಮಿ ರುದ್ರೇಗೌಡ ಅವರಿಗೆ ನೀಡಿ ಗೌರವಿಸಲಾಗುತ್ತದೆ. ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ವಿ.ವಿಯ ಕುಲಪತಿ ಪ್ರೊ.ಎಂ.ಎಸ್.ಜಯಶಂಕರ್ ವಿಜ್ಞಾನ ಸಂಸ್ಥೆಯ ಡೀನ್ ಡಾ.ಅಶೋಕ್ ಅಂಜಗಿ ಉಪಸ್ಥಿತರಿರಲಿದ್ದಾರೆ ಎಂದು ಪ್ರಕಟಣೆಯಲ್ಲಿ ತಿಳಿಸಿದೆ.

Website Launch Ceremony and Release of the Vaisheshika Periodical

The KAAS official website was launched by Prof. Jawahar Doreswamy, Pro Chancellor of PES University, enhancing accessibility and digital outreach for scientific communication and resources.

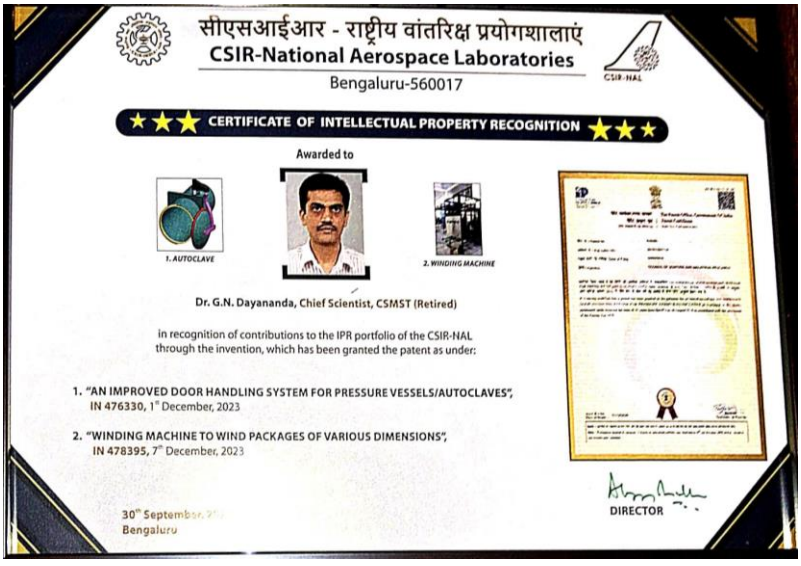
The inaugural release of the *Vaisheshika* periodical was officiated by K.J. Rao, Retd. Professor at IISc, promoting scientific discourse and serving as a vital bridge between science and society.



KAAS Office Inauguration

The inauguration of the KAAS office, marking a significant milestone in fostering scientific collaboration and community engagement.

Proud Moment: Our KAAS Secretary Dr. R. Shankar Represents India at the Olympiad in Beijing!



Dr. G.N. Dayanand was recognized at the CSIR Foundation Day event held at NAL. He received this esteemed award for his contributions during his tenure as Chief Scientist at NAL. His dedication and innovation continue to inspire the scientific community.

Bapuji Institute of Engineering & Technology, Davangere

In collaboration with

Karnataka Association for the Advancement of Science (KAAS), Bengaluru

Invitation

A brain storming Workshop

Collaborative and Advanced Research Project Proposal Presentations

on

21st October 2024

Inauguration & Keynote address by

Prof. S R Niranjana
Vice Chairman, Karnataka State Higher Education Council, Bengaluru
Government of Karnataka

Chief Guest
Prof. B D Kumbar
Vice Chancellor, Davangere University, Davangere

Guests of Honour
Prof. Y Vrushabhendrappa
Director, BIET

Dr. H B Aravinda
Principal, BIET

President
Prof. K Siddappa
President, KAAS, Bengaluru

Dr. Manjunath N S
Convenor, Prof. & Head
Dept.of Biotechnology, BIET

Dr. R Shankar
Secretary, KAAS, Bengaluru

Dr. A G Shankara Murthy
Professor & Dean R & D, BIET

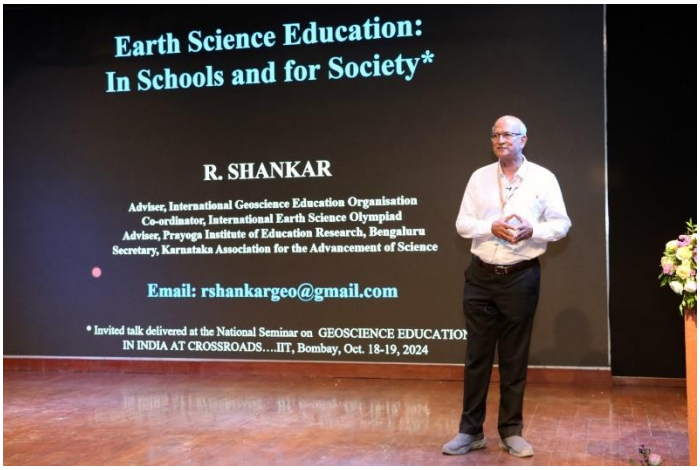
Prof. Manasa M B
Assistant Professor, Biotechnology, BIET

Staff members, Dept.of Biotechnology, BIET

Venue: Seminar hall, Dept. of Biotechnology, BIET, Davangere, Time: 10.30 Am

All are cordially invited

KAAS, Bengaluru, in collaboration with BIET, Davangere, organized a Brainstorming Workshop on "Collaborative and Advanced Research Project Proposal Presentations" on Monday, October 21, 2024, at Bapuji Institute of Engineering and Technology, Davangere. Distinguished KAAS executive members were invited to participate as resource persons, providing valuable insights and expertise.



A National Seminar to Brainstorm the Repositioning of Geoscience Education to Meet Changing Industry and Societal Needs was held at the Indian Institute of Technology Bombay on October 19, 2024. KAAS Secretary Dr. R. Shankar actively contributed his expertise to aligning geoscience education with the evolving demands of both industry and society.

Igniting Curiosity

Dr. Basavaraj Kagali actively engages students with live science demonstrations at BBMP High School on 25th Oct and Siddaganga Public School on 28th Oct. In this interactive session, Dr. Kagali uses simple, low-cost experiments to showcase scientific principles, sparking curiosity and encouraging students to explore the wonders of science.

Astronalitica: An Intriguing Podcast Program on 28th Oct. with Sri H. D. Anand, Retired ISRO Group Director, at BMS Engineering College

Dr. G.N. Dayanand, invited as Chief Guest for Kannada Rajyotsava at Godrej County, highlights the profound connection between Kannada literature and scientific innovation.

KAAS Member Shines: Dr. Mahesh K.K. Wins Prize for Illuminating Science in Kannada

The article titled, 'Sristiya Arivige Neravaagalu Higgs Boson' (**ಸೃಷ್ಟಿ ಯ ಅರಿವಿಗೆ ನೆರವಾಗಲು ಹಿಗ್ಸ್ ಬೋಸಾನ್**) and authored by the KAAS member Dr. Mahesh K.K. has received the prize in the competition for writing the Science articles in Kannada held by CSIR-NAL, Bengaluru. The article will be published in the *Suvarna Sanchike* of the magazine **ಕಣಾದ**.

ಸುವರ್ಣ (50ನೆಯ) ಸಂಚಿಕೆಗಾಗಿ
ಕನ್ನಡ ವಿಜ್ಞಾನ ಪ್ರಬಂಧ ಸ್ಪರ್ಧೆ – ೨೦೨೪

ಬಹುಮಾನ ವಿಜೇತರು

ಸಾರ್ವಜನಿಕ ವಿಭಾಗ

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು	ವಿಷಯ	ವಿವರಗಳು
೧.	ಶ್ರೀ ಎಮ್. ಎಸ್. ಧರ್ಮೇಂದ್ರ ಹೊಡ್ಡಮಗ್ಗೆ	ಬಾಹ್ಯಾಕಾಶ ತ್ಯಾಜ್ಯ ?	ತಾಂತ್ರಿಕ ಅಧಿಕಾರಿ 'ಬಿ', ಡಿಂಪಿ/ರಿಗೆ, ಡಿ.ಆರ್.ಡಿ.ಒ ಟೌನ್‌ಶಿಪ್, ಫೇಸ್–೧, ಸಿ.ವಿ.ರಾಮನ್ ನಗರ, ಬೆಂಗಳೂರು
೨.	ಶ್ರೀ ವೇದಾಕ್ಷ ಎಮ್	ಕ್ವಾಂಟಮ್ ಗಣಕಯಂತ್ರ	೩–೧೪೩, ಮತಾವು ಮನೆ ಪಡ್ಡೂರು ಗ್ರಾಮ, ಪುತ್ತೂರು ತಾಲೂಕು, ದಕ್ಷಿಣ ಕನ್ನಡ
೩.	ಶ್ರೀ ಜಿ.ಸಿ.ಮಧುಸೂದನ	ಸೂಕ್ಷ್ಮದರ್ಶಕ ಜೀವಿಗಳು ಮತ್ತು ರೋಗನಿರೋಧಕ ಶಕ್ತಿಗಳು	ಕನ್ನಡ ಶಿಕ್ಷಕರು, ಹವ್ಯಾಸಿ ಬರಹಗಾರರು, ಮರಿಮಲ್ಲಪ್ಪ ಪ್ರೌಢಶಾಲೆ, ಮೈಸೂರು.
೪	ಡಾ. ಕಂಬಿ ಕೆ. ಮಹೇಶ್	ಸೃಷ್ಟಿಯ ಅರಿವಿಗೆ ನೆರವಾಗಲು ಹಿಗ್ಸ್ ಬೋಸಾನ್	ಭೌತಶಾಸ್ತ್ರ ವಿಭಾಗ, ನ್ಯಾಷನಲ್ ಕಾಲೇಜ್ ಫಾರ್ ಇಂಜಿನಿಯರಿಂಗ್ ಆಂಡ್ ಟೆಕ್ನಾಲಜಿ, ವೆಂಕಟಗಿರಿ ಕೋಟೆ ಅಂಚೆ, ದೇವನಹಳ್ಳಿ, ಬೆಂಗಳೂರು
೫	ಶ್ರೀ ರಾಘವೇಂದ್ರ ಕೆ ಹೆಬ್ಬಾಳ	ವಾಯುಯಾನ ಮಾಲಿನ್ಯ ಮತ್ತು ಸುಸ್ಥಿರ ವಿಮಾನಯಾನ ಇಂಧನಗಳು	ವಿಷಯ ತಜ್ಞರು (ವಾಯುಯಾನ ಇಂಧನ) ಜಾನ್ಸೆಲ್ ಇನ್ಸ್ಟ್ರುಕ್ಟರ್, ನ್ಯೂಜಿಲೆಂಡ್
೬	ಡಾ. ಮೈತ್ರಿ ಭಟ್	ಹಾರ್ಮನ್‌ಸನ್ಸ್: ನರನಾಡದ ಕಂಪನ ಬದುಕೇ ತಲ್ಲಣ	ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕಿ, ಕನ್ನಡ ವಿಭಾಗ, ಸಂತ ಫಿಲೋಮಿನಾ ಕಾಲೇಜು, ದರ್ಬೆ, ಪುತ್ತೂರು, ದ.ಕ.
೭	ಶ್ರೀಮತಿ. ರೋಹಿಣಿ ಎ ಆರ್	ಶುದ್ಧ ಶಕ್ತಿಯ ಉಸಿರು, ಹಸಿರು ಜಲಜನಕ: ಭೂಮಂಡಲ ರಕ್ಷಕ	ತಿಕ್ಷಕಿ, ಎಸ್.ಜೆ.ವಿ. ವರ್ಲ್ಡ್ ಸ್ಕೂಲ್ ಯಲಹಂಕ ಉಪನಗರ, ಬೆಂಗಳೂರು

೮	ಡಾ. ಆರ್. ಎಸ್. ರವೀಂದ್ರ	ನೊಬೆಲ್ ಪಾರಿತೋಷಕ ತಂದುಕೊಟ್ಟ ಶಕಲ ಬೆಂದುಗಳು (ಕ್ವಾಂಟಮ್ ಡಾಟ್ಸ್): ಪದಾರ್ಥ ವಿಜ್ಞಾನದ ಹೊಸ ಆಯಾಮ	ಸಹ ಪ್ರಾಧ್ಯಾಪಕರು, ರಸಾಯನಶಾಸ್ತ್ರ ವಿಭಾಗ ಸಾಯಿ ವಿದ್ಯಾ ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ, ಬೆಂಗಳೂರು
೯	ಡಾ. ವೀಣಾ ಪಿ	ಭಾರತದಲ್ಲಿ ಸಮುದ್ರ ನೀರಿನ ನಿರ್ಲವಣೀಕರಣ – ಸಾಧ್ಯತೆಗಳು ಮತ್ತು ಸವಾಲುಗಳು	ನಂ.೫೦, ಹೊಸಪೇಟೆ ಬೀದಿ, ಹರಿಹರ, ದಾವಣಗೆರೆ ಜಿಲ್ಲೆ
೧೦	ಡಾ. ಸುಮ ವೈ	ಕತ್ತಲೆ ಶಾಖ: ದಾರ್ಕ್ ಆಕ್ಸಿಜನ್ ದಾರಿಯಲ್ಲಿ ಅಜ್ಞಾನದಿಂದ ಜ್ಞಾನಕ್ಕೆ	#೬೨, ೧೫ನೇ ಮಾರ್ಡ್, ಶಾಂತವೀರಯ್ಯ ಕಾಲೋನಿ, ತಾಳೂರು ರಸ್ತೆ, ಬಳ್ಳಾರಿ
೧೧	ಶ್ರೀಮತಿ. ಮಮತ ಎಮ್	ಬಾಹ್ಯಾಕಾಶ ಪ್ರವಾಸ – ಭೂಮಿಯ ಗಡಿಯಾಚೆಗೆ ಹೆಜ್ಜೆಯಿಡಿ	ಸಂಶೋಧಕಿ, ಕಾಸರಗೋಡು
೧೨	ಡಾ. ಅರವಿಂದ ಚಂದ್ರಕಾಂತ ಶ್ಯಾನಭಾಗ	ಪ್ರಾಚೀನ ವಿಜ್ಞಾನ ಪರಂಪರೆ	ಮೋ: ಕೋಡಕಣಿ, ತಾ: ಕುಮಟಾ ಜಿ: ಉತ್ತರಕನ್ನಡ
೧೩	ಎಸ್ ಕೌಸ್ತುಭ ಭಾರದ್ವಾಜ್	ಹೋಳೆಯುವುದೆಲ್ಲ ಚಿನ್ನವಲ್ಲ – ಕಾಣುವುದೆಲ್ಲ ನಿಜವಲ್ಲ AI–ಕ್ಯಾಮೆರಾಗಳ ಕೈಚಳಕ	#೬೨, ೧೫ನೇ ಮಾರ್ಡ್, ಶಾಂತವೀರಯ್ಯ ಕಾಲೋನಿ, ತಾಳೂರು ರಸ್ತೆ, ಬಳ್ಳಾರಿ
೧೪	ಡಾ. ಕೃಷ್ಣಕುಮಾರ್ ಟಿ.ಕೆ.	ಪ್ರಕೃತಿಯಲ್ಲಿ ನ್ಯಾನೋ ವಿದ್ಯಮಾನದ ಅಳವಡಿಕೆ	ಸಹಾಯಕ ಪ್ರಾಧ್ಯಾಪಕರು, ಭೌತಶಾಸ್ತ್ರ ವಿಭಾಗ, ಬಾಹೂಜಿ ಅಳಿಯಾಂತ್ರಿಕ ಮತ್ತು ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ, ದಾವಣಗೆರೆ
೧೫	ಶ್ರೀಮತಿ ಟಿ.ಶಿವಮ್ಮ	ಆಹಾರ ಹೊಟ್ಟಣಗಳ ತಯಾರಿಕೆಯಲ್ಲಿ ಖಾದ್ಯ ತಾಳೆಮರ್ ಹಾಳೆಗಳು	ಮುಖ್ಯೋಪಾಧ್ಯಾಯಿನಿ, ವನಿತಾ ಸದನ ಪ್ರೌಢಶಾಲೆ, ಕೃಷ್ಣಮೂರ್ತಿಪುರಂ, ಮೈಸೂರು
೧೬	ಡಾ ಪ್ರೀತಿ ಕೆ ಎಸ್	ಮಧುಮೇಹ ಮತ್ತು ಕಣ್ಣು	ಅಸೋಸಿಯೇಟ್ ಪ್ರೊಫೆಸರ್, ವಿಟ್ರಿಯೋ–ರೆಟಿನಾ ವಿಭಾಗ, ಕರ್ನಾಟಕ ಅಂತಃಸ್ರಾವಶಾಸ್ತ್ರ & ಸಂಶೋಧನಾ ಸಂಸ್ಥೆ ಬೆಂಗಳೂರು
೧೭	ಕು. ವಂದನಾ ವಿ	ಕ್ವಾಂಟಮ್ ಕಂಪ್ಯೂಟಿಂಗ್	#೬೨, "ಬ್ರಾಹ್ಮಿ", ೧೦ನೇ ಮುಖ್ಯ ರಸ್ತೆ, ೧೫ನೇ ಅಡ್ಡರಸ್ತೆ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು
೧೮	ಲಕ್ಷ್ಮೀದೇವಿ ಹಾಟೀಲ	ಅಂಗೈ ಮೇಲಿನ ಫಂಗೈಗಿನ್ನು ಚಂದ್ರನ ಮೇಲೆ ಮನೆ	ಸಹಶಿಕ್ಷಕರು, ಕರ್ನಾಟಕ ಪಬ್ಲಿಕ್ ಶಾಲೆ, ಬಳ್ಳಾರಿ

ತಮಗೆಲ್ಲ ಕಣಾದ ಸಂಶಾದಕ ಮಂಡಳಿ ಹಾಗೂ ನಮ್ಮ ಕನ್ನಡ ಸಾಂಸ್ಕೃತಿಕ ಸಂಘದ ವತಿಯಿಂದ ಹೃತ್ಪೂರ್ವಕ ಅಭಿನಂದನೆಗಳು.

(ಡಾ. ಸಂಧ್ಯಾ ರಾವ್)
ಸಂಪಾದಕರು, "ಕಣಾದ"
ಕನ್ನಡ ಸಾಂಸ್ಕೃತಿಕ ಸಂಘ