



UPL UNIVERSITY
OF
SUSTAINABLE TECHNOLOGY

Rotary
Ankleshwar



Happiest
BIRTHDAY
to our President
MR. ASHOK PANJWANI

KATHAN

NEWSLETTER

ISSUE-48

DECEMBER,
2022

By
SRICT-ISR.



PHYSICAL MEDICAL CHECK-UP CAMP



Department of
12



ROTARY



Ankleshwar Rotary Education Society Chairperson

Ms. Sandra Shroff, Chancellor UPL University

Mr. Ashok Panjwani, President UPL University

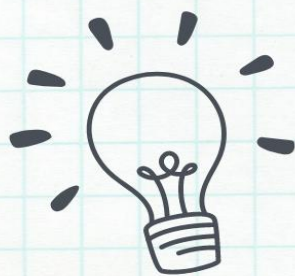
Mr. Angiras Shukla, ARES Secretary

Mr. Kishore Surti, ARES Treasurer



EDITORIAL TEAM MEMBERS

Dr. Shrikant J. Wagh (Provost)
Dr. Snehal Lokhandwala (Dean Science & Sustainability)
Dr. Vinitha Vakkayil (Assistant Professor-MSH)
Mr. Shivang Ahir (Assistant Professor-ME)
Mr. Hiren Jariwala (Assistant Professor-EE)
Mrs. Rupali Attarde (Assistant Professor-CO)
Mrs. Dhara Patel (Lecturer-CE)
Ms. Amishi Popat (Assistant Professor-EST)
Mr. Apurba Chakraborty (Assistant Professor-CT)
Dr. K. Nagaraj (Assistant Professor-M.Sc.)



WHAT'S IN THIS MONTH'S ISSUE:

Special Guest Talk
Shri R A Rajeev's visit to our UPL
Physical Medical Check-up Camp
Abhyuttan-2022 (II-Sem-2021)
Abhyuttan-2022 (Diploma. Eng)
NSS-Indian Constitution day
NBA-Accreditation (UG-Mech.Eng.)
Hands on training (One-day)
Faculty Corner (Tech. Article)
Students Corner (Tech. Article)
Faculty (Achievements)



KATHA-48



8th DECEMBER 2022



GUEST SPEAKER TALK

A guest talk by Dr. Janki Shah on the topic "Organizational behaviour and innovation in the educational industry"



A GUEST TALK WAS ORGANISED FOR STAFF MEMBERS OF OUR UNIVERSITY. THE SESSION WAS DELIVERED BY DR. JANKI SHAH, PH.D., BRAMPTON, ON, CANADA. WE EXPRESSED OUR IMMENSE GRATITUDE TO HER FOR SHARING SUCH A WONDERFUL TALK ON "ORGANIZATIONAL BEHAVIOUR AND INNOVATION IN THE EDUCATIONAL INDUSTRY", WE ARE THANKFUL TO HON. SECRETARY OF ARES, SHRI ANGIRAS SHUKLA SIR FOR HELPING US TO COORDINATE THE SESSION, AND ALSO THANK HIM FOR BEING AMONG US DURING THAT SESSION.



Shri R A Rajeev's visit to UPL University

SHRI R A RAJEEV PAID A VISIT TO OUR CAMPUS ON 24TH NOVEMBER 2022. HE IS THE IAS RETD., 1987 BATCH MAHARASHTRA CADRE AND FOUNDER DIRECTOR OF URBAN WORLD CONSULTING PVT. LTD. WORKING FOR THE BETTERMENT OF CITIES BY REDESIGNING THEM TO BE MORE INCLUSIVE. THE PRESIDENT OF OUR UNIVERSITY, SHRI ASHOK PANJWANI ACCOMPANIED HIM DURING THE VISIT. HAVING CONVERSATIONS WITH SUCH ESTEEMED PERSONALITIES ON VARIOUS ACADEMIC TOPICS GAVE A GREAT LEARNING EXPERIENCE TO OUR FACULTY MEMBERS WHO ATTENDED THE MEETING. HE INAUGURATED THE BIO-GAS PLANT INSTALLED ON CAMPUS. HE ALSO VISITED VARIOUS FACILITIES ON CAMPUS INCLUDING WORKSHOP, R&D LABORATORIES, CANTEEN, ETC.



**VISIT ON
NOVEMBER 24, 2022**



rarajeev@Mumbai 2.0 @... · 24 Nov ·
It is my privilege to get associated with the development of this technical university. I am really impressed with the work this University is doing for the development of local youth including tribal students and industries alike. It has great potential.

Physical Medical Check-up Camp
Batch 2022



Organized by :-
Department of Computer Engineering

12 Dec. 22 to 17 Dec. 22

Physical Medical Check-up Camp
Batch 2022



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Department of Computer Engineering

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Physical Medical Check-up Camp
Batch 2022



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Batch 2022



Organized by :-
Department of Computer Engineering

12 Dec. 22 to 17 Dec. 22

12th -17th
DECEMBER 2022



Physical Medical
Check-up Camp
Dept. of Comp. Eng

OUR MANAGEMENT HAS
ORGANISED THAT FOR EMPLOYEES
& FIRST YEAR STUDENTS (BATCH-
2022). THIS EVENT WAS
SUCESSFULLY COORDINATED BY
THE DEPT. OF COMP. ENG., SRICT
IN COLLABORATION WITH
SHRIMATI JAYABEN MODI
HOSPITAL, ANKLESHWAR.



ABHYUTTAN 2022



A felicitation Ceremony, ABHYUTTAN 2022, was coordinated to felicitate 2021 batch (IInd semester) students of UPL University for their results of Winter-2021 on 9th June, 2022. The program was coordinated by Chemical Engineering Dpt. Dr. Shrikant J. Wagh (PROVOST, UPL University), in his speech, motivated and appreciated students for getting very good results. President of UPL University, Mr. Ashok Panjwani, applauded the students for their efforts and also shared unique details of the results of Winter-2021 examinations. Some meritorious students shared feedback for their success and support provided by the University to get such wonderful results.



**SRICT-ISR 30 STUDENTS
RECEIVED A CHEQUE**



ABHYUTTAN 2022 (DIP. ENG.,)



An academic award ceremony was organized on 20th December 2022 to felicitate D.E (Diploma) students of the second year for their results in Semester-II

THIS PROGRAMME WAS
SUCCEFULLY COORDINATED BY
THE DEPT. OF CHEM. ENG., SRICT

NSS-ACTIVITY INDIAN CONSTITUTION DAY

Organized by Mr. Satish Verma, Dr. Tulasi Barik and Mr. Vijay Nirmal

Our Management conducted a presentation on Indian Constitution Day celebration for NSS students to commemorate the adoption of the Indian Constitution on November 26, 1949. There were 150 our university students enthusiastically participated this presentation on the title " Indian Constitution: Bharat Lokatantra Ki Janani".



The students highlighted the importance of various facets of our constitution and also realised the efforts of Dr. B.R. Ambedkar, father of the Indian Constitution.



NBA ACCREDITATION

DEPT. OF MECH. ENG.,

DECEMBER 09, 2022



CONGRATULATIONS

ALL, COORDINATORS,
HOD, FACULTY AND
STAFF MEMBERS OF
MECHANICAL
ENGINEERING

MECH. ENG.,

Mechanical Engineering is one of the oldest and evergreen branches of engineering, without which any type of industry cannot think to be functional. Right from the establishment of SRICT, Mechanical Department was started in 2011 with intake of 60 students at UG level and from 2015 department had started PG programme in Mechanical Engineering with specialization in Thermal Engineering. Looking to the needs of Mechanical skilled people, Department is starting Diploma in Mechanical Engineering from this year 2021 with the establishment of UPL university of Sustainable technology. Department has 11 experienced faculty members, out of which many faculty members have their degree from IITs and NITs.

Over the years, Department has progressed at rapid pace with development in both the spheres of infrastructure facility and academic programme. Faculty members of department are engaged in teaching, research and industrial consultancy works in the field of mechanical engineering. Department regularly conducts industrial trainings, expert lectures, seminars, workshops, technical competition for benefit of faculty as well as student community.

MS EXCEL

ONE-DAY HANDS-ON TRAINING PROGRAM

21ST OCTOBER 2022



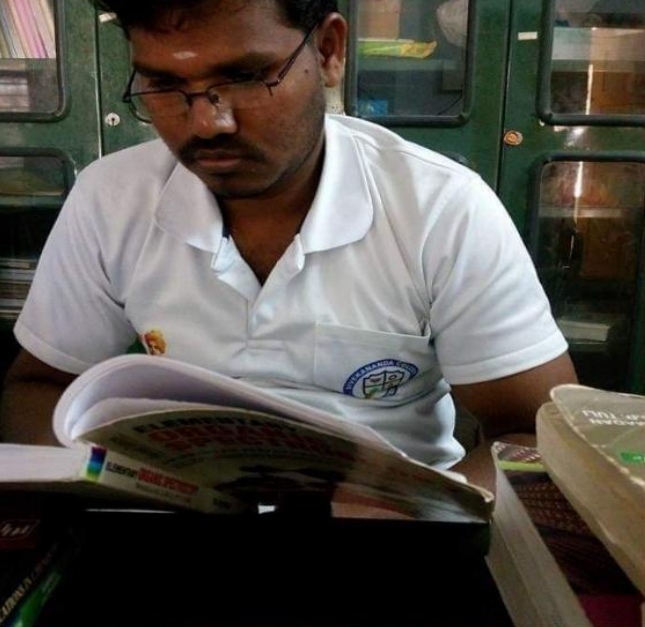
ABOUT PROGRAMME:

ONE-DAY HANDS-ON TRAINING PROGRAM ON MS EXCEL FOR CHEMICAL ENGINEERS WAS ORGANIZED BY THE DEPARTMENT OF CHEMICAL ENGINEERING FOR B.E. SEMESTER-VII STUDENTS IN ASSOCIATION WITH THE IICHE STUDENTS' CHAPTER.

TARGET AUDIENCE

OVER 60 STUDENTS PARTICIPATED IN THE WORKSHOP. THE TOPICS BASICS (DATA ENTRY, ADVANCED FILTER, SORTING, FORMULAS), INSERTING CHARTS & TREND LINES, ANALYSIS TOOLPAK, GOAL SEEK AND SOLVER, ARRAY CALCULATION, MATRICES WERE COVERED IN THE TRAINING PROGRAM.





ANTI-HIV USING NANOROBOTS

SCIENCE ARTICLES

Dr. K. Nagaraj

Assistant Professor

SRICT-ISR

There is no specific technology for the treatment of AIDS. Some drugs of specific composition are given to the patients who are able to increase the life time to a few years only. To make the treatment more specific we use the new technology called Nanotechnology which has bio-medical application. The size of nanorobots is about 100 times lesser than the size of an animal cell and hence it can easily monitor the behavior of cell inside the body. Nanorobots use nano sensors to sense the AIDS infected WBCs and convert them back into original WBCs. It operates at specific sites and has no side effects. Thus the AIDS patient is provided with the immune system so that he can defend himself from AIDS.

I. INTRODUCTION

A. Nanorobots

Nanorobotics is the technology of creating machines or robots at or close to the microscopic scale of nanometers (10⁻⁹ meters). Nanorobots would be typically devices ranging in size from 0.1-10 micrometers, they could work at atomic, molecular and cellular level. Nanorobots are to likely be constructed of carbon atoms, generally in diamond structure because of inert properties and strength, glucose (or) natural body sugars and oxygen might be source at propulsion, Nanorobots will respond to acoustic signals.

B. HIV

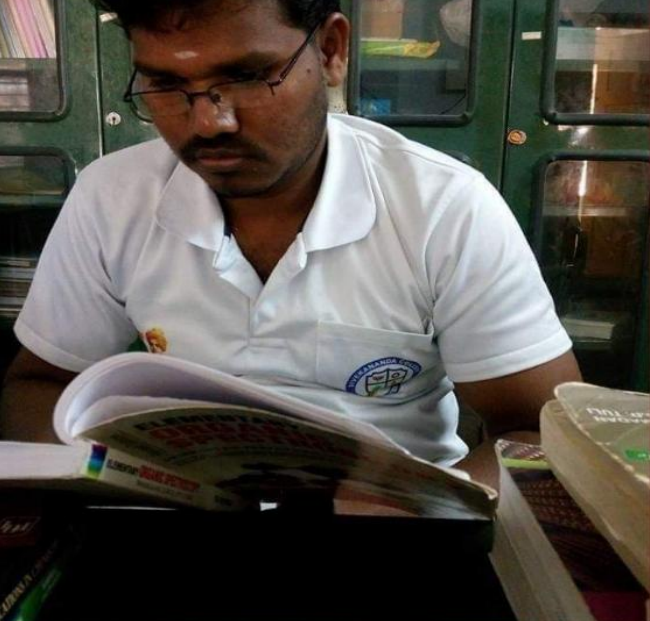
HIV stands for Human Immunodeficiency Virus. Like all viruses, HIV cannot grow or reproduce on its own. In order to make new copies of itself it must infect the cells of a living organism. HIV belongs to a special class of viruses called retroviruses. Within this class, HIV is placed in the subgroup of lent viruses. Outside of a human cell, HIV exists as roughly spherical particles (sometimes called virions). The surface of each particle is studded with lots of little spikes. An HIV particle is around 100-150 billionths of a meter in diameter. That's about the same as: 0.1 microns, one twentieth of the length of an E. coli bacterium, one seventieth of the diameter of a human CD4+ white blood cell. Unlike most bacteria, HIV particles are much too small to be seen through an ordinary microscope.

II. THE LATEST DRUG USED AGAINST HIV

Zidovudine is the latest known drug that is used for treatment of aids. This drug has an affinity to the HIV genome (RNA molecule) and they binds to it before reverse transcriptase starts working and as a result DNA cannot be synthesized. But any time this drug can lose its efficiency as mutation at the codon no. 67,70 and 215 will change the conformation which will result in the reduction of affinity of Zidovudine towards viral genome and as a result RT will start its action and viral genome will be replicated and integrate with host genome.

III. TREATMENT OF AIDS BY NANOROBOTS

Zidovudine can be used to resist the HIV but the virus cannot be destroyed. Destruction of viral genome is possible by using nanorobots. This type of nanorobots will consists of a nano-biosensor developed by nanoelectronics engineers, a data converter, and a container containing high concentration (say 20 u/microlitre) of DNase and RNase enzyme.



ANTI-HIV USING NANOROBOTS

SCIENCE ARTICLES

Dr. K. Nagaraj

Assistant Professor

SRICT-ISR

IV. REASONS FOR APPLYING NANOTECH TO BIOLOGICAL SYSTEM

Most animal cells are 10,000 to 20,000 nanometers in diameter. This means that nanoscale devices (having at least one dimension less than 100 nanometers) can enter cells and the organelles inside them to interact with DNA and proteins. Tools developed through nanotechnology may be able to detect disease in a very small amount of cells or tissue. They may also be able to enter and monitor cells within a living body. Nanotechnology could make it possible to run many diagnostic tests simultaneously as well as with more sensitivity. In general, nanotechnology may offer a faster and more efficient means for us to do much of what we do now.

V. COMPONENTS OF AN ANTI-HIV NANOROBOT

A. Nanobiosensor

The Ab for the Ag gp41 & gp120 will be tagged on its surface. So whenever it will come in contact of an infected cell the Ab will react with that by an immunochemical reaction and will identify this.

B. Nanochip

It's a chip which will receive the signal from nanobiosensor and will perform its job.

C. Nanotube

It's a tube in nanoscale. On receiving +ve signal the nanotube will be injected into the nucleus of the cell by nanochip.

D. Nanocontainer

A nanocontainer will contain highly concentrated DNase and RNase enzyme which will be delivered into the infected cell and will cleave the whole genomic DNA into single nucleotides.

VI. PROCESS

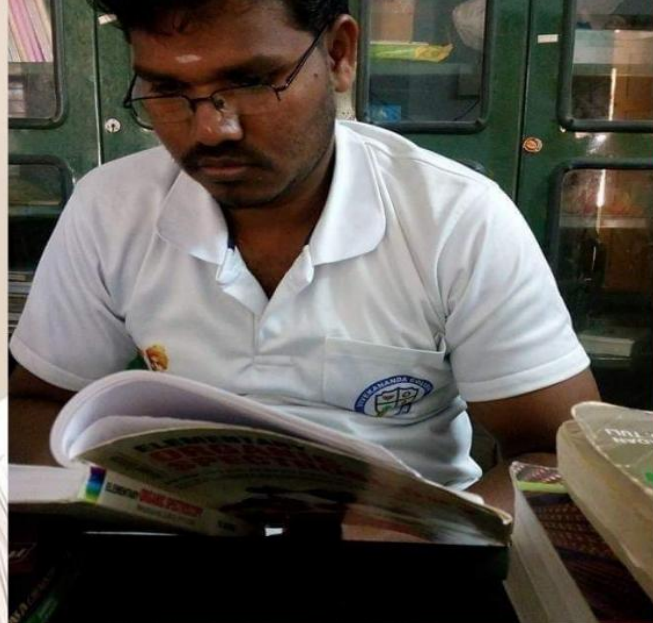
The function of the biosensor is to identify a particular compound. In this case the biosensor will contain a particular antibody. The gp41 and gp120 are two unique HIV envelope protein which is found in the cell membrane of the infected cell. The antigen (gp41 and gp120 protein) and antibody reaction will give the proper signal. In case of infected cell only this reaction will take place as those viral proteins are found in the cell membrane of the infected cell only. Getting the +ve signal the nanorobot will inject its nanotube into the nucleus of the infected cell and release the DNase as well as RNase enzyme into the cell. The DNase enzyme is not sequence specific and as a result it will cleave the whole genomic DNA containing the viral genome into single nucleotides. Once the viral genome loses its sequence it loses its viral effect and after the digestion of the whole genomic DNA the cell undergoes normal programmed cell death called apoptosis.

VII. CONCLUSION

The paper is just a theoretical justification. But the recent advancement in the field of Nanotechnology gives the hope of the effective use of this technology in medical field. This is the beginning of nano era and we could expect further improvements such as a medicine to AIDS using nanotechnology.

Reference: <https://www.azonano.com/article.aspx?ArticleID=3247>

Dr. K. Nagaraj



HOW DID TAMIL NADU PULL OFF A SUCCESSFUL CHESS OLYMPIAD?

FACULTY CORNER

Dr. K. Nagaraj

Assistant Professor

SRICT-ISR

Chennai's Napier Bridge, wearing chequered black and white like a chess board, and mascot "Thambi", a horse clad in the traditional Veshti with folded Sattai hand greetings which are featured everywhere from milk packets to billboards, got people's attention all over India. The Olympiad which is now a sensation in our country was initially scheduled to take place in Russia but due to the ongoing Russian Ukraine war, the International Chess Federation (FIDE) started looking for new bidders. At that point of time, the All India Chess Federation (AICF) sniffed an opportunity. With no financial backing or sponsors at the time, the federation went out of its way to show its interest in hosting the event. India's international standing in the world of chess also helped in the bid as India stands 4th in the world following the US, Russia, and China. But AICF was racing against the time. This is where the state and central government authorities stepped in. The Tamil Nadu government backed the federation by guaranteeing \$10 million to put up a bid in the first place. Together, the state and the central government have allocated Rs 100 crore for the event! Articles This Chess Olympiad is a team tournament where 343 teams are participating from 187 countries. 6 Indian teams are participating in the Olympiad and they are doing a fantastic job. Viswanathan Anand, a 5time world champion opted not to play in the Olympiad and has taken over the mentor role for the young prodigies on the Indian side. The sponsors and authorities were also a step ahead by adopting new technologies like virtual reality and artificial intelligence to give an immersive experience to the fans where users can track the board moves of top players in the event. And that's how Tamil Nadu is hosting a successful Olympiad with its outstanding abilities. The chess Olympiad in India is not just an event; it is a celebration of chess!

References:

[https://www.google.com/search?](https://www.google.com/search?lei=JW2ZY_atL7PomAXHtr_YAQ&q=tamil%20nadu%20chess%20olympiad%202022&ved=2ahUKEwi21NbNvfj7AhUzNKYKHUfbDxsQsKwBKAB6BAhREAE&biw=1366&bih=657&dpr=1)

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Dr. K. Nagaraj



LOVING ONES' JOB BEYOND CHALLENGES

Dr. K. Nagaraj

Assistant Professor

SRICT-ISR

About Me

I am Dr. K. Nagaraj. I am working here as an Assistant Professor, SRICT-ISR the Department of Organic Chemistry at UPL University of Sustainable Technology. I am proud to state that I have completed my M.Sc., M.Phil., and PhD., and cleared GATE. Currently I have been in the UPL environment for the past 6 Months.

Dealing with Challenges

Life is a mixture of hills and plateaus. When the going gets tough, you must show resilience. Bend but don't break! The focus needs to be on the goal, not on the difficulties along the way. Any problem today is another valuable lesson waiting to be learnt.

Why It Is Important to Love Your Job?

I strongly believe, this University is the right place for people who have the passion to succeed. In order to enjoy being part of the education sector, we must cultivate a passion for teaching and motivating students to do their best. I like University for its open culture, respect for people and flexibility offered to every teaching and non-teaching members in performing duties. My job holds strong responsibility and commitments. I also learn something new every day. The constant need to learn and re-invent myself is the most exciting part of my job.

My Career Goal

My next goal is to make a good research team and I want to utilise the knowledge gained in the teaching platform. I would like to test my ability in handling difficult situations both in personal and professional life. There is no bigger challenge than dealing with different students and temperaments and getting them all to achieve their academic goals.

My Dream...

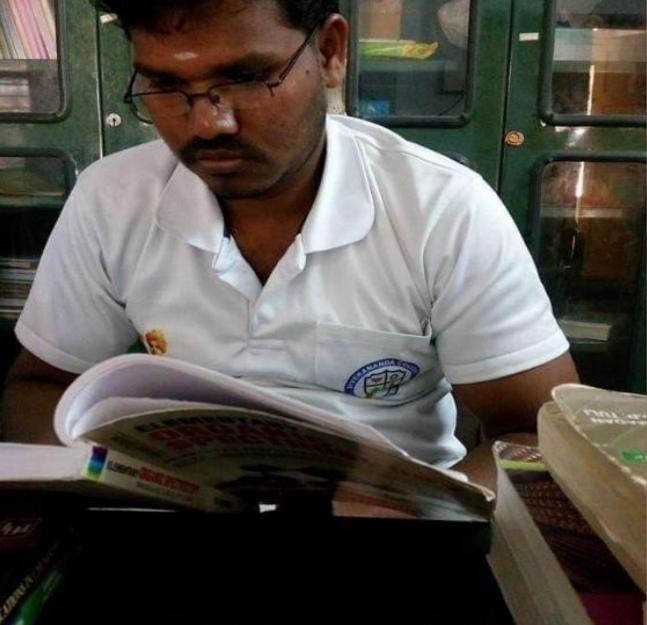
I want to contribute to society in any way I can. My dream is to give quality education to my students and boost their confidence level. Also I wish to make them responsible citizens in society. I love to see my students growing and succeeding in their career path.

Awaiting Adventure

An adventure is an exciting experience that is typically bold, sometimes risky undertaking. Adventure may be activities with some prospects for physical threats such as travelling, exploring, skydiving, mountain climbing, scuba diving, river rafting or participating in life-threatening sports. Adventures often undertaken to create psychological arousal or in order to achieve a greater goal such as pursuit of knowledge can be obtained through hard work and uncompromising commitment.

Outdoor adventurous activities are typically undertaken for the purpose of recreation or excitement: examples are adventure racing and adventure tourism. Adventure activities can also lead to advances in activities and knowledge.

Dr. K. Nagaraj



SIMPLE MAN OF GOLDEN HEART (ALOK SAGAR)

Dr. K. Nagaraj

Assistant Professor

SRICT-ISR

Professor Alok Sagar was born on 20 January 1950 in Delhi. He did his Bachelor's in Electrical Engineering from the prestigious IIT Delhi and got a Master's Degree from the institute in 1973. He went to Houston University in Texas to complete his Ph.D. After coming back, he joined as a Professor in IIT. He groomed a lot of students, including Raghuram Rajan, the ex RBI Governor. Soon he resigned from his work and started working for the tribal people in Betul District of Madhya Pradesh. He has been living there ever since then. Alok is a hardworking, self-made person. He has planted more than 50,000 trees in the Betul District and believes that people can serve the country by working at the grass root level. Today he can be seen riding a bicycle, in line with his green endeavour, collecting and distributing seeds among the tribal people at a reasonable rate. He said in INDIA, people are facing problems but they are busy showcasing their intelligence rather than serving people. According to some reports, it is said that Alok was asked to leave during the recent Betul's district elections. Alok met the police and informed them about his tryst with nature as they were ignorant about his selfless service to society. He focused on nature and has been educating people in growing trees and taking care of environment. He is a simple man who does what he says and means. Alok is a living example of a simple man who lives for the happiness of his fellowmen. His is truly an inspiring story.

Courtesy Google

Dr. K. Nagaraj

TECHNICAL ARTICLE

AR technology can be used for a wide range of applications, including education, entertainment, marketing, and industrial training.



Augmented reality (AR) and virtual reality (VR)

Mr. Jeet Solanki
BE CO- Sem 1

Augmented reality (AR) and virtual reality (VR) are technologies that allow users to experience and interact with computer-generated virtual environments in a way that feels immersive and real. AR involves overlaying digital content, such as images, text, and video, onto the real world in real-time, using devices such as smartphones, tablets, and specialized AR glasses. VR, on the other hand, involves creating a completely immersive digital environment that users can interact with using specialized VR devices, such as headsets and gloves. VR technology can be used for a variety of purposes, including gaming, training, education, and therapy.

- Both AR and VR have the potential to revolutionize the way we interact with digital content and each other, and have already found applications in a range of fields, including gaming, education, training, entertainment, and healthcare. However, there are also concerns about the potential negative effects of these technologies, such as their impact on social interactions and their potential to be used for nefarious purposes.

Future Of AI

We are using AI technology in our daily lives either unknowingly or knowingly, and somewhere it has become a part of our life. Ranging from Alexa/Siri to Chatbots, everyone is carrying AI in their daily routine. The development and evolution of this technology are happening at a rapid pace. However, it was not as smooth and easy as it seemed to us. It has taken several years and lots of hard work & contributions from various people to take AI at this stage.



Myths about Advanced Artificial Intelligence :-

1. I will replace all human jobs.

It's certainly true that the advent of AI and automation has the potential to seriously disrupt labour - and in many situations, it is already doing just that. However, seeing this as a straightforward transfer of labour from humans to machines is a vast oversimplification.

With the development of AI, a revolution has come in industries of every sector, and people fear losing jobs with the increased development of AI. But in reality, AI has come up with more jobs and opportunities for people in every sector. Every machine needs a human being to operate it. However, AI has taken over some roles, but it reverts to producing more jobs for people.

2. Super-intelligent computers will become better than humans at doing anything we can do :-

AI can be divided into three types, Weak AI, which can perform specific tasks, such as weather Prediction. General AI; Capable of performing the task as a human can do, Super AI; AI capable of performing any task better than human.

At present, we are using weak AI that performs a particular task and improves its performance. On the other hand, general AI and Super AI are not yet developed, and researches are going on. They will be capable of doing different tasks similar to human intelligence. However, the development of such AI is far away, and it will take years or centuries to create such AI applications. Moreover, the efficiency of such AI, whether it will be better than humans, is not predictable at the current stage.

SAURABH SINGH

Dip Computer Engineering

3rd Sem



NOVEMBER 2022



FACULTY
ACHIEVEMENTS

NPTEL COURSE

Dr. K. Nagaraj
successfully completed
NPTEL course Biological
Inorganic Chemistry By
Prof. Debashis Ray, IIT
Kharagpur on 29.10.2022

Elite

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to
KARUPPIAH NAGARAJ
for successfully completing the course

Biological Inorganic Chemistry

with a consolidated score of **78** %

Online Assignments	22.5/25	Proctored Exam	55.5/75
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Total number of candidates certified in this course: 261

Jul-Oct 2022
(12 week course)

Indian Institute of Technology Kharagpur

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur

FREE ONLINE EDUCATION
swayam
— Endless variety, endless success —

Roll No: NPTEL22CY52S34450478 To validate the certificate No. of credits recommended: 3 or



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to
KARUPPIAH NAGARAJ
for successfully completing the course

Metals in Biology

with a consolidated score of **64** %

Online Assignments	22.96/25	Proctored Exam	41.25/75
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Total number of candidates certified in this course: 187

Jul-Sep 2022
(8 week course)

Prof. Sridhar Iyer
Head CDEEP & NPTEL Coordinator
IIT Bombay



Indian Institute of Technology Bombay



Roll No: NPTEL22CY38S13290093

To validate the certificate



No. of credits recommended: 2 or 3

NPTEL COURSE

Dr. K. Nagaraj
successfully
completed NPTEL
course Metals in
Biology By Prof. D.
Maiti, IIT Bombay on
25.09.2022.

DECEMBER 2022



FACULTY
ACHIEVEMENTS

NPTEL COURSE

Dr.SHINA GAUTAM
successfully completed
NPTEL course on
29.10.2022



**“A PROCESS FOR EXTRACTION OF
POLYHYDROXYALKANOATES
(PHA) FROM SECONDARY
TREATMENT WASTEWATER
SLUDGE”. PUBLISHED IN THE
OFFICIAL JOURNAL OF THE
PATENT OFFICE ON 1ST JULY,
2022, INDIAN PATENT**

**APPLICATION NO. 202221026715
FILED ON 9TH MAY, 2022.**

PATENT

**Dr.SHINA
GAUTAM**
successfully
filed an Indian
Patent on 9th
May, 2022



DECEMBER 2022



FACULTY
ACHIEVEMENTS

NPTEL COURSE


Dr. K. Nagaraj
successfully completed
NPTEL course Biological
Inorganic Chemistry By
Prof. Debashis Ray, IIT
Kharagpur on 29.10.2022





NPTEL-AICTE Faculty Development Programme

(Funded by the MoE, Govt. of India)

This certificate is awarded to
KARUPPIAH NAGARAJ
for successfully completing the course
Biological Inorganic Chemistry
with a consolidated score of **78 %**


Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras






Prof. Dileep N. Malkhede
Advisor-I (Research, Institute & Faculty Development)
All India Council for Technical Education

(Jul-Oct 2022)

Roll No: NPTEL22CY52S34450478

Duration of NPTEL course : 12 Weeks


The candidate has studied the above course through MOOCs mode, has submitted online assignments and passed proctored exams. This certificate is therefore acceptable for promotions under CAS as per AICTE notifications dated 24th July 2018, similar to other refresher / orientation courses. F.No. AICTE / RIFD / FDP through MOOCs / 2017-18





NPTEL-AICTE Faculty Development Programme

(Funded by the MoE, Govt. of India)

This certificate is awarded to
KARUPPIAH NAGARAJ
for successfully completing the course
Metals in Biology
with a consolidated score of **64 %**


Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras




Prof. Dileep N. Malkhede
Advisor-I (Research, Institute & Faculty Development)
All India Council for Technical Education

(Jul-Sep 2022)

Roll No: NPTEL22CY38S13290093

Duration of NPTEL course : 8 Weeks

The candidate has studied the above course through MOOCs mode, has submitted online assignments and passed proctored exams. This certificate is therefore acceptable for promotions under CAS as per AICTE notifications dated 24th July 2018, similar to other refresher / orientation courses. F.No. AICTE / RIFD / FDP through MOOCs / 2017-18

NPTEL COURSE

Dr. K. Nagaraj
successfully
completed NPTEL
course Metals in
Biology By Prof. D.
Maiti, IIT Bombay on
25.09.2022.

Faculty Development Programme

Nanomaterials for Sustainable Future



Dr. K. Nagaraj
Assistant Professor
SRICT-ISR





GMR INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTE AFFILIATED TO JNTU-GV, Vizianagaram
SEVEN U.G. PROGRAMS ACCREDITED BY NBA (UNDER TIER-1) & INSTITUTE ACCREDITED BY NAAC WITH 'A'



Certificate of Participation

This is to certify that **Dr. K. NAGARAJ, ASSISTANT PROFESSOR**, Department of **SRICT-Institute of Science and Research**, Department of Organic Chemistry, **UPL University of Sustainable Technology, Vataria, Gujarat 393135** has participated in a Five Day Faculty Development Program (Online) on **Nanomaterials For Sustainable Future** during 12th - 16th December, 2022 organized by Physics Division, Department of Basic Science and Humanities, GMR Institute of Technology, Rajam.


Dr. A. Rambabu
Convener


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HoD-BS&H


Dr. C.L.V.R.S.V. Prasad
Principal

PUBLICATIONS

JOURNAL OF MATERIAL



materials



Article

Modification of Electrospun CeO_2 Nanofibers with CuCrO_2 Particles Applied to Hydrogen Harvest from Steam Reforming of Methanol

Kai-Chun Hsu^{1,2}, Chung-Lun Yu^{1,2}, Heng-Jyun Lei^{1,2}, Subramanian Sakthiathan^{1,2,*}, Po-Chou Chen^{3,4}, Chia-Cheng Lin¹, Te-Wei Chiu^{1,2,*}, **Karuppiiah Nagaraj**⁵, Liangdong Fan^{6,*} and Yi-Hsuan Lee⁷

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Journal of The Electrochemical Society, 2022 169 127504

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Graphitic Carbon Nitride Incorporated Europium Molybdate Composite as an Enhanced Sensing Platform for Electrochemical Detection of Carbendazim in Agricultural Products

Subramanian Sakthiathan,^{1,2,*} Arjunan Karthi Keyan,^{1,2} Dhanapal Vasu,^{1,2} Sivaramakrishnan Vinothini,^{1,2} **Karuppiiah Nagaraj**,³ V. L. Mangesh,⁴ and Te-Wei Chiu^{1,2,*}

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OCTOBER 2022



FACULTY
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GONZAGA COLLEGE OF ARTS AND SCIENCE FOR WOMEN



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Post Graduate Department of Chemistry

INTERNATIONAL WEBINAR ON CHEMICAL SCIENCE FOR SUSTAINABILITY - IWCS

This is to certify that Mr./Ms./Dr. **Dr. K. Nagaraj**, Assistant Professor from UPL University of Sustainable Technology has actively participated in the International Webinar on Chemical Science for Sustainability Organized by PG Department of Chemistry, Gonzaga College, Kathampallam, Krishnagiri, Tamil Nadu, India on October 19, 2022.

M. Sathya
Organizing President

C. Anand
HOD

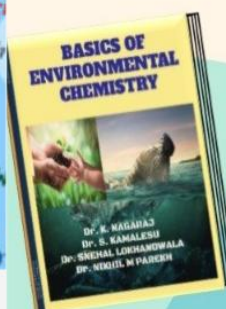
S. Anand
Principal

R. C. Nandhan
Secretary

DR. K. NAGARAJ SUCCESSFULLY PARTICIPATED IN INTERNATIONAL WEBINAR ON CHEMICAL SCIENCE FOR SUSTAINABILITY ORGANIZED BY PG DEPARTMENT OF CHEMISTRY, GONZAGA COLLEGE, KATHAMPALLAM, KRISHNAGIRI, INDIA ON OCTOBER 19, 2022



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DR. NIKHIL M PAREKH AND K. NAGARAJ PUBLISHED A BOOK ON 15 TH OCTOBER 2022



Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy

Volume 286, 5 February 2023, 122015



'On and Off' intercalative binding behaviour of double chain surfactant cobalt(III) complex containing 2, 2'-bipyridyl ligand in β -Cyclodextrin: A detail approach on Host-guest inclusion of surfactant cobalt(III) complex and CT-DNA binding in micro-heterogeneous medium

Karupiah Nagaraj^a, Subramaniam Kamalesu^b, Subramaniam Sakthiathan^c, Te-Wei Chiu^c, Snehal Lokhandwala^d, Nikhil M Parekh^a, Chelladurai Karupiah^e

CATALYTIC PYROLYSIS OF METAL FREE PCBs WITH ZSM-5 AND $\text{Ca}(\text{OH})_2$

Vaibhav Pandere^{1,2}, Alok Gautam^{1,2}, Shina Gautam^{1,2*}

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Bharuch-393135, Gujarat, India

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CONGRATULATIONS

**Dr. S.B. Prajapati, Dr.
Alok Gautam and
Dr. Shina Gautam**

ISOLATION AND PURIFICATION OF STEVIOSIDE FROM STEVIA LEAVES

Jignesh Joshi^{1,3}, Alok Gautam^{2,3}, Shina Gautam^{2,3*}

¹Chemical Engineering Dept, Government Engineering College, Valsad, Gujarat, India-382424

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Gujarat, India

CO-PYROLYSIS OF PCB AND COTTON STALK: TOWARDS ENHANCED PHENOL PRODUCTION AND DEBROMINATION OF PYROLYSIS OIL

Sonalben B. Prajapati^{1,3}, Alok Gautam^{2,3}, Shina Gautam^{2,3*}

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CONGRATULATIONS

**Dr. S.B. Prajapati,
Dr. Alok Gautam
and Dr. Shina
Gautam**

**Debromination and improved phenol content in fuel oil generated from co-pyrolysis of non-metallic PCB and biomass**Sonalben B. Prajapati^{1,2} · Alok Gautam^{2,3} · Shina Gautam^{2,3}

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Abstract

PCB, one of the main fractions of e-waste, is now becoming a source of pollution due to the presence of brominated flame retardants, which unleash highly toxic brominated compounds and other metals when burnt in presence of oxygen. The slow pyrolysis of PCB, CS and co-pyrolysis with different compositions have been carried out in a fixed bed reactor, for temperature up to 500 °C, with 10 °C/min heating rate. The produced oil had been analysed in GC-MS, and fuel properties of oil were measured and compared with FAME standard. The experiments revealed that the oil yield of PCB had increased.

CONGRATULATIONS

**Dr. S.B. Prajapati,
Dr. Alok Gautam
and
Dr. Shina Gautam**

**The effect of cotton stalk concentration on morphology and fixing bromine content in char while on co-pyrolysis with non-metal fractions of PCB**Sonalben B. Prajapati^{1,2} · Alok Gautam^{3,2} · Shina Gautam^{3,2}

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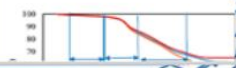
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**A kinetic study of thermal degradation of non-metallic part of printed circuit boards for the combined effect of particle size and catalyst**Vaibhav Pandere^{a,b}, Alok Gautam^{a,b} and Shina Gautam ^{a,b}^aDepartment of Chemical Engineering, Shroff SR Rotary Institute of Chemical Technology, Gujarat, India; ^bGujarat Technological University, Chandkheda, Ahmedabad, India**ABSTRACT**

After the successful removal of metals from printed circuit boards either through a physical or chemical process, epoxy resins are thermosetting plastics left over for landfilling. To overcome landfilling, thermal degradation of this resin was done under different particle sizes with varying catalyst concentrations. A series of thermogravimetric experiments were carried out using ZSM-5 as the catalyst. To study

KEYWORDS

Kinetics of PCB; particle size catalyst; ZSM-5

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**Dr. Vaibhav
Pandere,
Dr. Alok Gautam
and
Dr. Shina Gautam**

DECEMBER, 2022

PUBLICATIONS



FACULTY
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Dr. K. NAGARAJ, published a
research paper in *Materials*
2022, 15, 8770, on December
03, 2022



materials

Article

Modification of Electrospun CeO₂ Nanofibers with CuCrO₂ Particles Applied to Hydrogen Harvest from Steam Reforming of Methanol

Kai-Chun Hsu ^{1,2}, Chung-Lun Yu ^{1,2}, Heng-Jyun Lei ^{1,2}, Subramanian Sakthiathan ^{1,2,*}, Po-Chou Chen ^{3,4}, Chia-Cheng Lin ⁵, Te-Wei Chiu ^{1,2,*}, **Karuppiiah Nagaraj** ⁵, Liangdong Fan ^{6,*} and Yi-Hsuan Lee ⁷

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Graphitic Carbon Nitride Incorporated Europium Molybdate Composite as an Enhanced Sensing Platform for Electrochemical Detection of Carbendazim in Agricultural Products

Subramanian Sakthiathan, ^{1,2,*} Arjunan Karthi Keyan, ^{1,2} Dhanapal Vasu, ^{1,2} Sivaramakrishnan Vinothini, ^{1,2} **Karuppiiah Nagaraj**, ³ V. L. Mangesh, ⁴ and Te-Wei Chiu ^{1,2,*}

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TECHNICAL ARTICLE - 1: CAN COPPER BE USED TO MAKE PLASTIC, FABRIC MORE ANTIMICROBIAL?

**WRITTEN BY SUTARIA NIRAV RAMESHBHAI
B.Sc Student (SEM -III)**

Yes, according to Mike Maczuzak, owner of SmartShape, a Cleveland firm that designs plastic products, including some for the health-care industry, and engineers the molds to manufacture the products. Maczuzak said copper, silver and zinc can be mixed with plastic to create a material with antimicrobial properties. He said the germs are not eliminated immediately, but are prevented from multiplying so they slowly go away. The most effective applications are on items such as countertops, he said, where people aren't necessarily touching an area in quick succession. For example, a touch pad at a transit pay station may see little benefit.



Maczuzak said his company has worked primarily with silver as an antimicrobial agent. In one instance, the company was designing a cup lid infused with silver ions to protect against germs workers might pass along while delivering the lids to a drink station. Smart Shape is not working on any products with antimicrobial properties at the moment, but that could change. "It's definitely something that I would bring up in project discussions now," he said. "It's fairly easily done and it does add that benefit."

TECHNICAL ARTICLE - II: DINNER PLANS

WRITTEN BY MEHTA RITU KETAN
M.Sc Student (SEM -III)

A man, named Guru, walks into his office having a wooden desk and several files. His eyebrows are furrowed, as if he is deep in thought. His desk chair faces away from him and his secretary's voice answers him.

Man: Okay, let's go over it again. What do we have planned for tomorrow?

Woman: You have four appointments tomorrow.

Man: Oh boy, another long day! What's the point of having a secretary if she can't even

schedule the meetings correctly. Hmm, when is my last meeting tomorrow?

Woman: It is at 7 p.m. and is an hour long.

Man: Wow, I won't even be able to eat dinner in peace? How ridiculous.

Woman: If you want, I can cancel your 7 p.m. appointment and schedule some free time for dinner.

Man: Hmm, that's not such a bad proposition. But I'd have to run that by my boss, Akshay. He's very particular about giving him ample notice. Can you send him that message? My wife will be calling me any moment and it wouldn't be good to get caught talking to you at the same time.

Woman: You sound stressed. Should I get you something?

Man: No, it's just the usual. Work stress plus home stress plus...this stress.

Woman: In the meantime, I have a draft message to send to Akshay. Do you want to hear it?

Man: Sure, why not. It's not like I can't be too careful.

Woman: Here's the message: "Akshay, let us cancel tomorrow's meeting so I can have dinner." Should I send it?



WRITTEN BY MEHTA RITU KETAN
M.Sc Student (SEM -III)

Man: No, no. You shouldn't be that blunt.

Woman: What should I send instead?

Man: Tell him I have some personal matters to attend to and that I can't make it to our 7 p.m. meeting tomorrow.

Woman: Personal matters? It's no one's birthday or anniversary tomorrow.

Man: That's not the only personal matter I have to deal with.

Woman: Should I let your wife know about the personal matter?

Man: You? Letting her know? That would start another world war.

Woman: War?

Man: Oh, you're so dim-witted.

Woman: Sorry, I'm working on that.

Man: Anyway, let Akshay know I have some urgent personal matters and that I cannot make it to our 7 p.m. meeting tomorrow.

Woman: Sure, I'll send that.

Man: You're rather calm today. You're really accepting my criticisms.

Woman: Is there something else I can help with?

Man: Oh, don't be a glutton for work. Learn to ease up and work less!

Woman: Hmm, I'm not quite sure what you mean by that.

Man: Never mind, I'll let my wife know we can have dinner at 7 p.m. tomorrow.

Woman: Should I set up an appointment?

Man: My wife and I live in the same house...

Woman: Hmm, I'm not quite sure what you mean by that.

Man: It means we don't need a calendar appointment to eat together at the same dining table.

Woman: There are some cheap dining tables on amazon.com. Should I show you the options?

Man: And here my wife was getting suspicious I was spending too much time with my "personal secretary." Step aside, Alexa, I'll handle this myself.

Guru walks over to the chair and spins it around, revealing an empty cushion. A grey, cylindrical device on the corner of his desk pulsates a dim white light. A machine is a machine is a machine!

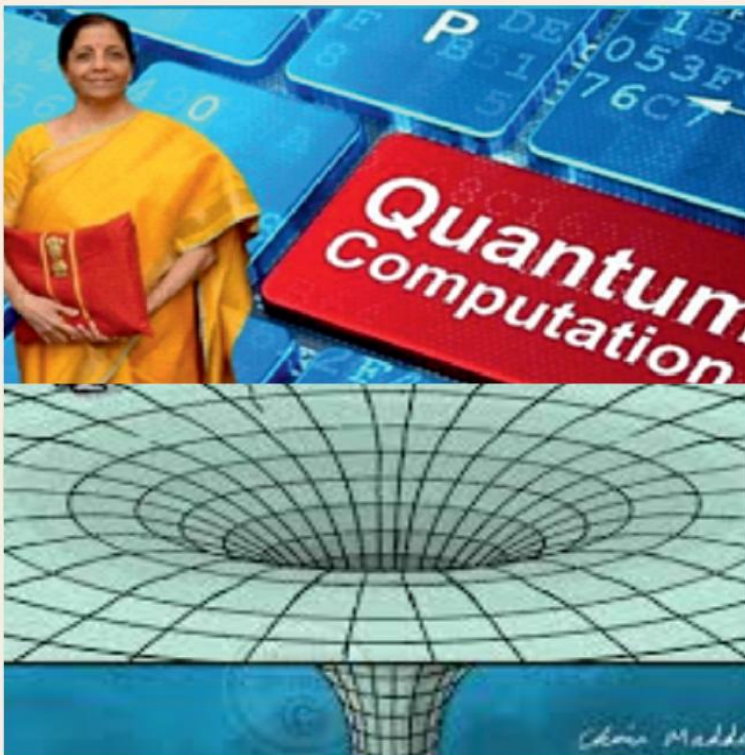
TECHNICAL ARTICLE - III: DEMYSTIFYING QUANTUM COMPUTING

WRITTEN BY VARACHHIYA DHURVRAJ
B.Sc Student (SEM -III)

Quantum Computing, a relatively booming field of computer science and a field that is proven to be significantly faster in solving np-complete problems. Even big name corporations like Microsoft, Google, IBM are investing millions into this technology gold rush, also in the recent budget session our financial minister Mrs.NirmalaSitharaman announced \$1.12 Billion towards the area of quantum technologies in India. The emergence of the Technology in 2010's has quite a lot of importance, Moore's Law is plateauing and this is seen very evidently as the size of transistors has already reduced to 7nm. Any further reduction in size would cause the electron to experience a phenomenon of Quantum Tunneling, i.e. the transistor fails to work normally because the known laws of physics don't apply for an electron of size 4nm to 6nm, and quantum physics starts to take over. Thus, we can say that nature is inevitably forcing us to shift towards quantum. Coming to the mathematical/computational aspect of the technology, it needs to be viewed as an entirely unique paradigm of computing, unlike traditional turing machines this one is not a deterministic computation, rather a probabilistic one. In simple terms, when an operation is performed on a bit of a normal computer it changes from one state to another, and the output is very much predictable using truth tables, but when dealing with a quantum computer and Quantum bits(qubits) the output is in probabilities of zero and one, this is also known as superposition of a qubit.

A very popular myth regarding quantum computers is that they will replace conventional computers that we use today. But the reality is far different, Quantum Processing units or qpu, when they come into existence they would work together with the conventional cpu just as the way the gpu works today. The gpu's have a particular job to perform, which the cpu fails to achieve when compared to the performance of gpu. Likely, the qpu will have a unique job that the cpu cannot perform. Hence, the cpu's will not be replaced totally. Another point of interest is that quantum computers can solve complicated problems like protein folding that can find a cure to cancer, and crack the RSA cryptosystems, etc. But in reality this would take around two to three decades to have a qpu that has such potential.

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TECHNICAL ARTICLE - IV: SATELLITE TV

WRITTEN BY NISHA D PANDEY
B.Sc Student (SEM –III)

Satellite TV is a type of television programming that is wirelessly delivered to TV sets across the world via a network of radio signals, communications satellites, broadcast centers and outdoor antennas. Broadcast signals are transmitted from satellites orbiting the Earth and received by local and regional satellite TV systems.

How Satellite TV service works

Satellite TV technology makes use of specialized antennas known as satellite dishes. These satellite dishes transmit signals to a satellite receiver such as a set-top box or satellite tuner module within a TV set. The programming source transmits signals to a satellite provider broadcast center and these waves are then picked up by a compact satellite dish and broadcast onto television sets.

Overview of Satellite TV Video Content Delivery

Satellite TV service can also be referred to as direct broadcast satellite (DBS or DBSTV) service. A DBS provider will select programming—often a wide range of channels and services—and will then broadcast this content to satellite TV subscribers as part of a larger TV package. DBS programming can either be sent to a digital satellite receiver or an analog satellite receiver. Analog satellite television is slowly being replaced by digital satellite programming. Digital satellite television has become increasingly available in better quality known as HD TV (high-definition television). Digitally-broadcast content is characterized by greater picture and sound quality.

Satellite stations and broadcast television stations both transmit TV programming through radio signals. Years ago, the first satellite television TV technologies were broadcast in the C-band radio frequency range. Today, digital satellite TV content is transmitted in the Ku frequency range.

To further understand the technology behind direct-broadcast satellite systems, it is important to review the top features and elements involved in direct-broadcast satellite TV video content delivery: programming sources, satellite provider broadcast centers, satellites, satellite dishes and the satellite receivers. Programming sources refer to networks or channels that offer TV shows and movies for the enjoyment of subscribers. A broadcast center plays an integral role in video content delivery. At broadcast centers, TV providers receive and send broadcast signals to satellites orbiting the Earth.



TECHNICAL ARTICLE - IV: SATELLITE TV

WRITTEN BY NISHA D PANDEY
B.Sc Student (SEM –III)

Before sending out a signal, a broadcast center will convert programming into a digital stream of content. Once satellites have received and processed all of these uncompressed signals, they ultimately rebroadcast them to satellite dishes on Earth. Next, a subscriber's outdoor satellite dish will pick up the broadcast signal and transmit it to the satellite receiver located inside of a home. A satellite receiver then completes the information transmission by processing the signal and passing it on to a viewer's television set.

Reliability and Reception

If a satellite dish or antenna is knocked out of place by inclement weather, homeowners may need to climb a roof to adjust these settings

Bundle Services

Bundling services like television, Internet, phone and home security is often a very convenient option for customers. One advantage of bundled service is a single bill. While cable TV providers frequently offer bundles, satellite TV companies may need to partner up with other carriers in order to provide Internet, phone and other services to their customers. Online Streaming Service If you are interested in streaming live TV and watching video content online, you may want to carefully review package details to ensure you sign on with a provider—whether Internet, cable or satellite—that offers a wide array of live TV streaming content, both in-home and on-the-go. Do you want to stream your favorite TV shows and movies online or would you prefer to watch live TV on your mobile devices?

Direct broadcast via satellite

Direct broadcast satellite, (DBS) also known as "Direct-To Home" can either refer to the communications satellites themselves that deliver DBS service or the actual television service. Most satellite television customers in developed television markets get their programming through a direct broadcast satellite provider. Signals are transmitted using Ku band and are completely digital which means it has high picture and stereo sound quality.

Programming for satellite television channels comes from multiple sources and may include live studio feeds. The broadcast centre assembles and packages programming into channels for transmission and, where necessary, encrypts the channels. The signal is then sent to the uplink where it is transmitted to the satellite. With some broadcast centers, the studios, administration and uplink are all part of the same campus. The satellite then translates and broadcasts the channels.

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<https://satellites.pro/>

TECHNICAL ARTICLE - V: SURROUND AND ATMOS

WRITTEN BY YADAV VISHAL LALJI
M.Sc Student (SEM -I)

If you've gone to the cinema theatre for at least 3 or 4 festive releases over the last few years, you would've noticed the words "Dolby Atmos 7.xyz" or "dts:X Surround Sound magic xoxo" and whatnot. Ever wondered what that was? Why would movie theatres bother to make sure we see seemingly random phrases and numbers before we get to watch a movie? A lot to unpack here. So traditionally, sound systems were systems consisting of one main receiver, which decodes the audio input stream and gives them out as discrete audio tracks for different speakers, which would correspond to the action being depicted in the onscreen visual. So, when you see the number 5.x or 7.y, the numbers before the period represent the number of distinct audio channels or regular speakers. Each of these channels can receive a separate audio signal. So in 5.x surround, generally the centre speakers play dialogue whereas the other speakers play audio corresponding to on screen visuals, for an overall immersive experience. By contrast, a 2.0 surround system means a plain old, straightforward stereo setup with a Left and a Right input channel only. The second number on the 5.1 system indicates the number of low effects frequency (LFE) channels which are reproduced on subwoofers. Typical speakers are not usually equipped enough to reproduce low subwoofer reproduces only sub-frequency sounds The bass sounds, so it's broken out as a separate 0.1 to indicate it's not a normal speaker. Sometimes you can see 2.0 systems which have capability to support an additional subwoofer for more spatial accuracy. So, when you see the number 5.x or 7.y, the numbers before the period represent the number of distinct audio channels or regular speakers. Each of these channels can receive a separate audio signal. So in 5.x surround, generally the centre speakers play dialogue whereas the other speakers play audio corresponding to on screen visuals, for an overall immersive experience. By contrast, a 2.0 surround system means a plain old, straightforward stereo setup with a Left and a Right input channel only.



TECHNICAL ARTICLE - V: SURROUND AND ATMOS

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Surround Sound

There is a newer standard which adds a 3rd number to the speaker system, like 9.2.4. The third number indicates the number of over channels which are used in ceiling mounted speed or height speakers. For systems that support object based surround protocol like Dolby Atmos or dts X. Here sounds are recorded as individual objects mapped out on a 3d Space, instead of splitting them into channels. This means that instead of each audio track corresponding to one channel, the tracks are encoded with data that indicate some location in space. So previously in the 5.x systems, when a helicopter flies over you in a scene, you can sense the audio coming first coming from the front speakers, then as the aircraft moves, the back speakers start to fire.

But whereas in surround sound, the helicopter is treated as an object, and it is encoded as a spot in space above you, that moves around in real time. This gives a much more immersive experience. The best part about surround sound systems is that they scale amazingly. They can work with upto 128 separate object speakers and can also perform well in 2 speaker set ups. They are able to do this because it is just software encoding that matters, so even a simple earphone will be able to simulate a surround sound experience. You can experience this for yourself in the Dolby Atmos official website.



Reference: <https://www.pcmag.com/how-to/what-is-surround-sound-51-71-dolby-atmos-and-more-explained>

TECHNICAL ARTICLE - VI: DEFORESTATION

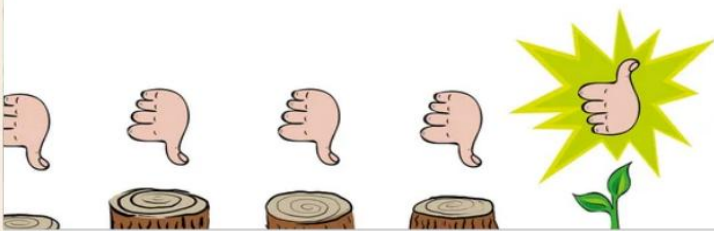
WRITTEN BY SINGH PUJA RAJENDRA SINGH
M.Sc Student (SEM -I)



Deforestation is the removal of a forest or wooded areas which is then converted to non-forest use. Deforestation can involve conversion of forest land, farms, and ranches for urban use. The most concentrated deforestation occurs in tropical rain forests. About 31% of the earth's land surface is covered by forest. Between 15, million to 18 million hectares of forest, an area the size of Belgium, are destroyed every year: on an average 2400 trees are cut down each minute. Deforestation of the Amazon rain forest can be attributed to many different factors at local, national and international levels. It is seen as a resource for cattle pasture, valuable hard woods, housing space, farming space, road works, medicines and human gain and livelihood. Deforestation of the Amazon rainforest in Brazil has surged to its highest level since 2008 according to the country's space agency. A total of 11,088 sq. km (4,281 sq. miles) of rainforest were destroyed from August 2019 to July 2020. This is a 9.5% increase from the previous year. Deforestation not only removes vegetation that is important for removing carbon dioxide from the air, but the act of clearing the forests also produces greenhouse gas emissions. Everyone can do their part to curb deforestation. We can buy certified wood products, go paperless whenever possible, limit our consumption of products that use palm oil and plant a tree when possible.



Save nature . Plant a tree





**EVERYDAY PLASTIC PRODUCTS – SUCH AS
COFFEE CUPS – RELEASE TRILLIONS OF
MICROSCOPIC PARTICLES INTO WATER**

DO YOU KNOW?

**Mr. MANDAL AMANKUMAR RAVISHKUMAR
BSC-SEM-III
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Abstract: NIST researchers analysed single-use beverage cups, such as coffee cups, which can release trillions of nanoparticles, or tiny plastic particles, from the inner lining of the cup when the water is heated.

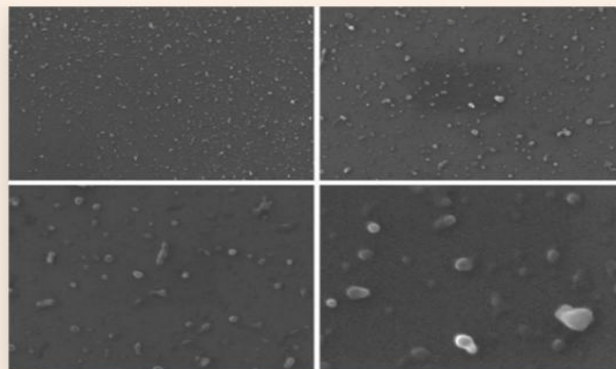
Plastics are all around us, whether it's the grocery bags we use at the supermarket or household items such as shampoo and detergent bottles. Plastics don't exist only as large objects either, but also as microscopic particles that are released from these larger products. These microscopic plastics can end up in the environment, and they can be ingested into our bodies.

Now, scientists at the National Institute of Standards and Technology (NIST) have analyzed some widely used consumer products to better understand these microscopic plastics. They found that when the plastic products are exposed to hot water, they release trillions of nanoparticles per liter into the water

The NIST researchers recently published their findings in the scientific journal Environmental Science and Technology. "The main takeaway here is that there are plastic particles wherever we look. There are a lot of them. Trillions per liter. We don't know if those have bad health effects on people or animals. We just have a high confidence that they're there," said NIST chemist Christopher Zangmeister.

There are many different types of plastic materials, but they are all made up of polymers, which are natural or human-made substances composed of large molecules linked together. Scientists have found microscopic particles from these larger plastics in many environments including the oceans. Researchers categorize them into two groups: micro- and nanoplastics.

**HIGH-RESOLUTION IMAGES OF THE
NANOPARTICLES FOUND IN SINGLE-USE
BEVERAGE CUPS, SUCH AS COFFEE CUPS, AT
THE MICROMETER (ONE MILLIONTH OF A
METER) SCALE.**



Microplastics are generally considered smaller than 5 millimeters (0.2 inches) in length and could be seen by the naked eye, while nanoplastics are smaller than one millionth of a meter (one micrometer) and most can't even be seen with a standard microscope. Recent studies have shown some consumer products that hold liquids or interact with them, such as polypropylene (PP) baby bottles and nylon plastic tea bags, release these plastic particles into the surrounding water.

In their study, the NIST researchers looked at two types of commercial plastic products: food-grade nylon bags, such as baking liners — clear plastic sheets placed in baking pans to create a nonstick surface that prevents moisture loss — and single-use hot beverage cups, such as coffee cups. The beverage cups they analyzed were coated with low-density polyethylene (LDPE), a soft flexible plastic film often used as a liner. The LDPE-lined beverage cups were exposed to water at 100 degrees Celsius (212 degrees Fahrenheit) for 20 minutes.



DO YOU KNOW?

Ms. YADAV ANJALI AVDESH

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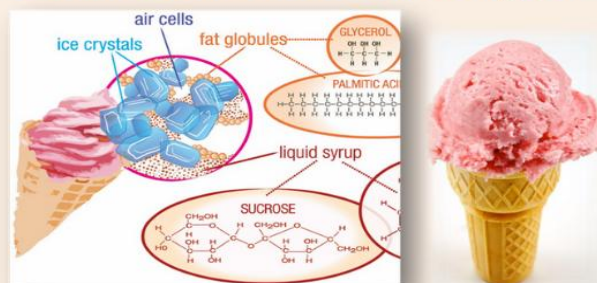
People have been enjoying ice cream for hundreds of years.

But there have never before been as many flavors as we enjoy these days. From sweet to savory, the ice's cream wondrous variety is all due to chemistry.

Ice cream is a heterogeneous mixture of a liquid and finely dispersed solids. That is why it is called a complex colloidal system.

Each part in this system has an important function. Air bubbles typically make up about 30 to 50 percent of the mixture's final volume. They alleviate the feeling of cold and provide suppleness.

If the air content is too low, the ice cream becomes hard. If it is too high, the treat becomes too frothy and loses its taste.



Fat droplets make ice cream creamy. Proteins from milk form around the fat, a combination that helps to separate the droplets and stabilize the mixture.

Liquid sugars surround the insoluble particles. They determine sweetness and softness. In food science, the sweetness is recorded using a scale called "potere dolcificante" ("sweetening power"), or POD. That part of sugar's contribution is obvious.

Less obvious is the fact that sugar lowers the freezing point of water, reducing the amount of ice that forms in the mixture. It therefore has "antifreezing power," which is also called "potere anticongelante," or PAC.

The sugar sucrose sets the standard for PAC, which corresponds to how much the freezing point is depressed by, say, one pound of sucrose dissolved in 100 pounds of water. Ice cream manufacturers use many more sugars. The lower the serving temperature, the more sugar is needed for creamy ice cream.

Professionally produced ice cream has a serving temperature of 12.2 degrees Fahrenheit. This corresponds to a PAC value of approximately 270.

In gastronomy, the serving temperature of ice cream drops to 1.4 degrees Fahrenheit, so the PAC value must be higher to get the perfect softness. The recommended PAC is between 400 and 420, which essentially affects the sugar content.

For 2.5 pounds of ice cream, we recommend this recipe. The result is a PAC of 390 and a POD of 320 at serving temperature.

But there is more than just sugar, fat, ice and air in your scoops. In addition, there are neutral components, such as emulsifiers and stabilizers. They bind solid components or fats with water and thus influence the consistency.

Locust bean gum and xanthan gum are most commonly used. The latter is obtained during the fermentation of sugar-containing substrates and serves as a thickening and gelling agent.

For a long time, the ice cream industry expanded the palette of flavors. Now the focus is on less caloric and less sweet concoctions. To achieve this, sugars are replaced with polyols, and fats are replaced with inulins.



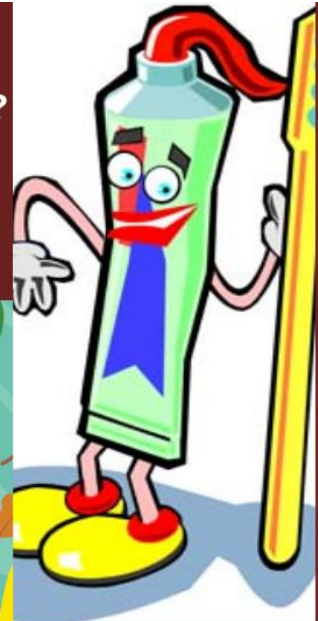
HOW DOES TOOTHPASTE WORK?

DO YOU KNOW?

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We all realise that brushing our teeth with toothpaste is necessary for healthy teeth and gums. Evidence has been found that even prehistoric man cleaned his teeth - using grasses as an early form of dental floss. But do we understand what is in our toothpastes, and why they work?

In the section 'How do our teeth work?' we saw that teeth are composed of layers and that damage to these layers and to the gums can lead to oral problems such as tooth decay. In particular the enamel outer layer is constantly under attack. It can be chipped or damaged and can be dissolved by acid. Dental plaque is a mixture of bacteria firmly adhering to the tooth surface. Bacteria from the plaque in our mouths feed off the carbohydrates/sugars we eat and produce two things:

- acid - which eats into tooth enamel to produce cavities
- volatile sulphur molecules - which can give breath an unpleasant odour

Toothpastes contain mild abrasives which physically scrub away the plaque and food debris without damaging the tooth enamel. Most toothpastes contain fluoride which protects the tooth enamel. Some also contain antimicrobial ingredients to reduce the formation of plaque which could lead to tartar build-up and further problems.

What other ingredients are necessary in toothpaste?

Each make of toothpaste has a slightly different formulation, to appeal to different consumer needs. However, most will contain the following ingredients:

1. **Abrasives:** these remove stains and plaque, and polish the teeth. They must be abrasive enough to do this without damaging the enamel or any exposed dentine. Examples include calcium carbonate, silica and alumina.
2. **Detergents:** these create the foaming action which helps dislodge food debris and bacterial plaque as well as providing a pleasant mouth feel. A common detergent is sodium lauryl sulphate.
3. **Humectants** (eg. glycerin): these give toothpaste its texture and retain moisture so the toothpaste doesn't dry out.
4. **Thickeners** (such as cellulose gum) are also used for texture. They help the toothpaste to stay on the brush when squeezed from the tube/pump.
5. **Preservatives:** prevent the growth of bacteria or other micro-organisms in toothpaste.
6. **Flavouring and colouring agents:** without these, toothpaste would look and taste less palatable.

Is it safe to use fluoride toothpastes on children?

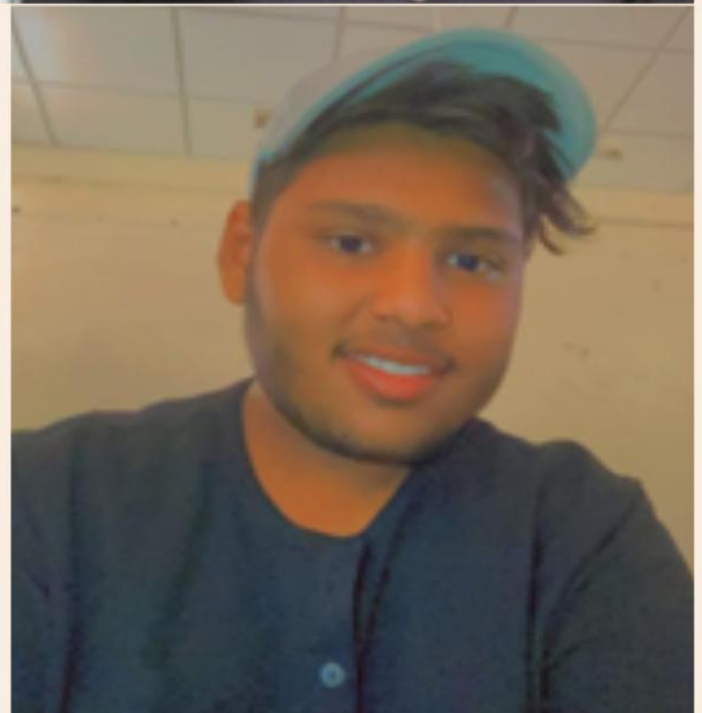
Fluoride is a very safe and effective way to help prevent tooth decay, so is an important ingredient in toothpaste and mouthwashes. It works by making the enamel (that's the tooth's hard outer surface) more resistant to acids produced by the bacteria living on the teeth and gums.

The levels of fluoride in toothpaste are safe but the advice is not to allow children to swallow large amounts (the small amount naturally swallowed is safe) and not to use too much paste (only a pea-sized amount) at one time.



WORDS OF WISDOM & STUDENTS AND SOCIAL MEDIA

Social media has taken today's youth by storm; teenagers go crazy over it and spend most of their time in social networking sites. At the same time, parents are always worried about their children. Social Media has both pros and cons. Let's take the positive aspect first. Social networking sites spread news faster than any other media. These sites are the best sources of news. They help students do better at schools and colleges. People can also connect with their family and friends living faraway. It has disadvantages too: addiction, mental illness, poor emotional health, decrease in face-to-face communication which consequently diminishes understanding and thoughtfulness. It also affects studies and health. Excess of everything is bad. Students should be made aware of the pros and cons of anything before they indulge in it.



Never tell a lie
Even if you have to die.
Never give pain, whatever you gain
Never be greedy but help the needy
Be very brave
Even to the grave.....

HOBBY CORNER(DEPT:EST)



**PRACHI PATEL(TOP), HEMANT
RAJ-BOTTOM-FIG. (SEM-7)**



HOBBY CORNER- PHOTOGRAPHY)

DEPT : DEE

**DEV JOSHI
PATEL ANAND**

SEM-III



HOBBY CORNER (SKETCH & GLASS PAINTING)



**MS. MEHTA RITU
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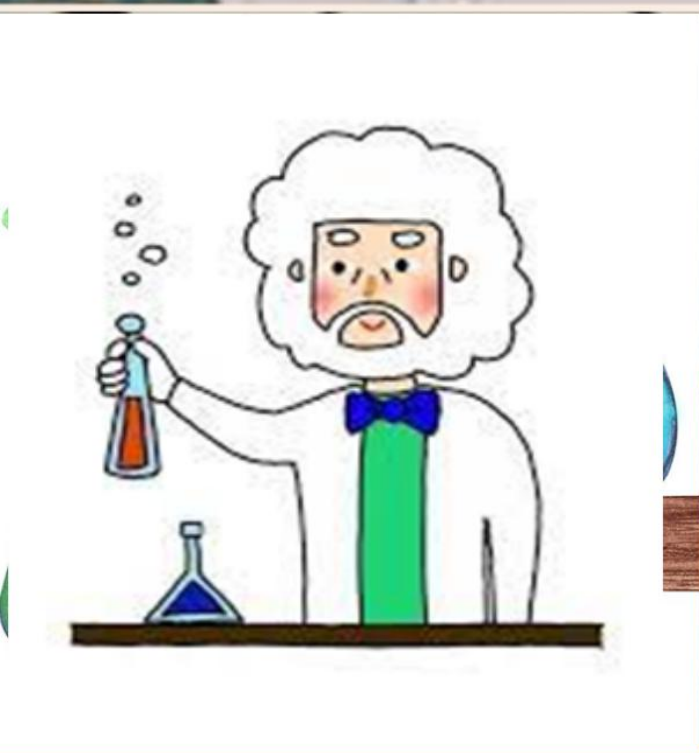
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