NATIONAL CONFERENCE

on

Emerging Trends and Technologies in Sciences

(NCETTS-2016)

Sponsored by

DHE, Haryana

March 25-26, 2016

SOUVENIR

(Book of Abstracts)

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Faculty of Science

Aggarwal College Ballabgarh

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National Conference

on

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Under the aegis of

ISCA, Kurukshetra Chapter

Intellectuals Society for Socio-Techno Welfare

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Prof. Kaptan Singh Solanki
Hon'ble Governor, Haryana

हरियाणा राज भवन,
चण्डीगढ़ - 160019

HARYANA RAJ BHAVAN,
CHANDIGARH - 160019

Message

It gives me immense pleasure to know that Aggarwal College Ballabgarh is organizing a National Conference on "Emerging Trends and Technologies in Science- (NCETTS-2016)" from March 25 to 27, 2016. To mark the occasion a souvenir is also being released.

The new trends in the field of science and technology practices have certainly ameliorated the quality of technical education and the theme of this Conference seems to be a perfect blend of multifaceted aspects of technical innovation. Science conference aims at generating enthusiasm for the creative future of science and increase public appreciation of science. This is very effective and productive academic exercise where participants have been able to absorb and share the current trends in the areas of science and technology.

I am sure NCETTS-2016 will certainly provide some tactile and effective solutions to the present innovation era. I hope that the experts, participating in the conference will uphold their potential of excellence and introduce new streams of science keeping in view the needs of the present age.

I extend my good wishes for the National Conference and also for the publication of the Souvenir.

(Prof. Kaptan Singh Solanki)

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मनोहर लाल
MANOHAR LAL

सत्यमेव जयते

D.O. No. CMH-2016 /.....

मुख्य मन्त्री, हरियाणा,
चण्डीगढ़।
CHIEF MINISTER, HARYANA,
CHANDIGARH.

Dated ....22.3.2016....

Message

It gives me immense pleasure to know that Aggarwal College Ballabgarh is organizing a national conference on the theme of "Emerging Trends and Technologies in Science (NCETTS-2016)" on 25th and 26th March, 2016.

Although there has been a rapid transformation in various fields of science in the recent past and this has opened new vista of hope and aspiration, yet it is essential for our scientists to continue their endeavour zealously for further advancement in this field for the betterment of the country.

I am sure, the conference will provide a common platform to the participants to share their views and discuss common problems.

My best wishes for the success of the NCETTS-2016.

(Manohar Lal)

राम बिलास शर्मा
Ram Bilas Sharma

D.O. No. 82

शिक्षा एवं भाषा, तकनीकी शिक्षा, पर्यटन,
नागरिक उड्डयन, संसदीय कार्य,
पुरातत्व एवं संग्रहालय तथा
सत्कार सगंठन मंत्री हरियाणा ।

Education & Languages,
Technical Education,
Tourism, Civil Aviation, Parliamentary
Affairs, Archaeology & Museums and
Hospitality Minister, Haryana

Dated, Chandigarh 16.3.16

संदेश

मुझे यह जानकर खुशी हुई कि अग्रवाल कालेज बल्लबगढ द्वारा 25 व 26 मार्च 2016 को **"विज्ञान के क्षेत्र में उभरती प्रवृतियां एवं तकनीक** "विषय पर दो दिवसीय नैशनल कान्फ्रैंस का आयोजन किया जा रहा है और इस अवसर पर कालेज की एक स्मारिका का भी प्रकाषन किया जा रहा है।

भारत ने आजादी के बाद जहां हर क्षेत्र में विकास किया है,वहीं विज्ञान के क्षेत्र में भी अभूतपूर्व तरक्की की है। उपलब्ध क्षमता और प्रोत्साहन के कारण 69 वर्षों में ही भारत ने विश्व की वैज्ञानिक और प्रौद्योगिकी की महानतम शक्तियों में तीसरा स्थान प्राप्त कर लिया है। परिणामस्वरूप भारत कच्चे माल के निर्यात से अब विश्व की सर्वाधिक मजबूत औद्योगिक अर्थव्यवस्था में से एक बन गया है। प्रधानमंत्री श्री नरेंद्र मोदी जी डिजीटल इंडिया के माध्यम से विज्ञान के साथ–साथ प्रौद्योगिकी को भी बढावा दे रहे हैं जिसके कारण आज देष की साख विष्व स्तर पर बढी है।

अग्रवाल कालेज बल्लबगढ द्वारा दो दिवसीय नैशनल कान्फ्रैंस का आयोजन करने और स्मारिका का प्रकाषन करने के लिए मैं अपनी शुभकामनाएं देता हूं और उम्मीद करता हूं कि यह कान्फ्रैंस विद्यार्थियों के कैरियर व भावी जीवन के लिए लाभप्रद सिद्ध होगी।

(राम बिलास शर्मा)

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प्रो. बिजेन्द्र कुमार पुनिया
कुलपति
Prof. Bijender K. Punia
Vice-Chancellor

No.VC: MDU: 131
14.3.2016

MESSAGE

It is a matter of great pleasure to know that Aggarwal College, Ballabgarh is organizing Two-Day National Conference on "**Emerging Trends And Technologies in Sciences (NCETTS-2016)**" on March 25-26, 2016 and that a Souvenir is also being published to commemorate the occasion.

It is indeed commendable that a National Conference on such an important topic is being organized by the college. The Principal of the college, along with faculty members, deserve kudos for organizing conference on a topic of contemporary importance.

Latest developments in Science & Technology will be beneficial for the mankind. Academicians and Scientists have an important role to play in sharing the latest knowledge in the field of Science & Technology and creating an enlightened society.

My best wishes for success of the event, as well as for the souvenir.

(Bijender K. Punia)

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March 17, 2016

MESSAGE

I am delighted to learn that our affiliate Aggarwal College, Ballabgarh is publishing proceeding book of National Conference on "Emerging Trends and Technologies in Sciences" to be held during 25-26 March 2016. Publication of proceedings containing useful and interesting scientific information deliberated upon in the Conference shall definitely implant awareness and curiosity of the prospective readers to learn more over the theme. It shall also be beneficial for those who could not make it to attend the Conference.

I wish a great success to this Proceeding Book and congratulate Dr. Krishan Kant, Principal, Aggarwal College, Ballabgarh and all the faculty members for deciding to bring out a Souvenir and Book of Proceedings on this occasion.

17/3/16

Jitender K. Bhardwaj

Message

Sh. Devender Kumar Gupta
President
Aggarwal College Ballabgarh

That the Faculty of Science of Aggarwal College, Ballabgarh is organizing a two day National Conference on 'Emerging Trends and Technologies in Sciences (NCETTS-2016)' on March 25-26,2016 is a matter of immense pleasure and pride. I am also delighted to learn that the college is bringing out the proceedings of this conference that contains the research work of the scholars and scientists from across India. I wish that all the endeavours put forth by the delegates and organizers prove fruitful. My best wishes for the grand success of the event.

Sd/-
Devender Kumar Gupta

Message

Dr. Krishan Kant
Principal &
Patron NCETTS-2016
Aggarwal College Ballabgarh

The modern era is undoubtedly an age of scientific and technological advancement. Since times immemorial, science has played a pivotal role in transforming human lives in a significant way paving the path to unprecedented heights of grandeur. In the present century, science has manifested itself into a plethora of technologies such as nanotechnology, smart materials, laser technology, etc. to name a few.

Keeping in perspective an outburst of multidimensional scope of science, we, at Aggarwal College Ballabgarh, feel proud to announce the organization of two day National Conference on 'Emerging Trends and Technologies in Sciences (NCETTS-2016)' on March 25-26,2016.

I feel confident that this gathering of scholars will provide food for thought and a step to further growth of India-specific Science and technologies. I hope that this 'Manthan' will be a watershed event in the road to India's future.

Sd/-
Dr. Krishan Kant

Message

Dr. A. S. Yadav
Convener NCETTS-2016

It is a matter of great pleasure to invite the participants, contributors & eminent speakers to our college for the National Conference on Emerging Trends & Technologies in Sciences (NCETTS-2016). This conference is being organized by Faculty of Science of our college on March 25-26, 2016.

I hope that the deliberations during this conference will prove to brain stroming & through provoking to the young scientists and technologist. I wish a great success to this conference and thank everyone associated with this event.

Dr. A.S. Yadav

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National Conference on

EMERGING TRENDS AND TECHNOLOGIES IN SCIENCES (NCETTS-2016)

March 25-26, 2016.

Technical Programme

Friday, March 25, 2016

8.30 – 10.00 Registration & Welcome at Aggarwal College Ballabgarh

Inaugural Function (10.00am – 11.15am)

Venue: Auditorium, Aggarwal College Ballabgarh

Chief Guest: Dr. Manoj Umesh Sharma, Scientist-G, SSPL, DRDO, New Delhi **Chairperson: Sh. Devender Kumar Gupta, President, Aggarwal College Ballabgarh**		
Key note address: Prof. P.C. Sharma (Prof., University School of Biotechnology & Director, Research and Consultancy, Guru Gobind Singh Indraprastha University, New Delhi		
Tea Break (11.15-11.45)		
First Session (11.45-1.15)		
Session Chairman: Prof. N.L. Singh (The Maharaja Sayajirao University of Baroda, Vadodara)		
11.45-12.15 IT	Nanopollution: Hype or Health Risk?	Prof. S.K. Chakarvarti
12.15-12.35 IT	Health effects of exposure to low-level Ionizing radiations from naturally occurring radioactive materials	Dr. Krishan Kant
12.35-12.45 O-16	Journey of Nanomaterial towards World of Fresh & Clean Water	Vanita Sapra
12.45-12.55 O-24	Synthesis, structural and magnetic properties of a new silicate mineral: pellyite ($Ba_2CaCo_2Si_6O_{17}$)	Shailndra Singh
12.55-1.05 O-1	Quaternion Analyticity of Generalized Proca-Maxwell's Equations	A. S. Rawat
1.05-1.15 O-2	Human Computer Interaction: A Study Of Interactive Tools And Techniques	Minakshi Garg
1.15-1.25 O-3	Study of radon and thoron concentration in the dwellings of Faridabad city Southern Haryana, India	Nitin Gupta
Lunch 1.25pm-2.00pm & Poster Display (P-1-P-14)		

SECOND SESSION : 2.00 – 3.30		
Session Chairman: Dr. S.K. Chakarvarti, Former Prof. & Assoc. Dean R&D MRIU, Fbd.		
2.00-2.30 IT	How to Prevent Heart Disease	Dr. Neeraj Jain Metro Hospital, FBD
2.30-3.00 IT	Dosimetry of High-Energy Radiations	Dr. P. D. Sahare
3.00-3.10 O-4	Measurement of radiological dose due to concentration of uranium in water samples in Patiala and Fatehgarh district of Punjab	Sarabjot Kaur
3.10-3.20 O-5	Spectroscopic methods(IR, EPR and Electronic) for characterization of Homobinuclear 3d complexes	Nidhi Gupta

3.20-3.30 O-6	Spectroscopic Studies of homobinuclear and bivalent Transition metal complexes	Rachna Gupta
	Tea Break (3.30-4.00)	
	THIRD SESSION : 4.00-5.30	
Session Chairman:	Dr. P. D. Sahare (Department of Physics & Astrophysics, University of Delhi, Delhi)	
4.00-4.30 IT	Recent Trends in Nuclear Reactions Studies using High Energy Accelerator	Prof. N.L. Singh
4.30-5.00 IT	Measurement of EEC, Unattached Fraction and Equilibrium factor Radon and Thoron Concentration in Air	Rohit Mehra
5.00-5.10 O-7	Scattering Fragmentation Pattern of Aluminum Atom by Electron Impact	Praveen Bhatt
5.10-5.20 O-8	Study of SHI irradiation induced modification in structural and optical properties of Oxide based thin films	Manoj Kumar Jaiswal
5.20-5.30 O-9	Measurement of radon activity, exhalation rate and radiation doses in coal and fly ash samples from NTPC Badarpur, Delhi, India.	Mamta Gupta

National Conference on

"EMERGING TRENDS AND TECHNOLOGIES IN SCIENCES (NCETTS-2016)
March 25-26, 2016.

Technical Programme

Saturday, March 26, 2016

FIRST SESSION : 9.40 – 11.30 (Venue : Auditorium)		
Session Chairman: Dr. Mahendra D. Shirsat, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad		
9.40-10.10 IT	Emerging Applications of Laser Technology	Dr. Lalita Gupta
10.10-10.40 IT	High Energy (MeV) Ion Fluence/Gamma Radiation Dose Dependent Nano Scale Free Volume Defects Studies of Polymeric Materials	Dr. Rajesh Kumar
10.40-10.50 O-10	Estimation of indoor radon from source data using different models and validation through measurement	Amit Kumar
10.50-11.00 O-11	Effect of Gamma irradiation on selenium nanowires	Suresh Panchal
11.00-11.10 O-12	Synthesis and Characterization of Cadmium Selenide Nanowires	Chetna Narula
11.10-11.20 O-13	Synthesis and Characterization of Electrodeposited CdSe Thin Film	Ritika Choudhary
11.20-11.30 O-14	Structural Properties of Copper Nanowires: Effect of Diameter	Anita Rani
	Tea Break (11.30-12.00) Poster Display (P-15-onwards)	
	Second Session 12.00-1.50	
Session Chairman:	Dr. R.P. Chauhan (Department of Physics, National Institute of Technology, Kurukshetra)	
12.00-12.30 IT	Sensor Array based on Porphyrins functionalized SWNTs	Dr. Mahendra D Shirsat
12.30-1.00 IT	Exploring emotional domain of Chemistry	Prof. Ranjana Aggarwal
1.00-1.10 O-15	Study of natural radioactivity and radon exhalation rates in Indian building constructions materials and estimation of radiation doses	Rati Varshney
1.10-1.20 O-22	Swift Heavy Ion Induced Modifications of Some Track Detector Polymers	Sanjeev Kumar Gupta
1.20-1.30 O-17	Development of Thermally Stable Coordinated Polymer using Polyurethane as a Ligand and Divalent metal ION	Laxmi
1.30-1.40 O-18	Degradation of LLDPE in presence of Nano catalysts	Beena Sethi
1.40-1.50 O-19	Particle Size dependent Dielectric properties of $PbTiO_3$-$Ni_{0.5}Co_{0.5}Fe_2O_4$ composites	Sushma Lather
Lunch 1.50-2.30		

SECOND SESSION : 2.30 – 4.20 (Venue : Auditorium)		
Session Chairman: Dr. Rajesh Kumar (University School of Basic & Applied Sciences,Guru Gobind Singh Indraprastha University, New Delhi)		
2.30-3.00 IT	Mathematical logic and Fuzzy logic	Dr. S.C. Arora
3.00-3.30 IT	Environmental radon: measurement and remediation techniques	Dr. R.P. Chauhan
3.30-3.50 IT	Exposure to Ionizing Radiation and Impact on Human Health	Dr. Ajay Kumar Garg
3.50-4.00 O-20	SHI induced modifications in Copper doped ZnO thin film grown by Solution growth technique	Arindam Ghosh
4.00-4.10 O-21	vPro: An Enhanced way to secure and manage IT Equipment's	Usha Rani
4.10-4.20 O-23	Study of Characteristics of Gravity Waves	Ajit Singh Yadav

Valedictory Function: 4.20-5.30

Chief Guest: **Prof. Dinesh Kumar, Hon'ble Vice-Chancellor, YMCAUST, Fbd** **Chairperson:** Dr. Krishan Kant, Principal, Aggarwal College Ballabgarh **Guest of Honour:** Sh. Mool Chand Mittal, Executive Member, Governing Body, Aggarwal College Ballabgarh		
4.20-5.30	**-Summary of the Conference** **- Delegates' Feedback** **- Valedictory Speech** **- Vote of Thanks** **- Wrap Up** **- National Anthem**	

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Invited Talks

IT-01

Biotechnology Education, Research and Industry in India

P. C. Sharma
University School of Biotechnology, Guru Gobind Singh Indraprastha University, New Delhi – 110078
Email: prof.pcsharma@gmail.com

Abstract

Biotechnology is the use of living systems and organisms to develop or make products, or "any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use" (UN Convention on Biological Diversity, Art. 2). Biotechnology is a multidisciplinary field that exploits principles and techniques from the allied fields including genetics, cell biology, microbiology, bioprocess engineering, molecular biology, immunology, and bioinformatics. New insights and developments have recently come from the areas of genomics, proteomics transcriptomics and pharmacogenomics. The applications of biotechnology cover diverse fields like agriculture, human health, environment and industry.

India has no dearth of talent in biotechnology, as a large number of institutions, both in public and private sector, provide ample opportunities for the students aiming to obtain a degree in this subject. The biotechnology education in India is being imparted through basically three types of courses: Science (B. Sc./M.Sc. Biotechnology), technology (B. Tech./B.E. and M.Tech. Biotechnology/Biomedical Engineering), and some integrated/dual degree courses like B.Tech-MBA. Doctoral programs are also offered in different universities and research institutions. The Government of India has provided much scope to this sector by providing facilities for Research and Development (R&D) activities.

The biotechnology sector in India is on a strong growth trajectory. India is among the top 12 biotech destinations in the world and ranks third in the Asia-Pacific region. The Indian biotech industry comprising of nearly 800 companies, holds about 2 per cent share of the global biotech industry. Out of the top 10 biotech companies in India, seven have expertise in bio-pharmaceuticals and three specialise in agricultural biotechnology. The Indian biotechnology sector is expected to grow from the current INR 400 billion to 6000 billion by 2025, growing at an average target rate of 30 per cent. Biopharma is the largest sector contributing about 64 per cent of the total revenue followed by bioservices (18%), bioagri (14%), bioindustry (3%), and bioinformatics (1%). The high demand for different biotech products has also opened up scope for the multinational companies to set up base in India, which has emerged as a leading destination for clinical trials, contract research and manufacturing activities. Due to numerous comparative advantages in terms of R&D facilities, knowledge, skills, and cost effectiveness, the biotechnology industry in India has immense potential to emerge as a global key player

IT-02

Nanopollution: Hype or Health Risk?

S.K. Chakarvarti

Former Professor, National Institute of Technology, Kurukshetra-136 119

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Abstract

Nanopollution refers to all the waste matter or byproducts that occur during the manufacture or use of nanoscopic devices or material. For example, fullerenes, molecular spheres of carbon, are used in products like industrial lubricants and sports equipment. Some amount of these fullerenes end up in landfills exposed to the open air, the soil, and the water table. Fullerenes, like many other nanomaterials, are non-biodegradable, and it is difficult to determine what effects they may have on the ecosystem.

Nanotechnology is being used more and more in consumer products - over 400 products in the U.S. alone are labeled as 'nano-based'. The discovery of carbon nanotubes and graphene, and our increasing understanding of the properties of materials on the nanoscale, is leading to an explosion in the commercialization of next generation technologies.

Although the nano boom will bring a wealth of positive changes, it is simultaneously giving rise to a persistent form of pollution which is too small to detect or contain easily. The health effects of nanopollution are yet to be fully understood, making nanopollution yet another man-made environmental impact with uncertain effects in the long term.

Universities and research centres around the world are carrying out an ever-increasing amount of research on the effects of nanoparticles on humans. Experts have stated that people are already exposed to high levels of nanopollution in urban areas due to the exhaust from cars and manganese oxide from construction sites, and researchers are working hard to determine and classify the toxicity of these pollutants. Nanoparticles are so small that they can easily penetrate living cells. The human body is designed to detect foreign objects and produce phagocytes to break down the foreign object. However, if the body's phagocytes are constantly digesting nanoparticles, the cells cannot break down bacteria or other debris inside the body.

The potential damage nanoparticles can do has been understood for quite some time. It had been discovered that nanoscopic particles, when inhaled, could enter the brain via the olfactory tract, as was seen in their experiment with chimps and rhesus monkeys.

Another study reveals that the small nanoparticles were able to bypass the fishes' immune systems, thereby raising the concerns that these nanoparticles could cause some damage to the body before they are even detected.Moreover, scientists at Trinity College Dublin have linked rheumatoid arthritis and the development of autoimmune diseases to exposure to nanoparticles. Nanoparticles in human cells caused the specific transformation of the amino acid arginine into the molecule called citrulline, which has the potential to develop autoimmune conditions such as rheumatoid arthritis.

Although there are numerous unanswered questions, research like this is gradually throwing more light on the hazards of nanopollution, which will help in creating more awareness and hopefully lead to safer workplaces and a cleaner environment.

This talk discusses various aspects of nanopollution and its impact on various issues**.**

IT-03

Health Effects of Exposure to Low-level Ionizing Radiations from Naturally Occurring Radioactive Materials

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Abstract

We have been born and brought up in a naturally radioactive environment and everybody is exposed to cosmic and terrestrial radiation from conception to death. The air we breathe, the water we drink and the soil in which we live in is radioactive due to presence of primordial radionuclides. Even our own bodies are radioactive, we being the products of our environment. Every day, we ingest and inhale radionuclides in our air and food and the water. Natural radioactivity is common in the rocks and soil that makes up our planet, in water and oceans, and in our building materials and homes. Radioactive materials which occur naturally and expose people to radiation occur widely, and are known by the acronym 'NORM' (Naturally Occurring Radioactive Materials). Besides, around the globe there are some high background radiation areas viz. Brazil, Iran, India and China. The sources of radiation in these areas include monazite (Thorium rich) containing beach sands and radium from hot springs. On the southwest coast of India, there are large deposits of thorium bearing monazite sands that contribute to an external radiation dose of about 5 - 6 mGy/yr, but in some parts doses up to 32.6 mGy/yr have been reported. Nevertheless, the public at large is associated with exposure to ionising radiations only with the nuclear power plants (nuclear industry) and other work places (Thermal power plants, granite industry, fertilizer industry, Asbestos industry, coal and gas establishments etc.) dealing with NORM and TENORM. The main exposure is from radon, thoron and their progenies which can be measured and are of great concern about health importance because they can be inhaled and retained in the lung causing cancer. The adverse health effects of high levels of ionizing radiations are well established and reported. Substantial controversy however exists on studies on health effects (cancer) from doses arising from these levels of natural radiation exposure. There are two schools of thoughts; some reporting adverse effects, others null and a few others beneficial hormetic effects. In the present talk, systematic and large-scale epidemiological studies and laboratory investigations and their analysis will be discussed in order to resolve this issue. Concerns on biological effects of radiations from NORM are growing and efforts are on to implement radiation protection standards in TENORM industries in the same way as in the nuclear industry as it is of great importance from health and hygiene point of view.

IT-04

Dosimetry of High-Energy Radiations

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Abstract:

High-energy radiations are hazardous to living beings. There are several online techniques used for this purpose, such as, gas filled detectors, area monitors and scintillation counters but they are not very convenient to use while working as they are bulky and carry electronic gadgets. Their life-times may be shortened due to hardening of the electronic components. Thermoluminescence (TL) is although passive but a simple and reliable technique fordosimetry of high-energy radiations. The numbers of electron/holetraps generated during the irradiation by high-energy radiationdepend on the number of such high-energy particles passingthrough the material. The traps are generally stable at room temperatureand need to be stimulated for their release and recombination. During TL readouts, they are stimulated by thermal energy and the energyof recombination (i.e., TL emission, generally in the visible range) isrecorded as a function of temperature. The intensity of lightemitted by phosphor is proportional to the radiation doses given toit and by establishing calibration with known doses of high-energyradiation, unknown doses could be estimated.

There are several commercially available TLD phosphors such asLiF:Mg,Ti (TLD-100), LiF:Mg,Cu,P (TLD-700), CaF_2:Dy (TLD-200),CaF_2:Tm (TLD-300), CaF_2:Mn (TLD-400), Al_2O_3:C (TLD-500) and$CaSO_4$:Dy (TLD-900), MgB_4O_7:Dy, etc. available. However, every phosphor has one orthe other drawback(s). For example, $CaSO_4$:Dyis highly sensitive to radiation but not tissue equivalent. CaF_2:Mn isalso very sensitive but is not tissue equivalent and its instability andhigh fading introduces errors in estimation of doses. Al_2O_3:C is sensitive to room light and cannot be used openly. There are notmany tissue equivalent (low-Z) phosphors and those available arealso not really ideal ones. LiF:Mg,Ti, BeO:A (A = Li, Na, K) andLiF:Mg,Cu,P are a few to name. They are also not ideal as the firstone is not very sensitive, second one highly sensitive but losesreusability if proper care is not taken while readouts, and the thirdis toxic and need special facilities for synthesis and its use. Therefore,efforts are being made either to develop new ones or toimprove the existing ones.

TLD phosphors, though reliable, have certain drawbacks. Certain materials undergo phase transitions, redox reactions and even clustering of impurities (in high concentrations) on heating and cooling during readouts and lose their sensitivity and reusability (generally termed as thermal quenching). We recently have shown such effects in Al_2O_3, CaF_2, $CaSO_4$, $K_2Ca_2SO_4$ and LiF based systems. Therefore, optically stimulated luminescence, another technique for radiation dosimetry which could be made completely optical is preferred. Another advantage of this technique is that optical fiber based system could be used online also. However, there are not many phosphors available commercially. Al_2O_3:C and BeO are the only ones (First one is costly due to difficulty in preparation and another is toxic). Attempts are, therefore, going on to study new (preferablylow-Z)

materials for their applications as OSL phosphors, such as, $LiMgPO_4$:Tb,B, Na_2SiF_6:Cu,P, Al_2O_3:B, $Y_3Al_5O_{12}$:C, Cudopedquartz (SiO_2:Cu), $LiAlO_2$, MgO:Tb, $NaMgF_3$:Eu, etc. However, all these phosphors are at the developmental leveland the issues related to their sensitivity and fading need to be addressed before they are finally accepted as OSLD phosphors.

In the present paper, recent developments in TLD and OSL phosphors, instrumentation and the outlook is reviewed and presented. It is expected that these developments make them more popular and useful.

IT-05

Recent Trends in Nuclear Reactions Studies using High Energy Accelerator

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Abstract

Study of nuclear reaction exhibits a wide variety of reaction dynamics using stable and weakly bound stable projectiles at high energy . These studies involve by using stable (C,O, Si, S etc) and weakly bound stable (Li , Be) projectiles as (i) Complete and incomplete fusion reactions. (ii) Fission fragments angular and mass distribution at near/sub barrier region (iii) Effect of break up on elastic scattering and fusion mechanism (iv) Effect of breakup on fission/fusion cross sections in Li-induced reactions with fissile target, etc. Study of nuclear reaction dynamics involving weakly bound or halo nuclei is a field of current interest because of its applications to research in astrophysics, nuclear structure and production of super heavy elements. There exist different conclusions about the enhancement or suppression of the fusion cross section over the predictions of single barrier fusion model in the reactions induced by weakly bound stable nuclei such as 6,7 Li and 9Be at energies around the Coulomb barrier.

The study of capture and reaction cross sections and reaction rates of the elements of Th-U fuel cycle at different neutron energies are fundamental important in studies of nuclear technology. The different neutron energies are produced by (proton + Lithium) reaction at accelerator centers. Nuclear data such as neutron capture and reaction cross sections, fission cross sections, fission yields etc are required for reactor design, waste handling and safety point of view etc.

Some of our recent results will be presented in this talk.

IT-06

Measurement of EEC, Unattached Fraction and Equilibrium Factor Radon and Thoron Concentration in Air

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Abstract

The unattached fractions are predominantly responsible for dose received by the target cells in the bronchial epithelium. The data for ^{222}Rn and ^{220}Rn progeny are quite meagre. However for an accurate dose assessment, the knowledge of the concentration of attached and unattached fraction of progeny along with their precursor, ^{222}Rn and ^{220}Rn for a typical environment is very important. High concentration of radon (^{222}Rn), thoron (^{220}Rn) and their decay products in environment may increase the risk of radiological exposure to the mankind. The ^{222}Rn, ^{220}Rn concentration and their separate attached and unattached progeny concentration in units of EEC have been measured in the dwellings of Muktsar and Mansa districts of Punjab (India), using Pin- hole cup dosimeters and deposition based progeny sensors (DTPS/DRPS).

Attached EETC ($EETC_A$) and Attached EERC ($EERC_A$) were obtained from time integrated measurements using wire-mesh capped DTPS and DRPS respectively. The Bare mode of DRPS and DTPS was used to measure the total (Unattached + attached) EEC for ^{222}Rn ($EERC_{A+U}$) and for ^{220}Rn ($EETC_{A+U}$) respectively. The unattached EEC ($EERC_U$ / $EETC_U$) was then obtained by subtracting the attached EEC from the total (Unattached + attached) EEC.

The indoor ^{222}Rn and ^{220}Rn concentration was found to vary from 21 Bqm^{-3} to 94 Bqm^{-3} and 17 Bqm^{-3} to 125 Bqm^{-3}. The average EEC (attached + unattached) of ^{222}Rn and ^{220}Rn was 25 Bqm^{-3} and 1.8 Bqm^{-3}. The equilibrium factor for ^{222}Rn and ^{220}Rn in studied area was 0.47 ±0.13 and 0.05 ± 0.03. The equilibrium factor and unattached fraction of ^{222}Rn and ^{220}Rn has been calculated separately. Dose conversion factors (DCFs) of different models have been calculated from unattached fraction for the estimation of annual effective dose in the studied area. From the experimental data a correlation relationship has been observed between unattached fraction (f_p^{Rn}) and equilibrium factor (F_{Rn}). The present work also aims to evaluate an accurate expression among available expression in literature for the estimation of f_p^{Rn}

Keywords: *Pin-hole cup Dosimeters, DTPS/DRPS, EEC, Unattached fraction, DCF, Annual Effective dose*

IT-07

High Energy (MeV) Ion Fluence/Gamma Radiation Dose Dependent Nano Scale Free Volume Defects Studies of Polymeric Materials

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Abstract

The potential of polymers has been proved in all fields of life and especially in medical sciences, electronics and space research. The intensified interest in polymers stems from their low cost, easy processability and light weight, besides, some special physic chemical properties exhibited by polymers such as ion transport, redox behavior, electrochemical effects, photo activity, catalytic agents and electronic junction effects. Swift Heavy Ion/Gamma radiation plays a crucial role in synthesis, modification (micro/nano size) and characterization of materials. It is notice that radiation induced modification of the polymers has increased in recent years, prompted by the ion/radiation induced improvements in the mechanical, structural, chemical, optical and electrical properties of various polymeric substrates and thus modification of polymer properties under ionizing radiation is a subject of great importance due to the enhanced utility of the polymers in a hard radiation environment such as high-energy particle accelerators, sterilization irradiators, nuclear power plants and space-crafts etc. The effectiveness of the modifications, produced in the polymer depends on the structure and the ion beam parameters (energy, fluence, mass, charge) and the nature of the target material itself. There is still a lack of detailed knowledge about the correlation between structure changes and macroscopic properties, and the role of different energy deposition mechanisms in the modification processes. Insulating polymeric materials were irradiated and exposed to Gamma radiation at different fluencies and doses at Variable Energy Cyclotron Centre, Kolkata and Inter University Accelerator Centre, New Delhi, India. After radiation treatment of insulating polymeric materials were characterized by Positron Annihilation Lifetime Spectroscopy, Atomic Force Microscopy, Scanning Electron Microscopy, X-ray Diffraction, Fourier Transform Infrared Spectroscopy and UV-visible Spectroscopy. The results will be discussed during the presentation.

IT-08

Sensor Array based on Porphyrins Functionalized SWNTs

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Abstract

It is well established that the semiconducting SWNTs show promising behaviour for sensing applications and could be a principal material in the designing of detection system. The novel and unique structural and electronic properties of SWNTs make them excellent material for nano-scale electronics. However, there are certain limitations of SWNTs based sensors in terms of recovery and selectivity. These limitations could be minimized by tailoring SWNT surface by various materials viz. organic conducting polymers (OCP), metal nanoparticles, porphyrins etc. However, Porphyrins could provide better options in terms inculcating selectivity by changing central complexes in porphyrins structure.

Field Effect Transistors (FET) and chemiresistors based on Porphyrins functionalized SWNTs have shown promising outcomes for development of sensor array. At the same time, FETand chemiresistive based platforms have been extensively applied for technologically appealing applications and sensors do stand as a mark of the same. In case of FET platforms, the gate electrode plays a significant role in optimizing sensing performance either by modulating the channel current level or depleting the charge accumulation in the channel for fast recovery of the sensors. Thin film based FET platforms with various sensing materials have been extensively explored, however investigations on 1-D formation of porphyrins functionalized SWNTs havenot been explored much. 1-D formation of porphyrins functionalized SWNTs are more advantageous than thin film structures as an active material since in the latter, fast charge kinetics is ensured.

Some of the recent findings of our research group have recorded a significant step towards predictable control in terms quantification and discrimination of various VOCs by using FET and chemiresistive platforms based on porphyrins functionalized SWNTs. We have used various free base and metal substituted porphyrins to functionalize SWNTs and observed noticeable screening capabilities of the devices in terms of detection various VOCs and hazardous gases. While investigating the applicability of these optimized platforms for gas sensing, we could achieve commendable results with detection of gaseous / VOC analytes (viz. Benzene, Xylene, Toluene, Ethanol, Methanol, Acetone etc) at low ppm range of concentration.

Our observations suggest that FETand chemiresistive platformsbased on porphyrins functionalized SWNTs could be a smart choice for fabrication of sensors towards addressing complex application needs and ultimately for the development of electronic noses.

IT-09

Environmental Radon: Measurement and Remediation Techniques

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Abstract

Radon is formed as an intermediate step in the normal radioactive decay chains through which thorium and uranium slowly decay into lead. Thorium and uranium are the two most common radioactive elements on earth; they have been around since the earth was formed. As radon itself decays, it produces new radioactive elements called radon decay products. Unlike the gaseous radon itself, radon progeny are solids and stick to surfaces, such as dust particles in the air. If such contaminated dust is inhaled, these particles can stick to the airways of the lung and increase the risk of developing lung cancer. Epidemiological studies have shown a clear link between inhaling high concentration of radon and incidence of lung cancer. Also, radon is ubiquitous i.e it is found everywhere. The radon survey program is also run by various countries to map the radon and for the identification of High Background radiation area (HBRA). The upper safe limit of radon is recommended by various national and international agencies. The main aim in the field of radon study is divided into three categories; (i) development of measuring techniques (ii) radon survey and mapping and (iii) remediation or mitigation methods. The second part is very common for new researcher working in the radiation field and good amount of data is already established. The first and third parts are still challenging and important in present scenario. The present work presents the details of various measurement techniques and formulation used for radon and thoron level measurements in air and the source strength in terms of radon exhalation rates. The radon free environment is beyond the bounds of possibility but mitigation is easy to pie. This work also includes discussion on various active and passive remediation techniques along with their advantage and cost effectiveness over one another.

IT-10

Exposure to Ionizing Radiation and Impact on Human Health

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Abstract

The ionizing radiation radiations are spontaneously emitted by naturally occurring radioactive material like ^{238}U and ^{232}Th, ever since their existence on earth. Over 60 radionuclides can be found in nature and can be placed in three general categories viz: Primordial, Cosmogenic and Man-made. Radionuclides are found naturally in air, water and soil. Our body itself contain radioactivity as we ingest and inhale radionuclides from air, food and water. There are three naturally occurring radioactive series among the elements in the periodic table known as the uranium series, the actinium series and the thorium series. Each series decays through a number of unstable nuclei by means of alpha and beta emission until end on a different stable isotope of lead. One of the most important decay products in each radioactive series is radon isotopes which exist in gaseous form. These radon isotopes further decay into other radioactive products which are ingested and inhaled by human through food and air. The gaseous radioactive gas, radon being an inert gas can easily disperse into the atmosphere immediately on its release. The solid alpha active decay products of radon like ^{218}Po and ^{214}Po become airborne and get themselves attached to the aerosols, dust particles and water droplets suspended in the atmosphere. When inhaled during breathe, these solid decay products along with air may get deposited in the tracho-bronchial and pulmonary region of lungs resulting in the continuous irradiation of the cells which may be the cause of lung cancer. The impact of ionizing radiation on human being depends upon several factors like, source strength, radiation type, tissue type, energy of incident radiation etc. Similarly the destruction of the tissue also depends upon the energy and flux of incident radiations. Present work highlights the study of natural and man-made radioactivity present in the atmosphere and their sources. The biological effects caused by ionizing radiation are also discussed.

IT-11

Emerging Applications of Laser Technology

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Abstract

The applications of the lasers in newer and upcoming areas of laser technology will be discussed in this talk. The talk will cover wider areas like physics, medical, chemical, environment, agriculture etc. Brief introduction of laser and laser technology will also be covered.

IT-12

Mathematical Logic and Fuzzy Logic

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Abstract

History of Mathematical logic and various equivalent formulations are introduced and studied. Its applications to different areas are presented. Formulation of logic in terms of switching circuits is shown. Generalization to Fuzzy logic is presented and applications discussed.

IT-13

Exploring Emotional Domain of Chemistry

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IT-14

How to Prevent Heart Disease

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Broad outlines of the talk will include

1. How Heart Disease occurs.
2. Symptoms of Heart Disease
3. Risk Factors of Heart Disease (which to is to be taken care)
4. Role of Cholesterol in Heart Disease
5. Role of Stress in Heart Disease
6. Difference between Good & Bad Cholesterol
7. Dietary Habits
8. Prevention from Heart Disease
9. New Advancement in Technology which helps to Prevent from this disease.
10. Do's and Don’ts for Heart Patients.

Oral Presentations

OP-01

Quaternion Analyticity of Generalized Proca-Maxwell's Equations

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Abstract
Keeping in mind the t'Hooft's massive monopoles and the role of quaternionic algebra in theoretical physics, generalized field equations of massive dyons in quaternionic formulation have been discussed in a consistent manner. Starting with the idea of two four-potential and taking the generalized charge, potential, field, current as complex quantities with real and imaginary parts of them as electric and magnetic constituents, the quaternionic formulation of generalized complex-electromagnetic fields equations and generalized Proca-Maxwell (GPM) equations for massive dyons have been established.

OP-02

Human Computer Interaction: A Study Of Interactive Tools And Techniques

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Abstract
Human–computer interaction is an area of applied science and engineering design. It is concerned both with understanding how people make use of devices and systems that incorporate computation, and with designing new devices and systems that enhance human performance and experience. *Human–Computer Interaction* includes most technologies from obvious computers with screens and keyboards to mobile phones, household appliances, in-car navigation systems and even embedded sensors and actuators such as automatic lighting. The goal of HCI is to solve real problems in the design and use of technology, making computer-based systems easier to use and more effective for people and organizations. Interaction between users and computers occurs at the user interface, which includes both software and hardware; for example, characters or objects displayed by software on a personal computer's monitor, input received from users via hardware peripherals such as keyboards and mouse, and other user interactions with large-scale computerized systems such as aircraft and power plants. This paper is an attempt to highlight the study of interaction between people (users) and computers using different techniques like:
1. Visual-Based techniques
2. Audio-Based techniques
3. Sensor-Based techniques
All the above mentioned techniques are described briefly in the paper.
Keywords: *Human Computer Interaction, Human Information Processing, Gesture Recognition.*

OP-03

Study of Radon and Thoron Concentration in the Dwellings of Faridabad City Southern Haryana, India

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Abstract
Radon is second most common cause of cancer and Faridabad situated in Southern Haryana is an industrial hub so radon may be a problem in this city. So, health and hygiene point of view radon and thoron concentration were calculated in the dwellings of Faridabad. For estimation twin cup were employed for a season of a year. Results show that concentration of radon and thoron varies from 31.59 Bq/m^3 to 67.23 Bq/m^3 and 14.89 Bq/m^3 to 21.52 Bq/m^3 respectively. PAEC due to radon and thoron varies from 3.42mWL to 7.27 mWL and 0.40 mWL to 0.58 mWL respectively. Annual exposure due to radon and thoron and annual effective dose vary from 140.70 $X10^{-3}$ WLM to 299.45$X10^{-3}$ WLM, 16.58$X10^{-3}$ WLM to23.96$X10^{-3}$ WLM and 0.6 mSv to 1.2 mSv respectively. The variations in the results are because of different types of floors, building structures and ventilation conditions.

Keywords: *Radon, Thoron, Concentration, Twin-cup, Dosimeters.*

OP-04

Measurement of Radiological Dose Due to Concentration of Uranium in Water Samples in Patiala and Fatehgarh District of Punjab

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Abstract
Uranium content in the ground water samples of Patiala and Fatehgarh district of Punjab have been determined using LED Fluorimetry technique. Radiological and chemical risks have also been determined for the uranium concentrations in the studied water samples. Uranium concentration in 80 water samples has been calculated from 16 different villages. The uranium concentration in the studied water samples varies from 3.92 to 17.98 μg l-1. The uranium content in all these samples have been found to less than the recommended safe limit of 60 μg l-1 (AERB). The average value of Excess Cancer Risk from the ingestion of uranium is 1.0 x 10-5. The Lifetime Average Daily Dose (LADD) and Hazard Quotient (HQ) vary from 0.08 to 0.35 μg kg-1 day-1 and from 0.13 to 0.59 respectively. The annual effective dose ranges between 1.55 nSv a-1 and 7.12 nSv a-1.

Keywords: *Laser Flourimetry, Excess Cancer Risk, LADD, HQ*

OP-05

Spectroscopic Methods(IR, EPR and Electronic) for Characterization of Homobinuclear 3d Complexes

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Abstract

Tetra aza di thio macrocyclic ligand have been used for the synthesis of macrocyclic complexes with copper metal salts . The stereochemistry, coordination behavior and structural analysis have been done by means of various physicochemical techniques i.e. elemental analysis, magnetic moment, molar conductance measurements and spectral studies such as IR, EPR and Electronic in DMSO/DMF solutions. The structures of the complexes have been determined with the help of spectroscopic as well as conductivity values and found to be six coordinated distorted octahedral geometry for the complexes. Molar conductance measurement revealed that the reported macrocyclic complexes were ionic and electrolytic in nature i.e.behaves as electrolyte.

OP-06

Spectroscopic Studies of Homobinuclear and Bivalent Transition Metal Complexes

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Abstract

A new series of symmetric tetradentate cyclic ligand and their transition metal complexes have been synthesized and characterized. Macrocyclic ligand has been synthesized by the condensation reaction of the thiodiglycolic acid and 2,6 diammino pyridine or 2,6 diammino phenylene in the molar ratio of 1:1 . Light yellow colored ligand was precipitated out . The synthesis of the ligand was confirmed by ir, and mass spectral data. The cobalt complexes were prepared by using the ligand and the metal salt in the ratio of 1:2 . Colored cobalt complexes were synthesized and characterized by elemental analysis, molar conductance , IR, Electronic and EPR spectral studies in DMSO/DMF solutions. Six coordinated octahedral geometry were proposed for the complexes.

OP-07

Scattering Fragmentation Pattern of Aluminum Atom by Electron Impact

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Abstract

The total ionization cross-sections of Aluminum atom due to electron impact for threshold ionization energy to 3000 eV have been studied. The present cross sections are compared to existing experimental cross sections as well as to theoretical predictions. The correlation between the total electron scattering cross section and the number of target-molecule electrons is discussed.
Keywords*: Electron impact, Cross section, Ionization*

OP-08

Study of SHI irradiation induced modification in structural and optical properties of Oxide based thin films

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Abstract

Tin oxide (SnO_2) based thin films were grown at room temperature by different techniques. The thin films were irradiated by Swift Heavy Ion (SHI) beams at normal incidence using 15 UD Pelletron Accelerator at IUAC, New Delhi with varying ion fluencies from 5×10^{11} ions/cm^2 to 1×10^{13} ions/cm^2. Phase transformation, variation in particle size and stability of different planes were studied by Glancing Angle X-ray Diffraction (GAXRD) technique. Modification in local electronic structure due to SHI irradiation was studied by X-ray absorption spectroscopic (XAS) technique. Elemental analysis was done by Resonance Rutherford Backscattering (R-RBS) techniques. Surface topography and grain size distribution was studied by Atomic Force Microscopy (AFM) techniques. Change in optical band gap due to variation in SHI irradiation ion fluence was observed from optical studies of these films by UV/Visible Spectroscopy using Tauc's relationship. The defects produced (oxygen vacancies and distortion in unit cell of the material) due to SHI irradiation are assumed to be key factors in modifying the material properties. Detailed results will be discussed during presentation.
Keywords: *GAXRD, XAS, R-RBS, AFM, UV/Visible.*

OP-09

Measurement of Radon Activity, Exhalation Rate and Radiation Doses in Coal and Fly Ash Samples from NTPC Badarpur, Delhi, India.

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Abstract

Coal is a technologically important material used for power generation. The increasing demand for electricity generation for industrial development and human living standards worldwide is met by combustion of fossil fuels. Since coal contains ^{226}Ra, ^{232}Th and ^{40}K radionuclide, so it is important to measure the radiation risk to population.Fly ash produced by coal-burning in thermal power stations has become a subject of worldwide interest in recent years because of its diverse uses in construction activities and considerable economic and environmental importance. In the present study the results for the radon activity, radon exhalation rates and effective doses from the coal and fly ash samples collected from NTPC (National Thermal Power Corporation), Badarpur, Delhi, are presented. "Can technique" has been used. The monitoring device is LR-115 type-II solid state nuclear track detectors (SSNTDs).

Keywords: *Radon, Coal, LR-115 type-II SSNTDs, Radon exahalation Rate, NTPC.*

OP-10

Estimation of Indoor Radon from Source Data using Different Models and Validation through Measurement

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Abstract

Building materials are the second major source of indoor radon after soil. The source data like radium content, exhalation rate, density, diffusion coefficient soil gas and thickness of sample are important parameter that can be used as primary indices for estimation of indoor radon. In literature three different approaches was discussed by Nazaroff & Nero, Stoulous and Sahoo. In addition to radium content, the radon wall flux from a surface strongly depends upon the radon diffusion length (L) and thickness of the wall (2d). In the present work the indoor radon concentrations from the measured radon exhalation rate of building materials calculated using different models available in literature and validation of models was made through measurement. The variation in the predicted

radon flux from different models was compared with d/L value for wall and roofs of different dwellings. The results showed that the radon concentrations predicted by models agree with experimental value. The applicability of different model with d/L ratio was discussed. The work aims to select a more appropriate and general model among available models in literature for the prediction of indoor radon.

Keywords: *Radon exhalation, One and two dimensional modeling, Soil gas*

OP-11

Effect of Gamma Irradiation on Selenium Nanowires

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Abstract

In the last few years, Preparation of low-dimensional materials attracts more and more interest of the researchers mainly due to the wide field of potential commercial applications. Nanowires can be used for interconnections and efficient transport of electrons. The increasing use of semiconducting nanowires in large applications requires understanding the effect of irradiation on the properties of these nanowires. In the present study synthesis of 80nm selenium nanowires was done with the help of track etched polycarbonate membrane. The electro-deposition of selenium nanowires was performed via three electrode set up using potentiostat. With this template technique required materials can be deposited within the pores of the membrane. These synthesized nanowires were then exposed to gamma rays by using a Co-60 source at the Inter University Accelerator Centre, New Delhi, India. The effect of Gamma exposure on Structural, Optical, electrical was investigated. An I-V measurement of selenium nanowires, before and after irradiation were made with the help of Keithley 2400 source meter, Ecopia probe station and shows an enhancement in the current with the exposed dose. The optical study of pristine and irradiated nanowires was done with UV/Vis spectrophotometer and exhibit a decrease in optical band gap with dose.. The crystallography of the pre- and post irradiated nanowires was also studied using a Rigaku X-Ray diffractrometer equipped with Cu–Kα radiation. XRD patterns of irradiated samples showed no variation in the peak positions or phase change. An increase in the conductivity and decrease in band gap may be due to the decrease in scattering of current carriers from grain boundaries and creation of electron hole pairs.

OP-12

Synthesis and Characterization of Cadmium Selenide Nanowires

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Abstract

One-dimensional nanostructures are of both fundamental and technological interest. They not only exhibit interesting electronic and optical properties associated with their low dimensionality, high surface to volume ratio and the quantum confinement effect, but they also represent critical components in potential nanoscale devices. Various methods are being employed to synthesize them. The template method is one of the most convenient in order to fabricate nanowires or nanotubes. This methods involves the fabrication of the desired material within the pores or channels of a nanoporous template (track-etch membranes, porous alumina etc). To provide a suitable chemical pathway for the synthesis of nanowires, electrochemical deposition is done. The present study aims at synthesizing CdSe nanowires of diameter 80nm and studying their structural, electrical and optical properties. The wires were synthesized by using template assisted electrochemical deposition technique in an aqueous solution of $3CdSO_4.8H_2O$ and SeO_2. The electro-deposition was performed at constant potential of the working electrode with respect to the reference electrode using a PC controlled potentiostat and a three electrode set-up. Structural properties and morphology of the synthesized nanowires were studied using Rigaku Mini-Flex II X-ray diffractometer and Scanning electron microscope (SEM) respectively. Electrical properties of cadmium selenate nanowires were measured with the help of Keithley 2400 source meter and Ecopia probe station. The optical studies were studied by measuring the absorption spectra by using UV–visible double beam spectrophotometer.

OP-13

Synthesis and Characterization of Electrodeposited CdSe Thin Film

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Abstract

CdSe is a wide and direct band gap semiconductor among II-VI systems. Thin film of CdSe semiconductor has better carrier mobility as compared to Si films and can be used on the top of the solar cells as absorber layer. Electro deposition is one of the non-vacuum, simplest and low-cost

technique for the deposition of thin films and deposition rate can be easily controlled by changing the deposition voltage and time, pH of the electrolyte, solution concentration etc .Thin films of Cadmium selenide (CdSe) were electrodeposited potentiostatically on indium tin oxide (ITO) coated glass substrates. The electro deposition was done by using SP-240 potentiostat employing a conventional three electrode set-up. The electrochemical cell consisted of Ag/AgCl electrode as the reference electrode, an indium doped tin oxide (ITO) coated glass substrates as the working electrode and platinum wire (length-5.7cm, diameter-0.5mm) as counter electrode. Working solutions for deposition were prepared by dissolving $3CdSO_4.8H_2O$ and SeO_2 in distilled water. The pH of the electrolyte was adjusted between 2 and 3 by using concentrated H_2SO_4 acid. The total volume of electrolyte was taken 50ml and the temperature was maintained at room temperature. Before deposition, the substrates were ultrasonically cleaned with distilled water and acetone successively. During electro deposition, the potential was set at -0.75V and time of deposition was 15 minutes. After deposition, the CdSe thin film on ITO substrate was taken out from the electrolyte and rinsed in de-ionized water to remove loosely bound precipitates .After this, thin film was dried in air at 100˚C for 15 minute. As deposited CdSe thin film was characterized by XRD, SEM, UV-Visible spectroscopy and PL spectroscopy.

OP-14

Structural Properties of Copper Nanowires: Effect of Diameter

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Abstract

Nanowires attracted those who seek to design the nano-devices for potential applications in various areas such as nanoelectronics, biotechnology solar cell and among others. Single and polycrystalline nature and different phases of materials established the ground for applications. In this context, the fabrication of nanowires of different diameter is an area of interest. In the present study, Copper nanowires of diameters, 50, 80, 100 and 200 nm were synthesized and characterized using X-ray diffractometer to investigate the structural properties of the nanowires. In XRD spectra, the strong reflection peaks and diverse family of planes recommended the poly-crystalline nature of the copper nanowires. Nanowires have the cubic lattice geometry with lattice parameter 3.608, 3.618, 3.61 and 3.62 Å for 50, 80, 100 and 200 nm diameters, which is in good agreement with the 3.615 Å as mentioned in standard database. For low diameter nanowires, it was observed that the growth of the planes increased along a particular direction {400} and the intensity of the other peaks is low comparative to spectrum of other diameter. This growth gave strength to anisotropic nature of the

nanowires due to strong bonding of the neighboring atoms with same helical chain. The average grain size of the nanowires (30, 38, 42 and 45 nm for 50, 80, 100 and 200 nm diameters) and broadening of the diffraction peaks were found to increase as the diameter approaches the low value at nano-scale. The rising in the broadening of the peaks attributed to the size effect and micro strain in nanowires. Strain often produced from dislocations, domain boundaries, surface defects etc. This study revealed the fact that diameter variation may have impact on the strain, grain size and thus number of grains in a specific volume that has a direct effect on electrical, mechanical and optical properties of the material and their potential applications as well.

OP-15

Study of Natural Radioactivity and Radon Exhalation Rates in Indian Building Constructions Materials and Estimation of Radiation Doses

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Abstract

Building construction materials are one of the important sources of radon emanation. Due to low level of radon emanation from these materials, long term measurements are needed. Radiation doses variation depends upon the concentrations of the natural radio nuclides like ^{226}Ra, ^{232}Th and ^{40}K present in building materials. These radio nuclides pose exposure risk due to their gamma ray emission and internally due to radon and its progeny that emit alpha particles.

In the present study the activity concentration of ^{226}Ra, ^{232}Th and ^{40}K radionuclides in building construction materials have been measured by using high resolution γ –ray spectroscopic system **(Mahur et al., 2008, 2013)**. Gamma spectrometric measurements were carried out at Inter-University Accelerator Centre, New Delhi using a coaxial n-type HPGe detector (EG&G, ORTEC, Oak Ridge, USA).The activity concentrations for ^{226}Ra, ^{232}Th and ^{40}K found in the building materials varied from 16.1 ± 0.7 to 69.7 ± 1.9 BqKg^{-1}, 12.3 ± 0.5 to 87.5 ± 1.6 BqKg^{-1}, 110.5 ± 1.7 to 1080.5 ± 11.5 BqKg^{-1} respectively. The absorbed dose rate in the investigated samples varied from 20.6 to 108.7 nGy h^{-1}. Radium equivalent activity, indoor and outdoor effective doses were also evaluated for these samples, which was varying from 44.9 to 235.7 Bq Kg^{-1}, 0.10 to 0.53 and

0.03 to 0.13 mSv respectively. External hazard index must be lower than unity, for keeping the radiation hazards insignificant, which was found to vary from 0.12 to 0.62 in the studied samples.
Radon concentration was analyzed and evaluated from different building construction materials using "Sealed Can Technique" with LR-115 type II solid state nuclear track detector. The internal radiation exposure, due to ^{222}Rn, exhaled from building materials i.e. Radon surface and mass exhalation rates, have been investigated, which varies from 29.02± 3.2 to 1040 ± 31.4 mBq m^{-2} h^{-1} and 1.12 ± 0.12 to 40.04 ± 1.21 mBq $Kg^{-1}h^{-1}$ respectively. Results will be discussed in the light of various factors.

OP-16

Journey of Nanomaterial towards World of Fresh & Clean Water

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Abstract
The availability of drinking quality water is fast becoming a major socio-economic issue across the globe, especially in the developing world. According to Global population projections, worldwide demand for water will increase by a third before 2030.
The situation is likely to get even worse as more than a billion people already experiencing drinking-water shortages, and a potential increase in temperature by 3-6 ^{o}C and subsequent redistribution of rainfall patterns. However, water purification technology is often tedious, requires special equipment and is expensive to run and maintain. Moreover, it usually requires a final costly disinfection stage. Nanotechnology could provide a simple solution to the problem. Nanotechnology could be the answer to ensure a safe supply of drinking water for regions of the world stricken by periodic drought or where water contamination is high. The review paper gives an insight how nanomaterial could replace conventional materials in water purification system for better future

OP-17

Development of Thermally Stable Coordinated Polymer using Polyurethane as a Ligand and Divalent Metal Ion

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Abstract

Last decade has observed the upsurge of research efforts in the development of coordination polymers, leads to great interest in coordination chemistry. The nature of coordination polymer can be modified by self-assembling the metal ions with organic ligand, thus the choice of coordinated ligand seems to be important along with choice of metal ions. Among various ligands, polyurethanes are the great choice of reinforcement containing valuable properties of their own which has been shown to increase on coordinating with metals ions and found several applications in all area of today life.

In presents work, an attempt has been made to synthesize coordination polymer from the polyurethane and transition metal ions under desirable conditions. The obtained polymer was analyzed by various techniques as Elemental analysis, UV-visible, FTIR, XRD, FESEM-EDX, TGA and shows the chemical stability with higher thermal stability and nano-pores which have capability to remove dye pollutants in comparison to virgin ligand, discussed in poster.

OP-18

Degradation of LLDPE in presence of Nano catalysts

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Abstract

Plastics have become an integral part of our lives. However, the disposal of plastic waste poses an enormous problem to society. An ideal solution would be to break down a polymer into its monomer, which could then be used as the building-blocks to recreate the polymer. Unfortunately, the majority of plastics do not degrade readily into their monomer units. Thermal degradation of polymers usually follows a radical mechanism (which is of high energy and requires high temperatures) and produces a large proportion of straight chain alkanes, which have low relative octane number (RON) and so cannot be used in internal combustion engines. However, a suitable catalyst can help to get branch chains and so give high RON fuels that can be blended into commercial fuels.

An extensive thermogravimetric and differential scanning calorimetric study of polymer- nano catalyst mixtures was undertaken and dramatic reductions in the onset temperature of degradation and significant changes in the activation energy are observed.

For example, GC-MS analysis of linear low-density polyethylene (LLDPE) degraded with nano catalyst showed the polymer forming a large percentage of C3-C4 hydrocarbons along with valuable feedstock and very less percentage of solid residue in comparison to pure LLDPE.

Gas chromatographic analysis was carried out for two films. It was found in gas chromatography (GC) analysis results that in presence of these catalysts more than 80% of polymer by weight was converted into either liquid or gaseous hydrocarbons. Adjustment of dose of nano-catalyst, use of nanoadmixtures and recycling of catalyst can make this catalytic feedstock recycling method a good tool to get sustainable environment. The products obtained can be utilized as fuel or can be transformed into other useful products. In accordance with the principles of sustainable development the tertiary recycling is attracting much attention from the viewpoint of the energy resource. The formation of a large proportion of high RON components from LLDPE could move us one step closer to tackling the enormous problem of plastic waste disposal that the world faces today.

Keywords: *Degradation, differential scanning calorimetry, feedstock recycling, gas chromatography, thermogravimetric analysis, Relative octane number.*

OP-19

Particle Size Dependent Dielectric Properties of $PbTiO_3$-$Ni_{0.5}Co_{0.5}Fe_2O_4$ Composites

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Abstract

The multiferroic composite ceramics (1-x)$PbTiO_3$-x-$Ni_{0.5}Co_{0.5}Fe_2O_4$ (x=0.2) (PTO-NCFO) were prepared by sol-gel method. The synthesized powder was ball-milled for 12, 24 and 48 hrs to reduce the particle size of PTO-NCFO composite. It is observed that with reduction in the particle size of the composites material the dielectric constant reduces along with the transition temperature (corresponding ferroelectric transition). The samples which were ball-milled for longer hour's shows low dielectric loss compared to pristine sample. The observed dielectric behavior of our samples can be correlated with the reduction in with particle size (i.e. domain wall contribution, strain effect etc.)

OP-20

SHI induced modifications in Copper doped ZnO thin film grown by Solution growth technique

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Abstract

The increasing demand of mankind and to make the life comfortable, the usage of modern sophisticated instruments has increased abruptly which also causes natural imbalance. This is a matter of great concern of the recent scientific community. So, in-order to reduce the natural imbalance and enhance the safety, the scientists are look forward to detect these harmful, inflammable gases at lower stage (concentration). With this motivation, we intended to grow an economical- good quality gas sensor which works at lower operating temperature. Due to their various properties like sensitivity, selectivity and and recovery time *Metal oxide semiconductors* attracted the attention of scientific community as gas sensors (GS). However, it requires relatively high temperature for sensing and there is a strong possibility of material modifications at such high temperatures giving rise to some unexpected sensing phenomena. So, in order to reduce the operating temperature as well as to enhance the gas response the ZnO thin films were doped by Cu by solution growth technique. Structural studies reveal hexagonal wurzite structure of chemically deposited Cu doped ZnO thin film. The crystallite size was found to increase with the concentration of the Cu dopant. Elemental analysis reveals the presence of Cu ions into ZnO matrix, which substitute at Zn site into the nanostructured ZnO crystal as it was presented in ball and stick model. Successful tailoring of band gap by doping was found in optical study and presented in band diagram model. LPG sensing property was studied. The gas response was found to be 1.15 for 200ppm of gas concentration. The response and recovery times were found to be ~ 10 and 8 sec respectively. These chemically synthesized nanocrystalline Cu doped ZnO thin films were then by 120 MeV Au^{9+} ions with fluences varying from 5x 10^{11} to 5x10^{12} ions/cm^2. The structural and opt electrical properties were studied. The X-ray diffraction pattern reveals polycrystalline nature of the film with hexagonal phase. The structural studies reveal the improvement in cryatallinity with 5x10^{11} ion/cm^2. As the fluencies enhance upto 5x10^{12} ion/cm^2 the crystallite size decreases. Successful tailoring of band gap by irradiation was observed in optical analysis. Enhancement in gas (Liquid Petroleum Gas) response was observed at 200 ppm of gas concentration. The response and recovery times were found to be ~ 6sec and ~ 9 sec respectively.

***Keywords**: Meal oxide thin film, Doping, SHI*

OP-21

vPro: An Enhanced way to secure and manage IT Equipment's

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Abstract

Dependency on IT equipments is increasing day-by-day. Any failure of computer system causes loss of work, time and money .vPro technology offers a new way of monitoring, managing and updating PCs and laptops. vPro technology, which is a combination of several technologies related to hardware, security, encryption and processors technology among others. vPro technology helps in remote monitoring of PC irrespective of state of its operating system (OS) health and state of power. This technology is built by Intel in 2nd generation Intel Core vPro processor family, Intel chipsets and network adapters. PCs that support vPro have a vPro-enabled processor, a vPro-enabled chipset, and a vPro-enabled BIOS's as their main elements. With vPro, we can check system information of desktops and laptops, immediately and without interruption or interaction with the end user. This technology is built into hardware of computer or laptop and is intended to provide better maintenance, monitoring, servicing and improved security for IT equipments. Objective of this research paper is to understand vPro technology and the benefits which we get after implementation of vPro technology in different sectors, industries and departments like telecom, defense, Postal services etc.

Keywords: *vPro, encryption, chipset, BIOS.*

OP-22

Swift Heavy Ion Induced Modifications of Some Track Detector Polymers

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Abstract

Different polymer samples after being irradiated with different swift heavy ions were studied for modifications in free volume, optical and structural properties. These properties were studied by Positron Annihilation Lifetime Spectroscopy (PALS), UV–visible (UV–Vis) spectroscopy and X-ray diffraction (XRD) respectively. The fluences of ions were taken in the range varying from 1×10^{11} to 5×10^{12} ions/ cm^2. PALS studies showed modifications in the size as well as the number of the free volume holes in the polymer samples upon irradiation. UV–Vis studies showed a shift in absorbance edge towards the visible region with a corresponding decrease in band gap energy (E_g) and an increase in the number of carbon atoms per conjugation length (N) for the irradiated polymers samples. The XRD analyses showed some structural changes in the irradiated polymers samples. The crystalline nature of the polymers got modified at higher ion fluences as a result of

modifications in the peak width (or FWHM) of XRD patterns. Results shall be discussed in detail during the presentation.

Keywords: *Ion beam, X-ray diffraction, UV–visible, PALS, Free volume*

OP-23

Study of Characteristics of Gravity Waves

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Abstract
Recently, gravity waves have been detected in the USA by the LIGO (Light Interferometer Gravitational Wave Observatory).These are waves created by space-time disturbances by large scale astronomical events (e.g. merging of black holes, motion of neutron stars etc.) occurring at far off places, about billions of light years ago. The principle of LIGO is simple: Light from a strong laser source is sent along two mutually perpendicular but equal path lengths to two stations situated far apart from each other. The lights reflected by gravity waves from the two stations are next made to superimpose at the original end. There will be a change in the light intensity if there is a path difference between the two beams, otherwise not. Therefore if the space-time fabric is differently curved at the two stations due to the existence of gravity waves a path difference between the two beams will be introduced and the light intensity would be modified at the incident end. According to Einstein's general theory of relativity, any accelerating astronomical object moving in a space-time continuum generates gravity waves. The situation is similar to an accelerating boat on the surface of a river generating water waves. The gravity waves, according to General theory of Relativity, move with the speed of light and are quite strong in intensity. The wave-particle dualism, their interactions with potential barriers, etc. are the new emerging topics under study.

OP-24

Synthesis, Structural and Magnetic Properties of a New Silicate Mineral: Pellyite ($Ba_2CaCo_2Si_6O_{17}$)

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Abstract
The barium silicate mineral; pellyite, of general formula Ba2CaCo2Si6O17 was found during the geological study of metasomatic deposits in the Yukon Territory. We have successfully synthesized the mineral using solid state reaction method. The room temperature X-ray diffraction data were analyzed by using the software Materials Studio. The lattice parameters refined in orthorhombic crystal system with space group Cmcm are a=15.677 Å, b= 7.150 Å & c=14.209 Å. The magnetic measurements (M~H and χ~T) were carried out using SQUID magnetometer. Magnetic measurements showed weak ferromagnetic behavior of the compound.

Poster Presentations

P-01

Li-Fi(Light Fidelity)Technology:Accessing Internet through LED Bulbs(Light Based Wi-Fi)

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Abstract

In today's modernized era nobody can think of his/her life without internet . Internet is used for a variety of purposes, chief among them being sharing of data. We all are connected to the internet wirelessly(Wi-Fi) or in wired form .Today multimedia mobile devices are widely used ,as a result Wi-Fi is getting more and more popular in public . For transmitting data quickly and efficiently, low speeds can be quite irritating. More than 5 billion smart devices use Wi-Fi every day increasing burden on system . When a huge number of people are within the same Wi-Fi access point , the user service would be seriously affected. As the number of users increases , speed decreases . Though Wi-Fi gives us speed but it is not sufficient to accommodate number of desired users. To antidote this limitation of Wi-Fi, a new breakthrough technology is introduced as Li-Fi technology i.e. Light Fidelity which uses light for data transmission rather than radio waves as in Wi-Fi.

Light Fidelity is a branch of optical wireless communication which is an emerging technology that use light emitting diodes (LEDs) for transmission of data . Prof. Dr. Harald Haas, first time publically displayed the proof of Li-Fi, a method of Visible Light communication(VLC) through LED Bulbs.

Through LED lights Li- Fi helps in the transmission of data much more faster and flexible than data that can be transmitted through Wi-Fi. As light reaches nearly everywhere , communication can also go along with light easily. The bit rate achieved by Li-Fi is much more faster than Wi-Fi. In this paper, I would like to attach weight on discussing the technology in detail and also how LED plays a crucial role in Li-Fi .

P-02

Forget the Cloud – Computing's Future is in 'Fog'(Fog Computing)

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Abstract

Cloud computing architectures won't be able to handle the communication demands of the Internet of Things. The future is in fog computing.Fog computing or Fog Networking, also known as fogging, is an architecture that uses one or a collaborative multitude of end – user clients or near – user edge devices to carry out a substantial amount of storage (rather than stored primarily in cloud data centres), communication (rather than routed over the internet backbone), and control, configuration, measurement and management (rather than controlled primarily by network gateways

such as those in the LTE(telecommunication)core). Fog computing can be perceived both in large cloud systems and big data structures, making reference to the growing difficulties in accessing information objectively. This results in a lack of quality of the obtained content. The effects of fog computing on cloud computing and big data systems may vary; yet, a common aspect that can be extracted in a limitation in accurate content distribution, an issue that has been tackled with the creation of metrics that attempt to improve accuracy.

In this paper a comparison is done between Fog Computing and Cloud Computing, like Cloud Computing is a model for enabling ubiquitous, convenient, on-demand network access to shared pool of configurable computing resources. Whereas Fog Computing emphasizes proximity to end-users and client objectives, dense geographical distribution and local resource pooling, latency reduction for quality of service (QoS) and edge analytics/stream mining, resulting in superior user-experience and redundancy in case of failure. Fog networking supports the Internet of Everything (IoE), in which most of the devices that we use on a daily basis will be connected to each other. Examples include our phones, wearable health monitoring devices, connected vehicle and augmented reality using devices such as the Google Glass.

P-03

Role of Cryptography in Network Security

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Abstract

Network Security has become a major concern with the large emergence of the network. Network security refers to all the procedures used to protect the information against unauthorized access. Network security is a critical requirement in emerging networks and communication technologies. It is used to prevent unauthorized access of the information across the entire network. Network security is the most vital component in the security of networks because it is responsible to secure all the information stored and used in the network of computers. Network security deals with all kinds of security problems across the networks. Various mechanisms such as cryptography, encryption, Firewalls, authentication are available to provide the proper network security. Among all these mechanisms, Cryptography is one of most reliable, helpful, most secured, effective, protective and widely used mechanism in the network security. Cryptography deals with methods for protecting the privacy as well as security of the computer networks. Cryptography is the process of converting the message into a standard coded format (encryption). The process of cryptography involves the use of ciphers, codes, encryption to transform the information into an intelligible format in order to make it secure. Cryptography plays a very important role in the network security. This paper describes the use of various methods in the process of cryptography in network security solutions.

Keywords*:* *Network security, cryptography, encryption, cipher text.*

P-04

Management of Fusarium Solani - Meloidogyne Javanica Disease Complex in Coleus by using a Fungicide as Bare Root-dip Treatment and Fungal Biocontrol Agents

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Abstract

Coleus forskohlii is an important medicinal plant. Its tuberous roots are a natural source of an alkaloid known as forskolin, a labdane diterpene compound which has been used to treat hypertension, congestive heart failure, diabetes, colic, respiratory disorders, glaucoma, uterine cramp, painful urination, insomnia, convulsion, eczema and other allergic conditions. Management of M. javanica- F. solani disease complex in coleus was also studied by using fungal biocontrol agents and a fungicide either alone or in different combinations. That out of eight fungal biocontrol agents, the individual inoculation of only four biocontrol agents viz., Trichoderma aureoviride, T. harzianum, T. lignorum and T. viride showed significant increase in plant growth parameters (except in number of tubers / plant) as compared to uninoculated plants (control). The highest increase in the plant growth parameters viz., length, fresh weight, tuber weight and forskolin content in tuber was observed in the soil treated with T. harzianum followed by T. viride, T. lignorum and T. aureoviride. The increase in plant growth parameters was significant only between the treatments of T. aureoviride and T. harzianum, and T. harzianum and T. lignorum.

However, on the other hand, the plants inoculated with P. lilacinus, T. hamatum, T. koningii, and T. pseudokoningii did not significantly affect the plant growth parameters as against control. Similar results were also recorded in the plants treated with a fungicide, Bavistin. The coleus plants did not survive when they were inoculated concomitantly with M. javanica and F. solani or even when inoculated plants grown in soil treated with fungal bioagents viz., T. aureoviride, T. harzianum, T. koningii, T. lignorum and T. pseudokoningii. The plants treated with fungal bioagents (P. lilacinus, T. harzianum and T. viride) and Bavistin not only delayed the appearance of appearance of collar - rot symptom but also checked the mortality of plants and appearance of crown rot symptom and showed better plant growth. The results will be discussed during the presentation.

P-05

Nanotechnology in Food Industry

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Abstract

Nanotechnology is the technology of manipulation of matter at the nanometer scale. Materials of nanostructure may possess unique physical and chemical characteristics. Nanotechnology enables the development of new products in various fields. It also paves a way for the improvement of existing conventional products with better efficacy, solubility and bioavailability. Nanotechnology has been applied in various sectors including electronics, medicine, diagnostics, military, food industry etc. The application of nanotechnology in food has gained great importance in the recent years in view of its potential in the development of novel and healthier food. Food nanotechnology opens up new possibilities for development of innovative food products. Application of nanotechnology in food includes improvement of packaging, processing, nano-additives, cleaning and sensors for detection of contaminants. The paper deals with the applications of nanotechnology in food industry.

Keyword*: Nanotechnology, Food industry, Food packaging, Food processing, Sensor*.

P-06

Involvement of Nanotechnology in Computers

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Abstract

This paper concern the idea that "How Nanotechnology chagned our Computers and what are next possible changes". Nanotechnology in computers provides the need for faster running computer processes at cooler temperatures. Nanotechnology is being used to improve the density of solid-state computer memory. This solid-state computer memory take up less space, uses less battery power, and is less likely to be damaged if the device is dropped. And there are number of improvements in computers due to nanotechnology. In future it is posssible that the computing power we need is just woven into the fabric of our shirt, or maybe it is in our ring, or our watch which may be connects automatically to some screen next to us, or some projector we carry with us.

P-07

Survey Paper on Mobile Robotics

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Abstract

Robotics is the study of Artificial Intelligence. It is a system that contains sensors, control systems, manipulators, power supplies and software all working together to perform task. Basically it is a mechanical intelligent agent which can perform tasks on its own. Designing building, programming and testing a robots is a combination of physics, mechanical engineering, electrical engineering and computing .In some cases biology, medicine, chemistry might also be involved. In this survey paper ,I emphasis on mobile robotics which concerned with movable robot system that are able to loco mote with in an environment. it can be flying, driving, swimming, walking etc. that means it is not steady in one place it move around the environment.

P-08

Spectrophotometric determination of Zirconium (IV) with 6-chloro-3-Hydroxy-2-(2'-furyl)-4-oxo-4*H*- 1-benzopyran as an analytical reagent

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Abstract

An ultra-sensitive and highly selective non-extractive spectrophotometric method for the rapid determination of Zr(IV) at trace levels using 6-chloro-3-hydroxy-2-(2'-furyl)-4-oxo-4*H*-1-benzopyran (CHFB) in slighty acidic medium (0.05 M Acetic acid). The 1:2 light yellow chelate is quantitatively and shows maximum absorbance at 422 nm. The reaction is instantaneous and the absorbance remains stable for over 48 hours. The method obeys Beer's law range of 0–2.5 mg ml^{-1} Zr. Potential interferences have been studied. The method is free from interferences of various cations such as Hg, Co, Mo, Se, Bi, Cd, V, Re, Ce, W, Ag, Ca, Be, U, Pt, Ti and other analytically important metals and anions/complexing agents. The method is quite simple, highly selective and sensitive with good reproducibility. The method has been satisfactorily by utilizing the proposed procedures; its applicability has been tested by the analysis of synthetic samples and an alloys sample of gun metal. The procedure assumes in view of the scarcity of better method for the determining tin. The results were in good agreement with certified value.

P-09

Biotechnology and Computer Science: in Medicine, its Tools and Techniques

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Biotechnology is the use of living systems and organisms to develop or make products, or "any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use"
Biotechnology in Medical Sciences fulfills that need by delivering a detailed overview of medical biotechnology as it relates to human diseases. The field of computer science in biotech is a complex hybrid of two distinct scientific disciplines - computer technology and bioscience. This research paper is designed to provide an understanding of bioinformatics and computer science related to medicine field for students whether or not they possess a background in bioscience. Biotechnology is also useful for who desires to explore this new information science in which computers help to simulate, visualize, and analyze genetic and biological information in the field of medicine. This paper covers all aspects of medical biotechnology, from labs to clinics and basic to advanced applications. it also Discusses the tools and techniques currently employed in medical biotechnology. It also explains how biotechnology products are used to treat and prevent disease. Biotechnology in Medical Sciences with the help of computer science provides a comprehensive yet accessible treatment of this growing field.

P-10

Latest Innovations in IT And Changing Face of Digital India

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Abstract
This Paper involves highlighting the recent developments which has happened in field of Information technology along with its effect on the society. The goal is to show that IT is becoming an integral part and parcel of daily lives along with businesses as usual way of reducing cost and improving efficiency. Top five industry trends are highlighted and explained. This Paper has shown how these industry trends are changing the way business is done. Despite the boom in the advancement of Information technologies, Digital split is deepening and the gaps in the usage of advanced communication resources between countries and regions widening. This work also reported in this paper is based on the results of the pilot study conduct in Faridabad of NCR region by means of questionnaires drifted in rural as well as urban areas with a focus to make changing face of Indian internet user.

P-11

Nanophosphors: A New Horizons to Technology World

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Abstract
Nano-crystalline semiconductors doped with optical active luminescence center create new opportunities for luminescence studies. Nano-crystalline phosphors have altogether different properties as compared to microcrystalline phosphors. Nano size semiconductors phosphors are used in radiation technology, sensor technology, laser and plasma physics as well as photochemistry and medical applications. These phosphors can also be used as information storage materials and coating materials of fluorescent screens and tubes which make them more efficient and stable. Nanophosphors can also be used in laser detection and alignment, plasma display panel, gene tagging and identification, drug delivery system etc. Laser induced photoluminescence study of these nanophosphors may explore the possibility of new phenomenon occurring in these phosphors at nano level. This paper reviews importance of nanophosphors, its characteristics and their application.
Keywords: *nanophosphors, semiconductor, photoluminescence, importance.*

P-12

Flavor SU(3) Analysis of Charmless B → PP Decays

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Abstract
We investigate weak decays of the $B \to PP$. Due to the strong interaction interference, like FSI and nonfactorizable contributions, on these processes, it is not possible to calculate their contributions reliably. Weak annihilation and W-exchange contributions, which are naively expected to be suppressed in comparison to the W-emission terms, may become significant due to possible nonfactorizable effects arising through soft-gluon exchange around the weak vertex. We employ the model independent Quark Diagram Scheme at SU(3) level for various weak quark level processes like: a) external -e mission b) internal-emission c) W-exchange d) W-annihilation d) W-loop diagram. Choosing appropriate components of the weak Hamiltonian for these quark level processes, we then obtain several relations among their decay amplitudes and branching fractions in the QDS to compare with available experimental information.

P-13

Scope of Virtual Reality Comprising its Prospects and Disputes

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Abstract
Virtual Reality also referred as immersive multimedia or computer simulated reality. Virtual Reality is a branch of computer science through which it implies user direct control of viewpoint. Virtual Reality is real time and interactive technology that works in simulation with computer graphics for creating a realistic looking world. It replicates an environment which simulates a physical presence of a person in places in real world as well as in imaginary world or may be at some historical event or scene where user is allowed to interact with that world. The virtual reality mainly works in artificial manner that creates sensory experience as a lifelike experience. Virtual Reality covers inaccessible communication environments which provide virtual presence of user with the concept of tele occurrence, tele continuation or a virtual work of art. These virtual reality systems are mainly intended by researchers and companies in last few years. Being a promising technology, it is applicable in large number of domains such as training simulators, medical health care, learning, entertainment diligence, scientific revelation, military etc. It works as a serious tool for psychiatrists and therapists that initially was used in psychological therapy around the world. Besides large opportunities the main challenge of the technology is that it has been exorbitant in education sector. In recent years, computer development has made it more realistic to integrate virtual reality into future teaching strategies. A concise preface of virtual development which has been done for trade undergraduates and post alumnae, tutoring, learning and training is discussed in this paper. Scope of virtual reality mainly focuses on creating the illusion for being a person feels present anywhere but not in real. This paper gives a technical preface on the role of virtual reality technology in many appliance domains having its opportunities and challenges in different areas.
Keywords: Virtual Reality, Tele presence, Tele existence, Virtual artifact

P-14

Nonlinear Optics: Real World Applications

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Abstract
Nonlinear optics develops as a field of research in electromagnetic wave propagation, its state-of-the-art technologies will continue to strongly force real-world applications in a variety of fields useful to the practicing scientist and engineer. From basic principles to examples of applications, Nonlinear Optics: Principles and Applications efficiently bridges physics and mathematics with related useful material for real-world use. Its application contain optical signal processing: parametric amplification, modulators, transmission of optical signals: optical solutions,

cross-phase modulation, four-wave mixing, phase conjugation, Raman scattering, sensing: temperature sensors, spectroscopy, and imaging, lasers: pulse compression and generation of super continuum. This paper reviews importance, impact and application of nonlinear optics.

Keyword: *Optics, principles, nonlinear, technology.*

P-15

Numerical Analysis of Doping in Copper-Indium-Gallium-Diselenide Based Solar Cells for High Efficiency by SCAPS-1D

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Abstract

We used a solar cell simulation program Solar Cell Capacitance Simulator in one dimension (SCAPS-1D) to optimize copper-indium-gallium-diselenide (CIGS) based solar cells for high efficiency. We examined the role of absorber layer thickness (w), hole density (p), back contact schottky barrier height and band gap (E_g) on the efficiency of solar cells. We optimized the electrical parameters under illumination density of 1000W/m^2 (AM1.5), w=1000nm and p=$10^{18}$$cm^{-3}$. The best device efficiency of our simulated structure is 20.18%, fill factor= 81.37%, Voc=.7298V and short-circuit current density (Jsc) = 33.98mA/cm^2. We also optimized the schottky barrier height to increase Voc, which leads to increase in efficiency. Our optimized results are very near to the efficiency of CIGS solar cells in laboratory, which is about 20.3%.

P-16

Estimation of Equilibrium Factor for Indoor Radon and Thoron using Pin Hole Cup Dosimeter and DRPS/DTPS Progeny Sensors

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Abstract

Single gas entry Pin hole cup dosimeters, Direct radon progeny sensors (DRPS/DTPS) have been used to estimate the radon (^{222}Rn), thoron (^{220}Rn) and their progeny concentration in air. 10 different locations have been selected for the present study in the Jalandhar district of Punjab. An attempt has been made to estimate the equilibrium factor for ^{222}Rn, ^{220}Rn and the average value of the equilibrium factor has been found to be 0.20 and 0.03 respectively.

Keywords: *Radon, Thoron, Equilibrium Factor*

P-17

BIO-COMP RBS System for Reasoning Biotechnology: An Approach

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Abstract
Biotechnology is a field of applied biology that involves the use of living organisms and bioprocesses in engineering, technology, medicine and other fields requiring bioproducts. This concept encompasses a wide range of procedures and knowledge for modifying living things according to human purposes. This large amount of bio-domain specific information and knowledge can be combined to form a knowledge base for reasoning purpose.
BIO-COMP RBS system seeks to exploit the specialized skills held by a group of experts on specific domain. It can be thought of as a computerized consulting service system. The objective of this paper is to introduce about the RBS system into biology and describe inference mechanism for the reasoning purpose of living organism. These RBS system are asked to provide "rules of thumb" on how they evaluate the problem either explicitly with the aid of experienced system developers or sometimes implicitly, by getting experts to evaluate the test cases and using computer programs to examine the test data and derive the rules from that.
Keywords: Biotechnology, RBS System, Knowledge base, test cases, Inference Engine, Living Organism, Experts, Domain Specific Knowledge

P-18

Particle Size dependent Dielectric Properties of $PbTiO_3$-$Ni_{0.5}Co_{0.5}Fe_2O_4$ Composites

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Abstract

The multiferroic composite ceramics (1-x)$PbTiO_3$-x-$Ni_{0.5}Co_{0.5}Fe_2O_4$ (x=0.2) (PTO-NCFO) were prepared by sol-gel method. The synthesized powder was ball-milled for 12, 24 and 48 hrs to reduce the particle size of PTO-NCFO composite. It is observed that with reduction in the particle size of the composites material the dielectric constant reduces along with the transition temperature (corresponding ferroelectric transition). The samples which were ball-milled for longer hour's shows low dielectric loss compared to pristine sample. The observed dielectric behavior of our samples can be correlated with the reduction in with particle size (i.e. domain wall contribution, strain effect etc.)

P-19

Electromagnetic Shielding Effectiveness of Graphene Based Magnetic Nanocomposites

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Abstract

The growths and development made in nanotechnologies have leads to high-density electronic devices operating at high frequency range that will create increased susceptibility to electromagnetic interference (EMI). The electric components of all types are subject to the interference induced by the electromagnetic signals. In order to reduce the electromagnetic interference, we have developed graphene based magnetic nanocomposites. The laminated graphene nanocomposites with ferrite nanoparticles have been synthesized via in situ chemical method incorporated with magnetic filler (ferrite) and conducting filler (graphene). Formation of nanocomposites has been confirmed by X-ray defractometer (XRD) and Fourier transformation of infrared spectrometer (FTIR) and layered structure have been confirmed by scanning electron microscope (SEM). Electromagnetic shielding and dielectric properties have been derived from the Scattering parameter (S_{11},S_{22},S_{12},S_{21}) using Nicolson–Ross–Weir method in 12.4–18 GHz The shielding effectiveness value of ~33 dB (> 99.9% attenuation) has been achieved for these composites whereas dielectric studies reveals the shielding effectiveness is mainly governed by absorption and strongly depends on the concentration of ferrite nanoparticles in the composite. The results reveal that there composites has a promising application in the area of electromagnetic absorption materials.

Keywords: *Microwave absorption, graphene, scanning electron microscope, shielding effectiveness*

P-20

Measurement of Radon Exhalation Rate in Some Building Materials using Plastic Track Detectors

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Abstract
In this paper, twenty-five samples of different building materials collected from local market in Gurgaon, Haryana. The present work is deals with harmful effect on human health due to radiation and to enlist the different building materials for radiation hazard. The radon concentration in these samples was measured using Can technique along with solid state nuclear track detector LR-115 type II. The experimental results shows that the highest value of radon concentration was found in granite samples, while the lowest value found in white cement . The obtained results show that the radon concentrations of the most samples are well below the allowed limit of ICRP.
Keywords: *Radon, Radioactivity, Building Materials, Radiation, LR-115*

P-21

Measurement of Radium Concentration and Radon Exhalation Rates of Soil Samples Collected from Some Areas of District Faridabad, Haryana, India

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Abstract
Radon is a gas, it may escape into the environment from the material in which it is formed and in soil, uranium and radium present in lager amount. The radon gas has been known as a first radiation hazard causing excess lung cancer among non- smokers. The measurement of the radon exhalation rates in soil samples helps in understanding the radiological impact on human health. Therefore measurement of radium and radon in the soil samples are necessary from public health point of view. In the present study, radon exhalation rate from soil samples have been measured using "Sealed Can technique" incorporating LR-115 type II plastic track detector. Fifteen samples were collected from industrial area of Faridabad district of Haryana (India). The observed radium concentration ranges from 8.8 to 15.7 $Bqkg^{-1}$.The radon area exhalation rate ranges from 363.3 to 678.5 $mBqm^{-2}$ h^{-1} and radon mass exhalation rate ranges from 13.4 to 28.6 $mBqkg^{-1}h^{-1}$.An excellent correlation coefficient has been observed between radium concentration and radon exhalation rate. The values of radium concentration in all the soil samples were found to be lower than the safe limit.
Keywords: *Radon, Radioactivity, soil samples, Radiation, LR-115*

P-22

Techniques Used to Reduce the Fraud Rates in Credit Cards

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Abstract
Credit card is a medium of selling goods or services without having cash in hand. Today almost every credit card carries an identifying number that helps in shopping transactions in daily life. Using of credit card transaction, credit card fraud can be defined as unauthorised account activity by a person for whom the account was not intended. Credit card fraud can be offline fraud and online fraud. In offline fraud is committed by using a stolen physical card at call centre or any other place. In online fraud is committed via internet, phone, shopping web or in absence of card holder. Fraud detection includes monitoring the user/customer activity in order to detection or avoidance of undesirable behaviour. The goal of this paper is increase high number credit card transactions and reduce financial risk (in bank, credit card companies etc. have).
Keywords: *Fraud detection in credit cards, Clustering, Neural Network*

P-23

Optical Computing

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Abstract
Optical computing means computing that performs computations using light. It is the advanced technology that uses light in place of electron for performing computation, storage & data transmission. Light is the fastest way we can use to transmit information. The computer we use today use transistor to control electricity. Optical fibers have been used to transmit large quantities of data over long distances, but the photons must be converted to electrons before the data can be manipulated. Optical computation is the most feasible technology that can replace electronics and promises impressive speeds that can enhance processing power and data rate transmission. Optical computer makes use of light particles called photon. The photon is the fundamental particle of visible light. Optical computing technology can eventually be millions of time faster and would also reduce power consumption and heat generation. The need of optical computing is its advantage over current computational system. It is an approach to generate a computer which can perform all functional operations in optical mode. In which all functions are done using optical gates, optical

switches, optical interconnection and optical memory. This paper provides us the approach for this future technology so that the system can work much faster than silicon technology.

P-24

Measurement of Uranium Concentration in Ground Water Samples of S.B.S. Nagar District of Punjab, India using LED Fluorimetry

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Abstract

Uranium concentration in the ground water samples of S.B.S. Nagar District of Punjab have been determined using LED Fluorimeter.Uranium concentration in water samples has been calculated from 18 different villages. The uranium concentration in the studied water samples vary from 3.49 to 62.43 μg $l^{-1}$with an average value of 18.4 μg l^{-1}.The uranium content in all the samples have been found to less than the recommended safe limit of 30 μg l^{-1} (WHO, 2011) except one sample of Khadkuwords (62.43 μg l^{-1}). Radiological and chemical risks have also been calculated for the uranium concentrations in the studied water samples.

Keynotes: *LED Flourimetry, Excess cancer risk, LADD, HQ*

P-25

Information Security Using Hide and Retrieval Method

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Abstract

Now-a-days we are living in an era of science and technology. In past secret information was sent through confidential persons to maintain the secrecy of the information, but with the advent of technology, the confidential information is sent in coded form and then the authentic receiver decodes the coded information to get the original information. This method is known as hide and retrieval method.

P-26

Study of Radon, Thoron and Their Progeny Concentration in Flats of District Faridabad, Haryana, India

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Abstract

Radon is a ubiquitous air pollutant, is well known fact for researchers. It is a most common cause of cancer after smoking so that its study is necessary for health and hygiene point of view. In the present study radon, thoron and their progeny concentrations were calculated during the season of a year in some flats of Faridabad situated in Haryana, India with the help of SSNTD'S. Measurements show that concentration of radon and thoron varied from 16.39 Bq/m^{-3} to 48.85 Bq/m^{-3} and 9.41 Bq/m^{-3} to 16.47Bq/m^3 respectively. Value of PAEC due to radon and thoron varied from 1.77 mWL to 5.28mWL and 0.25 mWL to 0.45 mWL respectively. Annual exposure due to radon and thoron and annual effective dose varied from $73.00x10^{-3}$ WLM to $217.58x10^{-3}$ WLM, $10.48x10^{-3}$ WLM to $18.34x10^{-3}$ WLM and 0.3 mSv to 0.9 mSv respectively.Variations in the results are because of location, structure and building material of flats and it strongly depends upon the living style of occupants.

Keywords: *radon, thoron, SSNTD, dose, exposure*

P-27

Comparative Study of Radon Exhalation Rate in Soil Samples from Kasimpur Thermal Power Plant, Aligarh, Uttar Pradesh, India

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Abstract

In coal fired thermal power stations, large amount of fly ash is produced after burning of coal. Fly ash is spread and distributed in the surrounding area by air and may be deposited on the soil of the region surrounding the power plant. As coal contains increased levels of these radionuclides and fly

ash may increase the radioactivity in the soil around the power plant. However, radon exposure shows an extreme variation according to the location considered and depends primarily on the exhalation rate of radon from the soil. The soil-gas radon concentration and its exhalation rate depend on the geology of the area, soil porosity, structures (shears, faults and thrusts) and associated uranium mineralization. Thus it is quite important to estimate the natural radioactivity in the soil around the thermal power plant for the estimation of radiation risk to the habitants there. Soil, the main source of continuous radiation exposure to human beings is generally considered as the third (next to air and water) main environmental component. Natural radioactivity (^{226}Ra, ^{232}Th and ^{40}K) is wide spread in the earth's environment and it exists in soils, rocks, water and sand etc. and these natural radioactive materials may reach hazardous radiological levels under certain conditions. Soil is widely used as building construction material in India such as in the formation of bricks and as filling materials etc. In the present study radon exhalation rate in soil samples from Kasimpur Thermal Power Plant, Aligarh,Uttar Pradesh, India have been measured by ''Sealed Can technique'' method using LR-115 type II detectors and "Smart Radon Monitor" Technique. Radon exhalation rate has been found to vary from 33.4 ± 3.3 to 200.2 ± 9.7 mBq m^{-2} h^{-1} with an average value of 100.5 ± 5.3 mBq m^{-2} h^{-1} whereas, mass exhalation rates (E_M) found to vary from 1.2 ± 0.3 to 7.7 ± 1.5 mBq kg^{-1} h^{-1} with mean value of 3.8 ± 0.7 mBq kg^{-1} h^{-1}. By using "Smart Radon Monitor" Technique radon mass exhalation rate varied from 9.5 m Bq kg^{-1} h^{-1} to 28.2 mBq kg^{-1} h^{-1} with an average value of 17.7 m Bq kg^{-1} h^{-1}.

Keywords: *Radon exhalation rate, Can technique, Smart Radon Monitor*

P-28

Nanotechnology in Smart Phones

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Abstract

No matter what type of computer or device you use, you probably use some nanotechnology. Nanotechnology has reached in the research in every field. This paper focuses the applications of nanotechnology in today's smart phones which is one of the most valuable assets we own. Nanotechnology has changed every feature of today's smart phones which make them even smarter such as battery charging, screen damage, water damage, speed, size, camera sensor, microprocessor, host's diagnosis and many more. Nanotechnology is the development and use of techniques to study physical phenomena and construct structures in the physical size range of 1-100 nanometers (nm), as well as the incorporation of these structures into applications. Processors and memory components made with nanomaterials are common on the market, and you can find antimicrobial coatings on keyboards, mice and casings which has changed the mobile phones completely to behave smart. This paper focuses the aspects that have improved the features of smart phones in light of nanotechnology.

P-29

Study of Navier Stokes Equations for Channel Flow Taking the Volume Friction of the Dust Particles into Account

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Abstract

Various researchers engaged in Fluid Dynamics have studied Navier Stokes Equations for Channel Flow taking the volume friction of the dust particles in to account. The present paper is to extend the study of Singh and Singh for Channel Flow taking the volume friction of the dust particles, heat – source and Soret effect in to account.

The solution for velocity field of liquid and dust particles, temperature field and concentration field are obtained taking in to account the heat source, volume friction and Soret effect of dust particles. The effects of various parameters like heat source parameter ,magnetic parameter, Soret number,Prandtl Number, Schmidt Number and Mass concentration of dust particle on velocity field, skin friction of the liquid and dust particles for externally cooled channel walls and externally heated channel walls are discussed. The rate of heat transfer and mass transfer are also observed for the effects of important parameters.

P-30

Ionization Scattering Pattern of Iron by Electron Impact

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Abstract

The scattering fragmentation pattern of Silver have been studied by electron impact with reference to Jain-khare in the energy range from threshold to around 2100eV. Absolute cross -sections for electron impact ionization of Iron ions leading to the formation of Fe^{+}, Fe^{+2}, Fe^{+3}, $Fe^{+4}$and Fe^{+5} are measured, having the corresponding threshold energies are 7.90eV, 16.18eV, 30.65eV, 54.80eV and 75eV respectively.

Keywords: *Ionization cross section, cross section, ionization energy.*

P-31

Global Market Development of Mobile Applications

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Abstract
The mobile phone has provided the freedom from the constraints of wired communication. The total number of mobile subscribers worldwide is over 6.8 billion and in India this growing figure is 1 billion as of December 2015. The introduction of fast and furious 3G and 4G networks and multi-facilitating handsets provided a mobile gateway to the Internet and access to an ever-widening range of mobile products, applications and services. This growing numbers of mobile telephony customers has direct relation with the growing of revenue. Revenue from mobile media and entertainment (MME) services will be more than doubled last the next five years. The strongest growth has occurred after 2010, as the technical and market environment for MME services has improved considerably. This paper focuses the global market development of mobile applications and to trace the various aspects for this development.
Keywords*: Mobile Application, mobile subscribers worldwide, mobile industry revenue, MME*

P-32

Evaluating Growth Responses of Azolla Microphylla to Heavy Metal Cadmium Exposure

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Abstract
Phytoremediation is a green technology used recently for removing pollutants from soil and water. It is gaining importance in the research domain as it is eco-friendly and economical. The selection of the hyperaccumulator plant depends on the type of polluted site and the pollutants to be removed. The present work was undertaken to study the ability of the aquatic fern: *Azolla microphylla* to remove heavy metal cadmium from the waste waters and its metabolic responses on its exposure. The changes in the growth behaviour and physiological parameters under stress conditions can be used as a significant tool determining the accumulating capacity of the macrophyte for cadmium. Azolla microphylla was allowed to grow in E&W growth media supplemented with 0.1ppm cadmium. The physiological and biochemical parameters were assessed after 7, 15 and 30 days. The results suggest that cadmium produces oxidative stress in *Azolla microphylla.* Acclimation is

exhibited as a defense mechanism in response to stress induced injury to plant. This implies that accumulating nature *Azolla microphylla* can be exploited for remediation of cadmium from waste waters.

P-33

Grid Computing: An Introduction and its Use in Global Infrastructure

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Abstract
Today is the world of the INTERNET. Everyone is using the internet to fulfill his requirements. Everyone prefers the fast access to the internet, but due to downloading multiple files in a single time, there is a chance that the system hangs up and slows down the performance that leads to the restarting of the entire process from beginning. This is one of the serious problems that need the attention of the researchers.
So we have taken this problem for our research and in this paper I'm providing the layout and architecture of Grid computing. This also provides the effective management of resources and application scheduling. Grid Computing enables the users in Grid to access the internet very fast. By using this Grid computing system user can easily download any number of files very fast depending on the number of system employed in the Grid. Grid computing also enables the sharing, selection and aggregation of geographically distributed resources for solving the large scale problems in science, engineering and commerce.
Availability, usage and cost policies vary depending on the particular user time priority and goal.
The Grid formulated by me uses the standard architecture which is the only Grid architecture currently used world wide.

P-34

Studies on Multiferroic Composite System $Ba_{0.5}Sr_{0.5}TiO_3$- $Ni_{0.4}Co_{0.2}Zn_{0.4}Fe_2O_4$

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Abstract
In this work, structural, dielectric, magnetic, ferroelectric and ferromagnetic properties of a multiferroic composite with compositional formula $Ba_{0.5}Sr_{0.5}TiO_3$- $Ni_{0.4}Co_{0.2}Zn_{0.4}Fe_2O_4$ were studied. The multiferroic composites with composition (1-x) BST + (x) NCZF (x= 0.1, 0.2, 0.3, 0.4) were prepared using conventional solid state reaction process. XRD confirmed the successful

preparation of di-phase composite material. The SEM images demonstrated that in multiferroic composites NCZF phase uniformly surrounded the BST phase. Density measurements indicated that composites possess low density as compared to both BST and NCZF pure samples. Composite materials showed dielectric dispersion at low frequencies due to Maxwell-Wagner relaxation mechanism. Dielectric constant of composite increased with increase on ferrite content. Composite samples possessed smaller values of saturation magnetization. The values of remnant magnetization of the composite increased with increase in ferrite content. The composite samples possessed high values of coercive field as compared to pure NCZF. P–E loops of the composite samples were unsaturated. There was a significant decrease in values of spontaneous polarization in the composite samples as compared to pure BST.

Keywords*:* *Multiferroic, Composite, Maxwell-Wagner Relaxation*

P-35

Changing Trends in Education

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Abstract

New tools promise to create a stronger learning community, where members can build expertise and develop problem-solving skills. In older days, distance education learner faced challenge of meeting, languages etc. But today learner requires educational opportunities not bound by language, time or place, yet allow interaction with the instructor and peers. Social presence is necessary in order to make appropriate selection of technology tools. New trends in emerging technologies solve the problem. Emerging technologies that foster different forms of interaction may also affect the role of the instructor. Voice and videoconferencing, whiteboards, live presentation tools, application sharing, chats, and emails are just a few of the many tools available for interaction and collaboration. By using internet one can learn different languages. Smart watches and Google Glass show promise for new ways of learning. Mobile market is expected to have 3.4 billion users. By using social media one can share any information. Current study reveals that new trends in technology are making the education easy and approachable.

P-36

Utilization of Waste to Energy Ash from Municipal Solid Waste in Manufacture of Bricks and Blocks

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Abstract

Land filling of WTE ash costs considerably to industry and filtration of water into this ash produces leachates containing inorganic salts which ultimately contaminates underground water as well as soil. This in turn poses environmental and human health hazard. Therefore utilization of WTE ash is being considered more viable option and efforts are being made to use this ash after conditioning it with appropriate activators in the manufacture of bricks and blocks. Its grain size, porous nature and moisture content indicated that the WTE ash has the similar physical properties as that of fly ash produced from electrostatic precipitators of thermal power stations where coal is burnt as fuel. Specimens of bricks were prepared in laboratory using WTE ash and cement along with aggregates in different proportions and the initial test reports were encouraging. Compressive strength of 2.32 N/mm^2, average bulk density 1255 kg/m^3 and moisture content up to 32.49% could be achieved. Further improvement in these parameters can be expected by maintaining controlled temperature and humidity during curing period.

P-37

Evaluation of Electronic Dielectric Constant and Heats of Formation of Normal Valence Compounds for Binary Solids

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Abstract

Evaluation of electronic dielectric constant and heats of formation of normal valence compounds for binary solids has been done by using the ion-dependent quantum dielectric model for normal – valence compounds .This model has also produced many applications, such as the prediction for the strain derivatives of these compounds, the calculation of energy gap between bonding and antibonding states This model can also be used for the modification to the Phillips-Van Vechten theory to calculate the heats of formation of binary compounds which facilitates a better agreement between the calculated and experimental data. In the first part of this paper we apply this model to predict ε_∞ for a large number of cross compounds with comparatively complicated structures, using both anion and cation dependence in covalent and ionic solids, respectively. We will include structures like fluorite, antifluorite, and rutile (A_2B and AB_2 crystals), Na_3As and Tl_2O_3(AB_3 and A_3B_2 solids).The dielectric study of such complicated structures has been quite inconclusive. In the

second part of this paper we use the same model to predict the heats of formation of A^NB^{8-N} tetrahedral semiconductors which is a very useful structural property of solids.

Keywords: *Ion-dependent Quantum dielectric model, Strain derivatives, energy gap, bonding and anti bonding states, electronic dielectric constant, heats of formation etc.*

P-38

Radon Exhalation Study of Fly Ash and Soil Samples, Kolaghat Thermal Power Plant, Eastern India

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Abstract

In India, about 70% of the power generated is coal based thermal power plants. The Indian coal generally ranks from bituminous to sub-bituminous type with a very high ash content (about 55-60%) and low calorific value. Earlier studies have shown that the ^{238}U, ^{232}Th content of Indian coal ash varied from few 1.8-10 ppm and 6.0-41 ppm respectively. With about 28% of fly ash utilization rate in various sectors (cement and concrete industry-50%; landfill -17%; roads and embankments-15%; dyke raising - 4%; brick industry – 2% and others) correct estimation of the exhalation rates of ash thus becomes an important criterion to ensure radiation safety. In the present study, radon exhalation rates of pond ash samples collected from the vicinity of Kolaghat thermal power plant, Eastern India is estimated using "CAN" technique.

The radon activity of slag ranged from 183-263 Bqm^{-3} with an average of 217.7 ± 36 Bqm^{-3}. The surface exhalation rate of the slag varied from 66 – 95 mBq m^{-2} h^{-1} with an average surface exhalation rate of 78.46 ± 13 mBq m^{-2} h^{-1}. Average mass exhalation rate of the slag samples was estimated to be 2.98 ± 0.49 (2.5 – 3.6) mBq kg^{-1} h^{-1}. In feed coal, the radon exhalation rate, surface exhalation rate and the mass exhalation rate was estimated as 194.2 Bqm^{-3}, 70 mBq $m^{-2}h^{-1}$ and 2.6 mBq $kg^{-1}h^{-1}$ respectively. The the radon exhalation rate, surface exhalation rate and the mass exhalation rate was estimated as 240.1 Bqm^{-3}(165.7 - 320), 1355.5 mBq $m^{-2}h^{-1}$ (520.1 – 7353.8) respectively.

P-39

Light Emitting Diodes: A Potential Application of ZnO

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Abstract
ZnO is a large band gap semiconductor with excellent, optical, electrical, chemical, piezoelectric and mechanical properties. ZnO is considered to be an alternative to GaN for device applications due to many reasons such as low production cost and excellent optical properties. It is an n-type material by un-intentional growth. The achievement of stable and reproducible p-type ZnO is still a challenge for the research community and it is the main obstacle in the fabrication and development of p-n homojunction ZnO based optical devices. The excellent optical properties of ZnO can be utilized in the best way by constructing ZnO heterojunctions with other p-type materials P-type GaN is a good choice for constructing heterojunction with ZnO because the industry is already using GaN for the production of blue light emitting diodes and lasers diodes. In this paper, we summarize the progress in the fabrication of ZnO based homojunction LEDs, hetrojunction LEDs and ZnO nanostructure hetrojunction LEDs.
Keywords:- *ZnO, GaN, Nanostructure, Light emitting diode.*

P-40

An Overview Physical Properties of Poly(Aniline-co-*m*-Fluoroaniline) and its Copolymers

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Abstract
Thermally stable and Conducting copolymers of Poly(aniline-co-*m*-Fluro) (PA-co-m-FA) with different molar compositions are obtained by conventional oxidative polymerization method. The physio-chemical properties of these copolymers have been studied by different analytical techniques. The structural and functional characterization of polymer has been studied by UV-vis and FTIR spectroscopy. The phenomenon of conductivity recorded was different for different copolymers depending upon the molar ratio of the monomers in the overall composition. Copolymer of (PA-co-m-FA)10 has higher electrical conductivity viz 1.01 x 10^{-4} σ, (S/cm) than any other copolymers of of (PA-co-*m*-FA). Fluorine functionalized copolymers showed better thermal stability than the parent polyaniline due to the incorporation of the F^- atoms onto the copolymers backbone. SEM micrograph showed that the copolymer of different molar ratio have unique morphology.
Keywords*: Polyaniline; (PA-co-m-FA); conducting copolymers; Conductivity, Solubilit*

P-41

Plastic issues – Myths and Facts

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Abstract

Plastic is superior than other materials as its good properties are obtained at low cost. Its properties include light weight, non-breakability, safe, hygienic, inert , chemical resistance, excellent barrier properties, enhancing shelf-life, superior impact resistance, transparency as well as opacity, lower fuel consumption and product loss during transportation. Only few KWH Kg^{-1} is required for manufacturing and transportation of finished plastic bags in comparison to bags of other materials.

Plastics manufacturing consumes 400 kwh/mt while composite textile mills consume 1310 kwh/mt. Textile contributes 30% SOx (second highest by any sector) and 23% NOx (highest by any sector). Comparative analysis of environmental burden generated by paper, jute & textile bags shows Plastic carry bags generate 60 % less GHG than uncomposted paper bags & 79% than composted paper bags. Plastic grocery bags consume 40% less energy during production and generate 80% less solid waste after use than paper bags. Paper bags generate 70% more air pollutants and ~ 50 times more water pollutants than plastic bags do. Plastics and Paper both can be recycled. However it takes 91% less energy to recycle a kg of plastic than a kg of paper. Major issues with disposal of plastics are health, safety, toxicity, biodegradability, disposal & waste management. Whereas facts show that plastics are inert materials and do not pose any danger of toxicity. Emissions during processing of plastics are well within regulatory norms. Additives used in plastics are approved as per BIS / FDA standards. Emissions at fire situation have similar or lesser implications in comparison to situation involving natural organic materials like wood, paper & cotton. Emissions during burning of paper and polyethylene are similar. In accordance with the principles of sustainable development (development that meets the needs of present generation without compromising the ability of future generations to meet their needs), the objective of a plastic management policy should not be only the reuse of polymeric materials but also the production of raw materials (monomers), from which they could be reproduced, or other secondary valuable products, which could be useful as feedstock for a variety of downstream industrial processes or as transportation fuel. Burying in landfill, incineration and recycling are three main methods to solve issues regarding plastic waste. Solutions for disposal problem include segregation at source, awareness among citizens against littering, proper system for collection of segregated wastes for facilitating recycling, incentives / encouragement for recycling, upgradation of the existing mechanical recycling technology and encouragement for alternate methods of recycling / recovery of energy.

Author recommends encouragement and incentives for recycling, mandating co-processing of plastics waste in all, cement kilns in the country.

Keywords: *Additives, biodegradable, composting, emissions, opaque, green house gases and shelf life.*

P-42

Photo Degradation of Polymer

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Abstract

A lot of research has been devoted within the last two to three decades to the development of plastics stable under solar irradiations. The need for more photo-stable materials in the aerospace industry is well known. The present paper describes the photo degradation of aromatic polysulfones which can be processed as bonafied thermoplastics by conventional molding and solution casting techniques.

P-43

Synthesis of Natural Bipolymer Electrolyte for Electrochemical Devices

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Abstract

The demand of electrochemical devices is increasing tremendously. The need of today is the development of batteries which are maintenance free. The use of natural polymer electrolyte in electrochemical devices is a major contribution to the emerging green chemistry. In this paper, carboxymethyl cellulose (CMC) is being synthesised from kneaf blast furnace method. This has been used to synthesize biopolymer electrolyte with ammonium acetate. The results indicated that the biopolymer electrolyte has great potential for application to electrochemical devices, such as proton batteries and solar cells.

Keywords: *Bipolymer electrolyte, carboxymethyl cellulose, green, electrochemical*

P-44

Emerging Technology: Organic Food

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Abstract

Organic foods are a promising and innovative means of tackling the challenges facing in the area of agriculture and food production. Organic food is growing sector around the world. This food is very rich in nutrient and biodegradable substances are included into it. Such food is environment friendly. The organic food is required very minimum amount of chemical fertilizers and pesticides .These food require manures,biofertilizers and biopesticides(cow dung) for their cultivation so this food is less chemical content and having larger amount of mineral content which is very healthier for us. Animals feeding organic food are very useful for their health and organic food is very safe for animal's diet and it give sufficient amount of essential nutrients.

P-45

Electric Voltage Control as an Implementation of Neural Network Applications

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Abstract
Present study was proposed the monitoring of mathematical model of electric voltage source with using neural network for application in control systems as sensor and command signal. The monitoring system, consist of steroidal choke or transformer with high saturated ferromagnetic cores. The input information we receive from current periodic curves. The current was distributed into Fourier or walsh series. The combination of these harmonics and their amplitude values determine monitoring voltage value directly. For increase of this system precision, the mathematical model was constructed on basis of partial differential quasi-stationary electromagnetic field equations and ordinary differential electromagnetic circuit equations combination.

Keywords: *Artificial neural network, differential equations, computer science, electric control, information monitoring*

P-46

Study of the Modification in the Properties of Mortar Due to Incorporation of Nano-SiO_2

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Abstract

The aim of the study is to investigate the effects of adding nano-SiO2 on the properties of cement mortar by measuring the mechanical, durability and microstructure properties of mortar incorporating nano-SiO2. These mechanical and durability properties have been studied through measurement of compressive strength, water absorption and chloride permeability. SiO2 based nano-particles in the quantity of 0.5%, 0.75%, 1.00%, 1.25% and 1.50% by weight of cement have been used as a partial replacement of cement. The mortar mixes were tested at different age. The study aims at providing mortar of ultra-high performance to be used in various construction applications. Based on the experimental results, mortar with addition of nano-SiO2 has improved chemical durability with very less decline in compressive strength and also the optimum replacement value of cement with nano-SiO2 can be determined as between 0.5% and 0.75% for higher early age compressive strength of mortar. In addition, microstructure analysis was done using scanning electron microscope (SEM) and x-ray diffraction (XRD) for the plain cementitious mortar as well as the cement mortar mixed with nano-SiO2 and the results indicated that the nano-SiO2 filled up the cement paste pores more efficiently, reducing Ca(OH)2 compound formation by reacting with it and forming more calcium silicate hydration (C-S-H) among the hydrates.

Keywords: *Nano-SiO2, Ordinary Portland Cement, Compressive Strength, Water Absorption, Chloride Permeability, Microstructure*

P-47

Applications of Nanotechnology in Day to-Day Life

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Abstract

The journey of Nanotechnology began with the quote of famous scientist Richard Feynman "There is plenty of room at the bottom". *Nanoscience* is the study of phenomenon on Nanometer scale. The aim of this paper is to provide the some useful information regarding the history and mystery of Nanoscience and technology. It describe the speciality of some nonmaterial due to some key properties like quantum confinement which helps us to describe the behavior of Nanomaterial. By tailoring the shape and size of Nanomaterials, we can modify the various property like chemical property, thermal property, mechanical property, optical property etc. This technology is not new at all. The painting of Ajanta and Ellora caves are the historical examples of it. The Hollywood movies

like Spider Man, Hulk are the best examples of use of Nano technology. The day to day life is not exception of the usage of Nano technology. The clothing with Nano fiber, the light weight bicycle , body lotion are also the field of uses of Nano-technology.The Nano robots are also widely used in medical science which reduces the pain of diagnosis. So finally we can say Nano technology is not a science, it is a tool in our day to day life.

Keywords*: Nanotechnology, Properties, Nano Robots, Applications*

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About the College

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About the Conference

With the advent of 20th century, the new era for growth and development of new interdisciplinary concepts had started and this culminated into well known Modern Science. The process was perpetual and the 21st century is witnessing the miraculous effects of a gamut of cutting edge technologies with myriad of applications. The contemporary technologies viz., nanotechnology, nano-electronics, nano sensors, smart materials, biotechnology, bio-informatics, bio-nanotechnology, information technology, optical fibre technology, laser technology, remote sensing, space technology, nuclear and radiation technologies etc can be quoted as the conspicuous. It is beyond doubt that physics has played and is still playing a dominant role in the culmination and development of these technologies, which have largely affected human life. Nanoscience and nano-engineering are leading to unprecedented understanding of the fundamental building blocks of all physical things. The scope and application of nanotechnology is tremendous and mind-boggling. Nanotechnology is an interdisciplinary subject which essentially combines Physics, Chemistry, Bio- informatics, Bio-technology, etc. including engineering. It is estimated that nanotechnology would revolutionize every area, be it medicine, aerospace, engineering, various industrial and technological areas, health or any other field. Nano-biotechnology can make tiny medical devices and sensors for fantastic military and civilian use. We are sure that the conference will provide a forum for young and talented students/scientists to show their innovations by presenting their work. Besides this, they will avail exposure to the latest trends and developments also.

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