National Conference on NEW HORIZONS IN APPLIED RESEARCH FOR SUSTAINABILITY (NHARS-2024)

19th-20th December 2024

ABSTRACT - CUM - SOUVENIR

Jointly Organized by
CSIR-ADVANCED MATERIALS AND PROCESSES RESEARCH INSTITUTE, BHOPAL
In Association with
SCHOOL OF ENVIRONMENTAL BIOLOGY & DEPARTMENT OF PHYSICS
AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

INVITED SPEAKERS

S.No.	Code	Speaker's Name & Affiliations	Talk Title	Mode
1.	IT-1	Dr. Satanand Mishra CSIR AMPRI		Offline
2.	IT-2	**Dr. Saket Kumar** AKS University Satna (MP)	Low Frequency Solar Bursts and their correlation with solar cycle 24 dynamic: Unveiling association with corononal mass ejection and key solar parameters	Offline
3.	IT-3	**Krishan Kumar Patel** CSIR-Advanced Materials and Processes Research Institute, Bhopal-462026, India	Recovery of valuable materials such as aluminum, silver fingers, and busbars from discarded c-Si solar cell	Offline
4.	IT-4	**Manish Mudgal** CSIR-Advanced Materials and Processes Research Institute (AMPRI), Bhopal, India		Offline
5.	IT-5	**Prof. Skand Kumar** Mishra Govt. MS Golwalkar College, APS University, Rewa (M.P.) India	Plant Biodiversity of Forests of Bandhavgarh of Vindhya region of India	Offline
6.	IT-6	**Prof. Swati Dubey** School of Studies in Physics, Vikram University Ujjain (MP) India	Nonlinear Interactions Studies in Semiconductor Plasmas	Online
7.	IT-7	**Dr. Nishchhal Yadav** School of Studies in Physics, Vikram University, Ujjain (M.P.) India 456001	Importance of Ion Implanted Semiconductor Plasmas for futuristic Research and Innovations	Online
8.	IT-8	**A. Steephenraj** Department of Physics and Electronics, Rhodes University, PO Box 94, Makhanda 6140, South Africa	On the use of crystalline 2methylimidazolium hydrogen succinate (2MISA) in non-linear optics	Online
9.	IT-9	**Dr. Avinas Manoharan** Department of Physics, Incheon National University, 119 Academy-ro, Yeonsu-gu, Incheon 22012, Republic of Korea	Preparation of Cd-free Zn (Sn,O) buffer layer by spray pyrolysis technique for CIGSSe thin film solar cells	Online
10.	IT-10	**Dr. Arun Kumar Singh** Faculty of Science, The ICFAI University, Durg, Chhattisgarh	Decoding the Intrinsic Shape and Structure of Elliptical Galaxies: Insights into Formation, Dynamics, and Cosmological Implications	Online
11.	IT-11	**Anuj Kumar.** Department of Physics, Chaudhary Charan Singh University Meerut, India	Unveiling Cathinone Derivative Interactions with Dopamine, Norepinephrine and Serotonin transporters: A Synergistic DFT and Docking Study	Online

Research Paper Presentation
Section- 1
Physical Science

S.No.	Code	Authors & Affiliations	Paper Title
1.	PH-1	Shivani Pandey Dr. Satanand Mishra	AI-Driven Graphene Quantum Dot Nanocomposite Sensors for Heavy Metals Detection in Consumable Water
2.	PH-2	Dr.Neelam Singh, Antima Singh	Solar Flares Influence on Cosmic Rays: A Study of Long-Term Modulation of Solar Cycles 24 and 25
3.	PH-3	Manju Nath Mishra and S.N. Mishra	In Situ Detection and Concentration Measurement of Fe and Lead in Drinking Water Using Bio-Based Quantum Dots and Semiconductor QDs A Comparative Fluorescence Spectrum Analysis
4.	PH-4	Shivum Patel, Vidyasagar Verma, P.K. Chamadiya and C.M. Tiwari	Effect of solar and interplanetry disturbances on geomagnetic field
5.	PH-5	Mukta Tripathi, and Santosh M. Bobade	Energy storage devices in the application of electrical vehicle and space craft
6.	PH-6	Vivek Dwivedi, Deepak K Chaurasiya, Anil Kumar Saxena and C.M. Tiwari	Cosmic Ray Intensity Variation with Solar Interplanetary Features during Consecutive Solar Cycle 23 & 24
7.	PH-7	Manish Kumar Jhala, Anchit Modi, Dhirendra Kumar Gupta, A.C. Pandey and Dinesh Kumar Pathak	Structural, optical, and photocatalytic properties of Ba-doped ZnO nanoparticles
8.	PH-8	Ashutosh Kumar Tiwari, C.M. Tiwari, Devendra Gautam	Study of Cosmic Ray Intensity in Relation to the Interplanetary Magnetic Field and Geomagnetic Storms for Solar Cycle 23 & 24
9.	PH-9	SonalDhuriya, R.K.Kuraria and Shashi R.Kuraria	Photoluminescence studies of Ce^{3+} doped cdse/polyvinylcarbazole nanocomposites
10.	PH-10	Suresh Jat	A Literature Review on Software Defect Prediction: Trends, Methods, and Frameworks
11.	PH-11	Brijesh Singh Chauhan Lalji Tiwari Ashish Chandra Pandey and Dpnesh Kumar Pathak	The Sun and its Structure of Solar InteriorSolar Core and Solar Transition Layer
12.	PH-12	Sri Krishna Sing, Rahul Patle, Vidya Sagar Chaudhary, and C.M. Tiwari	Geomagnetic Storms and Their Correlation with Solar Wind and IMF Parameter during Solar cycle 23
13.	PH-13	Sai Shikha Naidu and Swati Dubey	Effect of Magnetic dopants in Metal Oxides: Gas Sensing Applications
14.	PH-14	Rohit Dwivedi, C.M. Tiwari, A.K. Saxena	Study of Cosmic Ray Modulation with Different Observation of Solar Particles during Solar Cycle-24
15.	PH-15	Himanshu Chaurasia, Gyanendra Pandey, Neelam Chaurasia	The study of Ionospheric plasma variation at the high latitude and the low latitude station during quiet and disturb days
16.	PH-16	Gyanendra Pandey[1], Himanshu Chaurasia[2] and Neelam Chaurasia[3]	The study of diurnal variation, of Cosmic Ray Intensity and Total Electron Content
17.	PH-17	Vijay Shankar Saket, Saket Kumar, & P.L. Verma	Solar Cycle 25: Analyzing the Peak Phase and Its Impact on Space Weather
18.	PH-18	Vidya Sagar Chaudhary, C M Tiwari, Pushpendra Bahadur Singh, Aaka Singh Tiwari	Study of Maximum Cosmic Ray Intensity in Last Five Years during Solar Cycle
19.	PH-19	Harit Kumar Sharma , P.K. Shukla , S. K. Pandey and S. L. Agrawal	Study of composition dependent structural, optical, and electrical properties of (Zn 1-y Cu y)

			1-x Cd x S QD's
20.	PH-20	S.P. Tamrakar, Lalji Tiwari, P.L.Verma, Ganesh Agrawal, R.S. Gupta	Temperature Effect on Electroluminescence of Eu Doped ZnS Phosphors
21.	PH-21	Brijesh Kumar Patel, Dr. Sunil Tiwari, and Dr. C.M. Tiwari	Algorithmic Development of Switching Between Processors for Interconnection Network
22.	PH-22	Shivendra Shukla, Aparna Mishra, Dr. A.C.Pandey, Dr. D.K.Pathak	Role of Machine Learning Techniques for Smart Irrigation System
23.	PH-23	P.R. Singh[1], A.K. Saxena[2], C.M. Tiwari[2]	Signature of ~27 days and Heliospheric Variation of Solar Activity Parameters during the Period (2009–2012 and 2020 to 2023)
24.	PH-24	Arvind Dhurve, Anil Kumar Saxena and C.M.Tiwari	Study of the long-term behaviour of Cosmic Ray Intensity in association with Sunspot Number and Solar Flare Index during Solar cycle 24 & 25
25.	PH-25	S.K. Mishra, G. Pandey, S.K. Pandey, R.N. Singh	Para-Kenmotsu Manifolds admitting Quarter-Symmetric Metric Connection
26.	PH-26	Dr.Brijesh Singh Chauhan, Dr.Satya Prakash Shukla, and Dr.Rashmi Sharma	The Convection Zone of Photosphere in Chromospheres Temperature and Minimum Region of the Solar Corona
27.	PH-27	Dr. Sunil Tiwari, Dr. Shravan Pandey , Dr. C.M.Tiwari	A Study of Artificial Intelligence and Parallel Computing
28.	PH-28	Niyaz Ahmad, Khan Sarver, Krishna Singh, Ashutosh Tiwari, C.M Tiwari,	Solar activity is the coronal mass ejections with geomagnetic activity
29.	PH-29	Mahender Pal	Geomagnetic storm occurred in 2024
30.	PH-30	Gyanendra Pandey, Himanshu Chaurasia, Neelam Chaurasia	The study of diurnal variation, of Cosmic Ray Intensity and Total Electron Content
31.	PH-31	Udayveer Vikram Singh Bundela, Dharmendra Singh	Comparative study of geomagnetic storm during solar cycle-24
32.	PH-32	Prachi Mishraand Shravan K. Pandey	Quasi-Para-Sasakian Manifolds admitting Quarter-Symmetric Metric Connection
33.	PH-33	Dr. G. N. Singh, Dr. C. M. Tiwari, Dr. Sunil Tiwari & Mr. Manoj Kumar Gupta	Study of Interconnection Structure for Parallel and Distributed System
34.	PH-34	Shravan K. Pandey and R. K. Soni	Ricci solitons on generalized quasi-conformally recurrent para-Kenmotsu manifolds
35.	PH-35	A.C. Pandey, Namrata Thakur, C.M. Tiwari, V.K. Mishra, Sham Singh,	Modulation of cosmic rays in connection with solar and heliospheric characteristics
36.	PH-36	Satish Kumar Patel	Molecular structures, spectral, electrochemical, DFT and antioxidant activities of copper(II) complexes with NNO donor Schiff base ligand
37.	PH-37	Dr. Ritu Mishra	Study of Inter-Processor and Inter-Communication link BinaryRelationships for Load sharing/balancing algorithm in Parallel or distributed architectures
38.	PH-38	Neha Ghanghoriya	Biosensor for Selective Gelatin Detection in ETP Water: Enhancing Treatment and Resource Recovery
39.	PH-39	Chandani Sharma	MXene-Based Optical Sensors for Rapid Detection of Fluoride Ions in Groundwater
40.	PH-40	Satanand Mishra	IoT-Interfaced 3D Simulated Sensor for Real-Time Monitoringof Fluoride in Drinking Water
41.	PH-41	Anuishi Sharma	Silver-plated graphene-modified carbon foam for outstanding electromagnetic interference shielding performance

42.	PH-42	Ms. Priyanka Patel	A Morphological Approach to Dependency Analysis in Parallel Interconnection Networks
43.	PH-43	Mr. Suryaprakash Pandey	Innovations in Itemset and Web Usage Mining: From Frequent Patterns to Dynamic Parallelization
44.	PH-44	Srishti Tripathi	Transforming Agriculture with Generative AI: Applications and Innovations for Sustainable Farming
45.	PH-45	Prakash Kumar Tripathi	Deep Learning-Based Automated Pest Detection for Precision Agriculture

Research Paper Presentation
Section- 2
Life Science

S.No.	Code	Authors & Affiliations	Paper Title
1.	LS-1	Prof. Skand Kumar Mishra	Plant Biodiversity of Forests of Bandhavgarh of Vindhya region of India
2.	LS-2	Surya Kant Chaturvedi, and Shalini Singh .	Acoustic Variation of Aggressive Vocal Activities of *Semnopithecus entellus* in Chitrakoot
3.	LS-3	Shweta Kushwahand Vikas Poonia	Enhancing Emergency Preparedness: A Strategic Framework for Action Plans in Dam Safety
4.	LS-4	Surya Kant Chaturvedi and Prarthana Devi	Acoustic variation in morning chirrup and happy chirrup of Squirrels (*Funambuluspennantii*) in Chitrakoot
5.	LS-5	Uma Koul, Ruchi Bharti, Renu Sharma, Ajay Thakur, Monika Verma, Annu Pandey	Sustainable Synthesis of Silver Oxide Nanoparticles from Lobularia maritima: A New Approach to Antioxidant and Photocatalytic Applications
6.	LS-6	Mahima Pandey and Dr. Atul Kumar Tiwari	Study on Ambient Air Quality Parameters of Mauganj City, (M.P.) India
7.	LS-7	Shikha Tiwari, Dr. Atul Kumar Tiwari, and Dr. Arvind Kumar Tripathi	High prevalence of microcytic anemia, iron and folic acid deficiency in Indian women and their assessment
8.	LS-8	Krishna Nand Chaudhari, A.K. Tripathi, R.N. Tiwari	Assessment of ground water quality of Sihawal Block Sidhi district M.P. India
9.	LS-9	Rinisha Peter and Shadma Siddiqui	In-vitro inhibition of pathogenic bacteria through Probiotics lactobacillus metabolites
10.	LS-10	Rahul Dwivedi and Arti Saxena	Isolation, purification and characterization of antibacterial bioactive compounds from *Actinomycetes* collected from soil samples of Rewa (M.P.)
11.	LS-11	Shrishti Singh and Atul Tiwari	Studies on Removal of Ambient Air Particulates from Roadside Tress Species *Eucalyptus globulus* and *Ficus racemosa* Growing Along Rewa city, (M.P.)
12.	LS-12	Navneet Kumar Sen, and Pushpa M. Rawtani	Green Synthesis And Characterization of Silver Oxide Nanoparticles from *Azadirachta Indica* Along with Nanoremediation of Polluted Water
13.	LS-13	Mrs. Dipti Rani Minj	Environmental Impact Assessment (EIA) for evaluating the potential environmental

			consequences of proposed developmental activities
14.	LS-14	Mrs. Deepika Toppo	To Study the role of pollutants in causing environmental pollution
15.	LS-15	Aman Kumar Yadav	Review Examining the NCT Delhi's Plan for Aquifer Mapping and Surface Water Management and Its Effects
16.	LS-16	Swati Sharma, U.K. Mishra and Pushpendra Kumar Tiwari	Environmental Impact Assessment
17.	LS-17	Dhaneshwaripatle	A Review on Green Synthesis of Zinc Oxide Nanoparticles Using Plant Extract for Luminescence
18.	LS-18	Divya Saxena and Dr. Manju Jain	Phytochemical Analysis and Extraction of Bioactive Compounds from Wrightia tinctoria (Leaf, Stem, and Seed) Using Soxhlet Method for Potential Therapeutic Applications
19.	LS-19	Dr AnnmaryXalxo	Assessing waste management practices in Ambikapur city- a needs based approach
20.	LS-20	Monica Singh, Abhilasha Shrivastava, Shrikant Kol, Udita Singh	Medicinal Plants and Their Role in Controlling Rot Disease in Papaya: A Review
21.	LS-21	Rajesh Pandey and Neeti Mishra	Therapeutic Biochemical Approaches to limiting Oxidative Stress in Diabetes and Obesity
22.	LS-22	Dipali Patel, U.K. Mishra and A.K. Tripathi	Sustainable techniques of surface water Conservation for ground water recharge in Jaisingh Nagar area of Shahdol district, Madhya Pradesh, India
23.	LS-23	Neeti Mishra and Rajesh Pandey	Childhood and Adolescent Obesity pathophysiology and Clinical implications
24.	LS-24	Jay Shankar Singh Tiwari, U.K. Mishra and Sandeep K. Shukla	Groundwater Pollution and Control Measures: In Case Study
25.	LS-25	Devanshi Dwivedi	Isolation & screening of hydrocarbon degrading fungi from soil
26.	LS-26	Smt. Nisha Pandey	Sustainable development goals into the Integrating architecture curriculum: Experiences and perspectives
27.	LS-27	Dr. Anshu rani Patel & Dr. Atul kumar Tiwari	Study of antimicrobial and phytochemical contents Availability in Medicinal plants
28.	LS-28	Arun Kumar Tripathi, R.N. Tiwari and Sarvesh Kumar Patel	Irrigation Water Quality Assessment in Ramnagar Area, Satna, Madhya Pradesh, India
29.	LS-29	Manish Kumar Mishra, Ravindranath Tiwari and Arun kumar Tripathi	Morphometric Analysis of Watersheds using Geospatial Approach: A Case Study of Nagod Area of Satna District, Central India
30.	LS-30	A.K. Tripathi, R.N. Tiwari and Alankrita Saket	Assessment of Groundwater Quality, Beohari block Shahdol District, (M.P.), India
31.	LS-31	Pramila Singh	A Comprehensive study of Biodiversity with special reference of biodiversity Conservation in India
32.	LS-32	Neetu Parmar, Dr. Amit Tiwari, Dr. Samta Shukla, Dr. Atul Kumar Tiwari	Evaluation of antibacterial properties of clove essential oil and clove extract against *Escherichia coli* from urinary isolates
33.	LS-33	Smita Pandey	The avian species richness in Maihar district, Madhya Pradesh
34.	LS-34	Kunal Aggarwal and Ruchi Bharti*	Eco-Friendly Synthesis and Characterization of Zirconium Nanoparticles Using Ficus pumila

			Extract: Enhancing Anticorrosive Performance
35.	LS-35	Swati Verma, Neha Patel, Sapna San and Kamlesh Kumar Soni	Effect of Putrescine on Mitigating Salinity Stress in Mungbean (*Vigna radiata L.*)
36.	LS-36	Divya Singh Kushwah and Shadma Siddiqui	Microbial communities: The well-wishers of the Earth
37.	LS-37	Dr.Shama Ansari	Urban environmental assessment with particular reference to Rewa plan proposal
38.	LS-38	Kajal Singh Patel, Aparna Tiwari, Anshu Rani patel, and Arvind Kumar Tripathi	Role of TFR gene polymorphism in susceptibility to iron deficient anemia
39.	LS-39	Sadhan Priya	Impacts of dust pollution on plants: Implications for environmental bio monitoring
40.	LS-40	Parvat Raj Pandey & Rashmi Arnold	Unraveling the role of ADAM 33 in asthma
41.	LS-41	Dr. Shrikant Kol and Dr. Atul kumar tiwari	To study the microbial interaction during bioremediation Process in their natural habitat's
42.	LS-42	Dr. Bharat Kumar Choudhari, Dr. Shrikant Kol and Dr. Atul Kumar Tiwari	To study the mode of action for Multi Drug Resistance (MDR) pathogens against different classes of antibiotics
43.	LS-43	Dr. Rupam Yadav, Dr. Shrikant Kol, Dr.Pankaj Mishra and Dr. Atul Kumar Tiwari	To study the effect of NOX & SOX emission from diesel engines and its effect on human health
44.	LS-44	Dr. Deepali Shukla, Dr. Shrikant Kol and Dr. Atul Kumar Tiwari	To study the anti-oxidants capacity of dried fruits effective for Human health improvement
45.	LS-45	Sakshi Pare and Dr. Geeta Paryani	Study on Aegle Marmelos derived Bio-Char for Adsorption of Methylene Blue dye
46.	LS-46	Dr. Smriti Shukla	Role of PTPN22 and VDR gene polymorphisms in susceptibility to rheumatoid arthritis: a study from central India
47.	LS-47	Dr. Udita Singh, Dr. Arvind Kumar Tripathi	To Study The Association Of Interleukin-10 (−592A/C) Genepolymorphism And Its Susceptibility To Diabetes Type 2
48.	LS-48	Veronika Singh	Hydrobiological study of Sarfa River at district Shahdol (M.P.) India with reference to fisheries
49.	LS-49	Dr. Pramod Kushwaha	Assessment of asymptomatic fungal infections in COVID-19 positive and COVID-19 negative pneumonia: A comprehensive epidemiological analysis
50.	LS-50	Kamlesh Kumar Soni, Amita Kush Mehrotra	The Journey of AEG1 Promoter from Cotton
51.	LS-51	Amita Sarkar	Biodiversity and sustainable conservation
52.	LS-52	Dr. Aprana Singh	Heavy metal pollution in soil and its toxic effects on agriculture
53.	LS-53	Vijai Shanker Giri & Dr. Indiwar Ratna Pathak	Effect of toxic pesticide in aquatic media and on fish catla catla
54.	LS-54	Deepak Varma & Virendra Kumar Tripathi	Perspectives of anesthetic properties of cove oil on the toxic effects on channa punctatus
55.	LS-55	Vijeta Chaturvedi & Dr. Dev Brat Mishra	Histopathological hepatosomatic index on superoxide dismutase (SOD) enzyme activity of fresh water teleost fish

IT-1

Low Frequency Solar Bursts and their correlation with solar cycle 24 dynamic: Unveiling association with corononal mass ejection and key solar parameters.

Saket Kumar[1] O.P. Tripathi[1] Gauri Richharia[2] and P.L. Verma[3]

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ABSTRACT :

Solar radio bursts are a unique phenomenon in radio astronomy, occurring across a frequency range of 70 MHz to 2.2 GHz. This study investigates their correlation with key solar parameters, such as Coronal Mass Ejections (CMEs), Type II bursts, sunspot number (SSN), and solar radio flux (F10.7). The research confirms a robust correlation between Type II radio bursts and SSN and F10.7, with correlation coefficients approximating 0.98 for each. Type II bursts occur between 200 and 25 MHz during solar cycle 24, with 95.4% linked to CMEs and white light CMEs. The study also categorized CMEs based on their linear speed and angular width, finding 43% of Type II bursts associated with fast and wide CMEs. This research contributes to our understanding of solar dynamics and their impact on space weather phenomena.

Keywords: Radio Astronomy, Solar Radio burst, Solar Flares, Coronal Mass Ejection & Solar Parameters Low-Frequency Solar Radio Bursts and Their Correlation with Solar Cycle 24 Dynamics: Unveiling Associations with Coronal Mass Ejections and Key Solar Parameters

IT-2

Recovery of valuable materials such as aluminum, silver fingers, and busbars from discarded c-Si solar cell

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ABSTRACT:

The work reported herein is the leaching of valuable materials such as an aluminum back surfacefield (Al-BSF) layer, silver fingers, and busbars from spent crystalline silicon (c-Si) solar cellsthrough thehydrometallurgical route. Firstly, precious metal silver fingers and busbars from cellsare leached out in nitric acid (HNO_3) at room temperature with molar concentration varied from1 to 5. Further, silver-free cells leach in potassium hydroxide (KOH), which has a stronginorganic base, with molar concentrations varied from 3 to 7, with 5 minutes of ultrasonicagitation at room temperature. The surface morphological study was done using opticalmicroscopy and scanning electron microscopy coupled with energy-dispersive X-rayspectroscopy. The recovered cell is free from aluminum, silver fingers, and busbars, which canbe reused for the fabrication of new cells or another purpose for the sustainable development ofsolar cell industries.

Keywords: Recycling of solar cell; Hydrometallurgical route; Leaching of c-Si solar cell. Low-Frequency Solar Radio Bursts and Their Correlation with Solar Cycle 24 Dynamics: Unveiling Associations with Coronal Mass Ejections and Key Solar Parameters.

IT-6
Laser Plasma Interactions and Their Applications

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ABSTRACT:

Laser-matter interactions cause various second order and third order nonlinear optical effects in semiconductor plasma medium.Semiconductor plasma physics received a great attention of researchers all around the words due to wide applicability of various plasma phenomena. These plasmas exhibit unique optical properties due to the interaction between electromagnetic radiation and the free charge carriers.Nonlinear Absorption, Nonlinear Refraction, Second-Harmonic Generation (SHG), Third-Harmonic Generation (THG), Four-Wave Mixing (FWM), Stimulated Brillouin scattering and Stimulated Raman scattering are some important nonlinear optical interactions.Some important applications include Optical Communication Systems, Optical Sensing and Imaging,Laser Technology, Quantum Computing and Information Processing, inertial confinement fusion etc.

This talk covers historical development, basic theoretical explanation; mathematical models developed in the field and overall research activities in this area.Basic physical mechanism and important aspects of different nonlinear phenomena in semiconductors plasma medium will be the main highlight.Some important application based on nonlinear interaction will also be discussed.

IT-7
Importance of Ion Implanted Semiconductor Plasmas for futuristic research and innovations

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ABSTRACT :

In present article, Author has presented impact of relativistic effects on the parametric amplification in ion implanted semiconductor plasma (IISP) medium when colloids are assumed to be participating in nature. Classical hydrodynamic model has been utilised to derive second-order nonlinear optical susceptibility and absorption coefficient of acoustic wave. The subsequent numerical analysis is made with n-InSb at 77K duly irradiated by a 1.06μm Nd:YAG laser. Applied laser intensity is well below the damage threshold of the InSb and GaAs crystal. Analysis has been done quantitatively as well as qualitatively for the favourable threshold field intensity and higher amplification characteristics. It is found that both the threshold and amplification characteristics modified when relativistic effects are taken into account. Proper selection of laser pump field intensity, carrier concentration and acoustic wave vector plays a significant role for the enhancement of parametric amplification of the acoustic wave in the semiconductor plasma medium. It is hoped that investigations will enable better understanding of the mechanism of laser-driven acoustic wave amplification in an IISP medium. It is expected that the experimental studies on this interaction would create and generate new dimensions for range of applications in high speed devices and solid-state diagnostics.

IT-8
On the use of crystalline 2methylimidazolium hydrogen succinate (2MISA) in non-linear optics

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ABSTRACT :

2-methylimidazolium hydrogen succinct (2MISA) has of late drawn interest forpossible use in non-linear optics (NLO) owing to some of its structural and optical properties.We report the optical, vibrational and structural features of 2MISA organic nonlinear opticalsingle crystals grown using the slow evaporation technique. Single crystal X-ray diffractionshows that the resulting crystal is monoclinic with space group P2 1 /m. The presence ofvarious functional groups in the material was verified by Fourier Transform Infraredspectroscopy. UV–Vis–NIR spectroscopy showed that the compound is transparent to anacceptable degree and has a cut off wavelength in the UV–Vis–NIR region. Further studyemployed density functional theory at the B3LYP/6–311 G (d.p) method. In addition tocomparing the bond length, bond angles, and optimized geometrical parameters toexperimental X-ray diffraction data, were assessed. Based on the results and additionalinvestigations including ones on the hyperpolarizability value and intermolecular electroncharge transfer, we draw the conclusion that 2MISA is appropriate for NLO applications.

IT-9
Preparation of Cd-free Zn(Sn,O) buffer layer by spray pyrolysis technique for CIGSSe thin film solar cells

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ABSTRACT:

Focus towards Cd free buffer materials has increased in the recent years in order to minimize the toxicity caused by CdS in thin film solar cells. Among the various buffer materials, Zn(Sn,O) (ZTO) is an important buffer material due to good transparency, high band gap and electrical conductivity. However, achieving better efficiency using non-vacuum based techniques is quite challenging. In the present work, Zn(Sn,O) has been utilized as a buffer layer on CIGSSe solar cells using spray pyrolysis technique at a very low temperature of 200°C. CIGSSe/Zn(Sn,O) devices demonstrated a photo conversion efficiency around 8.4% with J_{SC} 32.54 (mA/cm^2), V_{OC} 0.464 V and FF 56%. With a dual CdS and Zn(Sn,O) buffer layers, CIGSSe /CdS/Zn(Sn,O) devices demonstrated efficiency around 13.72%.

Keywords : CIGSSe, Dual buffer layer, Zn(Sn,O), Spray pyrolysis

IT-10

Decoding the Intrinsic Shape and Structure of Elliptical Galaxies: Insights into Formation, Dynamics and Cosmological Implications

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ABSTRACT :

Elliptical galaxies, a foundation of galactic classification, display diverse shapes and kinematic properties, revealing insights into their formation and evolutionary processes. This study explores the intrinsic shapes of elliptical galaxies. This study concentrates on their triaxial geometries, stellar dynamics and the role of dark matter halos in shaping their structures. A comprehensive historical review traces early observations to modern computational techniques, while an extensive literature survey examines basic studies on galaxy morphology, stellar orbit models and kinematic features. Employing observational data from state-of-the-art telescopes and numerical simulations, this research evaluates the effects of mergers, anisotropic velocity distributions and feedback mechanisms on galaxy morphology. The outcomes underscore the interplay between baryonic and dark matter components in determining the intrinsic structure of elliptical galaxies. The cosmological implications such as their role as tracers of dark matter and large-scale structure are also discussed. This work advances the understanding of elliptical galaxies and provides a basis for future explorations into galactic evolution and cosmology.

Keywords: elliptical galaxies, galaxy dynamics, intrinsic shape, dark matter, galactic evolution, cosmology, stellar orbits, triaxiality, feedback mechanisms.

IT-11

Unveiling Cathinone Derivative Interactions withDopamine, Norepinephrine and Serotonin transporters: A Synergistic DFT and Docking Study

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ABSTRACT :

Often known as synthetic Cathinone or "bath salts," Cathinone derivatives are a class of synthetic stimulant substances that have a euphoric effect. The primary way that cathinone derivatives work in the brain is through interacting with different neurotransmitter systems to produce stimulant and euphoric effects. In the central nervous system, catehinone derivatives mainly influence the release and absorption of neurotransmitters like serotonin, norepinephrine, and dopamine. Density functional theory (DFT) is a popular computational technique for understanding and forecasting a variety of molecular and electrical properties of chemical systems. Additionally, it can be used to compute molecular properties and descriptors including polarizabilities, electrostatic potentials, and lipophilicity that are pertinent to biological activity. These characteristics can be utilised in QSAR models to forecast a compound's biological action.

In order to comprehend the pharmacological effects and related mechanisms of action of cathinone derivatives, docking is used to predict the binding interactions between these chemicals and particular target proteins, such as receptors or enzymes. In the present work, we have provided combined density functional theory and molecular docking studies to understand the mechanism of action of newly synthesized Cathinone derivative 1(4 methylphenyl)2 (ethylamino)pentan1one (4-MEAP). Molecular electrostatic potential (MEP), HOMO–LUMO, NBO, and Hirshfeld surface analysis are presented for the title molecule. Docking studies of 4-MEAP with Dopamine, Norepinephrine and Serotonin transporters, 6MOZ, 6MOF and 6M2R respectively, revealed that 4-MEAP could favourably interact with 6MOZ, 6MOF and 6M2R as can be concluded with low binding energies -7.3kcal/mol,-7.3kcal/mol and -7.0kcal/mol.

Keywords: DFT, HOMO-LUMO, NBO, Hirshfeld surface analysis, Molecular docking.

Section I

Physical Science

PH-1

AI-Driven Graphene Quantum Dot Nanocomposite Sensors for Heavy Metals Detection in Consumable Water

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ABSTRACT :

Rapid population and economic growth around the world have increased demand for clean water, making water quality monitoring an important topic of study. There is serious health hazards associated with heavy metals in water used for irrigation and food processing. Because of their pervasiveness in the air, soil, natural streams, and living things, these toxins must be detected. In this work, graphene quantum dot (GQD) nanocomposites-based chemo-optical sensors are presented, which are intended for the quick and accurate identification of heavy metals in drinking water.The produced material, which came from sustainable sources like potato peel based GQD nanocomposites was examined using FTIR, XRD, Raman spectroscopy, and UV-visible spectroscopy, SEM ,TEM and PL to ascertain its morphological, functional group, and quantitative characteristics and optical sensing property.The remarkable sensitivity and selectivity of functional group-doped GQDs allowed for the fast and accurate detection of heavy metal ions, at concentrations below regulatory limits. Compared to traditional approaches, this invention offers a quicker and labor-free solution. Furthermore, the use of IoT technology provides wireless connectivity for real-time monitoring, enabling data access through OLED screens, mobile devices, and desktop computers. Upgrades with I2C for remote monitoring and optical sensor calibration are supported by the system. With ANN technology improving water quality evaluations, this portable and affordable solution is especially helpful for rural and resource-constrained places, allowing non-expert users to detect heavy metals efficiently.

Keywords : Heavy metals, optical sensors, artificial intelligence, graphene quantum dots

PH-2

Solar Flares Influence on Cosmic Rays: A Study of Long-Term Modulation of Solar Cycles24 and 25

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ABSTRACT

This study explores the influence of solar flares on the long-term modulation of cosmic rays during solar cycles 24 and 25. Solar flares, intense bursts of energy from the Sun, play a significant role in modulating cosmic ray intensity by affecting the heliospheric magnetic field and solar wind. Using data from neutron monitors, space-based instruments, and solar observatories, we analyse how cosmic ray flux varied during the weaker solar cycle 24 and the more active solar cycle 25. The study highlights the relationship between solar flares and galactic cosmic rays. Graphical representations of cosmic ray variations and solar activity trends provide insights into the long-term effects of solar flares on cosmic ray modulation. This paper we have given how solar flares during solar cycles 24 and 25 influenced cosmic ray modulation. Solar cycle 24 was weak, with lower solar activity, while cycle 25 has shown increasing activity. The study provides insights into how the Sun's activity affects cosmic ray flux over time. Solar flares significantly influence cosmic ray modulation, both in the short term (Forbush decreases) and over longer periods, such as solar cycles. The weaker solar cycle 24 allowed higher cosmic ray flux, while the more active solar cycle 25 has shown stronger suppression. These findings improve our understanding of the relationship between solar activity and cosmic rays, contributing to space weather studies and radiation protection strategies.

*Keywords:*Cosmic ray modulation, Solar flares, Solar cycles 24 and 25, Galactic cosmic rays,Heliospheric magnetic field, Solar wind, Space weather.

PH-3

In Situ Detection and Concentration Measurement of Fe and Lead in Drinking Water Using Bio-Based Quantum Dots and Semiconductor QDs A Comparative Fluorescence Spectrum Analysis

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ABSTRACT :

The detection of toxic heavy metals such as lead (Pb^{2+}) and iron (Fe^{3+}) in drinking water is essential for safeguarding environmental and public health. Heavy metal contamination, often stemming from industrial discharge and agricultural activities, poses severe health risks, including neurological disorders and organ damage. This study evaluates the performance of metal sulphide quantum dots (MSQDs) and bio-based quantum dots (BQDs) for detecting Pb^{2+} and Fe^{3+} ions due to their unique fluorescence properties. MSQDs, synthesized chemically, exhibit high fluorescence intensity and remarkable sensitivity, particularly for Pb^{2+} detection. However, their synthesis involves hazardous chemicals, raising environmental and safety concerns. Conversely, BQDs, derived from renewable bio-sources such as biomassor plant extracts, offer a sustainable and eco friendly alternative. Although BQDs exhibit slightly lower fluorescence intensity, they demonstrate superior selectivity for Fe^{3+} ions, attributed to their distinct surface chemistry and binding affinities. The fluorescence quenching behavior of both QD types was found to be concentration-dependent, influenced by their surface properties and interaction mechanisms with metal ions. The study highlights the potential of MSQDs for applications requiring high sensitivity and BQDs for environmentally sustainable and selective detection of heavy metals. These findings underscore the promise of quantum dots as efficient and selective tools for heavy metal monitoring in water systems. By integrating sensitivity and sustainability, this study contributes to advancing nanotechnology-based solutions for addressing critical environmental challenges.

Keywords: Lead, Iron, Heavy metals, Quantum Dots

PH-4

Effect of solar and interplanetry disturbances on geomagnetic field

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ABSTRACT :

Sun is a huge source of energy in the Solar System due to which there is life on earth but the activities happening on the sun affect our Earth and its space weather. The Earth's geomagnetic field is influenced by solar activity and interplanetary disturbances, which can lead to variations in geomagnetic parameters, such as intensity, direction, and the occurrence of geomagnetic storms. Solar phenomena, including coronal mass ejections (CMEs), solar wind, and solar flares, release high-energy particles that interact with the Earth's magnetosphere, leading to disturbances that affect both the magnetosphere and the ionosphere. Similarly, interplanetary disturbances, primarily associated with the solar wind's interaction with the interplanetary magnetic field, can cause significant perturbations in Earth's magnetic field. These disturbances are often characterized by sudden increases in geomagnetic activity, which can manifest as geomagnetic storms, auroras, and magnetic field fluctuations. Understanding the mechanisms of solar and interplanetary disturbances, including their propagation through space and interaction with the Earth's magnetosphere, is crucial for space weather forecasting and for mitigating the effects of geomagnetic storms on communication, navigation systems, satellite operations, and power grids. This paper reviews the primary solar and interplanetary drivers of geomagnetic variations, explores their impact on Earth's magnetic environment, and discusses the implications for space weather prediction and technological infrastructure.

Keyword: Coronal Mass Ejection, Solar Wind, Magnetosphere, Ionosphere

PH-5

Energy Storage Devices in the Application of Electrical Vehicle and Space Craft

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ABSTRACT

The energy storage devices such as batteries, supercapacitors (SCs), solar cells etc.have wide applications in variouse advanced technologies. In the electric vehicleand the spacecraft, SCs played tremendous role for the energy storage due to itsfunctioning over wider temperature and long lifetimes and better energy density thanbatteries. Due to the issues caused by the ICE on the environment and folks, theautomotive and the space industry has turned to the electrical powered vehicle andcrafts. In this paper, the energy storage devices in the electrical vehicle and spaceapplication have been indicated. The report provides a number of the benefits anddrawbacks of the electrical vehicle and spacecraft. Additionally, a short future view ofthe technology is given. This paper reviews the advances of EVs and spacecraftsregarding battery technology trends, charging methods, in addition as new researchchallenges and open opportunities. Only if one among the elemental aspects in EVs/spacecraft is that the battery, the paper presents an intensive review of the batterytechnologies- from the Lead-acid batteries to the Lithium-ion.

Keywords: Supercapacitors, Electric vehicle, Spacecraft

PH-6

Cosmic Ray Intensity Variation with Solar Interplanetary Features during Consecutive Solar Cycle 23 & 24

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ABSTRACT

This work aims to investigate the long-term trends of CRI in relation to solar interplanetary parameters. The modulation of CRI is associated with solar activity. The study highlights an inverse correlation between solar activity and cosmic ray intensity, where increased solar activity, particularly phenomena like coronal mass ejections (CMEs), solar wind velocity (V), and interplanetary magnetic field (IMF B), corresponds to a decrease in cosmic ray intensity. Conversely, during periods of lower solar activity, cosmic rays tend to increase. Based on our research, we have concluded that solar wind velocity (V) has higher volatility and is not a useful parameter to investigate the long-term trajectory of cosmic ray intensity (CRI), whereas CME Rate and IMF B are indicators of solar activity and play a crucial role in the variation of CRI.

*Keyword:*Cosmic ray intensity, interplanetary magnetic field, solar wind velocity and solar cycle

PH-7

Structural, Optical and Photocatalytic Properties of Ba-Doped ZnO Nanoparticles

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ABSTRACT :

Pure and Ba-doped ZnO dilute magnetic semiconductor nanostructures were prepared using a lucrative co-precipitation method. The x-ray diffraction pattern of pure and Ba-doped ZnO nanoparticles manifests a hexagonal crystal structure retaining P6 3 mc as a space group.Rietveld refinement analysis of x-ray diffraction data accredited that pure and Ba-doped ZnO nanoparticles crystallize in the hexagonal crystal system. From UV-visible absorption data analysis, Tauc's equation was applied to obtain the direct bandgap of undoped and Ba-doped ZnO nanoparticles. Band-edge and deep-level emission defects in bare and Ba-doped ZnO nanoparticles are reported using photoluminescence spectroscopy. Chromaticity coordinates (x, y) and correlated color temperature (CCT) are enumerated using the CIE 1931 software. The photocatalytic activity informs us about degradation efficiency for bare and Ba-doped ZnO nanoparticles and shows an enhancement for methyl blue (M.B.) dye degradation. Photodegradation efficiency for Ba-doped ZnO nanoparticles gives the maximum value at (X=0.05).

PH-8

Study of Cosmic Ray Intensity in Relation to the Interplanetary Magnetic Field and Geomagnetic Storms for Solar Cycle 23 & 24

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ABSTRACT

For the duration of 2006–2024 Solar Cycle 23-24, we look at the relationship between the cosmic-rayintensity (CRI), the density of the interplanetary magnetic field (IMF, B), and geomagnetic storm activity(GS). We used the superposed approach to perform a analysis in order to reach this. On the days whengeomagnetic storm GS occurs, there is a brief reduction in CRI, and this drop has a pattern resembling thatof the disturbance storm-time index (Dst). Additionally, a drop in the Dst index correlates with an increasein IMF-B. For the time under study, there is no correlation between the sunspot number (SSN) the IMF,Dst index, or CRI, but there is a strong anti-correlation between the two. It is found that the IMF is a usefulparameter combination for generating a decline across GS and Forbush. we use each day average on thesolar wind speed (SWS-V) plasma proton temperature, plasma proton density, interplanetary magneticfield (IMF-B), geomagnetic storm (GS) averaged planetary A-index (Ap-index), and sun spot number(SSN) to examine the relationship between cosmic ray intensity (CRI) and these parameters for the period2006–2024 solar cycle 23&24. In order to determine the correlation between cosmic ray intensity CRI andseveral solar wind (SW) metrics, GSs, IMF-B, Ap index, and SSN, we use the superposed method ofanalysis. It has been seen that as IMF B grows, CRI falls. Furthermore, we demonstrate that during themajority of solar cycle 23&24, the CRI decreases in a manner akin to that of disturbance storm time (Dst index). There is a strong and supportive association between the Dst index and the CRI. a comparison of CRI and IMF, the Ap index and CRI have a stronger anti-correlation. There is an improvement between CRI and SSN. While the temperature and density of plasma particles are not CR-effective variables solar wind outcomes like (SWS) solar wind speed –V are.
Keyword: Solar wind parameters, Cosmic rays, Geomagnetic storms, IMF, Sun spot number, Ap index.

PH-9

Photoluminescence studies of Ce^{3+} doped cdse/polyvinylcarbazole nanocomposites

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ABSTRACT :

In this present work we were studied the Ce doped CdSe/PVK nanocompositeswith different concentration of rare earth material Cerium synthesized by chemicalroute method. PVK was used as a host matrix and these films were characterized byX-ray diffraction(XRD) and the crystalline size 10-28nm was calculated from it andSEM images confirm the surface morphology of these different nanocomposites. PLexcitation spectra at 295nm and PL emission spectra found at 300nm,409nm and593nm for all the samples is caused by luminescence centers or surface/defect states.PS/CdSe:Ce^{3+} nanocomposite has bcc structure. PS/CdSe:Ce^{3+} nanocomposite haveunique optical properties because CdSe has high electron mobility and Ce^{3+} givevisible colour emission.In this sample we get voilet and orange colour and ultraviolet radiatiation too.It is a fourth generation optical material that is useful in manyoptoelectronic and electronic devices like solar cells, Photovoltaniccells,lesser,amplifiers,LED etc.

*Keywords:*PVK, XRD, SEM, PL emission spectra

PH-10

A Literature Review on Software Defect Prediction: Trends, Methods, and Frameworks

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ABSTRACT :

Identifying possible problems at an early point in the development lifecycle is one of the most importantthings that software defect prediction can do to enhance software quality and minimize developmentcosts. This is one of the most crucial roles that software defect prediction can play. Of all the functionsthat software can perform, this is one of the most crucial ones. This literature review aims to offer athorough examination of the research trends, methodologies, and frameworks utilized in the field ofsoftware defect prediction. This study analyzes a broad range of scholarly publications. Thesepublications cover a wide variety of topics related to defect prediction, including dataset features,prediction models, assessment measures, and prediction approaches. Within the context of minimizingthe negative consequences of defects on software quality and project schedules, the review emphasizesthe significance of software defect prediction. This investigation identifies significant research themessuch as the use of machine learning algorithms, feature selection approaches, and ensemble methods indefect prediction. The paper also scrutinizes the challenges and limitations associated with the diversedefect prediction methodologies currently in use. These include the imbalance of the dataset, the bias infeature selection, and the over fitting of the model. Additionally, it highlights the development of researchfields and the opportunities for future study, such as the incorporation of domain knowledge, theincorporation of varied data sources, and the development of advanced approaches to predictivemodeling. Furthermore, it acknowledges the existence of these opportunities. In its entirety, thisliterature review provides researchers and practitioners working in the field of software engineering withcritical insights into the present state of the art in software defect prediction.

PH-11

The Sun and its Structure of Solar InteriorSolar Core and Solar Transition Layer

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ABSTRACT :

The Sun is the understand other stars the structure of the Sun is determinate by the conditions of mass conservation momentum conservation energy conservation and the mode of energy transport. The Sun is an oblate spheroid like all the major bodies in the solar system but in a first simplifying approach to describe the solar structure, the effects of rotation and magnetic fields will be neglected here so that the Sun is taken to be spherically symmetrical.The surface of the Sun consists of H (74%), Hi (25%) of its mass and trace quantities of other elements. These gases near its centre are under such tremendous pressure, it behaves like a fluid. Because of this gaseous state, the Sun rotates unevenly.This is suggested by a high abundance of heavy elements in the Solar system such as gold and uranium, relative to the abundances of these elements in so-called Population II, heavy-element-poor stars. The heavy elements could most plausibly have been produced by endothermic nuclear reactions during a supernova or by transmutation through neutron absorption within a massive II - generation star. The solar interior is not directly observable and the Sun itself is opaque to electromagnetic radiation.The innermost 20-25% of the Sun's radius where temperature and pressure are sufficient for nuclear fusion to occur H fuses into Hi the fusion process releases energy and the helium gradually accumulates to form an inner core of helium within the core itself the core of the Sun is a gravitationally stabilized fusion reactor there energy is produced by conversion of hydrogen into helium. Each H atom weighs 1.0078 atomic units and each Hi atom is made from four H atoms thus weighing 4.003 atomic units. Accordingly the difference of 0.0282 atomic units or 0.7% of the mass m, is converted into energy E according to Einstein's formula $E=mc^2$ where c is the velocity of light. Most atoms in the core of the Sun are entirely stripped of their electrons by the high temperature and opacity is governed by scattering of photons by free electrons by inverse bremsstrahlung on ionized hydrogen and Hi and by bound-free scattering by elements heavier than helium.

PH-12

Geomagnetic Storms and Their Correlation with Solar Wind and IMF Parameter during Solar cycle 23

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ABSTRACT :

Geomagnetic storms are brought on by anomalies in the interplanetary magnetic field andsolar wind plasma emissions, and the intensity of these storms is determined by the potentialgeoeffective of the solar or interplanetary parameters. We examined more than 200 geomagnetic storms in the current work, and we found that the disturbance storm time (Dst)decreased from more than -50 nT to less than -300 nT during solar cycle 23. Thisinvestigation was conducted using statistical methods to compare the peak value of theinterplanetary magnetic field (IMF) and solar wind plasma characteristics' dst strengths.Using a variety of satellites, hourly wind data and DST index values have been acquired. Theresults showed a clear relationship between geomagnetic storms and the 11-year sunspotcycle. Previous research has shown that the IMF B is substantially geoeffective during themain phase of magnetic storms and much more so during the storm peak. This is furthersupported by the southern component of the IMF Bz. In contrast to IMF, Bz, and ion density,the dst and solar wind velocity exhibit a high correlation. It has been proven that thegeomagnetic storm's severity correlates more strongly with the IMF's overall magnetic fieldstrength than with its southerly component.
*Keywords:*Solar cycle, Disturbance Storm Time (Dst), Interplanetary Magnetic Field, and GeomagneticStorms.

PH-13

Effect of Magnetic dopants in Metal Oxides: Gas Sensing Applications

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ABSTRACT :

Metal oxides are drawing the attention of industries and researchers due to their versatile properties andapplications. Now days magnetic doped metal oxides are widely used in Gas sensing. Gas sensors workon the principle of transforming the gas adsorption effects on the surface of the active material into adetectable signal in terms of its changed electrical, optical, thermal, mechanical, magnetic (magnetizationand spin), and piezoelectric properties[1]. When the sensor based on semiconducting metal oxide isexposed to the air, oxygen molecules are adsorbed on the active sites on a material surface. The adsorbedoxygen molecules capture electrons from the sensing metal oxide to form chemisorbed oxygen ions.Thisdecreases the concentration of electrons in the sensing material and established a thick depletion layer onthe metal oxide surface [2].Role of magnetic dopants in metal oxide sensors primarily enhances their sensitivity, selectivity, andresponse to gases, especially in the context of gas sensing mechanisms. Magnetic dopants are introducedinto metal oxide semiconductors to modify their Electrical Conductivity, Gas-Surface Interaction,Catalytic Activity, Magnetoresistance Effect, Spin-Dependent Effects, and increased Selectivity, whichsignificantly affects their interaction with target gases.With the aim of enhancing the gas sensitivity, many researchers synthesized magnetic doped metal oxidethrough several methods including a facile hydrothermal method [2,3] ,One step impregnation method[4],microstructure nano-sphere Fe-doped In $_2$ O $_3$,Chemical co-precipitation method [5] microstructure nanoparticles Vanadium-doped nickel ferrite(NiFe $_2$ O $_4$),Electrospinning method [6] nano fibers Cd-doped ZnO,Ultrasonic nebulizing deposition (UND) method [7]etc. A change in the gas sensing property of thesynthesized sample (Metal oxides) along with electrical, structural magnetic and optical properties .It canbe concluded that gas sensing performance is found to be improved by magnetic dopants in Metal oxides.This paper reviews current status of the field and state of the art techniques and synthesis methods.

PH-14

Study of Cosmic Ray Modulation with Different Observation of Solar Particles during Solar Cycle-24

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ABSTRACT :

An association of this problem that representing and determining the cosmic ray modulationswith various energetic particles of solar system during cycle-24. Generally, cosmic raymodulation is the process of solar wind that affect the intensity and energy of cosmic rays.That revenue as charged particles enter the heliosphere, the Sun's turbulent magnetic fieldcauses their intensity to decrease, called modulation. Solar modulation refers to the influence the sun exerts upon the intensity of galactic cosmic rays. After entering our local astrosphere,galactic cosmic rays, as charged particles, are affected by the Sun's turbulent magnetic field.This causes their intensities to decrease towards the inner heliosphere, a process referred toas modulation. The purpose of solar modulations in the Ground-level enhancementobservation that representing the various configurations of solar energetic particle events.Consistently Ground-level enhancements are associated with some events of solar-particleswhile growing mechanism of maximum variations is maintained. Mostly focused in this studyon cosmic- ray modulation with different events of solar particles during solar cycle-24.Overall determining of this learning that considers the characteristics and configuration ofcosmic ray intensity with different behavior events and SEP (Solar Energetic Particles) in thesolar environment. The observation of this research that measured mostly the authoritativeflares of solar energetic particles associated with different events and intensity of cosmic raymodulations. The modulation of cosmic ray varies with solar activity and anti associatedglowing. This research we are analyzing many different observations of cosmic ray activitieswith various solar modulations through specific configurations.
Keywords: Cosmic Ray, Solar Events, SEP, Solar Cycle 24, Heliospheric

PH-15

The study of Ionospheric plasma variation at the high latitude and the low latitude station during quiet and disturb days

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ABSTRACT :

In the ionosphere the amount of atmospheric atoms turns to be very scanty and therefore the incomingsolar high energetic radiations break these atoms into ions and electron. Since the mean free path of thesedissociated particles are more compare to the recombination rate, the atmosphere at the higher altitude remains inthe plasm state called as ionosphere. The amount of plasma present in the ionosphere can be well studied bycalculating the amount of Total Electron Content in the ionosphere (TEC). These TEC keeps on varying with dayand night, seasons, latitude and with solar activity. As the variation of TEC at both high and low latitude stationsare highly fluctuating and therefore are of deep concerned from the point of navigation and precise positioning.Keeping this in view a comparative study of TEC between the high latitude station Ny-Alesund (78.9°N Lat. And11.9°E Long.) and at the low latitude station Bhopal (23.2°N Lat. 77.4°E Long.) was carried out using GPS data.The study revealed that during the low solar activity period, the disturb days value of TEC remained high ascompared to that of quiet days at the low latitude station as well as at high latitude station.

Keywords: Ionosphere, Total Electron Content (TEC), Quiet days, disturbed days, Solar activity.

PH-16

The study of diurnal variation, of Cosmic Ray Intensity and Total Electron Content

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ABSTRACT :

The Sun is a very dynamic star, the energy expelled in terms of solar radiance or solar mass ejection is well felt on theearth. The Cosmic Ray consists of electrons, neutrons and atomic nuclei, which have been accelerated to very high speed.Anomalous cosmic ray reveals the new insight in the dynamic processes in the heliosphere and its interaction with the localinterstellar medium. Practically all the experimental studies of the solar daily variation of cosmic rays have been carriedout with the earth-based detectors responding to the particles of varying energies. This is of particular significance for themeson component measured at low levels in the atmosphere and enables correction to be made for variations ofatmospheric origin. In the present study the pressure corrected hourly data of neutron monitor at high latitude station'Kiel' and low latitude station 'Haleakala' for different days of the year 2000 has been distributed into five group of Apindex. The average diurnal vector of cosmic ray intensity for these groups has been well represented in terms of percentageamplitude and phase in form of the harmonic dial representation. The energy transported from the sun to the earth, altersthe amount of Total Electron content (TEC) present in the ionosphere. The paper also presents the insight into the diurnal variation of TEC.

*Keywords***:** Solar radiance; Solar mass ejection; Ap Index; Average Diurnal Vector; Cosmic Ray; Solar Cycle.

PH-17

Solar Cycle 25: Analyzing the Peak Phase and Its Impact on Space Weather

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ABSTRACT :

Solar Cycle 25, which began in December 2019, has entered its maximum phase, marked by a notable risein solar activity, including an increase in sunspots, solar flares, and coronal mass ejections (CMEs). Thisheightened activity has led to powerful geomagnetic storms, such as those in May 2024, which producedstriking auroras visible as far south as Florida. Solar Cycle 25, anticipated to peak around July 2025 withan estimated 115 sunspots, features a prolonged and more intense maximum phase compared to itspredecessor, Solar Cycle 24. These conditions have resulted in frequent and severe solar storms withsignificant implications for satellite operations, communication systems, and astronaut safety duringplanned missions. The ongoing cycle is the most extensively observed in history, facilitated by advancedsolar observation satellites and ground-based monitoring systems. Additionally, new solar observationmissions launching in 2024 aim to enhance our ability to monitor and predict solar phenomena, offeringcrucial insights into space weather forecasting and its impact on Earth and space exploration.

Keywords: Solar Cycle 25, solar activity, sunspots, solar flares, coronal mass ejections (CMEs),geomagnetic storms, auroras, space weather, satellite operations, astronaut safety, solar observation, spaceexploration, space weather forecasting.

PH-18

Study of Maximum Cosmic Ray Intensity in Last Five Years during Solar Cycle

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ABSTRACT :

We study in this paper would we analyze the data from cosmic ray (CR) detect by neutron monitor (NM)over a recent five-year period, focusing in particular on the peak intensity of cosmic rays (CR) occurringduring the recent solar cycle (SC), which typically lasts around 11 years, to value how the solar motioninfluence the level of cosmic rays (CR) reaching Earth, with the expectation that the highest intensity willbe observed near the solar minimum phase (SMP) when the Sun & magnetic field (MF) is weaker,allowing more cosmic rays (CR) to enter. The maximum cosmic ray intensity (CRI) occurs near the solarminimum phase (SMP) of the cycle, as the reduced solar activity (SA) during this period allow moregalactic cosmic rays (GCR) to reach Earth with less disturbance from the solar wind (SW) and magneticfield (MF); this inverse correlation means that as sunspot (SN) activity decreases, cosmic ray intensity(CRI) increases. They can travel to earth just about unrestricted so the intensity is forever maximum at thepoles. The earth magnetic field (MF) is the main reason for the decrease in cosmic ray intensity (CRI) atthe equator. In the poles, the exciting particles are travelling similar to the direction of the magnetic field(MF). We obtain sunspot data through the Solar Influence Data Center (SIDC). Cosmic ray intensity(CRI) we observe by the data of Oulu Cosmic Ray Station (CRS).

Keyword: Solar Cycle, Cosmic Ray Intensity, SSN, Solar Wind, Galactic Cosmic Ray, MF etc.

PH-19

Study of composition dependent structural, optical and electrical properties of (Zn 1-y Cu y) 1-x Cd x S QD's

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ABSTRACT   **:**

In the present work (Zn 1-y Cu y) 1-x Cd x S nanoparticles have been prepared by simple wet chemical co-precipitation method at room temperature and characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), atomic force microscopy (AFM), UV-visible absorption spectroscopy and impedance spectroscopy. The XRD patterns confirm cubic structure with broad diffraction peaks which shifts to lower angles with increasing Cd content, indicating formation of alloyed nanoparticles. SEM, and AFM measurements confirm nanocrystalline nature (particle size ~ 6 to 20 nm) of (Zn 1-y Cu y) 1-x Cd x S particles. Systematic Cd doping induces a red shift in the energy band gap of (Zn 1-y Cu y) 1-x Cd x S nanoparticles. Electrical conductivity behaviour appear to double activation process of variable range hopping mechanism described by Davis- Mott model.

PH-20

Temperature Effect on Electroluminescence of Eu Doped ZnS Phosphors

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ABSTRACT :

Study of Temperature effect on Electroluminescence brightnessof ZnS:Eu,Cl Phosphors. It is found that the initially the EL brightness increase withtemperature attains a maximum value and finally it decrease with temperature. Thepeak corresponding the EL brightness versus temperature curve shift towardshigher temperature values with increase frequencies. It is also found that higherheating rate shifts the peak towards lower temperature side. It is concluded thatwhen the temperature of phosphors are increased the number of excited as well asrecombining electron in the available frequency interval increases and hencebrightness increases. If the temperature further increases the EL brightness fallsdown because of the thermal quenching.

*Keywords:*Electroluminescence, Thermal quenching

PH-21
Algorithmic Development of Switching Between Processors for Interconnection Network

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ABSTRACT :

  The rapid advance of computational systems has significantly increased thedemand for efficient and scalable interconnection networks to support seamlesscommunication among processors. These networks are the backbone of a distributedsystem, data centers, and supercomputers, where performance, reliability, andadaptability is critical. One of the core challenges in such networks is developing aneffective mechanism for dynamically switching between processors to optimize resourceutilization, minimize communication latency, and enhance overall system performance.This paper based on the algorithmic development of switching mechanisms tailored forinterconnection networks, addressing challenges such as dynamic routing, congestionmanagement, fault tolerance, and load balancing.As the level of complexity of digital systems increases, the problem of interconnectingsubunits is receiving increasing attention.

Keywords: Interconnection Network, Switching, Communication Algorithm, FaultTolerance etc.

PH-22
Role of Machine Learning Techniques for Smart Irrigation System

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ABSTRACT :

  There is a need to determine the need for a Smart Iceland technology scenario for a library of weather data or soil. Smart Sewage Technology includes: These products maintain the health and quality of the sewerage system by reducing the water tank and majorly incorporating the Sewage System. Traditional agriculture has been the pillar of development on the planet for centuries. But with exponential population growth and increasing demand, farmers will need water to irrigate the land to meet this demand. Because of the scarcity of this resource, farmers need a solution that changes the way they operate. With the advent of new technologies, the notion of Agriculture 4.0 has become a reality to keep up with and meet the demand. With the addition of artificial intelligence and iot through the collection and processing of agricultural data, decisions have become more and more precise to facilitate decision-making. This paper proposes an intelligent and flexible irrigation approach with low consumption and cost that can be deployed in different contexts.

PH-23

Signature of ~27 days and Heliospheric Variation of Solar Activity Parameters during the Period (2009–2012 and 2020 to 2023)

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ABSTRACT :

We study a period of ~27 days and heliospheric effect for selected solar activity parameters:sunspot number (SSN), sunspot area (SSA), modified coronal index (MCI), solar radio flux(F10.7), chromospheric composite Mg II index and Galactic cosmic rays (GCRs), during theascending phase of solar cycles 24 and 25 (2009–2012 and 2020 to 2023). The Waveletanalyses of daily data of SSN, SSA, MCI, Mg II, F10.7, and GCRs (Oulu), reveal a solarrotational period of ~27 days. We studied the heliospheric effect on solar activity parametersand found the highest time lag for SSA is ~300 days, and for SSN is ~270 days during theascending phase of solar cycle 25. The highest cross-correlation values are 0.998 and 0.996for chromospheric composite Mg II index with Galactic cosmic rays (GCRs) during theascending phase of solar cycle 24 and 25 respectively. The chromospheric composite Mg IIindex is a good indicator of solar activity indices and it is strongly correlated to SSN.

PH-24

Study of the long-term behaviour of Cosmic Ray Intensity in association with Sunspot Number and Solar Flare Index during Solar cycle 24 & 25

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ABSTRACT :

In this study, we analyzed the annual mean values of cosmic ray intensity (CRI) recorded at the OuluSuper Neutron Screen alongside the annual mean values of sunspot number (SSN) and solar flareindex (SFI). We performed a correlation analysis between the annual mean CRI variations and thecorresponding SSN and SFI values over the period of solar cycles 24 and 25. To visualize theserelationships, we generated line and bar graphs comparing the annual mean CRI, SSN, and SFI. Theresults demonstrate a clear inverse correlation between the annual mean CRI and the annual meanSSN and SFI across the studied period. Statistical calculations of the correlation coefficients furtherconfirmed this inverse relationship.

Keywords: Sunspot Number (SSN), solar flare index (SFI), Cosmic ray intensity, and solar cycle.

PH-25
Para-Kenmotsu Manifolds admitting Quarter-Symmetric Metric Connection

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ABSTRACT :

The object of the present paper is to study various geometric properties of Para-Kenmotsu manifoldsadmitting quarter-symmetric metric connection and relationships between curvature tensors ofpara-Kenmotsu manifolds with respect to quarter-symmetric metric connection and Levi-Civitaconnection have been obtained. We studied quasi- concircularly flat para-Kenmotsu manifold withrespect to quarter-symmetric metric connection as well as -concircularly flat para-Kenmotsumanifold with respect to quarter-symmetric metric connection and shown that the manifold is an Einstein manifold. Further, we consider , which provides an Einstein manifold with respect to Levi-Civita connection, where and are concircular curvature tensor and Ricci tensor with respect toconnection .

Keywords: Para-Kenmotsu manifolds; quarter-symmetric metric connection; quasi-concircularly flat;concircularly flat para-Kenmotsu manifold; Einstein manifold; - Einstein manifold.

PH-26
The Convection Zone of Photosphere in Chromospheres Temperature and Minimum Region of the Solar Corona

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ABSTRACT :

The convection zone is the outer-most layer of the solar interior. It extends from a depth of about 210 5 km right up to the visible surface. The temperature at the base of the convection zone is about 2x10 6 °K. Ranging from 0.7 solar radii to 1.0 solar radi thematerial in the Sun is not that much dense or hot to transfer the heat energy frominterior to outward. Hence thermal convection occurs as thermal columns carry hotmaterial to the surface (photosphere) of the Sun. As soon as the material cools off at thesurface it plunges backside downward to the base of the convection zon, to obtain moreheat from the top of the radiative zone. Convective exceed is thought to occur at the base of the convection zone, moving turbulent down flows into the outer layers of theradiative zone. The thermal columns in the convection zone shape mark on the surfaceof the Sun, in the form of the solar granulation and super granulation. The visiblesurface of the Sun, the photosphere, is the layer below which the Sun becomes opaque tovisible light. Photons produced in this layer escape the Sun through the transparentsolar atmosphere above it and become solar radiation, sunlight. During a total solareclipse, when the disk of the Sun is covered by that of the Moon, parts of the Sun'ssurrounding atmosphere can be seen. The regions of the Sun above the photosphere areknown as the solar atmosphere.

PH-27
A Study of Artificial Intelligence and Parallel Computing

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ABSTRACT :

Within the last era, the practice of "Artificial Intelligence" has become popular across multiplediscirplines, especially in information systems and social sciences. In this paper we present areview of Artificial Intelligence (AI) concepts with exploring emerging trends, andmiscellaneous applications. AI is a bigger concept to create intelligent machines that cansimulate human thinking capability and behavior, AI has rapidly evolved, becoming pivotal innumerous fields including healthcare, finance, manufacturing, and autonomous systems.Application and trends of artificial intelligence is heaving a huge Impact on various fields of lifeas expert system is used to solve complex and automation problems. This paper explore thetechnology, scope and key concepts of artificial intelligence in different areas with specialreference to the use of this technology in the field of education along with its meaning, searchingtechniques, inventions and future.The study starts by fundamental study and exploring key concepts, delves into various learningparadigms such as supervised, unsupervised, and reinforcement learning. The paper alsoexamines current trends, including the rise of ethical AI; explain ability, and the integration of AIwith Parallel and Distributed Computing, which are shaping the future landscape of AIapplications. Additionally, it addresses the challenges and limitations associated with AI such asenable real-time computing, improve sustainability, improve data sovereignty, data privacyconcerns, model interpretability, and the need for sustainable computing solutions.

*Keywords:*Artificial Intelligence, Parallel and Distributed System, Sustainable Computing, Learning , Expert System.

PH-28
Solar activity is the coronal mass ejections with geomagnetic activity

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ABSTRACT :

One of the pivotal gauges of solar activity is the coronal mass ejections (CMEs), particularly inconnection with the results of short term events within the heliosphere. Despite the fact that CMEs show a closerelation with sunspot number, they are also allied with rest of the Sun's magnetic regions like quiescent filamentregions; thereby making CMEs a better indicator of Solar activity. The sunspots mostly constitute the toroidalmodule of solar magnetism, the quiescent filaments along with allied CMEs couple toroidal –poloidal componentthrough a phenomenon called rush-to-the-poles (RTTP). The variation of RTTP in two hemispheres indicates thesolar-polarity reversa. It can be depicted that this north-south dissymmetry has a quasi-periodicity of 3-5 solarcycles. Taking into account the effects of CMEs in geospace, the maximum CME speed with mean over Carringtonrotation period are shown to have a good correlation with geomagnetic indices like Dst and aa.Keywords: Coronal Mass Ejection, Prominence eruption, RTTP, Polarity reversal symmetry, geomagnetic activity

PH-29
Geomagnetic storm occurred in 2024

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ABSTARCT

Geomagnetic storms are significant space weather events that can disrupt Earth &magnetosphere, leading to potential impacts on technological systems and human activities.In 2024, a notable geomagnetic storm occurred, characterized by intense solar activity and its subsequent interaction with Earth's magnetic field. This storm was triggered by a CoronalMass Ejection (CME) associated with a solar flare from an active region on the Sun. Keyobservations included heightened auroral displays at lower latitudes, disruptions in satellitecommunication and navigation systems, and voltage irregularities in power grids.Space-based instruments, including satellites in geostationary and low-Earth orbits, detected asubstantial increase in charged particle flux and variations in geomagnetic indices, such as the Kp and Dst indices, which peaked at severe storm levels. Ground-based magnetometersconfirmed these disturbances, offering valuable insights into the storm& magnitude andglobal reach.This event underscored the critical need for improved space weather forecasting andmitigation strategies. This research highlights the storm& characteristics, its effects ontechnological infrastructure, and its implications for space weather preparedness. Lessonslearned from the 2024 geomagnetic storm can inform future efforts to enhance the resilience
of critical systems against similar space weather phenomena.

PH-30
The study of diurnal variation, of Cosmic Ray Intensity and Total Electron Content.

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ABSTRACT :

The Sun is a very dynamic star, the energy expelled in terms of solar radiance or solar mass ejection is well felt on theearth. The Cosmic Ray consists of electrons, neutrons and atomic nuclei, which have been accelerated to very high speed.Anomalous cosmic ray reveals the new insight in the dynamic processes in the heliosphere and its interaction with the localinterstellar medium. Practically all the experimental studies of the solar daily variation of cosmic rays have been carriedout with the earth-based detectors responding to the particles of varying energies. This is of particular significance for themeson component measured at low levels in the atmosphere and enables correction to be made for variations ofatmospheric origin. In the present study the pressure corrected hourly data of neutron monitor at high latitude station'Kiel' and low latitude station 'Haleakala' for different days of the year 2000 has been distributed into five group of Apindex. The average diurnal vector of cosmic ray intensity for these groups has been well represented in terms of percentageamplitude and phase in form of the harmonic dial representation. The variations in sun, alters the amount of Total Electroncontent (TEC) present in the ionosphere. The paper also presents the insight into the diurnal variation of TEC.

Keywords: Solar radiance; Solar mass ejection; Ap Index; Average Diurnal Vector; Cosmic Ray; Solar Cycle.

PH-31

Comparative study of geomagnetic storm during solar cycle-24

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A geomagnetic storm is a temporary disturbance of the Earth's magnetosphere caused by a solarevent. The direction of the magnetism in the eruption will determine how much affect the storm hason Earth. If the solar wind field is pointing northward, it will be repelled and slip by the Earth&magnetosphere and little harm will be done. A geomagnetic storm is a major disturbance of Earth&magnetosphere that occurs when there is a very efficient exchange of energy from the solar windinto the space environment surrounding Earth. These storms result from variations in the solar windthat produces major changes in the currents, plasmas, and fields in Earth& magnetosphere. Thelargest storms that result from these conditions are associated with solar coronal mass ejections(CMEs) where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrivesat Earth. CMEs typically take several days to arrive at Earth, but have been observed, for some of themost intense storms.A geomagnetic storm is clarify by the development of the ring current inmagnetosphere of geomagnetic field which is produced by energetic ions or particles. Generally wecan know about more deep information regarding geomagnetic storm by Dst growth and decay ofgeomagnetic storm can be monitored by the Dst Index, Kp and Cp with respect to C9.Geomagnetic activity levels during the rise phase (first 4 years) of solar cycle 24 were lower thanduring any comparable periods since at least cycle 17, the earliest cycle that can be investigatedusing the Kp geomagnetic index.The rate of storm days (defined by the NOAA G storm sizes) duringthe rise phase of each cycle in approximately correlated with the peak SSN in the cycle. If thisrelation-ship can be extrapolated to the lower storm rates found in cycle 24, they suggest values forthe peak SSN in cycle 24 that are consistent with the NOAA SWPC prediction, and indicate that cycle24 is likely to be the weakest cycle since at least 1932.Both ICME- and stream-related storm activity were reduced in the rise of cycle 24 compared to cycle20-23. No severe (Dst <-200 nT) storm were observed during the rise of cycle24, whereas such stormwere present in all the previous cycle since cycle 20, the earliest cycle with complete Dst data. Therehave been half as many intense (D<-100 nT) storm as in the similar period of cycle 23.An ICMEobserved at STEREO in July 2012 with southward magnetic fields reaching -45 nT might haveproduced an intense storm with minimum Dst -300 nT had it instead encountered the Earth. Thus,the unusually weak level of geomagnetic activity prevailing during the rise of solar cycle 24 do notalso imply that exceptionally strong storm are unlikely to occur during this cycle.Magnetic reconnection is very effective when the interplanetary magnetic field is directedsouthwards leading to strong plasma injection from the tail towards the inner magnetospherecausing intense auroras at high-latitude nightside region. The solar wind energy input in the magnetosphere is 1011 W during substorms and it is -1013 W during moderate magnetic storm.The basic process of energy transfer magnetic reconnection remains the same, but it occurs ondifferent time and spatial scales. Magnetopheric substorms usually last for a period one to a fewhours. During sub-storms there is an explosive please of stored magneto tail energy in the form ofenergetic particles (-5-50 keV) and strong plasma flows (100-1000 km/s or so) and dissipated in thenear-Earth nightside auroral region. This results in the excitation of discrete auroras which becomewidespread and intense, also much more agitated. The Earth magnetic field gets disturbed due tointensified field aligned current and auroral electojets, the aurora observe over Indian Antarcticstation Maitri.

PH-32

Quasi-Para-Sasakian Manifolds admitting Quarter-Symmetric Metric Connection

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ABSTRACT

The purpose of the present study is to deduce some curvatureproperties of quarter-symmetric metric connection. We studiedLocally φ-symmetric quasi-para-Sasakian manifold, φ-recurrentquasi-para-Sasakian manifolds, Locally projective φ-symmetric quasi-para-Sasakian manifold with respect to Quarter-symmetric metricconnection.

Keywords: Quarter-symmetric metric connection, Quasi-Para-Sasakianmanifold, φ- symmetric quasi-para-Sasakian manifold.

PH-33

Study of Interconnection Structure for Parallel and Distributed System

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ABSTRACT :

Parallel Processing are increasing in demand in the areas of structural analysis, artificial intelligence, automation andremote sensing among many other scientific and engineering application. Without effective algorithm forcommunication many of these challenges to advance human civilization cannot be made within a reasonable timeperiod. Achieving effective and reliable performance depends not only on mechanical properties but alsoimprovements in connectivity, complexities and topological properties. This work is devoted to studying topologicalproperties and structural analysis to meet the requirement. These papers also reviews and explore P and NP problemto study the performance of Quantum or Edge Computing by understanding the properties, structure andrelationship between processors.

*Keywords:*Parallel Computing, Quantum Computing, Artificial Intelligence, P and NP problem

PH-34

Ricci solitons on generalized quasi-conformally recurrent para-Kenmotsu manifolds

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ABSTRACT

Ricci solitons serve as a natural extension of Einstein metrics on Riemannian manifolds, acting as generalized fixed points of Hamilton & Ricci flow equation. The Ricciflow, defined by this evolution equation, functions as a nonlinear diffusion process analogousto the heat equation, but for Riemannian metrics. Through this flow, the metric evolvestowards a more canonical form by gradually smoothing out irregularities. Depending on the manifold 's Ricci curvature, the metric expands in regions of negative Ricci curvature and contracts in areas of positive Ricci curvature. The object of the present paper is to study -Ricci solitons on generalized quasi-conformally recurrent para-Kenmotsu manifolds.M.S.C. 2010: 53C21, 53C25, 53C44

Keywords: Recurrent manifold; Ricci tensor; quasi-conformal curvature tensor; Einstein manifold; -Ricci solitons; para-Kenmotsu manifolds.

PH-35

Modulation of cosmic rays in connection with solar and heliosphericcharacteristics

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ABSTRACT :

The interplanetary parameters linked to major geomagnetic storms and Forbush decreases havebeen examined in this research. In this paper, we have been conducted using hourly data of solarwind plasma, cosmic ray intensity (CRI), and geomagnetic activity from 1996 to 2024 whichcover the solar cycle 23, 24, and maxima of solar cycle 25. The disturbance storm time (Dst)index is often used to measure the intensity of geomagnetic storms. Large storms in geomagneticactivity are caused by interplanetary manifestations of coronal mass ejections (ICMs). Itsprimary phase is characterized by a significant drop in Dst during geomagnetic storms. A sharpdrop in cosmic ray intensity (CRI) signifies a forbush decrease. FDs are a sharp drop in galacticcosmic ray (GCR) intensity that happens when GCRs are swept away from Earth by the solarwind's magnetic field. We found that there is an anti-correlation between the CRI and Rz, B, and V for the solar cycle 22 to 24.
Keywords: Cosmic rays, Solar wind, and Geomagnetic activity.

PH-36

Molecular structures, spectral, electrochemical, DFT and antioxidant activities of copper(II) complexes with NNO donor Schiff base ligand

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ABSTRACT :

The synthesis and solid state structural, spectral and electrochemical solution characterization of $[Cu(L)(acpy)]ClO_4$**1** and $[Cu(L)(NO_3)]$ **2** [where L = *N'*-[(*E*)-phenyl(pyridin-2-yl)methylidene]thiophene-2-carbohydrazide and acpy = 2,6-Diacetylpyridine] have been done by elemental analysis, UV–vis, FTIR, electrochemical techniques (CV and DPV) and electron paramagnetic resonance (epr) spectroscopy. The single crystal structures were solved by the X-ray diffraction technique. In complex **1**, copper ion is in a distorted octahedral environment. The geometry of copper(II) in complex 2 is distorted square pyramidal (τ= 0.201). The mono deprotonated, HL ligand act as a tridentate to a copper(II) ion. On the basis of density functional theory (DFT) calculation, the electronic excitations involve transitions mainly from metal ligand bonding mostly the α-LUMO within the dominant Cu d_{xy} character and to α-LUMO+1. Epr spectra for polycrystalline samples showed the copper(II) hyperfine features as well as half-field signal which are appropriate for $\Delta M_s = \pm 2$ of dimers. Presence of half-field signal in **1** is due to solid-solid interaction (intra-molecular) where as in **2** the nature of interaction is intra-molecular. The antioxidant superoxide measurements show that the both complexes **1** and **2** behave as superoxide mimic in alkaline nitro blue tetrazolium chloride assay.

*Keywords:*Copper complexes, Electrochemistry, Electronic spectra, DFT calculations, Antioxidant SOD activity

PH-37
Study of Inter-Processor and Inter-Communication link BinaryRelationships for Load sharing/balancing algorithm in Parallel or distributed architectures

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ABSTRACT :

The paper focuses on to identification of the binary correlation among processingnodes and the edges of the hypercube through the set theoretic binary operation andlogical binary operation. The binary correlation so derived are helpful inunderstanding the nature of communication links, and important in a view ofunderstanding the structural connectivity among processors. The ordered pairrepresentation for the processors in hypercube interconnection network is beingintroduced on the basis of connectivity among processing elements in the degreenlog 2 N (n depicts dimensions in the interconnection network). Structural propertiesare being revealed among set of processing elements, Cartesian product is beingapplied that satisfies all the properties of binary relation among processing elements, as hypercube interconnection network is based on the perfect number system.Existence of reflexive, anti-symmetric and transitive properties is provable with thehelp of principal conjunctive normal from ("AND ($\wedge$)").This study of the processor-processor and edge-edge relationship (assumed to be bi-directional), helped tonavigate through the parallel communication links or next possible hop (processingelement) in the load balancing or load sharing or routing algorithm of finding shortestpath of the communication among two nodes.

Keywords: Hypercube, Set Theoretic operation, Logical operation, Binary relation,Cartesian product, load balancing, parallel system, distributed system

PH-38
Biosensor for Selective Gelatin Detection in ETP Water: Enhancing Treatment and Resource Recovery

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ABSTRACT :

Effluent Treatment Plants (ETPs) are crucial to controlling and lessening theimpact of industrial wastewater, which contributes significantly toenvironmental degradation. However, new pollutants are being introduced morefrequently as industries change, which calls for creative treatment methods. Thepresence of gelatin in wastewater from particular industries, such foodmanufacturing and pharmaceuticals, is one such new problem. If gelatin, acollagen-derived protein, is not adequately eliminated, it may reduce theeffectiveness of traditional therapeutic procedures. Because gelatin is an aceousprotein, its presence in ETP water presents special difficulties that demand fortechniques that can identify and remove it with precision while leaving otheringredients unaffected.With its benefits over traditional chemical approaches interms of sensitivity, specificity, and real-time monitoring, biosensor technologyhas emerged as a viable way for detecting and isolating such specificcontaminants. This research suggests creating a biosensor for the selectivedetection and extraction of gelatin from ETP water in order to increasetreatment efficacy and aid in resource recovery, given the increasing demand foreffective water treatment solutions. The effluent from the creation of emptyhard gelatin capsules frequently comprises between 30 to 40 percent gelatin. Asignificant amount of valuable material is lost when this gelatin content istransported to the Effluent Treatment Plant (ETP) for disposal. Since gelatin is akey non-sterile ingredient in the manufacturing of capsules, recovering it fromwastewater might greatly enhance both the productivity and economicefficiency of capsule manufacturing operations.

Keywords: Biosensor Development, Gelatin detection, ETP Water quality monitoring

PH-39
MXene-Based Optical Sensors for Rapid Detection of Fluoride Ions in Groundwater

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ABSTRACT :

Groundwater with the presence of Fluoride causes a serious health hazard known to mankind,as it originates from sources such as industrial emissions and geological formation or evenwater distribution system materials. Conventional detection methods are labor-intensive andtime-consuming, relying on manual sampling combined with limited laboratory testing.Therefore, design and fabricate highly specific fluoride sensors are required for theenvironmental monitoring or public security. MXene-Based Optical Sensor for Short TimeDetection of Fluoride Ions in Ground Water MXene is derived from the MAX phases and hasunique optical characteristics as well as a high surface area, which suits it for sensingapplications. MXene was synthesized by a selective etching of the MAX phase and itssurface functionalization to improve fluoride ion adsorption. Optical sensing was done usingUV-Vis absorption spectroscopy and fluorescence emission techniques, FTIR, PL ,SEM,XRD. MXene-based sensors showed good optical response to fluoride ions as seen fromchanges in absorbance and fluorescence intensity upon binding. The sensors showed highsensitivity, low detection limits and selectivity over other anions. This study demonstratesthat MXene-based optical sensors can serve as a feasible and efficient tool for detection offluoride ions in groundwater, which is crucial to public health and water safety standards.

Keywords: MXene, fluoride detection, groundwater monitoring ,optical sensor system; UV-Vis spectroscopy and fluorescence emission, XRD, PL, SEM

PH-40
IoT-Interfaced 3D Simulated Sensor for Real-Time Monitoringof Fluoride in Drinking Water

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ABSTRACT :

Water pollution is one of the biggest problems for human health as it affects health, and the economy and spoils bio-diversity. Smart solutions for monitoring water pollution are currently demand in worldwide. Innovations in sensors, communication, Artificial Intelligence (AI) and Internet of Things (IoT) technologies make it real-time observations of contaminants in drinking water. Fluoride is an essential mineral that plays a crucial role in dental health, but excessive intake can lead to health problems such as dental fluorosis, skeletal fluorosis, and even neurological disorders. To ensure it falls within the safe limits prescribed by regulatory authorities, a developed sensor aims to provide a low-cost and efficient solution for fluoride detection using IoT and 3D simulation technology. The system utilizes sensors to measure the fluoride levels in real time and a 3D simulation to visualize the results, making it easy for non-experts to understand the data. In this study, a 3D Simulated design is selected and novel material graphene quantum dots (GQDs) nanocomposites is developed for sensing fluoride up to 2 ppm detection range. Node-mcu microcontroller is used for control, Circuito is used for designing circuits, and Solidworks for simulations. The method involves activating the I2C interface, testing parameters, and publishing the computed concentration to an IoT dashboard. The developed sensor is optical in nature and the results are displayed at the indicator. This approach is based on the sensor fusion concept. In this work, I present a design and development of a cost-effective, user-friendly sensor for real-time monitoring of water quality based on IoT via a cloud network system. The developed sensor can detect the concentration of Fluoride in water samples and alarm the user with inbuilt artificial intelligence specifically Artificial neural network (AI-ANN). The developed sensing device gives more accurate results for sensing fluoride.

Keywords: Sensor development, IoT, Water quality monitoring, Graphene Quantum Dot, Artificial Intelligence.

PH-41

Silver-plated graphene-modified carbon foam for outstanding electromagnetic interference shielding performance

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ABSTRACT :

The modern electronics industry needs lightweight, porous materials with high-performance electromagnetic interference (EMI) shielding effectiveness (SE) and effective thermal management. This study proposes a straight forward electrochemical technique to produce light weight silver-plated (Ag-plated) graphene-modified carbon foams (Gr@CFs) with good thermal conductivity and outstanding EMI shielding performance. Initially, Gr@CFs weresynthesized via a sacrificial template method utilizing phenolic resin as a carbon precursor and graphene nano platelets (GNPs) as fillers, followed by carbonization at 1000ºC. Subsequently, the synthesized Gr@CFs experienced electroplating with silver (Ag) for varying durations ranging from 1 to 10 minutes. The Ag electroplating contributed to highEMI SE and endowed the Gr@CF with commendable electrical, thermal, and mechanical properties. The resultant Gr@CF with Ag plated for 10 minutes (Gr@CF-Ag10) possesses are markable combination of attributes: a high electrical conductivity of 180 S/cm and excellent EMI SE of 73.5 dB at X-band, along with enhanced compressive strength of 6.5MPa. Moreover, the fabricated Ag-plated Gr@CFs exhibit outstanding properties that renderthem well-suited for application in electronic devices requiring EMI shielding.

Keywords: Graphene foam, electroplating, silver, thermal conductivity, and EMI shielding.

IT-42

A Morphological Approach to Dependency Analysis in Parallel Interconnection Networks

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ABSTARCT :

The essential concepts of interconnection networks, data structures, and system architecturesin the context of parallel computing, with a focus on their role in enhancing high-performance computing (HPC). As the evolution of computer architectures introduces anincreasing number of nodes, parallelism emerges as a critical approach to improvingalgorithm speed and system performance. This study elaborates on the transformation ofgraphical models into circuit diagrams, switching functions, and their simplifications tomodel interconnection networks efficiently.This paper also investigates the dependencies and morphological properties ofinterconnection networks, which are determined by topological characteristics, datastructures, system architectures, processing modes, and algorithms. The study highlights thefundamental role of interconnection networks in high-performancecomputing (HPC)systems, where parallel processing has become a critical approach to improvingcomputational efficiency. The increase in nodes, enhanced reliability, and reduction in complexities such as communication time and cost has significantly optimizedinterconnection network performance.A new approach for modelling interconnection networks is introduced, focusing oninterconnect-wrapper and ReConBox (Reconfigurable Connection Box) concepts ofreconfigurable networks. Both concepts are compared and proven equivalent, providingefficient modelling of diverse reconfigurable inter-processor networks. The research employsthe Multi2Sim simulator to evaluate and optimize interconnection topologies, such as Ring,Mesh, and Torus, based on performance metrics like IPC (dispatch, issue, commit) andaverage latency. Simulation results demonstrate that Torus topology with 4 cores achievesminimal latency and superior overall performance, making it the optimal design choice. Thestudy further explores on-chip networks within multicore systems, where communicationoccurs via segmented packets and flow-control bits. Using a "timing-first" simulationscheme, the Multi2Sim framework allows efficient experimentation with functional andtiming simulations without requiring a full OS simulation. This work emphasizes trade-offsbetween performance, power, and area, demonstrating the relevance of interconnectionnetwork dependencies and morphology for enhancing massively parallel processorarchitectures.

Keywords: Interconnection Networks, High-Performance Computing (HPC),Reconfigurable Networks, Topology Dependencies, Morphological Analysis, MulticoreProcessing

IT-43
Innovations in Itemset and Web Usage Mining: From Frequent Patterns to Dynamic Parallelization

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ABSTRACT :

High-Yield Pattern Mining: A Utility-Based Approach to Data Analysis (HYPM) is an extension offrequent itemset mining, incorporates quantitative measures like unit profit, enabling its applicationacross diverse knowledge discovery tasks. Despite significant advancements in algorithms over thepast two decades, the potential of leveraging hardware advancements remains underexplored. In thefield of data mining, High-Yield Pattern Mining (HYPM) is a relevant mining task, with the aim ofanalysing customer transaction databases. HYPM consists of exploiting the set of items that areoften purchased together and yield high profit value. In practical scenarios, transaction databasesfrequently incorporate taxonomies that categorize items into hierarchical groups. This structureallows items to be analysed not only individually but also as part of broader categories, facilitatinginsights at multiple levels of abstraction. Extracting and analysing item-sets discovered fromdifferent levels of abstraction can provide more useful insights into customer behaviours.Incorporating item taxonomy significantly increases the complexity of the problem, leading to longerexecution times required to explore the search space. To mitigate this challenge, parallelism isemployed. However, existing approaches are often inefficient, relying on basic scheduling strategiesor failing to fully leverage the potential of multi-core processors. To address this, we presentDPHYPM (Dynamic Parallelization for High-Yield Pattern Mining), a novel parallelization methodthat dynamically decomposes mining tasks into subtasks. DPHYPM optimally allocates tasks and datato physical resources, such as processing cores and NUMA-aware memory, achieving significantperformance gains.Additionally, Web Usage Mining (WUM) methodologies are explored, leveraging data sources suchas web host logs and customer session records to extract actionable insights. By employing techniqueslike statistical analysis, association rule mining, clustering, and sequential pattern discovery, WUMidentifies user behaviours and predicts future interactions. Together, HYPM and WUM highlight theevolving role of mining algorithms in advancing hardware-aware analytics and web data utilization.

Keywords: High-Yield Pattern Mining (HYPM), Dynamic Parallelization, Web Usage Mining(WUM), Parallel computing in data mining, Multicore architectures, Web log analysis.

IT-44
Transforming Agriculture with Generative AI: Applications and Innovations for Sustainable Farming

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ABSTRACT :

The agricultural industry faces increasing challenges, including unpredictable weather patterns, limited resources, pest infestations, and the rising demand for food production. Generative Artificial Intelligence (AI) has emerged as a groundbreaking solution to address these issues by enhancing decision-making, improving productivity, and fostering innovation. This study explores the application of Generative AI models, such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and diffusion models, across various agricultural domains. These models can generate synthetic data to augment training datasets, simulate crop growth under diverse environmental conditions, predict pest and disease outbreaks, and optimize resource management strategies. Furthermore, Generative AI facilitates the development of realistic scenarios for precision agriculture, including the creation of digital twins for farms to simulate and forecast outcomes effectively. The findings demonstrate that Generative AI significantly enhances agricultural practices by addressing data scarcity, enabling predictive modeling, and supporting real-time decision-making. This study highlights the transformative potential of Generative AI in agriculture, paving the way for sustainable, resilient, and data- driven solutions to global food security challenges.

*Keywords:*Generative AI, Agriculture, GANs, Synthetic Data, Precision Agriculture, Predictive Modeling, Digital Twins.

IT-45
Deep Learning-Based Automated Pest Detection for Precision Agriculture

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ABSTRACT :

Pest infestation is one of the most pressing challenges in modern agriculture, causing substantial crop losses and threatening global food security. Accurate and timely pest identification is essential for implementing effective pest control strategies. Traditional pest detection methods, such as manual field surveys, are time-consuming, labor-intensive, and prone to human error. To address these limitations, deep learning algorithms have emerged as powerful tools for automating and enhancing pest detection accuracy. This paper investigates several deep learning models, including Convolutional Neural Networks (CNNs), Faster R-CNN and YOLO (You Only Look Once), to detect and classify agricultural pests from image datasets. Leveraging large-scale labeled datasets and advanced feature extraction capabilities, these models achieve high accuracy and robustness in differentiating pest species across diverse environmental conditions. The results demonstrate that deep learning techniques outperform traditional approaches in terms of detection accuracy, speed, and scalability. Furthermore, this work highlights the importance of deploying these models on edge devices and UAVs (Unmanned Aerial Vehicles) for real-time field applications. Overall, this study underscores the transformative potential of deep learning in pest monitoring, enabling farmers to adopt data- driven, precision agriculture practices that reduce crop losses and minimize reliance on chemical pesticides.

Keywords: Pest Detection, Deep Learning, Convolutional Neural Networks(CNN), YOLO,Precision Agriculture, Image Classification, Real-Time Monitoring.

Section II

Life Science

LS-1
Plant Biodiversity of Forests of Bandhavgarh of Vindhya region of India

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ABSTRACT :

Bandhavgarh surrounded by thirty two small Vindhya hills. It is one of such natural gifts which is endowed with precious natural resources. The forests of this reason are mixed tropical moist deciduous climate type with*Shorea robusta* and *Dendrocalamusstrictus* trees. This forest comes under Sal zone of North-East of the Country. In year 1993 this Park is declared as the Bandhavgarh Tiger Reserve a core area of 694sq. kms. and Panpatha Sanctuary along with a buffer area of 437 sq. kms. On the basis of composition the forests are divisible into four categories namely: hill peak, hill slope, hill bottom forest groups and river, rivulet and water catchment forests. The rare variety of trees are *Ficus tomentosa*Roxb., a tree with one feet long pod, feathered seeded . In addition, *Casearia tomentosa*, *Casearia graveolens*, *Ficus semicordata*,*Limonissvifiddims*. Multiple medicinal plants are conserved in Bandhavgarh which are used as *Ayurvedic*medicines, through no action plan has been desired to protect and maintain them. The major medicinal plants prevalent in this area include: *Andrographis paniculata*, *Asteracantha longifolia*, *Asparagus racemosus*, *Abrus precatorius,Curcuma, angustifolia*, *Chorophytum tuberosum*, *Curculigoorchioides*, *Centellaasiatica*, *Cyamposis psoraloides* etc.The fruit trees are *Emblica officinalis*, *Buchananialanzan*, *Cordia dichotoma*, *Aeglemarmelo*s, *Feronia limonia*, *D*iospy*ros melanoxylon*, *Syzygium heyneanum* etc. whose fruits form the consumables for tribes and wild animals. Tectonically the species of trees of Bandhavgarh are classified as under dense group trees (high and medium pillar-shaped, high and medium shadowed),dense bushes, trees with persistent leaves,ex. forest trees. The birds and animals avail these forests for shelter according to their own convenience. The grass lands of Bandhavgarh are categories as Underhill top, hill bottom,marshy, rivulet side, extensive grazing,dense forest, hill slope grass lands whichprovides grasses for feeding of wild herbivores animals of the park. Present paper deals the plant biodiversity of forests ofBandhavgarh in detail.

LS-2
Acoustic Variation of Aggressive Vocal Activities of *Semnopithecus entellus* in Chitrakoot

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ABSTRACT :

Animals communicate through many methods like tactile signals, electrical signals, visual signals, chemical signals and acoustic signals. Acoustic signals are very essential for communication in *Semnopithecus entellus*. Nineteen types of different Vocalization had been reported in the past. Present research work is focussed on acoustic variation of *Semnopithecus entellus* to distinguish the behaviour, acoustic signals and different type of aggressive vocalization. The research work was carried out from July to December, 2023 in Chitrakoot. PRAAT was used for sound analysis of collected vocalization. The present investigations reveal the pitch variation in different aggressive vocal behavior grunt, long grunt, bark, harsh bark, grunt bark of *Semnopithecus entellus*.

Keywords: Acoustic signals, vocalization, bioacoustics, grunt, harsh barking, PRAAT.

LS-3
Enhancing Emergency Preparedness: A Strategic Framework for Action Plans in Dam Safety

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ABSTRACT :

Water storage reservoirs and dams play a vital role in agricultural development and, consequently, in the economic growth of a country. Dams facilitate the sustainable management of water resources and are designed to endure indefinitely. However, changes in environmental conditions, aging, and evolving usage patterns necessitate systematic reviews and periodic upgrades to ensure their continued functionality. Ensuring dam safety is essential for their long-term sustainability and for maintaining public trust. The dam owner must have a comprehensive action plan to minimize loss of life and property damage in the event of emergencies. An Emergency Action Plan (EAP) organizes and coordinates the activities of various agencies to effectively mitigate the consequences of emergencies triggered by dam failures or incidents. Inundation maps, illustrating areas likely to be flooded due to events such as overtopping, piping, or large controlled releases, are prepared for various flooding scenarios. The model simulations for these flooding scenarios were conducted using HEC-RAS. Inundation maps were subsequently generated for each scenario, highlighting vulnerability, maximum water depth, maximum water velocity, and maximum water surface elevation. These maps play a crucial role in the development of evacuation plans and identifying suitable locations for shelters.

Keywords: Dam, Emergency action plan, HEC-RAS, Sustainability, Vulnerability.

LS-4
Acoustic variation in morning chirrup and happy chirrup of Squirrels (*Funambulus pennantii*) in Chitrakoot

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ABSTRACT :

Animals use many types of signals to communicate with each other, such as chemical, visual, electric and acoustic signals. Acoustic signals have been used to study the behaviour of Squirrels. The present study focuses on acoustic variations of squirrels (Funambulus pennantii). This study has been conducted in Chitrakoot during the summer season between March to June. Multiple behaviour were observed in Squirrels (Funambulus pennantii), with data from two acoustic variation analysed. Two types of vocal behaviour have been studied in squirrels, Morning chirrup and happy chirrup sound. PRATT software has been used to study their behavior, through which sound has been analyzed through computer using PRATT software.

Keywords: Acoustic variation, Communication, Behavior, Morning chirrup, Happy chirrup.

LS-5
Sustainable Synthesis of Silver Oxide Nanoparticles from Lobularia maritima: A New Approach to Antioxidant and Photocatalytic Applications

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ABSTRACT

This study successfully synthesizes silver oxide nanoparticles (AgO NPs) with substantial antioxidant and photocatalytic capabilities, using *Lobularia maritima* (sweet alyssum) extract as a natural reducing and stabilizing agent. The AgO NPs exhibited strong antioxidant activity, achieving $80 \pm 0.02\%$ in the ABTS assay, $75 \pm 0.02\%$ in the DPPH assay, and a total antioxidant capacity (TAC) of 17.2 ± 0.01, comparable to standard antioxidants. In photocatalytic tests, the AgO NPs achieved up to 91% degradation efficiency against methylene blue dye under visible light within 120 minutes, increasing effectiveness at higher nanoparticle concentrations and suggesting promise for environmental remediation. The nanoparticles were thoroughly characterized to confirm their formation and properties. UV-visible (UV-Vis) spectroscopy indicated successful nanoparticle synthesis, while Fourier-transform infrared (FTIR) spectroscopy identified functional groups in the plant extract that contributed to nanoparticle stability. Scanning electron microscopy with energy dispersive X-ray (SEM-EDX) analysis verified a high silver and oxygen content, confirming the expected composition, and dynamic light scattering (DLS) showed a monodisperse size distribution. This eco-friendly synthesis aligns with green chemistry principles, offering a scalable, cost-effective approach to AgO NP production with applications in biomedical and environmental fields. Future studies could focus on refining these nanoparticles for broader industrial applications, utilizing their significant antioxidant and photocatalytic potential.

Keywords: Green synthesis, Lobularia maritima, Silver Oxide nanoparticle, X-ray diffraction (XRD), Ultraviolet-visible spectroscopy, Scanning electron microscopy (SEM)

LS-6
Study on Ambient Air Quality Parameters of Mauganj City, (M.P.) India

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ABSTRACT :

A continuous study of ambient air quality is necessary for determining regional environmental Conditions, mainly air pollutants. Pollutant concentrations, sources and weather conditions all have anImpact on the quality of the air we breathe. The present study aims to measure the concentration ofvarious pollutants present in the ambient air. The primary focus of the study was on the Particulatematters (PM10, PM2.5) , although it also deals with other pollutants like SO2 and NOx at three differentsites of Mauganj city. In urban areas, the contribution from automobile sources has the most significantimpact on air quality. The results revealed that the ambient air of Mauganj city is deteriorated mostly byparticulate matters (PM10 and PM2.5) Followed by gaseous pollutants like Sulfur dioxide (SO_2)andNitrogen oxides (NOx). A result of investigation indicates that concentration of PM10 is exceeding theNational Ambient Air Quality Standard (NAAQS) at Commercial area whereas the concentration of SO_2 and NOX is bellowing the prescribed limits. Increasing vehicular activities are more responsible forthe emission of particulate matter PM10. The major causes include inadequate improper trafficmanagement system, road condition, and absence of effective mass rapid transport system.

LS-7

High prevalence of microcytic anemia, iron and folic acid deficiency in Indian women and their assessment

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ABSTRACT

Iron deficiency and folic acid deficiency anaemia are critical publichealth challenges in india, disproportionately affecting women of reproductiveage. This study explores the prevalence, causes, and assessment of microcyticanaemia among Indian women, with a focus on iron and folic acid deficiencies,which are major contributing factors. Anaemia, characterized by reducedhemoglobin levels, has multifaceted implications, including compromisedphysical and cognitive function, increased maternal morbidity, adversepregnancy outcomes, and reduced productivity. Despite longstandingnutritional programs, the burden of anaemia in India remains alarmingly high.Microcytic anaemia, predominantly caused by iron deficiency, is compoundedby folic acid deficiency and socio-economic, dietary, and cultural factors. Thisstudy investigates these issues through a systematic analysis of prevalencedata, dietary habits, and healthcare accessibility in diverse populations across India. The study employs a multi-pronged approach, including literaturereview, cross-sectional data analysis, and biomarker evaluation. Hemoglobinlevels mean corpuscular volume (mcv), serum ferritin, and folateconcentrations were assessed in women aged 15–49 years. Findings revealthat nearly 53% of women in this age group are anemia, with over 60% ofcases attributed to iron deficiency and 20% to folic acid deficiency. Rural areasshowed higher prevalence rates than urban regions, reflecting disparities indietary intake and healthcare access. Dietary habits emerged as a significantcontributor to anaemia. A predominantly cereal-based diet, low in bioavailable iron and folate, coupled with limited intake of hemi iron sources such as meatand fish, exacerbates deficiencies. Socioeconomic barriers and culturalpractices, including gender-based food distribution, further limit women access to nutrient-rich diets. Additionally, gastrointestinal infections andhelminth infestations, common in low-income populations, impair ironabsorption and utilization, compounding the issue. The study highlights criticalgaps in anemia management programs in India, particularly the distributionand uptake of iron and folic acid supplementation (ifa). Despite governmentinitiatives, adherence remains low due to side effects, inadequate awareness,and supply chain disruptions. Community-based interventions, such as dietarydiversification, fortification, and deworming campaigns, are proposed assustainable solutions to complement supplementation efforts. A novel aspectof the study is the use of advanced diagnostic tools for anemia assessment.Unlike traditional hemoglobin measurements, this study incorporatesbiomarkers like serum ferritin and transferrin saturation to differentiatebetween iron-deficiency anemia and anaemia of inflammation. Such tools canenhance the precision of anemia screening programs, enabling targetedinterventions. The study relies on the prevalence of anemia among Indianwomen and the complex relationship between nutritional, biological andenvironmental factors associated with it.

Keywords: Microcytic Anaemia, iron & folic acid deficiency, Indian women,public health, dietary interventions, Anaemia management programs.

LS-8
Assessment of ground water quality of Sihawal Block Sidhi district M.P. India

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ABSTRACT :

The present study groundwater quality in the Sihawal Block of Sidhi District, Madhya Pradesh, to assess its suitability for drinking, agricultural, and industrial uses. Groundwater is a primary water source in rural area and plays crucial role in the region's economy and public health, especially due to the semi-arid climate and limited surface water availability. The research involved collecting and analyzing samples from various source such as hand pumps, borewell, and tube wells for the various parameter, Total Hardness, Turbidity, pH value, (TDS), EC, Chloride, Calcium, fluoride, Sulphate, Magnesium, Alkalinity, Sodium, Potassium, Carbonates, Bicarbonate, heave Metals like Arsenic, Lead and Nitrate etc. with reference to Bureau of Indian Standards (BIS) and WHO Standards. The higher value ofvarious parameters at different locations shows the effect in geological formation and infiltration which making the water unsuitable for the Domestic uses. The results revealed variations in water quality across different sites with pH levels mostly within safe limits, but some location had TDS levels exceeding the permissible lime of 500 mg/L. elevated nitrate concentrations posed potential health risks. While trace amounts of arsenic and lead were found, remaining below WHO safety thresholds. Water hardness was significant, impacting both domestic and industrial use. The groundwater of study area has been also classified on the basis of piper trilinear method and US salinity classification schemes.

Keyworld: Groundwater quality, Geological Formation, Piper trilinear Method

LS-9

In-vitro inhibition of pathogenic bacteria through Probiotics lactobacillus metabolites

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ABSTARCT :

Bowel or gastro-intestinal infections are the most prevalent problem amongst allage group people. It's primarily caused by bacteria &virus. Probiotics or goodbacteria are the desirable solution for these types of infections. This study wasbased on the antimicrobial efficiency of probiotic lactobacillus strains againstpathogens. Lactobacillus strains isolated from dairy curd. Its essential extra cellularmetabolites were extracted by fermentation process & then tested against*Salmonella Typhi*&*Enterococcus faecalis* that are responsible for bowel infection.Results showed positive potential of Lactobacillus metabolites. These metaboliteswere further investigated on different tolerance that eventually showed inhibitionagainst *Salmonella Typhi* than *Enterococcus faecalis.* This can give a way todevelop more natural medicament for competing gastrointestinal infection.

Keywords: Bowel Infection, Probiotics, Metabolites, *S. Typhi, E. Fecalis*

LS-10
Isolation, purification and characterization of antibacterial bioactive compounds from
Actinomycetes collected from soil samples of Rewa (M.P.)

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ABSTRACT :

The global crisis of antibiotic resistance necessitates urgent exploration of new antimicrobial agents from natural sources, with Actinomycetes being a prolific producer of bioactive secondary metabolites. This study investigates the isolation, purification, and characterization of antibacterial compounds from soil-derived Actinomycetes in Rewa, Madhya Pradesh (M.P.). The region diverse and underexplored ecological niches provide a unique reservoir for microbial biodiversity. A total of 45 soil samples were systematically collected from varied environments, including agricultural fields, forested areas, and riverbanks, ensuring preservation of indigenous microbial populations through aseptic techniques. These samples underwent pre-treatment to suppress non-spore-forming contaminants, followed by selective cultivation on media like Starch Casein Agar and Actinomycetes Isolation Agar. A morphological evaluation identified 110 distinct Actinomycetes isolates, of which 30 demonstrated notable antibacterial activity during primary screening using the Perpendicular Streak Method. Further quantitative analysis through Agar Well Diffusion assays identified 12 isolates with significant inhibition zones (15–28 mm) against multidrug-resistant pathogens, including *Staphylococcus aureus, Escherichia coli, Bacillus subtilis*, and *Pseudomonas aeruginosa.* These pathogens were selected based on their clinical relevance and association with escalating resistance trends. Molecular identification via 16S rRNA gene sequencing revealed that most potent isolates belonged to the genus *Streptomyces* (98–99% similarity), with several closely related to Micromonospora. Phylogenetic analysis confirmed the novelty of certain strains, suggesting unique biosynthetic pathways potentially linked to the production of novel compounds.

Bioactive metabolites were extracted from fermentation broths using solvent partitioning with ethyl acetate, concentrating the active fractions under reduced pressure. These extracts underwent a series of purification steps, including TLC and HPLC, to isolate pure bioactive entities. Thestructural elucidation of the lead compound, termed &Rewamycinwas performed using advanced spectroscopic techniques. NMR spectroscopy provided insights into the molecular structure, including the connectivity of functional groups, while Mass Spectrometry (MS) established its molecular weight at 480Da. Rewamycin was identified as a novel anthraquinone derivative with unique structural attributes distinct from previously known antibiotics. The antibacterial efficacy of Rewamycin was assessed by determining MICs, revealing potent activity against S. aureus (1.5μg/mL) and *E. coli* (3μg/mL), surpassing the inhibitory capacity of standard antibiotics like ampicillin under similar assay conditions. This potency underscores its potential as a candidate for further pharmacological evaluation and development into a therapeutic agent. Moreover, the observed activity against Gram-positive and Gram-negative bacteria highlights its broad-spectrum efficacy, a critical feature in addressing multidrug-resistant infections. This research demonstrates that the soils of Rewa harbor a rich diversity of Actinomycetes capable of synthesizing novel bioactive compounds with significant pharmaceutical potential. The study not only contributes to expanding the understanding of Actinomycetes biodiversity in unexplored regions but also emphasizes the importance of natural product discovery in developing next-generation antibiotics. The identification and characterization of Rewamycin offer promising avenues for tackling the global challenge of antibiotic resistance. Future studies will focus on scaling the production of Rewamycin, evaluating its cytotoxicity, and elucidating its mode of action at the molecular level to assess its viability as a therapeutic candidate.

LS-11

Studies on Removal of Ambient Air Particulates from Roadside Tress Species *Eucalyptus globulus* and *Ficus racemosa* Growing Along Rewa city, (M.P.)

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ABSTRACT :

This study was undertaken to assess the removal of ambient air particulate matter of roadside trees *Eucalyptus globulus* and *Ficus racemosa* in Rewa city. The roadside plants play asignificant role in assimilation and accumulation of pollutants and act as efficient interceptors ofairborne pollutants. Particulate matters affect the photosynthesis, respiration, transpiration andallows the penetration of phytotoxic gaseous pollutants. This research was conducted duringJanuary 2023 to February 2024 on both these plant species in the region of Rewa city. Airquality monitoring at 6 selected sites of Rewa city have been carried out viz; Sirmour square(S1), PTS Square (S2), New Bus Stand (S3) Old Bus Stand (S4) and Prakash Square (S5) alongwith control site APS University Campus (S6) of Rewa city. It was found that maximumparticulate matter accumulation occurred during winter followed by summer and minimum inRainy season in both tree species. Eucalyptus globulus showed more particulate matteraccumulation on leaves in comparison to *Ficus racemosa.* Particulate matter accumulation indifferent plant species not only depends upon the sources and amount of pollutants in theenvironment but also depends on morphological characters of plants like leaf size and surface,texture, hair, wax, length of petiole, weather condition and wind direction. Thus, Roadside treeswork as natural air filters.

Keyword: Air Pollution, Micro morphological traits, PM2.5, PM10, TPM, Rewa.

LS-12

Green Synthesis And Characterization of Silver Oxide Nanoparticles from *Azadirachta Indica* Along with Nanoremediation of Polluted Water

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ABSTARCT :

Azadirachta indica (Neem) is a medicinal plant widely recognized for its antimicrobial properties.The leaf extract has been employed in the eco-friendly synthesis of silver nanoparticles (AgNPs),offering a sustainable alternative to traditional methods. AgNPs exhibit remarkable biological activities, including antibacterial and antioxidant properties, making them promising candidates for biomedical and environmental applications. Fresh leaves of I were harvested, cleaned, and used to prepare an aqueous extract,which served as both a reducing and stabilizing agent in the synthesis of silver nanoparticles (AgNPs). A 1mM silver nitrate $(AgNO_3)$ solution was combined with the neem extract under ambientconditions to produce AgNPs. The resulting biosynthesized AgNPs were analyzed using UV-Vis andFourier-transform infrared spectroscopy (FT-IR) for characterization. To assess their potential applications, water quality parameters, including dissolved oxygen (DO) and biochemical oxygen demand (BOD), were measured using the Winkler method, both before and after treatment with AgNPs.UV-Vis spectroscopy confirmed the successful synthesis of AgNPs, as indicated by a characteristic peak at 344 nm. FT-IR analysis revealed functional groups associated with biomolecules responsible for reducing and stabilizing the AgNPs. AgNPs treatment enhanced water quality by increasing DO levels (e.g., from 5.2 ppm to 6.3 ppm) and reducing BOD values (e.g., from 3.35 ppm to 2.32 ppm), demonstrating their efficacy in improvingwastewater parameters.The results highlight the potential of neem-based AgNPs in environmental applications. The increasein DO levels suggests improved oxygen availability for aquatic ecosystems, while the reduction in BOD reflects decreased organic pollution. These findings emphasize the utility of green-synthesized AgNPs in wastewater treatment and broader environmental management.The green synthesis of AgNPs using *Azadirachta indica* leaf extract offers an eco-friendly and effective approach for nanomaterial development. The study highlights the potential of AgNPs in improving water quality and addressing environmental challenges.

Keywords: Green synthesis, *Azadirachta indica,* Silver nanoparticles

LS-13
Environmental Impact Assessment (EIA) for evaluating the potential environmental consequences of proposed developmental activities

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ABSTRACT :

Environmental Impact Assessment (EIA) serves as a vital tool for evaluating thepotential environmental consequences of proposed developmental activities beforethey are undertaken. It ensures that sustainable development goals are achieved byintegrating environmental considerations into decision-making processes. This studyhighlights the significance of EIA in mitigating the adverse effects ofindustrialization, urbanization, and infrastructure development on ecosystems andbiodiversity. The discussion focuses on the methodologies employed in EIA, such asbaseline studies, impact prediction, and public participation, to provide acomprehensive understanding of environmental implications. Case studies reveal theeffectiveness of EIA in identifying and minimizing risks associated withdeforestation, habitat destruction, water pollution, and air quality degradation.Furthermore, this paper emphasizes the role of EIA in fostering compliance withenvironmental regulations and promoting eco-friendly practices. This review underscores the need for capacity-building initiatives to enhance the effectiveness ofEIA in rural and underdeveloped regions. Recommendations include strengtheninglegal frameworks, adopting advanced analytical tools, and encouraging activestakeholder participation to ensure long-term ecological sustainability. By bridgingthe gap between development and conservation, EIA emerges as a key strategy insafeguarding natural resources and ensuring a harmonious coexistence betweenhuman activities and the environment.

LS-14
To Study the role of pollutants in causing environmental pollution

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ABSTRACT :

Environmental pollution has become a global challenge, affecting ecosystems andhuman health severely. Toxicology plays a crucial role in understanding the mechanisms through which pollutants impact biological systems and developing strategies to mitigate their effects. This study focuses on the sources, pathways, and toxicological impacts of pollutants such as air, water, soil, and noise pollution. Industrial emissions, agricultural runoff, and urban waste have led to the accumulation of harmful substances like heavy metals, pesticides, and persistent organic pollutants. These contaminants disrupt ecosystems and cause serious health issues in humans through bioaccumulation and biomagnification. Emerging pollutants, such as microplastics and endocrine-disrupting chemicals, further exacerbate the situation. Toxicological assessments indicate a direct link between pollutant exposure and various health problems, including respiratory disorders, neurological damage, and reproductive issues. This research highlights the need for advanced biomonitoring techniques and risk assessment models to understand the dynamics of pollutants and their long-term effects. The study also emphasizes the socio-economic impacts of pollution, especially in vulnerable communities. Recommendations include stricter environmental regulations, sustainable waste management practices, and public awareness programs to minimize exposure to pollutants and mitigate their effects. Collaborative efforts from researchers, policymakers, and industries are essential to address these challenges effectively and ensure environmental sustainability and public health protection for future generations.

LS-15
Review Examining the NCT Delhi's Plan for AquiferMapping and Surface Water Management and Its Effects

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ABSTRACT :

The area that makes up the National Capital Territory of Delhi (NCT Delhi) is 1483 square kilometers. NCT Delhi is divided into 9 regions and 27 tehsils for official purposes. NCT Delhi receives 611.8 mm of precipitation annually on average. The increase in precipitation is coming from the southwest toward the direction of the upper east. The storm months of July, August, and September yield about 81% of the annual precipitation. The remaining annual precipitation falls in the form of winter rainfall and tempest downpour in the months leading up to and following rainstorms. The Delhi Super Group, also known as the Delhi edge, is located in the NCT Delhi and is surrounded by quartzite that is layered on top of unconsolidated Quaternary to Recent age sediments. Both the eastern and western sides of the edge are significantly influenced by the thickness of the alluvium that covers them. Generally speaking, it is thicker (300 m) west of the margin. The Aeolian and Quaternary stores as In the zone, groundwater is primarily stored in alluvial storage. The Delhi Edge serves as the energy centre for the areas that it encompasses. Watersheds on different scales, all miniature, begin at the quartzite edge.

LS-16
Environmental Impact Assessment

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ABSTRACT :

Environmental Impact Assessment (EIA) is a critical tool used to evaluate the potential effects of development projects on the environment. It is a systematic process that aims to predict, assess, and mitigate the environmental consequences of proposed actions before they are implemented. Environmental Impact Assessment (EIA) plays a crucial role in achieving sustainable development goals (SDGs) by integrating environmental considerations into development projects and activities. This abstract provides an overview of the role of EIA in achieving SDGs. EIA is a systematic process that evaluates the potential environmental impacts of proposed projects, policies, and programs. By identifying and assessing potential environmental risks and impacts, EIA ensures that development activities are carried out in an environmentally responsible and sustainable manner. The role of EIA in achieving SDGs is multi-faceted. Firstly, EIA helps integrate environmental considerations into development planning and decision-making processes. By evaluating potential impacts at an early stage, EIA enables the adoption of measures to minimize negative environmental consequences and enhance project sustainability. Secondly, EIA contributes to the preservation of ecosystems and biodiversity. Through the assessment of potential impacts on habitats and species, EIA identifies sensitive areas and promotes the adoption of measures to protect and conserve biodiversity. This aligns with SDG 15, which aims to sustainably manage forests, combat desertification, halt biodiversity loss, and protect ecosystem. Thirdly, EIA promotes the sustainable use of natural resources. By assessing resource availability and evaluating resource use patterns, EIA facilitates the identification of sustainable resource management practices. This supports SDG 12, which focuses on responsible consumption and production, including the efficient use of resources and the reduction of waste. Furthermore, EIA addresses climate change considerations. It assesses the greenhouse gas emissions, energy consumption, and climate change impacts associated with development projects. By identifying mitigation measures and promoting climate change adaptation strategies, EIA contributes to SDG 13, which aims to combat climate change and its impacts. EIA also fosters stakeholder engagement and participation. Through public consultation and involvement of affected parties, EIA promotes transparency, inclusiveness, and social acceptance of development projects. This aligns with SDG 16, which focuses on building effective, accountable, and inclusive institutions. Finally, EIA generates valuable knowledge and information about environmental impacts, best practices, and lessons learned. By sharing this knowledge with stakeholders and decision-makers, EIA facilitates informed decision-making, improves project design, and avoids repeating past mistakes. This supports SDG 17, which emphasizes partnerships and knowledge-sharing for sustainable development. In conclusion, the role of environmental impact assessment in achieving sustainable development goals is instrumental. Through its integration of environmental considerations, preservation of ecosystems and promotion of sustainable resource use, addressing of climate change, stakeholder engagement, and knowledge generation, EIA contributes to the overall objective of sustainable development.

*Keyword:*Land Degradation, Waste Management, Energy Transition, Sustainable Transport, Infrastructure

LS-17

A Review on Green Synthesis of Zinc Oxide Nanoparticles Using Plant Extract for Luminescence

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ABSTRACT :

This experiment successfully produced nanoparticles through biosynthesis. In this process, leaf extracts were used to create the nanoparticles. We analyzed and described the features of ZnO nanoparticles using several techniques, including X-ray diffraction (XRD), ultraviolet-visible (UV-VIS) spectroscopy, scanning electron microscopy (SEM), transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FTIR), and photoluminescence (PL). This research shows a method that is friendly to the environment. However, using biological extracts on a large scale for green synthesis is still challenging because of their complexity. Therefore, this review focuses on creating multifunctional ZnO nanoparticles from plant extracts, which could have many potential uses in the future. However, challenges and future prospects in the field are also highlighted to guide further research and development in this area.

LS-18

Phytochemical Analysis and Extraction of Bioactive Compounds fromWrightia tinctoria (Leaf, Stem, and Seed) Using Soxhlet Method forPotential TherapeuticApplications

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ABSTRACT :

Herbal remedies have gained significant popularity in recent years due to their therapeutic benefits and fewer side effects compared to conventional pharmaceuticals. Plants have been an integral part of traditional medicine, offering a rich source of bioactive compounds with medicinal value. *Wrightia tinctoria*, a small deciduous tree from the Apocynaceae family, is widely distributed in India and known for its various medicinal applications. The study focuses on the extraction and analysis of *Wrightia tinctoria* leaf, stem, and seed for their phytochemical components using Soxhlet extraction with solvents such as petroleum ether, acetone, and distilled water. The yields of the extracts varied, with distilled water yielding the highest percentage (77.5% to 85.5%). Phytochemical screening revealed the presence of alkaloids, glycosides, steroids, flavonoids, saponins, polyphenols, tannins, proteins, amino acids, terpenoids, triterpenoids, fixed oils, fats, and volatile oils. The study concluded that *Wrightia tinctoria* contains a wide range of bioactive compounds, particularly in acetone and distilled water extracts, suggesting its potential for antimicrobial, anti-inflammatory, and other therapeutic applications. Further research into the isolation and pharmacological evaluation of these compounds could lead to the development of novel medicinal products.

*Keywords:*Wrightia tinctoria, Phytochemical analysis, Soxhlet extraction, bioactiveCompounds

LS-19
Assessing waste management practices in Ambikapur city-
a needs based approach

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ABSTRACT :

This study takes a needs- based approach to understand the specific requirements ofthe city's waste management system. Combining both qualitative and quantitative datacollection and analysis techniques this aims to investigate the prevailing wastemanagement infrastructure, waste generation patterns, waste collection methods anddisposal. It also seeks to elucidate the role of stakeholders, municipal authorities, wastecollectors and residents in the waste management process and to identify potentialareas of improvement for developing a more robust waste management system.Existing door to door waste collection system has some gaps particularly in wastecollection and disposal. The analysis identifies opportunities for improvement andrevealed significant gaps leading to inefficiencies and environmental concern. Byunderstanding the specific needs of the city this study provides recommendations totackle the problems.

LS-20
Medicinal Plants and Their Role in Controlling Rot Disease inPapaya:
A Review

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ABSTRACT :

Rot disease in papaya (*Carica papaya*), primarily caused by fungal pathogens such as *Phytophthora palmivora* and *Colletotrichum gloeosporioides,* poses a severe threat to global papaya production. These pathogens lead to substantial post harvest losses and reduced marketability, impacting farmers' livelihoods and food security. While synthetic fungicides remain the primary defense against these diseases, their excessive use results in environmental degradation, health hazards, and the development of resistant fungal strains. Medicinal plants, known for their rich reservoir of bioactive compounds like alkaloids, flavonoids, tannins, and essential oils, present a promising eco-friendly alternative. Neem (*Azadirachta indica*), turmeric (*Curcuma longa*), garlic (*Allium sativum*), eucalyptus (*Eucalyptus globulus*), and marigold (*Tagetes erecta*) have demonstrated significant antifungal activity in laboratory and field studies. These natural extracts work by disrupting fungal cell membranes, inhibiting critical enzymes, and preventing spore germination. This paper explores the potential of medicinal plants in managing rot diseases in papaya. It highlights their mechanisms of action, application methods such as seed treatments, foliar sprays, and post-harvest washes, and their advantages over conventional methods. Despite challenges like standardizing extract concentrations and scaling production, the use of medicinal plants represents asustainable and effective approach to disease management. By integrating thesenatural solutions into agricultural practices, farmers can protect their crops whilereducing dependency on harmful chemicals.

*Keywords:*Post harvest losses, bioactive compounds, resistant fungal strains, disease management, etc**.**

LS-21
Therapeutic Biochemical Approaches to limiting Oxidative Stress in Diabetes and Obesity

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ABSTRACT :

Increasing evidence in both experimental and clinical studies suggests that there is a close link between hyperglycemia,oxidative stress and diabetic complications. High blood glucose level determines over production of reactive oxygen species (ROS) by themitochondria electron transport chain. High reactivityof ROS determines chemical changes in virtually all cellular components, leading to DNA and protein modification and lipid peroxidation. Measurement of biomarkerssuch 8-hydroxy-2' deoxyguanosine (8-OHdG), isoprostanes, malondialdehyde (MDA) and nitrotyrosineis a useful tool to assess the oxidative stress of theorganism. The intermediater eduction products, which are known to give rise to cellulardamage, are superoxide radical (O_2^-), hydrogenperoxide (H_2O_2) and the hydroxyl radical ($OH^.$). Thesethree species are often referred to collectively as reactive oxygen species (ROS). Cells have developed several enzymatic and nonenzymatic systems to preventor limit ROS-associated damage. The defense systemis complex and involves many compounds withvastly different properties: enzymes (superoxide dismutase(SOD), catalase, glutathione peroxidase),macromolecules (albumin, ceruloplasmin) and smallmolecules (vitamin C, vitamin E, β-carotene, reduced glutathione and uric acid). Knowledge of the mechanisms of ROS damageof is the first step for development of new therapeuticmolecules and for rationalizing the use of existingdrugs.
*Keywords:*Oxidative stress markers; Diabetes, Obesity,MDA,$H_2O_2,$ SOD,8-hydroxy-2'deoxyguanosine

LS-22
Sustainable techniques of surface waterConservation for ground water recharge in
Jaisingh Nagar area of Shahdol district, Madhya Pradesh, India

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ABSTRACT :

The present work briefly representing a case study was carried out for evolution andmanagement of surface water or rain water resource and impact on ground water recharge. Groundwater begins with precipitation that seeps into the ground. The amount of water that seeps into ground will vary from place to place, depending on the slope of the land, amount of intensity of rainfall and type of soil. Porous or permeable land containing lots of sand or gravels will allow as large quantity of precipitation to seeps into the ground and increase groundwater levels. Rain water conservation is plays a major role in recharge of the depleted groundwater aquifers. Most important form of water is rain water because all the water resources directly or indirectly depend upon rainwater. The availability of utilizable surface water is so low that people have to depend largely on groundwater for agriculture and domestic uses. In order toimprove the ground water situation it is necessary to development of water resources and management of rainwater for artificially recharges of the depleted groundwater aquifers. The available techniques are easy, cost-effective and sustainable in the long term. Many of these can be adopted by the individuals and village communities with locally available materials and manpower.
*Keyword:*Sustainable Techniques, Surface Water Conservation, Ground Water Recharge.

LS-23
Childhood and Adolescent Obesity pathophysiology and Clinical implications

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ABSTRACT

Obesity is a complex condition that interweaves biological, developmental, environmental, behavioral, and genetic factors; it is a significant public health problem. The most common cause of obesity throughout childhood and adolescence is an inequity in energy balance; that is, excess caloric intake without appropriate caloric expenditure. Adiposity rebound in early childhood is a risk factor for obesity in adolescence and adulthood. The increasing prevalence of childhood and adolescent obesity is associated with a rise in comorbidities previously identified in the adult population, such as Type 2 Diabetes, Hypertension, Non-alcoholic Fatty Liver disease, Obstructive Sleep Apnea, and Dyslipidemia. Due to the lack of a single treatment option to address obesity, clinicians have generally relied on counseling dietary changes and exercise. Due to psychosocial issues that may accompany adolescence regarding body habits, this approach can have negative results. However, there is limited data on the efficacy and safety of other weight-loss medications in children and adolescents. Nearly 6% of adolescents in the United States are severely obese and bariatric surgery as a treatment consideration will be discussed. Present overview the pathophysiology, clinical, and psychological implications, and treatment options available for obese pediatric child and adolescent patients.

Keywords: Obesity, pathophysiology,Childhood and Adolescent Obesity

LS-24
Groundwater Pollution and Control Measures: In Case Study

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ABSTRACT

Groundwater pollution is a significant and growing environmental issue that impact ecosystem, human health, and economics worldwide. It occurs when harmful substances infiltrate the underground water source, primarily due to human activities such as industrial discharge, agriculture practices, improper waste disposal, and urbanization. The pollution can include heavy metals, pesticides, fertilizers, organic chemicals, pathogens, other hazardous substances. These contaminants often result in the deterioration of water quality, making it unsafe for consumption and agriculture use, leading to severe health risks such as cancer, developmental issue, and waterborne diseases.The primary causes of groundwater pollution include industrial activities, which discharge harmful chemicals into the soil; agricultural runoff, which excess nutrients and pesticides into aquifers; and improper waste disposal, where hazardous waste from landfills and sewage systems leaks into groundwater. Additionally, mining operations and releasing toxic substances into the environmental. Urbanization and over extraction of groundwater exacerbate the issue, especially in coastal areas saltwater instruction is a concern.To control and mitigate groundwater pollution, several measures need to be implemented across different sectors. Firstly, stricter environmental regulation show is enforced to limit industrial and ensure proper treatment of industrial waste. There should be a significant push for sustainable agricultural practices that reduce the use of chemical fertilizers and pesticides, such as organic farming and integrated pest management systems, including the safe disposal of hazardous waste and the proper functioning of sewage treatment plants, can prevent contaminants from landfills and septic systems.

Advanced water treatment technologies are essential in mitigating the effects of groundwater pollution. Techniques such as bioremediation, reverse osmosis, and activated carbon filtration can help remove contaminants from polluted groundwater, making it safer for human use. Furthermore, regular monitoring and testing of groundwater quality are necessary to detect early signs of contamination and take corrective measures in time. Public awareness campaigns are also vital to educate communities about responsible chemical use, waste disposal, and the important of water conservation. Integrated water resource management (IWRM)is another important strategy for addressing groundwater pollution. This approach emphasizes the collaborative management of water resources by engaging all stakeholders, including local governments, industries, farmers, and communities, to ensure the sustainable use and protection of groundwater. It also addresses the problem of over-extraction, ensuring that groundwater is used efficiently and replenished regularly. In conclusion, groundwater pollution is a critical issue that requires coordinated efforts across multiple sectors to protect this vital resource. Through a combination of stricter regulations, sustainable practices, advanced treatment technologies, and public awareness, groundwater pollution can be controlled, ensuring safe and sustainable access to clean water for current and future generation.

Keywords: Groundwater contaminants, Nitrate leaching, Industrial discharge, Agricultural runoff, Wastewater treatment, Controlled use of fertilizers and pesticides, Public education on pollution prevention

LS-25
Isolation & screening of hydrocarbon degrading fungi from soil

Devanshi Dwivedi

ABSTRACT :
Soil serves as the best shelter of all types of microorganism. They are alsoregarded as the "mini factories" because they have enormous capacity to produce severalproducts as well as sufficiently able to degrade potentially hazardous xenobioticscompounds by their enzymes. Crude oil is one the major hydrocarbon occurring innature. Oil spill, accidental leakage, incomplete combustion of crude oil, discharge ofpetroleum adversely affects terrestrial as well aquatic life. A biological agent such as fungi produces several enzymes i.e peroxidases, laccase, monooxygenases whichpartially degrade such hydrocarbon.Fungal isolates were found to be effective in degrading polycyclic aromatic hydrocarbon.Soil sample from different areas such as petrol pump, railway station, motor garageswere collected. Direct plate method were used to isolate indigenous fungi from soil inwhich pinch of soil sample were spreaded onto Bacto- Bushnell Haas agar media whichalso include 0.1 % Tween 80 and incubated at 28 0 C for 8-9 days. Pure cultures of fungal isolates were maintained in Potato Dextrose agar media.A modified method of Desai et al (1993) was utilized for the screening of derivativeproperty of isolates. Bacto Bushnell Haas broth was used where 0.5 % of naphthalene, acenaphthene and anthracites serve as the sole carbon source (each in different flask). In broth, 2% (w /v) methylene blue was also added as a redox indicator. Redox indicatorchanges colour from blue (oxidized) to colourless (reduced). A control flask was alsoadded along with the test flask. Screening was carried out in shaker incubator at 28 ^{0}Cand 120 RPM. Out of total 8 fungal isolates, only 4 isolates showd best potential for biodegradationwhich are named as *Fusarium spp.,Rhizopus spp., Trichoderma harzianum* Aspergillus versicolor. Spectrophotometric analysis was carried out to detect the level ofdegradation. 55.04% of degradation were noted down by *Fusarium spp.* whereas40.93% of degradation by *Trichoderma harzianum.*Mycoremediation has been successful for the clean up of pesticides, PAHs etc because ofits versatile technology and cost efficiency. One approach is to stick this microorganismto carrier with Tween 80. Carrier with charcoal can protect fungi from environmentalfactors. They can be easily grown on a number of cheap forest or agricultural wastes suchas corncobs, sawdust. The use of white rot fungi *Phanerochaete chrysosporium* in soilbioremediation of PAH is an exciting and promising technology because it can degradelow molecular weight PAHs faster in soil. Extensive research on enzymes involved inmetabolic pathways is necessary to optimize the process which opens new era in PAHdegradation.

LS-26
Sustainable development goals into the Integrating architecture curriculum: Experiences and perspectives

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ABSTRACT :

The Sustainable development goals play a crucial role in architectural education, as buildingscontribute 39% of global energy-related carbon emissions and 40% of extracted materials is used inconstruction. This research investigates the current status of sustainable development goals integration inarchitecture education, its challenges, and potential future advancements. A qualitative survey wasconducted among architecture educators from 22 institutions across nine countries, focusing on four keyaspects: (i) general knowledge and understanding of the sustainable development goals; (ii) qualification and experience regarding the sustainable Development Goals; (iii) integration of the Sustainable development goals in architecture education; and (iv) implementation of the SDGs in architecturalpractices. The findings revealed that most educators did not receive formal education focused on the sustainable development goals, relying on self-exposure and self-learning. Sustainable development goal11 was the most adopted, focusing on improving slum areas, providing safe housing, and promotingsustainable urban settlements while preserving cultural heritage.
Keywords: Sustainable, Development, Goals, Architecture pedagogy, Architecture curriculum Academia,Architecture education, Sustainability etc.

LS-27
Study of antimicrobial and phytochemical contents Availability in Medicinal plants

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ABSTRACT :

Medicinal plants contain some organic compounds which provide definitephysiological action on the human body and these bioactive substances include tannins,alkaloids, carbohydrates, terpenoids, steroids and flavonoids. These compounds aresynthesized by primary or rather secondary metabolism of living organisms. Secondarymetabolites are chemically and taxonomically extremely diverse compounds with obscurefunction. They are widelyused in the human therapy, veterinary, agriculture, scientificresearch and countless other areas. A large number of phytochemicals belonging to severalchemical classes have been shown to have inhibitory effects on all types of microorganismsin vitro. Plant products have been part of phytomedicines since time immemorial. Knowledgeof the chemical constituents of plants is bdesirable because such information will be value forsynthesis of complex chemical substances. North-eastern India has been known for its richbiological diversity. For this study some medicinal plants such as Bryophyllum pinnatum,Ipomea aquatica, Oldenlandia corymbosa, Ricinus communis, Terminalia bellerica,Tinospora cordifolia, and Xanthium strumarium, were selected. The aim of the present studywas to investigate the presence of phytochemicals and to determine the total phenolic andflavonoid contents of the selected medicinal plants. Soxhletapparatus was used for theorganic solvent extraction. Total phenolic contents obtained were18.4mg/gm, 18.8mg/gm,11.6mg/gm, 29.2mg/gm, 29.6mg/gm, 40.8mg/gm, 12.8mg/gm, 71.6mg/gm of the extract andtotal flavonoid contents obtained were 8.4mg/gm, 37.6mg/gm, 4.4mg/gm, 6mg/gm,42.8mg/gm, 18mg/gm, 6mg/gm, 28.8mg/gm of the extract for the plants. Our findingsprovided evidence that crude aqueous and organic solvent extracts of these tested plantscontain medicinally important bioactive compounds and it justifies their use in the traditionalmedicines for the treatment of different diseases.
Keywords: Bryophyllum pinnatum, Ipomea aquatica, phytochemicals, phenols, tannins, flavonoids, etc.

LS-28
Irrigation Water Quality Assessment in Ramnagar Area, Satna, Madhya Pradesh, India

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ABSTRACT :

The paper deals with the utility of groundwater for irrigation in and around Ramnagararea of Satna district, Madhya Pradesh, India. Groundwater samples were collected from dugwells and borewells in the study area and analyzed in the laboratory. The collected groundwatersamples were analyzed for water quality parameters and EC, PH, TDS and TH were measured.Irrigation water quality parameters such as SAR, RSC, MR, KR, PI and CR were calculated asderived parameters. Analytical sodium adsorption ratio data plotted on US salinity diagramshows that the groundwater of the area falls in moderately saline and low alkaline and highlysaline and low alkaline categories. The analyzed values of SAR, RSC, MR, KR, PI and CR inmost of the samples limit the suitability of groundwater for irrigation use.

Keywords: Irrigation Quality, Permeability Index, Magnesium Ratio, Hardness, Calcium, Ramnagar.

LS-29
Morphometric Analysis of Watersheds using Geospatial Approach: A Case Study of Nagod Area ofSatna District, Central India

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ABSTARCT :

Water resource management is essential for maintaining the living environment inwatersheds. Anthropological activity on watersheds can lead to resource imbalance, affecting their functioning. Morphometric analysis of watersheds using GIS and remote sensing techniques is the main thrust of this study. Decision makers and strategists are increasingly using geographic information systems (GIS) and remote sensing (RS) techniques as they make decisions more effectively and accurately. Morphometric analysis of catchments is important for studying how drainage basins respond to topological properties. Remote sensing and geographic information systems are usefultools for detecting such changes in catchments, whether caused by natural processes or human intervention. Morphometric features linear, aerial and relief such as stream order (Nu), stream length (La), bifurcation ratio (Rb), drainage density (D), stream frequency (Fs), circularity ratio (Re), and form factor ratio (Rf) etc. have all been investigated. This study demonstrates that morphometric analysis with GIS and remote sensing methods is a useful tool for hydrological investigations. The present studywill be useful for decision makers and managers in organizations that emphasize watershed management and sustainable natural resource management.

Keywords: Morphometric Analysis, Watershed, Geographic Information System, Remote sensing.

LS-30
Assessment of Groundwater Quality, Beohari block ShahdolDistrict, (M.P.), India

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ABSTRACT :

The paper deals with groundwater quality assessment of Beohari block District Shahdol, Madhya Pradesh, India. Geologically, the area is occupied by the Gondwana formation, the clay and mudstone facies of Tihiki stage overlying the areneceous facies of Pali bed have an aquifer system of moderate to high yield potential in Beohari block. The upper Barakar sandstone of Gondwana Supergroup has a positive piezometric head and at may places auto-filling condition occurs. Twenty two groundwatersamples from the area were collected in pre- monsoon and post-monsoon seasons of 2024 from different locations of study area and analysed. The chemically analysis for various water quality parameters such as PH, electric conductivity (EC), Total dissolved solids (TDS), Total hardness (TH), Chloride (Cl), Sodium (Na), Potassium (K), Calcium(C), Fluoride(F),Magnesium (Mg)and Nitrate(NO_3).The main hydrochemical facies are Ca-Mg-HCO and Ca-Mg-SO-Cl type. The groundwater is hard to very hard in nature. The concentrations of various cations and anions suggest that the groundwater of the area is partially suitable for drinking.The analysis of various parameters like electrical conductivity, sodium percentage, integrated sodium adsorption ratio (SAR) and EC, residual sodium carbonate suggestthat groundwater of the area is suitable for irrigation.

*Keywords:*Groundwater, Quality, Beohari block, Shahdol, Madhya Pradesh, India etc.

LS-31
A Comprehensive study of Biodiversity with special reference of biodiversity Conservation in India

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ABSTRACT :

The loss of biodiversity is a global crisis. Biodiversity, or biological diversity, is variety of all species on earth. It is the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part. Biodiversity is both essential for our existence and intrinsically valuable in its own right because biodiversity provides the fundamental building blocks for the many goods and services a healthy environment provides. India is one of the 12th mega diversity regions of the world with 7.7% of genetic resources of the world but it has suffered a rapid decline in biodiversity in last few decades. Despite efforts to manage threats andpressures to biodiversity in India, it is still in decline. The objective of this paper to document the status and major threats to the biodiversity in the India, as well as deals with the various conservation strategies which is guiding our government, community, industries and scientists to manage and protect the plants, animals and ecosystems of India.

Keywords: **Global Crisis, Biodiversity, Ecosystems, Conservation Strategies**

LS-32

Evaluation of antibacterial properties of clove essential oil and clove extract against *Escherichia coli* from urinary isolates

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ABSTRACT :

The aim was to analyze antibacterial properties of Clove essential oil (*Syzygium aromaticum*) and clove extract against urinary isolates of Escherichia coli (Gram-negative bacteria). The analysis was performed by measuring the zone of inhibition or using disk diffusion method. Results: Clove oil was found to be more effective than clove extract in inhibiting growth of bacterial strains used in the study. New antibacterial agents are very valuable in multidrug-resistant bacteria and the present study provides additional support to the already available data to use essential oilsagainst various strains of bacteria.

Keywords: Essential oils, Antibacterial properties, Disk diffusion

LS-33

The avian species richness in Maihar district, Madhya Pradesh

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ABSTRACT

The class Aves is made up of warm-blooded vertebrates, including birds.Feathers, a beak without teeth, and the depositing of hard-shelled eggs are characteristics of birds. One of the most diverse and noticeable biota in the ecosystem is birds. Also the facts that manmade factors, pesticides, deforestation, contamination, habitat fragmentation, and climate change all reduce bird biodiversity. The aim of the study is to examine migratory bird species, the impact of blasting, mining, stone crushers, and cement factories on bird populations, and the threatened bird species for conservation. We'll use the line transect method and point count. The study will assist us to comprehend Maihar District's bird population. The intricate interaction between birds and their ecosystems can be better understood, and new opportunities for bird conservation can be found.

LS-34

Eco-Friendly Synthesis and Characterization of Zirconium Nanoparticles Using
Ficus pumila Extract: Enhancing Anticorrosive Performance

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ABSTRACT :

This study presents the green synthesis of zirconium nanoparticles (ZrNPs) using Ficus pumila extract,providing a sustainable and eco-friendly alternative to conventional methods. The nanoparticles werethoroughly characterized to understand their structure, stability, and anticorrosive properties. X-rayDiffraction (XRD) analysis confirmed a crystalline structure with a balance of crystalline (53.5%) andamorphous (46.5%) phases. Scanning Electron Microscopy (SEM) showed the particles had irregularshapes and sizes in both micron and submicron ranges. The stability of the nanoparticles was validatedthrough zeta potential analysis, which recorded a value of -16.19 mV, while dynamic light scattering(DLS) revealed a moderately broad size distribution.The anticorrosive properties of ZrNPs were tested using electrochemical impedance spectroscopy (EIS).The results demonstrated that corrosion resistance improved significantly with higher nanoparticleconcentrations. At 40 mg, the impedance and phase angle values closely matched those of the blankcontrol, indicating effective protection. In contrast, lower concentrations like 10 mg provided limitedcorrosion resistance. These findings highlight the potential of green-synthesized zirconium nanoparticlesas a sustainable and effective solution for anticorrosive applications.

LS-35

Effect of Putrescine on Mitigating Salinity Stress in Mungbean (*Vigna radiata L.*)

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ABSTARCT :

Mungbean (*Vigna radiata*) is an important legume crop widely cultivated for its highnutritional value and ability to improve soil fertility through nitrogen fixation. It is highlysusceptible to salt stress, which can severely hamper its growth, yield, and quality. Recentstudies have demonstrated that putrescine, a crucial polyamine, significantly mitigates thenegative impacts of salt stress in plants, emphasizing its mechanisms and efficacy.Physiological and molecular analyses have further elucidated the mechanisms by whichputrescine confers salt stress tolerance. The study reports for the first time the effect ofpolyamine in mitigating the impact of salinity on mung beans. This preliminary researchexplores the role of putrescine in alleviating salt stress in mung beans. The exogenousapplication of putrescine has helped the plant germinate and grow better than salt-stressedplants. Putrescine treatment had a significant effect on increasing fresh and dry weight, withhigher relative water content than salt-treated plants.

LS-36
Microbial communities: The well-wishers of the Earth

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ABSTRACT :

The cosmopolitan, vast, and varied collection of morphologically and physiologically unique An organism known as microorganisms includes bacteria, viruses, fungus, nematodes, andothers that give their environments ecological and functional traits. Microbial communitiesare the key forces behind ecosystem function in every ecological environment, and theirdominance is demonstrated by the physical, chemical, and biological characteristics theyimpart. Nearly all of Earth's land area is covered by soils, which play a crucial biological rolein the global cycles of carbon, nitrogen, and sulfur. They are phylogenetically andfunctionally rich in biodiversity because of their physico-chemical complexity and numerousmicro-niches. Numerous small-scale activities performed by communities of soilmicroorganisms underpin numerous ecologically significant processes. However, because the majority of microorganisms can survive laboratory cultivation, the precise ecological andfunctional roles of specific taxa are still unknown.Microbial diversity is fundamental to maintenance and conservation of global geneticresources. As extreme environments are explored, the richness of microbial diversity isincreasingly evident. Measures must be taken to estimate, record, and conserve microbialdiversity, not only to sustain human health but also to enrich the human condition globallythrough wise use and conservation of genetic resources of the microbial world.

Keywords: Cosmopolitan, Microbial diversity, Fungus, Nitrogen

LS-37

Urban environmental assessment with particular reference to Rewa plan proposal

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ABSTRACT :

Cities and towns in most countries around the world have been gaining considerable attentiondue to large number households migrating to cities and its consequent effects. It has also been dueto the centrality of goods and services that cities offer. Over this century we may witness a uniquesituation where more people will live in and around cities than in rural areas. In 1800 only 50 millionpeople lived in towns and cities worldwide, during 1975 there were 1.5 billion and by the year 2000this reached to more than 3 billion.Take any of today's environmental problems faced by the inhabitants of earth and its causes andpressures can easily be tracked back directly or indirectly urban areas. The forces and processes thatconstitute "urban activity" have far reaching effects not only on its immediate boundaries but alsoon the entire reason in which it is positioned. Study helps to identify Environmental impacts bothpositive and negative and to develop awareness and educate public on issues related to urbanenvironment.

Keywords: Urban activity, cities, Environmental assessment.

LS-38
Role of TFR gene polymorphism in susceptibility to iron deficient anemia

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ABSTRACT :

Iron deficiency anemia affects & 1.2 billions individuals worldwide and iron deficiency in the absence of anemia is even more frequent. Total-body (absolute) iron deficiency is caused by physiologically increased iron requirements in children, adolescents, young and pregnant women, by reduced iron intake, or by pathological defective absorption or chronic blood loss. Adaptation to iron deficiency at the tissue level is controlled by iron regulatory proteins to increase iron uptake and retention; at the systemic level, suppression of the iron hormone hepcidin increases iron release to plasma by absorptive enterocytes and recycling macrophages. The diagnosis of absolute iron deficiency is easy unless the condition is masked by inflammatory conditions. All cases of iron deficiency should be assessed for treatment and underlying cause. Transferrin receptor (TfR) is a carrier protein for transferrin. It is regulated in response to intracellular iron concentration and plays a role for the import of iron into the cell. The transferring receptor 2 (TFR2) gene showed homology to transferring receptor 1 (TFR1) gene and encodes a transmembrane protein with a large extracellular domain, which is able to bind transferrin. Mutations in transferrin receptors (TfR2 and TfR1) may alter the pathophysiology of iron deficiency anemia. Genotyping the TFR gene should be included in the disease diagnostic protocols.

LS-39
Impacts of dust pollution on plants: Implications for environmental bio monitoring

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ABSTRACT

Dust is a collection of solid particles of nature or industrial origin. Dustpollution refers to the presence of tiny solid particles suspended in the air. Theseparticles are often called as particulate matter (PM). Dust pollution represents athreat to both the environment and the human health. PM cause serious healthhazard owing to their ability to remain suspended for long periods of time andtravelling long distances in the atmosphere. Dust pollution is a significantenvironmental issue and has a substantial impact on plant life with implicationsfor environmental bio monitoring. The presented review discusses about theimpacts of dust pollution on plants. Dust pollution negatively affectsmorphological attribute such as leaf area as well as biochemical and physiologicalaspects such as pH, Relative Water Content (RWC), Total Chlorophyll Content.Overall review is shown that dust pollution has heavily reduced the rate ofphotosynthesis, respiration, loss of water through transpiration and has affectedplant growth and development. Dust also indirectly impacts on plants health suchas chemical toxicity and nutrient uptake. Plants are involved in biogeochemicalcycles and play an important role in monitoring and maintaining ecologicalbalance. Plants can effectively biomonitor for assessing the impact of dustpollution on ecosystems by analysing the physiological and biochemicalresponses of plant to dust exposure. We can monitor air quality with the help ofplants. Plants diversity can indicate the health of an ecosystem affected by dustpollution. Identifying plant species that are particularly sensitive to dust pollutioncan help prioritize conservation efforts and restoration strategies. Several studiesevidenced the possibility to use plants as bio accumulators (tolerant species) orbio indicators (sensitive species) in pollution monitoring protocols. In order todetermine the tolerance or sensitivity of species, the APTI has been devised, usingfour biochemical parameters i.e., pH, ascorbic acid, relative water content andtotal chlorophyll content. This index and all biochemical factors of the treespecies help in biomonitoring and screening out of tolerant species from thesensitive one.

LS-40
Unraveling the role of ADAM 33 in asthma

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ABSTRACT

Asthma, a chronic inflammatory disease of the airways, mediated by a Th2 dependent inflammation is an important cause of morbidity in both children and adults worldwide. It is associated with recurrent bouts of cough and wheezing and some of the main concerns are non-responsiveness to steroids, progressive and accelerated lung function decline in a sub-set of patients1. The prevalence of asthma in many countries around the world is around 5 per cent in adults and 10 per cent in childre. In a large multicenter study in India, the prevalence of asthma was lower and estimated to be about 2.4 per cent among the Indian adults. The smaller percentage still translates to a huge burden of disease in the community taking into account the population of India. Though *ADAM33* located on chromosome 20p13 was identified to be important in asthma pathogenesis a decade ago, there is a need for concerted effort to elucidate its full implications, including its role in normal physiology, which is still unclear. The key reason for this is the complexity of the gene itself with multiple SNPs having been associated with asthma. Unravelling the *ADAM33* would necessitate completely mapping all the SNPs in that gene region in all ethnic populations of the world, understanding the role of each SNP in health and disease, effect of these SNPs on gene transcription and resultant changes in the protein structure, protein levels and conformational changes in the tertiary protein structure that could potentially affect its functioning, thus leading to disease.

LS-41
To Study The Microbial Interaction During Bioremediation Process in Their Natural Habitat's

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ABSTRACT :

Nowadays, the world is facing the problem of different environmental pollution.Microorganisms are essential for a key alternative solution to overcome challenges. Microorganisms are survive in all place on the biosphere because of their metabolic activity is astonishing; then come into existence in all over range of environmental conditions. The nutritional capacity of microorganisms is completely varied, so it is used as bioremediation of environmental pollutants. Bioremediation is a biological mechanism of recycling wastes in to another form that can used and reused by other organisms. Bioremediation is highly involved in degradation, eradication, immobilization, or detoxifi cation diverse chemical wastes and physical hazardous materials from the surrounding through the all-inclusive and action of microorganisms. The main principle is degrading and transforming pollutants such as hydrocarbons, oil, heavy metal, pesticides, dye's and so on. That is carried out in enzymaticway through metabolizing, so it have great contribution role to solve many environmental problems There are two types of factors these are biotic and abiotic conditions are determine rate of degradation. Currently, different methods and strategies are applied in the area in different part of the world. All bioremediation techniques it has its own advantage and disadvantage because it has its own specific application. Bioremediation is involved in degrading, removing, altering, immobilizing, or detoxifying various chemicals and physical wastes from the environment through the action of bacteria, fungi and plants. Microorganisms are involved through their enzymatic pathways act as biocatalysts and facilitate the progress of biochemical reactions that degrade the desired pollutant. Microorganisms are act against the pollutants only when they have access to a variety of materials compounds to help them generate energy and nutrients to build more cells. The actual successful interaction between the two; however, depends on the environmental conditions of the site of the interaction. Microorganism growth and activity are affected by pH, temperature, moisture, soil structure, solubility in water, nutrients, site characteristics, redox potential and oxygen content, lack of trained human resources in this field and Physico-chemical bioavailability of pollutants (contaminant concentration, type, solubility, chemical structure and toxicity). Biodegradation can occur under a wide range of pH; a pH of 6.5 to 8.5 is generally optimal for biodegradation in most aquatic and terrestrial systems.

Keywords : Biodegradation, aquatic, microorganism, bioaugmentation, bioventing, biopiles.

LS-42

To study the mode of action for Multi Drug Resistance (MDR) pathogens against different classes of antibiotics

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ABSTRACT

Multi drug resistance (MDR) bacteria are bacteria that have become resistant to certain commonly used antibiotics. There are many different types of MDR bacteria that can easily be found throughout the environment including water and soil. They cause the same type of infections as non-resistant bacteria. The difference is that when an infection with multi-drug resistant bacteria is developed, include *Psuedomonas aeroginosa, Staphylococcus aureus* (MRSA), *Esherichia coli, Acinetobacter baumannii, Klebsiella pneumoniae, Mycobacterium tuberculosis, Neisseria gonorrhoeae* e.tc. Multiple drug resistance (MDR) is the ability of some microorganisms to resist the actions of multiple antimicrobial agents. MDR include those resistant to multiple antibacterial, antifungal, antiviral, and anti-parasitic drugs. Similar activities of some microorganisms to certain chemical (drug) that would normally kill them or limit their growth are called antimicrobial resistance (AMR). Multi drug resistance can be classified as primary resistance, secondary resistance, intrinsic resistance, extensive resistance and clinical resistance. The classes of antibiotics that fall victim of resistance include betalactams, glycopeptide, aminoglycosides, sulphonamides, cephalosporins etc. The mode of action of antimicrobial drug includes cell wall synthesis inhibitors, protein synthesis inhibitor, blockage of key metabolic pathways, nucleic acid synthesis inhibitors etc. Bacteria often become resistant and this could be through one of several biochemical mechanisms such as mutation, destruction or inactivation and efflux or genetic transfer of materials between bacteria by several means such as conjugation, transformation and transduction. The mode of action of MDR protozoa occurs through decrease of drug uptake, the export of drugs from the parasite by P-glycoproteins and other traffic ATPases etc. The mode of action of MDR occurs through genetic changes in the drug target, changes in drug transport, drug metabolism etc. The mode of action of antiviral drugs usually target viral DNA polymerase having the reverse transcriptase activity to inhibit the viral replication. The mode of action of MDR fungi occurs as they have learnt to modify the antifungal drug targets or most commonly increase the efflux of the incoming drugs There are various ways to reverse this resistance such as washing hands after seeing each patient, the public should wash raw fruit and vegetables thoroughly to clear off both resistant bacteria and possible antibiotic residues, avoid the misuse of antibiotics, etc.

Keywords: Microorganism, Multiple drug resistance (MDR), DNA polymerase, resistant.

LS-43
To study the effect of NOX & SOX emission from diesel engines and its effect on human health

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ABSTRACT :

NOx and SOx evolved from diesel engines, fuel combustion led to much human healthhazardous. The scientists based their predictions according to different scientific evidences, which categorized into two main groups; the first predicts decline air pollution and climatic changes till 2050. While the second predicted increase in air pollution and climatic changes till 2030. Sulfur dioxide (SO_2) is a gas formed when sulfur is Emissions are dominated by fossil fuelcombustion at exposed to oxygen at high temperatures during fossil fuel northern mid-latitudesand by biomass burning in the combustion, oil refining, or metal smelting. SOx is toxic attropics. The distribution of high concentrations, but its principal air pollution effects emissionsto the atmosphere in 2006 as determined by are associated with the formation of acid rain andsatellite measurements of atmospheric NOx aerosols. SO_2 dissolves in cloud droplets andoxidizes to concentrations. In the atmosphere , NOx reacts with form sulfuric acid (H_2SO_4),which can fall to Earth as acid volatile organic compounds (VOCs) and carbon rain, snow, orform sulfate aerosol particles in the monoxide to produce ground-level ozone through aatmosphere. Nitrogen oxides, referred together oxidized to nitric acid (HNO_3). Like sulfuric acid,nitric acid) are highly reactive gases formed when contributes to acid deposition and to aerosolformation oxygen and nitrogen react at high temperatures. Today coal combustion is a majorcontributor to urban air pollution in China, especially from emissions of SO_2 and aerosols. Airpollution regulations in developed countries have reduced industrial smog events, butphotochemical smog remains a persistent problem, largely driven by vehicle emissions.Photochemical smog forms when NO_2 and Volatile organic compounds (VOCs) react x in thepresence of solar radiation to form ozone. The solar radiation also promotes formation ofsecondary aerosol particles from oxidation of NOx , VOCs and SOx. The proposition that airpollutant emissions will sharply decline in the future is far more certain than any predictions ofhow and why the Earth's climate will change due to greenhouse gas emissions (NOx, SOx, CO, VOC).

*Keywords:*greenhouse, smog, Air pollution, radiation, fossil fuel.

LS-44
To study the anti-oxidants capacity of dried fruits effective for Human health improvement

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ABSTRACT :

Modern drying technology provides the opportunity to obtain dried fruits with highconcentrations of bioactive compounds. Such products may also be fortified with functionalingredients. The adoption of dried fruit as a carrier of functional ingredients for consumers isindispensable to launch this kind of product successfully on the market. Thus, the aim of thisstudy was to collect data on consumer perceptions and interests in dried fruits (plain orfortified). In this quantitative study, the respondents were first asked to rank statements abouta product with different positive influences on human health. Furthermore, we checked thelevel of consumer interest in dried fruits enriched with a particular functional ingredient (e.g.,anti-oxidants, natural fruit sugars, or pre-biotics. Products with anti-oxidants seemed to bethe most promising in all three countries investigated. Among five different forms of product(i.e., candy, fruit teas, cereals, bars, or cookies) in which dried fruit could be incorporated,cereals were selected by approx. 33% of all respondents as the best product to which afunctional dried fruit could be added. Dried fruits can be adopted as carriers of functionalingredients, especially when promoted as a source of anti-oxidants. New food productdevelopment, especially those with functional properties, represents a high risk for anycompany. Statistics show that many functional food products, even when developed from asound scientific point of view, encounter poor market acceptance. Approx. 75% of newly-launched food products are withdrawn from the food market during their first 2 years.Consumer acceptance of a specific functional ingredient is linked to consumer knowledge ofits health effects, thus, the first essential step in product development is to explore whichdiseases consumers are actually concerned about. To consume functional foods, consumersalso need to know what benefit they will get from consuming. For many years, in theEuropean Union, using disease-related information on packages or in product advertisementsfor a functional food was forbidden. This provides the food industry with new legislationopportunities to design innovative products with added nutritional value.

Keywords: opportunity, dried fruits, prebiotics, ingredient, human health.

LS-45
Study on Aegle Marmelos derived Bio-Char for Adsorption of MethyleneBlue dye

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ABSTRACT

The preparation of activated carbon from *Aegle marmelos* fruits shell, a biomass solid waste,required the use of three distinct acids as an activator. For the purpose of removing the cationicdye methylene blue (MB) from an aqueous solution, the activated carbon that had been treatedwith sulfuric acid served as a best low-cost adsorbent. Variations in adsorbent dose (0.1–1g/L),initial dye concentration (50–250 mg/L), and contact time (10–60 min) were used to evaluateMB adsorption from an aqueous solution under equilibrium and kinetic conditions in batchmode. The Freundlich model did not fit the equilibrium data as well but the Langmuir isothermmodel did. Compared to hydrochloric acid and phosphoric acid, sulfuric acid-treated carbonhad the highest adsorption capacity. The pseudo-second order (PSO) kinetic gave a gooddescription of the results of the kinetic uptake.

Keywords: Activated carbon; Adsorption; Aegle marmelos; Methylene blue; Sulfuric acid;Hydrochloric acid, Phosphoric acid and Chemical activation

LS-46
Role of PTPN22 and VDR gene polymorphisms in susceptibility to rheumatoid arthritis: a study from central India

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ABSTRACT :

Rheumatoid arthritis (RA) is an autoimmune disorder which can be characterized by chronic inflammation of the joints. All joints of the body are prime targets for RA. Several genes which are associated with immunomodulatory functions could be associated with RA as well. In the present investigation we selected the genes which are involved in immunoregulation such as PTPN22 (proteintyrosine phosphatase, non-receptor type 22 (lymphoid)), and VDR (vitamin D receptor), and investigated the impacts of their polymorphism in RA susceptibility. One hundred and twelve patients were enrolled and 125 controls from similar ethnicity were selected for the present investigation. Geneticpolymorphism was detected through the PCR-RFLP (polymerase chain reaction restriction fragmentlength polymorphism) method. The pattern of genotype, allele distribution, and carriage rate in thedisease and control groups suggested a significant association of PTPN22-1858 T (rs2476601) carriage(carriage of "TT" and "CT") in RA susceptibility. The pattern of genotype and allele distribution in thedisease and control groups suggested a lack of association of VDR FokI (rs10735810) in RA susceptibility.Our findings revealed that the PTPN22 polymorphism is associated with RA, while, the VDRpolymorphism is not associated with RA susceptibility.

Keywords: rheumatoid arthritis, autoimmune disorder, genetic polymorphism, VDR, PTPN22

LS-47
TO STUDY THE ASSOCIATION OF INTERLEUKIN-10 (−592A/C) GENEPOLYMORPHISM AND ITS SUSCEPTIBILITY TO DIABETES TYPE 2

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ABSTRACT :

As of 2002, about 18.2 million United States nationals suffer from diabetes type 2. The rise of the diabetic scourge is also distressing in India with the number of diabetics projected to be three times its current estimated number by 2025. This is a medically and economically important disease and is in the top 10 and perhaps in the top 5 most devastating diseases in the developed world and is becoming rapidly more so. The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The prevalence is higher in urban (10.8%) than rural (7.2%) areas, and in high-income (10.4%) than low income countries (4.0%). One in two (50.1%) people living with diabetes do not know that they have diabetes. The genetic as well as environmental risk factors have been established which may increase the risk of diabetes type 2. A complex gene environment interaction has been seen to be as the major factor behind the diabetes type 2 pathophysiology. In determining the risk of developing diabetes, environmental factors such as food intake and exercise play an important role.
Keywords: diabetes, pathophysiology, devastating diseases, complex gene, diabetes.

LS-48

Hydrobiological study of Sarfa River at district Shahdol (M.P.) India with reference to fisheries

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ABSTRACT :

Hydrobiological studies of Sarfa River were carried out for a period of one year from January 2023 to December 2023 from three different stations at Shahdol (M.P.). Water temperature, pH, dissolved oxygen, calcium, carbon dioxide, BOD, alkalinity, chlorides, total hardness, and total dissolved solids were among the parameters measured. These characteristics were examined and contrasted with the benchmark values suggested by the World Health Organization and the Bureau of Indian tandards. The goal of the current study was to determine the Sarfa River water quality at Shahdol. The findings showed that the majority of the parameters showed notable seasonal fluctuations; the water was determined to be hard, filthy, and unsuitable for fish, residential, and agricultural growth.

Keywords: Hydrobiological status, Sarfa River, water, fish culture

LS-49

Assessment of asymptomatic fungal infections in COVID-19 positive and COVID-19 negative pneumonia: A comprehensive epidemiological analysis

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ABSTARCT :

The COVID-19 pandemic has underscored the impact of secondary fungal infections on patient outcomes. This single-center study explores asymptomatic fungal infections in COVID-19- positive and COVID-19-negative pneumonia cases, elucidating the intricate relationship between viral respiratory illnesses and fungal co-infections. Methods: Conducted at a single center, this cross-sectional study examines the prevalence, risk factors, and clinical implications of asymptomatic fungal infections in patients with COVID-19-positive and COVID-19-negative pneumonia. Various demographic, clinical, and laboratory parameters were analyzed. Results: Fungal infections were significantly more prevalent in COVID-19 positive pneumonia cases (60%) compared to COVID-19 negative pneumonia cases (36%), with a notable P value of 0.016309. Furthermore, COVID-19-positive patients exhibited distinct clinical characteristics, including increased use of remdesivir (94%), higher rates of invasive mechanical ventilation (36%), and a prolonged hospital stay (14.29 days). Conclusion: This study sheds light on the heightened vulnerability to asymptomatic fungal infections in COVID-19-positive pneumonia cases. Understanding these infections prevalence and their associated factors is crucial for comprehensive patient care and may influence treatment strategies, emphasizing the need for targeted interventions in viral respiratory illnesses.

*Keywords:*COVID-19, fungal infections, hospitalized patients, ICU, immunocompromised, pneumonia

LS-50
The Journey of AEG1 Promoter from Cotton

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ABSTRACT :

Promoters are essential components for developing the transgenic plants. While CaMV35Spromoter is most commonly used promoter for constitutive expression, identification oftapetum specific promoters like TA29 from tobacco led to the development of pollinationcontrol system for hybrid seed production based on developing transgenics withbarnase/barstar genes. Development of hybrid system in Indian mustard (Dhara MustardHybrid-11: DMH-11) is a successful example of this technology approved by GeneticEngineering Appraisal Committee (GEAC). In order to expand this technology in cotton, there was a need to identify a tapetum specific promoter from cotton. The work was initiated by identifying a gene expressed 'specifically' in the anther tissue of cotton. Analysis of spatial expression showed that the identified gene name AEG1 (Anther Expressing Gene1) was expressed at tapetum layer. This was followed by isolating the Upstream Regulatory Module (URM: Promoter region+ 5`UTR) this gene and testing its activity in different tissue of transgenic cotton and tobacco lines. This analysis revealed that AEG1 URM was also active in root in addition to driving expression in tapetum. We thus analyzed the URM and engineered the promoter to make it tapetum specific. The activity of engineered AEG1 URM was assessed in tobacco by developing transgenics with reporter gene β-glucuronidase as well as by developing the male sterile lines using the barnase gene
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LS-51
Biodiversity and sustainable conservation

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ABSTRACT :

Biodiversity refers to a variety of living beings , living at a particular place, area or earth. Biodiversity comes from joining two words ie. Biological diversity. Biodiversity is facing numerous threats; many of them are driven by anthropological activities. These are threats to the ecosystems, biodiversity and human societies as well. Some of the primary threats to biodiversity include Habitat Destruction and Fragmentation, Human activities like urbanization and infrastructure development, Deforestation, Climate Change, Pollution, Invasive Species, Emerging infectious diseases, Legal and Illegal Wildlife Trade and Inadequate conservation efforts, and poor enforcement of conservation laws. In 1987, the United Nations Brundtland Commission defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability is ability to maintain or support a process over time. Sustainability is often considered into three economic, environmental, and social. Several professionals, trades and governments have committed to sustainable goals, such as reducing their environmental pollution and conserving the biodiversity and resources. Sustainability means Conservation of resources while development. Cycling of materials is important. In this paper various biodiversity forms and their sustainable conservation is discussed.

Key words- Biodiversity, sustainability, conservation etc.

LS-52
Heavy metal pollution in soil and its toxic effects on agriculture

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ABSTRACT :

Heavy metal pollution in soil poses a significant threat to global agricultural sustainability, food security,and human health. This paper investigates the sources, behavior, and toxic effects of heavy metals suchas cadmium (Cd), lead (Pb), arsenic (As), and mercury (Hg) in agricultural soils. These metals, introducedthrough industrial discharges, mining activities, pesticides, and fertilizers, accumulate in the soil overtime, altering its physicochemical properties and microbial diversity. The toxicological impact extends tocrops, resulting in reduced growth, nutrient imbalances, and bioaccumulation of metals in edible plantparts, which enter the human food chain. This study highlights the mechanisms of heavy metal uptakeby plants, their interference with photosynthesis and enzymatic activities, and their long-termconsequences on crop yield and quality. Mitigation strategies, including phytoremediation, soilamendments, and sustainable agricultural practices, are explored to reduce heavy metal bioavailabilityand toxicity. By integrating multidisciplinary approaches, this study underscores the need for robustmonitoring systems, regulatory frameworks, and awareness campaigns to combat heavy metal pollutionand ensure the health of soils, crops, and communities.

Keywords: Heavy metal pollution, Toxicological impact, Mitigation strategies, Heavy metal pollution,Health of soils, crops, and communities, Toxic effects on agriculture

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Effect of toxic pesticide in aquatic media and on fish catla catla

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Abstract : For all manner of poisons the aquatic environment is the ultimate sink. Every substance directly or indirectly used in big amount and inters in the aquatic ecosystem. The size and composition of water body and possible delusion determine the degree to whichorganisms accumulate their residues. A necessary evil in the agro technology paradigm is the uses of pesticide which flow in water resources and create harmful impact on aquatic living organisms. Even when is used in restricted locations, these pesticides are washed and transferred by rain or floods into big bodies of water such as pond and river and create harmful effects on life of fish especially catla catla. The most notable behaviour alteration in the form of a symptom that might be easily noticed in an aquarium during pesticide exposure is a change in fish movement and other physiological impact. Low pesticide level also have miner physiological and biochemical impact on fish. The surface phenomenon scene upon exposure to Azadirachtin in catla catla also show the hypoxic conditions and a desire for fish because of pollution stress.

Keywords : Pesticides, Fishes, Water, river, ecosystem, Azadirachtin, etc.

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Perspectives of Anesthetic Properties of Cove Oil on the Toxic Effects on Channa punctatus

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ABSTRACT

Toxicological effect of Channa punctatus is the scientific memorandum of different substances, medication, chemicals, polymers beverages, fertilizers, foods, pesticides and other toxicants, they are interact with the live organism, have adverse effects. A certain chemical compound may therapeutic effects with the treatment of disease when used in low concentration. How ever when in consumed more concentration that become toxic and lead to the death of an aquatic animals. There fore toxicants utilise a dose response connection. Clove oil has a character of distinctive and pleasing aroma, as well as sensation of burning, antibacterial, antibiotic, antiviral and antifungal property also. Clove oil is used in a aquaculture to mitigate the stress an physical harm of fish during transportation and manipulation.

Keywords: Clove oil, Antiviral, Antiseptic, Antibiotic, Sensation of burning.

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HISTOPATHOLOGICAL HEPATOSOMATIC INDEX ON SUPEROXIDE DISMUTASE (SOD) ENZYME ACTIVITY OF FRESH WATER TELEOST FISH

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ABSTRACT

One of the most extensive and diversified groups of vertebrates is the teleost family, which includes a wide variety of bony Fish found in freshwater environments. River, lakes, ponds and wetlands are just few of the many freshwater habitats in which they may be found. In aquatic habitats, freshwater teleosts contribute to biodiversity and are key markers of ecosystem health due to their complex anatomy and Adaptations. The effects of environmental stresses on fish health and ecosystem integrity may be better understood via the study of histopathological alterations in aquatic species, especially fresh water teleost fish. Oxidative stress in fish is a growing problem in today's polluted and degraded freshwater habitats. The research seeks to provide on the physiological impacts of environmental stressors, namely pollution, on the health of freshwater teleost fish by investigating their histopathological hepatosomotic index (HSI) and Superoxide Dismutase (SOD) enzyme activity. Bindeshwari Fishery pond in Bhilampur Jaunpur District was used to collect fish samples, After being bought to a laboratory settings, the fish were given sublethal dosages of Atrazine, Contaf and fenvalerate after becoming acclimated. Changes in SOD activity an essential enzyme in the antioxidant defense system against reactive oxygen species (ROS) and HIS which represent liver weight relative to body weight, were tracked in the Research. The fish liver, kidneys testicle and ovaries showed major changes after being exposed to the contaminants, according to Histopathological analyses normal cellular architecture and well organized liver structure were hallmarks of healthy histological findings seen in the control group. Atrazine, Contaf and fenvalerate on the other hand, caused oxidative stress symptoms in fish, such as inflammation, cellular necrosis and structural alterations in hepatocytes, which were Associated with elevated SOD activity. These results point to a physiological reaction to environmental Pollutants that cause oxidative damage.

Key words:- Environment, Pollution, Fresh Water, Contaminants, Ecosystem ,Oxidative stress.