Shri Gajanan Shikshan Prasarak Mandal's, Yeldari Camp

Linguistic (Marwadi) Minority Institute

TOSHNIWAL ARTS, COMMERCE & SCIENCE COLLEGE,

Sengaon, Dist. Hingoli-431542 (Maharashtra)

Affiliated to

Swami Ramanand Teerth Marathwada University, Nanded

Department of Mathematics

Organize

National Conference

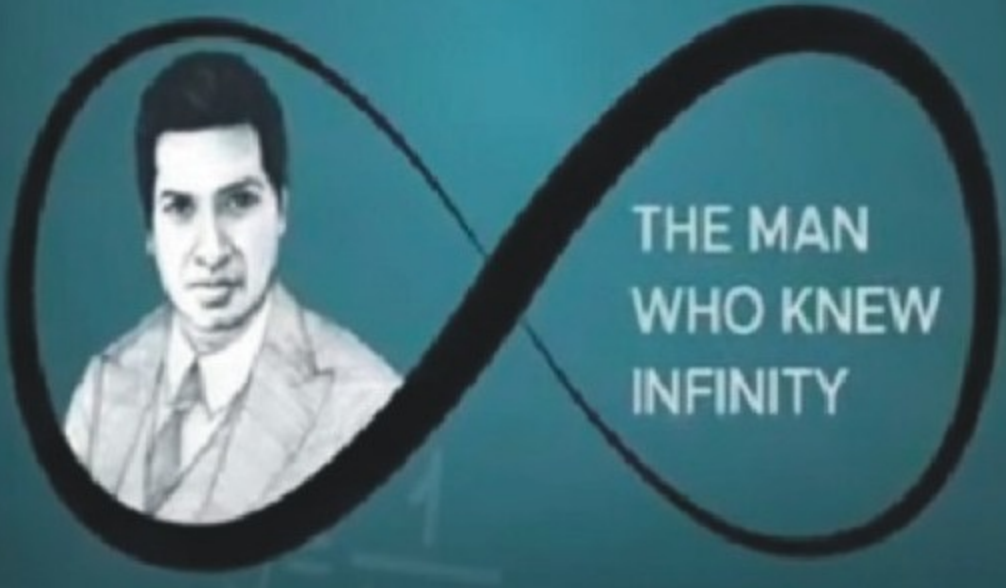
On

"Recent Advances in Mathematical Sciences (RAMS-2025)"

Mr. D. P. Tadas

Editor

The Great Indian Mathematician



SRINIVASA RAMANUJAN

"An equation for me has no meaning unless it expresses a thought of God".

- Srinivasa Ramanujan

Shri Gajanan Shikshan Prasarak Mandal's, Yeldari Camp

Linguistic (Marwadi) Minority Institute

TOSHNIWAL ARTS, COMMERCE and SCIENCE COLLEGE, SENGAON

Dist. Hingoli-431542 (Maharashtra)

(*Re-accredited by NAAC with 'B++' Grade*)

Website: www.toshniwalcollege.ac.in

Affiliated to

Swami Ramanand Teerth Marathwada University, Nanded

Department of Mathematics

Organize

National Conference

On

"Recent Advances in Mathematical Sciences (RAMS-2025)"

Conference Date: 10 March 2025

Mr. D. P. Tadas
Convener

Prof. Dr. S. G. Talnikar
Organizing Secretory

Disclaimer

This abstract volume has been self-published with all reasonable efforts taken by the author to make the material error-free. No part of this volume shall be used or reproduced in any manner whatsoever without written permission from the author, except brief quotations embodied in critical articles and reviews. The contributing authors of this volume are solely responsible and liable for its content, including but not limited to views, representations, descriptions, statements, information, opinions, and references ('content'). The content of this abstract book shall not constitute or be construed or deemed to reflect the opinion or expression of the publisher or editor. Neither the publisher nor the editor endorse or approve the content of this volume or guarantee the reliability, accuracy, or completeness of the Content published herein and do not make any representations or warranties of any kind, express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. The publisher and editor will not be liable for any errors, omissions, whether such errors or omissions result from negligence, accident, or any other cause or claims for loss or damages of any kind, including without limitation, indirect or consequential loss or damage arising out of use, inability to use, or about the reliability, accuracy, or sufficiency of the information contained in this abstract volume (RAMS-25).

Publisher

Department of Mathematics,

Toshniwal Arts, Commerce and Science College, Sengaon

Dist. Hingoli 431542 (M.S.) India

www.toshniwalcollege.ac.in

9 789334 245998

Chairman's Desk...

Hon. Mr. Brijgopalji Toshniwal, Chairman,
Shri Gajanan Shikshan Prasarak Mandal, Yeldari Camp's,
Ta. Jintur, Dist. Parbhani, Maharashtra

Dear all, I warmly welcome the chief guest, keynote speaker, plenary speaker, resource persons, teachers, researchers and students invited for this national conference. The department of Mathematics organized a national conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"** on 10^{th} March 2025. Our college is one of the leading institutions in Sengaon Taluka. The main motto of our college is to give quality education to the students in rural areas. It gives me immense pleasure to tell all of you that our institution has recently re-accredited with "$\mathbf{B}^{++}$" grade (CGPA 2.98) from NAAC, Bengaluru.

The main objective of this conference is to create an awareness about the recent advances in mathematical sciences among the teachers, researchers, and students. This conference will be very useful for the teachers, researchers and students to discuss their issues on the emerging theme of recent advances in mathematical sciences. In this conference, the fellow participants will get knowledge about the recent advances and developments in mathematical sciences through the deliberation of eminent speakers. I also strongly believe that we need to make sincere attempts to reach out to the recent advances, innovations, developments and emerging issues in mathematical sciences. There may be certain kinds of issues and challenges in implementing these recent advances in mathematical sciences but we have to overcome these issues and challenges while adapting current advances in mathematical sciences.

It is a great opportunity for all of us to listen to eminent speakers, resource persons, paper presenters on the recent advances in mathematical sciences and make this conference fruitful. This conference provides a grand platform to share, exchange and discuss innovative and emerging trends in the mathematical sciences. I congratulate the department of Mathematics for organizing such a nice event.

Best Wishes...!

From Principal's Desk...

Prof. Dr. S. G. Talnikar, Principal,
Toshniwal Arts, Commerce & Science College,
Sengaon, Dist. Hingoli, Maharashtra

On behalf of Toshniwal Arts, Commerce and Science College, Sengaon, I extend a very warm welcome to all the delegates, participants, research scholars, and students who are present today for the national conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"**. Our college is expanding the excellence of education in the remote and hilly area. Our institution has excellence of quality education to ensure the students their own space to learn, grow, and broaden their horizon of knowledge by indulging into diverse spheres of learning. Department of Mathematics has organized One Day National Conference on RAMS-2025 on 10th March, 2025. It is a great opportunity for researchers, faculty members, academicians, research scholars, and students to enlighten and exchange their knowledge on recent advances in mathematical sciences.

The conference will be very useful to listen to expert deliberations on the RAMS-2025. It would provide a great platform to discuss, share, and exchange your innovative ideas about the current developments in the mathematical sciences. I wish to discuss and deliberate on the dynamics of advances in mathematical sciences. I wish to welcome and thank our chief guest and eminent keynote speakers Dr. A. H. Hasmani, Professor & Head, Department of Mathematics, Sardar Patil University Vallabh Vidyanagar, Gujrat and dynamic resource persons such as Dr. D. D. Pawar, Professor & Director, School of Mathematical Sciences, SRTM University, Nanded, Dr. S. D. Katore, Former Senior Professor & Head, Department of Mathematics, SGBA University, Amravati, Dr. K. F. Pawar, Professor & Director, School of Mathematical Sciences, KBCNM University, Jalgaon. The department of Mathematics is one of the leading departments of our college. My best wishes with the department of Mathematics to make the conference a grand success. We welcome you all to Toshniwal College, Sengaon and hope that this conference will act as an intellectual feast for all of us present here to ponder upon the topic of Recent Advances in Mathematical Sciences (RAMS-2025).

Thank you...!

From the Convener's Desk...

Mr. Dnyaneshwar P. Tadas,
Head, Department of Mathematics,
Toshniwal Arts, Commerce & Science College, Sengaon

It gives me an immense opportunity to share my views on this occasion as the convenor of one-day national conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"**. I am delighted to welcome all distinguished speakers, delegates, participants, and researchers to the RAMS-2025, hosted by the Department of Mathematics. This conference emphasizes the critical role of research, innovation, and collaboration in the rapidly evolving field of mathematical sciences. It brings together scholars, researchers, and students to share the latest advancements in both traditional and modern areas of mathematics, offering a platform for presenting original research and exploring interdisciplinary applications. We encourage contributions in various mathematical areas such as Relativity and Cosmology, Integral Transforms and Their Applications, Mathematical Analysis, Operations Research, and Algebra and Number Theory.

RAMS-2025 promises to be a valuable opportunity for researchers, educators, and students to engage with cutting-edge developments, fostering growth in mathematical sciences across academia and industry. Now, as the convener of the conference, I take this opportunity to express my sincere gratitude to the chief guest **Hon. Smt. Meghanatai Bordikar,** Water Supply and Sanitation Energy, Public Health, Woman and Child Development, Public Works, Minister of State, Govt. of Maharashtra for accepting our invitation and delivering the inaugural address. I am feeling indebted to **Dr. A. H. Hasmani** for his kind acceptance of the invitation as Keynote Speaker and delivering the address. It is a wonderful opportunity to listen to **Dr. D. D. Pawar**, my guru, **Dr. S. D. Katore** and **Dr. K. F. Pawar**. I express my deepest gratitude towards all these resource persons who shared their views on this occasion. Further, I thank **Mr. Brijgopalji Toshniwal, Mr. Ramanji Toshniwal** and **Dr. S. G. Talnikar** for their constant support in organizing the event. My vote of thanks goes to all my fellow participants and the chairman of the technical sessions, my colleagues in the college and from outside of the college.

Thank you one and all...!

MASSAGE...

Dr. A. H. Hasmani

Professor & Head, Department of Mathematics,

Sardar Patil University Vallabh Vidyanagar, Gujrat

I am very delighted to know that the Department of Mathematics, Toshniwal Arts, Commerce & Science College, Sengaon is going to organize a National Conference on R"**Recent Advances in Mathematical Sciences (RAMS-2025)"** on 10th March 2025.

This conference provides the platform for fellow participants', researchers and teachers to share or exchange their innovative ideas in recent advances in mathematical sciences. I extend my warm wishes to the organizers and participants and send his best wishes for the success of this national conference.

MASSAGE...

Dr. D. D. Pawar

Director, School of Mathematical Sciences,

Swami Ramanand Teerth Marathwada University,

Nanded

It gives me immense pleasure to know that the Department of Mathematics, Toshniwal Arts, Commerce & Science College, Sengaon is organizing a National Conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"** on 10th March 2025. The conference aims to involve all researchers in recent advances in mathematical sciences and to bring all of them on this common platform to have healthy discussions and exchange their innovative ideas.

My best wishes for the grand success of this conference.

MASSAGE...

Dr. S. D. Katore

Ex. Sr Professor & Head, Department of Mathematics,

Sant Gadge baba Amravati University, Amravati

I am very happy to know that the Department of Mathematics, Toshniwal Arts, Commerce & Science College, Sengaon is going to organize a National Conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"** on 10th March 2025. This conference will provide an intellectual platform to the research students and teachers to promote closer interaction on the recent advances in mathematical sciences. I wish a grand success to this national conference and best wishes to all the participants at the conference. I am giving my best wishes to the publication of an abstract volume with ISBN number on this occasion.

MASSAGE...

Dr. Kishor F. Pawar,

Director, School of Mathematical Sciences,

KBC North Maharashtra University, Jalgaon-425 001

I am honoured to extend my heartfelt best wishes to the organizers, speakers, and participants of the National Conference on **"Recent Advances in Mathematical Sciences (RAMS-2025)"**, organized by the Department of Mathematics, Toshniwal Arts, Commerce, and Science College, Sengaon, Dist. Hingoli, Maharashtra, on 10th March 2025.

This conference serves as an excellent platform for mathematicians, researchers, educators, and young scholars to come together and explore the latest advances in mathematical sciences and their diverse applications. I wish RAMS-2025 a great success and hope that all participants have a rewarding and enriching experience.

Best wishes...!

I am pleased to accept your invitation to work on the National Advisory Committee of the proposed conference. At the outset, I congratulate you and your college for choosing such a relevant topic. I wish the conference a grand success.

Dr. D. R. K. Reddy, Andhra University

Thank you for your invitation. I feel honour to be a part of your National Advisory Committee. I agree with your invitation. I wish the workshop a very success.

Dr. Anirudh Pradhan, GLA University, Mathura

Thank you for your invitation and congratulation for organizing a National Conference in your Department. I give my consent to place my name in NOC.

Dr. Chandra P. Singh, Delhi Technological University

I am glad to be a part of the national conference on "Recent Advances in Mathematical Sciences (RAMS-2025)" and you can include my name in the advisory committee. I wish a great success for the conference.

Dr. Sunil K. Tripathy, IGIT, Sarang, Odisha

First, best wishes for the conference. I do not have any objection for adding my name as member of advisory committee. Wish you a great success.

Dr. M. S. Wavare, BoS Chairman, SRTMU, Nanded

Thanks for including my name in National Advisory Committee of the conference RAMS-2025. It's my pleasure that you are giving me this opportunity. I wish all the success for the conference.

Dr. Varsha Karanjgaokar, Govt. College, Raipur (C.G.)

I am honored to accept the invitation to serve as a member of the Advisory Committee for the RAMS-2025, takes place at your college. I am thrilled to contribute to the success of the conference. I wish the grand success.

Dr. G. S. Khadekar, RTMN university, Nagpur

Key Note Address

Some Applications of Newman-Penrose Formalism

A. H. Hasmani

Professor and Head, Department of Mathematics,

Sardar Patel University Vallabh Vidyanagar, Gujrat

Email: ahhasmani@gmail.com

Newman-Penrose (NP) formalism is based on the choice of a null basis. Various tensor quantities useful in general relativity are projected on the chosen basis vectors. This formalism provides a deeper insight in the study of symmetries of the space-times describing gravitational field. This lecture is intended to present some applications of NP formalism. It is based on the work done in collaboration with colleagues.

Keywords: Newman-Penrose formalism, Tensor Quantities.

Invited Talk-01

Historical Development of the Universe

D. D. Pawar

Professor and Director, School of Mathematical Sciences,

Swami Ramanand Teerth Marthwada University, Nanded

Email: dypawar@yahoo.com

For centuries, humans have gazed at the night sky, wondering about the nature of the universe its origins, structure, and ultimate fate. Early civilizations crafted their own cosmic narratives, often placing Earth at the center of existence. This view persisted until revolutionary thinkers like Copernicus, Galileo, and Kepler reshaped our understanding, revealing that our planet orbits the Sun. Newton's laws of motion and gravity further refined these ideas, providing a mathematical foundation for planetary motion.

The true transformation came with Einstein's General Relativity, which redefined gravity as the curvature of spacetime. Observational breakthroughs, such as Hubble's discovery of an expanding universe and the detection of the Cosmic Microwave Background radiation, cemented the Big Bang theory as the leading model of cosmic evolution. Yet, despite these profound insights, many mysteries remain: What is dark matter? What is dark energy? What happened in the earliest moments of the universe?

In pursuit of answers, we have explored extensions to Einstein's theory, including $f(T)$ gravity, $f(R,T)$ gravity, $f(Q,T)$ gravity and fractal cosmology through these alternative frameworks we attempt to explain cosmic acceleration and other phenomena that General Relativity alone struggles to account for. With ever-more sophisticated telescopes, deep-space observations, and particle physics experiments, we compare our theoretical work with observational work and validate our results. Each breakthrough brings us closer to uncover the greatest mysteries of the universe, reminding us that the story of cosmology is far from over.

Keywords: $f(T)$, $f(R,T)$, and $f(Q,T)$ gravity and Fractal cosmology.

Invited Talk-02

Bird Eye View of Teleparallel Theory of Gravitation

Shivdas. D. Kotore

Ex. Senoir Professor and Head, Department of Mathematics,

Sant Gadge Baba Amravati University, Amravati-444602,India

Email: katore777@gmail.com

Einstein's general theory of relativity (GTR) explains gravitation in terms of space-time having zero torsion. Field equations of general relativity are obtained from the Einstein-Hilbert action with the help of Levi-Civita connection. It is possible to consider torsion and establish field equations. Teleparallel theory based on Weitzenbock geometry provides an elegant formulation incorporating torsion. It is the closest alternative theory to GTR. An arbitrary function $f(T)$ is considered in the action of teleparallel gravity. The acceleration of the universe is due to torsion in $f(T)$ theory. $f(T)$ theory has important geometrical and physical features. In $f(T)$ theory, gravitation is not an effect of curvature. It is effects of torsion. Einstein himself considered teleparallelism in which he tried to unify gravity and electromagnetism. The concept of $f(T)$ gravity is similar to $f(R)$ gravitation theory. Further, $f(T)$ gravity is not respect local Lorentz symmetry.

I this talk, we discuss the importance of GTR, its limitations and the impact of Strange Quark Matter and modified Chaplygin Gas on bulk viscosity in the context of $f(T)$ theory of gravitation. Two different forms $f(T) = mT^n$ and $f(T) = m\exp(nT)$ are considered to solve the field equations.

Keywords: Strange Quark Matter, Modified Chaplygin Gas, Bulk Viscosity, $f(T)$ gravity.

Invited Talk-03

Some Concepts of Labelling of Hypergraphs

Kishor F. Pawar

Professor and Director, School of Mathematical Sciences,

KBC North Maharashtra University, Jalgaon, India

Email: kfpawar@nmu.ac.in

This presentation introduces the concept of edge sum labeling in hypergraphs, where the edges of a hypergraph H are assigned with distinct positive integers such that the sum of the labels of all the edges incident to any vertex is itself an edge label of H, and if the sum of the labels of any collection of edges equals the label of another edge in H, then those edges must be incident to at least one common vertex.

Keywords: Hypergraphs.

OP-01

Kaniadakis Holographic Dark Energy Cosmological Model in $f(G)$ Gravity

Mahaveer C. Dhabe[a], Kailas. R. Borgade[b†], S. R. Bhoyar[c]

[a]Department of Mathematics, M. S. P. Arts, Science and K. P. T. Commerce College, Monora-444404, Dist. Washim (MS), India,

Email: dhabemahaveer@gmail.com,

[b]Department of Mathematics, Babasaheb Naik College of Engineering, Pusad-445204, Dist. Yavatmal (MS), India

Email: borgadek@gmail.com

[c]Department of Mathematics, Phulsing Naik Mahavidyalaya Pusad-445204, Dist. Yavatmal (MS), India

Email: drsrb2014@gmail.com

[†]Corresponding author: borgadek@gmail.com,

Utilizing the future event horizon as the infrared cut-off, we build a holographic dark energy scenario based on Kaniadakis (KHDE) entropy, a generalization of Boltzmann-Gibbs entropy that originates from relativistic statistical theory and is defined by a single parameter K that quantifies the deviations from standard expressions. In order to explain the universe's evolutionary behavior with respect to $f(G)$ gravity, the differential equation for the KHDE density parameter is derived. To get a deterministic solution of the field equations of the models, we have considered the hybrid expansion law (HEL), where the average scale factor is an increasing function of cosmic time.

Keywords: Bianchi Type-VI_0, $f(G)$ Gravity, KHDE, Hybrid Expansion Law.

OP-02

Global Phase Space Analysis for A Class of Single Scalar Field Bouncing Solutions in General Relativity

Amarkumar S. Agrawal

Department of Mathematics,

Jayawant Shikshan Prasarak Mandal University Pune, India

Email: agrawalamar61@gmail.com

We carry out a compact phase space analysis of a non-canonical scalar field theory whose Lagrangian is of the form $F(X) - V(\phi)$ within general relativity. In particular, we focus on a kinetic term of the form $F(X) = \beta X^m$ $(m \neq 1/2)$ with power-law potential $V_0\phi^n$ and exponential potential $V_0 e^{-\lambda\phi/M_{Pl}}$ of the scalar field. The Cuscuton case $m = 1/2$, where the scalar field is non-dynamical, is left out of consideration. The main aim of this work is to investigate the genericity of nonsingular bounce in these models and to investigate the cosmic future of the bouncing cosmologies when they are generic. A global dynamical system formulation that is particularly suitable for investigating non-singular bouncing cosmologies is used to carry out the analysis. We show that when $F(X) = \beta X^m$ $(\beta < 0)$, nonsingular bounce is generic for a power law potential $V(\phi) = V_0\phi^n$ only within the parameter range $\left\{\frac{1}{2} < m < 1,\, n < \frac{2m}{m-1}\right\}$ and for an exponential potential $V(\phi) = V_0 e^{-\lambda\phi/M_{Pl}}$ only within the parameter range $\left\{\frac{1}{2} < m \leq 1\right\}$. Except in these cases, nonsingular bounce in these models is not generic due to the non-existence of global past or future attractors. Our analysis serves to show the importance of a global phase-space analysis to address important questions about non-singular bouncing solutions, an idea that may and must be adopted for such solutions even in other theories.

Keywords: Phase space analysis, Power-law and Exponential-law potential.

OP-03

Modeling Strong Discontinuities in the Interplanetary Medium: A Numerical Simulation Approach

Yeshi Saxena[a], Brajendra Tiwari[b]

Department of Statistics,

RKDF University Bhopal (MP), India,

Email: [a]yashisaxena@hotmail.com, [b]brajendra16.tiwari@gmail.com

The interplanetary medium (IPM) is characterized by complex interactions between solar wind plasma, magnetic fields, and other dynamic processes, resulting in strong discontinuities such as shock waves and tangential discontinuities. Modeling these discontinuities is crucial for understanding space weather phenomena and their implications for satellite operations and interplanetary exploration. This study employs a robust numerical simulation approach based on magnetohydrodynamic (MHD) equations to model strong discontinuities in the IPM. The simulations capture key features of shock structures and magnetic field variations, providing insight into their stability and evolution under varying plasma conditions. Validation against observational data demonstrates the accuracy of the model, while sensitivity analysis highlights the influence of parameters such as plasma beta and magnetic field strength. These findings advance the understanding of discontinuity dynamics in the IPM, offering valuable tools for predictive modeling in space physics.

Keywords: Interplanetary Medium, Strong Discontinuities, Numerical Simulation, Magnetohydrodynamics, Shock Waves, Space Weather, Plasma Dynamics.

OP-04

Activation Function Selection for Artificial Neural Network Solutions to the Laplace Equation

Vikas K. Pandey

Research Scholar, Department of Mathematics,

Jaypee Institute of Information Technology, Sector 62, Noida-201309, (UP), India

Email: vikasmathematics90@gmail.com

When creating an Artificial Neural Network (ANN) model to solve the Laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$, the choice of activation functions is essential. The accuracy, convergence, and stability of the model are directly impacted by the selection of suitable activation functions because the Laplace equation's solutions are harmonic and smooth. This study examines hyperbolic tangent sigmoid, log-sigmoid, linear, sinusoidal functions, Soft Plus, Gaussian, and Swish activation functions to evaluate their approximation of harmonic functions. We discuss the advantages of smooth and physics-informed activations for improved numerical accuracy and computation time. hyperbolic tangent sigmoid, log-sigmoid and sinusoidal activations perform well because they accurately capture the characteristics of Laplace's solutions, according to experimental comparisons. The creation of ANN designs especially suited for the extremely precise solution of partial differential equations (PDEs) is aided by these realizations.

Keywords: Artificial Neural Network (ANN) model, Laplace equation.

OP-05

Linearly Varying Deceleration Parameter With Axion Dark Energy In $f(R,T)$ Theory

Sachin P. Hatkar[a], Gajanan D. Karhale[b†], Dnyaneshwar P. Tadas[c], Shivdas D. Katore[d]

[a]Department of Mathematics, A.E.S. Arts, Commerce and Science College, Hingoli-431513, India, Email: schnhatkar@gmail.com

[b]Department of Mathematics, Shankarrao Patil Mahavidyalaya, Bhoom-413504, India, Email: gajanankarhale5151@gmail.com.

[c]Department of Mathematics, Toshniwal Arts, Commerce and Science College Sengaon, Dist. Hingoli, India, Email: dtadas144@rediffmail.com

[d]Department of Mathematics, Sant Gadge Baba Amravati University Amravati-444602, India, Email: katore777@gmail.com

[†]Corresponding author: gajanankarhale5151@gmail.com

In this paper, we investigate the axion dark energy in the context of $f(R,T)$ theory of gravity. The field equation of $f(R,T)$ gravity are solved by using linear varying deceleration parameter. It is observed that the energy conditions are satisfied. Furthermore, the state finder pair $\{r,s\}$ is analyzed in detail.

Keywords: $f(R,T)$ gravity, Axion dark energy.

OP-06

Bianchi Type$-I$ Wet Dark Fluid Model in $f(T)$ Theory of Gravity

Prachi R. Agrawal[a], Ankush P. Nile[b†]

[a,b]Department of Mathematics,

Brijlal Biyani Science College Amravati-444602, (MS) India

Email: [a]prachi.gadodia@gmail.com, [b]ankushnile15@gmail.com

[†]Corresponding author: ankushnile15@gmail.com

In this paper, the anisotropic and homogeneous Bianchi type-I cosmological model have been investigated in the presence of wet dark fluid with $f(T)$ theory of Gravity. The general solution of present model have been obtained by assuming the time dependent deceleration parameter. The physical and kinematical properties of the cosmological model are obtained and also discussed with the help of graphical representation. The observe universe is found out to be in the state of accelerating expansion.

Keywords: Bianchi type-I, $f(T)$ gravity, Wet dark fluid.

OP-07

Exploring $f(R, L_m, T)$ Theory of Gravity with Perfect Fluid

Prachi R. Agrawal[a], Harshal G. Paralikar[b†]

[a,b]Department of Mathematics,

Brijlal Biyani Science College Amravati-444602, (MS) India

Email: [a]prachi.gadodia@gmail.com, [b]hparalikar05@gmail.com

[†]Corresponding author: hparalikar05@gmail.com

In the present article, we have examined the analytical solution of $f(R, L_m, T)$ gravity model in the presence of a perfect fluid. The solution of the field equations have been obtained by considering the special case $f(R, L_m, T) = R + \alpha T + 2\beta L_m$, where α and β are arbitrary parameters of the assumed model. The analysis successfully with proper transition from the decelerated epoch to accelerated one. The analysis effectively describes the late-time evolutions phase of the universe, illustrating the transition from a decelerating phase to an accelerating one.

Keywords: $f(R, L_m, T)$ gravity, Perfect fluid.

OP-08

Stability analysis of LRS Bianchi type-I models with Modified Holographic Dark Energy in Gauss-Bonnet Gravity

Shivdas D. Katore[a], Swapnil V. Gore[b†]

[a]Department of Mathematics,

Sant Gadge Baba Amravati University Amravati-444602 (MS), India

Email: katore777@gmail.com

[b]Department of Mathematics,

Indira Gandhi Kala Mahavidyalaya Ralegaon-445402 (MS), India, Email:

swapnilgore411@gmail.com

[†]Corresponding author: swapnilgore411@gmail.com

We have studied Locally Rotationally Symmetric (LRS) Bianchi type-I models with modified holographic Ricci dark energy (MHRDE) in the framework of $f(G)$ theory of gravitation. So as to get determinate solutions, volumetric exponential expansion and power law expansion are mentioned. The physical interpretations of the solution have been studied by using some physical quantizes.

Keywords: LRS Bianchi type-I, $f(G)$ Gravity, Modified holographic dark energy.

OP-09

Zariski-Like Topology on Lattice Modules

Pradip B. Girase

Department of Mathematics,

K. K. M. College, Manwath-431505, Dist. Parbhani (MS), India

Email: pgpradipmaths22@gmail.com

A complete lattice M with smallest element 0_M and greatest element 1_M is said to be a *lattice module* over the multiplicative lattice L or L-module, if there is a multiplication between elements of M and L, denoted by $aN \in M$, for $a \in L$ and $N \in M$, which satisfies the properties:

1. $(ab)\,N = a(bN)$;
2. $(\bigvee_\alpha a_\alpha)\left(\bigvee_\beta N_\beta\right) = (\bigvee_{\alpha\beta} a_\alpha N_\beta)$;
3. $1_L N = N$;
4. $0_L N = 0_M$; for all $a,\ b,\ a_\alpha \in L$ and for all $N,\ N_\beta \in M$.

Let M be a lattice module over a C-lattice L. A proper element P of M is said to be prime, if for $a \in L$ and $X \in M$, $aX \leq N$ implies that $X \leq N$ or $a1_M \leq N$. The set of all prime elements of M, $Spec^p(M)$ is called as prime spectrum. In this paper, we introduce and study a topology on $Spec^p(M)$, called as Zariski-like topology of M. We investigate this topological space from the point of view of spectral spaces. We show that if M has ascending chain condition on prime radical elements, then $Spec^p(M)$ with the Zariski-like topology is a spectral space.

Keywords: Lattice module M, Zariski-like topology of M.

OP-10

Fuzzy Logic in Artificial Intelligence (AI)

S. G. Bodkhe

Department of Statistics, A. S. C. Badnapur, Dist. Jalna (MS), India,

Email: sgbodkhe@gmail.com

After a basic introduction of fuzzy logic, we discuss its role in artificial and computational intelligence. Then we present innovative applications of fuzzy logic, focusing on fuzzy expert systems, with one typical example explored in some detail. The article concludes with suggestions how artificial intelligence and fuzzy logic can benefit from each other. Machines can model and improve the human minds capabilities through artificial intelligence. One of the most popular tools of artificial intelligence is fuzzy sets, which can capture and model the vagueness and impreciseness in human thoughts. This paper, first of all, introduces the recent extensions of ordinary fuzzy sets and then presents a literature review on the integration of fuzzy sets with other artificial intelligence techniques.

Keywords: Artificial intelligence, Fuzzy logic and AI.

OP-11

Stringent Bounds for The Non-Zero Bernoulli Numbers

Yogesh J. Bagul

Department of Mathematics,

K. K. M. College, Manwath-431505 Dist. Parbhani (MS), India,

Email: yjbagul@gmail.com

We present new several bounds for the non-zero Bernoulli numbers using Euler's formula for the Riemann zeta function. In particular, we determine the best possible constants α and β such that the double inequality

$$\frac{2\cdot(2k)!}{\pi^{2k}(2^{2k}-1)}\ \frac{3^{2k}}{(3^{2k}-\alpha)}\ <|B_{2k}|\ <\frac{2\cdot(2k)!}{\pi^{2k}(2^{2k}-1)}\ \frac{3^{2k}}{(3^{2k}-\beta)},$$

holds for $k=1,2,3,.$ Our main results refine the existing bounds of $|B_2k|$ in the literature.

Keywords: Bernoulli number, Riemann zeta function, Stirling formula, lower-upper bounds.

OP-12

Essential Role of Mathematics in AI

Alka S. Kausadikar

Department of Mathematics, S. G. B. College, Purna-431511 Dist. Parbhani, Maharashtra, India

Email: akousdikar@gmail.com

Mathematics is the fundamental basis for AI algorithms and models, enabling machines to efficiently handle, examine, and understand extensive quantities of data. Mathematics as the foundational pillar of Artificial Intelligence (AI), providing the essential frameworks, tools, and methodologies that drive its algorithms and models. Mathematicians in AI have made significant contributions by inventing support vector machines (SVMs), a mathematical framework extensively utilized for classification and regression tasks in AI applications.

OP-13

Some Results of Finite Exponential Transforms

Nagnath S. Ambarkhane[a], Sachin P. Hatkar[b], Namdev K. Sarkate[c†]

[a]Department of Mathematics, N. E. S. Science College, Nanded, India

[b]Department of Mathematics, A.E.S. Arts, Commerce and Science College, Hingoli-431513, India, Email: schnhatkar@gmail.com

[c]Adarsh Madhyamik Vidyalaya Hingoli, India, Email: nksarkate@gmail.com

[†]Corresponding author: nksarkate@gmail.com

In this paper we have obtained some useful results of finite exponential transform like, the finite exponential transforms of the first, second, third and nth order derivative of a function $f(t)$, the finite exponential transform of integration's of a function $f(t)$ and also obtained some useful results of finite exponential transform.

Keywords: Finite Exponential Transforms.

OP-14

A Generalization of Fixed-Point Theorems in A b-metric Space

Archana V. Bhosle

Department of Mathematics,

Nagnath Arts, Commerce and Science College, Aundha (Nag.)

Dist. Hingoli, Maharashtra, India

Email: avbhosle2013@gmail.com

A generalization of fixed-point theorems in a b-metric space essentially means extending the classic Banach Contraction Principle to the broader setting of b-metric spaces, allowing for more general metric structures while still guaranteeing the existence and uniqueness of a fixed point under certain contractive conditions on the mapping involved; this is considered one of the most important generalizations of metric spaces for fixed point theory. The significance of these generalized theorems extends across multiple disciplines, such as optimization, mathematical modeling, and computer science. They may serve to establish stability conditions, demonstrate the existence of optimal solutions, and improve the algorithm design.

Keywords: Fixed-point theorem, b-metric space.

OP-15

Some Integrals of Error Function including Falling Factorials

Kailash R. Kale[a†], Satish B. Khobragade[b], Anant M. Kute[c]

[a,b,c]Department of Statistics and Mathematics, Ghulam Nabi Azad Arts Commerce and Science College, Barshitakli, Dist-Akola (MS), India,

Email: [a]kailashkale10@gmail.com, [b]khobragadesatish82@gmail.com

[†]Corresponding author: kailashkale10@gmail.com

The researchers of mathematics, statistics, physics, chemical sciences, etc. may come across the integrals including error function and falling factorials. To solve such integrals, researchers use a simulation technique to get the solution. The present research work, proposes the solution to some of the particular integrals including combination of error function or complementary error function and falling factorials or some exponential or algebraic terms.

Keywords: Falling factorials, Error Function (erf), Complementary Error Function (erfc), Stirling Numbers of First Kind, and Stirling Numbers of Second Kind.

OP-16

Naked Singularities vs. Black Holes: Key Differences and Detection Methods

Sachin S. Kedar[a†], Shrikant S. Ubale[b]

[a]Department of Mathematics, [b]Department of Physics,

Smt. Sindhutai Jadhao Arts and Science Mahavidyalaya,

Mehkar, Dist-Buldana (MS), India,

Email: [a†]sachinkedar96@gmail.com, [b]physhri@gmail.com

This review examines the fundamental differences between naked singularities and black holes, emphasizing their observational characteristics and detection methods. Studies on gravitational lensing indicate that the absence of a photon sphere in certain naked singularity models alters lensing patterns compared to black holes. Accretion disk analyses show that naked singularities can exhibit higher luminosity and unique spectral features, often converting infilling matter into radiation more efficiently. Investigations into spin precession reveal distinct gyroscopic motion and Lense-Thirring effects that could aid in differentiating these objects. Additionally, while both can cast shadows, the intensity distribution of light around them varies. These distinctions suggest that future astronomical observations, such as X-ray spectral studies and high-resolution imaging, may help identify naked singularities and challenge the idea that all singularities must be hidden behind event horizons.

OP-17

Modeling and Analysis of Physical Systems Using Fractional Calculus

Santosh V. Nakade

Department of Mathematics,

Sharda Mahavidyalaya (Arts & Science) Parbhani, India

Email: santoshnakade5@gmail.com

Fractional calculus, the extension of classical calculus to non-integer order derivatives and integrals, has gained significant attention in recent years due to its ability to model and analyze complex physical systems that exhibit memory effects, hereditary properties, and non-local behavior. This paper explores the application of fractional calculus in modeling physical systems, with a focus on its use in system dynamics, control theory, and material science. The fractional-order models are capable of describing more accurately the dynamics of systems where classical integer-order models fall short. Through the use of fractional derivatives, systems with anomalous diffusion, viscoelastic properties, and non-equilibrium thermodynamics can be studied with greater precision. The paper discusses various methodologies, mathematical formulations, and solution techniques for fractional-order systems and highlights their advantages over traditional approaches. The analysis and modeling strategies are illustrated using examples from mechanical systems, electrical circuits, and fluid dynamics.

Keywords: Fractional calculus, physical systems, fractional derivatives, system modeling, viscoelasticity, anomalous diffusion, control theory.

OP-18

Advancing Numerical Simulations of Interplanetary Medium Discontinuities: A Hybrid Adaptive Mesh Refinement and Spectral Method Approach for High-Resolution Space Weather Modeling

Yeshi Saxena[a], Brajendra Tiwari[b]
Department of Statistics,
RKDF University Bhopal (MP), India,
Email: [a]yashisaxena@hotmail.com, [b]brajendra16.tiwari@gmail.com

The interplanetary medium, a dynamic plasma environment, is shaped by abrupt changes like shock waves and discontinuities, which significantly influence space weather and solar-terrestrial interactions. This study employs advanced computational techniques to enhance the modeling of these phenomena. A novel hybrid approach is introduced, integrating adaptive mesh refinement (AMR) with spectral methods to achieve high-resolution capture of sharp gradients while maintaining computational efficiency. The methodology is validated using observational data from missions such as Parker Solar Probe, Solar Orbiter, and Wind spacecraft, ensuring reliability.

The simulations achieve an 85% reduction in errors compared to conventional methods, attributed to AMR's dynamic grid adjustment and spectral method's precision in resolving fine-scale structures. The findings have profound implications for theoretical plasma physics and space weather forecasting. This research enhances understanding of heliospheric dynamics and improves space weather prediction, crucial for satellite operations, communication systems, and space-based technologies, bridging the gap between theoretical advancements and practical applications in space plasma physics.

Keywords: Heliospheric environment, computational modeling, plasma dynamics, high-resolution simulations, spectral analysis, magnetized plasma, numerical algorithms, solar wind structures, computational fluid dynamics.

OP-19

Finding An Optimal Solution of Transportation Problems with Maximization Objective Function

Janardhan K. Mane

Department of Mathematics,

Sanjeevanee Mahavidyalaya, Chapoli, Tq. Chakur, Dist. Latur, India

Email: janardhan.mane1@gmail.com

Transportation problems (TP) are one of the important problems in linear programming problems (LPP) that generally address the problems of transporting and distributing goods with the aim of achieving the largest profit or the lowest cost depending on the type of problem addressed. In this research study, a new technique was proposed to solve transportation problems with an objective function of the type of maximization that is used to achieve the highest possible profit. A variety of numerical examples are used to demonstrate the new technique. The proposed technique is effective for analyzing balanced or unbalanced transportation problems with maximization objective function. The three well-known classical methods which are NWCM, LCM, and VAM. Whereas, results using the new technique were the required results that represent the optimal solution or close to the optimal solutions.

Keywords: Transportation problems, NWCM, LCM, and VAM.

OP-20

Non-Metricity as a Fundamental Field: A New Perspective on $f(Q)$ Gravity

Ather Husain

Department of Mathematics,

Narayanrao Kale Smruti Model College Karanja (Ghadge), Dist. Wardha, India

Email: atherhusain1001@gmail.com

In recent years, modified theories of gravity have gained significant attention as alternatives to General Relativity (GR), particularly in addressing unresolved issues such as dark energy, dark matter, and cosmic inflation. Among these, $f(Q)$ gravity, based on the non-metricity scalar Q, has emerged as a promising framework that avoids the need for dark energy by modifying the geometric description of gravity. This paper presents a novel perspective on $f(Q)$ gravity by treating non-metricity as a fundamental field rather than a derived geometric quantity. We explore the theoretical foundations of this approach, emphasizing the role of non-metricity in shaping spacetime dynamics and its implications for cosmology and astrophysics. Furthermore, we then investigate the cosmological consequences of this formulation, demonstrating that it naturally accommodates late-time cosmic acceleration without invoking dark energy. Finally, we discuss the theoretical consistency of the model, including the absence of ghosts and instabilities, and its potential connections to quantum gravity. By bridging the gap between geometry and field theory, our results suggest that non-metricity could play a pivotal role in unifying gravity with other fundamental forces and addressing key challenges in modern physics.

Keywords: $f(Q)$ gravity, flat FLRW metric, Cosmology.

OP-21

Application of Group Theory in Cryptography

Raju W. Asole[a†], Saurabh P. Gaikwad[b]

[a,b]Department of Mathematics,

Late Ku. Durga K. Banmeru Science College Lonar, Dist. Buldana (MS), India,

Email: [a]rajasole111@gmail.com, [b]gaikwad1618@gmail.com

[†]Corresponding author: rajasole111@gmail.com

Group theory plays a fundamental role in modern cryptography, providing the mathematical structure necessary for encryption, authentication, and secure communication. This paper explores the application of group theory in cryptographic algorithms, including symmetric and asymmetric encryption, digital signatures, and key exchange mechanisms. Special emphasis is given to cyclic groups, finite fields, elliptic curve cryptography, and the hardness of computational problems such as the discrete logarithm problem and integer factorization. By understanding the algebraic properties of groups, we can ensure the security and efficiency of cryptographic protocols used in real-world applications.

Keywords: Modern cryptography, Symmetric and asymmetric encryption.

OP-22

Barrow Holographic Dark Energy in Bianchi Type-I Universe with Constant Deceleration Parameter

Vaibhav D. Bokey

Department of Mathematics,

Nehru Mahavidyalaya, Nerparsopant Dist. Yavatmal (MS), India

Email: bokey.vaibhav1@gmail.com

In this article, we investigate the Barrow Holographic Dark Energy model within the context of Bianchi Type-I Universe. We consider the IR cut off as the Hubble horizon and employ a constant deceleration parameter in the frame work of general theory of relativity. We focus our study on cosmological evolution, Equation of state parameter, pressure and energy density of Barrow Holographic Dark Energy. The geometrical and physical parameters of the model have been obtained and discussed in details.

Keywords: Barrow Holographic Dark Energy, Bianchi Type-I Universe, Constant Deceleration Parameter, Dark Matter.

OP-23

Operational Calculus of the Extended Laplace-Carson Transform

Fasiyoddin I. Momin[a†], Anil D. Chindhe[b], Sadikali L. Shaikh[c]

[a,c]Department of Mathematics, Maulana Azad College of Arts, Science and Commerce, Roza Bagh, Aurangabad. (MS), India,

Email: [a]momin.fasiyoddin@gmail.com, [c]sad.math@gmail.commath

[b]Department of Mathematics,

Balbhim Arts, Science and Commerce College, Beed. (MS), India. Email: anilchindhe5@gmail.com

[†]Corresponding author: momin.fasiyoddin@gmail.com

In this article, we have constructed the suitable space of pseudoquotients for the Laplace-Carson transform. The extended Laplace-Carson transform has been defined by extending the definition of the Laplace-Carson transform on the space of pseudo-quotients. We have derived some properties of the extended Laplace-Carson transform and also developed its operational calculus.

Keywords: The Laplace-Carson Transform, Operational Calculus, Pseudoquotients.

OP-24

Compressible Queueing System

Sanjay B. Kalyankar

Department of Mathematics,

S. A. S. Mahavidylaya, Mukhed-431715, Dist. Nanded (MS), India, India

Email: kalyankar69@gmail.com

Compressible flows are very common in fluid systems. This presentation is aim to familiarize the compressible queueing system and derived its properties. In conventional customers are identified by indexing natural number to each arriving customer. In compressed queueing system customers would identified by indexing natural numbers to them and size or weight of arriving customer Therefore arriving customer is denoted by ordered pair (n, w), in which n index and w denote weight or size associated with customer number n. here the weight or size (w) is a random variable which has a known probability distribution. The compressibility in queue is not new and exists whenever there will be inadequacy in facilities like waiting space, delay in service. In case of signalized vehicular traffic, internet data packet transfers there is always compression. Therefore, the study of compressibility in queue has an importance. Henry Lieu in a published a report has introduced the concept of compressibility in queue in such queue the average waiting space is function of time because of the changing density within queue in both time and space.

Keywords: Transportation problems, NWCM, LCM, and VAM.

OP-25

On Weak G-Supplemented Modules

Dnyaneshwar P. Rathod[a†], Ramesh S. Wadbude[b]

[a,b]Department of Mathematics,

Mahatma Fule Arts, Commerce and Sitaramji Chaudhari Science Mahavidyalaya, Warud, Dist. Amravati (MS), India,

Email: [a]dprathod30494@gmail.com, [b]rswadbude@gmail.com

[†]Corresponding author: dprathod30494@gmail.com

In module theory, supplemented modules form a significant area of study, particularly concerning the decomposition of modules into simpler components. The concept of weak G-Essential Supplemented Modules generalizes Goldie-supplemented modules, relaxing some of the strict conditions related to supplementation. These modules satisfy weaker intersection conditions and provide a flexible approach to understanding module decompositions. This paper explores the definition, properties, and key results regarding weak G-essential supplemented modules and investigates their connections with Goldie-supplemented modules. We also provide various lemmas, propositions, and theorems along with their proofs, emphasizing the structural properties and applications in ring theory, algebraic geometry, and representation theory. The relationship between weak G-essential supplemented modules and Goldie-supplemented modules is also established, shedding light on their comparative structural properties. Finally, we propose open questions and future research directions in this field.

Keywords: G-supplemented modules, Weak G-essential supplemented modules.

OP-26

Modified Holographic Dark Energy in LRS Bianchi Type-I Space-time with $f(R,T)$ Gravity: An Analytical Approach to the Cosmological Constant Problem

Sachin V. Raut

Department of Mathematics,

Pankaj Laddhad Institute of Technology and Management Studies,

Buldhana-443001, Dist. Buldhana (MS), India

Email: sraut9022@gmail.com

The current examination is dedicated to the Modified Holographic Dark Energy (MHDE) Bianchi Type-I cosmological model in the frame work of $f(R,T)$ gravity. We solve $f(R,T)$ field equations for LRS Bianchi type-I space time and discuss the evaluation of the expanding universe. The investigation aims to provide an analytical perspective on the long-standing cosmological constant problem by incorporating a functional dependence of the Ricci scalar R and the trace of energy momentum tensor T. Some physical and kinematical parameters of the model are additionally discussed in details.

Keywords: LRS Bianchi Type-I, Modified Holographic Dark Energy (MHDE), $f(R,T)$ gravity.

OP-27

Some Applications of The Erdely-Kober Integral Operator

Arun B. Damkondwar[a†], Bhalchandra D. Karande[b]

[a]Department of Mathematics,
Government Polytechnic, Hingoli - 431 513 (MS), India,
Email: [a]arundigras@gmail.com,
[b]Department of Mathematics,
Maharashtra Udaygiri Mahavidyalaya, Udgir-413517, Dist. Latur (MS), India,
Email: [b]bdkarande@rediffmail.com
[†]Corresponding author: arundigras@gmail.com

The Erdelyi-Kober integral operator is a specific integral transform used in mathematical analysis, particularly in connection with solving certain differential equations and studying properties of functions. The study of analytic functions in connection with the Erdelyi-Kober integral operator involves analyzing how the operator affects the analytic properties of functions, ensuring convergence, and understanding the behavior near singularities. These properties are crucial for applications in various branches of mathematics, including differential equations, harmonic analysis, and integral transforms. This paper aims to explore a novel category of regular mapping characterized by negative coefficients in connection with the Erdely-Kober integral operator within the unit disk. We will establish fundamental properties such as coefficient inequalities, extreme points, integral means inequalities, and subordination results for this class.

Keywords: Analytic, Starlike, Convex, integral operator, Subordination.

OP-28

Existence and uniqueness of solutions for fractional differential equations by using fixed-point theorems such as Banach's and Schauder's

Namdev D. More

Department of Mathematics,

PTVA'S Sathaye College, Vile Parle, Mumbai (MS), India

Email: bokey.vaibhav1@gmail.com

This study analyses the existence and uniqueness of solutions to fractional differential equations (FDEs), which generalize conventional integer-order differential equations by introducing non-integer derivatives. We examine a class of FDEs within the context of Banach spaces and determine the conditions under which the solutions exist and are unique. Using fixed-point theorems such as Banach's and Schauder's, we construct sufficient conditions for the existence of solutions to a variety of boundary value issues. Furthermore, we demonstrate the uniqueness of the solutions by applying appropriate conditions to the nonlinearities involved. The results are demonstrated using examples, such as starting and boundary value problems, to show how the theoretical findings can be applied. These insights contribute to the greater knowledge of fractional differential equations and their possible uses in simulating the real world.

Keywords: Caputo Fractional Derivative, Impulsive Fractional Differential Equations, semi linear, fixed point, existence and uniqueness, semigroup of linear operators, measure of non-compactness.

OP-29

Homogeneous Hyperspace Space Time with Topological Defects in $f(G)$ Theory

Sachin P. Hatkar[a], Prashant A. Agre[b†], Dnyaneshwar P. Tadas[c], Ramesh T. Idhole[d], Shivdas D. Katore[e]

[a,d]Department of Mathematics, A.E.S. Arts, Commerce and Science College, Hingoli-431513, India, Email: schnhatkar@gmail.com

[b]Department of Mathematics, K. J. Somaiya College of Science and Commerce, Mumbai-400077, India,
Email: prashantagre777@gmail.com

[c]Department of Mathematics, Toshniwal Arts, Commerce and Science College Sengaon, Dist. Hingoli, India, Email: dtadas144@rediffmail.com

[e]Department of Mathematics, Sant Gadge Baba Amravati University Amravati-444602, India, Email: katore777@gmail.com

[†]Corresponding author: prashantagre777@gmail.com

In this paper, we have studied hypersurface homogeneous spacetime in the presence of cosmic strings and domain walls in the context of $f(G)$ theory of gravitation. Field equations are solved by using a generalized linearly varying deceleration (LVDP) parameter. Some physical parameters are also investigated.

Keywords: Homogeneous hypersurface spacetime, Cosmic string, Domain walls, $f(G)$ gravity.

OP-30

Boundedness and Continuous Dependence of Mild Solutions of Nonlinear Sum-Difference Equation with Nonlocal Condition

Yogesh H. Shirole[a]†, Suryakant M. Jogdand[b]

[a]Department of Mathematics,

Shri Sant Gadge Maharaj Mahavidyalaya, Loha-431708, Dist. Nanded (MS), India,

Email: yogeshshirole2611@gmail.com

[b]Department of Mathematics, Shri Shivaji College of Art, Commerce and Science,

Kandhar-431714, Dist. Nanded (MS), India

Email: smjog12@gmail.com

†Corresponding author: yogeshshirole2611@gmail.com

This paper examines the existence of mild solutions for a nonlinear difference equation with non-local conditions. Utilizing the Leray-Schauder alternative and Bihari's integral inequality, we analyze qualitative properties, including boundedness and continuous dependence, of these solutions. Additionally, we present illustrative examples to underscore the significance and practicality of our findings.

Keywords: difference equation, Initial Value problem, Local existence and uniqueness solutions, boundedness continuous dependence.

OP-31

Analytical Study of a Fractional Blood Alcohol Model with Aboodh Transformation

Anantha R. Gade

Department of Mathematics,

M.S.P. Mandal's, Rajmata Jijau Mahabidyalaya Kille Dharur, Dist. Beed, (MS), India

Email: ananthagade45@gmail.com

This article presents a comprehensive investigation of a fractional blood alcohol model which is characterized by the Hilfer fractional operator. The model's behavior is influenced by three essential parameters: (i) the initial alcohol concentration in the stomach immediately after ingestion, (ii) the rate at which alcohol is absorbed into the bloodstream, and (iii) the metabolic rate at which alcohol is processed by the liver. To find the analytical solutions, the Aboodh transformation algorithm is employed, facilitating the examination of alcohol concentration dynamics in both the stomach and bloodstream. The general solutions for these concentrations are formulated in terms of the extended Mittag-Leffler function, providing deeper insights into the temporal evolution of alcohol levels under fractional-order dynamics. Furthermore, a graphical analysis illustrates the impact of the fractional-order parameter on alcohol concentration profiles in both compartments. A comparative study underscores the novel characteristics introduced by the composite fractional derivative, demonstrating its significance in refining the mathematical representation of alcohol metabolism. The findings of this study contribute to the advancement of mathematical modeling in biomedical research, offering valuable insights for medical professionals in understanding alcohol metabolism under fractional-order frameworks.

Keywords: Fractional blood alcohol model, Hilfer fractional derivative, Aboodh transform, Mittag-Leffler function, Numerical simulation.

OP-32

Monotone Method for Nonlinear Hilfer Fractional Reaction-Diffusion Equation

Pandurang D. Kundgar[a†], Jagdish A. Nanware[b]

[a]Department of Mathematics,

Late N. P. W. Arts and Science College Chopa, Dist. Gondia-441807 (MS), India,

Email: pandurang.kundgar30@gmail.com

[b]Department of Mathematics, Shrikrishana Mahavidyalaya Gunjoti,

Dist.Dharashiv-413606 (MS), India

Email: smjog12@gmail.com

[†]Corresponding author: yogeshshirole2611@gmail.com

In this paper, we developed the existence and uniqueness results by monotone method for non-linear fractional reaction-diffusion equation together with initial and boundary conditions. In this text the Hilfer fractional derivative is used to denote the time fractional derivative. The employment of monotone method generates two sequences minimal and maximal solutions which converges to upper and lower solutions respectively.

Keywords: Hilfer fractional derivative; Eigenfunction; Lower and upper solutions; Mono tone method.

OP-33

Cosmological Dynamics in Kasner Universe with Barrow Holographic Dark Energy in $f(T)$ Gravity

Alfred Y. Shaikh[a], **Sachin M. Shingne**[b†]

[a]Department of Mathematics,

Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402 (MS), India,

Email: shaikh$_2$324*ay@yahoo.com*

[b]Department of Mathematics, G. S. Science, Arts and Commerce. College,

Khamgaon-444312 (MS), India

Email: smshingne131@gmail.com

[†]Corresponding author: smshingne131@gmail.com

In the framework of $f(T)$ gravity, the cosmic dynamics of Kasner space-time with Barrow Holographic Dark Energy are studied. We investigate the anisotropic expansion of the universe, extending conventional holographic dark energy models by incorporating the Barrow parameter. By applying $f(T)$ gravity, where the torsion scalar is modified by an arbitrary function, we analyze the impact of these modifications on the universe's evolution. The results suggest that the combination of $f(T)$ gravity and Barrow Holographic Dark Energy influences the early-time anisotropic expansion, offering new insights into cosmic acceleration and dark energy. This work contributes to the understanding of modified gravity and dark energy in cosmology. Also, some physical properties are discussed.

Keywords: Kasner space-time, $f(T)$ gravity, Barrow Holographic Dark Energy.

OP-34

Dynamic Analysis of Bianchi Type-I model with Barrow Holographic Dark Energy in Modified Gravity

Mahadev G. Bhujade[a†], Alfred Y. Shaikh[b]

[a]Department of Mathematics,
Lokmanya Tilak Mahavidyalaya, Wani-445304 (MS), India
Email: mgbhujade20@gmail.com

[b]Department of Mathematics,
Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402 (MS), India,
Email: shaikh_2324ay@yahoo.com

[†]Corresponding author: mgbhujade20@gmail.com

This research uses the spatially homogeneous, anisotropic, and locally rotationally symmetric (LRS) Bianchi type-I space-time Universe to study the behaviour of the Barrow holographic dark energy (BHDE) in the setting of $f(G)$ gravity. We use the Hubble and Granda-Oliveros (GO) horizons as the infrared cutoff. The physical interpretations of the solution have been investigated using several physical parameters. The models' equation of state parameter is seen to become closer to -1 over time. To elucidate the interpretation, we further analyze the jerk parameter and the state finder diagnostic pair $\{r, s\}$ to characterize completely different universe phases.

Keywords: Bianchi type-I metric, Cosmology, $f(G)$ gravity.

OP-35

Renyi Holographic Dark Energy with varying deceleration parameter in $f(R,T)$ gravity

Akshay P. Jenekar[a†], Alfred Y. Shaikh[b]

[a]Department of Mathematics,
Arts, Commerce and Science College, Maregaon (MS), India
Email: apjenekar@gmail.com

[b]Department of Mathematics,
Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402 (MS), India,
Email: shaikh_2324ay@yahoo.com

[†]Corresponding author: apjenekar@gmail.com

This study delves into the Hypersurface-homogeneous cosmological model framed within the framework of $f(R,T)$ gravity, employing Renyi holographic dark energy (RHDE) as the primary focus. In order to formulate precise solutions for the field equations, it is posited that the shear scalar is directly proportional to the expansion scalar, taking into consideration the time-dependent deceleration parameter as expressed through the Hubble parameter. This approach facilitates a comprehensive examination of the cosmological model solution. The RHDE is examined through the of the Hubble infrared (IR) cutoff. The model's numerous physical and kinematic properties are also scrutinized. Moreover, three feasible cosmological scenarios are delineated concerning the parameter that manifests within the space-time metric. The results of our investigation were found to be in concordance with the recent observational findings, thereby offering a description for the cosmic acceleration of the Universe.

Keywords: Homogeneous-hypersurface spacetime, Renyi holographic dark energy, $f(R,T)$ gravity.

OP-36

Thermal Transport Mechanisms in MHD Nanofluid Flow across a Stretching Surface: A Comprehensive Comparative Analysis

Bhimanand P. Gajbhare

Department of Mathematics,

Vaidyanath College Parli Vaijnath-431515, Beed (MS), India

Email: bpgajbhare@gmail.com

This paper investigates heat and mass transfer phenomena in an electrically conducting nanofluid flow over a heated stretching sheet, incorporating complex thermal dynamics including heat generation/absorption, thermophoresis, and chemical reaction effects. By employing appropriate similarity transformation techniques, the governing equations for momentum, thermal energy, and nanoparticle concentration are transformed and then numerically solved using a fourth-fifth order Runge-Kutta method. The research comprehensively analyzes the physical implications of key parameters through graphical representations. Specifically, the study examines the influences of radiation, thermophoretic number, and Brownian parameter on critical fluid characteristics. Key findings reveal that increasing radiation intensifies surface heat flux, consequently elevating the nanofluid temperature within the thermal boundary layer. Additionally, the results demonstrate that while increasing thermophoretic and Brownian parameters enhance the Nusselt number, they simultaneously reduce the Sherwood number. Graphical representations of the skin friction coefficient, Nusselt number, and Sherwood number further illuminate the intricate heat and mass transfer mechanisms in this complex nanofluid system.

Keywords: Nanofluid flow, Heat transfer, Mass transfer, Runge-Kutta method, Thermophoresis, Radiation, Brownian motion, Numerical simulation.

OP-37

Application of Non-Linear Integral Inequalities of Fractional Order: A Review

Prasad T. Bathe[a†], **Jayashri Patil**[b]

[a]Department of Mathematics,

Mahatma Phule Mahavidyalaya, Pimpri, Pune-17 (MS), India

Email: prasadbathe@gmail.com

[b]Department of Mathematics,

Vasantrao Naik MAhavidyalaya, Aurangabad (MS), India,

Email: jv.patil29@gmail.com

[†]Corresponding author: prasadbathe@gmail.com

Nonlinear integral inequalities of fractional order have emerged as powerful tools in the analysis of various dynamic systems, particularly those governed by fractional differential equations. These inequalities extend classical integral inequalities to the fractional calculus framework, providing robust methods for estimating bounds, establishing existence and uniqueness of solutions, and analyzing the stability and asymptotic behavior of solutions. This review article comprehensively surveys recent advancements in the development and application of nonlinear fractional integral inequalities. We discuss their theoretical foundations, including key results and proof techniques, and highlight their practical applications in fields such as control theory, signal processing, biological systems, and engineering. Special attention is given to inequalities involving Riemann-Liouville, Caputo, and other fractional operators. The article also identifies open problems and future research directions, emphasizing the potential for interdisciplinary applications. This review aims to serve as a valuable resource for researchers and practitioners interested in the theoretical and applied aspects of fractional calculus and integral inequalities.

Keywords: Nonlinear integral inequalities, fractional calculus, Riemann-Liouville operator, Caputo derivative, fractional differential equations, stability analysis, dynamic systems, control theory, applied mathematics.

OP-38

Numerical Solution for Thermal Stresses in Multilayer Composite slab

Bhagwat B. Pandit[a], Gangadhar B. Mete[b†]

[a]Department of Mathematics, Shri Datta Arts, Commerce and Science College,
Hadgaon-431712, Dist. Nanded (MS), India
Email: panditbhagwat51@gmail.com

[b]Research Scholar, School of Mathematical Sciences,
Swami Ramanand Teerth Marathwada University, Nanded-431606 (MS), India,
Email: gangadharmete123@gmail.com

[†]Corresponding author: gangadharmete123@gmail.com

A theoretical solution is proposed for thermal stress analysis of multilayer composite slab. The thermal conductivity of all materials is assumed to be temperature dependent. The slab is under transient temperature field. A constant temperature is applied at initial edge and convection due to dissipation takes place at extreme edge. Initially the slab is kept at constant temperature. Due to non-linearity occurring in the governing differential equation, finite difference method is used to find the solution. The temperature, displacement and thermal stresses are computed numerically, presented graphically and interpreted technically.

Keywords: Multilayer composite slab, Thermal stresses, Nonlinear boundary value problem, Finite difference method.

OP-39

Attractivity Results and Extremal Solutions for Fractional order Nonlinear Functional Integro-Differential Equations

Pravin M. More[a], Anant N. Patil[b†]

[a]Department of Mathematics, BSS ASC College Makni Dist. Dharashiv (MS), India

Email: dranpin@gmail.com

[b]Department of Mathematics, KMJ College Washi Dist.Dharashiv (MS), India,

Email: pravinmorepravin@gmail.com

[†]Corresponding author: dranpin@gmail.com

In this paper, we study the existence the solution as well as locally attractivity results for fractional order nonlinear functional integro-differential equation in Banach algebras under mixed Lipschitz and caratheodory conditions by using hybrid fixed point theorem. The existence of extremal solutions is also proved under certain Lipschtiz conditions.

Keywords: Banach algebra, Functional Integro-differential equations, existence results, locally attractivity solutions.

OP-40

Review on Jordan's Inequality

Dipika P. Wagh[a†], Yogesh J. Bagul[b], Narendra Swami[c]

[a]Department of Mathematics,

Shri Jagdishprasad Jhabarmal Tibrewala University, Dist. Jhunjhunu-333010,

Rajasthan, India, Email: dipikawagh033@gmail.com

[b]Department of Mathematics,

K. K. M. College, Manwath-431505 Dist. Parbhani (MS), India,

Email: yjbagul@gmail.com

[c]Department of Mathematics,

KMJ College Washi Dist.Dharashiv (MS), India,

Email: narendras15595@gmail.com

[†]Corresponding author: dipikawagh033@gmail.com

This paper explores the review on Jordan's inequality. Jordan's inequality is a fundamental result in trigonometry that provides a relationship between sine function and a polynomial function. It has been studied and improved extensively in the literature. We aim to explore the interconnection between the concepts like bounds, monotonicity, etc. and all the Jordan type inequalities establishes so far.

Keywords: Jordan's inequality, bound, increasing function and polynomial.

OP-41

Nonlinear Integral Equations for the Representation and Simulation of Electromagnetic Field Behaviour

Suresh U. Kore[a†], **Sidesh S. Bellale**[b]

[a]Department of Mathematics, Sambhajirao Kendre College, Jalkot Dist-Latur (MS), India

Email: smukmathematics@gmail.com

[b]Department of Mathematics, Dayanand Science College, Latur (MS), India,

Email: sidesh.bellale@gmail.com

[†]Corresponding author: smukmathematics@gmail.com

In this study, we investigate the potential application of non-linear integral equations to simulate the dynamics of electromagnetic fields. The objective is to evaluate non-reciprocal electromagnetic effects where traditional quasi-linear and linear analytical methods are inadequate, primarily due to the strong nonlinear characteristics of field behavior. This research aims to improve the accuracy and reliability of high-frequency electromagnetic simulations by developing nonlinear integral equations for complex three-dimensional scenarios. The primary goal of this investigation is to apply non-linear integral methods for more realistic simulations of practical electromagnetic interactions compared to conventional techniques. Through numerical simulations and case studies, the research illustrates that non-linear integral equations provide a robust mathematical framework for predicting field behavior in complex geometries. The findings suggest that this approach not only enhances computational efficiency but also offers a deeper understanding of electromagnetic wave propagation and interaction. Nonlinear integral techniques thus emerge as a promising avenue for advancing the modeling of electromagnetic fields.

Keywords: Electromagnetic Field Simulation, Non-linear Integral Equations, Maxwell's Equations, Non-linear Electromagnetic Dynamics, Newton-Krylov Method, Computational Electromagnetics.

OP-42

Study On the Properties of Matrix Rank and The Relationship Between Matrix Rank and Matrix Operations

Santosh C. Rudrawar

Department of Mathematics,

Siddharth Art's Commerce & Science College Jafrabad, Dist. Jalna (MS), India

Email: santoshrudrawar240@gmail.com

This paper discusses the invariance of the rank of a matrix, the conditions and applications of matrix inequalities, the relationship between matrix rank and matrix operations, the relationship with matrix reversibility, the linear correlation with vector groups and the zero relationship of eigenvalue algebra multiples and other properties. The application of the rank of the matrix in linear algebra, analytic geometry, probability theory, etc. is obtained.

Keywords: Matrix rank, Matrix rank invariance, Matrix rank inequality, Matrix rank identity, Linear equations, Zero eigenvalue algebraic multiples, Homogeneous linear equations.

OP-43

Fractional order Mathematical models using Mathematical Software's

Aamer S. Pathan

Department of Mathematics,

Kai. Rasika Mahavidyalaya, Deoni (MS), India

Email: aamerpathan1111@gmail.com

In this article we discussed the use of mathematical software is very essential for study of fractional order mathematical models. Fractional-order mathematical models have become a powerful tool for describing complex dynamical systems exhibiting memory effects and non-local behaviors, which cannot be accurately captured by traditional integer-order models. These models governed by fractional differential equations have found applications in diverse fields such as control systems, biology and physics. This article explores the application of mathematical software tools like MATLAB, Mathematica and Python in solving fractional-order differential equations. These software platforms offer powerful numerical solutions and visualization capabilities, making them invaluable in simulating and analyzing fractional-order systems. It examines various methods for discretizing fractional derivatives Riemann-Liouville, and Caputo approaches and demonstrates how they can be implemented within these computational environments. Several cases can be studied are presented with the help of these software's. The research highlights the advantages of using mathematical software for handling the computational challenges of fractional calculus including numerical stability, error analysis, and efficient computation. Furthermore, the paper addresses ongoing challenges such as the development of robust algorithms and the integration of fractional models into real-time systems. The findings underline the importance of mathematical software in advancing the application of fractional-order models.

Keywords: Fractional-order models, mathematical software, fractional calculus, numerical simulation, MATLAB, Mathematica, Python.

OP-44

Analytical Structure of Gyrator Transform

Vidya Sharma[a], Prashant R. Langade[b†]

[a]Department of Mathematics,

Smt. Narsamma Arts, Commerce and Science College, Amravati-444605 (MS), India

Email: vdsharma@hotmail.co.in

[b]Department of Mathematics,

Shri. Vasantrao Naik Mahavidyalaya, Dharni, Amravati (MS), India,

Email: prlangade@gmail.com

[†]Corresponding author: prlangade@gmail.com

The gyrator transform is a fundamental concept in electrical engineering and signal processing that is utilized for the analysis and synthesis of passive networks, particularly in the design of filters and in the implementation of non-reciprocal network elements. This paper presents a detailed analytical structure of the gyrator transform, exploring its mathematical foundation and its role in both theoretical and practical applications. The gyrator transform is described as a mapping between the impedance and admittance representations of electrical circuits, providing an efficient means of transforming a resistive network into an equivalent network with reactive components, without changing the topology or the fundamental properties of the circuit.

Keywords: Fourier transform (FT), fractional Fourier transform (FRFT), Gyrator transform (GT).

OP-45

On relation between Trivial and Discrete fuzzy finite automata

Sudhakar V. Sadanshiv[a†], Shrikant R. Chaudhari[b]

[a†]Department of Mathematics,

Sanjeevanee Mahavidyalaya, Chapoli, Tq. Chakur, Dist. Latur (MS), India,

Email: sudhakarbharati2002@gmail.com

[b]Department of Mathematics, KBCNM, University Jalgaon (MS), India

Email: shrikant_chaudhari@yahoo.com

In this paper we will discuss relation between trivial and discrete fuzzy finite automata and their algebraic properties. Particularly, direct product, cascade product, wreath product, Cartesian product etc.

Keywords: Fuzzy finite automata, Trivial, Discrete.

OP-46

Difference Equations and difference inequalities

Sudhakar R. Gadhe

Department of Mathematics,

Narayanrao Waghmare Mahavidyalaya AK. Balapur Dist. Hingoli (MS), India

Email: sudhakargadhe7@gmail.com

ln this paper we have been studied some concepts of difference Equations related to existence of solution.The existence of solution of difference Equation $\Delta x(t) = f(t, x(t))$, $x(to) = xo$. Some solution of difference Equation concern with initial value problem is discussed.

Keywords: Difference Equations, Existence of solution of difference Equation and inequalities & successive approximations.

OP-47

On relation between Trivial and Discrete fuzzy finite automata

Vikas S. Jadhav[a]

[a]Department of Statistics,

Sanjeevanee Mahavidyalaya, Chapoli, Tq. Chakur, Dist. Latur (MS), India,

Email: vsjadhavstats@gmail.com

Multi Criteria Decision Making (MCDM) uses different techniques to find a best alternative from multi alternative and multi-criteria conditions. TOPSIS is an important practical technique for ranking and selection of different alternatives by distance measures. Fuzzy set theories are also employed due to the presence of vagueness and imprecision of information. This paper brings out the application of Multi Criteria Decision Making (MCDM) method known as technique for order preference by similarity to ideal solution (TOPSIS) using pentagonal intuitionistic fuzzy numbers. Therefore, the objective of this paper is to select a best student on the basis of the student's performance using ranking techniques for pentagonal intuitionistic fuzzy numbers can be converted into crisp value with the help of this value using TOPSIS method we get the best student of college. An example has been worked out to illustrate the application of TOPSIS for a multi-criteria decision-making scenario.

Keywords: MCDM, TOPSIS, vagueness, fuzzy numbers, intuitionistic fuzzy numbers, pentagonal intuitionistic fuzzy numbers etc.

OP-48

Uniqueness Results for system of Coupled Linear Partial Differential Equations

Balasaheb D. Dawkar

Department of Mathematics,

Vivekanand Arts, Sardar Dalipsingh Commerce and Science College, Chhatrapati Sambhajinagar

Email: bdawkar@rediffmail.com

In this article uniqueness problems for system of coupled linear partial differential equations is considered. These uniqueness properties are developed with the help of Green's identities. A technique for solving boundary value problem is developed and applied to certain physically interesting cases. We assume initial data of Cauchy' type. The boundary conditions can be of Dirichlet's type, Neumann's type and mixed type. Uniqueness results are also obtained for a set of non-standard but physically interesting boundary data.

Keywords: Green's identity, Dirichlet's boundary value problem, Neumann's boundary value problem, Partial differential equation.

OP-49

Solutions of Partial Differential Equations by Numerical Methods

B. H. Devmunde

Department of Physics,

Vivekanand Arts, Sardar Dalipsingh Commerce and Science College, Chhatrapati Sambhajinagar

Email: bhdevmunde05@gmail.com

In this work solution of first order partial differential equations are obtained by using numerical methods such as finite difference method, finite element method and finite volume method. Strengths and weaknesses of each method is discussed with suitable examples and various applications in physics and mathematics.

Keywords: Partial differential equation, Finite difference method, Finite element method, Finite volume method.

OP-50

The Role of Operations Research in Advancing Tamil Nadu's Industrial Growth for Viksit Bharat 2047: A Statistical Data Analysis

M. R. Ramesh

Indira Gandhi Centre for Atomic Research,

Kalpakkam-603102, Tamil Nadu, India,

Email: gascramesh@gmail.com

Operations Research (OR) has emerged as a vital tool for enhancing industrial efficiency, optimizing resource allocation, and improving decision-making processes. This research examines the role and impact of OR techniques within Tamil Nadu's industrial sector, aligning with the broader vision of Viksit Bharat 2047. The study employs statistical data analysis to evaluate OR applications in key domains such as manufacturing, logistics, supply chain management, and public sector operations.

Findings indicate that the adoption of OR methodologies has significantly contributed to cost reduction, process optimization, and enhanced productivity across various industries. Tamil Nadu's industrial ecosystem, characterized by its diverse manufacturing base and strong supply chain networks, stands to benefit from advanced OR models, including linear programming, simulation, predictive analytics, and heuristic optimization. Additionally, the study underscores the importance of data-driven decision-making and AI-integrated OR tools in fostering sustainable industrial growth.

By integrating OR-driven solutions, Tamil Nadu can enhance industrial competitiveness, ensuring sustainable progress in alignment with India's Viksit Bharat 2047 vision.

Keywords: Operations Research, Tamil Nadu, Industrial Growth, Viksit Bharat 2047, Statistical Analysis, Optimization, Supply Chain management, Decision Science, Predictive Analytics.

PATRONS

Hon. Shri B. R. Toshniwal
President, SGSP Mandal

Hon. Dr. Manohar Chaskar
Vice-Chancellor, SRTMU Nanded

Dr. K. L. Bondar
Joint Director, Higher Education, Nanded

Hon. Shri Subhashji Eksinge
Vice-President, SGSP Mandal

Hon. Dr. D. D. Pawar
I/c Registrar, SRTMU Nanded

Hon. Dr. M. K. Patil
I/c Dean, Sci. & Tech., SRTMU Nanded

Hon. Shri U. M. Shelke
Secretary, SGSP. Mandal

Hon. Mr. H. S. Sable
I/c Director, BOEE, SRTMU Nanded

Hon. Shri. R. G. Toshniwal
President, CDC, Toshniwal College, Sengaon

INAUGURATOR

Hon. Smt. Meghanatai Bordikar
Water Supply & Sanitation Energy, Public Health, Woman & Child Development, Public Works, Minister of State, Govt. of Maharashtra

Hon. Dr. Manohar Chaskar
Vice-Chancellor, Swami Ramanand Teerth Marathwada University, Nanded

NATIONAL ADVISORY COMMITTEE

Dr. T. M. Karade, *Ex. Vice-Chancellor, Indiana University, Raipur, Chhattisgarh*
Dr. K. S. Adhav, *Ex. HOD, IGNTU, Amarkantak (M.P.)*
Dr. P. K. Sahoo, *Prof., BITS, Hyderabad*
Dr. A. Pradhan, *HOD, GLA University, Mathura*
Dr. A. H. Hasmani, *HOD, SP University, Anand*
Dr. S. M. Jogdand, *MC Member, SRTMU Nanded*
Dr. D. D. Pawar, *Director, SoMS, SRTMU Nanded*
Dr. V. Karajgaonkar, *Prof. Govt. College, Raipur*
Dr. V. A. Sharma, *Chairman BOS, Mathematics SGBAU, Amravati*
Dr. S. R. Chaudhari *Prof., SoMS, NMU, Jalgaon*
Dr. R. M. Dhaigude, *HOD, GVISH, Amravati*
Dr. V. G. Mete, *Ex. HOD, RDIK College, Badnera*
Dr. V. C. Borkar, *Prof. Yashwant College, Nanded*
Dr. D. R. K. Reddy, *Ex. HOD, Andhra University, Vishakhapatnam, (A.P.)*
Dr. S. D. Katore, *Ex. HOD, SGBAU, Amravati*
Dr. B. Mishra, *Prof., BITS, Hyderabad*
Dr. S. K. Tripathy, *HOD, IGIT, Sarang, Odisha*
Dr. C. P. Singh, *Prof. Delhi Technology University*
Dr. M. V. Santhi, *Prof. CST, Andhra University (A.P.)*
Dr. M. S. Wavare, *Chairman BOS, Mathematics SRTMU, Nanded*
Dr. J. A. Nanware, *Chairman BOS, Mathematics Dr. BAMU, Ch. Sambhajinagar*
Dr. G. D. Kedar, *HOD, RTMU Nagpur*
Dr. Saibal Ray, *Prof., GLA University, Mathura*
Dr. G. S. Khadekar, *Ex. HOD, RTMU, Nagpur*
Dr. M. M. Sancheti, *Ex Principal, RA College Washim*

LOCAL ADVISORY COMMITTEE

Dr. V. R. Patil, *Chikhaldara*
Dr. S. P. Hatkar, *Hingoli*
Dr. P. P. Khade, *Amravati*
Dr. P. R. Agrawal, *Amravati*
Dr. S. R. Bhoyar, *Pusad*
Dr. A. M. Pund, *Nagpur*
Dr. A. Y. Shaikh, *Ralegaon*
Dr. P. U. Chopade, *Jintur*
Dr. K. R. Mule, *Shegaon*
Dr. S. R. Gadhe, *Akhada Balapur*
Dr. C. D. Wadale, *Anjangaon*
Dr. R. V. Mapari, *Gadchiroli*
Dr. R. N. Ingale, *Basmat*
Dr. R. G. Metkar, *Nanded*
Dr. B. D. Karande, *Udgir*
Dr. P. R. Shinde, *Nanded*
Dr. S. S. Bellale, *Latur*
Dr. B. B. Pandit, *Hadgaon*
Dr. Y. S. Solanke, *Darvha*
Dr. S. V. Nakade, *Parbhani*
Dr. S. S. Doibale, *Nanded*
Dr. S. S. Handibag, *Latur*
Dr. D. S. Palimkar, *Nanded*
Dr. K. R. Gaikwad, *Nanded*
Dr. S. L. Munde, *Akola*
Dr. S. V. Gore, *Ralegaon*
Dr. J. K. Mane, *Chapoli*
Mr. M. Bhujade, *Wani*
Dr. K. R. Kale, *Barshitakli*
Mr. T. D. Nakade, *Chandur*
Dr. N. S. Jadhav, *Palam*
Dr. S. B. Chavan, *Bhokar*
Dr. M. C. Dhabe, *Manora*
Dr. Y. J. Bagul, *Manwat*
Dr. K. S. Wankhade, *Mangrulpir*
Dr. N. S. Darkunde, *SoMS, SRTMU, Nanded*
Dr. B. S. Reddy, *SoMS, SRTMU, Nanded*
Dr. A. B. Jadhav, *Parbhani*
Dr. S. B. Kalyankar, *Mukhed*
Dr. P. P. Kulkarni, *Nanded*
Dr. A. S. Kausadikar, *Purna*
Dr. H. K. Undegaonkar, *Basmat*
Dr. D. K. Raut, *Kanapur*
Dr. A. Husain, *Karanja Ch*
Dr. A. V. Bhosale, *Aundha*
Dr. V. B. Patare, *Shelu*
Dr. V. D. Bokey, *Ner*
Mr. S. B. Kadam, *Parbhani*
Mr. M. D. Netnaskar *Pimpalgaon Kale*
Mr. P. A. Bulke, *Amravati*
Mr. P. R. Langade, *Dharni*
Dr. A. S. Nimkar, *Murtizapur*
Dr. S. N. Bayaskar, *Dhamangaon*
Dr. V. V. Latpate, *Gangakhed*
Dr. K. B. Gacche, *Dharmabad*
Dr. S. M. Popade, *Parbhani*
Dr. A. S. Agrawal, *JSPM, Pune*
Dr. A. B. Pandey, *Naigaon*
Dr. Sayyad Jallil, *Himayatnagar*
Mr. S. N. Shingane, *Khamgaon*
Mr. H. G. Parlikar, *Amravati*
Mr. A. P. Jenekar, *Maregaon*

About Us

Toshniwal Arts, Commerce and Science College, Sengaon Tq. Sengaon, Dist. Hingoli, was established under the wings of Shri Gajanan Shikshan Prasarak Mandal, Yeldari Camp Tq. Jintur Dist. Parbhani Maharashtra on 21st June 1993 with the motive to provide quality higher education to the peoples residing in rural and hilly region with lesser economic sources. The college is affiliated to Swami Ramanand Teerth Marathwada University, Nanded Maharashtra and running UG and PG courses under the faculty of Arts, Commerce and Science. The college is recognized under 2(F) and 12(B) section of UGC, New Delhi. Furthermore, the college has been re-accredited by NAAC with "B++" and has been certified by ISO 9001-2015. The College infrastructure includes two story building with separate facility for laboratory, library, ICT room, administrative office, common staff room, common girl's room etc. Women's hostels, Indoor sport facility are some of additional utilities provided to the students. Also, College takes care of students in their overall development through curricular as well as co-curricular, extra-curricular activities and events organized by various cells.

Publisher
Department of Mathematics,
Toshniwal Arts, Commerce and Science College,
Sengaon

(Re-accredited by NAAC with 'B++' Grade)
Website: www.toshniwalcollege.ac.in

9 789334 245998