VIGNANAMRITAM

AMRITA
VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF UGC ACT. 1956

SCHOOL OF PHYSICAL SCIENCE

VIGNANAMRITAM

From the Editor's Desk

Dr. Prasanna Ramani
Associate Professor
Amrita School of Physical Sciences,Coimbatore

The editorial board is delighted to present the second issue of "Vignanamritam," the Amrita School of Physical Sciences (Coimbatore) official newsletter. In this edition, we aim to shine a spotlight on the recent developments within the department, fostering increased awareness, interaction, and integration among our esteemed readers.

Communication is pivotal for the department's growth, and "Vignanamritam" continues to serve as a vital medium to recognize and appreciate the dedicated individuals who work tirelessly behind the scenes, contributing to the continuous planning and successful outcomes.

Published quarterly, this newsletter provides a concise summary of all activities that transpired through Oct-Dec 2023, giving our readers an insight into the dynamic progress of the department.

As we embark on this journey, let this second issue inspire us all to begin anew and stay engaged to explore more about the School of Physical Sciences' activities, business news, and intriguing facts. We encourage you to share your comments and recommendations to help enhance the caliber of our publication.

Thank you for your ongoing support.

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About Amrita School of Physical Sciences

Amrita School of Physical Sciences - Coimbatore is a vibrant component of the Amrita Vishwa Vidyapeetham- has 67 faculty members belonging to the disciplines of Physics, Chemistry, Mathematics, Data Science, and Food Science and Nutrition. It has over a 1000 undergraduate and post graduate students. The school is very active in research with around 100+ Full-time Scholars and has funded projects from National Research agencies like DST, DBT, SERB, DRDO, etc. It runs undergraduate, Five-Year Integrated MSc Program, Two-year MSc Program, and PhD programs in the field of Physics, Chemistry, Mathematics, Data Science, Food And Nutrition, and Applied Statistics. The thrust area of the School is Materials for Energy Applications, Bio-inspired materials, Water technology, Biosensors, Cancer chemistry, Data Science, Graph theory, and Modelling - to name a few.

RESEARCH LABS

Advanced Multifunctional Materials and Analysis Laboratory (AMMAL)

Amrita Material Processing Laboratory

Amrita Medicinal Research and Industrial Technology Acquisition (AMRITA) Laboratory

Bio-Materials Chemistry Research Laboratory

Biomaterials Laboratory

Biosensor Research Lab

Ceramics Research Laboratory

Dhanvanthri Laboratory

Energy Technology Laboratory

Functional Materials Laboratory

Light and Photonics Research Laboratory

Analytical Instrumentation Laboratory

OUR STUDENTS AT CONFERENCES/WORKSHOPS
ORAL PRESENTATIONS

1. "Thermal dilepton production from QGP medium within Gubser flow." **Lakshmi J. Naik** at the 2nd Workshop on Dynamics of QCD Matter at NISER, Bhubaneswar. 07 to 09 October, 2023

2. " Biogenic Silica-Zinc composite: Comprehensive analysis, toxicological and photocatalytic efficacy." **Archana P** at the International Conference on Material Science and Engineering (ICMSE) at NIT Jalandhar, 23 to 25 November 2023

3. "Manganese doped Zinc Oxide nanoparticles as an efficient photocatalyst in pharmaceutical degradation." **Daphne Mary John** at the International Conference on Material Science and Engineering (ICMSE) at NIT Jalandhar, 23 to 25 November 2023

4. " Macroalgae as a potential candidate for solar energy harvesting towards a sustainable future." **Anamika Chatterjee** at the International Conference on Recent Trends in materials and devices (ICTRMD) at Amity University, New Delhi. 19 to 20 December 2023

5. " Molecular level of investigation of the photoluminescence property of carbon quantum dots." **P. S. Sugatha** at the International Conference on Recent Trends in materials and devices (ICTRMD) at Amity University, New Delhi. 19 to 20 December 2023

6. "Total Chromatic Number for Indu-Bala Product and Symmetric Difference Product of Graphs", **Sandhiya** presented at International Conference on Discrete Mathematics and Combinatorics (ICDMC-2023), organised by Manipal Institute of Technology, Bengaluru in association with Jangjeon Mathematical Society, South Korea, December 20-22, 2023.

7. "A class of projective two-weight and three-weight linear codes" **Prabu J** presented at International Conference on Discrete Mathematics and Combinatorics (ICDMC-2023), organised by Manipal Institute of Technology, Bengaluru in association with Jangjeon Mathematical Society, South Korea, December 20-22, 2023.

8. "Weighted PI Index of Neighbourhood Corona Product of Some Classes of Graphs", **Hemalatha R** presented at "International Conference on Discrete Mathematics and Combinatorics (ICDMC-2023), organised by Manipal Institute of Technology, Bengaluru in association with Jangjeon Mathematical Society, South Korea, December 20-22, 2023.

POSTER PRESENTATIONS

1. 'Enhancement of the structural stability of β-Ni(OH)2 using WC for high-energy supercapacitor applications." Mohanraj M at International conference on advanced materials for sustainability at University of Calicut, Tirur-673635_ Dec 21-23, 2023

2. "Superior pseudocapacitance of beta-cobalt hydroxide/wc composite and it's energy storage application" Abishek Krishnamoorthy at International conference on advanced materials for sustainability at University of Calicut, Tirur-673635_ Dec 21-23, 2023

3. "Putting Light on the Ion Migration of Perovskite: Ionophotovoltaics with Lead-free Perovskite" , Ashna K Pramod at Global Conference for Decarbonization of Energy and Materials (GCDEM 2023), Singapore, held at Nanyang Technological University , Singapore. Dec 27th - 31st 2023

OUR STUDENTS AT CONFERENCES/WORKSHOPS PARTICIPATION

1. **Anila. S** attended the "Workshop on Finite Element Method: Theory Computation and Application (FEMTCA 2023)", organized by Department of Mathematics, National Institute of Technology, Tiruchirappalli, December 04 – 08, 2023.
2. **Anjali Mohanan** attended the "Three Day National Seminar on 100 Years of Point-Set Topology" organized by Department of Mathematics, Victoria College, Palakkad, 6th, 7th and 8th December 2023.

OUR FACULTY AT CONFERENCES

- **Dr. Govindarao .L P. Sudheer Kumar**, **Shree Bala** presented a paper "Post processing method for time delay partial differential equation with integral boundary conditions" in the International Conference on "Computational Modeling in Science and Engineering & 32nd Congress of APTSMS" October 28-30, 2023. organized by the Department of Mathematics, National Institute of Technology, Warangal.
- **Dr.Ramesh Babu** presenter a paper "Human Emotion Detection from Audio Using Feed-Forward Neural Networks", in the Fourth International Conference on Advances in Computational Science and Engineering (ICACSE2023), at De La Salle University, Manila, Philippines, 16th – 17th December 2023.
- **Dr. Ramesh Babu** .A attended the ARTPARK @ IISc Funded AI-MPOWER: Empowering Educators for the Data-Driven Future, Department of Computational and Data Science, IISc Bangalore in collaboration with Zenteiq Edtech, 6th November 2023 to 8th November 2023.

INVITED TALK BY OUR FACULTY AT CONFERENCES

- **Prof. Sudip K Batabyal** delivered an invited talk on "Development of nanomaterials based interfacial solar water evaporator and evaporation induced power generation" at the International Conference on Recent Trends in materials and devices (ICTRMD) at **Amity University, New Delhi** conducted between 19 to 20 December 2023

- **Prof. Sudip K Batabyal** delivered an invited talk on "Water evaporation-induced power generation from surface-engineered nano-porous materials" at **Institute of Nanoscience and Technology, INST, Mohali** on 21 December 2023.

- **Dr. Sreekanth V delivered a**n invited talk on "Hyperon Bulk Viscosity & R-mode instability in Neutron Stars" at the 2nd Workshop on Dynamics of QCD Matter at **NISER, Bhubaneswar, Odisha** on October 07-09, 2023

EXPERT TALK AND CONFERENCE

Dr.Sanu Jacob, Director of the National Food Laboratory, Chennai, Tamil Nadu delivered a talk on "FOOD SAFETY & BEYOND" In commemoration with World Food Day 2023,on 28th October 2023 at Sandeepani Hall, Amrita Vishwa Vidyapeetham, Coimbatore.

Prof. Dr. N. Somanathan, Senior Principal Scientist (Rtd.) from Central Leather Research Institute, Chennai delivered a talk on "POLYMERIC SEMICONDUICTORS FOR FLEXIBLE ORGANIC OPTOELECTONICS ", on 10th Nov 2023 at Sandeepani Hall, Amrita Vishwa Vidyapeetham, Coimbatore.

Guest Lecture (through online mode) by Dr. Somesh Kumar, Professor of Mathematics, IIT Kharagpur, to the MSc (Maths), M.Sc Applied Statistics and Data Analytics, M.Sc. Data Science with Logistic and Supply Chain Management and fourth year of Five Year Integrated M Sc – Data Science Students on 9th Nov,2023 at the Sandeepani Hall, Amrita Vishwa Vidyapeetham, Coimbatore.

Department of Mathematics, organized "International Conference on Graph Theory and its Applications" during December 18th – 20th 2023. 15 Delegates (International & National). A total of 72 participants have registered for the conference out of which 32 of them presented their research articles.

SPOTLIGHT

67
FACULTY

2
DEPARTMENTS

1000+
STUDENTS

12
RESEARCH LABS

100+
RESEARCH SCHOLARS

10
ACADEMIC LABS

500+
PUBLICATIONS SINCE '08

40+
PATENTS FILED SINCE '08

2200L
RESEARCH GRANTS

WALL OF FAME 🏅

Dr. V. Sreekanth delivered an **invited talk** on "BEC Stars in Rastall and Rainbow Gravities" at "India-JINR Workshop on Elementary Particle and Nuclear Physics and Condensed Matter Research" at **Joint Institute for Nuclear Research (JINR), Dubna, Russia** held between **October 16-19,2023**

PLACEMENTS

Sreekanth K
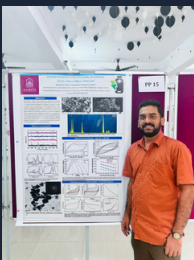Officer in Junior Mgmt Grade-1

Ch Dharani

Chaithanya V
Associate Analyst

Aardra Jyothish

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KS. Priyendhu, Ph.D. scholar was awarded the International Mathematical Union Breakout Graduate Fellowship-2023 (IMU-BGF-2023-Oct).
The fellowship amount USD 8,366.00 per annum.

Abishek Krishnamoorthy won the "BEST POSTER AWARD" at International conference on advanced materials for sustainability at University of Calicut, Tirur-673635_ Dec 21-23, 2023 for his poster on "Superior pseudocapacitance of beta-cobalt hydroxide/wc composite and it's energy storage application"

Bose-Einstein Condensate Stars
Lakshmi J Naik

## Bose Einstein Condensates as candidates for dark matter

After several years of research, dark matter, which outweighs the normal matter in the universe, is still not known adequately. The dark matter holds the galaxies in the universe together and prevents them from being torn apart. It is invisible, meaning that it does not absorb or emit light, making it hard to be observed. If dark matter consists of bosons and is cold, from a physical point of view, there is a high level of certainty that it must exist in the form of Bose-Einstein Condensate (BEC). Bose-Einstein condensation is a well-known physical phenomenon in which the particles of a dilute Bose gas condense to the same quantum ground state at sufficiently low temperatures. Massive objects formed of BECs can be realized within astrophysical scales that are held together by the self-generated gravitational interaction of the bosons. The possibility that such BECs exist in high density general relativistic environments such as neutron stars cannot be excluded a priori.

BECs within neutron stars

BECs can occur within the core of neutron stars with the nucleons treated as composite bosons through Cooper pair formation. We focus on such stars composed of BECs, termed as the BEC stars.

Finite temperature BEC stars

Our novel study analyse the effect of temperature on rotating BEC stars within general relativity. A temperature dependent equation of state is used to describe the BEC matter within the star. We find that with increasing temperatures from 0 K to 4 T11 (T11 = 1011K) mass-radius values are found to be decreasing for the static and rotating stars, though the presence of temperature supports high mass values at lower central densities. Further, the maximum mass of the static and rotating stars is observed to decrease by lowering the interaction strength of bosons (g) in the presence of temperature.
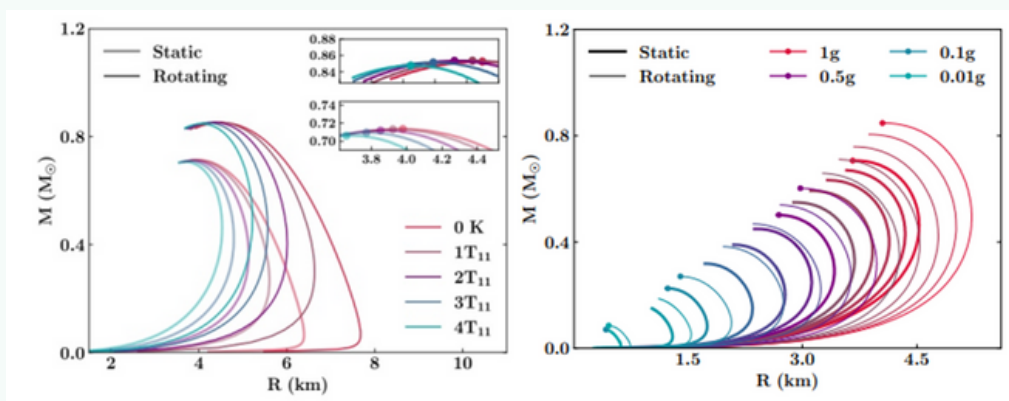
Betterment of diagnosis of cystic fibrosis with point-of-care testing sensors using silver-based nanorods
Dr. Arun Kumar P

The early diagnosis and treatment of cystic fibrosis (CF), a genetic disease, is highly important. It prevents permanent damage to the organs in the body, though the disease has no cure. The diagnosis is done by electrochemical sensing of chloride ions in sweat. We have developed a point-of-care testing sensor for CF that is disposable, portable, user-friendly, and accessible to all people.

Making silver-based nanorods for sensing:
We began this process by making silver-based nanorods from silver and manganese salts. Through the urea hydrolysis method, we made the nanorods with different compositions, to ensure a maximum electrochemical response.

Drawing electrochemical sensor:
Using screen-printing technology, we have drawn conducting patterns on flexible and disposable plastic sheets. We have coated nanorods on the patterns to form sensors. Testing against the chloride ions, the optimal conditions for sensors were ensured.

Crafting and calibrating electrochemical sensor test strip:
With the optimized conditions, we assembled a point-of-care testing prototype for using different solid-state membranes. The parts are screen-printed electrodes, electrolyte, hydrophilic, and adhesive layers. We then calibrated the test strips using simulated sweat and used them for monitoring chloride ions in generated sweat as a screening test for cystic fibrosis.

Successful screening and future:
After calibration, we have tested the strip with sweat collected from different people with comparable results to market standard. The sensor detected different levels in sweat for CF screening with a wide linear range, good selectivity and sensitivity. The results obtained are promising for real-time detection of chloride ions and diagnosis of cystic fibrosis.
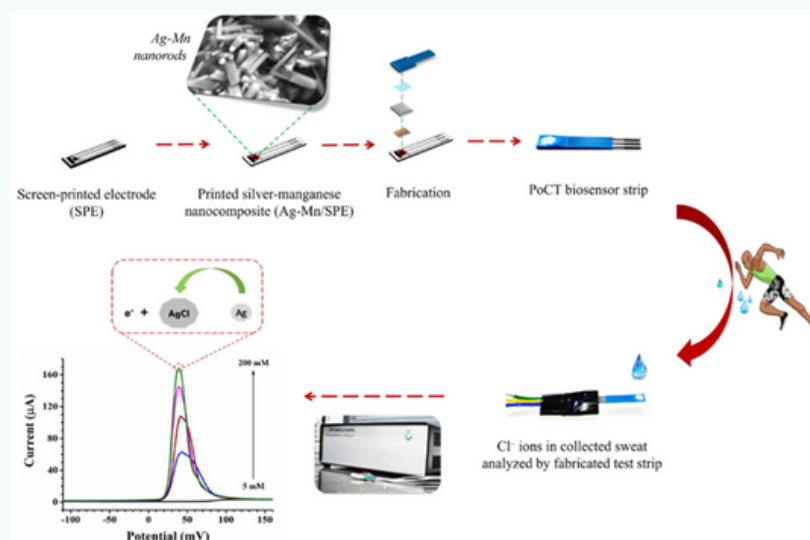
RECENT PUBLICATIONS-SCIENCES

An efficient upcycling of graphite anode and separator for Na-ion Batteries via solvent-co-intercalation process
Krishnan Subramanyan, Shaji Jyothilakshmi, **Mani Ulaganathan***, Yun-Sung Lee, Vanchiappan Aravindan*
Carbon Q1 IF: 10.9

Symmetrical dialkyl-benzotriazolium as gel polymer electrolyte for energy storage and their alkyl chain trend on their electrochemical property
Anjitha Satheesh*, Sweata Hanson, Nandita Mishra, Elango Kandasamy*
Journal of Energy Storage Q1 IF: 9.4

Redox flow batteries: Pushing the cell voltage limits for sustainable energy storage
Rahul Thamizhselvan, Raghupandiyan Naresh, Ramachandran Sekar, **Mani Ulaganathan***, Vilas G. Pol, Pitchai Ragupathy*
Journal of Energy Storage Q1 IF:9.4

Electrocatalytic Behavior of Carbon Quantum Dots in Sustainable Applications: A Review
E Unnikrishnan*, A Krishnamoorthy, SP Shaji, AS Kamath, M Ulaganathan*
Current Opinion in Electrochemistry IF: 8.5

Manganese-doped polyaniline electrodes as high-performance supercapacitors with superior energy density and prolonged shelf life
Swapnika Suresh*, Hridya C. Prakash, M. Sathish Kumar, Sudip K. Batabyal,*
Journal of Science: Advanced Materials and Devices,
Q1 IF:8

High surface area cobalt aluminium layered double hydroxide printed electrodes for flexible supercapacitor and on-chip electrochemical bacterial lysing
Punnakkal Navaneeth*, Subasini Jayakanthan, Megha S Kumar, Arun Kumar P, Aarathi Pradeep , T G Satheesh Babu, Punathil Vasu Suneesh*
Electrochimica Acta Q1 IF: 6.6

RECENT PUBLICATIONS-SCIENCES

Rotating Bose-Einstein condensate stars at finite temperature,
P. S. Aswathi, *P. S. Keerthi, O. P. Jyothilakshmi, Lakshmi J. Naik, and V. Sreekanth*
PHYSICAL REVIEW D, Q1 IF:5.4

β-Cyclodextrin-Stabilized CuO/MXene Nanocomposite as an Electrode Material for High-Performance Supercapacitors
D. R. Anakha, *R. Yamuna, Mari Vinoba, amd M. Bhagiyalakshmi*
Langmuir Q1 IF: 4.331

Design, Synthesis, and Anti-Breast Cancer Potential of Imidazole–Pyridine Hybrid Molecules In Vitro and Ehrlich Ascites Carcinoma Growth Inhibitory Activity Assessment In Vivo,
Baladhandapani Aruchamy, *Mahadevaswamy G. Kuruburu, Venugopal R. Bovilla, SubbaRao V. Madhunapantula, Carmelo Drago, Sonu Benny, Aneesh Thankappan Presanna, and Prasanna Ramani*
ACS Omega Q1 IF:4.132

Effect of Polyvinylpyrrolidone on the Structure Development, Electrical, Thermal, and Wetting Properties of Polyvinylidene Fluoride-Expanded Graphite Nanocomposites
Reshma Haridass, *Aleena Sabu, Nikhitha Augustin, Pratheep Kumar Annamalai,and Ramanujam Brahmadesam Thoopul Srinivasa Raghava*
ACS Omega Q1 IF: 4.132

Pyrrole: A Decisive Scaffold for the Development of Therapeutic Agents and Structure-Activity Relationship
Bharathi Hassan Ganesh, *Anirudh G. Raj, Dr. Baladhandapani Aruchamy, Dr. Pandurangan Nanjan, Dr. Carmelo Drago, Dr. Prasanna Ramani*
ChemMedChem Q1 IF: 3.54

Investigation on copper-nickel co-doped anatase titania nanospheres as an efficient material for photocatalytic and photovoltaic applications
 T Raguram, *K S Rajni, E Nandhakumar and G Kiruthiga*
New Journal of Chemistry Q1 IF: 3.3

RECENT PUBLICATIONS-SCIENCES

Numerical investigation on Nonautonomous Optical Rogue waves and Modulation Instability analysis for a nonautonomous system
S Saravana Veni, *M. S. Mani Rajan, Conrad Bertrand Tabi and Timoléon Crépin Kofané*
Physica Scripta Q1 IF: 3.081

Effective degradation of Rhodamine B using α-MoO3 nanoplates synthesised using thermal decomposition method,
Lakshmi Mohan, B Devu, Radhika R Menon, Malavika Surendran, Kathirvel P, D Maruthamani, Balraju P and Saravana kumar S
Physica Scripta Q2   IF:2.9

Exploration of N-Tetra-Substituted Imidazoles as Effective Agents To Counteract Gastric Cancer Cell Viability: Synthesis and Biological Evaluation
Bharathi Hassan Ganesh, *Dr. Baladhandapani Aruchamy, Dr. Prasanna Ramani, Prof. Susi Zara, Prof. Simone Carradori, Dr. Silvia D'Agostino, Prof. Bijo Mathew*
Chemistry select Q2 IF:2.1

Cnoidal Waves and Solitons to three-coupled nonlinear Schrodinger's equation with spatially dependent coefficients
Thilagarajah Mathanaranjan, M.S. Mani Rajan, **S. Saravana Veni** *and Yakup Yildirim*
Ukrainian Journal of Physical Optics, Q3 IF: 0.783

Second Order Viscous Hydrodynamics within an Effective Kinetic Theory and Thermal Particles from QGP,
L. J. Naik *& V. Sreekanth*
Physics of Particles and Nuclei Letters

Preparation and characterisation of nickel oxide and nickel oxide codoped with magnesium and zinc,
Erin Ann Sunny, Nahan Nazar, M Bhagyalakshmi, S Sooryanarayanan, A Chithra Mohan, Jomol Mariyam Thomas, Varsha Nair, G Sivasubramanian, K M Sreekanth and K M Sreedhar
IOP Conference Series: Materials Science and Engineering

RECENT PUBLICATIONS-MATHEMATICS

SSH-DAuth: secret sharing based decentralized OAuth using decentralized identifier
Ravichandran K.S., *Prudhvi Krishna D., Ramaguru R., Praveen K., Sethumadhavan M., Krishankumar R., Gandomi A.H.*
Scientific Reports Q1 IF: 4.996

Ligand Based Virtual Screening of Molecular Compounds in Drug Discovery Using GCAN Fingerprint and Ensemble Machine Learning Algorithm
Deepa O.S., *Ani R, & Manju B.R*
Computer Systems Science and Engineering Q2 IF:4.397

Graph Convolutional Neural Network-Based Virtual Screening of Phytochemicals and In-Silico Docking Studies of Drug Compounds for Hemochromatosis
Deepa O.S., *&Ani R*
IEEE Access Q1 IF:3.9

Selection of Suitable Cloud Vendors for Health Centre: A Personalized Decision Framework with Fermatean Fuzzy Set, LOPCOW, and CoCoSo
K. S. Ravichandran, *Dhruva Sundararajan, Raghunathan Krishankumar, Edmundas Kazimieras Zavadskas and Amir H Gandomi*
Informatica Q2 IF: 3.429

Is reinfection negligible effect in COVID-19? A mathematical study on the effects of reinfection in COVID-19
Tamilalagan P, *B Krithika, P Manivannan & S Karthiga*
Mathematical Methods in the Applied Sciences
Q1 IF: 3.007

Results on Relative Controllability for Nonlinear System with Multi-delays in Control
A. Vinodkumar *and S. Hemalatha*
Mathematical Methods in the Applied Sciences
Q1 IF: 3.007

RECENT PUBLICATIONS-MATHEMATICS

Invariant subspace method and exact solutions of the coupled system of time-fractional convection–reaction–diffusion equations
P. Prakash, *K.S. Priyendhu, and M. Meenakshi*
Computational and Applied Mathematics Q1 IF: 2.998

A Novel Approach to the Algebraic Structure of Neutrosophic SuperHyper Algebra
I R Sumathi, *S. Santhakumar & J. Mahalakshmi*
Neutrosophic Sets and Systems Q1 IF:2.34

An Enhanced Geneeralized Neutorsophic Number and its role in Multi-Criteria Decision-Making Challenges
I R Sumathi, *Augus Kurian, and Parvathy K*
Neutrosophic Sets and Systems Q1 IF:2.34

Common best proximity point theorems for proximally weak reciprocal continuous mappings
Pragadeeswarar, V., *Sreelakshmi Unni, A. and Manuel De la Sen*
AIMS Mathematics
Q2 IF: 2.29

Numerical scheme for partial differential equations involving small diffusion term with non-local boundary conditions
Govindarao L Bala, *Shree, and Das A, Majumdar A.*
Journal of Applied Mathematics and Computing
Q2 IF: 2.196

An Evidence-Based CoCoSo Framework with Double Hierarchy Linguistic Data for Viable Selection of Hydrogen Storage Methods
K. S. Ravichandran, *Raghunathan Krishankumar, Dhruva Sundararajan, and Edmundas Kazimieras Zavadskas*
Computer Modelling in Engineering & Sciences
Q3 IF: 2.027

RECENT PUBLICATIONS-MATHEMATICS

Irregular chromatic number for hypercube graph and its variants
Iyer Radha Rajamani *and Shyama S*
Journal of Intelligent and Fuzzy Systems Q2 IF: 1.737

A combined algorithm for selection of optimal bidder(s)
J. **Ravichandran** *and B. Vanishree*
Journal of Revenue and Pricing Management Q2 IF:1.60

Power unit Gumbel type II distribution: Statistical properties, regression analysis, and applications
Rajitha.C.S, *M Nagy, Ahmed M Gemeay, Kadir Karakaya, Şule Sağlam, AH Mansi, Mutua Kilai*
AIP Advances Q2 IF:1.6

Existence and convergence of best proximity points for generalized pseudo-contractive and Lipschitzian mappings via an Ishikawa-type iterative scheme
Pragadeeswarar, V., *and Gopi R.*
Fixed Point Theory and Algorithms for Sciences and Engineering
Q2 IF: 1.396

On the Sombor Index of Sierpi´nski and Mycielskian Graphs
Radha R Iyer *& Surabhi Chanda*
Communications in Combinatorics and Optimization
Q1 IF: 1.254

A class of t -weight codes and its applications
J Mahalakshmi, *Prabu J and Santhakumar .S*
Journal of Algebra and its Applications
Q2 IF: 0.762

RECENT PUBLICATIONS-MATHEMATICS

Common Best Proximity Points for Proximal Weak Commuting Mappings in Metric Spaces
Pragadeeswarar .V *and Gopi R*
JIranian Journal of Mathematical Sciences and Informatics Q2 IF: 0.175

B-spline method for second order RLC closed series circuit with small inductance value
L. Govindarao *& E. Sekar*
Journal of Physics: Conference Series Q2 IF:0.21

BOOK/BOOK CHAPTERS-MATHEMATICS

Brain Image Analysis Using Parallel Computing Techniques
Sriramakrishnan P and Kalaiselvi T
LAP LAMBERT Academic Publishing
BOOK PUBLISHED

Arunodaya Raj Mishra, Raghunathan Krishankumar, Fausto Cavallaro, Ram Kishun Lodhi & K. S. Ravichandran
Single-Valued Neutrosophic CRITIC-Based ARAS Method for the Assessment of Sustainable Circular Supplier Selection
Decision Making Using AI in Energy and Sustainability

P. Paramanathan and Aparna.M.P
Growth Analysis of Covid-19 Cases Using Fractal Interpolation Functions
Fractal Signatures in the Dynamics of an Epidemiology: An Analysis of COVID-19 Transmission,
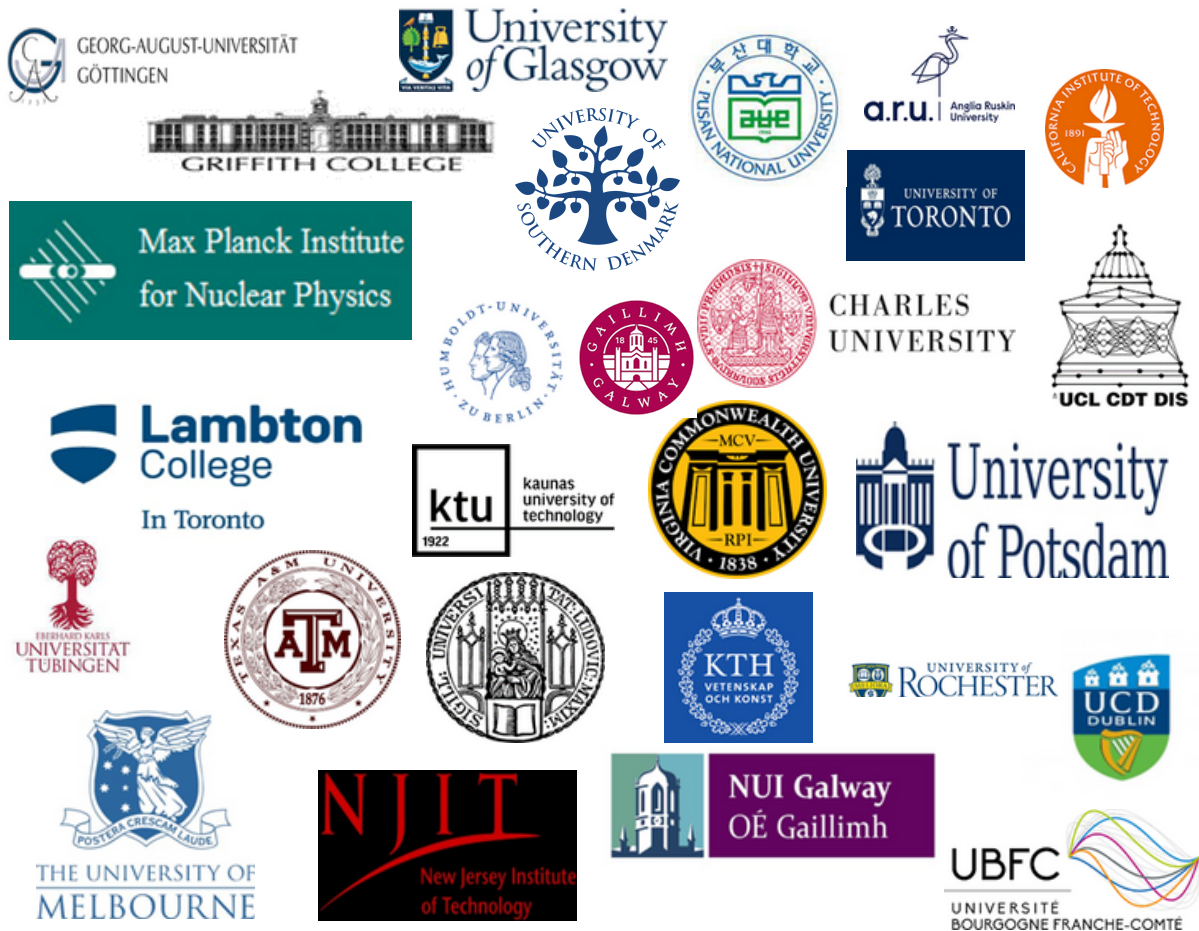Taylor and Francis Group

P. Paramanathan and Aishwarya.C
Mathematical Modelling of Multicellular Tumor Spheroid Growth Using Lambert Function
Fractal Signatures in the Dynamics of an Epidemiology: An Analysis of COVID-19 Transmission,
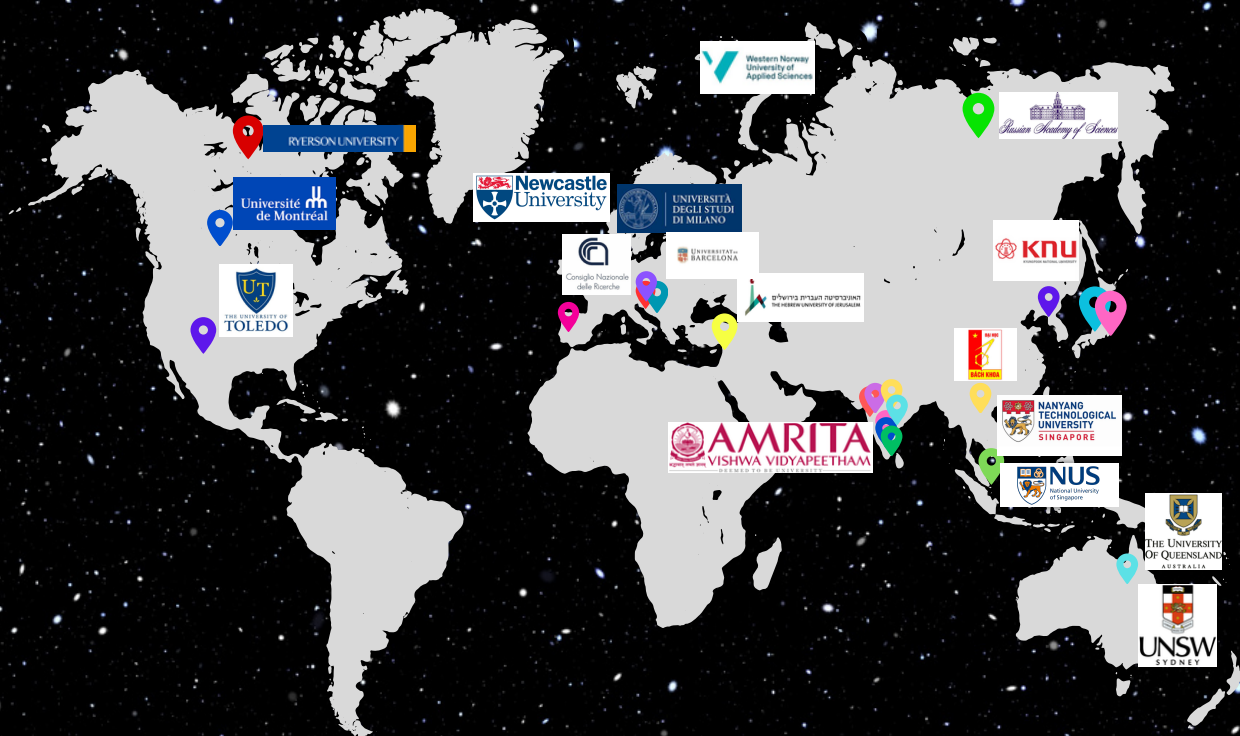Taylor and Francis Group

COLLABORATIONS

- University of Quebec, Montreal
- Russian Academy of Sciences
- Hebrew University of Jerusalem
- Nanyang Technological University
- Norway University of Applied Sciences
- National University of Singapore
- Hanoi University of Science
- CNR, Catania, Italy
- University of Milan, Italy
- Kyungpook National University, South Korea
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- University of Queensland, Australia
- University of Barcelona, Spain
- Tokyo Medical and Dental University
- University of Toledo, USA
- Newcastle University, UK

- Vidcare Innovations, Pune
- Abbott Healthcare and Innovosense
- High Energy Batteries(India)Limited
- Wipro Technologies, Bangalore
- Larson and Tubro Bangalore
- IIT, Hyderabad
- PRL, Ahmedabad
- TIFR, Mumbai
- IACS, Kolkata
- NIPER, Hyderabad
- Hyderabad University
- ICT-Indian Oil, Odisha
- INST, Mohali
- CSIR-CECRI, Karaikudi
- CMET , Pune
- MIT-Pune
- CSIR-NIO, Goa
- BITS Pilani, Goa
- CEBS, Mumbai
- PSG IAS, Coimbatore
- NISER, Bhubaneswar
- IIT, Gandhinagar
- IISc, Bangalore
- AIMS, New Delhi
- VIT, Vellore
- VNIT, Nagpur

UPCOMING EVENTS

- Amrita School of Physical Sciences will be celebrating "Science Day" on March 6th, 2024.

- Students can submit their design entries on "Recent Trends in Science" for the back cover of VIGNANAMRITAM Jan-Mar 2024 Issue. The best design will get featured and prizes will be awarded.

- Research Scholars are welcome to submit their articles for the upcoming issue.

- Entries to be sent to vignanamritam@cb.amrita.edu

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