



From the Editor's Desk

The January–June 2026 edition of the Amrita School of Physical Sciences newsletter presents a glimpse of the academic, research, and professional accomplishments that have marked the first half of the year. The achievements highlighted in this issue reflect the collective efforts of our students, research scholars, faculty members, and staff in fostering a culture of excellence and innovation. During this period, the School witnessed several noteworthy milestones, including high-quality research publications, successful student placements, and commendable performances in national-level competitive examinations. These accomplishments exemplify the commitment of our academic community to excellence in teaching, research, and professional development.

The Departments of Physics, Chemistry, Mathematics, and Food Science continued to enrich the academic environment through seminars, invited lectures, workshops, and outreach activities. A significant highlight of this period was the successful organization of national conferences and scientific events, including those conducted in collaboration with the Central Electrochemical Research Institute (CECRI), which facilitated the exchange of ideas and strengthened academic and research collaborations.

This issue also features informative articles contributed by our PhD scholars, providing readers with insights into emerging areas of research and scientific innovation. In addition, it documents the publications, academic events, awards, achievements, and other notable activities of the School from January to June 2026, serving as a record of the collective progress made during this period.

We sincerely thank all the contributors for their valuable support in bringing out this edition. We hope this newsletter serves as a source of inspiration and reflects the continued pursuit of excellence that defines the Amrita School of Physical Sciences.



Prof. Prasanna Ramani
Department of Chemistry
Amrita School of Physical Sciences
Coimbatore

AMRITA SCHOOL OF PHYSICAL SCIENCES

Amrita School of Physical Sciences, Coimbatore, is a vibrant component of Amrita Vishwa Vidyapeetham, which has 78 faculty members from the disciplines of Physics, Chemistry, Mathematics, Data Science, and Food Sciences and Nutrition. It has over 1100 undergraduate and postgraduate students. The school is very active in research, with around 170+ full-time scholars, and has funded projects from National Research agencies such as DST, DBT, SERB, and DRDO. It offers undergraduate, Five-Year Integrated MSc Programs, Two-year MSc Programs, and PhD programs in the fields of Physics, Chemistry, Mathematics, Data Science, Food and Nutrition, and Applied Statistics. The thrust areas of the School include 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 SCIENCE STUDENTS AT CONFERENCES/WORKSHOPS

POSTER PRESENTATIONS

- “Poly(vinylidene fluoride) (PVDF)-Poly(butylene succinate) (PBS) Based Blend Nanocomposites for Absorption Dominant EMI Shielding”, **Nikhitha Augustin** at International Conference on Scientific Advances in Natural and Technological Sciences (SAINTS 2026) at Christ University, Bengaluru, 7–9 January 2026.
- “Performance Enhancement of Zinc–Vanadium (Zn–V) Hybrid Redox Flow Cell via Acid-Based Additive”, **Subash S** at International Conference on Advanced Materials, Green Energy and Sustainability (ICAMGES 2026) at University of Kerala, Thiruvananthapuram, 5–7 February 2026.
- “Thermal Particles from Heavy-Ion Collisions within Viscous Gubser Flow”, **Lakshmi J. Naik** at International Workshop on Hard Probes in Non-equilibrium QCD Matter at International Centre for Theoretical Sciences (ICTS), Bengaluru, 16–27 March 2026.
- “Investigations on the Structural and Photoluminescence Properties of Alkali-Doped Cesium Copper Iodide Single Crystals”, **Aryalakshmi S** at 2nd International Conference on Advanced Functional Materials and Devices (AFMD-2026) at SRM Institute of Science and Technology (SRMIST), Chennai, 19–24 March 2026.
- “Hybrid Carbon Quantum Dot/NaBiF₄:Eu³⁺ Nanophosphors for White Light-Emitting Diode”, **Krishnendu R** at 2nd International Conference on Advanced Functional Materials and Devices (AFMD-2026) at SRM Institute of Science and Technology (SRMIST), Chennai, 19–24 March 2026.
- “Isomeric Effects in Cyanoindole via Dissociative Ionisation under Low-Energy Electron Impact and UV Multiphoton Excitation”, **Devika V S** at Golden Jubilee Meeting of the Indian Society of Atomic and Molecular Physics at IIT Delhi, 2026.
- “Influence of Supporting Electrolyte and Heterostructured Electrocatalyst on Zinc–Iodide Redox Flow Battery”, **Aparnasree M** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Fabrication and Testing of High-Performance Flexible Symmetric Supercapacitors Using Copper Cobaltite Spinel Nanostructures”, **Pooja Sanjeev** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Fabrication of Screen-Printed Zinc Alkaline Rechargeable Micro-Battery with Silver Nanoparticles Decorated Reduced Graphene Oxide Cathode”, **Keerthana S** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Development of a Disposable Label-Free Electrochemical Immunosensor Using V₂O₅–PANI–Chitosan Nanocomposite for Sensitive Detection of HER-2 Breast Cancer Biomarker”, **Swetha R** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Defect Engineered Metal Organic Framework CeM–mIm (M = Mn, Fe, Co, Ni, Cu) for Dopamine Sensing”, **Prabisha K E** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Polymerised Photosensitive EDOT-Coated Cotton Fabric as Efficient Solar Thermal Interfacial Evaporation and Hydrovoltaic Power Generation”, **Krishna P** at International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026) at Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026.

OUR SCIENCE STUDENTS AT CONFERENCES/WORKSHOPS

ORAL PRESENTATIONS

- “Support-Free Synthesis of Sequence-Defined Peptoid Oligomers for Biomedical Applications”, **Kavya C** at International Conference on Scientific Advances in Natural and Technological Sciences (SAINTS 2026) at CHRIST University, Bengaluru, 7–9 January 2026.
- “Tuning the Electrochemical Behaviour of Bismuth Oxide through Tin Doping for Energy Storage Application”, **Gayathri S** at International Conference on Advanced Materials, Green Energy and Sustainability (ICAMGES 2026) at University of Kerala, Thiruvananthapuram, 5–7 February 2026.
- “Sn-Doped Bi₂O₃ as an Efficient and Robust Catalyst for Oxygen Evolution Reaction”, **Eeswar Unnikrishnan** at International Conference on Advanced Materials, Green Energy and Sustainability (ICAMGES 2026) at University of Kerala, Thiruvananthapuram, 5–7 February 2026.
- “Hetero-Engineered Electrocatalyst with Modified Electrolyte for High-Performance Zinc–Iodide Redox Flow Battery”, **Aparnasree M** at National Conference on Recent Trends in Sustainable Energy Materials (NCRTSEM 2K26) at Mannar Thirumalai Naicker College, Madurai, 24 February 2026.
- “Classical Lie Asymmetry Analysis Method of the Coupled Systems of Time-Fractional Partial Differential Equations Under the Hilfer Time-Fractional Derivative”, **S. Kayalvizhi** and **Anita Vishnu** at ANRF Sponsored National Conference on Partial Differential Equations & Applications at Periyar University, Salem, 6–7 March 2026.
- “Fabrication and Testing of High-Performance Flexible Symmetric Supercapacitors Using Copper Cobaltite Spinel Nanostructures”, **Pooja Sanjeev** at 2nd International Conference on Advanced Functional Materials and Devices (AFMD-2026) at SRM Institute of Science and Technology (SRMIST), Chennai, 19–24 March 2026.
- “Classical Lie Symmetry Analysis Method of the Hilfer Time-Fractional Derivative”, **S. Kayalvizhi** at International Conference on Nonlinear Dynamical Systems (ICNDS 2026) at Bharathiar University, Coimbatore, 23–25 March 2026.
- “Charge Collection Efficiency of Ionization Chambers in FLASH-RT”, **Shree C** at 5th International Conference on Multifunctional Materials and Radiation Measurements at SSN College of Engineering (Autonomous), Chennai, 26–27 March 2026.
- “Calculation of Reaction Cross Sections for Secondary Particle Production in Proton Beam Therapy using the Glauber Model”, **Shree C** at 5th International Conference on Multifunctional Materials and Radiation Measurements at SSN College of Engineering (Autonomous), Chennai, 26–27 March 2026.

OUR SCIENCE STUDENTS AT CONFERENCES/WORKSHOPS

ORAL PRESENTATIONS

- “Integration of Kernel Methods and Bayesian Hybrid EWMA Control Charts for Monitoring Nonlinear Process: Insights From Air Quality Index”, **Ishah Maria Mathew** at 2nd International Conference on Engineering and Technology for Sustainable Future (ICETSF 2026) at P. R. Pote Patil College of Engineering and Management, Amravati, 18–19 April 2026.
- “Enhancing Pseudocapacitive Performance of Hydrothermal Sn-Engineered Bi_2O_3 for Supercapacitor Application”, **Gayathri S** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “ Ag_2MnO_2 as the Electrode Material for the Fabrication of High-Performance Flexible Symmetric Supercapacitors”, **Janella Mariam Samuel** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Pulsed Potential Electrodeposition of Silver and Zinc for the Fabrication of Thin Film Rechargeable Batteries”, **Architha M** at Twenty Fourth National Convention of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, 27–28 April 2026.
- “Single-Walled Carbon Intercalation in Lead-Free Halide Perovskite for Ultrasensitive UV Photodetection”, **Darsana S** at International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026) at Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026.
- “Pyro-Phototronic Non-Centrosymmetric Orthorhombic NaBiS_2 Broadband Self-Powered Photodetectors for Encrypted Optical Communication”, **Edita Joseph** at International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026) at Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026.
- “Temperature-Controlled Biochar Materials: Paving the path to future Green Energy”, **Anamika Chatterjee** at the International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026), Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026

PROJECT INNOVATIONS

- **Athulya Ravindran**, from department of Physics, presented a prototype titled "Water Rechargeable Supercapacitors" at the International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026), Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026.
- **Sugatha P. S**, from department of Physics, presented a prototype titled "Transparent Display Technology" at the International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026), Coimbatore Institute of Technology (CIT), Coimbatore, 3–5 June 2026.

OUR FACULTIES IN CONFERENCES/ WEBINARS

- **Dr. Prakash P** served as an Academic Audit Expert on the Academic Audit Council for the Academic Year 2026–2027 at PSG College of Arts and Science, Coimbatore, on January 7, 2026.
- **Prof. Sudip K. Batabyal** from the Department of Physics delivered a talk during the Pre-Conference Workshop on Advanced Polymer Materials for Next-Generation Energy Conversion and Storage Devices, organized by Mahatma Gandhi University, Kottayam, on 8 January 2026.
- **Dr. Biswambhar Rakshit**, Department of Mathematics, Amrita Vishwa Vidyapeetham, Coimbatore, delivered a talk entitled “Robust oscillatory dynamics in a mixed population of excitable and self-oscillatory Izhikevich neurons: Influence of second-order linear and nonlinear interactions”, at Eighth International Conference on Complex Dynamical Systems and Applications (CDSA2026) at Dhirubhai Ambani University (DAU), Gandhinagar, 23-26 January 2026.
- **Prof. Satheesh Babu T G**, Department of Chemistry, delivered an invited talk on Point of Care Detection of Bacteria and Fungi International Conference on "Microbial Networks and Planetary Health: A Systems Approach to One Health" held from 28-30 January 2026 at Manipal School of Life Sciences, Manipal.
- **Prof. Satheesh Babu T G**, Department of Chemistry, delivered an invited talk on “Rapid and Affordable Point - of - Care Detection of Bacteria and Fungi”, in the SPARC International Symposium held from 9-11 February 2026 at Amrita Vishwa Vidyapeetham, Amritapuri.
- **Dr. Prakash P** delivered an invited series of lectures on Fractional Calculus and Complex Analysis at the Science Academies' Three-Day Lecture Workshop on Mathematical Physics, held at PSGR Krishnammal College for Women, Coimbatore, during March 2–4, 2026.
- **Dr. Prakash P** delivered an invited talk titled "Engineering Mathematics: Innovation in Certain Mathematical Aspects of Differential Equations and Optimization" for B.E./B.Tech. students at Nehru Institute of Engineering and Technology, Coimbatore, on March 6, 2026.
- **Dr. Prakash P** served as a Session Chair at the International Conference on Analytical and Numerical Methods in Differential Equations, held at the School of Mathematics and Geoinformatics, Suranaree University of Technology, Thailand, during March 23–27, 2026.

OUR FACULTIES IN CONFERENCES/ WEBINARS

- **Dr. Prakash P** gave a talk on Analytical Methods and Exact Solutions of Fractional-order Partial Differential Equations at the International Conference on Analytical and Numerical Methods in Differential Equations, held at the School of Mathematics and Geoinformatics, Suranaree University of Technology, Thailand, on March 27, 2026.
- **Ms. Mahalakshmi J** from the Department of Mathematics served as an Organising Committee Member for the Workshop on Algebra and Analysis, held at Bharathidasan University, Tiruchirappalli, on 2 April 2026.
- **Dr. Prakash P** delivered an invited talk at the One-Day National Seminar on Modern Methods and Linear Algebra Techniques for Solving Differential Equations and Their Applications, held in the Department of Mathematics, Vellore Institute of Technology, Vellore, on April 6, 2026.
- **Dr. Prakash P** delivered an invited lecture on "Concepts of Linear Algebra and Their Applications in Engineering" for B.Tech. Computer Science and Engineering students at Vellore Institute of Technology, Vellore, on April 8, 2026.
- **Dr. Prakash P** served as an External Expert Member of the Curriculum Development Committee at Nehru Arts and Science College, Coimbatore, for the Academic Year 2026–2027, on April 18, 2026.
- **Dr. S. Subburaj** from the Department of Mathematics chaired a technical session titled “Automation and Digital Transformation” at the 5th National Level Research Conclave 2026, held at PSG College of Technology, Coimbatore, during 14–15 May 2026.
- **Prof. Sudip K. Batabyal** from the Department of Physics delivered a talk at the TriCHET Summer School on “AI, DFT, and Materials-Driven Hydrogen Enabling Technologies”, held at the Indian Institute of Technology Madras, during 28–30 May 2026.
- **Prof. Sudip K. Batabyal** from the Department of Physics delivered a talk at the 4th International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026), held at the Coimbatore Institute of Technology, Coimbatore, during 3–5 June 2026.

SPOTLIGHT



4

DEPARTMENTS

ACADEMIC
LABS
10



FACULTY
MEMBERS
78



1100+
STUDENTS



12
RESEARCH
LABS



2200L
RESEARCH
GRANTS



900+
PUBLICATIONS
SINCE '08



170+
RESEARCH
SCHOLARS



40+
PATENTS
FILED
SINCE '08

WALL OF FAME

HONOURING THE DOCTORATES



Dr. Sai Prem Shaji



Dr. Mohanraj M



Dr. Himabindu P



Dr. Sushmita K S



Dr. Augus Kurian

WELCOMING OUR NEW FACULTY MEMBERS



Dr. Nandhini V

Department of
Mathematics



Dr. Sakila A

Department of
Mathematics



Dr. Jayashree Joshi

Department of Food
Science & Nutrition

WALL OF FAME

INSTITUTIONAL DAY AWARDS

Best Faculty Award



Dr. Nandakumar
Department of Physics



Dr. Elango K
Department of Chemistry



Dr. Banupriya L
Department of Food
Science and Nutrition



Dr. Palanisamy T
Department of Mathematics

Exceptional achievement in securing competitive research funding for projects



Dr. Janci Rani P R
Department of Food Science
and Nutrition

Best technical staff award



Mr. Nandakumar
Department of Physics



Mr. L R Ravikumar
Department of Chemistry



Ms. Manimegalai P
Department of Food Science
and Nutrition

WALL OF FAME



Prof. Sudip Kumar Batabyal, Professor, Department of Physics, has received the Editorial Contribution Award 2026 from Scientific Reports, a Springer Nature journal, in recognition of his outstanding editorial contributions and dedicated service in maintaining the quality and integrity of scientific publications. Moreover, he has been elected as a Fellow of the Royal Society of Chemistry (FRSC), UK, in recognition of his outstanding contributions to chemical sciences, research excellence, innovation, and global scientific leadership. The fellowship is one of the highest professional recognitions conferred by the Royal Society of Chemistry.

Dr. A. K. Nandakumar, Department of Physics, has been awarded a research project grant from the Anusandhan National Research Foundation (ANRF) in 2026 for the project titled "Probing the Electrochemical Redox Origins for the Flash Phenomenon in Ceramics: Design for Fundamental Studies and Applied Extensions." The project has been sanctioned for a duration of three years to investigate the fundamental mechanisms of flash phenomena in ceramics and explore their potential applications.



Dr. V. Sreekanth, Department of Physics, has been elected to the Editorial Board of Scientific Reports, a Nature Portfolio journal, in recognition of his research expertise and contributions to the scientific community.

Prof. Prasanna Ramani, Department of Chemistry, delivered a talk as the Keynote speaker on the title "From Molecular Design to Structural Insight: Imidazole Heterocycle in Cancer Research" at ITACA.SB workshop on "MassSpec in Structural Biology and Beyond" at Catania, Italy (2026).



Dr. Janci Rani P.R, Department of Food science & Nutrition, **Dr. V. Sowmya**, School of Artificial Intelligence, **Dr. Premjith. B**, Centre for Computational Engineering and Networking have been sanctioned a research project titled "Feasibility study on Digital Health in Primary Health Centers." This interdisciplinary study is funded by the HCL Foundation.



WALL OF FAME



Subash S, research scholar from Department of Physics, has won Best Poster presentation award for the work titled "Performance enhancement of Zinc-Vanadium (Zn-V) hybrid redox flow cell via acid based additive", International conference on advanced materials, green energy and sustainability (ICAMGES 2026) at university of kerala, Thiruvananthapuram, Feb 5-7, 2026.

Shree C, research scholar from the Department of Physics, has won Best Oral presentation award for presenting the paper titled "Calculation of Reaction Cross Sections for Secondary Particle Production in Proton Beam Therapy using the Glauber Model " Shree C at the "5th International Conference on Multifunctional Materials and Radiation Measurements" at SSN College of Engineering (Autonomous), Chennai from 26-27 March 2026.



Janella Mariam Samuel, research scholar from Department of Physics has won Best Oral Presentation Award on the work titled " Ag_2MnO_2 as the electrode material for the fabrication of high-performance flexible symmetric supercapacitors", Twenty Fourth National Convention of Electrochemists (NCE-24), SAEST, at Amrita Vishwa Vidyapeetham, Coimbatore, April 27-28, 2026.

Keerthana S, research scholar from Department of Physics has won Best Poster Presentation Award on the work titled "Fabrication of screen-printed zinc alkaline rechargeable micro-battery with silver nanoparticles decorated reduced graphene oxide cathode", Twenty Fourth National Convention of Electrochemists (NCE-24), SAEST, at Amrita Vishwa Vidyapeetham, Coimbatore, April 27-28, 2026.



Swetha R, research scholar from Department of Chemistry, has won Best Poster presentation award for the work titled "Development of a disposable label-free electrochemical immunosensor using V_2O_5 -PANI-Chitosan nanocomposite for sensitive detection of HER-2 breast cancer biomarker", Twenty-Fourth National conference of Electrochemists (NCE-24) at Amrita Vishwa Vidyapeetham, Coimbatore, April 27-28, 2026.

WALL OF FAME



Kavya C, research scholar from Department of chemistry has won Best Poster Presentation award for the work titled "Support-Free Synthesis of Sequence-Defined Peptoid Oligomers for Biomedical Applications", International Conference, Scientific Advances in Natural and Technological Sciences (SAINTS 2026) at CHRIST University, Bangalore from 07-09 January 2026.

Aparnasree M, research scholar from Department of Chemistry has won Best poster award at Twenty-Fourth National Convention of Electrochemists (NCE-24) held at Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu during April 27-28, 2026, and Best Oral Presentation award at National conference on Recent Trends in Sustainable Energy Materials (NCRTSEM 2K26) at Mannar Thirumalai Naicker College, Madurai on 24th February, for the work titled, "Influence of Supporting Electrolyte and Heterostructured Electrocatalyst on Zinc-Iodide Redox Flow Battery".



S. Hari Krishnan, research scholar from the Department of Food Science and Nutrition, has received the "Top Viewed Article" award for the Journal of the Science of Food and Agriculture, awarded by Wiley.

Nandakumar P and **Ritu Mithra**, first year Bsc Food Science and Nutrition students were awarded cash prizes for their outstanding performance during the four-day workshop on "Food Regulations - Domestic & Export Compliance" conducted at CSIR-CFTRI, Mysuru.



NANDAKUMAR P



RITU MITHRA

WALL OF FAME



Edita J, research scholar from Department of Physics has won Best Oral Presentation Award at the International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026) on June 3-5 for presenting research work entitled "Pyro-Phototronic Non-Centrosymmetric Orthorhombic NaBiS₂: Broadband Photodetectors for Encrypted Optical Communication."

Amal Ajayan, research Scholar, Department of Mathematics, is a Visiting Student at Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), Abu Dhabi, UAE, working under the supervision of IEEE Fellow Prof. Mohsen Guizani. The research focuses on privacy, forensics, and security for smart city applications. The visit provides valuable international exposure, collaboration with researchers from EMAT, Université de Moncton, Canada, and engagement with academic and industry professionals, marking a significant milestone in Amal's research journey.



Dr. Sreejith P M and **Ranjith Kumar A**, from Department of Physics has won Best Innovation Showcase Award at the International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2026) on June 3-5 for presenting research work entitled "The synergistic use of sewage water as electrolyte for Mg-air fuel cells for sustainable energy solutions."



RANJITH KUMAR A



DR. SREEJITH P M

ROAD TO SUCCESS

JAM QUALIFIERS

JAM
53



V ADVAITH



AIR 53 (JAM 2026 – PH)

3rd Year Integrated
M.Sc. Physics



CHINMAY V MENON

AIR 234 (JAM 2026 – CY)

3rd Year Integrated
M.Sc. Chemistry



SINDHU P S

AIR 302 (JAM 2026 – CY)

3rd Year Integrated
M.Sc. Chemistry



ASHOK VARMA

AIR 1607 (JAM 2026 – PH)

3rd Year Integrated
M.Sc. Physics



EESHIKA S

AIR 1825 (JAM 2026 – PH)

3rd Year Integrated
M.Sc. Physics



NANDANA S NAIR

AIR 2263 (JAM 2026 – PH)

Integrated
M.Sc. Physics



AADHI A

AIR 3180 (JAM 2026 – PH)

3rd Year Integrated
M.Sc. Physics



NEELIMA B

AIR 3229 (JAM 2026 – PH)

3rd Year Integrated
M.Sc. Physics

ROAD TO SUCCESS

GATE CRACKERS



MANAV NAMBIAR
AIR 380 (GATE 2026 – PH)
4th Year Integrated
M.Sc. Physics



HARIHARAN S
AIR 1545 (GATE 2026 -MAT)
Research Scholar,
Department of Mathematics

OUTSTANDING MULTIPLE ACIHEVEMENTS

JEST
6



SREEDATH P R
AIR 6 (JEST 2026-PH)
AIR 1164 (GATE 2026 – PH)
4th Year Integrated
M.Sc. Physics

NET
88



G PRANAV KARTHIK
AIR 403 (GATE 2026 – PH)
AIR 88 (CSIR-UGC NET
DECEMBER 2025 – PHYSICAL
SCIENCE, UGC-JRF)
4th Year Integrated
M.Sc. Physics



NANDANA M
AIR 534 (JAM 2026 – CY)
AIR 1256 (GATE 2026 – CY)
4th Year Integrated
M.Sc. Physics



PLACEMENTS



MEGHNA MK
INTEGRATED M.SC. CHEMISTRY



SHRINITHI P S
INTEGRATED M.SC. PHYSICS



NEHA LIBU
INTEGRATED M.SC. CHEMISTRY



NAMRATHA SANTHAKUMAR
M.SC. CHEMISTRY



NANDANA T
M.SC. CHEMISTRY



VYSHNAVI K
INTEGRATED M.SC. CHEMISTRY



DHIYA SUDHAKARAN
M.SC. CHEMISTRY



RIYA SUDHAKARAN
M.SC. CHEMISTRY



SOORYA V BHASKAR
M.SC. CHEMISTRY



GAYATHRI NAIR
INTEGRATED M.SC. CHEMISTRY



ANJU P
M.SC. CHEMISTRY



RIDHI
INTEGRATED M.SC. CHEMISTRY



ANIKA DAYANANDAN
INTEGRATED M.SC. CHEMISTRY





PLACEMENTS



ADDITI
M.Sc. ASDA



ARYA AMBALAPPAT VASUDEVAN
M.Sc. ASDA



VIJAY R
Integrated. M.Sc. Data science



B KALYANI PRIYA
Integrated. M.Sc. Data science



ARJUN B
Integrated. M.Sc. Data science



ABHIRAMI B
Integrated. M.Sc. Data science



K BHAVANA
M.Sc. ASDA



DEVIKA R
Integrated. M.Sc. Data science



ASHWIN ESSAN
Integrated. M.Sc. Data science



SOWGANDHIGA S
Integrated. M.Sc. Data science



JANI J
Integrated. M.Sc. Data science



SARVESHWARAN AM
Integrated. M.Sc. Data science



UTHAYARAHAVAN M S
Integrated. M.Sc. Data science



GOPIKA R NAMBIAR
Integrated. M.Sc. Data science





PLACEMENTS

DAIMLER TRUCK



KIRUBHASINI S
Integrated. M.Sc. Data science

MERIT



PRAMOTHINI S
Integrated. M.Sc. Data science

SUPERAGENT



RANJIT N
Integrated. M.Sc. Data science

CGI



ASHWATH C
Integrated. M.Sc. Data science

>F



DEEPAK KV
Integrated. M.Sc. Data science

LIGHT & WONDER



GUHAN C
Integrated. M.Sc. Data scienceE

techspire



NAVEEN
Integrated. M.Sc. Data science



MELVIN BALU
Integrated. M.Sc. Data science

i2o
INPUTS TO OUTPUTS



RAGUL M
Integrated. M.Sc. Data science

Prodapt



SHREYA SIVAKUMAR
Integrated. M.Sc. Data science

enthuziastic



SOWNDHARYA LAKSHMI. G
Integrated. M.Sc. Data science

Jeev Lifeworks



SUBIKSHA K
Integrated. M.Sc. Data science



SRIKANTH RAGHAVAN
Integrated. M.Sc. Data science



Featured Articles



Dr. Anamika Chatterjee, Postdoctoral Fellow, Department of Physics, authored an article titled "The Rainbow of Hydrogen: Understanding Energy's Colour Code", published in the University of Jaffna Clean Energy Newsletter (Volume 01, Issue 02). The article explains the various hydrogen "colours" based on their production pathways and associated environmental impact, highlighting their significance in the global transition toward sustainable and clean energy. Through an engaging and accessible narrative, it emphasizes hydrogen's growing role as a key fuel for a low-carbon future.

Dhanvi Anu and Samala Phani Chandra, Integrated M.Sc. Physics students, published a review article titled "Think Space is Deadly? Try Flying over the South Atlantic" in the January 2026 issue of 3E Magazine, published by the NoRC&I Institute. The article highlights the scientific importance of the South Atlantic region in space research and its implications for satellites and space exploration.



PROUD MOMENTS



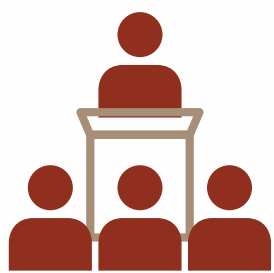
From Amrita classrooms to a Civil Servant - Vishnupriya's journey is pure inspiration! Ms. Vishnupriya alumna of School of Physical Sciences from Coimbatore Campus, has secured All India Rank 149 in the Civil Services Examination! She credits her years at Amrita for more than just academics - diving into club activities, community service, and campus initiatives that sharpened her leadership, empathy, and drive to serve. Her story is a reminder that success isn't built in a day, but in every debate, every project, and every step taken beyond the textbook. Amrita Vishwa Vidyapeetham proudly felicitated Ms. Vishnupriya, alumna of the Amrita School of Physical Sciences, Coimbatore campus, for securing All India Rank 149 in the Civil Services Examination. The event was a proud celebration of dedication, perseverance, and excellence. Her remarkable achievement inspired students and faculty alike, reflecting how determination and focused effort can lead to extraordinary success. The gathering was filled with pride and encouragement as the Amrita community came together to honor one of its distinguished alumni.

Inauguration

AMRITA CENTRE FOR FOOD NUTRITION AND INTEGRATED RESEARCH (ACFNIR)



The Department of Food Science and Nutrition, under the Amrita School of Physical Sciences, officially inaugurated the Amrita Centre for Food Nutrition and Integrated Research (ACFNIR) on July 3, 2026, at the Ettimadai Campus. Located in the New Food Science Laboratory facility situated above the New Kitchen and near the CTR building, the day commenced with traditional sacred rituals, including a Ganapathi Homam from 6:30 AM to 8:00 AM, followed by Archana and Arathi from 9:30 AM to 10:30 AM to invoke blessings for the facility's future endeavors. The formal inauguration was solemnized by Swami Tapasyamritananda Puri, a Senior Disciple of AMMA from the Mata Amritanandamayi Math, after which the facility was opened to a university delegation comprising Heads of Departments, Chairpersons, faculty members, and research scholars from various academic domains and sister schools. Attendees toured the new laboratory space, noting its advanced infrastructure, modern instrumentation, and its potential to facilitate productive, inter-departmental collaborations across the campus. By integrating specialized units for Food Science, Nutrition, Food Microbiology, and Food Analysis alongside practical setups for Cookery, Product Development, Food Processing, and Packaging under a single framework, the centre establishes a comprehensive, multidisciplinary platform. This centralized approach is strategically positioned to advance applied research in human nutrition, value-added functional foods, food safety, and sustainable processing, thereby bridging the crucial gap between academic learning and industrial application while empowering students and researchers to generate measurable real-world impact.

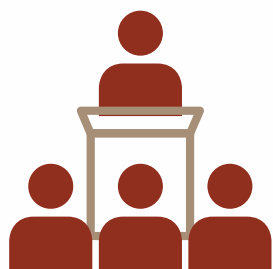


CONFERENCES

National Conference on Recent Trends in Science and Technology (NCRTST-2026)



The one-day National Conference on Recent Trends in Science and Technology (NCRTST-2026), jointly organized by the Departments of Physics and Chemistry at Amrita Vishwa Vidyapeetham, provided a vibrant platform for researchers, faculty members, and students to exchange ideas on emerging interdisciplinary research. The conference was inaugurated by Dr. S. Mahadevan, Principal, Amrita School of Physical Sciences, who emphasized the importance of interdisciplinary collaboration and the institution's vision of establishing NCRTST as an annual academic event. The keynote lecture by Dr. Saurabh Ghosh, Associate Professor, SRM Institute of Science and Technology, on Machine Learning in Materials Design highlighted the application of computational methods, including Density Functional Theory (DFT), Molecular Dynamics (MD), and machine learning techniques in solving complex materials science problems. A major attraction of the conference was the poster presentation session, where 63 research posters were presented across seven scientific themes, encouraging active discussions and constructive feedback among participants and experts. Ten outstanding posters were recognized with awards sponsored by IOP Publishing. The conference concluded with an interactive feedback session involving students and faculty, followed by a vote of thanks, marking the successful completion of a scientifically enriching event that promoted research collaboration, innovation, and academic excellence.



CONFERENCES

National Convention of Electrochemists (NCE 2026)



The 24th National Convention of Electrochemists (NCE-24), organized by the Society for Advancement of Electrochemical Science and Technology (SAEST) in association with CSIR–Central Electrochemical Research Institute (CECRI), Karaikudi, and Amrita Vishwa Vidyapeetham, Coimbatore, was held on 27–28 April 2026 at Amrita Vishwa Vidyapeetham. The convention brought together eminent scientists, academicians, industry professionals, and research scholars from across the country to deliberate on recent advances in electrochemical science and technology. Dr. K. Ramesha, Director, CSIR–CECRI, Karaikudi, served as the Chairman of the convention, while the event featured prestigious memorial lectures by Prof. U. Kamachi Mudali (IIT Bombay), Prof. Sagar Mitra (IIT Bombay), and Prof. C. Retna Raj (IIT Kharagpur). Among the invited speakers, Prof. T. G. Satheesh Babu, Professor and Research Head, Amrita School of Physical Sciences, Amrita Vishwa Vidyapeetham, delivered an insightful lecture on “Biosensors for Point-of-Care Applications,” highlighting the growing role of electrochemical biosensors in healthcare diagnostics. The convention also included invited lectures by experts from ISRO, IISc Bengaluru, IISER Pune, IISER Bhopal, BITS Pilani Goa, IGCAR, CSIR-CGCRI, CECRI, covering emerging topics in batteries, supercapacitors, fuel cells, corrosion, biosensors, and AI-driven electrochemistry. Alongside technical sessions, the event featured oral and poster presentations, a commercial exhibition showcasing the latest electrochemical instruments, materials, and technologies, and awards sponsored by the Royal Society of Chemistry (RSC) for outstanding oral and poster presentations. The convention concluded on a vibrant note with cultural performances by the students of Amrita Vishwa Vidyapeetham, who captivated the audience with music and dance, celebrating the spirit of scientific collaboration and cultural harmony.

Collabration highlights

CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi & Amrita Vishwa Vidyapeetham, Coimbatore signed an MoU on 27th April 2026 focusing on the Skill Development Training, Joint Research, Incubation Networking, and Exchange of Students & Faculty Members!!



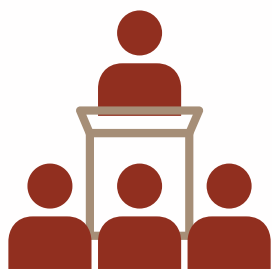
மத்திய மின்வேதியியல் ஆராய்ச்சி நிறுவனம்
सीएसआईआर-केंद्रीय विद्युतरसायन अनुसंधान संस्थान
CSIR-Central Electrochemical Research Institute
காரைக்குடி / कारैकुडी / Karaikudi



MoU signed between CSIR-Central Electrochemical Research Institute, Karaikudi & Amrita Vishwa Vidyapeetham, Coimbatore for collaboration

27th April 2026



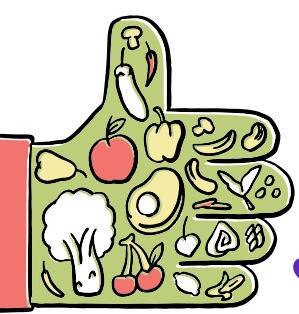


SEMINARS

ANRF-Sponsored Two-Day International Seminar on Electrospun Advanced Polymer Materials for Sustainable Energy, Environment and Biomedical Applications



ISEAPM 2026 – ANRF-Sponsored Two-Day International Seminar on “Electrospun Advanced Polymer Materials for Sustainable Energy, Environment and Biomedical Applications”, organized by the Department of Physics, Amrita School of Physical Sciences, Amrita Vishwa Vidyapeetham, Coimbatore. The seminar served as a vibrant platform for researchers, academicians, industry experts, and students to explore the latest advancements in electrospinning technology and the diverse applications of electrospun polymer nanofibers in Sustainable Energy, Environmental Remediation, Energy Storage, Biomedical Applications. We were privileged to host distinguished speakers from premier institutions, including IISc Bengaluru (Anurima De, Ph.D., Bhashkar Singh Bohra), IIT Madras (Kothandaraman Ramanujam), NITK Surathkal (S Anandhan FRSC, FIE, FICS), NIIST Thiruvananthapuram (Bhoje Gowd Erathimanna), VIT Vellore (Arunkumar Chandrasekhar), SCTIMST (Lynda Thomas), CUSAT (Prasanth Raghavan), Yonsei University (South Korea) (Rajkumar Patel, Ph.D.), and the University of Southern Queensland (Australia) (Pratheep K. Annamalai, Ashok Kumar Nanjundan), ElektroactivX Pvt Ltd, Assam (Arindam Adhikari). The event witnessed enthusiastic participation from more than 70 students, featuring insightful invited talks, engaging poster presentations, and vibrant technical discussions that fostered knowledge exchange, networking, and future collaborations.



SMART FOOD CHOICES FOR GEN ALPHA

The Community Nutrition Awareness Program titled “Smart Food Choices for Gen Alpha” was organized by the Department of Food Science and Nutrition, School of Physical Sciences, Amrita Vishwa Vidyapeetham, on 19 February 2026 at Amrita Vidyalayam, Ettimadai, Coimbatore. The program aimed to promote healthy eating habits and nutrition awareness among school children. A total of 201 students from Classes VI and VII (10–13 years) participated. The sessions focused on the importance of a balanced diet, regular breakfast consumption, food label reading, identifying hidden sugars and fats in packaged foods, healthy food choices, adequate hydration, and physical activity. Interactive discussions and educational activities enhanced student engagement, while pre- and post-test assessments demonstrated improved knowledge of nutrition and healthy lifestyle practices. Students actively participated in quizzes, question-and-answer sessions, and practical demonstrations, which reinforced key nutritional concepts in an engaging manner. Educational materials and healthy eating messages were provided to encourage the adoption of positive dietary practices beyond the classroom. Overall, the program effectively increased nutrition awareness, fostered informed food choices, and encouraged healthier dietary behaviors among the participants.

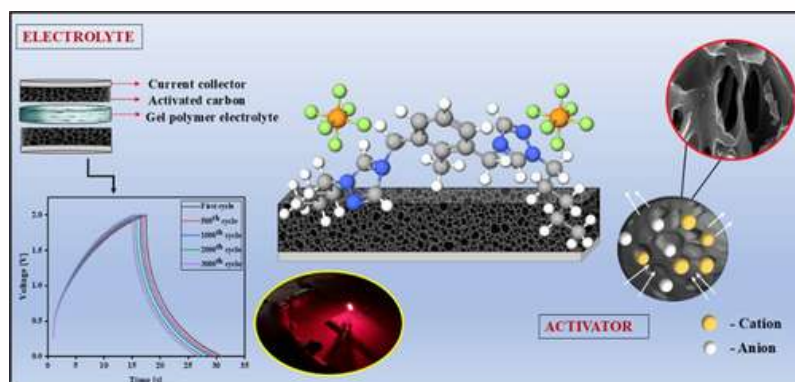




RESEARCH SPOTLIGHT

A TRIAZOLIUM-BASED DICATIONIC SALT AS A DUAL-FUNCTION AGENT FOR CARBON ACTIVATION AND ELECTROLYTE IN SUPERCAPACITOR

SUSHMITA K S

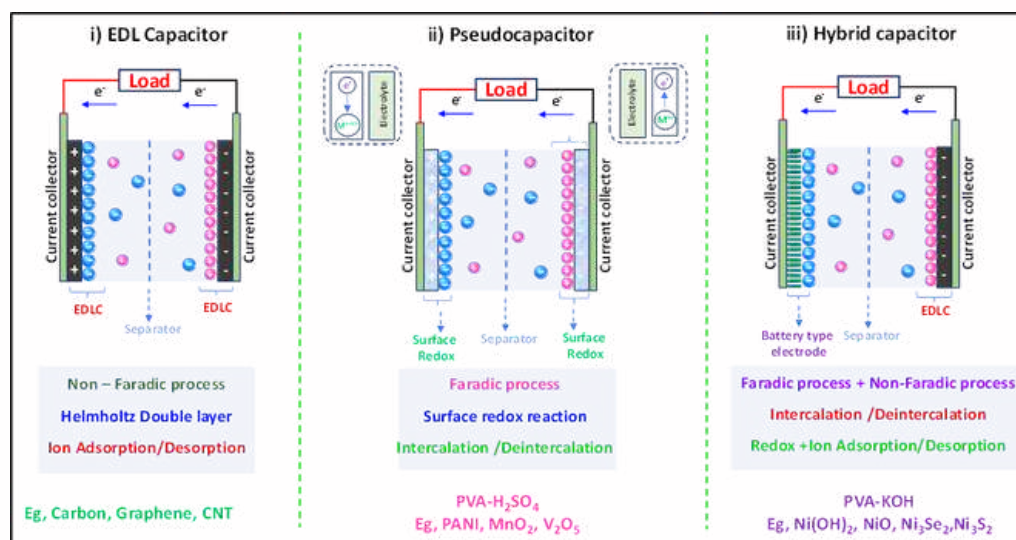


As the demand for efficient and sustainable energy storage systems continues to grow, researchers are exploring innovative materials that can improve supercapacitor performance while reducing environmental impact. In this study, a triazolium-based dicationic salt (TBDS) was investigated as a unique dual-function material capable of acting both as a carbon-activating agent and as an electrolyte for supercapacitor applications. This approach offers a greener alternative to conventional activation methods, which typically rely on corrosive chemicals such as potassium hydroxide and phosphoric acid. The research began with coconut shell charcoal, an inexpensive and renewable biomass resource. During the activation process, TBDS interacted with the carbon precursor and facilitated the development of a highly porous carbon structure. The resulting activated carbon exhibited a large specific surface area of $865 \text{ m}^2/\text{g}$, enhanced graphitization, and reduced structural defects, all of which are desirable characteristics for energy-storage electrodes. A particularly innovative aspect of this work was the use of the same dicationic salt as the electrolyte in the final supercapacitor device. This created a highly compatible electrode-electrolyte system, improving ion transport and charge-storage efficiency. Electrochemical investigations revealed excellent capacitive behaviour with a specific capacitance of 186 F/g at a 2 V operating window. The device also delivered an energy density of 6.11 Wh/kg and a power density of 815.16 W/kg , demonstrating its capability to store and supply energy effectively. Furthermore, the supercapacitor maintained 87% of its initial capacitance after 3000 charge-discharge cycles, indicating remarkable long-term stability and durability. To demonstrate practical applicability, the fabricated supercapacitor was used to power a red LED, confirming its potential for real-world energy-storage applications. The successful illumination of the LED showcased the device's ability to deliver usable energy beyond laboratory testing conditions. Overall, this study presents a sustainable and efficient strategy for supercapacitor development by integrating a multifunctional dicationic salt into both material synthesis and device operation. The dual role of TBDS simplifies processing, reduces the need for hazardous chemicals, and enhances electrochemical performance. By transforming agricultural waste into a high-value electrode material and employing a single compound for multiple functions, this work provides a promising pathway toward environmentally friendly, high-performance energy-storage technologies for future applications.



DEVELOPMENT OF HIGH ENERGY SUPERCAPACITOR BASED ON ACIDIC AND ALKALINE ELECTROLYTE ENVIRONMENTS

MOHANRAJ M



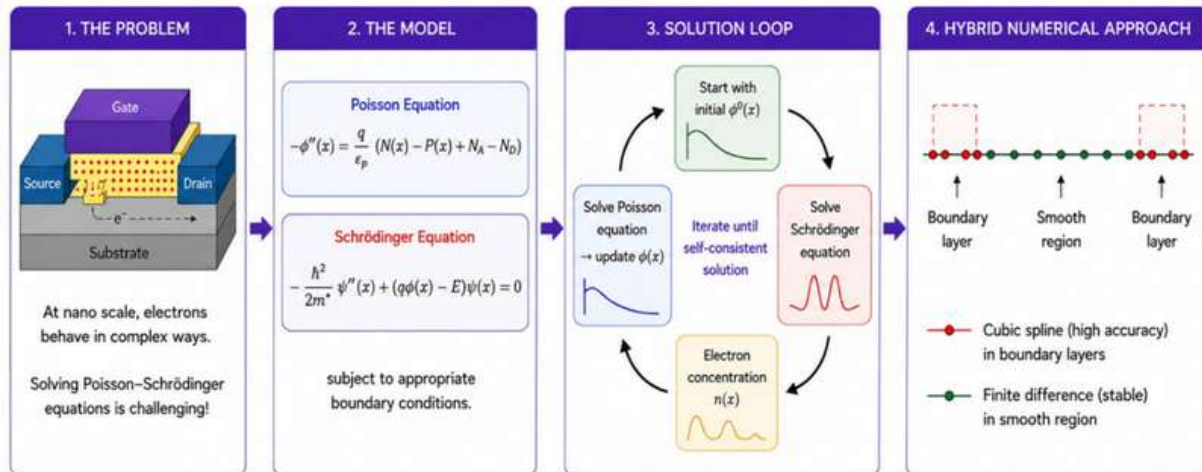
The fast depletion of the conventional energy resources such as fossil fuels coal, oil, and natural gas., etc and the emission of the greenhouse gasses such as CO₂, NO₂, etc by these resources while functioning are polluting the environment, Therefore, the renewable resources such as wind solar, hydro, renewable resources are being considered better replacement due to the above issues due to their environmental friendliness, sustainable, and abundant characteristics nature. However, these resources are intermittent. Therefore, the generation and storage of energy are key to compensating for the energy demand and preventing pollution, which is a major threat at present. This thesis focuses on developing advanced hybrid supercapacitors by engineering nickel-based electrode materials for both acidic and alkaline electrolyte systems. Initially, a PANI-MoS₂ composite was developed for acidic electrolytes and demonstrated improved electrochemical performance in flexible solid-state pouch-cell supercapacitors. The research then shifted to alkaline electrolytes, where β -Ni(OH)₂-WC, fluorine-doped NiO, fluorine-doped β -Ni(OH)₂-Ti₃C₂ MXene, and Ni₃S₂/Ni₃Se₂ heterostructures were designed to enhance electrical conductivity, ion transport, and redox activity. These materials were successfully applied in coin-cell, flexible, solid-state, and high-voltage (up to 11.2 V) hybrid supercapacitors. Among the developed electrodes, the Ni₃S₂/Ni₃Se₂ heterostructure exhibited the best electrochemical performance, delivering a specific capacity of 179.2 mAh g⁻¹, an energy density of 56.08 Wh kg⁻¹, and a power density of 1332.2 W kg⁻¹. The optimized hybrid supercapacitors also showed excellent cycling stability, retaining 90% capacitance after 10,000 charge-discharge cycles.

Overall, this work demonstrates that fluorine doping, composite engineering, and heterostructure design are effective strategies for developing high-performance hybrid supercapacitors suitable for flexible electronics, portable devices, electric vehicles, and future sustainable energy storage applications



HYBRID DIFFERENCE SCHEME FOR A COUPLED POISSON-SCHRÖDINGER EQUATION MODELING NANO SCALE SEMICONDUCTOR DEVICES: A SINGULAR PERTURBATION APPROACH

ANILA S



Tiny devices and Mathematics: From smartphones to laptops, modern technology depends on tiny semiconductor devices. As these devices shrink to the nanometre scale, predicting the movement of electrons becomes increasingly challenging because quantum effects begin to dominate. To study this behaviour, the coupled Poisson–Schrödinger equations are solved, where the electric potential and the electron wave function continuously influence each other until a self-consistent solution is obtained.

The challenge: One of the equations in this system is a singularly perturbed reaction-diffusion equation, whose solution changes very rapidly near the boundaries. These narrow regions, called boundary layers, are difficult to approximate accurately using conventional numerical methods.

A new framework: A higher-order hybrid numerical method was developed by combining the finite difference method with cubic spline approximation. Starting with an initial electric potential, the Schrödinger equation is solved to obtain the electron wave function. This is then used to calculate the electron concentration, which updates the electric potential through the Poisson equation. To accurately capture the sharp boundary layers, a Shishkin mesh was employed, placing more computational points where the solution changes rapidly and fewer where it varies smoothly. Although cubic spline approximation provides high accuracy, mathematical analysis showed that it does not maintain the required stability throughout the entire domain. To overcome this limitation, cubic splines were applied only within the boundary layer, while the standard finite difference method was used elsewhere. This hybrid strategy successfully combined stability with higher accuracy.

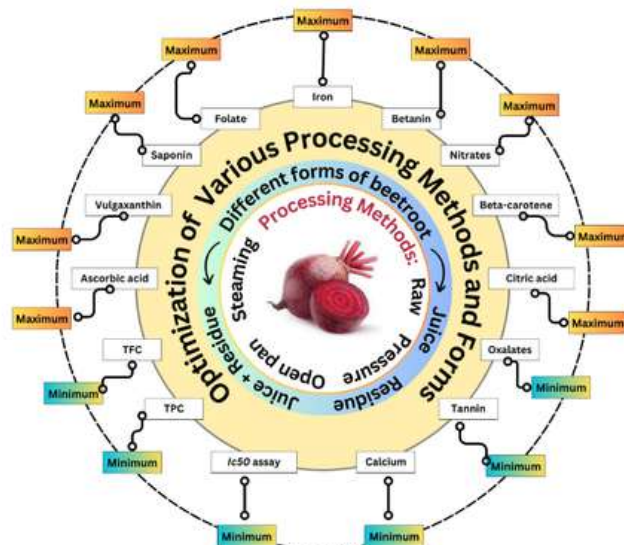
The validation: The proposed method was supported by a detailed mathematical analysis, including stability, convergence, and rigorous error estimates. The accuracy was validated by presenting the corresponding error obtained, and the order of convergence for Molybdenum Disulfide (MoS₂) based on transistors of two different channel lengths, namely 20 nm and 3 nm. The numerical results demonstrated smaller errors and a higher order of convergence compared with the conventional finite difference approach.

The significance: Reliable computer simulations play a vital role in designing nanoscale semiconductor devices before they are manufactured. By providing a mathematically validated and highly accurate numerical technique for solving the coupled Poisson–Schrödinger equations, this work contributes to the development of more dependable simulation tools. It highlights how mathematics and numerical analysis quietly drive many of the technological advances that shape everyday life.



PROCESSING-INDUCED MODULATION OF NUTRACEUTICAL AND ANTI-NUTRITIONAL PROFILES OF BEETROOT VARIANTS TARGETING ENHANCED IRON RETENTION

ATHIRA M



Iron plays a crucial role in the body by supporting oxygen transport, myoglobin synthesis, red blood cell formation, and brain development. Despite being a micronutrient, iron deficiency remains a major public health concern. Iron is obtained from animal and plant sources as heme and non-heme iron, with heme iron being more readily absorbed. In plant foods, organic acids such as citric, ascorbic, tartaric, and malic acids enhance iron absorption, whereas oxalates, calcium, phytates, and certain polyphenols inhibit it. Food processing methods, including steaming, pressure-cooking, and open pan-cooking, influence nutrient retention and bioavailability, while different food forms also affect nutrient availability. Beetroot juice is commonly consumed as a dietary supplement for iron deficiency anemia. This study evaluated different processing methods and beetroot variants (juice, residue, and juice with residue) to optimize the retention of nutritional and bioactive compounds while reducing antinutrients that interfere with iron absorption.

Why is this important? Many plant-based foods contain anti-nutritional compounds that bind iron and limit its absorption in the human body. Processing can either improve or worsen this situation. Certain treatments may break down anti-nutrients, enhancing mineral availability, while others may lead to losses of heat-sensitive bioactive compounds. Finding the right balance is essential for developing nutritionally superior food products.

Key findings: The steaming process was most effective in retaining nutraceutical compounds, antioxidant activity, total phenols, flavonoids, and nitrates, while pressure-cooking reduced anti-nutrients and preserved nutrients such as folic acid, β -carotene, ascorbic acid, and citric acid. Among the beetroot variants, juice with residue showed better overall nutrient retention, whereas the residue variant retained the highest iron content. These findings highlight the importance of selecting appropriate processing methods and food variants. Using a desirability-based optimization approach, the pressure-cooked juice with residue variant was identified as the optimal option, as it reduced iron absorption inhibitors (oxalates, calcium, and tannins) by approximately 26–42% while increasing beneficial compounds such as saponins, citric acid, folic acid, and β -carotene by an average of 67%.

The broader impact: The outcomes of this work can support the development of innovative iron-rich functional foods, nutraceutical products, and fortified formulations aimed at combating iron deficiency anemia. The generated knowledge also provides guidance for food processors seeking evidence-based approaches to maximize nutritional quality while maintaining product acceptability.

Looking ahead: Future research will focus on integrating optimized beetroot ingredients into convenient food products and evaluating their iron bioaccessibility and efficacy through in vitro and clinical studies. Combining beetroot with synergistic ingredients that promote iron absorption may further enhance its nutritional potential.

RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS



Development of a Stable Electrolyte for Dendrite Suppression and High-Performance Zn-I₂ Redox Flow Battery

Aparnasree Moothedath, Mohanraj Madeshwaran, Anjana Puthanpurayil Jayarajan, Bal Sydulu Singu, Ulaganathan Mani, Samanth Kokkiligadda, Soong Ho Um
Small Q1 IF: 11.8

Layered V₂O₅-VOPO₄ heterostructure photo-sensitive electrodes for light-enhanced, flexible, and ultra-stable supercapacitor with 1.7 lakh cycle life

Hridya C Prakash, Dhamodaran Santhanagopalan, Sudip K Batabyal
Journal of Energy Storage Q1 IF: 9.8



PMMA assisted filler dispersion and morphology control in multifunctional PVDF based blend nanocomposites for absorption dominant EMI shielding and energy harvesting

Nikhitha Augustin, Amit Malakar, Suryasarathi Bose, Rajkumar Patel, Pratheep Kumar Annamalai, Ramanujam Brahmadesam Thoopul Srinivasa Raghava
Results in Engineering Q1 IF: 9.4

Fluorine-doped β -Ni (OH)₂-Ti₃C₂ MXene composite: a bifunctional electrode

Madeshwaran Mohanraj, Moothedath Aparnasree, KS Rajni, Sangaraju Shanmugam, Mani Ulaganathan
Journal of Materials Chemistry A Q1 IF: 9.2



Efficiency Enhancement of CdTe solar cells using Cu₂MnSnS₄ back contact layer:-Experimental and Numerical Analysis

KS Rajni, Ipsita Jena, Udai P Singh
Renewable Energy Q1 IF: 9.1

High-performance hydrovoltaic devices: Utilizing temperature-controlled carbonization of Mahogany fruit shell

Anamika Chatterjee, P Krishna, Sreejith P Madhusudanan, V Karuppasamy Vikraman, Sudheesh Manalil, Sudip K Batabyal
Journal of Power Sources Q1 IF: 8.4



RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS

Fluorine-Incorporated Graphene Oxide for Hydrovoltaic Power Generation: Improving Proton Migration and Storage Capacity

Neethu Manikandan, KB Abhinand, Hridya C Prakash, Kaushik Suvigya, Sudip K Batabyal
ChemSusChem Q1 IF: 6.6



Surface Charge-Engineered Activated Carbon-PVDF Composite-Based Thin Film Device for Hydrovoltaic Applications

Athulya Ravindran, Sreejith P Madhusudanan, Sudip K Batabyal
Advanced Sustainable Systems Q1 IF: 6.1

Single-walled carbon nanotube intercalation in lead-free halide perovskite for ultrasensitive UV photodetection

Darsana Sudarsan, Sudip K Batabyal
Surfaces and Interfaces Q1 IF: 6



Integrated Experimental and Theoretical Study of CuO/ZnO Nanocomposites for Photocatalytic and Supercapacitor Applications

T Raguram, A Raksha, Madeshwaran Mohanraj, MR Venkatraman, KS Rajni, Michael Zambrano-Angulo, Kevin Granados-Tavera, Javier J Santaella, Gloria Cárdenas-Jirón
Surfaces and Interfaces Q1 IF: 6

Propagation dynamics and modulation instability control in inhomogeneous nonlinear Schrödinger equation with two-photon absorption

S Saravana Veni, MS Mani Rajan, Conrad Bertrand Tabi, Timoléon Crépin Kofané
Chaos, Solitons & Fractals Q1 IF: 5.7



Gd³⁺-induced phase modulation and luminescence enhancement in NaBiF₄: Sm³⁺ nanophosphors

Krishnendu Remadevi, Janani Krishnamoorthy, Shashank U Menon, Ramasubramanian Swaminathan
Materials Science and Engineering: B Q1 IF: 5.7

RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS

High Surface Area Graphitic Porous Carbon for Efficient and High-Energy Li-Ion and Na-Ion Capacitors

Shaji Jyothilakshmi, Sai Prem Shaji, P Krishna, Mani Ulaganathan, Yun-Sung Lee, Vanchiappan Aravindan
Advanced Sustainable Systems Q1 IF: 5.6



Multifunctional Copper-Doped $\text{Fe}_3\text{O}_4/\text{rGO}$ Hybrid: Toward Energy Storage, Water Splitting, and Hydrovoltaic Applications

Chinnadurai Lakshmi, Sreejith P Madhusudanan, Balraju Palanisamy, Dhayalan Velauthapillai, Sudip K Batabyal
Energy & Fuels Q1 IF: 5.3

Properties of dark matter admixed neutron star within relativistic mean field model

Tamanna Iqbal, Yashmitha Kumaran, A Bhagwat, BK Sharma
Physical Review D Q1 IF: 5.3



Electrochromic responses of short-range ordered vanadium pentoxide (V_2O_5) thin films prepared by laser ablation method

S Santhosh, K Balamurugan, M Mathankumar, AK Nandakumar, B Subramanian
Materials Chemistry and Physics Q1 IF: 5.2

Impact of self-interaction and photon interactions on solitonic structures in ultralight dark matter

Zayana, SaravanaVen
European Physical Journal C Q1 IF: 4.9



Reduced graphene oxide coated cotton fabric as flexible counter electrode for dye sensitized solar cell applications

K Surya Vinod, Raguram Thangavel, SR Reshma, KS Rajni, Venkatraman MR
Next Materials Q2 IF: 4.7

RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS

The multifunctional applications of $\text{Cu}_2\text{FeSnS}_4$: A deep dive into synthesis, defects, and device integrations

Sreejith P Madhusudanan, Deepalekshmi Ponnammam, Sudip K Batabyal

Materials Today Communications Q1 IF: 4.5



Silt Soil-Driven Hydrovoltaic Generators for Eco-Friendly and Scalable Energy Harvesting

Sujith Lal, Tung Pham, Byungil Hwang, Sudip K Batabyal

International Journal of Energy Research Q1 IF: 4.2

Shaping Micelles, Targeting Cancer: The Power of Block Copolymer Architectures

Seojin Park, Gayatri Patel, Bandana Padhan, Joyjyoti Das, Ramanujam Brahmadesam Thoopul Srinivasa Raghava, Madhumita Patel

Macromolecular Bioscience Q1 IF: 4.2



Zinc Oxide/Zinc Fluoride Nanocomposites With Groundnut Shell-Derived Activated Carbon Electrodes for Energy Storage Applications

K. S. Rajni Shruthi S., Vishnu Narayanan V., Pughal Selvi, Madeshwaran Mohanraj, Shyambhavi S.

Energy Storage Q2 IF: 4

Solution-processed kesterite $\text{Cu}_2\text{ZnSnS}_4$ back contact layer to enhance the hole collection and transport in CdTe solar cells

KS Rajni, Udai P Singh

Emergent Materials Q2 IF: 4



Graphene scaffolds entrapped polyacrylonitrile electrospun nanofibrous separator for aqueous zinc-ion storage application

Shanmugasundaram Lakshana, Mani Ulaganathan, Mani Karthega

Scientific Reports Q1 IF: 4.9

RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS



Investigations on New Zinc Triflate-Based Electrolyte Composition for Zn||MnO₂ Cell

Radhika Rajan, Athulya C Prakash, Mani Ulaganathan
Energy Technology Q2 IF: 3.6

Electrospun PCL nanofiber coating on H₂O₂-treated AZ61 magnesium alloy: an effective approach for coating adherence improvement and bio-functional orthopedic application

Silpa Cheriyan, M Karthega

Journal of Coatings Technology and Research Q2 IF: 3.4



A Novel Lead-Free Perovskite Cs₂CuBr₄/Cs₃Bi₂Br₉ Bulk Heterojunction as Self-Powered Photodetectors: Effect of Precursor Ratios on Photoresponse Behavior

Neethu Annie Santhosh, D R. Amrithesh, Ashna K Pramod, Parthasarathy Srinivasan, Sudip K Batabyal
Advanced Engineering Materials Q2 IF: 3.3

Development of CuO/rGO nanocomposite back-contact layer for CdTe solar cells

V Vishnu Narayanan, SR Vishnu Vijay, CP Aiswarya, Meghna Pavithran, KS Rajni, Udai P Singh

Journal of Materials Science: Materials in Electronics
Q2 IF: 3.2



Effect of Se on α-Bi₂O₃ microspheres as a negative electrode in an asymmetric aqueous supercapacitor

Chandrasekaran Nivetha, S Harikrishnan, Madeshwaran Mohanraj, GN Kumaraswamy, Abhilash Ravikumar, Mani Ulaganathan

Journal of Physics D: Applied Physics Q1 IF: 3.2

Enhancing Cu₂O nanoparticle stability with curcumin: a promising photocathode material for dye-sensitised solar cells

Unniyarcha KK, S Saravana Kumar, P Kathirvel, Lakshmi Mohan

Applied Physics A Materials Science & Processing Q2 IF: 3



RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS



Boswellic Acid Derivatives: A Traditional and Multifunctional Therapeutic Agent for Infectious and Non-Infectious Diseases–A Comprehensive Review

Aiswarya Kollamparambil Raj, Kamalam Sambasivam Rajni, Nanjan Pandurangan

Chemistry & Biodiversity Q2 IF: 2.9

Influence of helicoidal spin-orbit coupling and Rabi coupling in dynamics of 2D Bose–Einstein condensates

Sai Satyaprakash Biswal, S Saravana Veni

European Physical Journal Plus Q2 IF: 2.9



Hydrothermally synthesized Ni–Co–Cu–O Micro-flakes as high-performance symmetric supercapacitor electrodes

D Pughal Selvi, KS Rajni, Raguram Thangavel, S Sriram, Francisco Herrera Diaz

Materials Letters Q2 IF: 2.6

Toroidal confinement and beyond: Vorticity-defined morphologies of dipolar quantum droplets

S Sanjay, S Saravana Veni, Boris A Malomed

Physical Review E Q1 IF: 2.5



Characterizing noise effects on multipartite entanglement via phase-space visualization

B Nithya Priya, S Saravana Veni, Araceli Venegas-Gomez, Ria Rushin Joseph

Quantum Information Processing Q2 IF: 2.2

Crafting Brilliance: The Artistry and Legacy of Adakkaputhur Intermetallic γ -Bronze Mirrors (Cu₄₁Sn₁₁)

VK Mahesh, MP Krishnakumar, KM Sreedhar, KM Sreekanth, G Sivasubramanian

Archaeometry Q1 IF: 1.4



RECENT PUBLICATIONS

DEPARTMENT OF PHYSICS

Sustainable Recovery of Graphite from Dead Li-Ion Cells as a Next-Generation Dual Anion Intercalated Cathode for Zn-Ion Cells

Athulya C Prakash, Rajan Radhika, Mani Ulaganathan
ACS Sustainable Resource Management Q3



Photon envelopes and rogue waves: Exploring SPM and XPM effects in fiber media

S Saravana Veni, S Sanjay, Conrad Bertrand Tabi, Timoléon Crépin Kofané
Optik

Conference Proceedings

Dual-mode Mn-and Sn-Silica composites from millet husk: Photoreduction of Cr (VI) and sulphanimide, adsorptive capture of basic fuchsin

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Inventors: N Pandurangan, Sunil Kumar Deevi, Prasanna Ramani

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Machine Learning-Based Analysis of Multi-Source Network Packet Captures

Kirubavathi G., M. A. Niranjani Nair, Sreedhanu Surendran, Sanjana S.

2026 IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI 2026)

IEEE Conference Proceedings



TabNet-Driven Efficient DDoS Detection for High-Dimensional Network Traffic

G. Kirubavathi, B. Kesav and V. Radhakrishnan

Proceedings of the 2026 IEEE International Conference for Convergence in Computing Technology (I3CTCON 2026)



Assessing the Impact of Feature Dimensionality on IoT Intrusion Detection

M. Thilaga, Kirubavathi G., Anagha P., Venkateswaran Radhakrishnan, Lakshmi Narayanan Padmanaban

International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET 2026)



RECENT PUBLICATIONS

DEPARTMENT OF MATHEMATICS



Cross-Dataset Binary and Ordinal Diabetic Retinopathy Classification with Deep Learning and Statistical Evaluation

Presitha M., Somasundaram K.

11th International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET 2026)

Graph Neural Network Based Skin Lesion Classification

Somasundaram K., Moorthi S., Thangavel Senthil Kumar

11th International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET 2026)



AI-Driven Framework for Automated Cyberbullying Detection Using Severity-Aware Behavioral Modeling, Temporal Consistency, and Social Network Analysis

Venkateswaran Radhakrishnan, Sarath Sriram A., Akash S., Kirubavathi G.

Proceedings of the 2026 International Conference on Recent Advancement in Electrical, Computer and Communication Technologies (IECCT 2026)

AI-Driven Self-Supervised Transformer Framework for Explainable and Early Insider Threat Detection

V. Radhakrishnan, D. P., S. H. Varthini, Kirubavathi G.

Proceedings of the 2026 International Conference on Recent Advancement in Electrical, Computer and Communication Technologies (IECCT 2026)



RECENT PUBLICATIONS

DEPARTMENT OF MATHEMATICS

Book chapters

Diagnosis of Alzheimer's Disease Using Machine Learning and Deep Learning: A Study

Ravichandran K.S., Reshma B.

Communications in Computer and Information Science (CCIS), Vol. 2534, pp. 285–296 (2026).



A Comprehensive Analysis of Computer-Aided Techniques: The Future of Gastric Cancer Diagnosis

Ravichandran K.S., Aarth S.P.

Communications in Computer and Information Science (CCIS), Vol. 2534, pp. 273–284 (2026).

Intelligent Detection of Physical Activity and Functional Fitness Level Using Smartphone Sensors by Deep Learning Techniques

Kirubavathi G., Anne W. Regis, U.K. Sridevi

Medical Internet of Things, 1st Edition (2026).



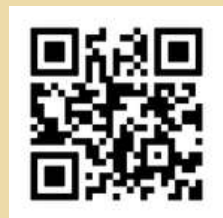
RECENT PUBLICATIONS

DEPARTMENT OF FOOD SCIENCE

Green extraction of RuBisCO-rich leaf protein for sustainable food systems: process efficiency, functional quality, and sustainability assessment

Hari Krishnan, L Banupriya, Mukesh Dubey, Jancirani Ramaswamy, Ilaiyaraja Nallamuthu, Baojun Xu, Chagam Koteswara Reddy, Mukul Kumar

Food Chemistry Q1 IF: 9.8



Sustainable preservation of cakes: A critical review of protein-polysaccharide edible films, nanotechnology integration and commercial barriers

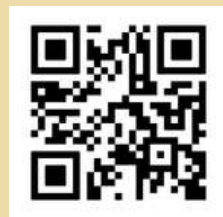
Priyanka Saha, Prashant Anil Pawase, Omar Bashir, Gholamreza Abdi, Hari Krishnan, L Banupriya

Applied Food Research Q1IF: 6.2

Processing-induced modulation of nutraceutical and anti-nutritional profiles of beetroot variants targeting enhanced iron retention

Athira Mundassery, Jancirani Ramaswamy, Kiruba Krishnaswamy, Dr.Meera Balachandran, Dr. Sivasabari Kathirvel, Prema Nedungadi

Scientific reports, Q1 IF: 3.9



Nutraceutical applications of agricultural by-products in 3D food printing: Potential in enhancing neurocognitive health

Nathanias Solomon, Tharanidevi Natarajan, Jancirani Ramaswamy, Abikaysavee Vel Paandian Lakshmi

Journal of the Science of Food and Agriculture Q1 IF: 3.5

Pumpkin Seeds, Oil, and Flour in Functional Foods: Effects of Processing on Composition, Techno-Functional Performance, and Therapeutic Aspects

Mukul Kumar, Deepika Kaushik, Marios C. Christodoulou, Vishal Kumar, Hari Krishnan

Journal of Food Process Engineering Q2 IF: 2.9



RECENT PUBLICATIONS

DEPARTMENT OF FOOD SCIENCE

Book chapter



Introduction to Nutrigenomics and Food Science

Book Name: Nutrigenomics and Food Science: Revolutionizing Personalized Nutrition

Pooja Pradeep, Indumathi Mullaiselvan, Priyadarshini Ravivarma, Haripriya Ravikumar, Vignesh Duraisamy, Nivetha Elangovan

Conference Proceedings

Digital Technologies in Diagnosing Maternal and Child Nutrition Deficiencies for Improved Health Outcome

Soorya Haridas, Dr P R Janci Rani, Dr Vidhya Balasubramanian, Dr N M Dhanya, Dr Tharanidevi Natarajan

2025 Gender and Technology Conference, GTC 2025



Non-Invasive Analysis of Chilli Powder Adulterant

Shilpa Jayakrishnan, Dr. Supriya P, Dr. Haripriya Ravikumar

2025 Control Instrumentation System Conference (CISCON), IEEE

Patents Published

Application of Kappaphycus Alvarezii Derived seaweed salt in curing of fish

Inventors: Deepthi R, Haripriya Ravikumar, Parvathy Prajith, Shreya P Sarathy

Patent Application Number: 202641064289

Status: Published

Development and characterization of Bio-film from palashgum (Butea Monosperma)

Inventors: Visali A S, Haripriya Ravikumar, Sharmila Shree

Patent Application Number: 202641072086

Status: Published

Development and characterization of Bio-film from Neem Gum

Inventors: Visali A S, Haripriya Ravikumar, Sharmila Shree

Patent Application Number: 202641072086

Status: Published

Invited Talks & Worksops

PHYSICS

A TALK ON TEM!



Prof. Sankaran S., Indian Institute of Technology Madras, delivered an insightful talk on “Transmission Electron Microscopy: Basics to Applications.” The session introduced the fundamental principles of transmission electron microscopy (TEM), covering instrumentation, sample preparation, and advanced imaging techniques. He also highlighted the wide-ranging applications of TEM in materials science, nanotechnology, and energy materials, emphasizing its role in elucidating structure–property relationships at the atomic scale.

EXPLORING SPACE TECHNOLOGIES!

Prof. Umesh R. Kadhane, Professor & Associate Dean, IIST, and Deputy Project Director, ISRO–LPSC, delivered a technical talk on high-thrust electric propulsion systems, materials development, space qualification, and advanced instrumentation on 31 January 2026. The lecture highlighted recent advancements in electric propulsion technologies, materials for space applications, and qualification processes for space missions, providing valuable insights into emerging trends in space research and engineering.



INTO THE QUANTUM REALM!



Dr. Uma Divakaran, IIT Palakkad, and **Dr. Ashok Kumar, IIST Thiruvananthapuram**, conducted a One-Day Workshop on Quantum Computation & Quantum Technology on 23 February 2026. The workshop introduced participants to the fundamental principles of quantum computing, quantum information processing, and emerging quantum technologies, while highlighting their applications in computation, communication, and future technological advancements. The interactive sessions provided valuable exposure to one of the fastest-growing areas of modern science and technology.

Invited Talks & Worksops

MATHEMATICS

OPTIMAL CONTROL MEETS ARTIFICIAL NEURAL NETWORKS !



Dr. P. Balasubramaniam, Professor, Department of Mathematics, Gandhigram Rural Institute (Deemed to be University), Gandhigram, delivered an expert lecture on “Solving PDE-constrained Optimal Control Problems using ANNs” to Research Scholars and M.Sc. Mathematics students on 22 September 2025 at Sandeepani Hall, AB-II. The lecture introduced participants to the fundamentals of partial differential equation (PDE)-constrained optimization and demonstrated how Artificial Neural Networks (ANNs) can be employed to solve complex optimal control problems efficiently. The session highlighted recent advances, practical applications, and computational approaches, providing valuable insights into the integration of machine learning with mathematical optimization and scientific computing.

BUILDING FUTURE PROFESSIONALS !



Mr. John Emmanuel, Tamil Nadu State Head, Wiz Klub, Bengaluru, delivered an expert lecture on “Soft Skill Training for Professional Development” to fourth-year M.Sc. Data Science students on 25th February 2026 at Acharya Hall. The session focused on enhancing essential professional competencies, including effective communication, leadership, teamwork, critical thinking, problem-solving, and interview skills. Participants also gained practical insights into workplace etiquette, career readiness, and strategies for personal and professional growth. Through interactive discussions and real-world examples, the lecture equipped students with the confidence and interpersonal skills required to excel in today's competitive professional environment.

Invited Talks & Worksops

FOOD SCIENCE



The Department of Food Science and Nutrition organized an invited talk on “Plant-Based Foods – Building Sustainable Food Entrepreneurship” on 30th January 2026 at Sandeepani Hall (AB2), Amrita Vishwa Vidyapeetham, Coimbatore. The session was delivered by Ms. Harini Rangarajan, Chief Operating Officer of Nutrigenetics Life Science Private Limited, who shared her entrepreneurial journey and highlighted opportunities in plant-based food innovation and sustainable food entrepreneurship. She discussed the key stages of building a startup, challenges faced by entrepreneurs, and government funding and incubation support available through agencies such as BIRAC and DBT. The session also featured her flagship plant-based egg alternative as a successful example of innovation in the food sector. She emphasized the importance of innovation, sustainability, and consumer acceptance in developing successful plant-based food products. The interactive session also provided participants with practical insights into translating research ideas into commercially viable products. Attended by undergraduate students, Ph.D. scholars, faculty, and staff, the session encouraged participants to explore entrepreneurship, innovation, and sustainable food product development.

DISTINGUISHED ALUMNI



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- Nanyang Technological University
- Norway University of Applied Sciences
- National University of Singapore
- Hanoi University of Science
- CNR, Catania, Italy
- University of Milan, Italy
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- Indian Institute of Technology (IIT), Palakkad
- Indian Institute of Management (IIM), Bodh Gaya
- Defence Research and Development Organisation (DRDO), India
- CSIR – National Aerospace Laboratories (CSIR-NAL), Bengaluru

VIGNANAMRITAM

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