

# Horizon

## Quarterly Newsletter

Volume 2, Issue 3

(July to September 2023)



**School of Basic Sciences** 

**College of Engineering and Technology SRM Institute of Science and Technology** 

Kattankulathur - 603 203, Chengalpattu District

Tamil Nadu, India









(2024) World Ranking one among 45 Indian Universities







ID (2022) World Ranking
Globally one among 14 Indian Universities

SHANGHAI

# Message from the Dean Sciences



Dr. D. John Thiruvadigal
Professor and Dean Sciences
School of Applied Sciences
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur 603 203

I am very happy to see that the fourth issue of the newsletter "Horizon" is being released. I take this opportunity to thank the entire faculty and the coordinators of various assignments for their dedication and hard work in preparing the necessary documents for the NAAC accreditation of the SRM Institute of Science and Technology.

I extend my hearty thanks, appreciations and congratulations to the faculty and scholars for their accomplishments in publishing the high impact journals, publishing patents and securing the funds for carrying out research during the period July 2023 to September 2023. I take this opportunity to welcome the newly recruited faculty of research track to the school of Basic Sciences. I certainly feel that the new faculty will take the onus in strengthening the research ecosystem of the departments.

My hearty congratulations to the editorial team of the newsletter "Horizon".

**Cover page theme:** Recognition of carbohydrates which play vital roles in cellular and pathological processes, using metal-ligand assemblies and highlight the challenges and future directions in the field

(D. John Thiruvadigal)

### Message from the HoD, Chemistry



Dr. M. Arthanareeswari
Professor and Head (Admin.)
Department of Chemistry
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur 603 203

It's our great pleasure to summarize our teaching and research accomplishments for the **Horizon** (volume 2, issue 3).

We are overwhelmed to share that our Prof. Dr. B. Neppolian (Dean Research) has received a prestigious SPARC project for a total outlay of Rs. 74.92 Lakhs during 2023-2025. It is also a great pleasure to share that four of our young faculty members (Dr. S. Karthikeyan, Dr. Abhijit Saha, Dr. Dipankar Das and Dr.Rahul Narayanan) have received SERB funded SRG projects with a total of Rs. 1.05 Crores during 2023-2025. In addition, Dr. M. Prakash has received Quantum computing-QCAL project Sanctioned by MeitY to a tune of Rs. 26.63 Lakhs, for the duration of 2023-2025.

During the campus placement, two of our M.Sc. Chemistry students got placed in Zifo R&D Solutions. Moreover four PhD s were awarded during this period.

Our Research Scholar Ms. G. Abigail Jennifer received "Mitacs Globalink Research Award" for a tune of \$6000 which will allow her to visit University of Manitoba, Canada for 6 months as an intern. Another Research scholar Mr. J. Premkumar has received Taiwan's NSTC, International Internship Pilot program, for a period of three months with a fellowship 90,000 NTD for his stay.

Our Department is actively involved in inviting various eminent scientists from India and abroad through Chemistry association Event. Up to 9 technical talks were organized, where Master students actively involved and benefited the most.

Our faculty member Dr. Rahul Narayanan organized a two day Astons Workshop on Mass spectrometry. This enabled the participants to learn the basic Instrumentation and applications. They also got a great opportunity to visit Prof. Pradeep's Laboratory at IIT- Madras.

Our active involvement in research lead to 81 high impact publications with an average impact factor of 5.8, with 6 nature indexed journals.

# Message from the HoD, Mathematics



Dr. V. Subburayan

Associate Professor and Head In-Charge
Department of Mathematics
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur 603 203

The department of mathematics is elated in the release of the third Issue (Volume II) of our newsletter "Horizon". It is indeed a proud moment to share the achievements of all our students and faculties. We are happy to announce the publication of the research articles presented in the "3rd International Conference on Mathematical Techniques and Applications (e-ICMTA-2022)" in

September 2023 as Issue 1, Volume 2852, by AIP Conference Proceedings. The department congratulates all rank performers for the academic year 2022-23 and to all the placement.

Congratulations to all the students who got recruited. Some of our research scholars have been offered Assistant Professor positions across the country. Students visit to Fluid dynamics laboratory at Department of Aerospace Engineering, SRMIST, was a validating initiative to expand the boundaries of research across various disciplines. A hearty welcome to all newly joined faculty members. I express my sincere gratitude to the members of the department for their dedication and contribution.

# Message from the HoD, Physics & Nanotechnology



Dr. A. Karthigeyan

Professor and Head In-Charge

Department of Physics

and Nanotechnology

College of Engineering and Technology

SRM Institute of Science and Technology

I would like to start by welcoming newly joined faculty members Dr Alladi Hemanth Kumar, Dr. Ashutosh Kumar and Dr. Vijith Kalathingal and wishing them success. Our appreciations are due to the faculty members who have attracted external fundings and published in Nature indexed journals as well as journals with impact factor greater than 10 in this quarter. It is important to give special appreciation to Snehidha Irudayaraj, student from II MScphysics for participating in different events with a lot of effort and enthusiasm bringing proud moments to the department. Let us keep up our spirit high and achieve the set target for this academic year.

### **Editorial Team**

Dr. D. John Thiruvadigal
Dean Sciences

Prof. M. Arthanareeswari

Head, Department of Chemistry Prof. V. Subburayan

Head, Department of Mathematics Prof. A. Karthigeyan

Head, Department of Physics and Nanotechnology

Dr. K. Ananthanarayanan

Research Associate Professor Department of Chemistry Dr. K. K. R. Datta

Research Associate Professor Department of Chemistry

Dr. A. Anuradha

Assistant Professor Department of Mathematics Dr. E. Suresh

Assistant Professor Department of Mathematics

Dr. T.V. Lakshmi Kumar

Research Associate Professor Department of Physics and Nanotechnology Dr. S. Venkataprasad Bhat

Research Professor Department of Physics and Nanotechnology

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### From the Editors Desk

Dear Readers,

Greetings!

We take pleasure in announcing the release of the Volume 2, Issue 3 of HORIZON, the quarterly newsletter of school of Basic Sciences that showcases the activities and achievements of our students and faculty members in the last three months (July 2023 – September 2023).

The issue spotlights the breadth and depth of the contribution of students and faculty members towards teaching, research and consultancy which makes the school of basic sciences special. The issue also highlights the numerous accomplishments by the members of the school in research article publication, acquiring grants and fellowship, patenting and alumni activities.

We invite all the readers' inputs for the betterment of the newsletter. Please write to us at dean.sciences.ktr@srmist.edu.in

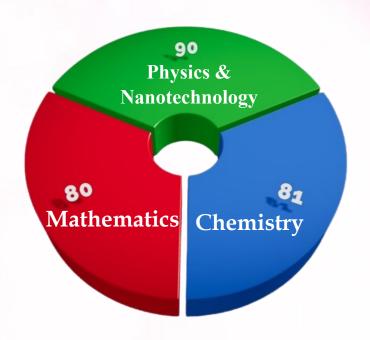
Please enjoy reading our newsletter!!

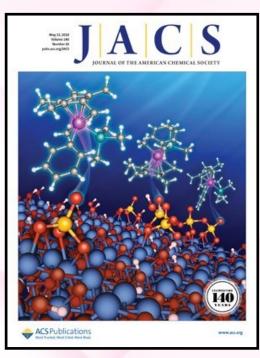
# Highlights School of Basic Sciences

Key Metrics	April to June	July to September
Total No. of publications (SCI/Scopus)	183	251
Highest Impact Factor Journal		
Publication	17.9	15.0
No of projects sanctioned	1	10
Total grant outlay	45 Lakhs	349.22 Lakhs
No of patents filed / granted	3	1
No of book chapters	7	6
MoUs (International / National)	-/	2
Number of Ph.D's completed	20	30

### **Total number of research publications:**

(July to September 2023)





(Impact factor: 15.0)

### **Academics - Chemistry**

QS world ranking 501 - 550 by subject
Asian university ranking 351 - 400, 9<sup>th</sup> position among Indian universities and 2<sup>nd</sup> under the private institutes.

### Awards / recognitions / honors received: Student Achievements

The following students got selected in Zifo RnD Solutions.



Kavinkumar S (RA2232008010017), II M.Sc.Chemistry



Harish Kumar L (RA2232008010035) II M.Sc.Chemistry

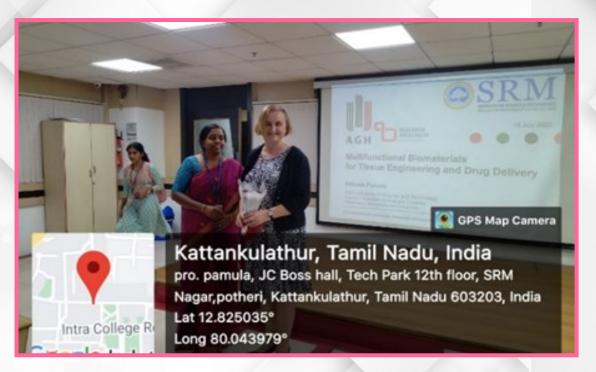


**Mr. J. Premkumar** (Reg. No. RC2133003011022) Research Scholar, 2021 batch received International Internship Pilot program to Taiwan under Dr Yuan-Yao Li at Department of Chemical Engineering, National Chung Cheng University, Taiwan. As the Internship is scheduled for the duration on 1.9.2023 – 30.11.2023 (3 months).

#### CHEMISTRY ASSOCIATION EVENT'



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on **"Biomimetic Processes Utilizing Functional Molecular Switches"** under the ``CHEMISTRY ASSOCIATION EVENT`` on 12<sup>th</sup> July 2023. The speaker of the event is **Dr. Susnata Pramanik**, Assistant Professor, Department of Chemistry, SRMIST



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on **Multifunctional biomaterials for tissue engineering and drug delivery**" and "Calcium phosphate bone implant materials" under the "CHEMISTRY ASSOCIATION EVENT" on 19<sup>th</sup> July 2023. The speakers of the event are Professor **Elżbieta Pamuła**, Faculty of Materials Science and Ceramics, AGH University of Science and Technology (AGH), Kraków, Poland and **Professor Aneta Zima**, Faculty of Materials Science and Ceramics, AGH University of Science and Technology, Kraków, Poland.



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "Surfactants in & as Ionic Liquids" under the "CHEMISTRY ASSOCIATION EVENT" on 26<sup>th</sup> July 2023. The speaker of the event is Dr. Srinivasarao Kancharla, Assistant Professor, Department of Chemistry, SRMIST.



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "Energy Conversion and Storage through the Chemical Route: State of the art" under the ``CHEMISTRY ASSOCIATION EVENT`` on 4th August 2023. The speaker of the event is **Dr. Babasaheb R Sankapal,** Professor and Former Head, Department of Physics, Visvesvaraya National Institute of Technology, (VNIT), Nagpur



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "Integrated layered oxides as cathode materials for Li-ion batteries" under the ``CHEMISTRY ASSOCIATION EVENT`` on 9<sup>th</sup> August 2023. The speaker of the event is **Dr. Prasant Kumar Nayak,** Research Assistant Professor, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur



Department of Chemistry, SRM IST, Kattankulathur campus organized a guest lecture on **``Nanomaterials for Printed Electronics`** under the **``CHEMISTRY ASSOCIATION EVENT``** on 23<sup>rd</sup> August 2023. The speaker of the event is **Dr. Priyanka Ganguly**, Lecturer (Assistant Professor), Chemical and Pharmaceutical Sciences, London Metropolitan University, London, UK



Department of Chemistry, SRM IST, Kattankulathur campus organized a Aston's Workshop – 2023 On Mass Spectrometry, Instrumentation and Applications 25-26th August – 2023. Aston's workshop is a two-day interactive and hands-on program focusing on mass spectrometry, instrumentation and applications. About mass spectrometry – Mass spectrometry is a sophisticated analytical tool used for sample analysis at very low concentration. This highly sensitive technique gives both qualitative and quantitative information about a sample.



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "10+ years of chasing better efficiency in H<sub>2</sub> production through water-splitting electrolysis!" under the ``CHEMISTRY ASSOCIATION EVENT`` on 30<sup>th</sup> August 2023. The speaker of the event is Dr. Anantharaj Sengeni, Research Assistant Professor, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India.



Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "Innovation Management" under the ``CHEMISTRY ASSOCIATION EVENT`` on 14<sup>th</sup> September 2023. The speaker of the event is **Dr. Immanuel Selvaraj** Founder Director, i - EL Technologies, Bangalore, and Karnataka, India



**Awareness campaign on Prevention of Sexual Harassment :** 22<sup>nd</sup> of September, 2023 at 2.30 pm in Faraday Hall, ES block, 2nd floor, Main campus.



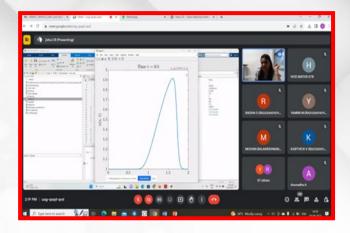
Department of Chemistry, SRM IST, Kattankulathur campus organized a lecture on "Advanced porous materials for mobility solutions" under the ``CHEMISTRY ASSOCIATION EVENT`` on 30<sup>th</sup> August 2023. The speaker of the event is **Dr. Tanay Kundu**, Assistant Professor, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India.

### **Academics - Mathematics**





A two-day event of nurturing the mathematics students on applications of mathematics by visiting a mathematics-based engineering lab was organized on 12<sup>th</sup> and 13<sup>th</sup> September 2023. UG/PG students and some Research scholars visited the Fluid Dynamics Lab of the Department of Aerospace Engineering, SRMIST. From observing intricate flow patterns to understanding the practical applications of fluid dynamics in various industries, it was an eye-opening experience to all participants.



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The July event [dated 21.07.2023] of Research Colloquium witnessed the talk entitled "On the detection of singularities using wavelets and shearlets: theory and numerics" by Dr. Swaraj Paul, Research Assistant Professor, Department of Mathematics, SRMIST.

### **Student Achievements**



**Dr. Hemanta Mandal,** [PhD – 2023] has been offered the post of Assistant Professor at C V Raman Global University, Odisha.

**Dr. M. Saraswathy,** Ph.D Research Scholar has been offered the post of Assistant Professor at SRMIST, Ramapuram, Chennai.



Mr. V. Saravanan, Ph.D., Research Scholar has been offered the post of Assistant Professor at SRMIST, Ramapuram, Chennai..

Ms. Dharmika chowdary, II M.Sc., Mathematics student has been accepted to do her Master of Science Program @ University of Cinciannati, Ohio, USA.

### **Placement Details**

Congratulations to all the students who are placed in the recent placement drive organized by SRMIST.

		100	
Register Number	Name of the Student	Programme	Company placed
RA2232005010016	PAVITHRA M	M.Sc., Maths	Zifo R&D
RA2232005010020	PRAVEENKUMAR R	M.Sc., Maths	Zifo R&D
RA2232005010022	REKHA R	M.Sc., Maths	Wayspire Ed-Tech Pvt Ltd.
RA2232005010010	VIVEGAA M V	M.Sc., Maths	Wayspire Ed-Tech Pvt Ltd.
RA2232005010001	HARSHINI VHALLI S	M.Sc., Maths	Wayspire Ed-Tech Pvt Ltd.
RA2232005010012	ASHVITHA C	M.Sc., Maths	Wayspire Ed-Tech Pvt Ltd.

### **Academics - Physics and Nanotechnology**



ACCMS-Global Research Center, SRMIST, Chennai India; Webinar #20 by Prof. Puru Jena, Department of Physics, Virginia Commonwealth University, Richmond, VA, USA on 29 August 2023, 5.30 – 7.00 pm.



2<sup>nd</sup> International Conference on the Asian Summer Monsoon Anticyclone (ASMA-2023), 11-13 September 2023 jointly organized by the Scheme for Promotion of Academic and Research Collaboration (SPARC), Govt of India, and the SRM Institute of Science and Technology (SRMIST) in association with Hokkaido University, Japan and University of Saskatchewan (USask), Canada at the Atmospheric Observation and Modelling Laboratory (AOML), Department of Physics and Nanotechnology.







Participants and resource persons at the **pre-conference lectures on the Asian Summer Monsoon Anticyclone** held in AOML, SRMIST Chennai, India, during 28 August -8 September 2023. Radiosonde launching training was also provided to the participants.

**Weekly Research Colloquium:** Sb2Se3 Based Substrate Configured Thin Film Solar Cell by Mr. M G Srinivasan; Research Scholar on 13/09/2023.

#### Value added courses:

- NTV 0604T: Entrepreneurship by Dr. C.Gopalakrishnan & Dr. Kiran Mangalapalli.
- UPY20V01J: Solar cells: Basics and Engineering by Prof. J K Rath (IIT Madras), Prof. S. Venkataprasad Bhat, Prof. P. Malar, Dr. Elangovan Elamurugu, Dr. Trilochan Sahoo.

### Research—Chemistry

Number of Journal publications: 81

Average Impact Factor: 5.8

Highest Impact Factor Journal published: 15.0

### Highest impact factor paper: (2)

Heyifei Fu, **Susnata Pramanik**, and Ivan Aprahamian. *Metal and Proton Relay-Controlled Hierarchical Multistep Switching Cascade*, **Journal of the American Chemical Society**, 145(36), 2023, 19554-19560. **(Impact factor = 15.0).** 

**Jayanta Samanta**, Miao Tang, Mingshi Zhang, Russell P. Hughes, Richard J. Staples, and Chenfeng Ke. *Tripodal Organic Cages with Unconventional CH···O Interactions for Perchlorate Remediation in Water*, **Journal of the American Chemical Society**, 2023, 145(40), 21723-21728. (Impact factor = 15.0).

### Nature indexed publications: (6)

Rajendra Kumar Konidena, Minlang Yang, and Takuma Yasuda. A  $\pi$ -extended tercarbazole-core multiresonance delayed fluorescence emitter exhibiting efficient narrowband yellow electroluminescence, **Chemical Communications**, 59, 2023, 10252-10254. (Impact factor = 4.9).

Heyifei Fu, **Susnata Pramanik**, and Ivan Aprahamian. Metal and Proton Relay-Controlled Hierarchical Multistep Switching Cascade, **Journal of the American Chemical Society**, 145(36), 2023, 19554-19560. (Impact factor = 15.0).

Pushbaraj Palani, Ajithkumar Arumugam, Dineshkumar Raja, Kesavan Muthu, and **Gopal Chandru Senadi.** Photoredox-Catalyzed 1,2-Oxo-Alkylation of Vinyl Arenes with 1,3-Diketones: An Approach to 1,4-Dicarbonyls via C -C Activation, **Chemical Communications**, 59, 2023, 11433-11436. (Impact factor = 4.9).

Sulakshana Shenoy, Chitiphon Chuaicham, Keiko Sasaki, Sungkyun Park, Muthuchamy Nallal, Kang Hyun Park, and **Karthikeyan Sekar.** Nitridation-free preparation of bimetallic oxide-nitride bifunctional electrocatalysts for overall water splitting, **Chemical Communications**, **59**, 2023, 12451-12454. (Impact factor = **4.9**).

Sengeni Anantharaj, Mochen Li, Roshini Arulraj, Karthik Eswaran, Sara Fidha C. M, Rajini Murugesan, Arthanareeswari Maruthapillai, and Suguru Noda. A tri-functional self-supported electrocatalyst featuring mostly NiTeO3 perovskite for H2 production via methanol—water co-electrolysis, Chemical Communications, 2023, 59, 12755-12758. (Impact factor = 4.9).

**Jayanta Samanta,** Miao Tang, Mingshi Zhang, Russell P. Hughes, Richard J. Staples, and Chenfeng Ke. Tripodal Organic Cages with Unconventional CH···O Interactions for Perchlorate Remediation in Water, **Journal of the American Chemical Society**, 2023, 145(40), 21723-21728. (Impact factor = 15.0).

MoU signed between SRMIST and UPEC (France).

Total number of Ph.D. completed: 4

**Total number of Book Chapters:** 5

### Research Projects: 6

Total lay out of the abovementioned projects: 204.74 lakhs INR

S.No	S.No Name of the PI Title of the project  1. Dr. B. Neppolian Solar Light Driven Highly Efficient Production of Hydrogen Using Photocatalysis		Agency/ Sanction File No.	Grant Amount (in lakhs)	Period of support	
1.			Scheme for Promotion of Academic and Research Collaboration (SPARC) SPARC/2019-2020/ P2197/SL	74.92 Lakhs	2023-25	
2.	Dr. M. Prakash	The Investigation of Anticancer Drugs for Triple- negative Breast Cancer(TNBC) by QM,QM/MM,and Molecular Dynamics Simulations Guided Virtual Screening	QCAL MeitY	26.63 lakhs	2023-25	
3.	Dr. S. Karthikeyan	Photoconversion of CO <sub>2</sub> into Fuels with Advanced Graphitic Carbon Nitride   Multimetalox- ide Heterostructures	SRG/2023/000658	29.17 lakhs	2023-25	
4.	Dr. Abhijit Saha,	Investigating the effect of Om- pA-derived peptide molecules on actin cytoskeleton of BMEC and activation of PKC-α: An ap- proach to get peptide shuttle for brain drug delivery	SRG/2023/000554	30 lakhs	2023-25	
5.			SRG/2023/000970	27 lakhs	2023-25	
6.	Dr.Rahul Nara- yanan	Accelerated chemical synthesis in microdroplets	SRG/2023/001408	17.02 lakhs	2023-25	

### Awards:



Ms. G. Abigail Jennifer (Reg. No. RA2133003011045), PhD. Research Scholar of Dept. of Chemistry received an award "Mitacs Globalink Research Award for Research in Canada" during the period of 15<sup>th</sup> Sep. 2023 – 15<sup>th</sup> March 2024 with a grant of \$6000.00.



Jenson Samraj Jeyaprakash, Research scholar, Department of Chemistry was awarded with DST-Inspire fellowship for research students.

### Research—Mathematics

Number of Journal publications: 80

Average Impact Factor: 2.86

Highest Impact Factor Journal published: 8.7

### **Highest impact factor papers:**

G. Narayanan, M. Syed Ali, Young Hoon Joo, **R. Perumal**, Bashir Ahmad, and Hamed Alsulami, Robust Adaptive Fractional Sliding-Mode Controller Design for Mittag-Leffler Synchronization of Fractional-Order PMSG-Based Wind Turbine System, **IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS: SYSTEMS,** VOL. 53, NO. 12, 2023. 7646-7655. (Impact factor = 8.7).

**Nikita Naik,** R. Gayathri, **H. Behera**, Chia-Cheng Tsai, Wave power extraction by a dual OWC chambers over an undulated bottom, **Renewable Energy**, Volume 216, 2023, 119026, ISSN 0960-1481, https://doi.org/10.1016/j.renene.2023.119026. (Impact factor = 8.7).

### **Research Projects:**

Total number of new grants received: 1

Total outlay of the above mentioned project: 35.07 lakhs INR

S.No.	Name of the PI	Title of the project	Agency/ Sanction File No.	Grant Amount (in lakhs)	Period of support
1	Dr. Harekrushna Behera (Co-PI)	A comprehensive approach to the problem of spatial evolution of water waves by wind	MoES, Govt India / MoES/36/ OOIS/Extra	35.07	2023-26

#### Patents - Published: 1

Mr.S.Satheesh Kumar, **Dr. V. Muthukumaran**, Mrs. Radhika E.K, IoT-Driven Wireless Communication System of Wind-Induced Pressure Prediction on Tall Buildings for Smart City, Published Patent Number: 202341050824

Number of Ph.D. Completed: 9

**Total number of Book Chapters: 1** 

### Awards/ recognitions / honours received by Faculty & Students:

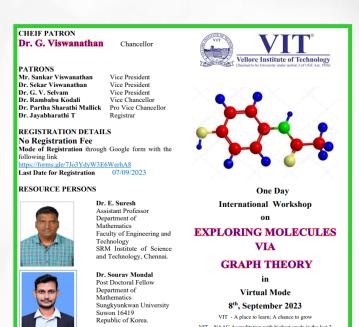
**Dr. R. Senthamarai** delivered an invited talk on "Steady state amperometric biosensor analysis by Taylor series method" at Sadakathullah Appa College, Tirunelveli on 27.09.2023.



**Dr. L. Shobana** delivered an invited talk on "Encrypting Numbers through Graphs" Women's Christian College, Chennai on 11.09.2023



**Dr. P. Godhandaraman** delivered an invited talk on "Power of Mathematics in Real World Problems", at ETAM-2023, Auxilium College, Vellore Campus On 01.09.2023



VIT - A place to learn; A chance to grow

VIT - NAAC Accreditation with highest grade in the last 3
consecutive cycles, the 9th best University, the 10th best research
institution and the 12th best engineering institution in India (NIRE
Ranking, Govt. of India), World rank 601 - 700 (Shanghai Ranking

**Dr. E. Suresh** delivered an invited talk on "On vertex based topological indices", at one day international workshop on Exploring Molecules Via Graph Theory, VIT University, Vellore Campus, 08.09.2023

**Dr. Sourav Mondal** delivered an invited talk on "Chemical graph theory and its applications", at one day international workshop on Exploring Molecules Via Graph Theory, VIT University, Vellore Campus, 08.09.2023

### Research—Physics and Nanotechnology

Number of Journal publications: 90

Average Impact Factor : 5.52

Highest Impact Factor Journal published : 15

### **Highest impact factor papers:**

Haining Zheng, Arup Ghosh, M. J. Swamynadhan, Gang Wang, Qihan Zhang, Xiao Wu, Ibrahim Abdelwahab, Walter P. D. Wong, Qing-Hua Xu, **Saurabh Ghosh**, Jingsheng Chen, Branton J. Campbell, Alessandro Stroppa, Junhao Lin, Ramanathan Mahendiran and Kian Ping Loh, "Electron Spin Decoherence Dynamics in Magnetic Manganese Hybrid Organic–Inorganic Crystals: The Effect of Lattice Dimensionality", Journal of American Chemical Society, 2023, 145, 33, 18549–18559. DOI:10.1021/jacs.3c05503 (Impact Factor = 15)

### Nature Indexed journal publications (2):

Haining Zheng, Arup Ghosh, M. J. Swamynadhan, Gang Wang, Qihan Zhang, Xiao Wu, Ibrahim Abdelwahab, Walter P. D. Wong, Qing-Hua Xu, **Saurabh Ghosh**, Jingsheng Chen, Branton J. Campbell, Alessandro Stroppa, Junhao Lin, Ramanathan Mahendiran and Kian Ping Loh, "Electron Spin Decoherence Dynamics in Magnetic Manganese Hybrid Organic–Inorganic Crystals: The Effect of Lattice Dimensionality", Journal of American Chemical Society, 2023, 145, 33, 18549–18559. DOI:10.1021/jacs.3c05503 (Impact Factor = 15)

**Debanjan Polley,** Akshay Pattabi, Ashwin Rastogi, Kaushalya Jhuria, Eva Diaz, Hanuman Singh, Aristide Lemaitre, Michel Hehn, Jon Gorchon, Jeffrey Bokor, "Picosecond spin-orbit torque—induced coherent magnetization switching in a ferromagnet" Science Advances, 9, eadh5562(2023), DOI: 10.1126/sciadv.adh5562 (Impact Factor = 13.16)

### **Research Projects:**

Total number of new grants received: 3

Total outlay of the above mentioned project: 114.41 lakhs INR

SI. N o.	Name of the PI	Title of the project	Agency/ Sanction File No.	Grant Amount (in lakhs)	Period of support
1	Dr.J.Archana	Development of hybird solar- thermoelectric generator by inter- acting dye sensitized solae cell with thermoelectric device for high performance energy applica- tions	CSIR-EMR	27.5	2023-26
2	Dr. Iyakutti K (co-PIs: Dr. A. Karthikeyan and Dr.VJ. Surya)	Design and fabrication of Nanostructured metal hydride based hydrogen storage material for portable, light-weight applica- tions.	ONRG-Office of Naval Research Global, United Kingdom	66	2023-25
3	Dr.G.Devanand Venkatasubbu	Fabrication of polymeric scaffold using layer by layer assembly for enhanced diabetic foot ulcer intervention	Department of Biotechnology (DBT), Govt. of India	20.91	2023-25

### Number of Ph.D. completed: 17

### **Memorandum Of Understanding:**

MoU with Shizuoka university, Japan - renewed in July 2023

### Awards/ recognitions / honours received by Faculty & Students:

- Dr. Sandeep Kumar Lakhera, Editorial board member, Green Biomaterials (Taylor and Francis).
- Dr. Kamala Bharathi, Editorial board member, Materials Research Bulletin (Elsevier).



• SNEHIDHA IRUDAYARAJ of II MSc-physics received achievers award on INDEPENDENCE DAY from IAS. Also bagged 1st Prize (Rs. 5000) in Open speech Competition on same day evening conducted by IUML (Indian Union Muslim League).

# Faculty Corner

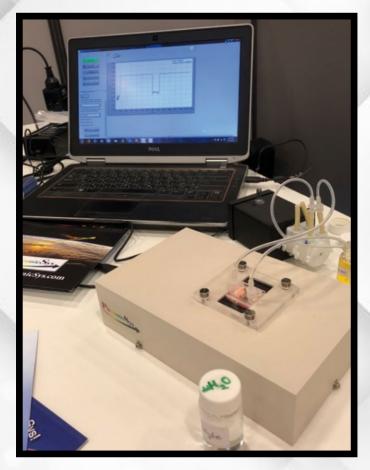
### ADVANCING EARLY DISEASE DIAGNOSIS WITH PLASMONIC RESONANCES: PAVING THE WAY FOR COMMERCIAL TRANSLATION



Early and accurate diagnosis of a disease and its causative pathogens is an important step toward appropriate intervention measures. Early detection of diseases, particularly chronic diseases, while they are asymptomatic, they necessitate specialized diagnostic testing. Traditional diagnostic techniques require excessive examination schedules and medical resources, and it is also inevitably costly. Nowadays a biosensor is a ubiquitous tool in biomedical diagnosis and is also an integral part of various areas such as point-of- care (POC) monitoring and treatment, environmental

monitoring, food control, drug discovery, and biomedical research.

Surface Plasmon Resonance (SPR) is an optical phenomenon that offers a non-invasive, label-free method for observing binding interactions between an analyte and biomolecules. Nylander and Liedberg's introduction of SPR for gas detection and biosensing has led to a growing interest in SPR-based biosensors. The target molecule is detected through the refractive index (RI) change that occurs near the sensing layer due to the presence of a new substance, namely, analyte molecules. This change in RI is discerned through alterations in the electromagnetic resonance of the evanescent wave. The properties of the Surface Plasmon Polariton (SPP) wave are highly responsive to the dielectric layers and any modifications in the sensor. To function, SPR sensors require a coupling mechanism. Initially, this was accomplished through prism coupling with the introduction of the Kretschmann configuration. Over time, this approach has evolved, and studies have explored other coupling mechanisms, such as optical fiber, waveguide, and grating-based sensors. Such type of sensors has shown a great advantage compared to the conventional ones including (i) real-time monitoring to uncover the binding dynamics for observing various biological interactions between biomolecules, (ii) labelfree detection, (iii) high reusability, (iv) short response time, and (v) simple sample treatments, along with the use of minimal electrical components. Today, several companies such as Biacore, PhotonicSys, Plasmetrix, and others are producing devices used to evaluate the performance of chip-based sensors for POC devices.



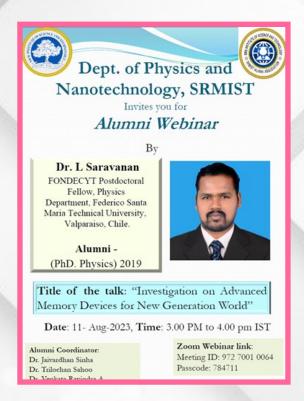
**Figure:** PhotonicSys SPR system H5 in operation under flow. The name H5 came from its height which is 5 cm. (Source: PhotonicSys Ltd.)

Biacore™ systems and consumables helps to generate information-rich affinity, kinetics, concentration, specificity, and comparability data in real-time. The high-quality data produced allows the better discriminate crucial differences in molecular interactions, from research to drug discovery and quality control (www.biacore.com). On the other hand, Photonicsys Ltd. presented its first miniature surface plasmon resonance (SPR) instrument and special substrates in BioX conference-Singapore. The device is less than 5cm height, weighs less 1kg and performs refractive index measurement accuracy down to 10<sup>-6</sup> equivalent to <pg/mm sq., can handle four channels simultaneously (www.photonicsys.com). It allows to the ability for portable clinical diagnosis device and can be used for in-house hospital diagnosis.

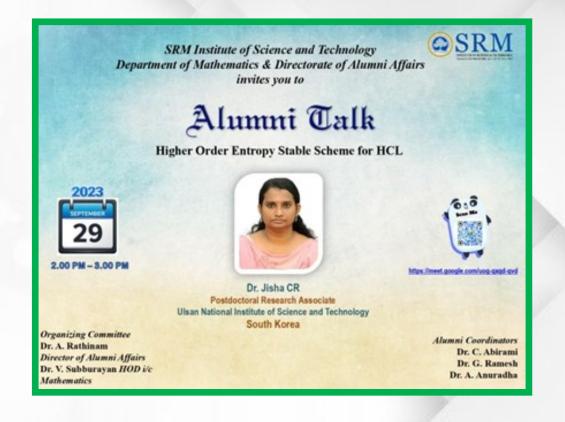
Ву

Dr. Anand M. Shrivastav, Research Assistant Professor, Department of Physics and Nanotechnology, SRMIST, Kattankulathur.

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**ICRAMC - 2024** FEBRUARY 15-17, 2024

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A bout the Department: Department of Chemistry, SRM IST has been engaged in opening up the fascinating world of Chemistry to students since 1985. The Department is supported by DST-FIST, Govt of India. The Department is offering B.S. (Chemistry), B.Sc. (Chemistry), M.Sc. (Chemistry), M.Sc. (Organic Chemistry) and Ph.D (Chemistry) programs. It has 55 faculty members whose areas of expertise and research include organic, inorganic, physical, analytical, environmental, electrochemistry and nanotechnology. The main objective of this conference is to provide platform for constructive ideas on recent trends and innovative approaches in efficient use of materials in the field of chemical sciences.

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#### **Important Dates**

Early Bird Registration : 31-12-2023 Acceptance of Abstract : 02-01-2024 Last Date for Abstract Submission : 31-12-2023 Submission of Full Paper : 31-01-2024 Last Date for Registration :31-01-2024

The conference will provide a good platform to find a suitable research collaborator in home and abroad. The brain storming session paves the way to submit joint research proposals for funding between India and rest of the world.

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#### Best presentations will be selected for the award.

All the accepted papers will be peer reviewed and the selected papers will be published in Scopus Indexed Journals

77.				
Category	Early Bird Registration for Indian Delegates (before 31-12-2023) (Fee INR)	Late Registration for Indian Delegates (After 31-12-2023) (Fee INR)	Early Bird Registration for Foreign Delegates (before 31-12-2023) (Fee USD)	Late Registration for Foreign Delegates (After 31-12-2023) (Fee USD)
Students / Research Scholars	4,000	5,000	250	300
Academic / R&D Participants	5,000	6,000	400	500
Industry	6,000	7,000	500	550

Registration fees shall be paid online transaction or by DD drawn in favour of "Chemistry Department Association" payable at Chennai must be sent to the convenor along with registration form.

Convener: Dr. M. Arthanareeswari, Prof. & Head, Department of Chemistry, SRMIST, Kattankulathur. Ph: 044-27417872

Mailing Address: Convener - ICRAMC 2024 ering and Technology, SRM IST

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### 5th International Conference on Mathematical Techniques and Applications (ICMTA-2024)

### **Workshop on Scientific Computing, Modeling and Deep Learning (WSCMDL)**

### 02-06 January, 2024

Organized by

**Department of Mathematics** 

SRM Institute of Science and Technology (SRM IST) Kattankulathur, Chengalpattu District, India

#### In association with

Indian Society for Mathematical Modeling and Computer Simulation (ISMMACS)

#### eme of the Conference

- Machine learning and Scientific applications
- Computational algorithm, Image processing Soft Computing, Optimization

- Stochastic differential equations,
  Mathematical modelling, Computational fluid dynamics
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- Controllability, Stability of differential equations. Inverse problem

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Dr. T. P. Ganesan Auditorium, Mini Hall-I SRM Institute of Science and Technology attankulathur, Chengalpattu District, India

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registration fee. For membership visit https://ismmacs.org.in/index.html

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Overseas

The availability of democratized computational power and rich advanced programming tools has led to the emergence of Scientifii machine learning (SciML) which entangles and harnesses the rich knowledge and tools from traditional scientific computing advanced machine learning. SciML has immensely improved the ability to solve and simulate mathematical models of complex problems in computational science and engineering. This fusion of scientific computing and machine learning synergistically propels. propers. It leads to the creation of novel algorithms and network models characterized by scalability, computational efficiency, domain-specific insight, interpretability, and robustness. This interdisciplinary event serves as a collaborative platform, facilitating the exchange of insight, interpretability, and robustness. This interdisciplinary event serves as a collaborative platform, facilitating the exchange of insights between budding applied mathematicians and engineers. The event delves into the realms of the pearing for modeling and simulation, scientific computing, and the reciprocal influence of scientific computing within the domain of deep learning. Additionally, it to tosters opportunities for the interchange of research concepts encompassing both theoretical and applied advancements in SciML and mathematical modeling computational techniques.

The workshop aims to cover classical as well as recent advances along with the future research directions in the machine learning for computational Mathematics and applications. It will also aims to cover some of deep learning frameworks for scientific computing computational maintenances and applications. It will also aims to cover some or deep learning frameworks for scients with hands-on code implementation. Some of the tentative focus topics are:

Physics Informed neural networks for solving nonlinear partial differential equations and some theoretical results.

Fourier neural operator and some theoretical results.

Classification and regression approach to learn polynomial reconstructions and its applications in PDEs.

Synthetic data generation and data processing for network training.

- Neural ODEs and applications for neural networks with skip connections
- Bayesian inference for scientific computing.

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uasis)
The life members of Indian Society for Mathematical Modeling and Computer Simulation (ISMMACS) will get 15% discount in the

The registration fee includes tea/coffee, working funch/dinner and conference kit and possible excursion trip.

Booking for paid accommodation in nearby hotels can be made on subsidized rate for outstation conference participants on

payment basis.

Outstation PhD and PDF participants can be given travel support as per government norm subject to the availability of funds.

It is advised that the participants bring their laptops for hands on practice on deep learning codes for the workshop, free wi-fi will

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\*Abstract is required for paper presentation in the control of th

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be provided.
Best paper and poster presentation will be given



































































































The Department of Physics and Nanotechnology, SRMIST is organizing a six days Faculty Development Program on "Modeling and Technology of Advanced Materials", from 27th November, 2023 to 2nd December, 2023.

**National Physicists Conclave 2024 (NPC 2024)** -being organized by Department of Physics and Nanotechnology from 06 - 10, February 2024.



https://npc2024.in/

https://tinyurl.com/NPC2024PosterFirstCall



#### International Conference on Advanced Functional Materials and Devices (AFMD -2024) Nanotechnology Feb 26 - 29, 2024 Research Centre Organized by Nanotechnology Research Centre (NRC) SRM Institute of Science & Technology, Kattankulathur - 603 203, Chennai, Tamil Nadu, India NRC Website: https://www.srmist.edu.in/research/research-wings/nrc/ In association with AFMD Website: https://afmdsrmist2024.in/ Université UNIVERSITI MALAYA **W**UTHM (DO/ST) **Gustave Eiffel** University of Gustave, Eiffel, Paris JEOL BioLogic National Cheng Kung University, Taiwan SPD Laboratory Inc., Japan IPGI instruments, India AFMD stands as a unique conference initiated by the Nanotechnology Research Centre (NRC) at SRMIST, with a specific emphasis on highlighting the latest breakthroughs in the realm of materials science research and nanotechnology. This conference extends invitation to researchers who are actively engaged in the fields of advanced materials, devices, and emerging topics in nanotechnology with an utilimate aim of catalyzing significant technological transformations. AFMD encourages the researchers to showcase their research findings among the diverse community of scientists, educators, industry professionals, and students through poster and oral presentations. AFMD-2024 is a collaborative effort with the association of premier institutions and organizations, including Shizuloka University, Japan; University of Paris cite, France; University of Montpellier, France; Nara Institute of Science and Technology, Japan; University of Gustave Eiffel, France; Daegu Gyeongbuk institute of Science & Technology, South Korez, Universiti Malaya, Malaysis Universiti Tun Husseri on, Malayasis Chievastitale, Latvia; Universitals Latvia; Universitals Andonasis, Indonesis; Japan Society of Applied Physics (JSAP): The Ceramic Society of Japan; Polish academy of science; National Cheng Kung University, Taiwan; FUJI Electronic Industrial Co., Ltd., Japan; SPD Laboratory Inc., Japan; JCRI Instruments; IGU Lefti and exacts consociations. IPGI Instruments; JEOL India Pvt Ltd; Biologic Instrument; in addition to various national and international societies and research organizations. Pref. Mode Khaini Ahmad, UTHM, Malaysia Pref. 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