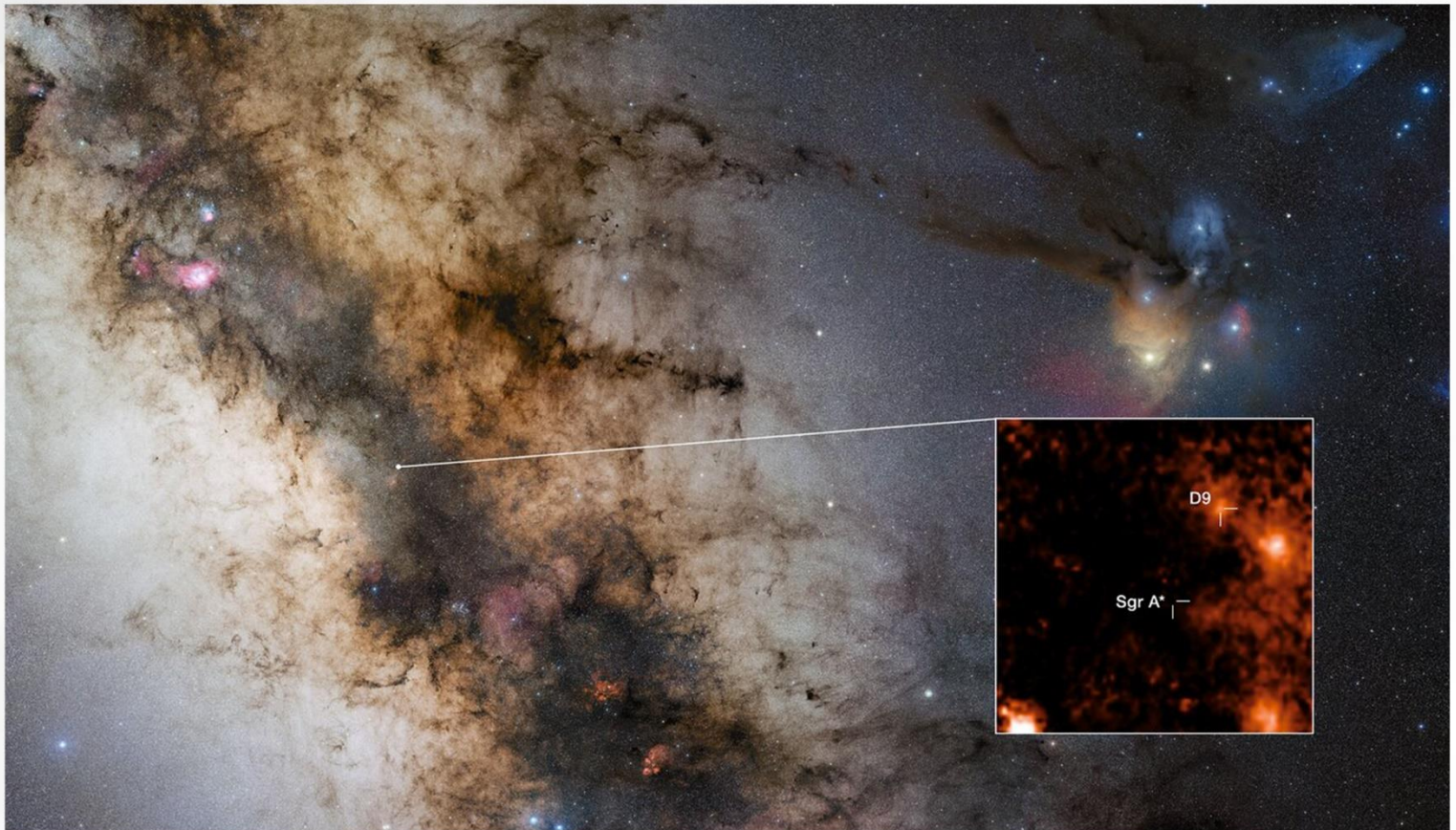


Department of Physics

the assayer

...the beautiful nature is
ruled by the laws of physics....



Two-day Hands-on Workshop in Material Analysis

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, hosted a two-day hands-on training program in material analysis for students from various colleges on January 30-31, 2025. This event was financially supported by the DST CURIE-PG project and saw participation of 23 postgraduate students across three colleges. The workshop commenced with an inauguration by Dr. Malini K A, Vice-Principal, Dean of Academics, and Professor in the Department of Physics. Dr. Veena Gopalan E, Assistant Professor, introduced the Department and Research Centre, emphasizing the consultancy services available.



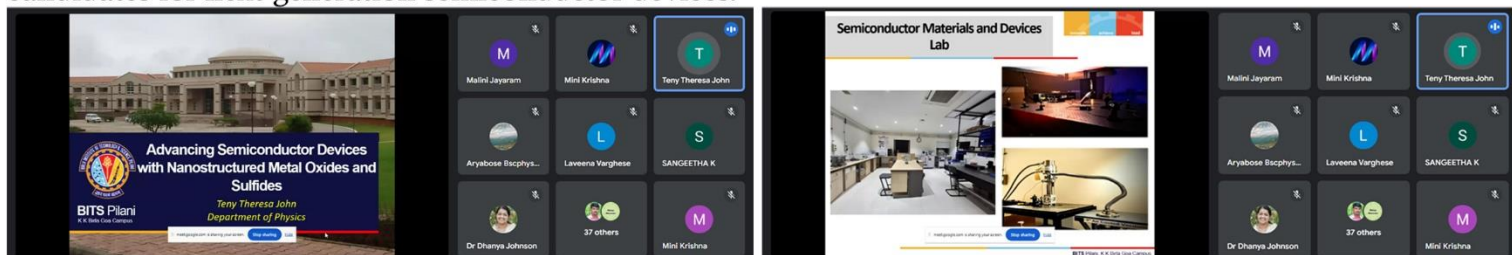
On the first day, the morning session covered the theoretical background of key characterization tools such as the UV-Visible (UV-Vis) Spectrophotometer, Spectrofluorophotometer and Fourier Transform Infrared Spectroscopy (FTIR). These sessions were conducted by Dr. Aneesh George, Assistant Professor; Dr. Mini Krishna K, Associate Professor and HoD; and Ms. Laveena Varghese, Assistant Professor of the Department of Physics. In the afternoon, students were introduced to various synthesis tools, with research scholars Ms. Haripriya V K, Ms. Rachana R, and Ms. Aswathy M explaining the basic theory and working principles of each instrument.

On the second day, students visited the DST lab, where research scholars demonstrated the instrumentation and sample analysis using UV-Vis, DRS, PL, and FTIR techniques. A hands-on demonstration of sample analysis was also provided. In the afternoon, students learned basic data plotting using Origin Pro software, with practical examples for better understanding. The valedictory function was held at 2:30 PM, during which Dr. Sr Beena Jose, Principal of Vimala College, unveiled the logo of Vimala Physics Research Centre (VPRC) and distributed certificates to both resource persons and participants. The workshop concluded with feedback collection from the students and a vote of thanks delivered by Mr. Santhosh P Jose, Assistant Professor, Department of Physics.

Women in Science

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, organized an inspiring event titled "Women in Science" on the 29th of January 2025. This event aimed to celebrate and promote the contributions of women in the field of science, encouraging students to pursue careers in scientific disciplines. The highlight of the event was a presentation by Dr. Teny Theresa John, an Associate Professor at BITS Pilani, Goa, who shared her groundbreaking research on advancing semiconductor devices using nanostructured metal oxides and sulfides. Dr. Teny's presentation focused on the significant role of metal oxides

and sulfides in modern semiconductor technology. She explained that these materials exhibit unique electrical, optical, and catalytic properties at the nanoscale, making them ideal for a wide range of applications in electronics, photovoltaics, and sensors. Dr. Teny highlighted the advantages of these nanostructured materials, such as their high surface area, tunable band gaps, and enhanced stability, which make them promising candidates for next-generation semiconductor devices.



The event was highly interactive, with students and faculty members actively engaging with Dr. Teny during the Q&A session. Participants asked insightful questions about the challenges and opportunities in semiconductor research, as well as the practical applications of nanostructured materials. Dr. Teny's responses were both informative and encouraging, inspiring the attendees to explore the field further.

Dr Sr Ritty J Nedumpara Endowment Lecture

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, organized the "Dr Sr Ritty J Nedumpara Endowment Lecture" on the 21st of January, 2025. This event featured Dr. Sam Solomon, who delivered an enlightening lecture on "Renewable Energy: Challenges and Opportunities." Dr. Solomon's presentation focused on the critical role of renewable energy in addressing global energy demands and sustainability challenges, providing the audience with a comprehensive overview of the subject. Dr. Solomon began by discussing the significance of renewable energy in the context of global energy needs and environmental sustainability. He emphasized the urgent need to transition from fossil fuels to renewable energy sources to mitigate climate change and ensure a sustainable future. His lecture elaborated on various renewable energy sources derived from the Pancha Bhoothas (five elements) – solar (fire), wind (air), hydro (water), geothermal (earth), and biomass (space/ether). Each energy source was explored in detail, highlighting their unique advantages, current advancements, and the challenges they face.



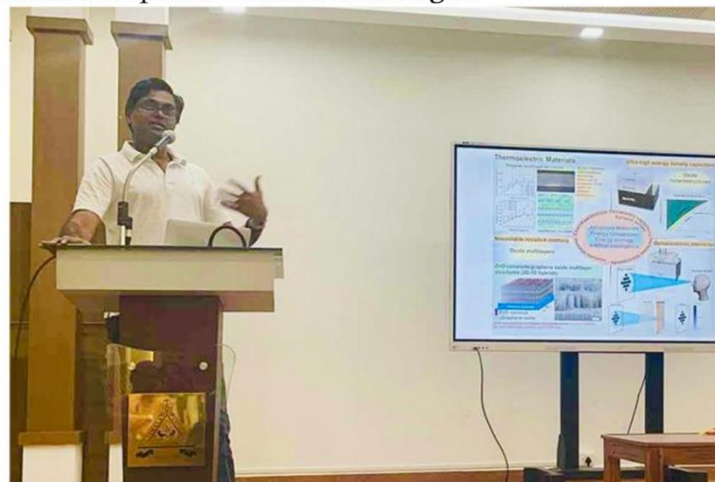
Solar energy, harnessed from the sun, was discussed as a powerful and abundant source of clean energy. Dr. Solomon explained the technological advancements in solar panels and their increasing efficiency. Wind energy, derived from the movement of air, was presented as another promising renewable source, with innovations in wind turbine design enhancing its viability. Hydro energy, generated from water, was highlighted for its reliability and capacity for large-scale power generation. Geothermal energy, sourced from the heat within the earth, was noted for its potential in providing consistent and sustainable energy. Biomass energy, produced from organic materials, was discussed for its versatility and role in waste management. Dr. Solomon also emphasized the need for innovative solutions in energy storage and efficiency to overcome the intermittent nature of some renewable sources. He discussed emerging technologies, policy frameworks, and career opportunities in the renewable energy sector, encouraging students to actively engage with these topics. In addition to the technical aspects, Dr. Solomon introduced students to the idea incubation centers at the University of Kerala, which support innovation and entrepreneurship in renewable energy and sustainability.

Coffee with Scientist

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, organized an engaging session titled "Coffee with Scientist" for undergraduate and postgraduate students of the department. This event, held in an informal and interactive setting, featured Dr. Anoop Gopinathan, Associate Professor in the Department of Physics at Amrita Viswa Vidyapeetham, Amritapuri, Kollam. Dr. Gopinathan delivered an insightful talk on "Next Generation Materials: Recent Trends in Materials Science Research," captivating the audience with his expertise and enthusiasm.

Dr. Gopinathan began his talk by discussing the latest advancements in materials science, focusing on cutting-edge developments in nanomaterials and smart materials. He highlighted how these materials are

revolutionizing various industries, from electronics and healthcare to energy and environmental sustainability. He shared his own research experiences, illustrating how collaboration across different scientific disciplines can lead to groundbreaking discoveries and innovations. His insights underscored the value of integrating knowledge from physics, chemistry, engineering, and other fields to address complex scientific challenges.



The interactive nature of the session allowed students to actively engage with Dr. Gopinathan. They had the opportunity to ask questions, share their thoughts, and gain valuable insights into emerging opportunities in materials science research. The event was well-received by the students, sparking a renewed interest in research and innovation. Many students left the session feeling inspired and motivated to explore the field of materials science further.

PhD Open Defence

Ms. Sharon V S, a dedicated research scholar from the Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, has achieved a significant milestone in her academic journey. Under the expert guidance of Dr. Malini K A, Professor in Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, Ms. Sharon submitted her thesis entitled "Dielectric Magnetic and Multiferroic Characterization of Nanocomposites based on Spinel and Perovskite Ferrites and Barium Titanate" on August 14, 2024. This thesis represents a comprehensive study of the dielectric, magnetic, and multiferroic properties of nanocomposites, specifically focusing on spinel and perovskite ferrites combined with barium titanate. The research aims to explore the potential applications of these materials in various technological fields, including electronics and magnetoelectric devices.

The culmination of Ms. Sharon's research efforts was marked by the open defence and viva voce held on March 14, 2025. The chairman of the Board of Adjudicators for this significant occasion was Dr. Santhosh Kumar, Professor at NIT Trichy, who brought his extensive expertise and experience to the evaluation process. The open defence meeting commenced with a warm welcome from Dr. Malini K A, who introduced the chairman to the audience and set the stage for the proceedings. Dr. Sr Beena Jose, Principal and Director of the Research Advisory Council (RAC) at Vimala College (Autonomous), Thrissur, also addressed the gathering.



Following the presentation and the subsequent viva voce, Dr. Santhosh Kumar, as the chairman of the Board of Adjudicators, declared the successful defence of the thesis. He commended Ms. Sharon for her outstanding research work and her ability to defend her findings with clarity and confidence. With this declaration, Ms. Sharon was officially designated as Dr. Sharon, marking the successful completion of her doctoral journey.

Workshop on Microcontroller Based Science Experiments

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, organized an engaging hands-on training session on "Microcontroller-based Science Experiments" for undergraduate students on the 4th of September 2024. This workshop was designed to enhance the practical skills and understanding of science experiments through the application of modern technology, providing students with valuable insights into integrating technology with scientific research.

The first session, titled "Experiment Science at Your Fingertip," was conducted by Prof. (Dr.) Mohamed Shahin Thayyil, Professor and Head of the Department of Physics at the University of Calicut. Prof. Thayyil introduced the students to basic physics experiments and demonstrated the simplest approaches to conducting these experiments using microcontrollers. His session was highly informative, offering students a clear understanding of how microcontrollers can be utilized to simplify and enhance the accuracy of scientific experiments. Prof. Thayyil's expertise and engaging teaching style made the session both educational and enjoyable for the participants.



The second session of the workshop focused on hands-on training with ExpEYES (Experiments for Young Engineers and Scientists), a versatile tool for conducting science experiments. This session was led by Dr. Jithin B. P., a Post Doctoral Fellow at the University of Calicut. Dr. Jithin provided students with practical experience using ExpEYES, guiding them through various experiments and demonstrating the capabilities of this innovative tool. The hands-on nature of the session allowed students to directly apply what they had learned, fostering a deeper understanding of the concepts and techniques involved.

PHYSIGALA 2K24 (*A Voyage Through the Wonders of Physics*)

On August 22, 2024, the Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, in collaboration with the Breeze Foundation, organized PHYSIGALA 2K24 as part of VISMAYAM 2K24, The Fest of Science and Arts. This captivating and informative Physics exhibition aimed to showcase a variety of concepts, experiments, and practical applications of Physics, fostering students' interest and deepening their understanding of the subject. The event featured five distinct pavilions, each offering unique insights into the world of Physics. The DR APJ ABDUL KALAM PAVILION displayed quotes from Dr. APJ Abdul Kalam and distributed miniature books, inspiring visitors with his wisdom. The SPACE PAVILION highlighted India's space achievements, touching lives while touching the Moon. The FUN PAVILION emphasized the idea that everything happens for a reason, and that reason is usually Physics. The EXPERIMENT PAVILION embraced the beauty of Physics through hands-on experiments, while the VISUAL PAVILION showcased phenomena that are not easily seen.

A series of exciting experiments demonstrated fundamental concepts such as mechanics, optics, electricity, and magnetism. Interactive demonstrations featuring the Van de Graaff generator, Newton's cradle, and optical illusions thrilled students and sparked their curiosity. Additionally, several models and exhibits visually illustrated complex scientific phenomena, covering topics such as the solar system, wave properties, electromagnetism, and the principles of motion. The exhibition also featured working models of simple machines and circuits, allowing students to observe and understand the practical applications of Physics in everyday life. One of the highlights was the dedicated space pavilion, where students showcased India's space achievements, sparking discussions on space exploration and scientific advancements. In addition to the exhibits, students organized fun, tricky games designed to help visitors grasp Physics concepts in an engaging way. The hands-on activities and interactive exhibits fostered curiosity and critical thinking, inspiring students to pursue further scientific exploration. PHYSIGALA 2K24 served as an essential steppingstone towards nurturing a generation of young scientists and

innovators, equipping them with the knowledge and inspiration needed to make significant contributions to the world of science.



Physics Association Inauguration

The inauguration of the association for the Postgraduate & Research Department of Physics was held on August 14, 2024, at 2:00 pm in the Lissieux Seminar Hall. The event was graced by the presence of Dr. Sr. Ritty J. Nedumbara, Former Vice-Principal and Head of the Department of Physics, who served as the chief guest for the occasion. Dr. Mini Krishna K, Head of the Department, extended a warm welcome to the chief guest and the attendees. The ceremony commenced with a traditional lamp lighting by Dr. Sr. Ritty J. Nedumbara, marking the official inauguration. Following the lighting of the lamp, the chief guest interacted with the students and delivered an insightful talk, sharing her experiences and knowledge, which inspired the audience. During the function, Dr. Sr. Ritty J. Nedumbara also released the seventh volume of the departmental newsletter, "The Assayer," themed "The Beautiful Nature is Ruled by the Laws of Physics."

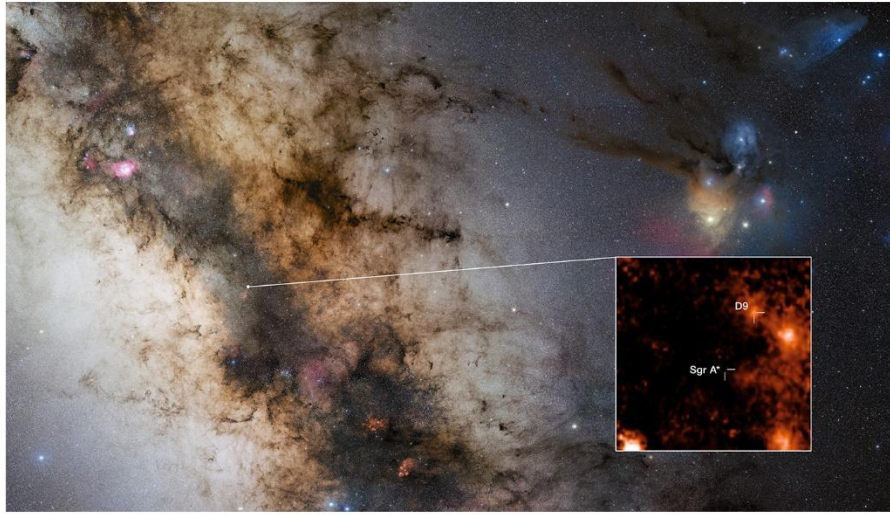
After the inaugural session, the students of the department organized a series of dance and song performances, adding a lively and cultural touch to the event. Dr. Malini K. A., Professor of the Department of Physics, shared her personal experiences with the chief guest and expressed her gratitude for her presence and contributions. The event concluded with the student coordinator delivering an official vote of thanks to the chief guest, faculty members, students, and all participants who contributed to making the event a success. The inauguration served



as a meaningful start to the activities of the association, fostering a sense of community and enthusiasm within the department. It set the stage for future initiatives aimed at enhancing the academic environment and inspiring students to pursue excellence in the field of Physics.

Discovery of First Binary Star Near Sagittarius A*

(Source: <https://www.eso.org/public/news/eso2418/>)



An international team of researchers has made a groundbreaking discovery by detecting a binary star system orbiting close to Sagittarius A*, the supermassive black hole at the center of our galaxy. This marks the first time a stellar pair has been found in such close proximity to a supermassive black hole. The discovery, based on data collected by the European Southern Observatory's Very Large Telescope (ESO's VLT), provides valuable insights into how stars can survive in environments with extreme gravity and could pave the way for the detection of planets near Sagittarius A*.

"Black holes are not as destructive as we thought," says Florian Peißker, a researcher at the University of Cologne, Germany, and lead author of the study published in *Nature Communications*. Binary stars, which are pairs of stars orbiting each other, are common in the Universe, but they had never before been found near a supermassive black hole. The intense gravity in such regions can make stellar systems unstable. However, this new discovery shows that some binaries can briefly thrive even under these destructive conditions.

The newly discovered binary star, named D9, was detected just in time. It is estimated to be only 2.7 million years old, and the strong gravitational force of the nearby black hole will likely cause it to merge into a single star within just one million years—a very narrow timespan for such a young system. "This provides only a brief window on cosmic timescales to observe such a binary system—and we succeeded!" explains co-author Emma Bordier, a researcher at the University of Cologne and a former student at ESO.

For many years, scientists believed that the extreme environment near a supermassive black hole prevented new stars from forming. However, several young stars found in close proximity to Sagittarius A* have disproved this assumption. The discovery of the young binary star now shows that even stellar pairs have the potential to form in these harsh conditions. The D9 system shows clear signs of the presence of gas and dust around the stars, which suggests that it could be a very young stellar system that must have formed in the vicinity of the supermassive black hole, explains co-author Michal Zajacek, a researcher at Masaryk University, Czechia, and the University of Cologne.

The binary star was found in a dense cluster of stars and other objects orbiting Sagittarius A*, known as the S cluster. Among the most enigmatic objects in this cluster are the G objects, which behave like stars but appear as clouds of gas and dust. During their observations of these mysterious objects, the team noticed a surprising pattern in D9. Data obtained with the VLT's ERIS instrument, combined with archival data from the SINFONI instrument, revealed recurring variations in the velocity of the star, indicating that D9 was actually two stars orbiting each other. "I thought that my analysis was wrong," Peißker says, "but the spectroscopic pattern covered about 15 years, and it was clear this detection is indeed the first binary observed in the S cluster."

The results shed new light on the nature of the mysterious G objects. The team proposes that these objects might be a combination of binary stars that have not yet merged and the leftover material from already merged stars. The precise nature of many objects orbiting Sagittarius A*, as well as how they could have formed so close to the supermassive black hole, remains a mystery. However, upcoming advancements in observational technology could change this.

The GRAVITY+ upgrade to the VLT Interferometer and the METIS instrument on ESO's Extremely Large Telescope (ELT), currently under construction in Chile, will allow the team to conduct even more detailed observations of the Galactic center. These facilities will help reveal the nature of known objects and undoubtedly uncover more binary stars and young systems. "Our discovery lets us speculate about the presence of planets, since these are often formed around young stars. It seems plausible that the detection of planets in the Galactic center is just a matter of time," concludes Peißker.

This discovery represents a significant milestone in our understanding of the dynamics near supermassive black holes. The detection of a binary star system in such an extreme environment challenges previous assumptions and opens new avenues for research. As observational technologies advance, we can expect to uncover more secrets of the universe, bringing us closer to understanding the complex interactions between stars and black holes.

Vimala Astronomy Club

Workshop on Telescope making and Sunspot watching

On December 12, 2024, the Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, in collaboration with the Vimala Astronomy Club (VAC) and Breakthrough Science Society, organized an engaging workshop on Telescope Making and Sun Spot Watching. The event featured esteemed resource persons Mr. Harikumar K S (Rtd. Security Officer, FACT and BSS State Secretariat member), Mr. P C Thankachan (BSS Ernakulam Chapter), Mr. Ravi M Krishnan (BSS Thrissur Chapter), and Mr. Sreenivasan (BSS Thrissur Chapter).

The workshop was divided into two informative sessions. In the first session, the resource persons provided detailed explanations of the different parts of refracting telescopes, offering participants a solid understanding of the components and their functions. In the second session, students were divided into ten groups, and each group was given all the necessary parts to assemble their own telescopes. The resource persons guided the students through the assembly process, ensuring that everyone successfully built their telescopes. After completing the telescope assembly, the resource persons demonstrated how to focus and observe distant objects using the newly constructed telescopes. This hands-on experience not only enhanced the students' practical skills but also ignited their passion for astronomy. The workshop was a resounding success, fostering curiosity and a deeper appreciation for the wonders of the cosmos.



Sunspot watching

On December 16, 2024, the Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, in association with the Vimala Astronomy Club (VAC), conducted a workshop on Telescope Alignment and Sunspot Observation for the second-semester MDC students. The resource persons for the session were



Mr. Santhosh P. Jose, Dr. Aneesh George, and Dr. Regina Jose, all faculty members from the Department of Physics. They provided hands-on training on the use of azimuthal and equatorial telescope mounts and guided students in observing sunspots safely. The workshop also equipped students with practical skills to capture astronomical events using mobile phones through telescopic assistance.

On January 23, 2025, a hands-on training session was organized to familiarize students with various types of telescopes. Participants had the opportunity to closely observe the functioning of different telescope models. The session featured demonstrations of an 8-inch Dobsonian reflecting telescope and an azimuthal refracting telescope. Students actively engaged in setting up and aligning the telescopes under expert guidance.



Sky Watch

The Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, in collaboration with the Vimala Astronomy Club and the Breakthrough Science Society, organized a Sky Watch event on 21st February 2025. The event drew astronomy enthusiasts from various departments, eager to explore the wonders of the night sky. Six representatives from the Breakthrough Science Society, along with faculty members from the Department of Physics, provided participants with an immersive stargazing experience aimed at deepening their understanding of celestial phenomena. The session commenced with a brief introductory talk on observational astronomy, highlighting key aspects of the night sky, constellations, and planetary motion. From 7:00 pm to 11:00 pm, participants used both in-house telescopes and those brought by the Breakthrough Science Society to observe planets such as Venus and Jupiter, including its four prominent moons. Experts and faculty guided attendees in identifying major constellations and explained their astronomical significance. Following a short break, the





the group reconvened at around 3:00 am to observe the Moon. Participants were captivated by the clarity of the lunar surface, with its craters and mountains vividly revealing the Moon's rugged terrain. The event concluded around 6:30 am, leaving students inspired and more curious about astronomical phenomena and their scientific importance.

World Space Week Celebration

The Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, organized an invited talk on October 4, 2024, in connection with World Space Week 2024. The event aimed to spark interest and awareness among students about recent advancements in space science. The resource person for the session was Dr. Indu Gopan, Division Head of the RF System Division at the Vikram Sarabhai Space Centre, Thiruvananthapuram. Dr. Indu delivered an insightful presentation on the fascinating world of space science, drawing from her vast experience at ISRO. She highlighted the critical role of radio frequency systems in satellite communication and deep



space missions. Her talk also included an overview of India's achievements in space technology and ongoing research initiatives. The session was highly interactive, with students eagerly asking questions and sharing their thoughts. Dr. Indu's enthusiasm and clarity made complex concepts accessible to all attendees. The talk not only deepened the participants' understanding of space science but also inspired many to consider future careers in the field. The event successfully celebrated the spirit of World Space Week and reinforced the importance of scientific exploration.

National Space Day Celebration

The National Space Day celebration was held on August 23, 2024, to commemorate and honor India's remarkable achievements in space exploration, particularly focusing on the Chandrayaan missions. The event highlighted the



historic success of Chandrayaan-3, which, on August 23, 2023, made India the fourth country to achieve a soft landing on the lunar surface and the first to land near the Moon's south pole. The theme for this year's celebration was 'Touching Lives while Touching the Moon,' emphasizing the broader impact of space science on everyday life. The Postgraduate and Research Department of Physics at Vimala College (Autonomous), Thrissur, Kerala, organized a series of engaging activities in connection with the celebration. These included student-led PowerPoint presentations and an invited talk aimed at deepening understanding of India's space missions. The keynote speaker was Dr. Prajith S. S., Scientist SF at the Space Physics Laboratory, Vikram Sarabhai Space Centre (VSSC), ISRO, Thiruvananthapuram. His talk, titled "Monitoring the Earth's Climate from Space: Applications of Satellite Remote Sensing," provided valuable insights into how space-based technologies contribute to climate science. Dr. Prajith explained the applications of satellite data in monitoring environmental changes and addressing global climate challenges. His presentation was both informative and inspiring, sparking curiosity and enthusiasm among the students. The session concluded with an interactive Q&A, where students actively participated with thoughtful questions. As part of the National Space Day celebrations, the Department also organized a "Space Pavilion" for school students on August 22, 2024. The pavilion featured educational exhibits such as atmospheric layers, Moon phases, Indian space missions like Mangalyaan and Chandrayaan, and detailed displays of 103 Messier objects. Authentic models of ISRO rockets including PSLV, GSLV, and INSAT were also showcased, along with a VR space station experience. Students engaged in fun and educational activities like space-themed games, constellation projections in a dark room, guided tours, and quizzes. The Space Pavilion attracted over 600 school students, whose enthusiastic participation made the event a grand success. The entire celebration fostered a sense of wonder and appreciation for space science, inspiring the next generation of scientists and explorers.

PhD Pre-Submission: Vinitha



NATIONAL SCIENCE DAY

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, in collaboration with the Breakthrough Science Society, celebrated National Science Day on the 28th of February, 2025. This event was marked by the enthusiastic participation of students and faculty members, who gathered to honor the legacy of Indian scientists and to promote scientific awareness. The celebration began with an interactive session where three esteemed members of the Breakthrough Science Society engaged with the students. The highlight of the event was an inspiring address by Dr. Babu, who emphasized the significance of National Science Day. He elaborated on the contributions of renowned Indian scientists such as C. V. Raman, S. N. Bose, J. C. Bose, Prafulla Chandra Ray, and Meghnad Saha. To further popularize National Science Day, the organizers distributed badges featuring the images of these illustrious scientists. This gesture was aimed at instilling a sense of pride and recognition of India's rich scientific heritage among the students. In a solemn ceremony, both faculty and students took a pledge to uphold the spirit of scientific inquiry and innovation. They committed themselves to spreading scientific awareness and combating misinformation. This pledge underscored the importance of critical thinking and evidence-based knowledge in today's world.



AGNI 2K24

AGNI-2K24, the flagship annual event organized by the Department of Physics, Vimala College (Autonomous), Thrissur, was held in commemoration of Dr. A.P.J. Abdul Kalam, the former President of India and the esteemed "Missile Man of India," on his death anniversary. This year, the program took the form of a state-level intercollegiate quiz competition. The event was hosted by Mr. Justin John, Assistant Professor at St. Berchmans College, Changanassery, who served as the quiz master. The competition comprised four rounds—a preliminary round, an audio-visual round, a 'find me' round, and a final round—each designed to challenge the participants through diverse question formats and topics.

A total of 15 teams, each consisting of two students, took part in the contest. The first prize, a cash award of ₹5,000, was secured by Mr. Nadeem and Mr. Mohannad Ijaz, MBBS students from Government Medical College, Thrissur. Mr. Sreerag R and Mr. Delwin C. Raju from Sri Vyasa NSS College won second place, while the third prize went to Mr. Thejus N. S and Mr. Darius N. Johnson from Christ College, Irinjalakkuda.



The event witnessed enthusiastic participation from students across the state and was made successful by the dedicated efforts of the faculty and students of the Department of Physics. Prizes were distributed by Dr. Malini K. A., Professor, Department of Physics. The program concluded with a vote of thanks delivered by Mr. Santhosh P. Jose, the faculty coordinator, marking the formal closure of the event. AGNI-2K24 stood out as a memorable celebration of knowledge, competition, and the enduring legacy of Dr. Kalam.

Research Lab Visit



The Department of Physics, Vimala College (Autonomous), Thrissur, organized a research lab visit for first-year undergraduate students on 26th June 2024. The visit aimed to familiarize students with the advanced research facilities and equipment available in the department. Research scholars from the department guided the students during the visit and explained the working and significance of various sophisticated instruments. The session provided valuable insights into experimental techniques and current research practices in physics. Students expressed great enthusiasm and curiosity throughout the visit, making it a highly engaging learning experience.

Stress Management in Student Life

The Postgraduate & Research Department of Physics organized a student induction program titled 'Stress Management in Students' Life' for the first-year students of the department on 28th June 2024. The session aimed to help students cope with the pressures and challenges of academic life and promote mental well-being. The program featured Dr. Asha P. Rao, Former Head of the Department of Social Work at Vimala College (Autonomous), Thrissur, as the resource person. Dr. Rao delivered an insightful and encouraging talk, providing students with practical tips and



strategies to manage stress effectively. Her session was well-received, and she engaged the students with valuable advice on maintaining a balanced and healthy mindset during their academic journey. The students actively participated in the session, discussing their concerns and learning new techniques for managing stress. The program concluded with a vote of thanks offered by Mr. Santhosh P. Jose, Assistant Professor of the Department of Physics. The induction program was an enriching experience, equipping students with the tools they need to manage stress and navigate the challenges of student life.

First year UG orientation

The Department of Physics, Vimala College (Autonomous), Thrissur, organized an orientation program for first-year undergraduate students and their parents on 24th June 2024. The session aimed to introduce the academic structure and support systems available to new students. Dr. Malini K A, Professor and Vice Principal, provided a detailed



demonstration of the Four-Year Undergraduate Programme (FYUGP), helping the audience understand its framework and objectives. Dr. Mini Krisha K, Head of the Department, highlighted the key achievements and milestones of the department. The orientation served as a valuable platform for students and parents to gain clarity and confidence as they embarked on their academic journey.

International Opportunities



The Department of Physics, Vimala College (Autonomous), Thrissur, organized a talk on international opportunities for final-year undergraduate students on 19th June 2024. The session aimed to inform students about higher education, research, and internship opportunities abroad. It provided valuable guidance on application processes, scholarships, and global academic prospects.

Study Tour



The Department of Physics, Vimala College (Autonomous), Thrissur, organized a study tour for final-year UG and PG students from 2nd to 4th January 2025. The tour began from the college and covered major destinations including Coorg, Chikmagalur, and Wayanad. A key highlight of the trip was the visit to the Central Coffee Research Institute (CCRI) in Chikmagalur. In addition to academic exposure, the tour included a trekking expedition in Chikmagalur, visited the historic Belur Temple and Coorg Golden Temple. The final leg of the tour was a stop at Wayanad before returning to the college.

Interdepartmental Seminar

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, organized an Interdepartmental Seminar on the 16th of December, 2024. The seminar, held at Marian Hall, was financially supported under the DST-CURIE program, reflecting the commitment to fostering scientific research and education. The event featured Prof. G Ambika, a distinguished professor from IISER Trivandrum, as the resource person. Prof. Ambika delivered an insightful lecture on the topic "Recurrences in Dynamics from Data." Her expertise in the field provided the attendees with a deep understanding of



the subject, exploring the intricate patterns and behaviors that emerge in dynamic systems through data analysis. The seminar aimed to bridge the gap between theoretical concepts and practical applications, making it highly relevant for students and faculty members from various departments. Prof. Ambika's lecture delved into the concept of recurrences in dynamic systems, illustrating how data can reveal underlying patterns and predict future behaviors. Her presentation was both comprehensive and accessible, making complex ideas understandable to a diverse audience. The interactive nature of the seminar allowed participants to ask questions and engage in discussions, further enriching their learning experience.

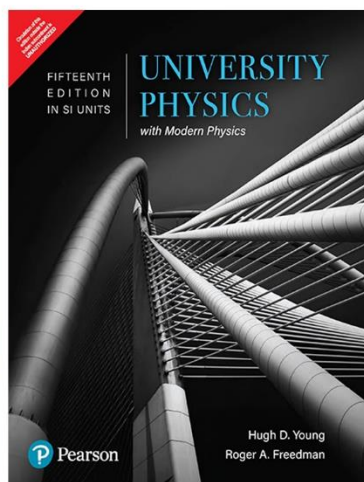
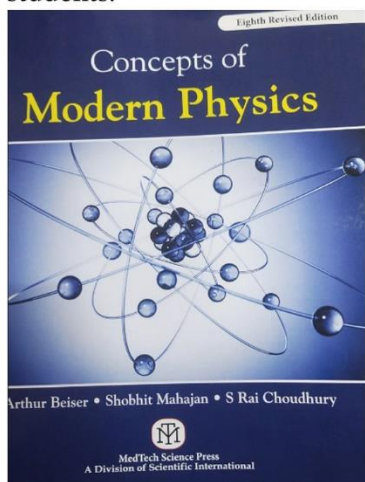
Introduction to Computer Programming, Python Basics, and Numerical Methods

The Postgraduate & Research Department of Physics, Vimala College (Autonomous), Thrissur, in association with KELTRON (A Government of Kerala Undertaking), is organizing a 15-day internship program for undergraduate students from 1st to 15th May 2025. The course is titled Introduction to Computer Programming, Python Basics, and Numerical Methods. This internship is designed to provide hands-on experience in fundamental computing and programming skills. Upon successful completion, participants will receive a certificate issued by KELTRON. The certificate is recognized as equivalent to a 1.7-credit internship under the Four-Year Undergraduate Programme (FYUGP) framework. These credits will be

added to the Academic Bank of Credits (ABC) through the APAAR ID. The internship will be conducted entirely online via Google Meet, ensuring accessibility for all students. All required study materials will be provided through Google Classroom. The total registration fee for the program is only ₹1500, making it an affordable opportunity for skill enhancement. Mr. Santhosh P Jose will serve as the course coordinator. The course outcomes include understanding the fundamental concepts of computing systems and the Python programming language. Students will learn how to install and set up the Python environment and summarize Python's basic syntax and data types. The program will also focus on implementing logic using control structures to solve simple problems. Participants will analyze data using Python's built-in data structures and explore techniques for code reusability through functions and modules. Additionally, the course will emphasize applying Python programming to solve numerical problems in physics. The resource persons for the internship include Dr. Aneesh George, Dr. Regina Jose, Dr. Jovia Jose, and Mr. Santhosh P Jose, who will guide the students throughout the program.

APT Book Library

The Postgraduate & Research Department of Physics at Vimala College (Autonomous), Thrissur, has been selected for the prestigious APT Science Book Club 2024. The cost of the books was shared equally by the department and APT, with APT contributing a maximum of ₹3000. As part of this initiative, the department purchased two copies of Concepts of Modern Physics and three copies of University Physics with Modern Physics. These valuable academic resources are expected to greatly enrich the learning experience of both undergraduate and postgraduate students.



Students' Achievements



Ms Reshmi K P, a student of the MSc Physics 2021-2023 batch, has qualified the UGC NET admission to PhD. The department congratulates her on this commendable achievement.



Rachana R Sreelekshmi G Jaithra S Aleena Anto

Ms Rachana R, Research Scholar, was awarded the prestigious Aspire Fellowship and actively contributed as the resource person for a two-day workshop on Material Analysis. She also made oral presentations at several reputed conferences, including the International Conference on Advances in Functional Materials and Coatings (ICAFMC-24) at MES College, Ponnani; the 23rd Endowment National Seminar on Frontiers in Material Science at Sacred Heart College, Thevara; and the International Conference on Science and Technology of Advanced Materials (STAM-25) at Mar Athanasius College, Kothamangalam. Additionally, she presented a poster at the 4th International Conference on Optoelectronic and Nanomaterials for Advanced Technology (icONMAT 2025) held at CUSAT. **Ms. Sreelekshmi G, Ms. Jaithra S, and Ms. Aleena Anto**, second-year M.Sc. Physics students, also received the Aspire Fellowship. **Ms. Aleena Anto** and **Ms. Jaithra S** successfully completed an 8-week NPTEL online course on Solar Photovoltaics: Fundamentals, Technology, and Applications conducted by IIT Roorkee from July to September 2024. **Ms. Jaithra S** inaugurated the innovative student initiative 'The Escape Room' and, along with Ms. Lakshmi K K, won first prize in the Interdepartmental Sr. Canisia General Quiz organized by the Department of Chemistry in January 2025. **Ms. Sreelekshmi G** and **Ms. Aleena Anto** also secured placement at Holy Sai International School, marking a commendable step in their professional journey.



Haripriya V K Sangamithra R Sandra C S Meegal Anna Sunil

Ms Haripriya V K, Research Scholar, actively participated in multiple prestigious academic events. She presented a poster at the International Conference on Advanced Energy Materials for a Sustainable Future (ICAEMS 2024) organized by the Department of Science and Humanities, FISAT, Angamaly (22-23 August 2024). She delivered an oral presentation at the 3rd International Conference on Science and Technology of Advanced Materials (STAM-25) held at Mar Athanasius College (Autonomous), Kothamangalam, Kerala (8-10 January 2025). Additionally, she presented a poster at the 4th International Conference on Optoelectronic and Nanomaterials for Advanced Technology (icONMAT 2025) hosted by CUSAT (11-14 February 2025). She also served as a resource person in a Two-day Workshop on Material Analysis. **Ms. Sangamithra R**, a second-year MSc Physics student, participated in Vigyan Vidushi 2024, an advanced program for postgraduate Physics students conducted by Homi Bhabha Centre for Science Education (HBCSE), TIFR, Mumbai (27 May - 15 June 2024). **Ms. Meegal Anna Sunil** and **Ms. Sandra C S**, first-year MSc Physics students, took part in a Bridge Course in Mathematical Physics organized by the Academy of Physics Teachers (APT), Kerala, and hosted by the Department of Physics, Union Christian College, Aluva. Notably, **Ms. Meegal Anna Sunil** was also awarded the INSPIRE Scholarship.



Mary Alphonsa C N Jaima James Angel Joy Anagha V Jacob

Ms. Mary Alphonsa C N, first-year MSc Physics student, attended the Bridge Course in Mathematical Physics organized by the Academy of Physics Teachers (APT), Kerala, and hosted by the Department of Physics, Union Christian College, Aluva. She was also awarded the INSPIRE Scholarship for her academic achievements.

Ms. Jaima James, second-year MSc Physics student, successfully completed an 8-week NPTEL course on Solar Photovoltaics: Fundamentals, Technology and Applications, conducted by IIT Roorkee during July–September 2024. She also delivered an oral presentation at the International Conference on Innovative Functional Materials (ICIFM-2025) held at Christ College (Autonomous), Irinjalakuda (17–18 February 2025), and was honored with the Best Oral Presentation Award. **Ms. Angel Joy** and **Ms. Anagha V Jacob**, both first-year MSc Physics students, participated in the IUCAA-sponsored three-day Introductory Workshop on Astronomy and Astrophysics conducted at The Cochin College, Ernakulam, Kerala, from 13–15 November 2024.



Lakshmi K K Ahitha K P Hridya S Vinitha N

Ms. Sangamithra R and **Ms. Lakshmi K K**, second-year M.Sc. Physics students, shared their insights on 'SWAYAM' courses in the Mathrubhumi Uparipadanam Directory 2024. In cultural events, **Ms. Daliya** (third-year B.Sc.) and **Ms. Sangamitra** (first-year B.Sc.) secured First Prize in Margamkali at the Calicut University Interzone Arts Festival 2024–2025. **Ms. Samyuktha Mahadevan** (first-year B.Sc.) won Second Prize in Thandri Vadyangal (Eastern), while **Ms. Durga** (third-year B.Sc.) was awarded an A Grade in Oppana. **Ms. Hridya S**, a second-year M.Sc. Physics student, received an A Grade in Folk Song at the Calicut University Interzone Arts Festival 2024–2025. She also demonstrated excellence in sports by securing a Silver medal in the Intercollegiate Fencing Championship (Epee Team), along with Bronze medals in the Senior State Fencing Championship (Epee Team) and the District Fencing Championship (Individual Epee). Additionally, she presented an oral paper at International Conference on Innovative Functional Materials (ICIFM-2025) held at Christ College (Autonomous), Irinjalakuda, on 17–18 February 2025. **Ms. Anushka**, a second-year B.Sc. student, was awarded an A Grade in Thiruvathirakali at the Calicut University Interzone Arts Festival 2024–2025. **Ms. Ahitha K P**, a second-year M.Sc. student, secured the First Runner-up position in the Thrissur Cultural Capital Marathon 2025 (10 km, Women's

18–40 category), organized by Endurance Athletics, Thrissur. **Ms. Vinitha N**, Research Scholar, was honoured with the Best Research Scholar Award 2024 and also received the Second Best Paper Award at ICAMFC 2024. She further presented an oral paper at the International Conference on Advances in Functional Materials and Coatings (ICAFMC-24), organized by the Department of Physics, MES College Ponnani, Malappuram, held from 14–16 February 2024.



Aswathi T S Gracey George T Devagayathri S Durga K

Ms Aswathi T S, a third-year BSc. Physics student, has been placed at Accenture. First-year MSc. students **Ms Ahitha K P**, **Ms Avani Madhu**, **Ms Mary Alphonsa C N**, **Ms Nandana C**, and **Ms Sandra C S** attended a workshop at VSSC, Thiruvananthapuram, in connection with World Space Day on the theme Climate Change. **Ms Gracey George T S**, a third-year BSc. Physics student, secured Second Prize in Oil Painting at the D Zone 2025 competitions of the University of Calicut. **Ms Devagayathri S**, also from the third-year BSc. Physics batch, won Second Prize for Mohiniyattam in D Zone 2025. **Ms Durga K**, a third-year BSc. Physics student, earned Second Prize for Oppana in the same competition.



Sangamithra S Manazhi Samyuktha Mahadevan

Ms Sangamithra S Manazhi, a first-year BSc. Physics student, secured Third Prize for Nadodi Nrutham in the D Zone 2025 competitions of the University of Calicut. **Ms Samyuktha Mahadevan**, also a first-year BSc. Physics student, won Second Prize for Violin in the same competition. **Ms Anagha Raphy**, a student of the MSc. Physics 2022–2024 batch, secured First Prize in the SPARK 2024 project presentation competition. **Ms Arya Chandran**, a second-year MSc. Physics student, delivered an oral presentation at the International Conference on Innovative Functional Materials (ICIFM-2025), held at Christ College (Autonomous), Irinjalakuda, on 17–18 February 2025.



Faculty Achievements



Prof. Dr. Malini K A, Professor, Department of Physics and Vice Principal of Vimala College, was honoured with the Best Teacher Researcher Award 2024. She served as a Resource Person and member of the AAA assessment committee at Sahradaya College, Kodakara. Dr. Malini K A also served as a Subject Expert for faculty recruitment across various institutions in Kerala. She has been appointed as the University Nominee to the Academic Council of St. Mary's College (Autonomous), Thrissur. Additionally, she is a Member of the Board of Studies at St. Xavier's College for Women, Aluva; St. Teresa's College, Ernakulam; and Nirmala College, Muvattupuzha. Dr. Malini K A also holds memberships on the Board of Studies in Nanoscience and Technology, University of Calicut.



Dr. Mini Krishna K, Associate Professor and Head of the Department of Physics, was selected to participate in the prestigious Women in Space and Allied Science Leadership Program (WiSLP), organized by the Department of Science and Technology (DST), Government of India, in collaboration with the British Council under the UK-India Education and Research Initiative (UKIERI). The program was held at IIT Hyderabad from 18th to 21st February 2025. She also contributed as a Subject Expert for faculty recruitment in multiple higher education institutions across Kerala. Furthermore, Dr. Mini Krishna K. has been appointed as the University Nominee to the Board of Studies of Sacred Heart College (Autonomous), Chalakudy, and Christ College (Autonomous), Irinjalakuda. She also actively participated in the 4th International Conference on Optoelectronic and Nanomaterials for Advanced Technology (icONMAT 2025), held at Cochin University of Science and Technology (CUSAT) from 11th to 14th February 2025.



Dr. Veena Gopalan E, Assistant Professor, Department of Physics, has rendered her service as a Subject Expert for faculty recruitment in multiple higher education institutions across Kerala. She has also been nominated as a Member of the Board of Studies at St. Mary's College (Autonomous), Thrissur.

Dr. Dhanya Johnson, Assistant Professor and IQAC Coordinator, was selected for the Women in Space and Allied Science Leadership Program (WiSLP) organized by the DST, Government of India, in



collaboration with the British Council under UKIERI, held at IIT Hyderabad from 18th to 21st February 2025. She also participated in the International Conference on Advanced Ceramics for Sustainability (Cera4S 2024) and the 88th Annual Session of the Indian Ceramic Society, conducted at IIT Madras from 28th to 30th November 2024.



Mr. Santhosh P Jose, Assistant Professor, Department of Physics, was honoured with the Social Service Appreciation Award by the Social Service Wing, Brahma Kumaris, India, in recognition of his contributions to social service.

He served as Quiz Master for multiple academic events, including the National Science Day Quiz (Department of Chemistry, St. Mary's College, 26 February 2024), PHYSIKOS 2023-24 (Department of Physics, St. Joseph's College, Irinjalakuda, 21 February 2024), Intercollegiate Space Quiz (St. Mary's College, Thrissur, 23 August 2024), Prof. E. K. Narayanan Memorial Intercollegiate Physics Quiz (Christ College, Irinjalakuda, 26 September 2025), Intercollegiate Business Quiz (Department of Commerce, Vimala College), Sr. Canisia Quiz (Department of Chemistry, Vimala College), and as Chief Guest and Quiz Master for Techno Quiz (Department of Computer Science, St. Joseph's College, Irinjalakuda). He also delivered an oral presentation at the International Conference on Advances in Functional Materials and Coatings (ICAFMC-24) organized by MES College, Ponnani, from 14th to 16th February 2024.

Journal Publications

- 📖 V K Haripriya and K. A. Malini, Review on the synthesis routes of nickel manganite—a potential material for thermistor applications, Journal of Electroceramics, <https://doi.org/10.1007/s10832-024-00376-8>
- 📖 Rachana R, Aswathy M, Vinitha N, Ancy Mariya and Mini Krishna K, An investigation on the photocatalytic and antibacterial response of green fluorescent carbon dots synthesized from corn flour. in the journal Zeitschrift für Physikalische Chemie, <https://doi.org/10.1515/zpch-2024-0793>
- 📖 Vinitha N, Rachana R and Mini Krishna K, Low-temperature Co-precipitation Synthesis of ZnAl₂O₄ Nanophosphors Probing its Luminescent, Antibacterial and Anticancer Potentials in the journal "Journal of Fluorescence" <https://doi.org/10.1007/s10895-024-03814-6>
- 📖 V S Sharon, V K Haripriya, Swapna S Nair, E Veena Gopalan, Aneesh George and K A Malini, Zinc-doped cobalt ferrite nanoparticles: modified sol-gel synthesis, multifunctional properties, and cytotoxicity evaluation, Journal of Sol-Gel Science and Technology <https://doi.org/10.1007/s10971-025-06689-6>

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