



ST. MARY'S COLLEGE (Autonomous)

Re-accredited with 'A+' by NAAC (4th Cycle)

Thoothukudi- 628001, Tamil Nadu

Department of Physics (SSC)

Message from the Co-Ordinator

As we embark on this significant year dedicated to the *Year of Faith*, I would like to take a moment to reflect on what this theme means to each of us, both as individuals and as a collective community.

Faith is not just a religious or philosophical concept—it is the foundation upon which we build our values, our relationships, and our approach to the world. It is the belief that drives us to pursue knowledge, overcome challenges, and strive for excellence in all that we do. Whether we are scholars, educators, or professionals, faith serves as the compass that guides us through moments of uncertainty and inspires us to work with passion, integrity, and purpose.

This Year of Faith calls us to deepen our understanding of our core beliefs, to reexamine the role faith plays in our academic and personal lives, and to recognize the interconnectedness of our intellectual, emotional, and spiritual journeys. It invites us to be more mindful of the world around us, to engage with the complexities of life with compassion and empathy, and to contribute positively to our communities and the world at large.

In our department, we have the unique opportunity to approach this theme through the lens of our studies. Whether through the lens of philosophy, history, science, or the arts, we are reminded that faith can take many forms. It is not limited to any one tradition or worldview but is a shared human experience that transcends boundaries and unites us in our quest for meaning and understanding.

With Gratitude

Ms. P. Padmavathi

EDITORIAL TEAM

Ms. P.Padmavathi,
M.Sc.,M.Phil.,SET.,B.A (Hindi),
Co-Ordinator & Assistant
Professor

Dr. A. Nirmala Shirley,
M.Sc.,B.Ed.,M.Phil.,PhD.,
B.A(Hindi)

Assistant Professor,

Ms. S. Saravana Selvi,M.Sc.,
(SET); B.Ed

Assistant Professor

Ms. Y. Sasikala., M.Sc.,(SET)

Assistant Professor



Activities of the Association

The Department of Physics successfully conducted an engaging association meeting, bringing together students, faculty, and guest speakers to explore recent advancements in the field. The session featured thought-provoking discussions, interactive activities, and knowledge-sharing opportunities. It fostered a collaborative environment, inspiring participants to deepen their passion for physics and research.

On September 27, 2021, Department of Physics conducted an online invited talk on science behind the nanotechnology in the light of quantum mechanics under the Star College Scheme sponsored by the department of Biotechnology, Ministry of Science and Technology, Government of India. Dr. M. Melvin David Kumar, Assistant Professor, Department of Physics, St. Xavier's College, Palayamkottai was the resource person. 95 members have participated in the talk.

Behaviour of the electron in the free space

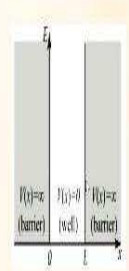
Schrödinger equation in free-space:

$$\left(-\frac{\hbar^2}{2m_0}\nabla^2\right)\psi_{z,z} = i\hbar\frac{\partial}{\partial t}\psi_{z,z}$$

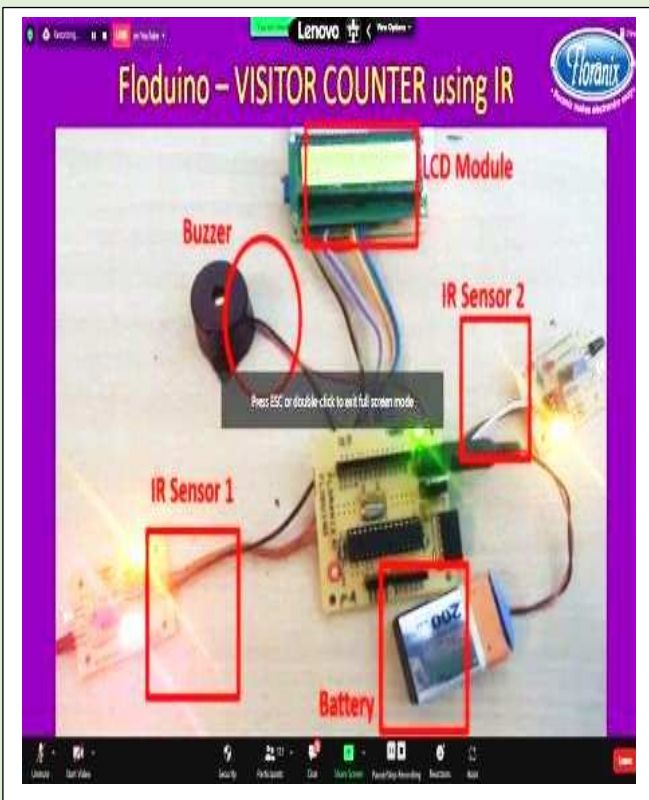
Solution:

$$\psi_{z,z} = e^{i(kz - Et/\hbar)} \quad k = 2\pi/\lambda, \quad l = 1, 2, 3, \dots$$
$$E = \frac{\hbar^2 k^2}{2m_0}$$

Electron behavior: plane wave



The diagram shows a potential well with two barriers. The wave function $\psi(x)$ is zero in the barriers and oscillatory in the well. The energy levels are labeled E_1, E_2, E_3 . The wave function is labeled $\psi(x) = 0$ in the barriers and $\psi(x) \neq 0$ in the well.



The two days National Webinar on “Microprocessor and Microcontroller for College students” organised by the Department of Physics, Marian Star Centre, St. Mary's College (Autonomous), Thoothukudi, sponsored by Department of Biotechnology, Government of India, New Delhi was held on 8th and 9th November 2021 at 2.30 pm through zoom platform. Dr. G. Kumar Sathiyam, Former Professor, Head Department of Physics & Academic Dean, Madras Christian College, Tambaram, Chennai and Proprietor, Floranix, Chennai was the resource person on both days. Around 220 participants took part in the programme.

An in service training for the school teachers sponsored by the DBT star scheme on 25.03.2022 commenced with a prayer and a welcome address by Dr. Sr. Jessie, Head of the department of Physics. Around 25 Physics teachers enthusiastically participated.



A five days faculty development program was organized from 23rd to 27th November, 2021. The First day session on biomedical applications of Nanomaterials was held on 23.11.2021. The resource person Dr. P. Gopinath, Head Centre of Nanotechnology, Department of Biosciences and Bioengineering, Indian Institute of Technology Roorkee, Uttarakhand. The Second day session started off with the lecture on Palmyraculture: An insight into the role of Asian Palmyra palm in Nanoscience and Nano technology Biomedical applications of Nanomaterials was held on 23.11.2021. Dr.P. Mosae Selvakumar, Assistant Professor, Asian university of Women, Bangladesh. The third day session on Nanomaterials and its industrial Applications was held on 25.11.2021. Dr. S. Senthil Velan, Associate Professor of Chemistry, Annamalai University, Chidambaram. The Fourth day session on UV-Vis Spectroscopy of Nanomaterials was held on 26.11.2021. Dr. Israel VMN Enoch, Professor & Technology Head, Centre for Nanoscience and Genomics, Karunya Institute of Technology and Sciences, Coimbatore. The Fifth day session on Micro - Nano Fabrication techniques and its application in sensors was held on 23.11.2021. The resource person Dr. P. Dinesh R Rotake, Research Associate, Electrical Engineering Department, IIT, Hyderabad.

Lab Activities

The students actively participated in a series of engaging 81 lab activities designed to enhance their understanding of core concepts and practical skills. They attended hands-on sessions that involved conducting experiments, analyzing data, and applying theoretical knowledge to real-world scenarios. From working with advanced laboratory equipment to collaborating in teams to solve complex problems, the activities encouraged critical thinking and innovation. These sessions provided valuable opportunities for students to deepen their subject comprehension, develop technical expertise, and foster a collaborative spirit. Their consistent enthusiasm and dedication were evident throughout each activity, contributing to a dynamic and productive learning environment.

MENTOR- MENTEE SYSTEM

The students actively engaged in the mentor-mentee system, a structured program designed to foster guidance, support, and personal growth. Through regular interactions, mentors provided valuable insights, academic advice, and career guidance tailored to the mentees' individual needs and aspirations. These sessions created a platform for open communication, enabling students to address challenges, set goals, and build confidence. The program also encouraged the development of strong interpersonal connections, as mentors shared their experiences and mentees actively participated in discussions and activities. This system not only strengthened their academic journey but also nurtured a sense of community and mutual learning.

Semester	Dates
ODD	24.9.21
	18.10.21
	27.10.21
EVEN	12.11.21
	24.12.21
	27.1.22
	4.2.22
	11.3.22
	18.3.22

ALUMNÆ MEET

The alumni meet was a vibrant and nostalgic gathering, bringing together former students from various batches to reconnect with their alma mater. The event was held on 23.04.2022 and served as a platform for alumni to share their professional journeys, experiences, and achievements, inspiring the current students and faculty alike. It was a joyous occasion filled with engaging speeches, cultural performances, and networking opportunities. The alumni reminisced about their time on campus, revisiting cherished memories while expressing gratitude for the foundation the institution provided. The meet reinforced the bond between the alumni and the institution, fostering a sense of pride, belonging, and continued collaboration for future growth and success.

PTA

The Parent-Teacher Association (PTA) meeting was held on 09.04.2022 and 17.09.2022 it was a constructive and collaborative session aimed at fostering strong communication between parents and the institution. Parents had the opportunity to interact with teachers, gaining insights into their child's academic progress, co-curricular involvement, and overall development. Teachers shared detailed feedback, highlighted strengths, and suggested areas for improvement, ensuring a comprehensive understanding of each student's growth. The meeting also served as a platform for discussing institutional updates, upcoming events, and initiatives aimed at enhancing the learning environment. Parents actively contributed their perspectives, fostering a sense of partnership and mutual commitment to the students' success.

BOARD OF STUDIES

The Board of Studies meeting was held on 26.02.2022 and 3 external experts attended the meeting namely Dr. Sabarinathan Venkatachalam, Dr. Krishnabama, Mr. J.E. John Dalton and the department has successfully implemented the Choice-Based Credit System (CBCS) and Outcome-Based Education (OBE) framework. This has ensured a student-centric approach, flexibility, and accountability in the academic programme.



EDUCATIONAL TOUR/IV

- On 15-02-2022, "Field visit to Killikulam" was organized by PG Department of Physics.. Students and staff members have benefited from it.
- 18 students have participated in the educational tour to "Solar Observatory, Kodaikanal" on 04.03.2022 gaining valuable insights into specialized telescope and instruments.



STAFF ACTIVITIES

DR. A. NIRMALA SHIRLEY

Date	Paper Presented/ Participated	Title of the Paper	Title of Workshop/ Seminar/ FDP/ Conferences	Organized By	Type
07.05.2022	Participated	-	Online Reference Management Tools for Manuscripts and Theses	Library Committee and Marian Research Forum, St. Mary's College (Autonomous), Thoothukudi	National Webinar
18.04.22 - 24.04.22	Participated	-	Enhancing Quality by Unearthing Innovative Practices- EQUIP 2022	IQAC , Mannar Tirumalai Naicker College, Madurai & A P C Mahalakshmi College For Women, Thoothukudi in Collaboration with IQAC Cluster	One week Online FDP
21.03.22 - 25.03.22	Participated	-	Advanced Computational Methods in Energy & Power Sector	Electrical Engineering Department, Engineering College, Bikaner (Rajasthan) & Sponsored by TEQIP-3	One week Online FDP
07.03.22 - 16.03.22	Participated	-	Recent Advancements in Sustainable Development through Renewable Energy Systems	Electrical Engineering Department, Engineering College, Bikaner (Rajasthan) & Sponsored by TEQIP-3	Two Weeks Online FDP
03.03.22 & 04.03.22	Participated	-	Climate Change and Future Challenges	Marian Star Centre, Department of Botany, St. Mary's College (Autonomous), Thoothukudi, sponsored by the Department of Biotechnology, New Delhi	International Webinar

P. PADMAVATHI

Date	Paper Presented/ Participated	Title of the Paper	Title of Workshop/ Seminar/ FDP/ Conferences	Organized By	Type
18.02.2022 - 23.02.2022	Participated	-	Department of Physics, St. Mary's College, Thoothukudi	Online FDP on Smart materials for New technology	International FDP
07.02.2022- 08.02.2022	Participated	-	Department of Physics, Jamal Mohamed College (Autonomous), Tiruchirappalli	An online FDP on Astronomical studies	National FDP
10.01.2022	Participated	-	Library Committee, St. Mary's College, Thoothukudi	Hands on Tutorial on Library without walls: E-Resources through NLIST	National
23.11.2021 - 27.11.2021	Participated	-	Department of Physics, St. Mary's College, Thoothukudi	Five days international faculty Development Programme on Nano materials	International FDP

S. SARAVANA SELVI

Date	Paper Presented/ Participated	Title of the Paper	Organized By	Workshop/ Seminar/ FDP/ Conferences	Type
Jan – Apr 2021	-	Experimental physics II	NPTEL	-	Elite
Jan – Apr 2021	-	Biomass conversion and biorefinery	NPTEL	FDP	Elite
10/09/2021 to 12/09/2021	Presented	The Effect of Nitrogen Doping on Almond (<i>Prunus dulcis</i>) Gum Derived Biocarbon for Supercapacitor Application	Mahatma Gandhi University, Kottayam.	Conference	International
23.11.2021 - 27.11.2021	Participated	-	Department of Physics, St. Mary's College, Thoothukudi	Five days international faculty Development Programme on Nano materials	International FDP
18.02.2022 - 23.02.2022	Participated	-	Department of Physics, St. Mary's College, Thoothukudi	Online FDP on Smart materials for New technology	International FDP

PAPERS PUBLISHED

Paper Title	Author(s)	Journal	Year	Volume	Issue	Page No.
A discussion of acoustical parameters in binary mixtures at different temperatures: An ultrasonic study	P. Padmavathi, S.Irudaya Sahaya Lancy, Krishna Kumar Pandey, A. Mathana Gopal, J.Poongodi, A. MosesEzhil Raj	International Journal of Scientific Research in Science and Technology	2021	8	1	16-20
Comparative Analysis of Commercial and Herbal Extorted Cough Syrups in Tamilnadu (South India) Zone - An Investigation by Methodologies of Spectral Way and High Frequency (Ultrasonic) Waves to Predict Samples Efficacy	P Padmavathi, Senthil Kannan K, Jessie Fernando, Poongodi , Vijayalakshmi B, Moses Ezhil raj, Irudaya Sahaya Lancy S	AIP Conference proceedings	2022	2385		060001- 060006

Paper Title	Author(s)	Journal	Year	Volume	Issue	Page No.
Automatic Windshield Wiper Using Servomotor and Embedded Microcontroller	J. Diana Rosary A. Nirmala Shirley G. Kumar Sathian	Marian Quest	2022	12	-	104- 112
Analytical Study of deposition of TiO ₂ and SiO multilayers for blue color display	M. Sheeba, A. Nirmala Shirley, S. Surendarnath, J. JebarajDevadason	AIP Conference Proceedings	2022	2446	1	130011(1-5)
Studies of ZnS thin Films Synthesized by Nebulizer Spray Pyrolysis Technique for Solar Cell Applications	A. Nirmala Shirley, M. Sheeba , J. JebarajDevadason	AIP Conference Proceedings	2022	2446	1	130012 (1-4)
Structural and Morphological Characterization of Zinc Selenide Thin Film by SILAR Method	J. Diana Rosary A. Nirmala Shirley G. Kumar Sathian	Marian Quest	2022	12	-	121-

AWARDS AND HONOURS:

Name of the Staff	Department	Name of the Award	Name of the Awarding Agency with address	Date
Dr. A. Nirmala Shirley	Physics	Eminent Faculty Award	Thannammal Educational Trust, K. Pethananthal, Sivagangai District & Siddhar Tamil Research Center	15- July- 2022
Dr. A. Nirmala Shirley	Physics	Academic Excellence Award	Institute of Researchers, Wayanad, Kerala (India)	22- June- 2022
Dr. A. Nirmala Shirley	Physics	Grabs Virtual Award 2021- Best Young Faculty Award	TamilNadu Association of Intellectuals and faculty (TAIF) & Grabs Educational Charitable Trust, Chennai.	13-June- 2021

STUDENT ACTIVITIES

6 students from II PG have completed 6 projects, demonstrating their research work and problem solving skills. Students undertook a range of innovative projects, and applying theoretical knowledge to practical scenarios.

Academic Achievement

Achieving a 100% pass percentage is a remarkable milestone that reflects the unwavering dedication of both students and staff. This outstanding accomplishment is a testament to the hard work, perseverance, and commitment of the students, who have shown exceptional focus and determination throughout their journey. Equally, it highlights the tireless efforts and guidance of the staff, whose passion for teaching and mentoring has been instrumental in fostering a supportive and inspiring learning environment. Together, their collaborative spirit and shared pursuit of excellence have brought this extraordinary success, setting a shining example of what can be achieved through teamwork and determination. Congratulations to everyone involved in this remarkable achievement!

MOOC EXAM

NAME OF THE PAPER: Fundamentals of Spectroscopy

SUBJECT CODE: noc22_cy23

DURATION: January-April 2022 (12 weeks)

S.No.	Reg.No.	Student Name	Internal	External	Total	Grade
1.	21SPPH01	ANJUTHA. R	18.35	41.25	60	Elite
2.	21SPPH02	AROCKIA PUNITHA. K	16.63	36.23	53	Successfully completed
3.	21SPPH03	MAHALAKSHMI. J	15.6	39	55	Successfully completed
4.	21SPPH04	MANGAIYARKARASI. P	18.1	32.51	51	Successfully completed
5.	21SPPH05	MECKANCY. A	17.1	49.49	67	Elite
6.	21SPPH06	MOHAMED SHIFANA. M	17.31	43.88	61	Elite

Elite

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to
ANJUTHA
for successfully completing the course
Fundamentals of Spectroscopy
with a consolidated score of **60** %

Online Assignments	18.35/25	Proctored Exam	41.25/75
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Total number of candidates certified in this course: **116**

Jan-Apr 2022
(12 week course)

Prof. M. S. Santhanam
Dean, International Relations and Outreach
IISER Pune

Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras

IISER - Indian Institute of Science Education
and Research Pune

swayam
INDIA WISE, SKILL WISE

Roll No: NPTEL22CY23S34330128

To validate and check scores: <https://nptel.ac.in/noc>