

## **PHYSICS ASSOCIATION REPORT 2021-22**

The Department of Physics offers B.Sc. Physics (Vocational-Model II Applied Electronics) from the year 2001 onwards and new course-Integrated Programme in Basic Sciences-Physics from 2021 onwards, with the aim of upskilling knowledge in all areas of Physics. The Department aims at overall development of its students not only in academics but also in co-curricular activities. The two best practices of Department of Physics are Vocational Education Training and Energy & Environmental Protection. Physics Association conducted various curricular and co-curricular activities during the academic year 2021-22 with the support of Head of the Department Dr. Anupama P. and other faculties of the Department. Dr. Rajani Jacob served as the Lecture in charge of Physics Association. Following students were selected as the office bearers.

Association Secretary: Ms. Nasooha Jalal (II B.Sc. Physics)

Committee Members: Ms. Fathima Shiril (III B.Sc. Physics)

Ms. Aiswarya Ramesh (II B.Sc. Physics)

Ms. Syamini Sasi (I B.Sc. Physics)

Ms. Anakha P.S. (I IP)

### **ACHIEVEMENTS**

The major achievements of the year 2021-2022 are listed below:

- Two final year students bagged top positions in the University examinations.

**Ranks:**



Sara Abey- CCPA-9.06-Rank-6



Anitha Thomas-CCPA-9.36-Rank-8

- Government has sanctioned **Integrated MSc Physics** under new generation course category in aided stream and classes were begun during this academic year.
- A refresher course in Physics, **Recent Advances in Physics** was organized by Department of Physics, Mar Thoma College for Women, Perumbavoor in association with STRIDE(UGC-MHRD), Mahatma Gandhi University, Kottayam, Kerala from 10 July to 24 July 2021 for the teachers. This was the first refresher course which STRIDE

MG University organizing in association with an affiliated college. The programme got inaugurated by Dr. V. Shivadasan M.P. Rajyasabha and presided by Prof. Dr. Sabu Thomas, STRIDE Chairman & Vice Chancellor, MG University. The resource persons of this programme were experts from reputed institutions all over India and also from abroad.





മഹാത്മാഗാന്ധി സർവ്വകലാശാല, കേരളം  
Mahatma Gandhi University, Kerala  
महात्मा गांधी विश्वविद्यालय, केरल  
Re-accredited by NAAC with A Grade



MAR THOMA COLLEGE FOR WOMEN  
Perumbavoor, Ernakulam, Kerala.  
Affiliated to MG University & Accredited 'B+' by NAAC

Refresher course in Physics  
10 July- 24 July 2021,  
**Recent Advances in Physics**

**Inaugural Function**

10 July 2021 9:00 am

**Programme Schedule**

**Prayer Song**

**Welcome Speech :**

**Dr. Anupama P**

Programme Coordinator & HoD, Department of Physics

**Presidential address:**

**Prof. Dr. Sabu Thomas**

Honourable Vice Chancellor M G University

**Introductory Remarks:**

**Dr. Abhilash Babu**

Coordinator, STRIDE, MG University

**Inaugural Address:**

**Dr. V. Sivadasan**

Honourable MP, Rajyasabha

**Special address:**

**Dr. Biju Lakshman**

Director, School of Distance education, MG University

**Felicitation:**

**Dr. Sujo Mary Varghese**

Principal in charge, Mar Thoma College for Women, Perumbavoor

**Vote of Thanks:**

**Dr. Paulose Thomas**

Joint Programme Coordinator, Department of Physics,

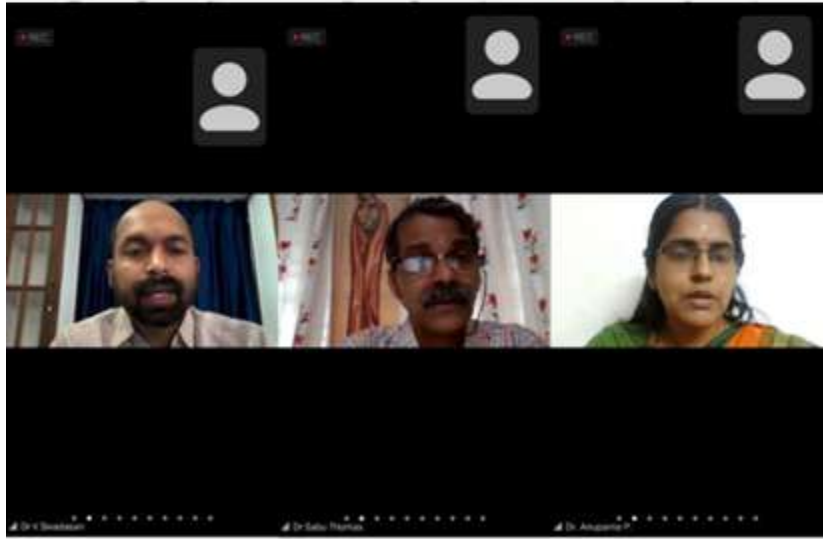
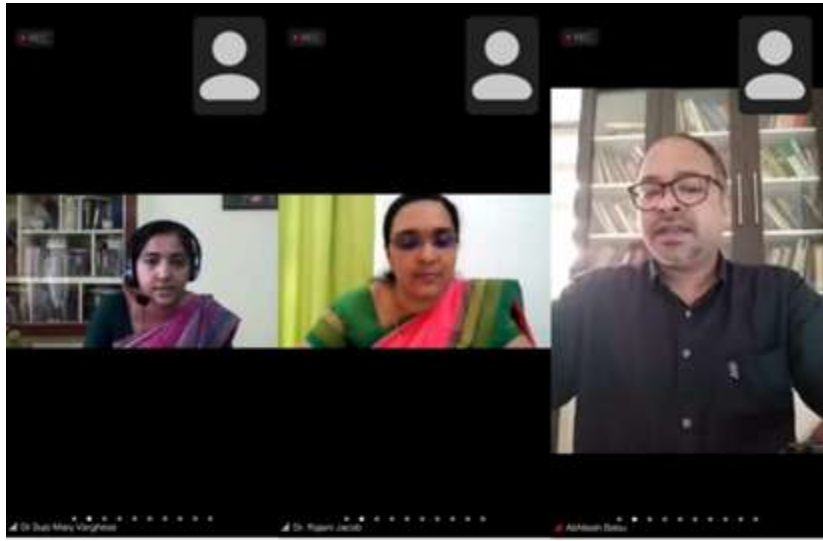
Mar Thoma College for Women, Perumbavoor

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- Physics department applied for a funding of Rs.50000/- for celebrating Energy Conservation day as part of Azadi ka Amrit Maholsav from Energy Management Centre Kerala and our proposal got sanctioned. Department conducted various programmes as part of this. Adv. Eldhose Kunnappilly, MLA Perumbavoor inaugurated the programme.
- Department of Physics took initiative in applying for campaign partner of ANERT, Department of Power Kerala as part of publicity of solar rooftop project. Only two



colleges in Ernakulam district got selected as campaign partner and our college is one among them.

- Department of Physics launched an academic collaboration with Pavanatma College, Murickassery and the department offered an online Certificate course in Applied Electronics for the students of Pavanatma College through LMS Moodle and Google Meet.
- Students of the department made LED stars. The stars were put a sale. .It got inaugurated by Adv. Eldhose Kunnappilly,MLA.
- Anna Davis of III B.Sc. Physics got **Summer Research Fellowship programme** at IIST, Trivandrum.
- 15 students of III B.Sc. Physics have done internship programme on **Energy Audit** which is jointly organized by the Department of Physics and Energy Conservation Society. As their practical work they did the energy audit of the college.



- Seven of our students have done **Basic Course in Astronomy** in online in the academic year 2021-22, offered by Breakthrough Science Society, Kerala Chapter. Students are also doing online certificate courses through Coursera (from international universities)
- 15 students of final year B.Sc. Physics completed a certificate course on ‘**Basics in C programming**’ offered by Pavanatma College, Murickassery.
- Ms. Shahanas T.S. from II B.Sc. Physics got first prize in the **All Kerala Science Quiz** Programme conducted by Breakthrough Science Society, Ernakulam Chapter.



### **CERTIFICATE COURSE OFFERED BY OUR DEPARTMENT**

Department of Physics offers a certificate course in Applied Electronics to students of other colleges and the first batch had been started on 29 November 2021 with the students of B.Sc. Physics, Pavanatma College, Murickassery.

### **LECTURES**

#### **□ ALUMNI LECTURE SERIES**

- Department initiated to start an Alumni lecture series to continue building relationships between alumni, current students and faculty. First lecture was delivered by Dr. Anjali A.R. (2010-2013 batch), Research Associate, Newcastle University, UK on 20 November 2021.



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- Alumni lecture-2 was delivered by Dr. LiniDevassy (2002-2005 batch), Asst. Professor, Dept. of Physics, Bharat Matha College, Thrikkakara on 17 December 2021 and Physics Association was officially inaugurated on the same day by Dr. Lini.


**Mar Thoma College for Women**  
**Perumbavoor**  
**Department of Physics**  
**ASSOCIATION INAUGURATION &**  
**ALUMNI LECTURE SERIES 2**  
**Meet our Alumna**  
*B.Sc. Physics ( Applied Electronics )*  
*2002 - 2005 Batch*

  
**Dr. Lini Devassy**  
 Asst. Professor, Department of Physics  
 Bharat Matha College, Thrikkakara

**17 December 2021**  
**Friday**  
**Time:**  
**10 AM**

**VENUE: PG Seminar Hall**

**Nasooha Jalal**  
 ( Association Secretary )

□ **MY STORY- MOTIVATIONAL SESSION BY SUCCESSFUL IDEATORS**

In association with Institution's Innovation Council, Department organized My Story session in which Ms. Jinu John, Ms. Anitha Thomas and Ms. Ann Maria Jose of our Dept. presented the

topics-AI Based brain signal interpreter, Reversible step and ramp, respectively who were the Winners and finalists of Young Innovators Programme (YIP) 2019-2022.



#### □ INVITED TALK

An expert talk has been arranged in association with Institution's Innovation Council, on 'Innovations in Solar Power-Sun Powers Cochin Airport' on 12 January 2022 and the resource person was Mr. Rajumon P.C., DGM, Cochin International Airport Ltd.



### **COMPETITIVE EXAMINATIONS AND COACHING**

Talent Search Exam (TSE-2021) was conducted in association with Academy of Physics Teachers (APT), Kerala. Students from first, second and third year classes attended the exam.

### **YOUNG INNOVATORS PROGRAMME**

- Three student teams from our Department participated in the second level evaluation of the Young Innovators Programme (YIP 2020) conducted by Kerala Development and Innovation Strategic Council (K-DISC), Kerala. They also attended the training programme on Introduction to Design Thinking and Pitch deck preparation conducted during 7 April and 5 May 2021 by YIP, K-DISC.
- Seventeen students (4 teams) of Physics Department are participating and have submitted their innovative ideas in Maestro Challenge-YIP 2021. Team from I B.Sc. Physics submitted an innovative idea of 'Wireless Charging of Automobiles by Electromagnetic Induction', Two teams from II B.Sc. Physics submitted the ideas – Paper from Algae and Ayurveda Plant Biometric App. Electricity from waste plastic is the idea proposed by the team from I Integrated Physics.

## CELEBRATION DAYS

Every year the Department celebrates days of national and international importance. This year the different days celebrated are:

### □ NATIONAL SCIENCE DAY CELEBRATION

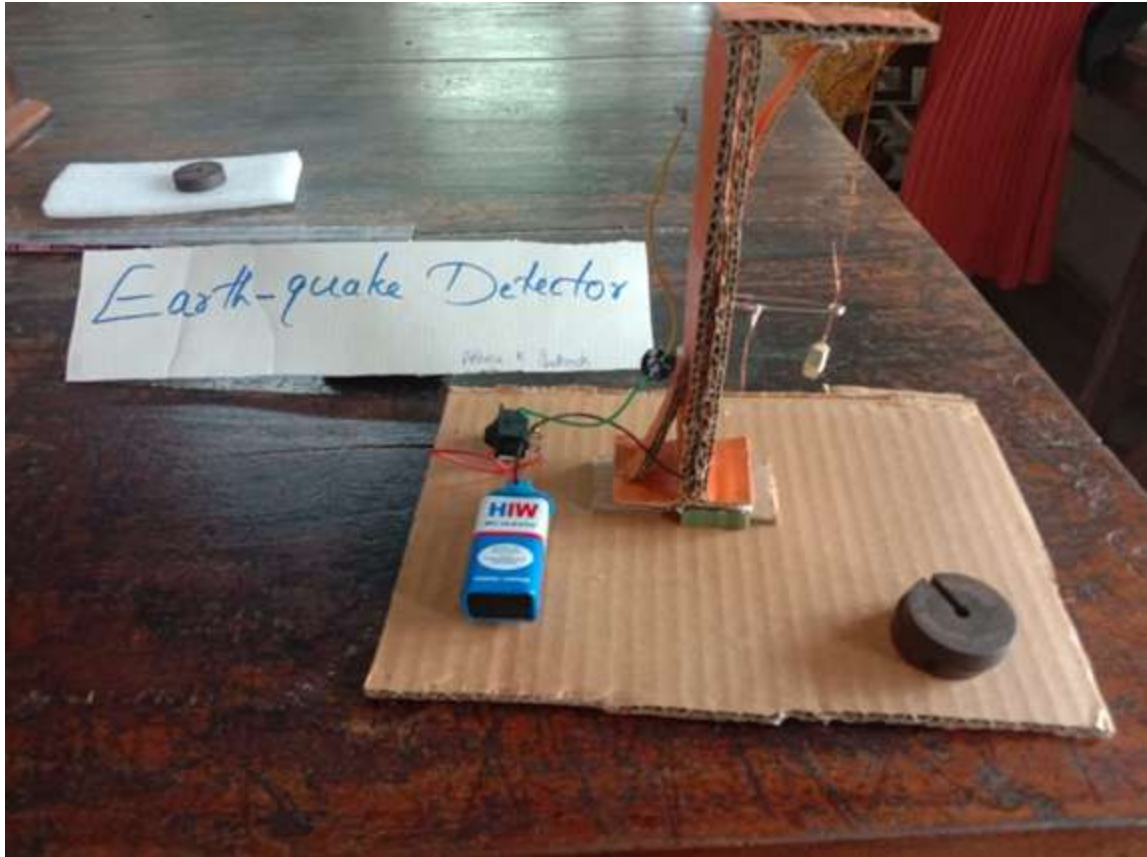
- Department of Physics, Mar Thoma College for Women, Perumbavoor celebrated the National Science Day 2022 by organizing activities like competition and presentation with the support of Academy of Physics Teachers (APT), Kerala. We conducted an intercollegiate powerpoint presentation competition on 'Integrated Approach in Science and Technology for Sustainable Future'.





- Also, an **interdepartmental power point presentation** has been arranged in the college on 28 February 2022. Groups consisting of 5 students, from the four science departments of our college- Mathematics, Physics, Zoology and Chemistry, presented relevant topics including the details of contribution of scientists in the field of fundamental discoveries. The topics of presentation were Beauty of nature in the language of Mathematics, Great Indian Physicists, Eminent Scientists who unveiled the science of Life and Green Chemistry.
- A one-day **science exhibition** was also arranged on 3 March 2022 by the students and they exhibited various interesting optics and electronic experiments and innovative projects like automatic hand sanitizer, earthquake detector, dancing laser show etc.

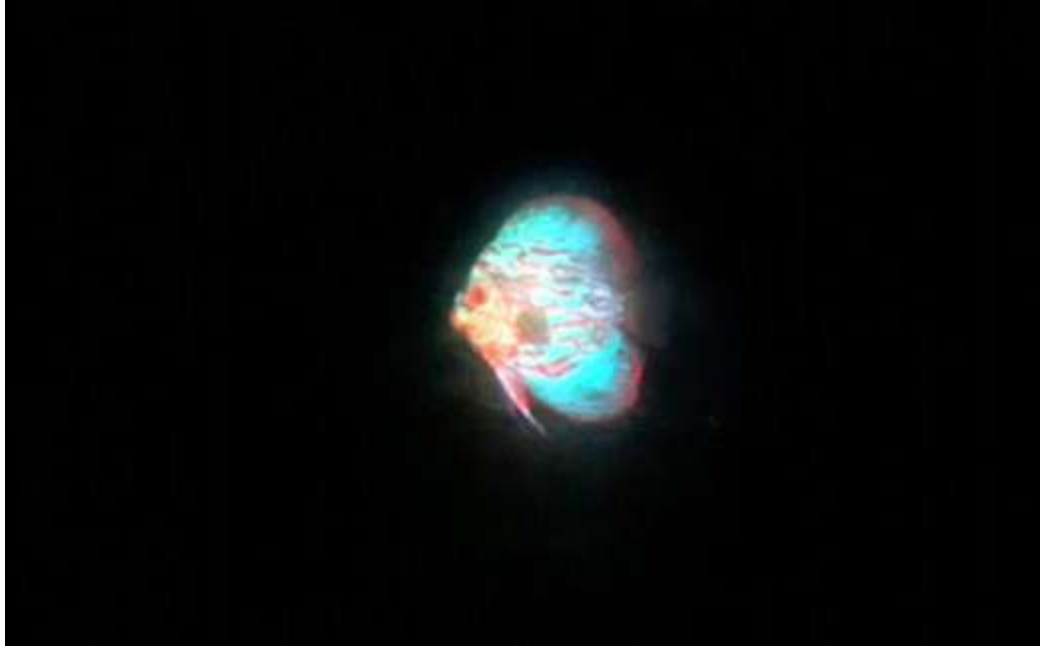




# AUTOMATIC HAND SANITISER

By  
Farsana Ashraf & Fatima Shant  
3rd Year





□ **NATIONAL ENERGY CONSERVATION DAY CELEBRATIONS**

- Department of Physics conducted Energy Awareness Campaign as part of '**Energy Conservation Day 2021**' in association with Energy Management Centre, Kerala as part of Azadi Ka Amrit Maholsav. The programme was conducted in offline mode on 10 December 2021. Covid protocol has been strictly followed throughout the programme. The awareness programme was inaugurated by the honorable M.L.A. of Perumbavoor, **Adv. Eldhose Kunnappilly**. Er. Antony M. T. (Retd. Engineer, KSEB and Principal, Social Welfare ITI, Aluva) was the resource person for two sessions.



- **Urjakiran** 2021-22, Go Electric campaign was organized in association with Urjamithra, Perumbavoor. As part of that, an awareness rally, energy conservation pledge taking, classes etc. were conducted in Perumbavoor municipality. Students actively participated in all the programmes conducted on 14 December 2021.



□ **WORLD SPACE WEEK CELEBRATIONS**

In association with Breakthrough Science Society, Ernakulam Chapter two webinars were organized on the topics- Talk on Mangalyan and History of Space Mission by Mr. Sajeev Kumar P.P, BPCL,Cochin Refinery and Mr. Harikumar K.S., Dy. Manager(Fire and Safety),FACT(Rtd) respectively. An online space quiz was also conducted.



□ **ONAM CELEBRATION**

Department celebrated Onam and conducted competitions like PunchiriMalsaramand Sundarikkupottuthodeel on 18 August 2021.

□ **AZADI KA AMRUT MAHOTSAV- INDEPENDENCE DAY CELEBRATION**

Slogan Writing competition was held as part of Azadi ka Amrut Mahotsav- Independence Day Celebration on 15 August 2021.

□ **READING WEEK CELEBRATIONS**

Competitions such as Online quiz, Reading Competition, Recitation Competition and Photography and Documentary Competition were conducted for all students of the college from 21 – 26 June 2021.

□ **NATIONAL ELECTRICITYSECURITY DAY**

Department initiated an awareness campaign on 26 June 2021 to promote electrical safety in the home and college.

**LED STAR MAKING**

As a continuation of the previous years, in 2021 too, the students of our department made LED stars during the months of November and December and put for sale. **Adv. Eldhose Kunnappilly, MLA**, inaugurated the sale.







### **SKY WATCH**

On 16 March 2022 a **sky watch** programme has been arranged in our college and many students, teachers and neighbours with their families attended the programme. The programme was conducted in association with Breakthrough Science Society, Ernakulam chapter who arranged a telescope to watch the close view of Moon and other celestial bodies and arranged a very enthusiastic interactive session with students.



**GLIMPSES FROM ARTS FESTIVAL**





**Mime @physics  
Marthoma college for woman**



## **TRIP**

The final year students conducted a one-day study tour to Marayoor, Kanthalloor and Munnar on 11 March 2022.

## **FAREWELL**

II and I year students bid a warm farewell to the final year students with lunch and entertainment programmes on 25 March 2022.

## **PUBLICATIONS:**

### **Dr. Paulose Thomas**

Book Chapter

Hand book of Carbon Nanotubes-Carbon nanotubes for nano electronics and microelectronic devices,

Anju K Nair, Paulose Thomas, Kala M S, N Kalarikkal, Handbook of Carbon Nanotubes, Springer

Publication, accepted on 3rd march 2022.

### **Dr. Rajani Jacob**

1. Enhanced photocatalytic activity of nZnO/n+Al:ZnO homojunction with an overlayer of Al<sub>2</sub>O<sub>3</sub> nanoballs,

Surya Mary A, Julie Ann Joseph, Bindu G Nair, Rajani Jacob, Stephen K Remillard, Forest D Rulison,

Sadasivan Shaji and Rachel Reena Philip, Journal of Physics D: Applied Physics, Volume 55, Number 17,

2022.

2. Transparent heterojunctions of Cu-based delafossites n-CuInO<sub>2</sub>/p-CuGaO<sub>2</sub> by reactive evaporation method

for transparent electronic applications, Chinnu Esthan, Bindu G.Nair, A.Surya, Mary Julie Ann Joseph, Linu

Mary Joseph, Rajani Jacob, V.K.Shinoj, Rachel ReenaPhilip, Vacuum, Volume 197, March 2022, 110808