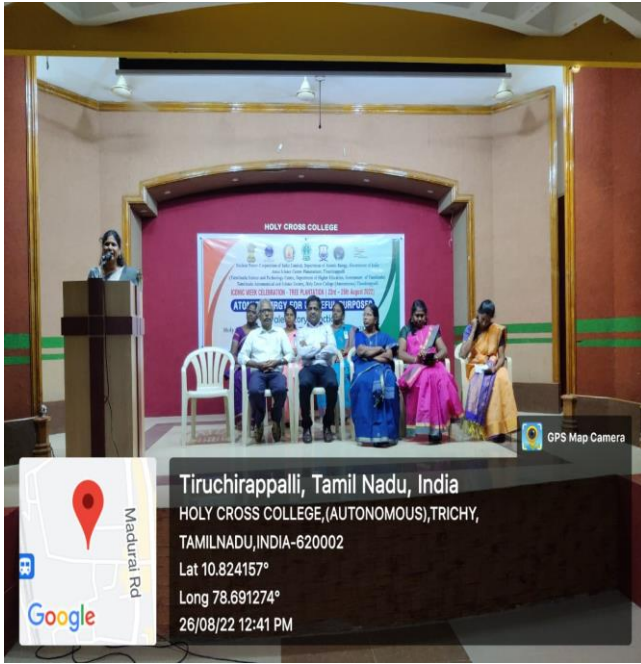


PHYSICS ASSOCIATION – LONG REPORT 2022-2023

The government of India is celebrating a year-long program Azadi Ka Amrit Mahotsav to pay homage to and showcase India's achievements in 75 years of Independence. In regard to this, Nuclear power corporation of India Limited, Department of Atomic Energy, Government of India, Anna Science Centre- Planetarium, Tiruchirappalli (Tamil Nadu Science and Technology Centre, Department of Higher Education, Government of Tamil Nadu) Tamil Nadu Astronomical and Science Society, Holy Cross College (Autonomous), Tiruchirappalli jointly organized " The Iconic Week Celebration" an Inter-school Contest (23rd - 26th August 2022) for the school children in and around Tiruchirappalli to create awareness about the usage of Atomic Energy for peaceful purposes. Competitions such as

- (1) Essay Competition (Tamil and English)
- (2) Quiz Competition (English)
- (3) Painting Competition

were conducted on 23rd August 2022 at Holy Cross College (Autonomous), Tiruchirappalli. Nearly 235 students from 25 schools participated. The Valedictory function of the iconic week celebration was held on 26th August 2022. Dr. A. V. Paulin Edwidge Mary, Head of the Department of PG & Research Department of Physics gave the welcome address. Dr. I. Mary Clementia, Assistant Professor of PG & Research Department of Physics, read the report on the Iconic Week. The presidential address was delivered by Thiru. J. Manohar, State coordinator, Tamil Nadu Astronomical and Science Society. Keynote Address was given by Dr. K Pauline Preetha Jebaselvi, Regional Co-ordinator, Tamil Nadu Astronomical and Science Society, **Er. R. Suresh Kumar, Scientific Officer Grade G, Senior Maintenance Engineer (Instrumentation), Kudankulam Nuclear Power Project, Kudankulam** gave a talk on the topic, "Atomic Energy for Peaceful Purposes".





Thirumigu T. Santhi, State Advisor, Tamil Nadu Astronomical and Science Society, Health Activist, Thirumigu R. Jayalakshmi, Block Educational Officer, Manikandam block, Tiruchirappalli Dt and Thirumigu. S. Uma, District coordinator, Tamil Nadu Astronomical and Science Society gave the felicitation address. Thiru. J. Manohar State Co-ordinator, Tamil Nadu Astronomical and Science Society inaugurated the TASS FM Online Radio. Two sandal samplings were planted depicting the pollution-free environment. The best performers in various competitions were given prizes. The Valedictory Function came to an end with the Vote of thanks by Dr. A. Philominal, Assistant professor, PG & Research Department of Physics followed by the National Anthem.

The PG and Research Department of Physics organized a one-day seminar on **Multi-Disciplinary Research in Global focus in Post - Covid Era** on 23rd September 2022.

The session started with a prayer followed by the welcome address.

Dr. Vijayshankar Asokan, Researcher, Limerick University, Ireland, and The Managing Director of Mullai International Academy addressed on the topic "Importance of multi-disciplinary learning after the post-Covid era." The Resource person discussed about Digital Image processing, Machine learning and the working of Electron Microscope in multi disciplinary perspective.



He also explained the various scholarships provided by the European Union, Germany, and United Kingdom that facilitate the women in STEM fields to pursue Multidisciplinary courses in some of the top universities around the world. The chief guest listed the fully funded scholarships that could be made use of the students.

The session was informative and interactive. The students raised questions and their doubts were cleared by the resource person. The session ended with a vote of thanks.

Every journey changes you, for the better. Apart from building academic capability, PG & Research Department of Physics of Holy Cross College (Autonomous) also aims at building skills such as team work, communication, problem solving skills and decision making through life experience which can be enabled by traveling. A group of students of 111 and 5 staff went on **Educational tour to Mysore and Coorg** from 13th - 15th October 2022. We started at 8.45 p.m from Trichirappalli junction on 13th October 2022 and reached Mysore at 9.20 am on 14th October 2022. We went to Railway Museum at 11.00 a.m . Then we visited the Mysore palace at 22.30 p.m . We visited the zoo at 3.00 p.m followed by the visit to Brindhavanam garden at 7.00 p.m.

On 15th October 2022, we departed from Mysore and reached Coorg at 9.00 a.m. we visited Dubare Elephant Camp at 10.00 a.m. Then we visited chiki hole reservoir at 12.30 p.m and then we reached Abbey falls at 3.00 p.m. On 16th October 2022 , we visited Golden temple in the morning at 9. 30 a.m. we visited Bamboo forest at 11.00 a.m. Then we

departed from mysore at 4.15 p.m and reached Trichirappalli at 4.00 a.m on 17th October 2022.
We had a great time and enjoyed a lot and the memories will be cherished forever.



The **Parent – Teachers Association** meeting for the academic year 2022-2023 ODD Semester was held on 30th September 2022 for the classes of II UG , III UG and II PG ,for I UG and I PG, the meeting was held on on 21st October 2022. The meeting was conducted in the PG & Research Department of Physics. The main objective of the meeting was to discuss about the performance of the students in the internal examination conducted in the month of september 2022 .





Nearly 187 parents took part in the meeting. The progress report of the I Internal examination were shown to the parents and feedback about their ward's performance were given to them. Feedback regarding curriculum , infrastructure of the College were collected from the parents.

The Physics Association for the month of November was held on 1st November 2022, the resource person was **Dr. R. Venkatesh, Assistant Professor of Physics, Bishop Heber College (Autonomous), Trichy**. He gave a talk on “ **Metal oxide thin film for multifunctional Applications**” He insisted on the fabrication of metal oxide films , the methodology adopted and finally the applications.



The Meeting on **career Guidance** was conducted on 19th December 2022, the resource person of the session was **Mrs. Manchula Mary, Psychological Counsellor, Therapist & Career counsellor , Coimbatore**. She explained about enhancing self esteem and the methods

of

understanding

one

self.



GPS Map Camera



Tiruchirappalli, Tamil Nadu, India
HOLY CROSS COLLEGE, (AUTONOMOUS), TRICHY,
TAMILNADU, INDIA-620002

Lat 10.824157°

Long 78.691274°

19/12/22 12:01 PM GMT +05:30

The **intercollegiate Physics contest HYPHY ‘ 2023** was organised by the PG and Research Department of Physics of Holy Cross College (Autonomous) , Trichy was held on 11th January 2023. A total of 10 institutions took place in the contest. As scheduled, the Inauguration began at 9.30 a.m. at Sophy’s Hall. The contest started with the welcome address followed by the launching the winners and runner up trophies Various competitions were conducted that includes,

“BREAD BOARD” [CONNECTION] – a game in which various pictures were displayed and the participants have to connect those picture to find the various concept related to physics.

“PITCH YOUR PRODUCT” [ADZAP] – a game in which participants were given a product and they have to enact it as an advertisement to promote the product.

“BRAIN KNOCKERS” [QUIZ] - competition in which the questions related to the physics were displayed on the screen. After the Quiz competition, the lunch was served in PG and Research Department of Physics at 1:30 p.m.

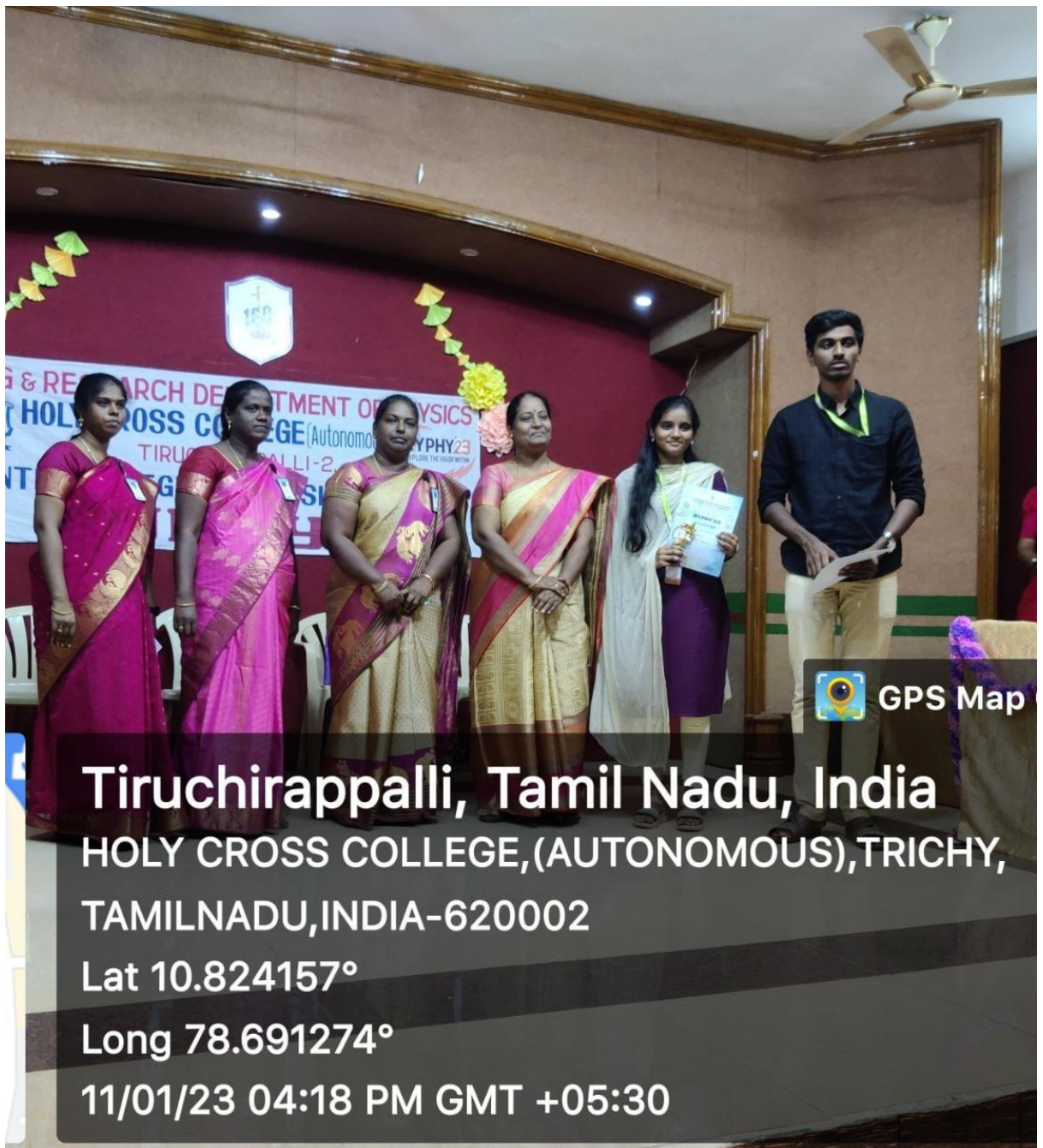
In the post lunch session,

“FLUTTER MY SHUTTER” [PHOTOGRAPHY]- a game in which the participants will be given a theme on the spot and they have to take a picture related to the theme and explain.

“PHYSHAIKU” – [SONGS IN PHYSICS] - a game in which cine songs will be displayed and the participants have to find the physics concepts behind the songs.

The valediction of “HYPHY 2023” commenced at 4.00 p.m. The valedictions was by **Dr.A. Inigomary Rita, Dean, School of Physical sciences and Assistant Professor, PG and Research Department of Physics, Holy Cross College(Autonomous) Trichy** presided over and delivered the valedictory address. Participants from various institutions gave their suggestions and feedback Winners of all the events were given prizes . The overall Winner trophy was won by the students of School of Physics , Bharathidasan University, Trichy and the Runner up trophy was won by the students of PG & Research Department of Physics, Bishop Heber College (Autonomous) , Trichy. The intercollegiate contest came to an end with Vote of thanks followed by the National Anthem at 5 p.m. after the feedback session.





Dr. M. Jamal Mohamed Jaffar, Associate Professor & Head, Jamal Mohamed College (Autonomous) , Trichy took a motivational session to the final year UG students on the topic “ **Safety of Girl Children** ” on 25th January 2023 at 11.30 a.m in the PG & Research Department of Physics, Holy Cross College (Autonomous), Trichy. He insisted the students on the proper usage of the mobile phones.

The PG and Research Department of Physics organized a meeting on the topic Women’s health on 15th February 2023 at 11.30 a.m in Regina’s Hall

The session started with a prayer followed by welcome address. **Dr. Akila Vaidyanathan** MD(OG)., addressed on women’s health and healthy diet. The resource person

enunciated about the proper diet and calories to be consumed per day in order to lead a healthy life. She listed out some of the vaccines that ought to be administered to infants and women. The chief guest briefed about the prevalence of PCOD among 1 in 15 women and she also explained about the causes and medications available in modern medicine.

She expounded on the female reproductive system and elucidated about the cancer risk for women above the age of 40. She also stated that women are prone to Anemia and obesity due to lack of exercise and improper food habits. The question session was crammed with queries. The meeting ended with a vote of thanks followed by college anthem.

The PG & Research Department of Physics organized a two-day **INTERNATIONAL CONFERENCE ON NANOPHOTONICS- ICNP 2023**

DAY 1

Day 1 07-03-2023 the Inauguration begins at 9.30 a.m with a prayer followed by the welcome address delivered by **Dr. Paulin Edwige Mary, A.V.** Conference Chair and Head PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli

Rev. (Sr). Dr. Anne Xavier Secretary and **Rev. (Sr.) Dr. A. Christina Bridget** Principal, Holy Cross College (Autonomous), Tiruchirappalli, India, rendered the felicitations

The inaugural address was given by **Prof. M. Lakshmanan**, F.N.A., FTWAS Professor of Eminence & DST-SERB National Science Chair Department of Nonlinear Dynamics School of Physics Bharathidasan University, Tiruchirappalli, India, and Keynote address was delivered by **Rev. Fr. Dr. Jesuraj Anthoniappen**, SVD Vice President for Academic Affairs University of San Carlos, Cebu City, Philippines. **Dr. Philominal .A** Conference Convener ICNP-2023 proposed the vote of thanks.



TECHNICAL SESSION 1: Dr. Maira Bernadette Leena .A , Assistant professor , PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli introduced the speaker of the session, **Rev. Fr. Dr. Jesuraj Anthoniappen**, SVD Vice President for Academic Affairs University of San Carlos, Cebu City, Philippines, He addressed on the topic **“Nanomaterials: Challenges and opportunities for Innovative Applications.”**

He explained the novel properties and functions of nanomaterials and also discussed the application of nano materials in different identified areas providing lots of opportunities. The Resource person discussed the uses of nano innovations in different industries and possible opportunities for new nanotechnology-based products and services due to challenges for human prosperity on earth.

TECHNICAL SESSION 2: Ms. Babiyana, S ,Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli introduced the speaker, **Dr. R. Vasantha Jayakanthan Raja**, school of electric and electronics engineering, Department of Physics, Sastra University, Thanjavur, India. He discussed on the topic **“Simultaneous Pulse Compression and Pedestal suppression.”**

The resource person discussed the importance of diagnosis of HIV virus instantly by using the Non-Linear Pulse Compression mechanism and also explained the role of a Nonlinear optical loop mirror in the suppression of pedestal and formation of high-quality compressed pulses.

TECHNICAL SESSION 3: Dr. Vasumathi. V , Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli introduced the speaker **Dr. Logu Thirumalaisamy**, Newton International Fellow: Royal Society of London, Uk, Assistant Professor, Department of Physics, G.T.N Arts College, Madurai, India. He routes on the topic **“CD4+T lymphocytes Counter and Impacts of X-ray and Photoelectron in a semiconductor.”**

He explained the process of CD4+T cell counting by coupling magnetic activated cell sorting to separate CD4+T cells from blood using an automated cell counting system.

TECHNICAL SESSION 4: Dr. Juliat Josephine, A. Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli, introduced the speaker **Dr. Ashraf Ali** Post Doctoral Researcher at Emirates for energy and environment research United Arab Emirates University, UAE. Dr. Ashraf Ali connected with us virtually and addressed on the topic **“Nanophotonics: Overview and Recent Advances- Plasmonic Resonances in Silver thin films for Biosensor Applications-Fabrication of Microelectronic devices for Gas sensing applications.”**

He explained the various techniques for the synthesis of silver nanoparticles, He showed all the experimental setup of the process and explained the Surface Plasma Resonance method based on optical measurement of refractive index changes associated with the binding of analyte molecules in a sample to recognize molecules immobilized on the SPR sensor.

The Researcher discussed about the gas sensors used the property oxygen absorbed on a metal oxide that is heated and reacts with the gas to be detected thereby changing the sensor resistance value.

All the sessions ended up with question sessions

DAY 2

Day 2 08-03-2023 The conference started with the prayer song as it is the link that connects us with the almighty, followed by the technical sessions.

TECHNICAL SESSION 5: Ms. Jasmine Banu, A. Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli, introduced the speaker **Dr. Jumisree Sharmah Pathak**, Assistance Professor, Department of physics Indian Institute of Teacher Education, Gandhinagar, Gujarat, India.

She presented her talk on the topic **“the spectroscopy of nanophotonics produced by the laser-induced plasma”**. She briefed on the various new terms like Porosity, Irradiance, etc, and explained the usage of gold nanoparticles in detail. Through this session how nanophotonics produced by laser-induced plasma was brought to light.

TECHNICAL SESSION 6: Ms. Arockiya Diana. G, Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli, introduced the speaker **Dr. MD. Mabud Hossain**, Assistant Professor, Department of physics, Aliah University, Kolkata, India.

Dr. MD. Mabud Hossain presented on the topic **“Controlling laser-induced atomic coherence in vapour cells and hollow-core photonic crystal fiber”**. He explained the ETI and EIT peaks in UV-Vis spectroscopy, and how it is used to analyse the energy transmission. Through this session how the hollow core photonic crystal is made and how it is altered for its betterment was made clear.

TECHNICAL SESSION 7: Ms. Roselin Jeyaseeli. J, Assistant Professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli, introduced the speaker **Dr. Arvind Kumar Saxena** department of physics Gujarat arts and science college (GASC), Ahmedabad, India.

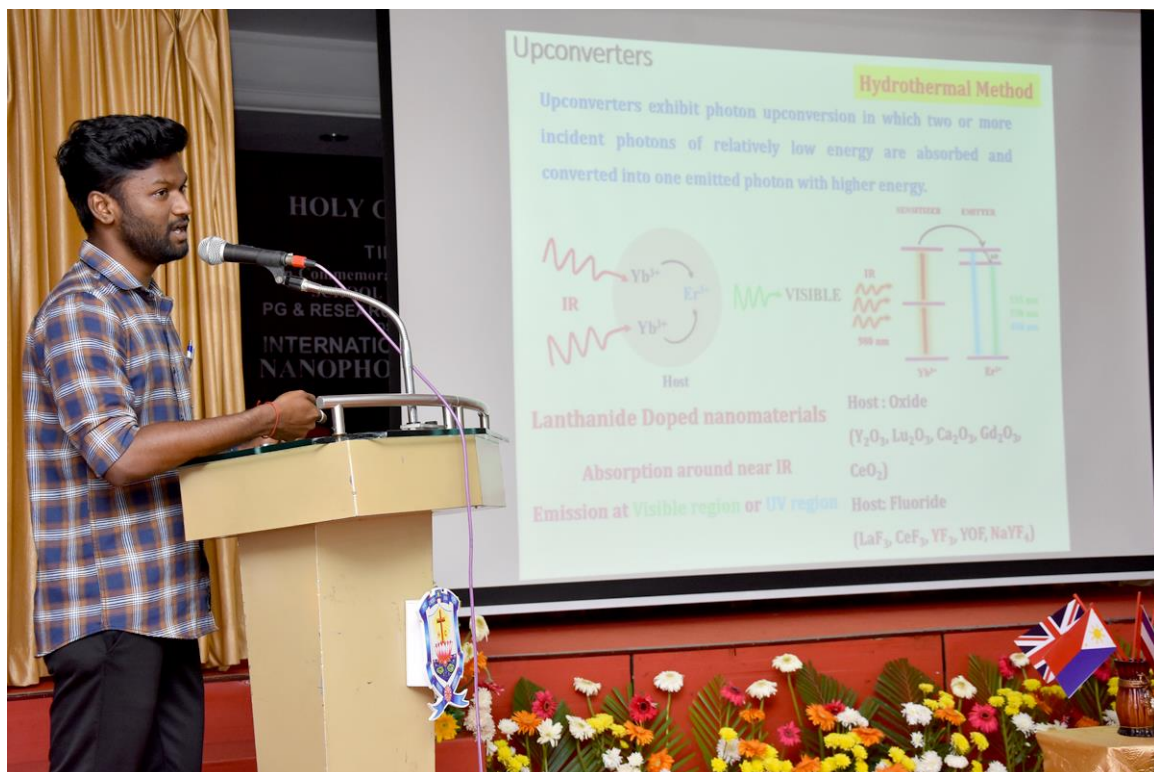
The resource person addressed the topic **“Study of gas phase nanoparticles using mass spectroscopy”**. This session gave a clear understanding on various type of clusters, their formation, how the cluster is used as a catalyst, and mass spectroscopy.

TECHNICAL SESSION 8: Ms. Bansura Banu. K, Assistant Professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli, introduced the

speaker **Dr. Purushothaman Varadhan**, scientific researcher, Dutch Institute for fundamental energy research (DIFFER) Eindhoven, Netherlands.

Dr. Purushothaman Varadhan virtually connected with us and addressed the topic of “**solar hydrogen technologies**” . This session explained how solar energy can be used to produce hydrogen from water hydrolysis. This session covered a brief introduction to the principles and mechanisms of these technologies, the recent achievements in solar H₂ production are summarized, with a particular focus on the high solar-to-H₂ conversion achieved by each route.

After the session paper presentation and poster presentation were conducted simultaneously.





Dr. Arvind Kumar Saxena Department of physics Gujarat arts and science college (GASC), Ahmedabad, India, Dr. Inigomary Rita, Assistant professor, PG & Research Department of Physics Holy Cross College (Autonomous), Tiruchirappalli, Dr. MD. Mabud Hossain Assistance professor, Department of physics, Aliah University, Kolkata, India, and Dr. Juliat Josephine, Assistant professor, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli were the chair persons for paper and poster presentations

Students and research scholars from various colleges presented their papers on nanophotonics.

The valedictory ceremony of the international conference on nanophotonics begins around 4:30 PM with a prayer followed by the welcome address delivered by **Dr. Inigomary Rita**, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli

The valedictory address was delivered by **Dr. Jumisree Sharmah Pathak** Assistance professor, the Department of physics Indian Institute of Teacher Education, Gandhinagar, Gujarat, India followed by the feedback session

Best paper and poster presentations was honoured with a shield and certificate.





Dr. I. Mary Clementia, Conference Convener ICNP-2023 thanked each and every person who contributed their hard work to the success of the conference through a Vote of thanks followed by the national anthem the conference came to an end.