



St. Xavier's College (Autonomous)

(Recognized as "College with Potential for Excellence" by UGC & Accredited at A⁺⁺ grade with CGPA of 3.66/4 in IV Cycle by NAAC)

Palayamkottai – 627 002

ANNUAL REPORT 2023-2024

ENERGY RESEARCH CENTRE

In the Energy Research Centre, research is carried out in the field of solar energy and energy storage using batteries and super capacitors with nanocomposites and polymers by Dr. S. Anna Venus and research scholars. One of the research scholars, C. Bhagya Lakshmi, defended her Ph.D. thesis under the RFRS scheme funded by TNSCST on 11.12.2023.

The following research works have been reported in National International Journals and Conferences in the academic year 2022-2023 by the energy research centre:

Publications in journals

1. Published a paper entitled "Probing Novel Photoanodes Relying On Cubise/Metal' Oxides Nanocomposites-Based Dye-Sensitizing Solar Cells" in the Journal **Surfaces and Interfaces** 37(2023)
2. Published a paper entitled "Structural, Optical, And Photovoltaic Properties Of V2o5/Zno and Reduced Graphene Oxide (Rgo)-V2o5/Zno Nanocomposite Photoanodes For Dye-Sensitised Solar Cells" in **Carbon Letters** 1007 (September 14, 2023)

Publications in Proceedings

1. "A New Class Of Highly Stable Co-Polymer 4-Fluoro Phenyl Maleimide With Methyl Methacrylate" in the International Conference on Technology Important Materials for Device Fabrication held in Aditanar College of Arts and Science on September 1, 2023.
2. "Synthesis And Study On Photocatalytic Activity Of Mn-Doped Zns" in the national conference on Recent Developments in Effective Materials Redeems' 24 by the Department

Of Physics And Research Centre, Sarah Tucker College (Autonomous), Tirunelveli on February 2, 2024.

3. “Investigation Of Synthesis And Characterization Studies Of Yttrium Oxide Nanocomposite For Electric Charge Application” in the National Conference” on ‘Recent Developments In Effective Materials’ ‘Redeems’ 24 by the department of physics and research centre, Sarah Tucker College (Autonomous), Tirunelveli on February 2, 2024
4. “Photocatalytic Studies Of Crystal Violet Dye Using Zns Nanoparticles” in the International Conference on Recent Advancements in Materials Science and Nuclear Energy Research (ICRAMNR-2024), Department of Physics, Government Arts and Science College, Kovilpatti, on February 16, 2024.

Paper Presentation

The research scholars presented four papers in different National and International Conferences and attended four conferences and workshops.

1. Presented a paper titled “Synthesis And Characterization Of Yttrium Nano Composite For Battery Application” in the International Conference on “Recent Trends in Material Science (ICRTMS-2023)” organized by the Department of Physics, Kristu Jayanti College, Bengaluru, on 7.3.2023.
2. Presented a paper titled “Concise Review of Biopolymers and Their Composites For Energy Storage Applications” in the international conference on “Recent Trends in Material Science (ICRTMS-2023)” organized by the Department of Physics, Kristu Jayanti College, Bengaluru, 7.3.2023.
3. Presented a paper titled “Electrochemical Performance of Mg Ion/ Biopolymer Electrolytes” in the national conference on Recent Trends in Physics organised by the Department of Physics, Sri Sarada College for Women College (Autonomous), Tirunelveli on 16.3.2023.
4. Presented a paper titled “Bio-Host Polysaccharides Pectin Complexed with Mg-Based Solid Electrolyte for Battery Application” in the three-day International Workshop/Summer school and course preparation on “Solar water splitting and artificial synthesis” SWAP 2023 held at Madurai Kamaraj University, Madurai. 05.06.2023 – 07.06.2023.

Participation

The students and research scholars participated in the following 4 conferences and workshops:

1. National Conference on “Recent Trends in Physics”, organised by the Department of Physics, Sri Sarada College for Women College (Autonomous), Tirunelveli on 16.3.2023.
2. Workshop on “Research Publication in Scopus Indexed Journals” conducted by St. Xavier’s College, Palayamkottai, on 15.7.2023.
3. All-India Workshop on “Mobilising Renewable Energy for Battery Swapping, G2v, and V2g Charging Stations in India” was conducted by the Department of Electrical and Electronics Engineering, SRM IST, Kattankulathur, from 21.07.2023, to 22.07.2023.
4. A State-Level Hands-on Workshop on “The Gaussian 16 W Potential Tool for Materials Scientists” conducted by the Department of Physics, St. Xavier’s College (Autonomous), Tirunelveli, on 08.12.2023.