



ST. XAVIER'S COLLEGE (AUTONOMOUS)
PALAYAMKOTTAI - 627 002
(Recognized as "College with Potential for Excellence" by UGC &
Accredited by NAAC at A++ Grade with a CGPA of 3.66 out of 4)



ANNUAL REPORT 2022-2023
ENERGY RESEARCH CENTRE

In charge: Dr. S. Anna Venus

In the Energy research center the research is carried out in the field of solar energy. A two year project entitled Synthesis & characterizations of some nanocomposites for opto-electronic applications, under the scheme "Programme for Bridging the Gap in Research Funding For Research Scholars In Colleges (RFRS 2019-2020)" funded to the tune of Rs.3,00,000 by Tamil Nadu State Council For Science And Technology (TNSCST), Department Of Higher Education, Government Of Tamil Nadu has been granted for C. Bhagya Lakshmi and is being carried out under the principal investigation of Dr. S. Anna Venus. New findings are recognized with the following awards:

1. "Investigation of CuBiSe/V₂O₅&CuBiSe/ZnO nanocomposites using hydrothermal method for opto-electronic application." is awarded with BEST ORAL PRESENTATION, in the 5th international Conference ICRTAST 2021 held during November 25-28, 2021 organised by Department of Physics, Manonmaniam Sundaranar University, Tirunelveli.

2. A Poster on "Discussion on structural & optical properties of binary metal selenide/Nb₂O₅ nanocomposite synthesized by hydrothermal method." is presented at the Indo-Norwegian International Online Conference on FARAON-2022 held during 2-4 February 2022 organized by Institute for Energy Technology (IFE), University of Oslo (UiO), Norway and Madurai Kamaraj University, India.

3. "Discussion & Fabrication of ZnO/V₂O₅ nanocomposite prepared by novel solid state mixture method as a photoanode material in DSSC device." is awarded with BEST RESEARCH PAPER PRESENTATION in the International Conference on ICASE 2022 held at A.P.C. Mahalaxmi College for Women, Thoothukudi, on 24.03.2022 – 25.03.2022.

A Paper entitled "Designing ZnO/V₂O₅/rGO Nanocomposites As A Photo Electrode In Dye-Sensitized Solar Cell With 1.27% Efficiency" is presented the 2nd International Conference

On Advances In Chemistry... Studies(ICACSEM -2022) held during 28,29 March 2022 By the Department Of Physical Chemistry, School Of Chemical Science, University Of Madras, Chennai.

4. Paper entitled as “Assessing the Structural & Optical Properties of Synthesized Nb₂O₅/V₂O₅/ rGO Nanocomposites” was presented in the International Conference on "Functional materials for sustainable energy and environment - FMSEE'23 held at Dept of Chemistry & Physics, Lady Doak College for Women, Madurai, Tamil Nadu on 30 th & 31st January, 2023 and is awarded with BEST ORAL PRESENTATION.

A Paper entitled “Synthesis and Optical Studies of Yttrium Oxide Nanocomposites” is presented in the International Online Conference on Basic Sciences for Sustainable Development, Organized by centre for Nanoscience and technology and Department of Basic Sciences, AmalJyothi College of Engineering in partnership with Department of Energy materials, Mahatma Gandhi University and Faculty of Chemistry, Gdansk University of Technology, Poland from 16.12.2022 to 17.12.2022.

A Paper entitled “Electrochemical Analysis of Yttrium Oxide Nanocomposite” is presented in the two Day Workshop Sponsored by BRNS, MUMBAI on “ Advanced XRD and Electron Microscopy Characterization for the Development of Novel materials” Organized by the Department of Physics, MepcoSchlenk engineering College, Sivakasi on 4th and 5th January, 2023.

A Paper entitled “Synthesis and Studies on the influence of MgCl₂ with CMC composite film” was presented in the International Conference on ‘Functional Materials For Sustainable Energy & Environment’ jointly organized by Department of Chemistry & Physics, Lady Doak College, Madurai on 30.01.2023 - 31.01.2023.

PAPERS PUBLISHED

- Published a paper in *Materials Today: Proceedings* 64 (2022) A3–A6 journal: “Discussion on structural & optical properties of binary metal selenide/Nb₂O₅ nanocomposite synthesized by hydrothermal method.”
- Published a paper in *Surfaces and Interfaces* 37 (2023) 102638 journal: “Probing novel photoanodes relying on CuBiSe/metal oxides nanocomposites-based dye sensitizing solar cells.”

Patent: A patent entitled “Solar cell and Photoelectric conversion element” is obtained by Dr. S. AnnaVenus and her team.