SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

CENTRE OF EXCELLENCE FOR ENERGY RESEARCH

PATRONS

Dr. Mariazeena Johnson, Chancellor

Dr. Marie Johnson, President

Dr. T. Sasipraba, Vice Chancellor

Profile of the Centre

The Centre of Excellence for Energy Research (CEER) funded by the Ministry of Human Resource Development (MHRD), Govt. of India was inaugurated by **His Excellency Dr. A. P. J. Abdul Kalam**, Former President of India on December 9th, 2014 in the august presence of **Col. Dr. JEPPIAAR, Founder Chancellor**, Chancellor, and President of the Sathyabama Institute of Science and Technology. This Centre of Excellence was generously funded by MHRD, under the scheme of Centre of Excellence in the Frontier Areas of Science and Technology (FAST) for the establishment of "Centre of Excellence for Energy Research (CEER)" to promote research activities in the area of Solar Photovoltaic, Fuel Cells, Supercapacitors, and Bio-energy etc.

The main objectives of this Centre of Excellence is to promote education, training, research and developmental programmes in the novel and newly emerging areas of energy research and to develop cost effective, efficient and sustainable technologies for the energy needs of the nation.The Centre also aims to enhance the quality and quantity of basic and applied research programs. The Centre would organize training programs/workshops/conferences for students, researchers, academic staff, and scientists in India to further strengthen their expertise in the areas of energy research, to accelerate the India's human development index and to provide energy security.

The Centre has been established in the International Research Centre (IRC) with facilities such as DEKTAK profilometer from (Bruker, USA), Potentiostat, and Galvanaostat with Impedance Analyser (Biologic, France), Hall Effect Measurement system (Ecopia, South Korea), Raman Spectroscopy (Renishaw, United Kingdom), UV-Visible Spectroscopy (Jasco Analytical Instruments), 50L Biodiesel Pilot plant (Malnad Extraction Industries Bangalore, India), and Gas chromatography (YL Instrument South Korea). The major research laboratories established are Photovoltaics, Surface physics,Energy Materials, Materials Chemistry,Materials Processing, Fermentation and Bio Processing and Bio fuels.

Vision: To establish a robust Centre of Excellence for Energy Research to provide energy security and to meet the growing energy demand with novel technologies in renewable and bio-energy sectors

Objectives:

- **To promote Education, Training, Research and Developmental Programmes in the novel and newly emerging areas of energy research**
- **To develop efficient, cost effective and sustainable technologies for the energy needs of the nation**

- **Focus on rural empowerment through green energy technologies relevant to national development goals**
- **Provide consultancy to industries, R&D organizations in the area of energy, energy conservation and management**

Research Laboratories

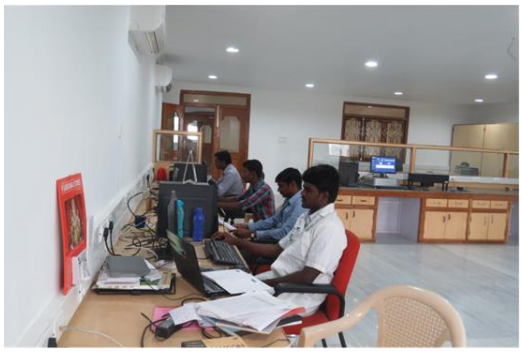
- Photovoltaics
- Surface physics
- Energy Materials
- Materials Processing
- Fermentation and Bio Processing
- Materials Chemistry
- *Quality testing and Analysis*
- *Bio fuels*

Equipments

- Thickness measurement system (Dektak, Bruker,USA)
- Hall Measurement System (HMS7000, Ecopia, South Korea)
- Potentiostat,&Galvanostat with Impedance Analyser(BioLogic-SP300,)
- UV-Visible spectrophotometer (JASCO, Japan)
- Gas chromatography (TCD/FID),YL Instrument South Korea
- 50L Biodiesel Pilot plant, Malnad Extraction Industries Bangalore,India
- Micro Raman Spectrometer (Renishaw, UK) Funded by SathyabamaInsitute of Science and Technology

Facilities for Energy Research in Materials

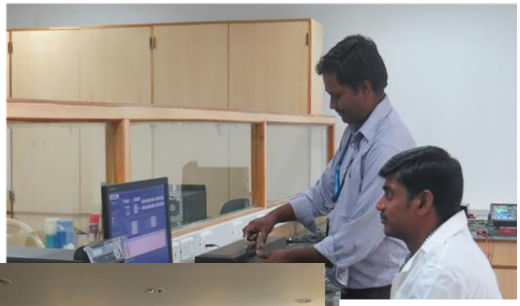
Raman Spectrometer

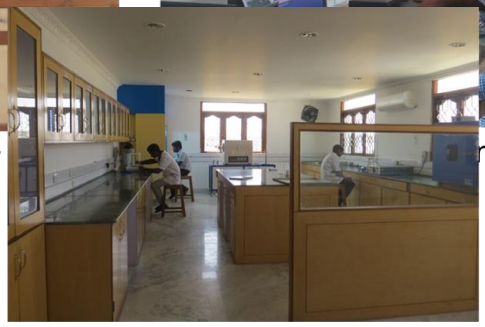


JRF Sitting Place

Materials Processing Lab

Thickness profilometer

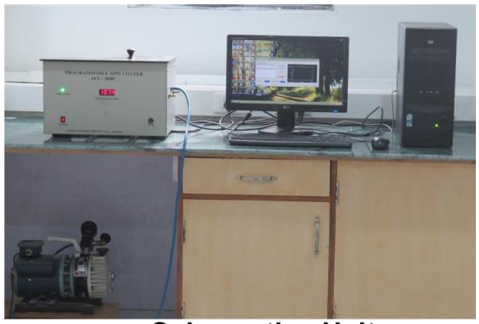




Materials Chemistry Lab

Impedance Analyzer

Fume Hood for chemical synthesis



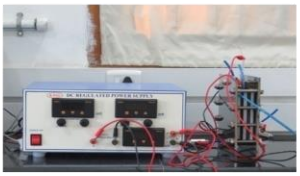
Spin coating Unit

Facilities for Bio Energy Research

Cannon-Fenske Viscometer

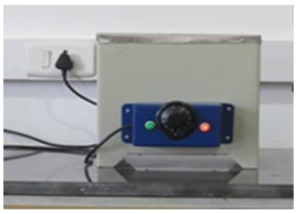
Hot Air Oven

Bio –Diesel Plant



Electrolytic Cell

Filter Press



Copper Strip Corrosion Test Bomb

Digital Turbidity Meter

Pensky-Marten's Closed Cup Tester

Research Programmes

a. Solar Cells

- **Fabrication of Chalcogenide Thin film solar cells**
  - CZTS and CZTSe absorber Materials
  - Cu:ZnS thin films
  - CFTS and CFTSe absorber materials

- **Development of perovskite thin film solar cell**
  - Single Step Process-Mechanosynthesis
  - Development new perovskite materials for solar cell application
  - Fabrication of stable high efficiency perovskite solar cells

- **Nitride thin film Solar cells by RF Magnetron Sputtering**
  - Fabricated Transparent Zn-N Thin Films by RF Magnetron Sputtering
  - Development of Zn-Sn-N absorber material
  - p-type Ba:ZnSnN Materials
- **Dye sensitized Solar cells**
  - plasmonic solar cells

b. Solid Oxide Fuel Cells (SOFC)

- Electrochemical Impedance spectroscopy (EIS) of Ni-YSZ Anode material for SOFC application
- Development of anode material for SOFC
- Development and study of conducting mechanism in cerium co-doped electrolyte materials for intermediate temperature SOFC applications-
- Application of pulsed laser deposition of doped ceria electrolyte thin films

c. Supercapacitors

- Synthesis and characterization of metal oxide and nitride based thin film supercapacitor by reactive magnetron sputtering.
- Study of influence substrate temperature, metal dopant concentration and electrolytes on the supecapacitive properties of the metal oxides/metal nitride electrodes
- Application of voltammetry and impedance analysis to study the performance of the supercapacitors.
- Finding new materials for fabrication of symmetric and asymmetric supercapacitor

d. Smart Materials

- Super-hydrophobic and hydrophilic coating for self-cleaning windows
- Electrochromic and Photochromic coating for smart windows

e. Photocatalysis

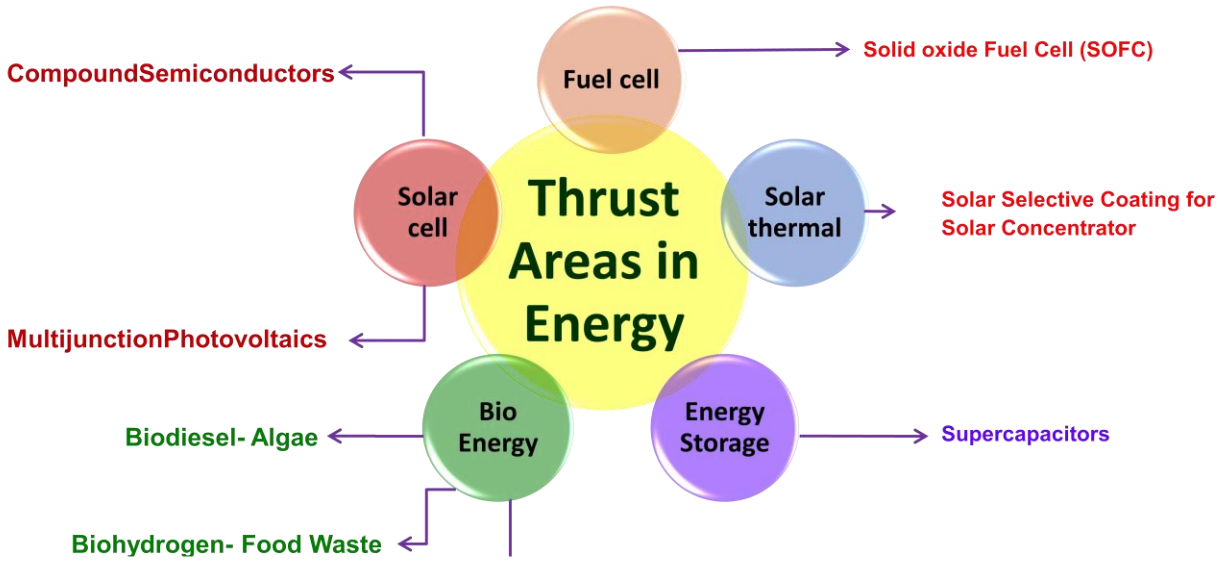
- Rational design and development of heterogeneous nanocomposite for textile dye removal
- Development of large dye degradation chamber for large-scale decolouration of the polluted water
- Developing functional materials for photocatalytic water splitting
- Engineering the physical and chemical parameters for efficient photocatalysis
- Testing of materials for photocatalytic water splitting under solar simulator

f. Electrochemical sensor application

- Development on new and efficient electrocatalyst
- Application of materials for electrochemical determination of biological molecules and harm materials for health and environmental applications

g. Bio-Energy

- Optimization of fermentation conditions for maximum bioethanol production from the recovered Kappaphycusalverizii rejects and food waste.
- Recovery of Bio ethanol from fermentation broth using nanomembrane technology.
- Establishment of 50 Litres Capacity Pilot Plant for Biodiesel Production
- $ZnCl_2$ activated carbon food waste nanoparticles for Biodiesel Wash water treatment
- Compositional and structural evaluation of Kappaphycusalvareziirejects and solid food waste blends for bioethanol production
- Investigation of Bio-Ethanol production from Municipal solid waste brewing
- Oleaginous microalgae isolation for biodiesel production
- Characterization of food waste for Biohydrogen Production
- Biodiesel feed stock production using micro -organism (actinomycetes)

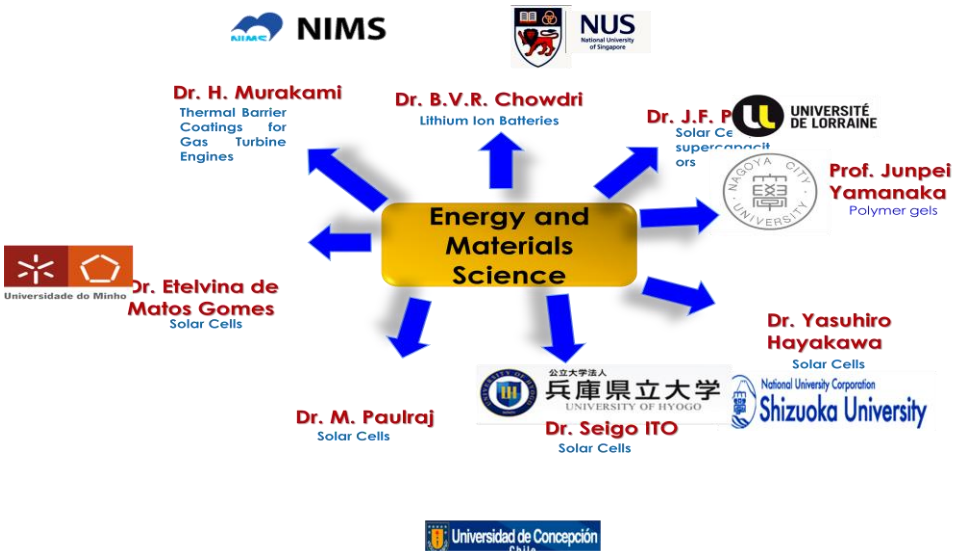


List of Scientists/Researchers who underwent Post Doctoral Fellowships and Internships in Abroad

S. No	Scientist Name	Name of the laboratory / Institution	Name of the Fellowships	Duration
1.	**Dr. J. Ramkumar**	Department of Physics, Faculty of Physical Sciences and Mathematics, **University of Concepcion, Concepcion, Chile**	National Fund for Scientific Research and Technological Development (FONDECYT)	March 2016-October 2018
2	**Dr. T.S. Shyju**	Department of Physics, Faculty of Physical Sciences and Mathematics,**University of Concepcion, Concepcion, Chile**	National Fund for Scientific Research and Technological Development (FONDECYT)	March 2016- October 2018
3	**Dr. I. Neelakanta Reddy**	College of Information and Communication, **Tongmyong University, Busan, South Korea**	Post-Doctoral Fellow	October 2016-Sept 2017
5	**Dr.Brijitta**	Department of Chemistry , Soft Condensed Matter, **University of Lund, Sweden**	European Research Council (ERC) Post-Doctoral Fellow	August 2017- August 2019
6.	**Dr.J.Theerthagiri**	Department of Chemistry and Research Instituite of Natural Sciences,**Gyeongsang National University, South Korea**	Post Doctoral Fellow	July 2019 - August 2020
7	**Mr. S. Ajith Kumar**	Research internship at Department of Materials Science and Engineering, National Dong Hwa University, through T**aiwan Education Experience Program (TEEP Asia@2018)**	**Ministry of Education (MoE)**, Taiwan	July 2018-Nov 2018
		Visiting scholar (Nov 2018 to Jan 2019) at Dept. of Bio-Chemistry, Tzu Chi University, Hualien City, Taiwan	**Ministry of Education (MoE)**, Taiwan	Nov-2018-Jan 2019

8.	**Mr. P. Vengatesh**	To participate in the 5th International conference on Perovskites Solar Cells and Optoelectronics (PSCO-2019), Switzerland	**DST-SERB-International Travel grant**	30, September 2019-2,October 2019
9	**Mr. Durai Govindarajan**	Department of Medicinal and Applied Chemistry, Kaohsiung Medical University (KMU), Taiwan under **TEEP-Asia, Ministry of Education (MoE)**	**Ministry of Education (MoE)**, Taiwan	August 2018- Feb 2019

International Collaborations in Materials



International Conferences/ Seminars/Workshops/Webinars Conducted during 2014-2020

1. International Conference on "Energy Materials" **(ICEM-2014)** 28th – 30th July, 2014.
2. National workshop on **Recent Trends in X-ray Diffraction Techniques (RTX-2014) ,** Nov 28th& 29th, 2014
3. International Conference on Recent Advances In Nano-Science and Technology **(RAINSAT-2015)** during July 8th - 10th, 2015
4. International Conference on Nanoscience and Nanotechnology for Energy Applications **(EApp-2016**), 27-29 June,2016.
5. International Conference ON "Advances in Biotechnology and Biotherapeutics" (**ICABBS-2017)** , 8th& 10th March, 2017
6. International Congress On "Education And Public Welfare" **(ICEPW-2017)** On 09th& 11th, February, 2017.

7. National Symposium on Sustainable Energy Conversion & Storage Materials**,(NSSECSM-2018) on** 26 -27 April 2018, Sponsored by DST /SERB and BRNS.
8. Organized an Interactive Session on “Opportunities in Chile to Pursue Doctoral and Postdoctoral Programs”Dr. PAULRAJ MANIDURAI, University of Conception, Chile on 19.02.2019.
9. Virtual seminar on Raman Spectroscopy:Basics, Instrumentation and Applications, July 2-3, 2020Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai organised in association with Labindia Instruments and Renishaw.
10. Webinar on Virtual Tribology, June26, 2020, 2020Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai organised in association with DUCOM Instruments.
11. Webinar on Energy Research- Series-II, June 25-29, 2020, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai
12. Webinar on Materials Research- Series-I, June18-21, 2020, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai.
13. International Virtual Seminar (Webinar) Emerging Technology in Energy Conversion and Storage June 1&2, 2020, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai.
14. National Virtual Seminar on “Career Opportunities for Science Graduates” on June 20, 2020, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai.
15. Webinar on Driving Innovation in Advanced Materials with Modelling and simulations, Dr. Ritwik, July 21, 2020 in association with DASSAULT Systems, BIOVIA, India, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai
16. International Virual Conference on Recent Advanced Materials in Energy Applications, July 30-31, Centre for Nanoscience and Nanotechnology, Sathyabama Institute of Science and Technology, Chennai.
17. International Virtual Seminar on materials for Energy Conversion and Storage, Centre for Nanoscience and Nanotechnology, August 10-13, 2020, Sathyabama Institute of Science and Technology, Chennai.

Publications

1. Publications (only publications listed in Scopus/Web of Science)

Sl.No	Title	Author	Name of the Journal	Year	Vol, page no,
1.	Solvent effect on structure and morphology of formamidinium lead tri-iodide perovskite via hydrothermal method	G. Murugadoss	Inorganic Chemistry Communications	2020	24th, June, Vol: 119, doi.org/10.1016/j.inoche.2020.108059
2.	Large- scale preparation of ZnS-ZnO-SnS nanocomposites: Investigation on structural and optical properties	S. Muruganandam	Optik	2020,	12 June, Vol: 220 doi.org/10.1016/j.ijleo.2020.165187
3.	Synergetic Effects of Hybrid Carbon Nanostructured Counter Electrodes for Dye-Sensitized Solar Cells: A Review	M. R. Samantaray,	Materials	2020	19th June, Vol: 13, doi.org/10.3390/ma13122779
4.	Synthesis of Ag2O-SnO2 and SnO2-Ag2O nanocomposites and investigation on photocatalytic performance under direct sun light	M. Rajesh Kumar	Chemistry Select	2020	17th June, Vol: 5, DOI: 10.1002/slct.202001227
5.	Synthesis and characterization of CuO-NiO nanocomposite: highly active electrocatalyst for oxygen evolution reaction application	M. Praveen Kumar	Journal of materials science: materials in electronics	2020	1st June, Vol: 31, DOI: 10.1007/s10854-020-03677-0
6.	Nickel hexacyanoferrate film coated pencil graphite electrode as sensor and electrode material for environment and energy applications	Sedhu Nagarajan, V. Vasudevan, Theerthagiri Jayaraman, R. Arumugam, Raj Vairamuthu	Int. J. Energy Research	2020	https://doi.org/10.1002/er.5640.
7.	Recent progress and emerging challenges of transition metal sulfides	J. Theerthagiri, R.A. Senthil, P. Nithyadharseni, S.J.	Ceramics International	2020	46 (2020) 14317-14345.

	based composite electrodes for electrochemical supercapacitive energy storage	Lee, G. Durai, P. Kuppusami, J. Madhavan, M.Y. Choi			
8.	Ionic liquid-based electrolytes for energy storage devices: a brief review on their limits and applications	K Karuppasamy, J. Theerthagiri, D. Vikraman, C.J. Yim, S. Hussain, R. Sharma, T. Maiyalagan, J. Qin, H.S. Kim	Polymers	2020	12 (2020) 918
9.	Synthesis of hierarchical structured rare earth metal doped Co_3O_4 by polymer combustion method for high performance electrochemical supercapacitor electrode materials	J. Theerthagiri, G. Durai, TetianaTatarchuk, M. Sumathi, P. Kuppusami, M.Y. Choi	Ionics	2020	26 (2020) 2051–2061.
10.	Rational design and development of perovskite materials: Analysis of structural, optical, morphological and phase transition	G. Murugadoss	Materials Science in Semiconductor Processing	2020	7th May, Vol: 117, Doi.org/10.1016/j.mssp.2020.105177
11.	Rapid degradation of organic dyes under sunlight using tin-doped ZnS Nanoparticles	K. Ramki	Journal of materials science: materials in electronics	2020	21 April, Vol: 31, Doi.org/10.1007/s10854-020-03410-x
12.	CeO_2-based heterostructure nanocomposite for electrochemical determination of L-cysteine biomolecule	G. Manibalan	Inorganic Chemistry Communications	2020	10th March, Vol: 113, doi.org/10.1016/j.inoche.2020.107793
13.	Seaweed (Turbinariaornata)-assisted green synthesis of magnesium hydroxide [Mg (OH) $_2$] nanomaterials and their anti-mycobacterial activity	K Govindaraju, K VijaiAnand, S Anbarasu, J Theerthagiri, S Revathy, P Krupakar, G Durai, M Kannan, KS Subramanian	Materials Chemistry and Physics	2020	239, 122007 https://doi.org/10.1016/j.matchemphys.2019.122007
14.	Analysis of Performance and Emission characteristics	Nirmala.N, Dawn S S and C. Harindra	Renewable Energy	2020	147, pp. 284-292

	of Waste cooking oil and Chlorella variabilis MK039712.1 biodiesel blends in a Single cylinder, four strokes Diesel				
15.	High Electrochemical Performance and Enhanced Electrocatalytic Behavior of a Hydrothermally Synthesized Highly Crystalline Heterostructure CeO2@NiO Nanocomposite	G. Manibalan	ACS Inorganic Chemistry	2019	21th October, Vol: 58, Doi.org/10.1021/acs.inorgchem.9b01723
16.	Organic-free indium-doped cesium lead iodide perovskite for solar cell application	G. Murugadoss	Micro & Nano Letters	2019	18th December, Vol: 14, Doi.10.1049/mnl.2019.0321
17.	Selective metal ions doped CeO2 nanoparticles for excellent photocatalytic activity under sun light and supercapacitor application	G. Murugadoss	Inorganic Chemistry Communications	2019	10th November, Vol: 108, Doi.org/10.1016/j.inoche.2019.107577
18.	Synthesis and characterization of ZnOnanoflakes anchored carbon nanoplates for antioxidant and anticancer activity in MCF7 cell lines	M.V. Arasu, A. Madankumar, J. Theerthagiri, S. Salla, S. Prabu, H.S. Kim, N.A. Al-Dhabi, S. Arokiyaraj, V. Duraipandiyan	Materials Science and Engineering: C	2019	102, 536-540 https://doi.org/10.1016/j.msec.2019.04.068
19.	A review on ZnO nanostructured materials: energy, environmental and biological applications	J Theerthagiri, SunithaSalla, RA Senthil, P Nithyadharseni, A Madankumar, P. Arunachalam, T Maiyalagan, Hyun-Seok Kim	Nanotechnology	2019	30 392001 10.1088/1361-6528/ab268a
20.	Robust bifunctional catalytic activities of N-doped carbon aerogel-	P. Shanmugam, A.P. Murthy, J. Theerthagiri, W. Wei,	International Journal of Hydrogen	2019	44/26) 13334-13344 https://doi.o

	nickel composites for electrocatalytic hydrogen evolution and hydrogenation of nitrocompounds	J. Madhavan, Hyun-Seok Kim, T. Maiyalagan, J. Xie	Energy		rg/10.1016/j.ijhydene.2019.03.225
21.	Photocatalytic Degradation of Rhodamine B Dye Using Biogenic Hybrid ZnO-MgO Nanocomposites under Visible Light	K. Vijai Anand, J. Aravind Kumar, K. Keerthana, S. Tamilselvan, J. Theerthagiri, V. Rajeswari, S. Muthamil Selvan, K. Govindaraju	Chemistry Select	2019	4, 5178 – 5184 https://doi.org/10.1002/slct.201900213
22.	Highly Electroactive Ni Pyrophosphate/Pt Catalyst toward Hydrogen Evolution Reaction	J. Theerthagiri, E. Cardoso, G. Fortunato, G. Casagrande, B. Senthilkumar, J. Madhavan, G. Maia	ACS Appl. Mater. Interfaces	2019	11/5 4969-4982 https://doi.org/10.1021/acsami.8b18153
23.	Single-step economical and quick electrochemical deposition of rare earth metal ions doped ZnSe/FeS2 double-layer thin films with enhanced photoelectrochemical performance	T. Rajesh Kumar P. Prabukanthan G. Harichandran R. A. Senthil T. Arunkumar J. Theerthagiri	Ionics	2019	1–8 https://doi.org/10.1007/s11581-019-03121-2
24.	Integrated Remediation Processes Toward Heavy Metal Removal/Recovery From Various Environments-A Review	A. Selvi, A. Rajasekar, J. Theerthagiri, A. Ananthaselvam, K. Sathishkumar, J. Madhavan, P.K.S.M. Rahman	Front. Environ. Sci.,	2019	https://doi.org/10.3389/fenvs.2019.00066
25.	Single-step electrochemical deposition of $Mn2^{+}$doped FeS2 Thin films on ITO conducting glass substrates: physical, electrochemical and electrocatalytic properties	P. Prabukanthan S. Thamaraiselvi G. Harichandran· J. Theerthagiri	Journal of Materials Science: Materials in Electronics	2019	30 3268-3276 Doi.10.1007/s10854-018-00599-w
26.	Assembled composite of hematite iron oxide on	Kavin Micheal, A. Ayeshamariam, R.	Materials Science for	2019	2,104-111 10.1016/j.ms

	sponge-like BiOCl with enhanced photocatalytic activity	Boddula, P. Arunachalam, M.S. AlSalhi, J. Theerthagiri, SaradhPrasad, J. Madhavan	Energy Technologies		et.2018.11.004
27.	Investigation on the Effect of Deposition Temperature on Structural and Nanomechanical Properties of Electron Beam Evaporated Lanthanum, Zirconate Coatings	S. AnandhJesuraj, P. Kuppusami, S. Ajith Kumar, PadmalochanPanda, U. Suresh, .RamachandaranandDeepaDevapal	Materials Chemistry and Physics	2019	236 121789 https://doi.org/10.1016/j.matchemphys.2019.121789
28.	Effect of Polyurea Coating on Corrosion Resistance Over Mild Steel and Aluminium Substrates for Liquid Storage Applications	T. Arunkumar, S. Sunitha, J. Theerthagiri, J. Jeevagan, M. Anish, T. Tatarchuk	Molecular Crystals and Liquid Crystals	2019	670 60-73 10.1080/15421406.2018.1542065
29.	Microstructure, Optical and Dielectric properties of Cerium oxide Thin films Prepared by Pulsed laser deposition	BalakrishnanGovindasamy, Arun Kumar Panda; Raghavan C.M, Ph.D.; Akash Singh; Prabhakar M.N.; Mohandas E.; Kuppusami P; Jung il Song,	Journal of Materials Science: Materials in Electronics,	2019	(2019) 1–6 https://doi.org/10.1007/s10854-019-02031-3
30.	Phase Stability and Thermal Behavior of Single Layered PSZ and Bi-layered PSZ/$Gd_2Zr_2O_7$ on Bond Coated Inconel Substrates	S. AnandhJesuraj, P. Kuppusami, Ch. JagadeeswaraRao, A. M. KamalanKirubaharan, DeepaDevapal, K. Viswanathan	Surface & Coatings Technology	2019	374 (2019) 500–512 https://doi.org/10.1016/j.surfcoat.2019.06.030
31.	Supercapacitive properties of manganese nitride thin film electrodes prepared by reactive magnetron sputtering: Effect of different electrolytes	G. DuraiTMaiyalagan, Vinoth Kumar Ponnusamy , M. Ahila and Dr. P. Kuppusami	Ceramics International	2019	45 (2019) 17120–17127 10.1016/j.ceramint.2019.05.265
32.	Influence of chromium content on microstructural and electrochemical	G. Durai, P. Kuppusami, T. Maiyalagan, J.	Ceramics International,	2019	45, (2019)12643-12653

	supercapacitive properties of vanadium nitride thin films developed by reactive magnetron co-sputtering process	Theerthagiri, P. Vinoth Kumar, Hyun-Seok Kim			10.1016/j.ceramint.2019.02.170
33.	Optoelectronic and Electrochemical Behavior of γ-CuI Thin Films Prepared by Solid Iodination Process	C. Karthik Kumar, P. Vengatesh, G. Durai, S. Ajithkumar, P. Kuppusami and T.S. Shyju	Progress in Natural Science: Materials International (Accepted)	2019	29, (5), 2019, 533-540 10.1016/j.pnsc.2019.09.005
34.	Electrochemical tuning of heterojunctions in TiO_2 nanotubes for efficient solar water splitting	Preethi L K, Tom Mathews	Catalysis Science and Technology	2019	9, 2019 5425-32 DOI: https://doi.org/10.1039/C9CY01216H
35.	Co-Doped Ceria $Ce_{0.8}M_{0.1}Gd_{0.1}O_{2-\delta}$ (M= Sm^{3+}, Sr^{2+}, Ca^{2+}) and Co-Doped Ceria-Na_2CO_3 Nanocomposite Electrolytes for Solid Oxide Fuel Cells	S. Ajith Kumar, P. Kuppusami,B. Vigneshwaran and Yen-Pei Fu	ACS Applied Nanomaterials	2019	https://pubs.acs.org/doi/abs/10.1021/acsanm.9b01282
36.	Effect of Sm co-doping on structural, mechanical and electrical properties of Gd doped ceria solid electrolytes for intermediate temperature solid oxide fuel cells	S.Ajith Kumar, P. Kuppusami, S. Amirthapandian and Yen-Pei Fu	International Journal of Hydrogen Energy	2019	https://doi.org/10.1016/j.ijhydene.2019.10.098
37.	Preferentially oriented $CuCdS_2$ thin films and thickness effects on structural, optical and electrical properties	Saravanan, SelladuraiSubramanian P. Vengatesh, T.S. Shyju	Applied Physics A	2019	(2019), 125:356 DOI: 10.1007/s00339-019-2656-z
38.	Fabrication of p-type cubic γ-CuI by solid iodination process for energy conversion and storage applications	C. Karthikkumar, P.Vengatesh, G. Durai and T.S. Shyju	Materials Today Proceedings (Accepted)	2019	DOI: 10.1016/j.matpr.2019.05.387
39.	Vibrational modes, chemical states and thermal	Vengatesh Panneerselvam	Materials Letters	2019	241(2019) 140-143

	stability of mechanochemically synthesized methylammonium lead iodide ($CH_3NH_3PbI_3$) perovskites	ShyjuThankaraj Salammal Karthik Kumar Chinnakutti Paulraj Manidurai			10.1016/j.matlet.2019.01.069
40.	Surfactant-mediated synthesis of polyhydroxybutyrate (PHB) nanoparticles for sustained drug delivery	SenthilkumarPachiyappan, Dawn Shanmuganatham, Selvanantham, Sree SamanvithaKuppa, SaipriyaChandrasekaran, Antony Vincent Samrot	IET Nanobiotechnology	2019	13 (2019) 416 – 427, doi: 10.1049/iet-nbt.2018.5053
41.	Process optimization for biodiesel production from sheep skin and its performance, emission and combustion characterization in CI engine	J.Jayaprabakar, S.S.Dawn, A.Ranjan, P.Priyadharsini, R.J.George, S.Sadafa, C. RajeswaraRajha	Energy	2019	174/1 (2019) 54-68 10.1016/j.energy.2019.02.140
42.	Nano-structured manganese promoted ferrous catalyst synthesized by incipient wetness impregnation method: Synthesis and characterization	M. Arul Jayan, G.G. Vinoth Kumar and Dawn SS	Materials Letters	2019	240 (2019) 55–58 10.1016/j.matlet.2018.12.115
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Sl.No	Title of the Chapter	Authors	Title of the Book	Publisher	Details
1.	Titania based heterojunction for hydrogen generation by water photolysis	Preethi L K, Rajini P Antony, Tom Mathews	Green Photocatalysts for energy and environmental process	Springer Nature	57-86, 2020
2.	Enhancing the Ionic Conductivity in the Ceria based Electrolytes for Intermediate Temperature Solid Oxide Fuel Cells	S. Ajith Kumar and P. Kuppusami,	Solid Oxide Fuel Cells	Elsevier Publications	2020 (in print)
3.	The Behaviour Of Ceramic Nanocomposite Coatings on Corrosion at Nanoscale, Book Chapter in a special issue on, Elsevier Publications (2019).	A. M. Kamalan Kirubaharan and P. Kuppusami	Corrosion Protection at Nanoscale	Elsevier Publications	2020 (in print)
4.	Interfacial Engineering in Functional Materials for Dye-Sensitized Solar Cells	T.S. Shyju, S. Anandhi, P. Vengatesh, C. Karthik Kumar, M. Paulraj	Graphitic Carbon Nitride Based Nanocomposites as Photoanodes	John Wiley & Sons, Inc.	Chapter 12, 2020 (in print)
5.	Design and Fabrication of Carbon-based Nanostructured Counter electrode Materials for Dye-sensitized Solar Cells	JayaramanTheerthagiri, Raja Arumugam Senthil, and Jagannathan Madhavan1	Rational Design of Solar Cells for Efficient Solar Energy Conversion	John Wiley & Sons, Inc. Published 2018	Chapter 7, (2018) 193-219
6.	PtElectrocatalysts	JayaramanTheerthagiri	Counter	Wiley-VCH	Chapter

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3.Patents filed:

(Mention only those in which MHRD FAST support is acknowledged)

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2.	Compact Sensor System for Train Compartment Washbasin Water Recovery	201641037331	Published in May 2018
3.	Automatic Smart Segregator	201641037332	Published in May 2018
4.	Development of compositionally graded Ni-YSZ nanocomposite coatings for high temperature and corrosive environments	201741046287	22/12/2017
5.	Development of ceramic coatings on dental abutments for better corrosion protection	201841022285	14/06/2018
6.	Tunable Optoelectronic Properties And Highly Efficient P-Type Metal Nitride By Barium (Ba) Doping	201941027791	11-07-2019

4. Conference/Seminar Proceedings

1. Investigation of Microstructure and Coating Integrity of YPSZ and GZ TBCs by EB-PVDS. AnandhJesuraj**, P. Kuppusami**, A. M. KamalanKirubaharan, In the Conf. Proc. ICPCS-2019, Hindustan Institute of Science and Technology, Chennai, published inInternational Journal of Scientific Research and Review, Volume 8, Issue 3, 2019, ISSN NO: 2279-543X, pp48-53.
2. Structural and Ferroelectric Properties of $Ba_{0.4}Sr_{0.6}TiO_3$ Ceramics Prepared by Sol -gel Technique, B.Vigneshwaran[1], **P. Kuppusami[1, 2*],** M. Mari Alias Esakki Kumar[1], H. Sreemoolanadhan,Conf. Proc. ICPCS-2019, Hindustan Institute of Science and Technology, Chennai, published in the International Journal of Scientific Research and Review, Volume 8, Issue 3, 2019, ISSN NO: 2279-543X, pp 77-83.
3. Nitriding Processes- A Review, S. Lakshmi Shankar, Krishna Chaitanya, K. Arunkumar and P. Kuppusami, IEEE transactions (2019)
4. Fabrication of p-type cubic γ-CuI by solid iodination process for energy conversion and storage applications, July 2019, Materials Today: Proceedings, 10.1016/j.matpr.2019.05.387

5. One dimensional TiO_2 by electrochemical anodization of DC sputtering Ti films. P. Vengatesh, C. Karthik Kumar, T.S.Shyju, Journal of Indian Chemical Society, Vol. 96, (2019) pp. 100-102.

6. Synthesis and Characterization of Magnetron Sputtered Alloyed Films of ZrAlN (Al:13at.%), Akash Singh. **P. Kuppusami**, R. Thirumurugesan and P. Parameswaran, Proc. International Conference on Electron Microscopy and Allied Techniques & XXXVIII Annual Meeting of the Electron Microscope Society of India (EMSI-2017),Mahabalipuram 603 104, Tamilnadu, (Eds) S Raju ,R Mythili, R Divakar, Arup Dasgupta, Saroja Saibaba, ISBN No.: 978–81–933428-1-7 Copy right: EMSI 2017 Organizing Committee, p. 32-35.
7. Structural and Morphological Investigation of Sm and Gd-doped Ceria/Na2CO3 Nanocomposite for Intermediate Temperature Solid Oxide Fuel Cell, S. Ajith Kumar, **P. Kuppusami**, S. Amirthapandian and A.M. KamalanKirubaharan, International Conference on electron Microscopy and Allied Techniques & XXXVIII Annual Meeting of the Electron Microscope Society of India(EMSI-2017), Mahabalipuram 603 104, Tamilnadu, (Eds) S Raju, R Mythili, R Divakar, Arup Dasgupta, Saroja Saibaba, ISBN No.: 978–81–933428-1-7 Copy right: EMSI 2017 Organizing Committee, pp.154-157.
8. A New Approach to Grow A-TiO_2Nanocubes,Shyju ThankarajSalammal and PaulrajManidurai, Key Engineering Materials Vol. 759 (2017) pp 76 -80.
9. Structural and Optical Properties of Electron Beam Evaporated Yttria Stabilized Zirconia Thin Films, A.M. Kamalan Kirubaharan, P. Kuppusami, Akash Singh, T. Dharini, D. Ramachandran and E. Mohandas, AIP Conf. Proc. 1665, 080052 (2015).
10. Nickel/Nickel oxide thin films as electrode material for electrochemical supercapacitor, Meenu Sunny, K. Gobi Saravanan, Ananada Kumar Ramadoss and **P. Kuppusami,** Proceedings of the ICEM -2014, July 28-3^{0th} 2014, Abstract no. OP-6, ISBN: 978-1-4799-6180-1.
11. Synthesis of CZTS films for solar cell by thermal evaporation technique, T.S. Shyju, K. Viswanathan, and P. Kuppusami, Proceedings of the ICEM -2014, July 28-30th 2014, Abstract no. OP-12, ISBN: 978-1-4799-6180-1.
12. Optical properties of copper doped ZnS thin films using RF magnetron sputtering, T.S. Shyju, Maria Kuruvilla, K. Gopisaravanan, D. Ramachndran, K. Viswanathan and **P. Kuppusami**, PP.23 Proc. of the ICEM -2014, July 28-30th, 2014, Sathyabama University, Chennai, ISBN: 978-4799-6181-8/14.
13. Synthesis and properties of Zr based coatings, P. Kuppusami, Akash Singh and E. Mohandas, Surface Engineering, 01/2013; pp.55-63 In proceeding of: Surface Modification Technologies XXVI, (Eds.) T.S. Sudarshan, Michel Jeandin and Vincent Fridrici.
14. Structural and corrosion behaviour of bilayer and alloyed films of Cu-Ni International Conference on Advanced Nanomaterials and Emerging Engineering Technologies, K. Gobi saravanan, R.Ananthakumar , D. Ramachandran, T. S. Shyju, Vinita Vishwakarma, Sang-jae Kim and P. Kuppusami (ICANMEET-2013) ISBN**:**978-1-4799-1377-0 ; Page(s)**:** 179 – 180 (2013).

Funded Projects by Government Agencies

S. No	Year	Name of the Project	Name of the Funding Agency/ Sanction Order no.	Total Grant sanctioned	PI/Co-PI
1	2013	Transmission Electron Microscopy of Compositionally Graded Coatings of YSZ/ Ni-YSZ on Ni Base Superalloy for Nuclear Waste Vitrification Components	UGC-DAE Consortium for Scientific Research (UGC-DAE CSR), Kalpakkam Node. Sanction order no. CSR-KN/CSR-49/2013-14/648	Rs. 6,09,000/-	P. Kuppusami and T. S. Shyju
2	2014	Development of Diffusion Barrier Coatings of YSZ/Ni-YSZ on Ni-Based Superalloy by Electron Beam Evaporation for Applications in Nuclear Waste Processing	Board of Research in Nuclear Sciences, Mumbai Sanction order no: 2013/37P/65/BRNS/ dated 24/12/2013	Rs.24,89,200	Dr. P. Kuppusami and Dr. T. S. Shyju
3	2014	Development of Thermal Barrier Coatings by Electron Beam Physical Vapour Deposition	VSSC/ISRO Sanction order no: ISRO/RES/3/662/2014-15	Rs.19. 41,000	Dr. T. S. Shyju and Dr.P. Kuppusami
4	2014	Centre of Excellence for Energy Research	MHRD/ MHRD letter No. 5-7/2014 TS-Vll dated 27th September, 20l4	Rs. 4,00,00,000	Dr.T. Sasiparaba Dr. P, Kuppusami Dr. T. S. Shyju Dr. S. Dawn
5.	2015	Development of BaxSr1-xTiO3(BST) Tunable Dielectric Thin Films Prepared by Pulsed laser	VSSC/ISRO ISRO/RES/3/684/15-16 dated 06/08/2015	Rs. 24,65,000	P. Kuppusami Dr.I.Neelakanta Reddy

		Deposition			
6	2015	High Temperature X-ray Diffraction Studies on Precipitation Behavior of Ni and Fe Based Alloys	LPSC/ISRO(ISRO/RES/3/689/2015)	Rs.18,42,000/-	Mr. D. Ramachandran and Dr. P. Kuppusami
7	2017	Development and Characterization of Tribological Coatings on Inner and Outer Races of Hybrid Ball Bearings Prepared by ReactiveMagnetron Sputtering	CVRDE/DRDO (CVRDE/18CR0008/RDD/17-18/LP/23-08-2017)	Rs. 23,75,120	P. Kuppusami and Dr. A.M. Kamalan Kirubaharan
8	2019	Development of Morphology-Controlled Transition Metal SulfidesSupported on Carbon-Based Materials as Advanced Electrodes for Supercapacitor Applications	ISRO/RES/792/18-19 dated 12/12/2018	Rs. 14.92lakhs	Dr. J. Theerthagiri and Dr. P. Kuppusami
9	2019	Design, Fabrication and Evaluation of Compositionally Graded Nano-composite Hard Coatings for high Temperature Tribological Applications	SERB/F/12036/2018-2019/09-3-2019/ 36 months	Rs.43,43,020	Dr. D. Dinesh Kumar and Dr. P. Kuppusami

10	2019	Tailoring the microstructure of YPSZ to coat ceramic material by EBPVD	GTRE/DRDO GTRE/MMG/BMRI /1117/19/06-09-2019/CARS/A/19/ 18 months	Rs.9,60, 000	Dr. P. Kuppusami and Dr. A.M. Kamalan Kirubaharan
11	2020	Fabrication of Silicon-based nanocomposites for high energy density Li-ion anodes	ISRO/RES/3/865/19-20	Rs. 20,02,000	Dr. Preethi L K and Dr. Kamalan Kirubaharan

For Further Queries Please Contact :

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