amal nathan <nathan.amalphysics@gmail.com>

### UGC-DAE CSR \*\* CRS Project (2022-23)Status\*\*

UGC-DAE CSR <support@csruserportal.com>

Wed, May 24, 2023 at 12:02 AM

Reply-To: support@csruserportal.com
To: nathan.amalphysics@gmail.com

### Welcome to UGC-DAE CSR

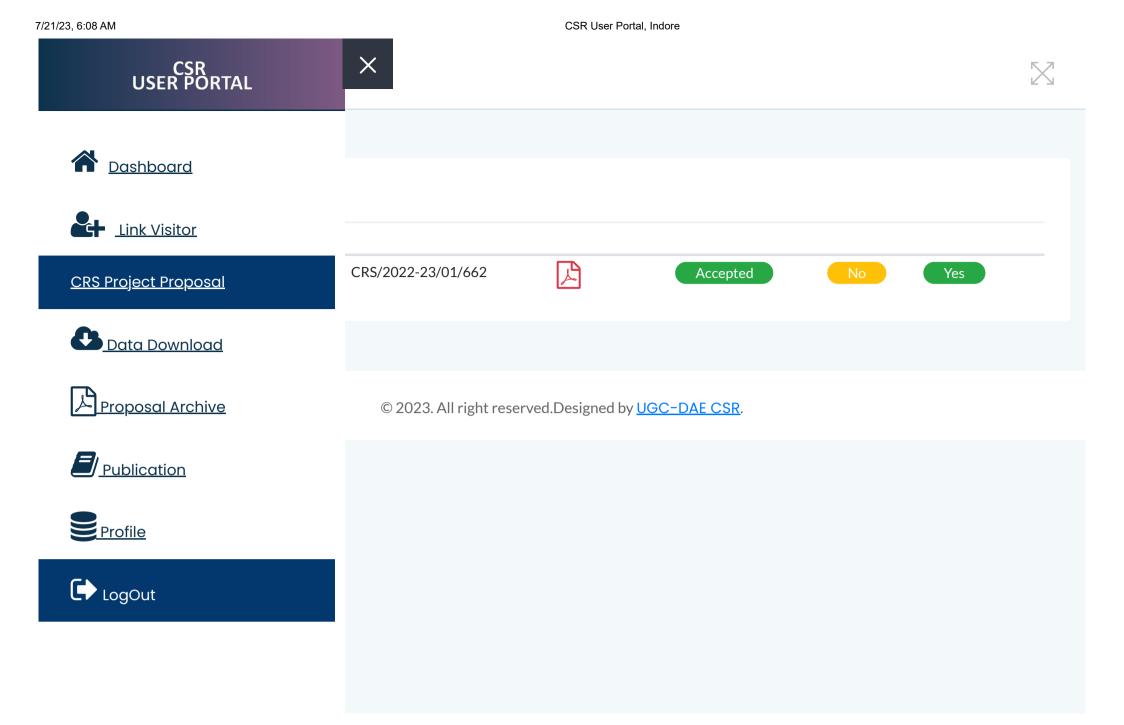
### Dear Dr. Dr.M.Amalanathan,

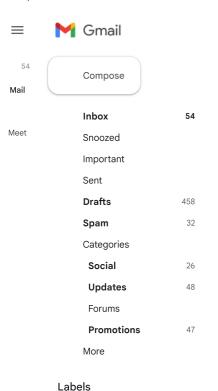
The updated status of your CRS project can now be seen at our user portal. Due to the limited amount of funds received from UGC, funds could be released only to some CRS projects. It is anticipated that funds for remaining CRS projects will soon be available from UGC and subsequently released. Please login to your account to view the sanction order and status of your project.

With best regards,

User Office, UGC-DAE CSR

Note: This is a system generated email. Please don't reply.





CDS project approved without student followshi

CRS project approved without student fellowship

CRS Project <support@csruserportal.com> to me

Search in mail

विश्वविद्यालय अनुदान आयोग - परमाणु ऊर्जा विभाग वैज्ञानिक अनुसंधान संकुल UGC-DAE Consortium for Scientific Research (An Autonomous Institution of University Grants Commission, New Delhil)

캺

Inbox ×

**CRS Program** 

### CRS Projects FY 2022-23.

Dear Dr.M.Amalanathan,

With reference to the CRS project proposal CRS/2022-23/804 submitted at L evaluated by the User Committee and the status of your project proposal is:

### Approved without student fellowship.

Kindly note that we have received a larger number of project proposals and du only few could be approved with a student fellowship.

In case you are willing to take up this project, please login to our user port March 25, 2023. Guidelines: <a href="https://www.csruserportal.com/data/Guidelines">https://www.csruserportal.com/data/Guidelines</a> fo

Please note that the decision of the User Committee is final and no comm

Bank Details

JOB

**IOB Transaction** 

Biosys

Journals Reg



## CRS/2022-23/804

## **Chosen Centre: Indore**

Project details					
Project title:	Synthesis of noble metal doped/transition metal oxide nanostructured composite for super capacitor electrode				
Type of Project:	In-house facilities of Indore Centre				
Name(s) of Principal Collaborator from UGC-DAE CSR:	Dr. R. Venkatesh				
Names(s) of other Collaborator(s) from UGC-DAE CSR (if any):	N.P. Lalla				
Names(s) of Collaborators from DAE (if any):	Rajamani Raghunathan				
Is there an ongoing CRS project of UGC-DAE CSR as a PI?	No				
Financial support required from UGC-DAE CSR?	Yes				
Require Fellowship for a Student?	Yes				
Consumable (MAX 50,000/- PER YEAR):	Yes				
contingency (MAX 15,000/- PER YEAR):	Yes				
Do you have any ongoing/submitted project with SERB/UGC/CSIR/BRNS or other funding agencies?	No				
Personal Information					
Name of the Principal Investigator (PI):	Dr.M.Amalanathan				
Date of Birth:	1984-03-09				
Designation:	Head of the Department				
Affiliation:	Nanjil Catholic College of Arts and Science				
Official E-mail address:	nathan.amalphysics@gmail.com				
Postal address:	Nanjil Catholic College of Arts and Science Nedumcodu Kaliyakkavilai Kanyakumari District Pincode: 629153				
Bank Details					
Beneficiary Name	Nanjil Catholic College of Arts and Science				
Account Number	10270100217857				
Bank Name	FEDERAL BANK				
IFSC Code	FDRL0001027				
Branch Name	PARASALA				
Finance Authorities					
Account Officer's Name	Dr.N.R.Sheela				
Account Officer's Email	nanjilccas@gmail.com				

## Synthesis of noble metal doped/ transition metal oxide nanostructured composite for super capacitor electrode

### 1.Introduction

Energy is one of the major resources used by the humans. Energy consumption has consistently grown in all sectors, including agricultural, industrial, commercial, and residential, during the last few decades, and is anticipated to continue to rise. India has been addressing the effects of energy on the environment, including air, water, land, and waste. In India, the energy industry is essential for both achieving sustainable development goals and minimising environmental externalities. A major issue is reducing the negative impact of air pollution on human health. India's coal supply has increased substantially, and coal continues to be the country's principal energy and power generating source. In the face of tighter air pollution restrictions, new coal power plants that are more efficient, flexible, and release less pollutants will be better positioned for economic viability. An efficient coal sector is critical not just for electricity generation, but also for industrial development in industries such as steel, cement, and fertilisers. Coal is used for power generation, oil is used for transportation and industry, and biomass is used for home heating and cooking. Bioenergy and the majority of coal is generated in the nation. Bioenergy supply has grown slowly in comparison to the explosive expansion of fossil fuels. Hydropower supply has remained reasonably constant over the last decade, growing at a rate of approximately 10%. Wind and solar, on the other hand, have grown at a quick pace, although from considerably lower levels.

Although funding for Nanotechnology has risen dramatically in the last five years, practical application of the research to tackle issues across the studies disciplines remains a challenge. These studies have helped solar cells and fuel cells, but the implications are not represented in today's products. Thin-film nanotechnology, and electrode for batteries are crucial areas for green-cell-based innovations. In the fields of fuel cells, reformers, and hydrogen storage, a number of institutions and research groups are active. The automobile industry will transition to fuel cells, but they must make the best decision for their individual applications. Additionally, cost reduction and dependability can only be achieved through nanotech enabled solutions, which opens up a new market and adds a new dimension to this sector. We've also targeted emerging countries as a market. Portable Nano-enabled fuel cells would be used in the electronics sector. Researchers are currently concentrating their efforts on developing solar PV, lithium batteries, and solar charging infrastructure. The world has witnessed massive research and development in the field of nanotechnology, but the application of the findings in green energy is an area that has yet to be successfully implemented for a variety of reasons, both known and unknown.

This research investigates the current issues in solar and fuel cell energy and suggests nanotechnology-based solutions. We have detailed the current development in this field as well as our previous work in this proposal. Metal embedded metal oxide composite based electrode, for super capacitor application are set to be considerably more helpful than their present counterparts. In this novel work we focused on the consequences of introducing Nano-enabled green cells. In this present work, gives a details report about production, modelling, reliable, high efficient, and low cost, metal embedded metal oxide composite for energy application.

### 2. Objective

- To fabricate metal doped metal oxide composite nanostructure for super capacitor electrode by hydrothermal method.
- Different nanostructured composites can be synthesized by varying dopant and synthesis parameters.
- Structural, optical, morphological and electrochemical properties are to be carried out using analytic instruments.
- Tuning the band gap and electrochemical behaviour by varying oxygen stoichiometry in the metal oxides, heat treatment, inclusion of dopant, fabricate suitable nanostructured composite.
- To commercialize the nanostructured composite as a super capacitor electrode.

### 4. Novelty of the research

- Tailoring the properties of electrode: tuning the band gap by oxygen stoichiometry in the metal oxide, by adding dopant.
- To enhance the surface area of the electrode by inclusion of co-catalyst.
- By encapsulating noble metal doped metal oxides increases the capacitance value and stability.
- Different nanostructure of metal oxides is to be synthesized and the structure- property reaction will be studied.

### 4. Methodology

High quality noble metal doped metal oxide composite will be synthesized by hydrothermal techniques and the properties will be tailored using various parameters and different annealing temperature.

### NAME: M.AMALANATHAN

### **Objectives:**

To pursue a career with leading corporate of hi-tech environment with committed and dedicated people, which will help me to explore myself fully and realize my potential



#### **Email:**

nathan.amalphysics@gmail.com nathan.amalphysics2011@gmail .com

### **Address for Communication: -**

M.Amalanathan S/O. J.Michael East kalpahaseri vilai Vavarai S.T.Mankad (Post) Kanniyakumari district Tamil nadu Pin: 629172

Ph: 04651-293178 Mob: 9940347178 : 7598864911

### **Personal Data**

Date of Birth: 09-03-1984

Age : 38
Sex : Male
Nationality : Indian
Community : BC

**Religion** : RC Christian

### **Education:**

- Ph.D Physics (University of Kerala) (Regular)
- M.Phil Physics (St.Joseph's college, Trichy) (Regular)
- M.Sc Physics (St.Joseph's college, Trichy) (Regular)
- B.Sc Physics (Annai velankanni college, Tholavavattam)
- H.Sc (St.Francis H.S.S, Vavarai)
- S.S.L.C (St.Francis H.S.S, Vavarai)

### **Published Papers:**

- **♣** Published 57 papers in International Journals
- Published 3 papers in National Journals
- **4** Communicated 3 papers in International Journals
- **Presented and Participated in 17 National and International Seminars/Conference**

### Languages known:

- Tamil (Reading, Writing, Speaking)
- English (Reading, Writing, Speaking)
- Malayalam (Speaking)

### **Award Received:**

\*

Dr. APJ Abdul Kalam Award for Scientific Excellence - 2016

### **Research Experience:**

- Reviewer in Spectrochimic Acta, Journal of Molecular Structure, Canadian Journal of Physics, Journal of Theoretical and Computational Chemist
- Two years working in UGC Major Project as a project assistant
- Organized Three National seminar
- Guided 4, Guiding 4 Ph.D Students and Guided 10 M.Phil Student

### **Other Experience:**

- **❖** Research Guide in Manonmaniam Sundaranar University
- **❖** IQAC Co-ordinator and Assistant coordinator
- **Staff association secretary 2 years**
- Chief Superentendent and Additional Chief Superentendent
- **❖** Membership in Asian Journal of Physics
- **❖** Head in the Department of Physics, Nanjil Catholic College of Arts and Science
- **❖** Edited 2 ISBN books

### **Academic profile**

Courses	Name of the Institution	Year of Passing	Board/ University	Marks Obtained	Maximum Marks	Percentage	Class
Ph.D	Mar Ivanios College Thiruvananthapuram	June 2012	University of Kerala	-	-	-	-
M.phil., Physics	St.Joseph's college (Autonomous), Trichy	Aug 2007	Bharathidasan University	313	400	82.80	I
M.Sc., Physics	St.Joseph's college (Autonomous), Trichy	April2006	Bharathidasan University	1253	1700	68.7	I
B.Sc., Physics	Annai Velankanni college, Tholayavattam	Apr.2004	Manonmanium Sundharanar University	1328	2000	66.4	I
H.Sc.,	St.Francis H.S.S.,Vavarai	Apr.2001	State Board	739	1200	61.58	I
S.S.L.C.,	St.Francis H.S.S.,Vavarai	Apr.1999	State Board	343	500	68.6	I

### **Teaching Experience**

		Period		Na	Nature of Employment		
Sl.No	Name of the Institution	From	То	Mode of Institution	Mode of Appointment	Teaching level	Total Years
1	Annai Velankanni College, Tholayavattam	13-07- 2011	15-12- 2016	Self- Finance	Regular	UG, PG, & M.Phil	5 Years 5 Months
2	Nanjil Catholic College of Arts and Science, Kaliyakkavilai	15-12- 2016	Till Date	Self- Finance	Regular	UG, PG, M.Phil & Ph.D	4 Years 4 Months

### **Declaration**

I here by declare that the above statements are true, complete and correct to the best of my knowledge and belief

Place: Vavarai Yours Sincerely

Date: 14-10 -2022 (M.Amalanathan)

### ` List of Publication

### **List of International Publication:**

- Theoretical and vibrational spectral investigation of sodium salt of Acenocoumarol Hubert Joe, Irena Kostova, C. Ravikumar, M. Amalanathan and S. Cinta Pinzaru Journal of Raman Spectroscopy 40 (2009) 1033-1038. (ISSN: 1097-4555)
- 2. NBO analysis and vibrational spectra of 2,6-bis(p-methyl benzylidene cyclohexanone) using density functional theory

L. Padmaja, M. Amalanathan, C. Ravikumar and I. Hubert Joe

Spectrochimica Acta Part A: 74 (2009) 349. (ISSN: 1386-1425)

 Charge Transfer Interaction and Terahertz Studies of a Nonlinear Optical Material L-Glutamine Picrate: A DFT Study
 M. Amalanathan, I. Hubert Joe and S.S. Prabhu

Journal of Physical Chemistry A 114 (2010) 13055–13064. (ISSN: 1089-5639)

Density functional theory calculation and vibrational spectral analysis of 4-hydroxy-3-(3-oxo-1-phenylbutyl)-2H-1-benzopyran-2-one
 M. Amalanathan, I. Hubert Joe and Irena Kostova

Journal of Raman Spectroscopy 41(2010) 1076–1084. (ISSN: 1097-4555)

5. Molecular first order hyperpolarizability and vibrational spectral investigation of Warfarin Sodium

Irena Kostova, M. Amalanathan and I. Hubert Joe

Chemical Physics 78 (2010) 88–102. (ISSN: 0301-0104)

6. Infrared and Raman spectra, vibrational assignment, NBO analysis and DFT calculations of 6-aminoflavone

Y. Erdogdu, O. Unsalan, M. Amalanathan and I. Hubert Joe

Journal of Molecular Structure 980 (2010) 24-30. (ISSN: 0022-2860)

7. Molecular structure, vibrational spectra and nonlinear optical properties of L-

**Valine Hydrobromide: DFT study** 

M. Amalanathan, I. Hubert Joe and V.K. Rastogi

Journal of Molecular Structure 985 (2011) 48-56. (ISSN: 0022-2860)

8. Vibrational and Terahertz spectral Investigation and nonlinear optical properties of L-Phenylalanine phenylalanium nitrate -A DFT study

M. Amalanathan, I. Hubert Joe and V.K. Rastogi

Journal of Molecular Structure 1006 (2011) 513-526. (ISSN: 0022-2860)

9. Density functional theory calculations and Vibrational spectral analysis of 3,5(Dinitro benzoic acid)

M. Amalanathan, I. Hubert Joe, M.A. Palafox, Satentra kumar, V.K. Rastogi Spectrochimica Acta A 78 (2011) 437-1444. (ISSN: 1386-1425)

10. Intramolecular charge delocalization and nonlinear optical properties of push- pull chromophore 1-(4-N, N-dimethylaminopyridinium) acetic acid bromide monohydrate from vibrational spectra

C. Jesintha John, M. Amalanathan, D.Sajan, K. Udaya Lakshmi and I. Hubert Joe Spectrochimica Acta A78 (2011) 264-272. (ISSN: 1386-1425)

11. Vibrational spectra and first order hyperpolarizability studies of Dimethyl amino pyridinium 4-nitrophenolate 4-nitrophenol

C. Jesintha John, M. Amalanathan, A.R.Twinkle, P. Srinivasan and I. Hubert Joe Spectrochimica Acta Part A 81 (2011) 151-161. (ISSN: 1386-1425)

12. Analysis of Vibrational Spectra and Nonlinear Optical Properties of Organic Molecule L-Alaninium Formate

C. Jesintha John, T.S. Xavier, M. Amalanathan, I. Hubert Joe and V.K. Rastogi Spectrochimica Acta Part A 86 (2011) 174-180. (ISSN: 1386-1425)

13. Vibrational spectral analysis of nonlinear optical crystal L-Prolinium picrate: A density functional theory study

Bismi Edwin, M. Amalanathan and I. Hubert Joe

Spectrochemica Acta 96 (2012) 10-17. (ISSN: 1386-1425)

14. Vibrational Spectral Investigation and Natural Bond Orbital analysis of anti-Rheumatoid drug Ethyl 4-nitrophenylacetate - DFT approach

D.M. Suresh, M. Amalanathan, S. Sebastian, D. Sajan, I. Hubert Joe, V. Bena Jothy Spectrochemica Acta (2012) 98 (2012) 413-422. (ISSN: 1386-1425)

15. Molecular structure, Normal Coordinate Analysis, Harmonic Vibrational frequencies, Natural Bond Orbital, TD-DFT calculations and biological activity analysis of antioxidant drug 7-hydroxycoumarin

S. Sebastian, S. Sylvestre, D. Jayarajan, **M. Amalanathan**, K. Oudayakumar, T. Gnanapoongothai, T. Jayavarthan

Spectrochemica Acta 101 (2013) 370-381. (ISSN: 1386-1425)

- 16. FT-IR, FT-Raman, FT-NMR spectra and DFT simulations of 4-(4-Fluoro-phenyl)-1H-imidazole
  - Y. Erdogdu, D. Manimaran, M.Amalanathan and I. Hubert Joe

Optics and Spectroscopy, 114, 2013, 525–536. (ISSN: 1562-6911)

- 17. Vibrational spectral investigation and molecular polarizability studies of NLO crystal Naphthalene Picrate for THZ application
  - M. Amalanathan, V.K. Rastogi and I. Hubert Joe

Spectrochemica Acta 108, 2013, 256-267. (ISSN: 1386-1425)

- 18. Vibrational Spectra, Molecular Structure, Natural Bond Orbital, First Order Hyperpolarizability, TD-DFT and Thermodynamic analysis of 4-amino-3-hydroxy-1-naphthalenesulfonic acid by DFT approach
  - S. Sebastian, S. Sylvestre, N. Sundaraganesan, **M. Amalanathan**, S. Ayyapan, K. Oudayakumar, B. Karthikeyan

Spectrochemica Acta 107(2013) 167-178. (ISSN: 1386-1425)

19. Vibrational Spectral Investigation and natural bond orbital analysis of Pharmaceutical compound 7-Amino-2,4-dimethylquinolinium formate- DFT approach

D.M.Suresh, M. Amalanathan, S. Sebastian, D.Sajan, I. Hubert Joe and V.Bena Jothy, Ivan Nemec

Spectrochemica Acta 115 (2013) 595-602. (ISSN: 1386-1425)

- 20. Normal coordinate analysis and Nonlinear Optical Response of cross-conjugated system 4,4-Dimethyl Benzophenone
  - M. Amalanathan, T.S. Xavier, I. Hubert Joe and V.K. Rastogi

Spectrochemica Acta 116 (2013) 574-83. (ISSN: 1386-1425)

21. Molecular structure, vibrational spectral investigation and the confirmation analysis of 4-Methylesculetin molecule

Y. Erdogdu, M. Guzel, M. T. Güllüoğlu, M. Amalanathan, S. Saglam, I. Hubert Joe Optics and Spectroscopy, 116, 2013, 348–359. (ISSN: 1562-6911)

22. Studies on molecular structure, vibrational spectra and molecular Docking analysis of 3-Methyl-1,4-dioxo-1,4-dihydronaphthalen-2-yl 4-aminobenzoate

D.M.Suresh, M. Amalanathan, I. Hubert Joe, V.Bena Jothy, and Yun-Peng Diao Spectrochemica Acta 130(2014) 591-603. (ISSN: 1386-1425)

23. Vibrational Spectra (FT-IR and FT-Raman), Molecular Structure, Natural Bond Orbital, and TD-DFT analysis of L-Asparagine Monohydrate by Density Functional Theory approach

S. Sylvestre, S. Sebastian, S. Edwin, **M. Amalanathan**, S. Ayyapan, T. Jayavarthanan, K. Oudayakumar, S. Solomon

Spectrochemica Acta 133 (2014) 190-200. (ISSN: 1386-1425)

24. Study on conformational stability, molecular structure, vibrational spectra, NBO, TD-DFT, HOMO and LUMO analysis of 3,5-dinitrosalicylic acid by DFT techniques

S. Sebastian, S. Sylvestre, J. Jayabharathi, S. Ayyapan, **M. Amalanathan**, K. Oudayakumar, Ignatius A. Herman

Spectrochemica Acta 136 (2015) 1107-1118. (ISSN: 1386-1425)

25. FT-IR and FT-Raman spectral investigation and DFT Computations of

Pharmaceutical Important Molecule: Ethyl 2-(4-Benzoyl-2,5-Dimethylphenoxy)

Acetate

D.M.Suresh, M. Amalanathan, I. Hubert Joe, V.Bena Jothy, S.Sebastian and S.Ayyapan Pharmaceutica Analytica Acta 7 (2016) 1-9 (ISSN: 2153-2435)

26. FT-IR Molecular structure and Charge transfer contributions to nonlinear optical property of 2-Methyl-4-Nitroaniline: A DFT Study

G.Femina Jasmine, M. Amalanathan, S.Dawn Dharma Roy

Journal of Molecular Structure 1112 (2016) 63-70. (ISSN: 0022-2860)

27. Infrared Spectral Investigations and Ab Initio Computations of Pharmacological Drug Goniofufurone Monoacetate

Amalanathan M, Usha D, Hubert Joe I and Ajithabai MD

Pharmaceutica Analytica Acta 7:8 (2016) 1-7(ISSN: 2153-2435)

28. Comparative studies on Molecular structure, Vibrational Spectra and Hyperpolarizabilies of NLO Chromophore Ethyl 4-Dimethylaminobenzoate

M. Amalanathan, Femina Jasmine, S.Dawn Dharma Roy

Journal of Molecular Structure 1141 (2017) 400-416. (ISSN: 0022-2860)

29. Structure activity relationship, vibrational spectral investigation and molecular docking analysis of anti-neuronal drug 4-(2-Aminoethyl) Morpholine

Bismi Edwin, **M. Amalanathan**, Ridhima Chadha, Nandita Maiti, Sudhir Kapoor and I. Hubert Joe

Journal of Molecular Structure 1148 (2017) 459-470. (ISSN: 0022-2860)

30. Quantum chemical computations on structural elucidation, homo-lumo and NLO analysis of 5-chloro-2-hydroxypyridine

D.Usha, M.Amalanathan, H.Marshan Robert

International Journal of Engineering Science and Innovative Technology (IJESIT) 7( 2018) 67-75 (ISSN: 2319-5967)

31. FT-Raman and FTIR Spectroscopic Investigation, First Hyper Polarizability, Homo

**Lumo Analysis of P-Fluorobenzonitrile (PFBN)** 

S. Aslin, D. Usha, M.Amalnathan

International Journal of Science and Research (IJSR) 7, 2018, 1144-1149 (ISSN: 2319-7064)

32. Identification of Anticoagulants Activity using Structural, Spectroscopic and Molecular Docking Analysis of 6-Methyl Coumarin

Loice Bessylet, C.Gnana Sambandam, M.Amalanathan and D.Usha

International Journal of Research and Analytical Reviews (IJRAR) 5, 2018, 652-665 (E-ISSN 2348-1269, P- ISSN 2349-5138)

33. Terahertz studies of some nonlinear optical material

M. Amalanathan and D.Usha

International Journal of Research and Analytical Reviews (IJRAR) 5, 2018, 399-407 (E-ISSN 2348-1269, P- ISSN 2349-5138)

- 34. Identification and Analysis of anticancer and antimicrobial activity of 1-(p-toluenesulfonyl)imidazole using theoretical and experimental analysis
  - G. Golding Sheeba, D. Usha, **M. Amalanathan**, and M. Sony Michael Mary Journal of Theoretical and Experimental Biology, 13 (1 and 2): 111-123, 2018 (ISSN: 0972-9720)
- 35. Structural Analysis, Vibrational Spectral Investigation and Charge Transfer Interactions of 5-ChloroSalicylaldehyde by Experimental and Theoretical Investigations
  - B. Queen Sheeba, C. Besky Job, M. Sony Michael Mary, M. Amalanathan, R. Racil Jeya Geetha

Journal of Theoretical and Experimental Biology 13 (1 and 2): 125-134, 2018, (ISSN: 0972-9720)

36. Molecualr Docking, Harshiefield Surface And Reactivity And Hyperpolarizability Analysis Of 3-(2-Bromoacetyl)-2h-Chromen-2-One

S.Loice Bessylet, C.Gnana Sampantham, **M.Amalanathan**, D.Usha and M.Sony Michael Mary**Journal of Emerging Technologies and Innovative Research 6, 2019, 211-225** (ISSN-2349-5162)

37. Investigations On The Optical And Mechanical Properties Of Non Linear Optical Creatininium Phosphite Single Crystal

Sindhusha S, Padma C M, Amalanathan M

International Journal of Scientific & Technology Research 8, 2019, 1676-1682 (ISSN 2277-8616)

38. Spectroscopic (UV, NMR) Investigation, Anti- Microbial And Molecular Docking Analysis Of 2,3- Dichloronaphthalene-1,4-Dione

Marshan Robert H, **Amalanathan M**, Usha D, Racil Jeya Geetha R, Sony Michael Mary M

International Journal of Scientific & Technology Research 8, 2019, 2127-2134 (ISSN 2277-8616)

39. Vibrational spectral, density functional theory and molecular docking analysis on 4-nitrobenzohydrazide

H. Marshan Robert, D Usha, M. Amalanathan, R. Racil Jeya Geethad, M. Sony Michael Mary **Journal of Molecular Structure 1223 (2020) 128948 (ISSN: 0022-2860).** 

- 40. Vibrational Spectroscopic Analysis of 10H-Dibenzo[b,e][2,4]oxazine and nvestigate their Structural Reactivity by DFT Computations and Molecular Docking Analysis M. Latha Beatrice, S. Mary Delphine, M. Amalanathan And H. Marshan Robert Asian Journal of Chemistry; Vol. 32, No. 10 (2020), 2475-2485 (ISSN: 0970-7077)
- 41. Structural, morphological, and optical properties of country egg shell derived activated carbon for dye removal

M. Aravind, M Amalanathan

Materials Today: Proceedings Volume 43, Part 2, 2021, Pages 1491-1495 ISSN: 2214 -7853

42. A Spectroscopic (IR, Raman, UV, NMR) Characterization and investigation of reactive properties of pyrazine-2-carboxamide by anti-bacterial, anti-mycobacterial, fukui function, molecular docking and DFT calculations

H. MarshanRobert, D.Usha, **M.Amalanathan**, R. Racil JeyaGeetha, M. Sony Michael Mary

Chemical Data Collections Volume 30, December 2020, 100583 ISSN: 2405-8300

43. Identification of structure activity relation of a synthetic drug 2,6-pyridine dicarbonitrile using experimental and theoretical investigation

G.Golding Sheeba, D.Usha, M.Amalanathan, M.Sony Michael Mary

Wutan Huatan Jisuan Jishu Volume XVI, Issue XI, November/2020 Page:89-113 ISSN:1001-1749

44. Quantum chemical computation, vibrational analysis, molecular structure, nonlinear optical studies of 4-(Diethylamino)salicylaldehyde

B.Queen Sheeba, , C. Besky Job, M.Sony Michael Mary, M.Amalanathan

Wutan Huatan Jisuan Jishu Volume XVII, Issue I, January 2021Page:268-295 ISSN:1001-1749

45. Critical green routing synthesis of silver NPs using jasmine flower extract for biological activities and photocatalytical degradation of methylene blue Author links open overlay panel

M.Aravind, AwaisAhmad, IkramAhmad, **M.Amalanathan**, KhalidaNaseem, Sony M. MichaelMary, C.Parvathiraja, ShahidHussaingTahan, SaadAlgarnihMuhamma, Pervaiz, Muhamma, Zubair,

Journal of Environmental Chemical Engineering Available online 9 December 2020, 104877 In Press, ISSN: 2213-3437

46. Synthesis of TiO2 nanoparticles by chemical and green synthesis methods and their multifaceted properties

M. Aravind M. Amalanathan1 and M. Sony Michael Mary

SN Applied Sciences (2021) 3:409

47. Molecular Structure, Spectroscopic, Fukui function, RDG, Anti-microbial and Molecular Docking analysis of higher concentration Star Anise content compound Methyl 4-methoxybenzoate -DFT Study

Latha Beatrice, S.Mary Delphine, **M.Amalanathan**, M.Sony Michael Mary, H.Marshan Robert, K.Thibi Mol

Journal of Molecular Structure 1238, 2021, 130381

48. Spectroscopic Profiling (FT-IR, FT-Raman), Vibrational Assignments, Wave Function (ESP, ELF, LOL) Analyses and Fukui Function Study of NBenzylidene Aniline (NBAN)

S.Aslin, D.Usha, M.Amalanathan

Wutan Huatan Jisuan Jishu Volume XVII, Issue V, May/2021, 17-37

49. Molecular Structure, Vibrational Spectroscopic, Frontier Molecular orbital and Natural Bond Orbital analysis of Anti-cancer drug 6-Chloro-3- Pyridine Carbonitrile

G.Golding Sheeba,b, D.Usha, **M.Amalanathan**, M.Sony Michael Mary, H.MarshanRobert

Spectroscopy Letters 2021, VOL. 54, No. 6, 419-436

- 50. Structural and vibrational spectral investigation on the identification of Non Linear Optical properties and wave function analyses (Electrostatic potential, Electron localization Function, Localized Orbital Locator) of 3-Ethoxy Salicilaldehyde B.Queen Sheeba, M.Sony Michael Mary, M.Amalanathan, C. Besky Job Molecular Simulation Vol. 47, 2021, Pages 1217-1233 |
- 51. Enhanced photocatalytic and biological observations of green synthesized Activated carbon, Activated carbon doped Silver and Activated carbon/Silver/Titanium dioxide nanocomposites

Aravind.M, Amalanathan. M, Sony Michael Mary.M, C.Parvathiraja, Asma A. Alothman, Saikh M. Wabaidur, Mohammad Ataul Islam

Journal of Inorganic and Organometallic Polymers and Materials 32, (2022)

pages267-279.

**52.** Synthesis, Structural, Spectroscopic and Docking Studies on (E)-1-Ferrocenyl-3-phenyl-propen-1-one by Density Functional Theory

 $\textbf{M.Amalanathan,} \ \textbf{M.Sony Michael Mary, M.Latha Beatriced, S.Mary Delphine },$ 

H.Marshan Robert, A.R.Twinkle, Zoran Ratkovic, Y.Samson

Molecular Simulation Vol. 48, 2022, 387–402

53. Synthesis of silver nanoparticles using Syzygium malaccense fruit extract and evaluation of their catalytic activity and antibacterial properties

Herbin Basalius H, Aravind. M, Amalanathan , Sony Michael Mary. M4, Maria Lenin.

M, C. Parvathiraja, Masoom Raza Siddiqui, Saikh Mohammad Wabaidur, Md Ataul Islam.

Journal of Inorganic and Organometallic Polymers and Materials 32, pages1103–1115 (2022)

54. Synthesis, Structural, Spectroscopic investigation on 3-(2-Hydroxyphenyl)-1-ferocenylpropan-1-one by Density Functional Theory

M.Sony Michael Mary, R. Racil Jeya Geetha, **M.Amalanathan**, A.R.Twinkle Zoran Ratkovic

Wutan Huatan Jisuan Jishu Volume Volume XVIII, Issue I, January/2022, 114-143

55. Structure Activity Relationship, Topological Analysis and Molecular Docking
Analysis of Pharmaceutical Molecule 2356 -Tetrafluoro-4-Pyridine Carbonitrile
M. Sony Michael Mary, R. Racil Jeya Geetha, M. Amalanathan and R. Benisha

Journal of Pharmaceutical Research International 33(60B): 2886-2902, 2021

56. Spectroscopic and Topological analysis and in vitro antimicrobial activity of Phenothiazine

M.Sony Michael Marya, R. RacilJeya Geetha, M.Amalanathan, H.Marshan Robertd, A.Ronaldo Anuff

Spectroscopy Letters 55, 2022 - Issue 3, 212-228

57. Catharanthus roseus leaf extract mediated Ag-MgO nanocatalyst for Photocatalytic degradation of congo red dye and their antibacterial activity

R.Benisha, **M.Amalanathan**, M.Aravind, M Sony MichelMary, AwaisAhmad, SobiaTabassum, Wahidah H.Al-Qahtani, IkramAhmad

Journal of Molecular Structure 2022, 133005

58. Green synthesis of nano silver using Syzygium samarangense flower extract for multifaceted applications in biomedical and photocatalytic degradation of Methylene Blue.

Herbin Basalius, Aravind, **Amalanathan M,** Sony Michael Mary, Maria Lenin, Parvathiraja, Masoom Raza Siddiqui, Saikh Mohammad Wabaidur, Mohammad Ataul Islam.

**Applied Nano Science (2022)** 

### **List of National Publication:**

1) Density functional theory calculation and vibrational spectroscopic study of p-Hydroxy benzoicacid dimer

V. Bena Jothy, M Amalanathan, V.K Rastogi, I. Hubert Joe

Asian Journal of Physics, Vol. 24 (2015) 00-00.

http://asianjournalofphysics.in/content2/vol-24-2015/vol-24-no-5

2) Molecular structure and spectroscopic properties of L-Histidinium dihydrogen monophosphate monohydrate: FT-Raman, FT-IR ,SERS and DFT computations

V. Bena Jothy, M. Amalanathan, V.K. Rastogi and I. Hubert Joe Asian journal of spectroscopy (2012) 207-224. (ISSN: 0971-9237)

3) Molecular Structure, Vibrational spectra and theoretical studies of Bis Glycyl glycinium Oxalate

V. Bena Jothy, M. Amalanathan, D. Sajan, V.K. Rastogi and I. Hubert Joe Asian journal of spectroscopy 2010 87-105. ((ISSN: 0971-9237)

### Others:

1. Spectroscopic, Frontier Orbital's and NBO analysis of 3-Pyridinecarboxylic acid hydrazide - DFT method

H.MarshanRobert, D.Usha, M.Amalanathan

Studies in Indian Place Names (UGC Care) 40, 2020, 1041-1050 (ISSN: 2394-3114)

2. Structural and Spectral Analysis of Picric Acid 2 Nitroaniline A DFT Approach
G.Bagavathi Sankar , D.Usha, M. Amalanathan

Studies in Indian Place Names (UGC Care) 40, 2020, 1197-1203 (ISSN: 2394-3114)

3. Structural analysis and electronic transfer investigation of a anticancer drug 2,6-pyridinedicarbonitrile

G.Golding Sheeba, D.Usha1 M.Amalanathan, M.Sony Michael Mary

Studies in Indian Place Names (UGC Care) 40, 2020, 1070-1074 (ISSN: 2394-3114).

### **Special issue Papers**

1. Quantum Chemical computations and spectral Investigation of 2, 6-Bis (P-Methyl Benzylidene Cyclohexanone) M. Amalanathan, C. Ravikuma, L. Padmaja, V.S. Jayakumar and I. Hubert Joe

American Institute of Physics 978-0-7354-0606-3/08

2. Growth and vibrational spectroscopic Investigations of NLO crystal Barium Thiourea Chloride M. Meena Kumaii, C. Ravikumar, M. Amalanathan, V. S. Jayakumar and I. Hubeit Joe

American Institute of Physics 978-0-7354-0606-3/08

3. Natural bond orbital analysis and vibrational spectral investigation of 3,5-(dinitro benzoic acid)

Rastogi, V.K., **Amalanathan, M.**, Hubert Joe, I. (2010) AIP Conference Proceedings 1267 PP. 621 - 622 doi: 10.1063/1.3482712

4. Terahertz and FT-IR spectral analysis of a NLO material L-glutamine picrate: A DFT study

**Amalanathan, M.**, Joe, I.H. (2010) AIP Conference Proceedings 1267 PP. 1192 - 1193 doi: 10.1063/1.3482375

5. Polariton dispersion of a quantum wire superlattice system K. S. Joseph Wilson, M. Amalanathan, V. Revathy and S. Maria Lenin AIP Conf. Proc. 1665, 090037 (2015); <a href="http://dx.doi.org/10.1063/1.4918017">http://dx.doi.org/10.1063/1.4918017</a>

### **Conference Publication:**

1. DFT Computation on Molecular structure and Vibrational Spectral Investigations of NLO Chromophore 2-Amino-3-Nitro Pyridine

G.Femina Jasmine, M. Amalanathan and S.Dawn Dharma Roy

UGC sponsered National seminar on Emerging Trends in Theoritical and Experimental Physics, 8<sup>th</sup> & 9<sup>th</sup> January 2015, Organized by Department of Physics, Sree Avyappa College for Women, Chunkankadai, (ISBN 978-81-9-2-308-2-4).

- 2. Studies on Molecular structure, Vibrational Spectral analysis and Hyperpolarizabilies study of 2-Amino-3-Nitro Pyridine
  - G.Femina Jasmine, M. Amalanathan and S.Dawn Dharma Roy

National Seminar on New Materials and Nanotechnology (NSNMN-2015) 1<sup>th</sup> February 2015 Organized by Department of Science and Department of Electronics and Comunication Engineering, Heera College of Engineering and Technology, Thiruvananthapuram.

- 3. DFT computation on Molecular Structure & Vibrational Spectral Investigations of NLO Chromophore 2-Methyl-4-Nitro Aniline
  - G.Femina Jasmine, M. Amalanathan and S.Dawn Dharma Roy
  - UGC Sponsered National Conference on Emerging Trends in Applied Physics (NCETAP-2015) 19<sup>th</sup> & 20<sup>th</sup> February 2015 organized by Department of Physics, Lekshmipuram College of Arts and Science, Nevyoor.
- 4. Studies on Molecular structure, Vibrational Spectra and Hyperpolarizabilies of NLO Chromophore Ethyl 4-Dimethylaminobenzoate,
  - G.Femina Jasmine, C.Sindhiya, M. Amalanathan and S.Dawn Dharma Roy
  - National Conference on Technologically Advanced Materials (NCTAM-2016) on 6<sup>th</sup> September 2016 organized by Department of Physics, Muslim Arts college, Thirivithancode (ISSN:2349-6886).
- 5. Nonlinear Optical Response of cross-conjugated system 4,4-Dimethyl Benzophenone M. Amalanathan, T.S. Xavier, I. Hubert Joe and V.K. Rastogi National Conference on Exploring the Frontier of Vibrational Spectroscopy (EXFOVIS-2011) (Sept 1-2, 2011) at Women's Christian College.
- 6. Charge transfer interaction and vibrational spectral investigation of a nonlinear optical material L-Glutamine Picrate: A DFT study
  - M. Amalanathan and I. Hubert Joe
  - 98th Indian Science congress (ISCA 2011) (Jan 3-7, 2010) at SRM University, Chennai.
- 7. Density functional theoretical modeling and HOMO-LUMO energy of p- Hydroxy benzoic acid dimmer
  - V. Bena Jothy, M. Amalanathan and I. Hubert Joe

- 98th Indian Science congress (ISCA 2011) (Jan 3-7, 2010) at SRM University, Chennai.
- 8. Vibrational Spectroscopic studies and Natural Bond Orbital Analysis of non linear push-pull chromophore 1-(4-N, Ndimethylaminopyridinium) acetic acid bromide monohydrat C. Jesintha John, M. Amalanathan and I. Hubert Joe
  - International Conference on Recent Frontiers in Applied Spectroscopy (ICORFAS-2010) 22nd 24th September, 2010 at Annamalai University Chithambaram.
- 9. Quantum Chemical Methods First order hyperpolarizability study and vibrational spectral investigation of the NLO crystal L-Valine Hydrogen chloride
  - A.R. Twinkle, M. Amalanathan and I. Hubert Joe
  - International Conference on Recent Frontiers in Applied Spectroscopy (ICORFAS-2010) 22nd 24th September, 2010 at Annamalai University Chithambaram.
- Density functional theory and natural bond orbital of p- Hydroxy benzoic acid dimer
   V. Bena Jothy, M. Amalanathan and I. Hubert Joe
   International Conference on Recent Frontiers in Applied Spectroscopy (ICORFAS-2010) 22nd 24th September, 2010 at Annamalai University Chithambaram.
- 11. Natural Bond Orbital Analysis and Vibrational Spectral Investigation of 3,5-(Dinitro benzoic acid)
  - V.K. Rastogi, M. Amalanathan and I. Hubert Joe

Science and Technology Centre (LASTEC) Delhi.

- XXII International Conference on Raman Spectroscopy (ICORS 2010) (August 8 13, 2010) at Boston, USA. (Accepted).
- Teraertz and FT-IR spectral Analysis of NLO material L-Glutamine Picrate: A DFT study
   M. Amalanathan and I. Hubert Joe
  - XXII International Conference on Raman Spectroscopy (ICORS 2010)(August 8 13, 2010) at Boston, USA. (Accepted).
- 13. FT-IR analysis and First order hyperpolarizbility study of NLO crystal Naphthalene picrate
  M. Amalanathan and I. Hubert Joe
  - Ninth DAE-BRNS National Laser Symposium-(NLS-09) (Jan 13-16, 2010) at Bhabha Atomic Research Centre (BARC), Mumbai.
- 14. FT-IR spectral investigationa and Natural bond orbital analysis of Naphthalene picrate M. Amalanathan and I. Hubert Joe National Seminar on Photonic Materials (NSPM 2009) (February 26-28) Kerala University Trivandrum.
- 15. FT-IR Spectral Investigation and NBO analysis of Nonlinear material L-Prolinium Picrate Bismi Edwin, M. Amalanathan, C. Ravikumar and I. Hubert Joe Eight DAE-BRNS National Laser Symposium -(NLS-08) (Jan 7-10, 2009) at Laser

- 16. Quantum chemical computational hyperpolarizability studies of Cyclohexanone derivatives
  - I. Hubert Joe, M. Amalanathan, C. Ravikumar and V.K. Rastogi
    XXI International Conference on Raman Spectroscopy ICORS 2008 (17th 22nd
    August 2008) at Uxbridge, West London, UK.
- 17. Quantum chemical computations and spectral incestigation of 2,6-Bis(p-methyl bezyliene cyclohexanone)
  - M. Amalanathan, C. Ravikumar, L. Padmaja, V.S. Jayakumar and I. Hubert Joe International conference on perspective in vibrational spectroscopy (ICOPVS2008)(Feb 24-28, 2008) at Mascot Hotel, Trivandrum.
- 18. Growth and vibrational spectroscopic investigation of NLO crystal Barium Thiourea Chloride
  - M. Meena Kumari, C. Ravikumar, M. Amalanathan, V.S. Jayakumar and I. Hubert Joe International conference on perspective in vibrational spectroscopy (ICOPVS2008) (Feb 24-28, 2008) at Mascot Hotel, Trivandrum.



## Nanjil Catholic College of Arts & Science

NEDUMCODE, KALIYAKKAVILAI - 629 153, K.K.DISTRICT, TAMIL NADU

(Accredited with 'B' by NAAC)
(Approved by UGC under section 2(f) & 12(B) status)

Phone: 04651-244788, Mobile: 8903013368, E-mail: nanjilccas@gmail.com, Website: www.nccas.edu.in

### **DECLARATION**

- 1. As a Principal Investigator (PI), I understand that it is my responsibility to carry out the Collaborative Research Scheme (CRS) project work as per rules and regulations of UGC-DAE CSR.
- 2. The scientific program of the CRS will be carried out jointly by me and a Principal Collaborator at UGC-DAE CSR. All scientific publications resulting from the CRS, will be communicated with each other's consent. Technical and scientific assistance from UGC-DAE CSR and DAE personnel will be acknowledged, either in the acknowledgements or in authorship.
- Financial support received from UGC-DAE CSR will be acknowledged explicitly in all publications. Please add following sentence in the acknowledgement section of the manuscript, ""This work was partially/fully carried out using the facilities of UGC-DAE CSR"
- Progress reports, extension requests, conclusion documents, etc., will be submitted by me to the UGC-DAE CSR with the consent of the Principal Collaborator.
- 5. Copies of the publications, thesis, etc., resulting from the CRS will be sent to UGC-DAE CSR.

Place:Kaliyakkavilai Date:14-10-2022

Signature of Principal Investigator

Dept of Physics & Research Centre Nanjil Catholic College of Arts & Science Kaliyakkavilai , 620 152

Signature and Seal of Head of Department/University

Dr. A. Meenakshi Sundara Rajan PRINCIPAL

Nanjil Catholic College of Arts & Science Kaliyakkavilai - 629 153

Kaliyakkavilai - 629 153

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IFSC Code :FDRL0001027

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6	DD	Demand Draft
7	Dr.	Debit
8	DW	Dividend Warrant
9	ECS	Electronic Clearing Service
10	FBxxxx	Standing Instruction
11	FCCP	Foreign Currency Cheque Purchased
12	IBC	Inward Bills for Collection
13	IBP	Inward Bills under LC
14	ICBP	Inland Clean Bills Purchased
15	IDBP	Inland Documentary Bills Purchased
16	Inst	Instrument
17	int.	Interest
18	10	Interest Outflow
19	LCC	Local Cheque for Collection
20	LCP	Local Cheque Purchased
21	OBC	Outward Bills for Collection
22	Pd.	Paid
23	POS Sur.	Point of Sale Surcharge
24	RTN	Return
25	Tran.	Transaction
26	Trf.	Transfer

Account Type Account Number : Savings Account

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From

Dr.M.Amalanathan
Principal Investigator
Project No: CRS/2022-23/01/662
UGC-DAE CSR Project
Department of Physics
Nanjil Catholic College of Arts and Science
Kaliyakkavilai

To

The Secretary
Nanjil Catholic College of Arts and Science
Kaliyakkavilai

Through

The Principal

Respected Father,

Sub: Requesting to release the fund sanctioned to the project CRS/2022-23/01/662 UGC-DAE CSR Project Reg:-

I am served as a principal investigator of the project (CRS/2022-23/01/662 UGC-DAE CSR Project) entitled "Synthesis of noble metal doped/transition metal oxide nanostructured composite for super capacitor electrode". An amount Rs.45000 was sanctioned by UGC for the consumable and contingency for the academic year 2022-23 and it was transferred to our college account on 08-02-2024 from UGC-DAE consortium. I request you to release the money for the implementation of the project successfully. Herewith I am enclosed the fund sanctioned letter and Proposal copy.

Thanking You

Kaliyakkavilai

26-02-2024

4. M. 2 2 2 2 2

(Dr.M.Amalanathan)

Yours Sincerely

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## Nanjil Catholic College of Arts and Science- Kaliyakkavilai

### **Statement of Accounts**

## CRS Project CRS/2022-23/01/662

Income item	Amount	Expenditures	Date	Amount
Contingency	45000.00	SEM-EDS Analysis	10-11-2023	1947.00
Maringert - 1 in the		SEM-EDS Analysis	04-01-2024	6000.00
	Transfer Live	SEM-EDS Analysis	20-10-2023	4000.00
Special Company	i i wie	Chemicals	05-12-2023	2700.00
To have the British	12.5	Chemicals	15-12-2023	5697.00
Particle Fra		SEM-EDS Analysis	ne' e p	1770.00
	100	Chemicals	02-07-2023	12187.54
		Chemicals	03-09-2023	4752.00
		UV-Spectrum	18-12-2023	2000.00
		Miscellaneous		446.66
			Total Expanse	45000.00
			Balance:	0.00

Rev. Fr. Dr. M. ECKERMENS MICHAEL
Secretary M.B.A., Ph.D
Nonjil Cotholic College of Arts & Science
Kaliyakkavilai - 629 153.
Kanyakumari District, Tamilnadu, India.

Nanjil Catholic College of Arts & Science Kaliyakkavilai - 629 153 Accounts Officer



### UTILISATION CERTIFICATE

Certified That out of Rs.45000.00 of grants-in-aid sanctioned during the year 2022-23 in favour of Dr.M.Amalanathan (PI, Project Number: CRS/2022-23/01/662) under UGC-DAE Consotrium of Scientific Research letter/Order No.CRS/2022-23/01/662 dated 08-02-2024 has been utilised for the purpose of execution of the project for which it was sanctioned and that the balance of Rs.0.00 remaining unutilised at the end of the year has been surrendered to the UGC-DAE Consotrium of Scientific Research (Vide DD No Nil Dated Nil) will be adjusted towards the grants-in-aid payable during the next year i.e.\_\_\_

and:	*	
(Principal Investigator) Nanj Date : 19/3/24	Finance Officer il Catholic College of Arts & Science Kaliyakkayilai - 629 153 Date	Institute Rev. Fr. Dr. M. ECKERMENS MICHAE Secretary M.B.A., Ph. Nanjil Catholic College of Arts & Science
Dept of Phys 1 - 2 arch Centre Nanja Cetholo Calloys of John & Science: Kaliyaklassias - 529 153	Accounts Officer	Kaliyakkavilai - 629 153. Kanyakumari District, Tamilnodu, indi
The second secon	(To be filled by UGC-DAE CSR)	

Certified that I have satisfied that the conditions on which the grants-in-aid ws sanctioned have been fulfilled/are being fuilfilled and that I have excercised the following checks to see that the money was actually utilised for the purpose for which it

Kinds of Checks exercised.	SIC COLLEGE		
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TAMILNADU COUNCIL FOR SCIENCE AND TECHNOLOGY

(Established by Government of Tamilnadu)

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Prof. Dr. S. Vincent, D.Sc., PhD., MNASc, FNABS, FRSB(Lon) Member Secretary

01.10.2024

Lr.No.TNSCST/SPS 2023-2024/ 3106A /01

To

The Principal Nanjil Catholic College of Arts and Science Kanyakumari-629153

Sir/Madam,

TNSCST - Student Project Scheme (2023-2024) - approval intimation-grant

release- Reg.

With respect to the above scheme, the list of project(s) approved by the State Council is enclosed, along with the terms and conditions. Guides are requested to adhere to these terms and conditions, including the timely submission of the Utilization Certificate (UC) and the seminar paper on or before 25.10.2024.

We trust that your students have successfully completed the project. Please inform the guides to submit the Utilization Certificate and the seminar paper in accordance with the terms and conditions specified in items 5 and 6. Kindly note that the grant will be released only upon receipt of both the UC and the seminar paper. Additionally, provide the institution's bank details (Account holder name, Account Number, IFSC code, and Branch name) to facilitate the transfer of the grant via NEFT. The grant should then be promptly disbursed to the concerned students through their respective guides.

Thanking you,

Yours faithfully

Member Secretary

Encl: a) List of the approved SPS Projects 2023-24

b) Terms & Conditions (T&C)

c) Format of Utilization Certificate (UC)

d) Model Seminar Paper (SP)

## TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE Campus, Chennai- 25

## Student Project Scheme 2023-24

## List of Approved Project(s)

S.No	Guide Name and Institutional Address	Title of the Project	Students Name	Project Code	Head of the Institution	Grant Amount
1	Dr.M.Amalanathan, Associate Professor, Dept. of Physics, Nanjil Catholic College of Arts and Science, Kanyakumari-629153	Identification and analysis of therapeutic targets for SARS-CoV-2 and discovery of potential drugs by experimental and computational methods	Abith. M.S, Ashilin Star. S.L, Lekha R.S	PS-294	The Principal	Rs 7500
				New Colo	Total	Rs 7500

## TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE Campus, Chennai-600 025

### STUDENT PROJECT SCHEME 2023-2024

### Terms and Conditions of the grant

- The project team SHOULD NOT change the topic of the project and should not deviate from the objectives of the sanctioned proposal. In the event of any such changes, sponsoring will be treated as cancelled.
- Every sanctioned project is allotted with a Project code Number. Please refer this number while corresponding with TNSCST.
- The project sanction letter will be sent to the Principal/Registrar/Dean of the institution with a copy to the Project guide.
- The sanctioned completed project's, Utilization Certificate (UC) and seminar paper should be reached to 'The Member Secretary, Tamilnadu State Council for Science and Technology, DOTE Campus, Chennai-600 025' on or before 25<sup>th</sup> October 2024.
- The Utilization Certificate should be signed by the <u>Guide</u>, <u>HOD</u> and <u>Principal/Registrar/Dean</u> with official seal as the case may be.
- 6. For the completed project, 2 pages seminar paper (500 words, Times New Roman, 12 font size, single column, margins left- 2.5cm, right-2cm, top-2cm & bottom- 2cm, 1.5 line space in Word format without any figures, tables & references) should be submitted/uploaded in the council website (https://forms.gle/YYzjWfkSWEGGEcE16) along with a scanned copy of the Utilization Certificate (PDF file) and Institutional Bank account details.
- The institution heads informed to collect all the sanctioned project's the utilization certificate (s), seminar paper and institution bank details and send to the council address at the earliest.
- 8. The seminar paper will be included in the form of <u>Proceedings</u> which will be brought out during Seminar cum Exhibition, only for those who submit the **UC**.
- If the guide wishes to leave the Institution where the project is based, the Institute/guide will
  inform the same to the Council and in consultation with Council, evolve steps to ensure
  successful completion of the project, before relieving the guide.
- The Council reserves the right to order verification/audit of accounts by any Officer authorized by it. The bills and accounts shall be kept safely.
- 11. Students/faculties are encouraged to publish the research papers emerging out of the project work in peer reviewed Journals.
- 12. They should acknowledge the Council in reports and technical/scientific papers publishing based on the research work done under the project.
- 13. If the results of research are to be legally protected by way of patent/copy rights etc. the results should not be published in any form without action being taken to secure legal protection for the research results.
- 14. The state council encourages the students/faculties, who want to protect the results/invention created out of the project by getting patents through its Patent Information Centre free of cost.
- 15. The knowledge generated from the project will be the property of TNSCST and must be appropriately acknowledged. Any transfer of technology developed through the project will be conducted in consultation with the Council.
- 16. The recipient organization shall comply, with such other conditions as may be suggested in the 'guidelines' issued in this regard from time to time.

MEMBER SECRETARY

## TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY DOTE Campus, Chennai - 600 025

### STUDENT PROJECT SCHEME 2023-2024 UTILIZATION CERTIFICATE

(TWO COPIES)

1. Name of the guide and address	ss :			
2. Name of the student(s)				
3. Title of the project				
4. Project code				
It is certified that a su sanctioned by the council fo utilized for the purpose for wh unutilized is refunded.	r carrying out ab	ove mentione		
Signature of the Guide	Signature of the I	IOD	Signature of the Registrar/Principal/Dean with SEAL	

### **ModelPaper**

# Antibiofilm and Antiquorum Sensing Potential of Biosynthesized Silver Nanoparticles from Nutmeg Against MDR Salmonella enterica Serovar Typhi

Duraisamy S
Division of Biological Sciences
Tamil Nadu StateCouncil for Science and Technology
Chennai – 600 025

### Abstract

Globally, Salmonella infection poses a major public health problem. In this study, we report the antibiofilm activity and quorum sensing inhibition of an aqueous extract of nutmeg and biosynthesized silver nanoparticles (AgNPs) against multidrug-resistant (MDR)Salmonella entericaserovarTyphi (S. Typhi) isolated from typhoid patients and asymptomatic carriers. The inhibition of biofilm formation by MDR S. Typhi isolates and the suppression of pigment production in Chromobacterium violaceum demonstrated the quorum-sensing potential of nutmeg. The aqueous nutmeg extract exhibited 87% antibiofilm activity, while the biosynthesized AgNPs showed 99.1% antibiofilm activity. Molecular docking studies further revealed that the bioactive compounds in nutmeg possess anti-quorum sensing properties.

### Introduction

Salmonella species are among the most important pathogens worldwide, exhibiting high morbidity and mortality rates. Following infection, *S.* Typhi colonizes the gallbladder and can remain there long after symptoms have subsided, serving as a reservoir for the further spread of the disease. However, a significant percentage of typhoid infections result in the asymptomatic carriage of *S.* Typhi. Clinical observations among typhoid carriers show that their resistance to antibiotic treatment and the extension of infection to the gallbladder are associated with the biofilm-producing potential of *S.* Typhi. In many typhoid cases, persistence can lead to the formation of biofilms on gallstones in both acute patients and chronic carriers. Typhoidal and non-typhoidal Salmonella biofilms represent a major health problem in industrial, veterinary, and medical settings, as they contribute to the failure of antibiotic treatments and facilitate the development and spread of antibiotic resistance.

### Methodology

In this study, a nutmeg aqueous extract, biosynthesized AgNPs, and MDR *S. Typhi* isolates (NCBI accession numbers KT037135-38, KT037130-34, KT696507, KT696504-06) from asymptomatic typhoid carriers and typhoid patients were used. Potent biofilm-forming MDR *S. Typhi* isolates were evaluated using the Congo red agar, tube adherence, and tissue culture plate methods. The quorum sensing inhibition ability of the nutmeg aqueous extract and biosynthesized AgNPs was determined using a soft agar overlay protocol with *Chromobacteriumviolaceum* (ATCC 12472) as the indicator bacterium. Molecular docking studies of the bioactive compounds of nutmeg were performed against the transcriptional regulatory protein RcsB and the sensor kinase protein RcsC.

### Results

S. Typhi isolates revealed a higher percentage (46%) of biofilm production when identified by the tissue culture plate method compared to the Congo red agar and tube adherence methods. The inhibition of biofilm formation by MDR S. Typhi isolates and the reduction in pigment production by C. violaceum (indicator bacteria) demonstrated the quorum-sensing potential of nutmeg. The aqueous nutmeg extract exhibited 87% antibiofilm activity, while the biosynthesized AgNPs showed 99.1% antibiofilm activity. Molecular docking studies of the bioactive compounds in nutmeg against the transcriptional regulatory protein RcsB and sensor kinase protein RcsC revealed interactions with these target proteins, indicating their anti-quorum sensing potential.

### Conclusion

It is concluded that biosynthesized AgNPs could be used as an effective candidate for treating asymptomatic typhoid carriers or typhoid patients and for controlling the persistence of biofilm-producing *S. Typhi* strains or other pathogenic bacteria in environmental or industrial settings.

Guide: Dr. S. Arjunan, Professor, Division of Biological Sciences, Tamil Nadu State Council for Science and Technology, Chennai – 600 025



### INDIANCOUNCILOFPHILOSOPHICALRESEARCH

DarshanBhawan,36, TughlakabadInstitutionalArea, M.BRoad, New Delhi-110062

### APPLICATIONFORFINANCIALASSISTANCEFORORGANIZINGLECTURE/MAEPROGRAMS

[World Philosophy Day (WPD), Periodic Lecture (PL), Indian Philosophers' Day (IPD), International Day of Yoga (IDY), Buddha Jayanti Lecture (BJL), Mahaveera Jayanti Lecture (MJL), Study Circle Lecture (SCL), Minor Academic Events (MAE), Other Lecture Programmes]

### (PleasePrefertoType-setFilled-inDatainthe Format.)

A

- 1. Application for :Lecture programme on Yoga Philosophy and Practice along with demonstration (If MAE mentions Heading and Sub-heading, IfotherLectureProgrammes,mentiontheHead/TitleoftheLectureProgramme)
- 2. Category: Gen
- 3. (a)PersonalTitle:Mrs.
  - (b) OfficialTitle:Assistant Professor
- 4. Name, Designation & complete Official/Departmental Address of the Applicant/Organizer:

Mrs.S Mary Pelsit, Head and Assistant Professor, Department of social Work, Nanjil catholic college of Arts and Science, Nedumcode, Kaliakkavilai, Kanyakumari District, 629153.

5. Telephone/MobileNo.: 8300177635, 7305392632

E-mailID:mpelsit@gmail.com

(Allcommunications will be made by this EmailID, and Phone No. will be used for urgent communications.)

- 6. (a) Whether the same or any Programme of ICPR was organized by the Same Applicant/Dept.,/ Same Univ.in Last3 Years or not? No
  - (b) If so, whether the mattes of Accounts were Settled or still Pending (If pending provide details )? N/A
- 7. Name and designations of the Invited/Proposed / Speakers or Resource persons and Title of Their Proposed

Presentations/Tasks:(Provide In separate page, if space is insufficient.ProvidetheThemeofPresentationsinDetailinSeparatePages.)

SI. No.	NameoftheResourc e Persons	Affiliation	TitleofLectureorEvent	Tentative Dates of the Programme
01	Dr. Nice Mol	AMO, Naturopathy wing GH, Kuzhithurai.	Health benefits of Yoga	17-06-02024
02	Dr. Archana	Senior Consultant, Marvel Naturecure Hospital, Marthandam.	Best yoga Poses for Beginners	18-06-2024
03	Dr.Bidhu K K	Clinical Psychologist, Yoga Consultant, Trainer, Motivational Speaker,	Breathwork for beginners	19-06-2024
04	Dr,Jayaraj		Yoga Asanas to improve Concentration and Memory: 7 best asanas for students during exams	20-06-2024

(Add abstract/write-up oftheprogramme/eventin separatepages, ifany)

8. Number of Students of the Organizing Department. 36 MSW students, 46 MCOM students

(a)U.G.:

; (b) P.G.:

(c) M.Phil:

; (d) Ph. D:

(e)IftheApplicationisforMAE, providethelistofrequiredstudents.

[B]

- 9. I.EstimateofProposedExpenditureunderDifferentHeads(extralinesmaybeaddedasrequired):
- (a) Honorarium for 4 Resource Persons × Rs. 3000 =Rs. 12000
- (b) Travel Allowance for Resource Person (maximum of Rs.1000 for each Resource Person) = Rs. 4000
- C) Banner, Certificates and Stationery = Rs. 5000
- D) Refreshment and Lunch for 100 Participants = Rs.19000

Total

- (c) II.(a)Financial assistance expected from ICPR: 40000
- (d) Financial assistance from the Concerned Department apart from ICPR Grant:NIL
- (e) TotalAmountrequiredfororganizingtheProgramme:Rs. 40000

[C]

9. Official Bank Details of (theInstitution/Dean/Director/Registrar/Principal/HOD/Coordinatorof the Dept., of the payee'sInstitutionthroughwhichthegrantamountwillbedisbursed,if the application is selected for the grant.

Name of the Account Holder as in the bank account (of Institution / Department or the Designated One, not personal): Nanjil Catholic College of Arts and Science Kaliakkavilai, 629153.

Account No. (Provide, if you are sure of selection of your application):

10270100217857

IFSC: FDRL0001027

Name of the Bank: FEDERAL BANK

Address of the Branch of the Bank: Sivasakthi Building, Inchivilaa, Parasala, 695502.

[D]

#### **UNDERTAKING:**

- 1. I certify that I have gone through all required information and the above-mentioned information is correct to best of my knowledgeand belief.
- 2. Norequiredinformationregardingpreviousandunsettledissue, askedfororrelated, iskepthidden.
- 3. Thebankaccountdetails are authenticand entered here with knowledge of the account holder.
- Thesanctionedamountwillbeutilizedforthepurposeitissanctionedandwithintheperiodforwhichitissanctioned.
- 5. Immediately, after the completion of the event, soft copy of detailed academic reports in both English and Hindi with 2/3photographs (all being kept in a single MS Word file) will be uploaded in the designated link for report in ICPR Website / oremailstobe provided forthepurpose.
- 6. The statement of expenditure along with original Vouchers (with required TDS, GST), completed in all respects, with the print copy of the academic reports (soft copy of which was submitted previously) all self-attested by the organizer, will be submitted to the Councilby post / courierwithinonemonthoftheactualevent/programme.

7. Other Terms and Conditions to be laid down by the Council and stated in Sanction Order will be complied.

S.MaryPelsit / Head

Nameofthe Eggyarding the Incity Work

HoD/Coordination Control of Arts & Science

(Signaturealis Sea) vilai - 629 153, Tamil Nadu.

Signature of the Applicant Organizer with Seal

Department of Social Work
Nanjil Catholic College of Arts & Science
Kaliyakkavilai - 629 153, Tamil Nadu.

NameoftheForwardingAuthority:

Dean/Director/Registrar/Principal

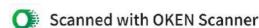
Dr. M. Amalanathan, M.Sc., M.Phil., Ph.D.

(SignatureandSeal)

PRINCIPAL

Nanjil Catholic College of Arts & Science Kaliyakkavilai - 629 153







# भारतीय दार्शनिक अनुसंधान परिषद् (शिक्षा मंत्रालय, भारत सरकार)



#### INDIAN COUNCIL OF PHILOSOPHICAL RESEARCH

(Ministry of Education, Government of India)

F. No. 12-4/2024/P&R/ICPR/30 June 12, 2024

#### SANCTION ORDER

Sanction of the Indian Council of Philosophical Research is hereby conveyed for payment of a grant of Rs. 40,000/- (Rupees forty thousand only) to the Nanjil Catholic College of Arts and Science Kaliakkavilai for disbursement to Mrs. S. Mary Pelsit, Head and Assistant Professor, Department of Social Work, Naniil Catholic College of Arts and Science, nedumcode, Kaliakkavilai, Kanyakumari District - 629153 for organizing programme (s) for the Celebration of International Day of Yoga, 2024.

#### The grant is subject to the following terms and conditions:

- 1. Brief Programme Report in English and Hindi in MS Word format along with 2-3 photos are sent to lecture@icpr.in within 7 days after the programme.
- The sanctioned amount shall be utilized for the purpose for which it has been sanctioned.
- 3. The payee shall exercise reasonable economy in expending the sanctioned amount,
- 4. Regular accounts shall be maintained in respect of expenditure of the sanctioned amount. TDS and GST as applicable may deducted.
- 5. Immediately after the programme is over, the payee shall furnish the detailed statement of expenditure duly supported with original bills/vouchers, latest by one month after the programme. All documents/papers/vouchers must be self-attested, while submitting the account details.
- 6. The payee shall submit a brief report of the programme along with a copy of the script of the Lecture delivered as well as 2/3 photographs with the background of banner/back drop etc.
- 7. All these documents must be sent in original through Speed Post to the Council.
- 8. Apart from conveyance charges, an honorarium of Rs. 3,000/- for each lecture may be paid to the Resource Person/Scholar, who delivers the lecture.
- 9. If the event is not organized before July 31, 2024 the sanctioned amount may be refunded to the Council forthwith via D. D. in favour of 'Indian Council of Philosophical Research, New Delhi'.

The sanctioned amount shall be paid through the Nanjil Catholic College of Arts and Science Kaliakkavilai through Bank Transfer to A/c. No. 10270100217857 6 at Federal Bank, Branch: Sivasakthi Building, Inchivilaa, Parasala. (IFS Code: FDRL0001027).

The expenditure will be met from the budget of the Council for the current financial year and debited to the head of account Group D D-VII F General 2202.80.004.11.00.31 International Yoga Day.

(Authority: Competent Authority approval dated 27.05.2024 on note 9/n).

(Dr. D.K. Jatav) **Programme Officer** 

Director (A&F), ICPR, New Delhi. Copy to:

- 1. Principal, Nanjil Catholic College of Arts and Science, nedumcode, Kaliakkavilai, Kanyakumari District
- 2. Mrs. S. Mary Pelsit, Head and Assistant Professor, Department of Social Work, Nanjil Catholic College of Arts and Science, nedumcode, Kaliakkavilai, Kanyakumari District - 629153 ID: mpelsit@gmail.com, Mb: 8300177635/7305392632

स्वच्छ भारत अभियान (पर्यावरण को स्वच्छ बनाएं)

E-mail: icpr@bol.net.in, icprhqrs@gmail.com Website: http://www.icpr.in

This is DSC Based Payment. PPA generation not applicable

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#### **PFMS Generated DSC Transaction Payment Advice Report**

Agency Name: Indian Council of Philosophical Research (ICPR)-[ICPR]

Debit Bank Name: RESERVE BANK OF INDIA

Bank Account No: 10671201004

Approval date in PFMS: 19-Jun-2024

DSC Signing Date in PFMS: 19-Jun-2024

Amount (in Rs.): 1,280,000.00 (Amount in words: Twelve Lakhs Eighty Thousand

No. Of Beneficiaries: 32

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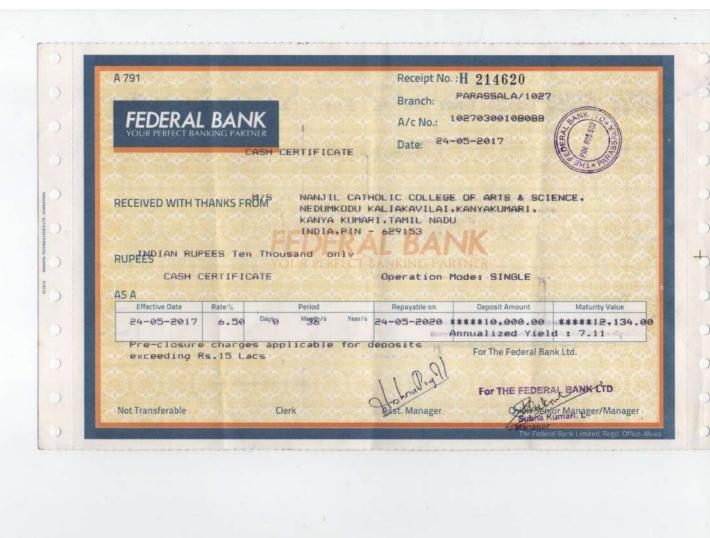
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Designation	Designation -
Mobile No -	Mobile No -

## NANJIL CATHOLIC COLLEGE OF ARTS AND SCIENCE KALIYAKKAVILAI

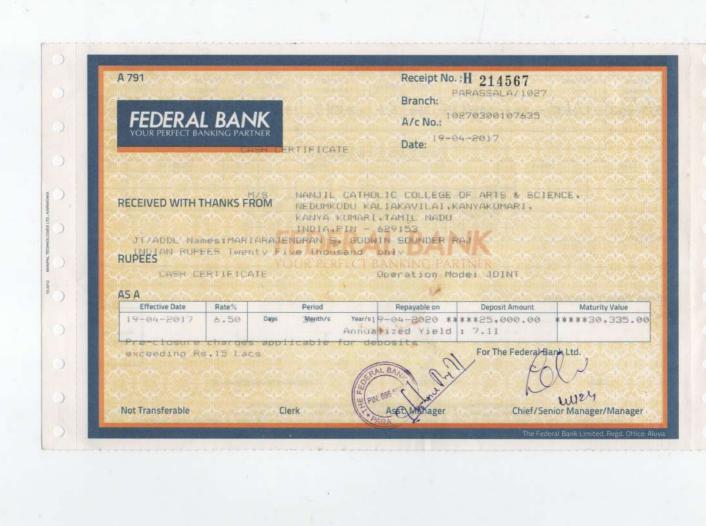
### Endowment-Details of Award received by faculty

Name of the Endowment	Instituted by	Name of the Bank	Account Number	Date	Receipt Number	Amount	Beneficiary
NACCAS Founder SMR Award	Rev. Fr. Dr. S. Maria Rajendran	Federal	10270300107635	19.04.17	214567	25000	Academic Topper in the College
M.S.R.*Award	Dr. C. Arul Mary Thangam	Federal	10270300107668	19.04.17	214570	10000	Academic Topper in PG Commerce
Agnes Memorial Award	Miss. A. Mary Dayana	Federal	10270300107718	19.04.17	214574	15000	Academic Topper in B.Sc. Computer Science
Mani Memorial Award	Dr. M. Sindhu	Federal	10270300107650	19.04.17	214569	10000	Academic Topper in UG Commerce
.ul Durai Nadar Award	Dr. P. Sekhar Ramasubramaniam	Federal	10270300107619	19.04.17	214565	25000	Academic Topper in PG Physics
Augustin Award	Dr. A. Karolin	Federal	10270300107627	19.04.17	214566	25000	Academic Topper in UG and M.Phil. Physics
Nelson Memorial Award	Prof. N. Jose	Federal	10270300107676	19.04.17	214571	10000	Academic Topper in B.Com.(CA)
Arulappan Durai Moni Anthonyammal Award	Dr. A. Sujatha Joice	Federal	10270300107643	19.04.17	214568	10000	Academic Topper in Part-I Tamil
English Language Prize	Dept. of English	Federal	10270300107684	19.04.17	214572	10000	Academic Topper in Part II English
English Literary Award	Dept. of English	Federal	10270300107692	19.04.17	214573	10000	Academic Topper in UG English
sterly English	Dept. of English	Federal	10270300108088		214620	10000	Academic Topper in PG English
Malayalam Rank Holders Award	Mrs.M.Sheenamol Thankamoni	Federal	10270300107726	19.04.17	214576	5000	Rank Holder in Malayalam
Ramanujam Memorial Award	Dept. of Mathematics	Federal	10270300107700	19.04.17	214575	10000	Academic Topper in UG Mathematics
Best Reader Award	Rev. Fr. Dr. S.K. Jose Robinson	Federal	10270300107700	19.04.17	214575	20000	Best Reader Award (for Arts, Science, PG and M.Phil.)
M.E.M Award	Rev. Fr. Dr. M. Eckermens Michael	Federal	10270300124648	12.10.22	24069359	50000	Academic Toppers in UG Male students

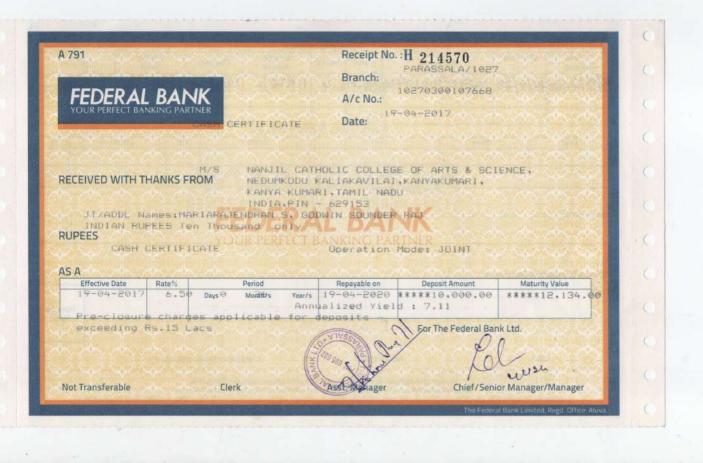
Rev. Fr. Dr. M. ECKERMENS MICHAEL
Secretary M.B.A., Ph.D.
Nonjil Cotholic College of Arts & Science
Kaliyakkavilai - 629 153.
Kanyakumari District, Tamilnadu, India.



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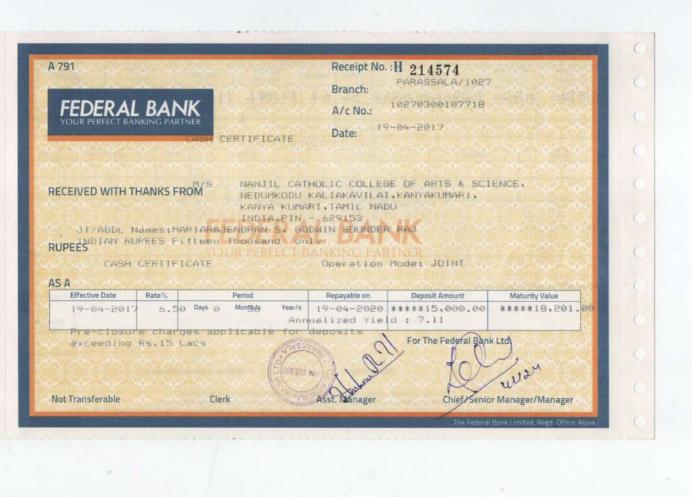


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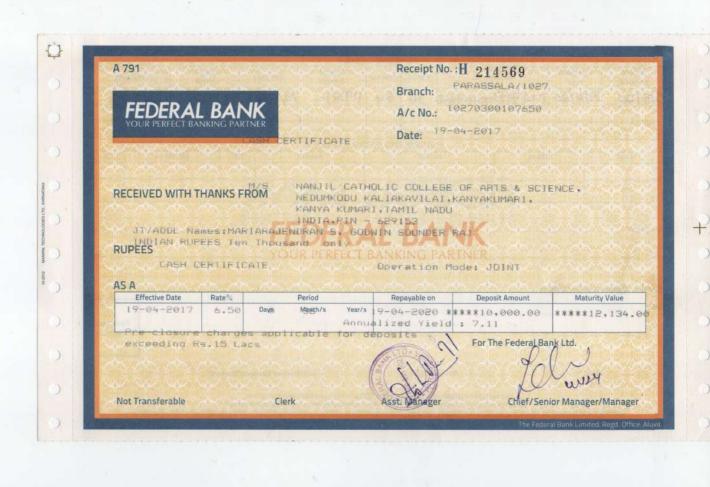
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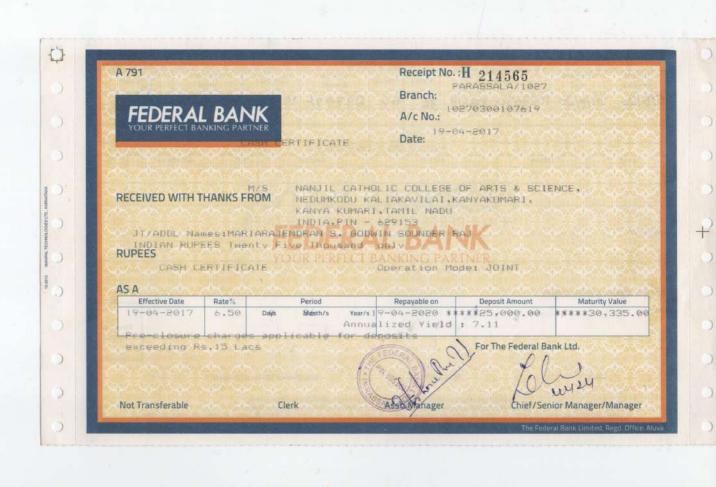


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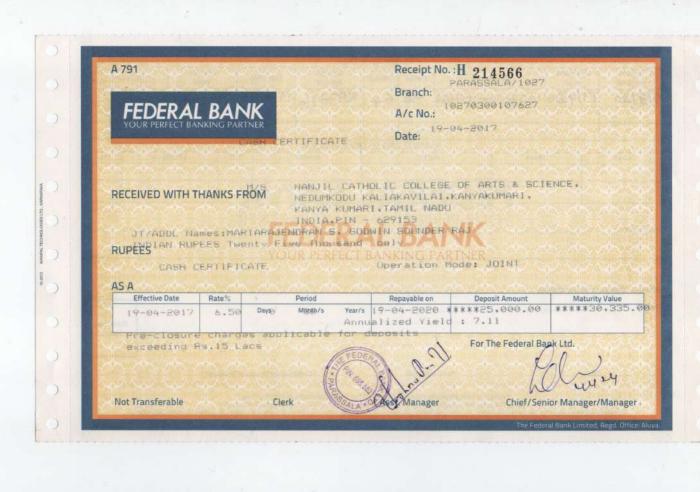
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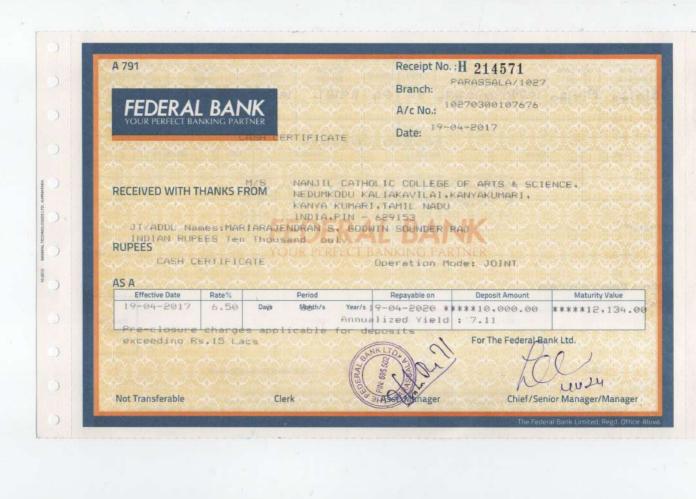
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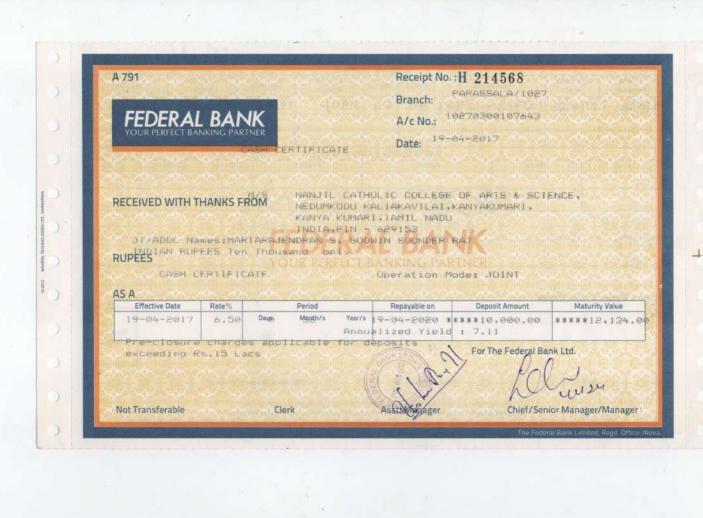


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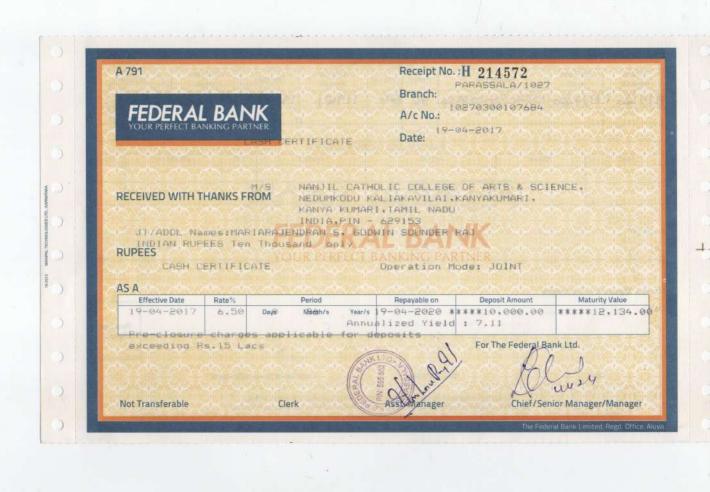
Payment of interest/maturity value is subject to TDS at the rate applicable from time to time.

Tax will be deducted at source unless Form 15H / 15G is submitted for every financial year in advance.

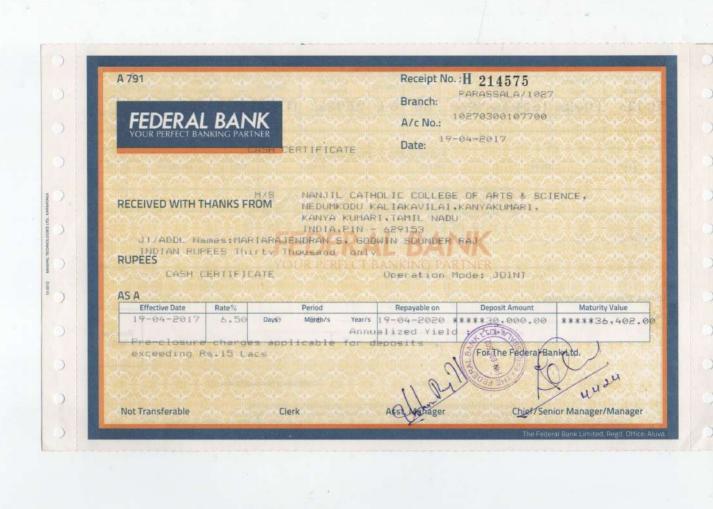
Deposits will be renewed for the identical period at interest rates then applicable as a continuing process until instruction to the contrary is received from the Depositor/s.



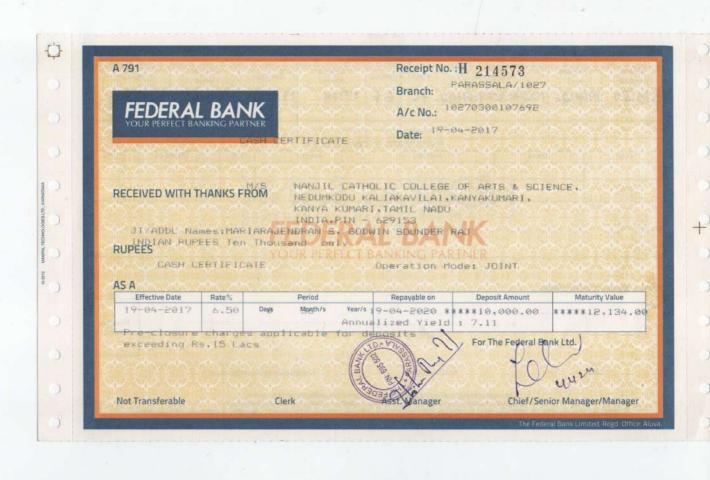
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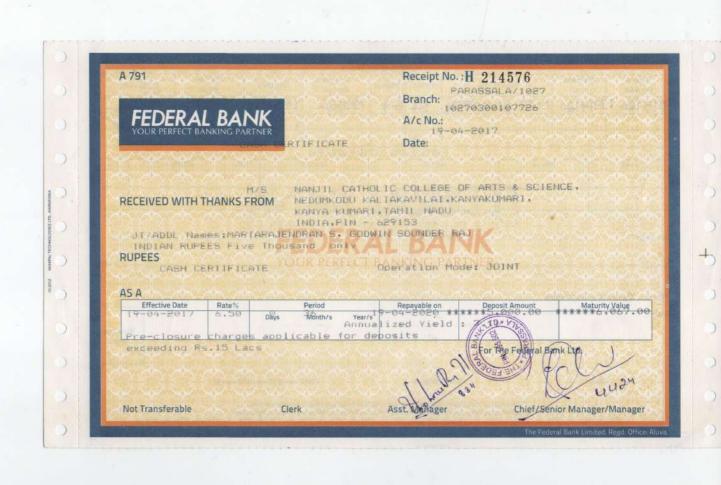
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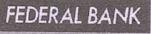
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#### TERM DEPOSIT ADVICE

YOUR PERFECT BANKING PARTNER

Branch : PARASSALA

Name : NANJIL CATHOLIC COLLEGE OF ARTS & SCIENCE

Address: NEDUMKODU KALIAKAVILAI

KANYAKUMARI KANYA KUMARI

TAMIL NADU, INDIA - 629153

Customer ID

: 24069359

A/C No

: 10270300124648

Scheme

: CASH CERTIFICATE

Mode of Operation : JOINT

Minor

: NA

Dear Sir/ Madam,

We are pleased to confirm the details of the following Term Deposit held in your name with us. Thank you for banking with us.

Amount in words: Rupees Fifty Thousand only

Effective Date	Interest Rate (%)	Period	Repayable On	Deposit Value	Maturity Value
12-OCT-2022	6	36 Months 0 Days	12-OCT-2025	50,000.00	59,781.00

Annualized Yield : 6.51%

Nomination

Not-registered

Premature closure penalty not applicable if closed within 90 days of opening/ renewal. All other cases, premature closure penalty applicable.

Payment of interest/ maturity value is subject to extant Tax rules.

Tax will be deducted at source unless Form 15H/ 15G is submitted for every financial year in advance.

Deposits will be renewed for the identical period at interest rates then applicable as a continuing process until instruction to the contrary is received from the deposito

This is a system generated advice and does not require any signature