

**DEPARTMENT OF PHYSICS**  
**UNION CHRISTIAN COLLEGE, ALUVA**

**CERTIFICATE**

This is to certify that this project report entitled “**DYNAMICAL SYMMETRY OF HYDROGEN ATOM**” is an authentic record of project work carried out by Ms **ALEENA ZACHARIA** (Reg.No.SHATMPH001), student of Master of Science in Physics, Department of Physics, Sacred Heart College Chaiakudy, successfully completed under my supervision in the Department of Physics, UC College, Aluva .



Dr.Pramod Dominic



**DEPARTMENT OF PHYSICS NIRMALA COLLEGE,  
MUVATTUPUZHA**



**CERTIFICATE**

This is to certify that this project report entitled "***SYNTHESIS AND PHOTOLUMINICENCE ANALYSIS OF EUROPIUM ACTIVATED CALCIUMTUNGSTATE PHOSPHOR***" is an authentic record of project work carried out by **ANJALY K Ramachandran**, student of master of science in Physics, Department of physics, Sacred Heart College Chalakudy, successfully completed under my supervision in the department of physics, Nirmala College, Muvattupuzha. The contents of this project work have not been presented earlier for the award of any other degree in any other university.

**Dr Dinu Alexander**

*Asst. Professor*

*Dept of Physics*

*Nirmala college*

*Muvattupuzha*



External Examiner **Post Graduate Department of Physics &  
Research Centre  
Sree Krishna College, Guruvayur  
Ariyannur (P. O)  
Thrissur (Dt.)**

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This is to certify that the dissertation entitled “**Glass-free LTCC ceramic for Microwave applications: A literature review**” is an authentic record of the project work done by **AVANI SASI (REG.NO: SHATMPH003)**, IV<sup>th</sup> Semester M.Sc. Physics, Sacred Heart College, Chalakudy under my guidance for partial fulfilment of requirements for the award of degree of Master of Science in Physics in the year 2021.

**Dr. Manu K M**

**Assistant Professor**

**SYNTHESIS AND PHOTOLUMINESCENCE ANALYSIS  
OF TERBIUM ACTIVATED CALCIUM TUNGSTATE PHOSPHOR**

**Project report submitted to the  
UNIVERSITY OF CALICUT**

In partial fulfillment of the requirements for the award of the degree in

**MASTER OF SCIENCE IN PHYSICS**

By

**Chandhana PR**

**Reg.No: SHATMPH004**

**Under the guidance of:**

**Dr. Dinu Alexander**

Dept. of Physics

Nirmala College, Muvattupuzha

**CERTIFIED AS BONAFIDED RESEARCH WORK**

EXTERNAL EXAMINER:

- 1.
- 2.

HEAD OF THE DEPARTMENT:

Department of physics  
Sacred Heart College  
Chalakydy





**Dr. Sibi K. S.**

Assistant Professor and Head  
Department of Physics

**University of Kerala**

Thiruvananthapuram-695034  
sibi@keralauniversity.ac.in

## **CERTIFICATE**

Certified that the work presented in the project work entitled “Neurophysiology of mindfulness meditation on EEG waves” is an authentic record of bonafide research work done by JOMOL JOY, under my guidance and supervision in the Department of Physics, University of Kerala, Thiruvananthapuram 695581 and no part of it has been included in any other thesis submitted previously for the award of any degree. It is also certified that plagiarism checking has been effected using the URKUND software approved by the UGC/University and that no plagiarism has been found in this thesis.

Kariavattom

17/05/2021



**Sibi K S**  
(Guide)

**DEPARTMENT OF PHYSICS**  
**COCHIN COLLEGE, KOOVAPADAM**

**CERTIFICATE**

This is to certify that this project report entitled “**CHARACTERISATION OF BARIUM TITANATE**” is an authentic record of project work carried out by Ms **KEERTHANA RAVINDRAN (Reg.No.SHATMPH006)**, student of Master of Science in Physics, Department of Physics, Sacred Heart College Chalakudy, successfully completed under my supervision in the Department of Physics, Cochin College, Koovapadam. The content of this project has not been included in any other project report submitted previously for the award of any degree.


Submitted by  
**KEERTHANA RAVINDRAN**  
**SHATMPH006**  
Sacred Heart College, Chalakudy

Place

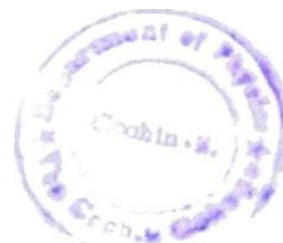
Edappally

Date:

26/08/21

  
Signature of the project guide  
**Dr. MANJUSHA M.V**  
Assistant Professor  
Department of Physics  
THE COCHIN COLLEGE, COCHIN

Dr MANJUSHA M V  
Assistant Professor  
Department Of Physics  
The Cochin College  
Cochin- 682 002



## CERTIFICATE

This is to certify that this project report entitled “**SYNTHESIS AND CHARACTERIZATION OF Fe – DOPED TiO<sub>2</sub> NANOPARTICLES BY SOL-GEL METHOD**” is an authentic record of project work carried out by Ms. Keerthylal K, student of Master of Science in Physics, Department of Physics, Sacred Heart College, Chalakudy, successfully completed under my supervision in the Department of Physics, Nirmala College, Muvattupuzha. The contents of this project work have not been presented earlier for the award of any other degree in any other University.



A handwritten signature in blue ink, appearing to read "Radhu".

Dr. Radhu. S

Assistant Professor

Department of Physics

Nirmala College, Muvattupuzha

# CERTIFICATE

This is to certify that this project report entitled “Determination of orbital parameters and mass of the exoplanet 51 Pegasi b” is an authentic record of project work carried out by Ms. Lakshmi Babu, student of Master of Science in Physics, Department of Physics, Sacred Heart College, Chalakudy successfully completed under my guidance in the Department of Earth and Space Sciences, Indian Institute of Space Science and Technology, Thiruvananthapuram.

*Anand Narayanan*

Dr. ANAND NARAYANAN

Professor, Department of Earth and Space Sciences

Indian Institute of Space Science and Technology, Thiruvananthapuram





**DEPARTMENT OF PHYSICS**  
**COCHIN COLLEGE, KOOVAPADAM**

**CERTIFICATE**

This is to certify that this project work entitled "**CHARACTERISATION OF BISMUTH FERRITE DOPED WITH COPPER**" submitted by **MARIA PAUL**, M.s.c. in physics, 4<sup>th</sup> semester Register no. SHATMPH009, Department of Physics, Sacred Heart College Chalakudy, Calicut University is an authentic work carried out by her under my guidance and supervision. The contents of this project work have not been presented earlier for the award of any other degree in any other university.

Place *Edappally*  
Date *27/8/21*

*Manjusha*

Dr. MANJUSHA M V  
Assistant Professor  
Department of Physics  
The Cochin College  
Cochin 682 002

Assistant Professor

Dept. of Physics

The Cochin College, Koovapadam



**DEPARTMENT OF PHYSICS**  
**COCHIN COLLEGE, KOOVAPADAM**

**CERTIFICATE**

This is to certify that this project report entitled "CHARACTERISATION OF BISMUTH FERRITE DOPED WITH COBALT" is an authentic record of project work carried out by Ms **MIRUTHUSHA MARY** (Reg.No.SHATMPH010), student of Master of Science in physics, Department of physics, Sacred Heart College Chalakudy, successfully completed under my supervision in the department of physics, Cochin College, Koovapadam. The content of this project has not been included in any other project report submitted previously for the award of any degree.

Place: *Edappally*

Date: *26/08/21*

*Manjusha*  
Dr. MANJUSHA M V  
Assistant Professor  
Department Of Physics  
The Cochin College  
Koovapadam 682 202

Assistant Professor

Department of Physics

The Cochin College, Koovapadam





**PG & RESEARCH DEPARTMENT OF  
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**Dr. Sumod S G**  
**Assistant Professor & Research Guide**  
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30<sup>th</sup> August 2021

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## CERTIFICATE

This is to certify that this project report entitled “*TEMPORAL EVOLUTION OF TEC OVER THEVARA IN INDIA*” is an authentic record of project work carried out by **RIYA JOY K** (Reg.No.SHATMPH011), student of Master of Science in Physics, Department of Physics, Sacred Heart College, Chalakudy during the year 2019-‘21 under my guidance in the Department of Physics, Sacred Heart College, Thevara.

Dr. Sumod SG



**Assistant Professor**  
**PG and Research Department of Physics**  
**Sacred Heart College (Autonomous)**  
**Thevara, Kochi - 682013**

## CERTIFICATE

This is to certify that this project report entitled “**SYNTHESIS AND CHARACTERIZATION OF TiO<sub>2</sub> NANOPARTICLES BY SOL-GEL METHOD**” is an authentic record of project work carried out by Ms. Riya Rappai, student of Master of Science in Physics, Department of Physics, Sacred Heart College, Chalakudy, successfully completed under my supervision in the Department of Physics, Nirmala College, Muvattupuzha. The contents of this project work have not been presented earlier for the award of any other degree in any other University.



A handwritten signature in blue ink, appearing to read 'Radhu'.

Dr. Radhu. S  
Assistant Professor  
Department of Physics  
Nirmala College, Muvattupuzha